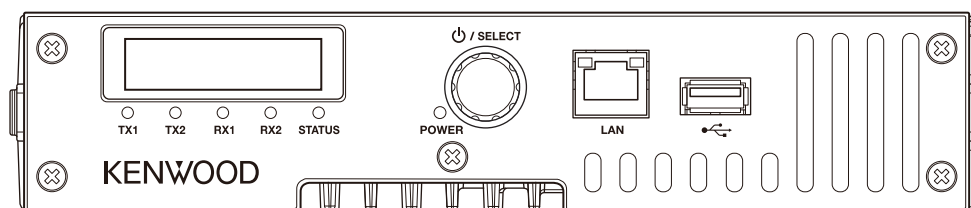


KENWOOD

SERVICE MANUAL

VHF REPEATER

NXR-1700



This service manual is issued for the following reasons.

1. The TX-RX UNIT PCB pattern in the NXR-1700 Service Manual (B5B-7348-00) has been changed.
2. Addition of NXDN Information for Adjustment based on Firmware/FPU Ver2.00 or later version.
3. Addition of Chinese language

出于以下原因发布本维修手册。

1. NXR-1700 维修手册 (B5B-7348-00) 中的 TX-RX 单元 PCB 图案已更改。
2. 添加的 NXDN 调整信息基于固件 /FPU 版本 2.00 或更高版本。
3. 添加了中文

This product complies with the **RoHS** directive for the European market.



This product uses Lead Free solder.

无铅焊接通信产品  
保护环境建伍领先

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Transceivers containing AMBE+2™ Vocoder:

The AMBE+2™ voice coding technology is embedded in the firmware under the license of Digital Voice Systems, Inc.

NOTE

- This equipment should be serviced by only qualified technicians.
- Danger of explosion if the battery is incorrectly replaced; replace only with the same type.
- To dispose of batteries, be sure to comply with the laws and regulations in your country or region.

Service Manual List

Manual number	Model name	Type	Serial number	TX-RX unit number	Remarks
No.RA088<Rev.001>	NXR-1700	E	-	XC1-326E-00 (J7C-0341-10)	First edition
No.RA095<Rev.001>	NXR-1700	E	C3C60208~	XC1-326E-00 (J7C-0341-20)	First edition This service manual

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维修手册列表

手册编号	产品型号	类型	序列号	收发单元号码	备注
No.RA088<Rev.001>	NXR-1700	E	-	XC1-326E-00 (J7C-0341-10)	第一版
No.RA095<Rev.001>	NXR-1700	E	C3C60208 之后	XC1-326E-00 (J7C-0341-20)	第一版 本维修手册

SPECIFICATION

TIA measurement compliant

GENERAL		
Frequency Range		136 ~ 174 MHz
Channel Capacity		32
Channel Spacing	Analog	12.5 / 15 / 25*1 / 30*1 kHz
	Digital	6.25 / 12.5 kHz
PLL Channel Step		2.5 / 3.125 / 5 / 6.25 kHz
Frequency Stability		± 0.5 ppm
Power Supply		10.8 ~ 15.6 V DC
Current Drain	Standby	0.6 A
	Transmitting	12.0 A (Max. power), 9.0 A (25 W)
Operating Temperature		-22°F to +140°F (-30°C to +60°C)
Antenna Impedance		50 Ω
Dimensions (W x H x D)	Projections included	8.44 x 1.73 x 9.56 in (214.5 x 44.0 x 242.9 mm)
	Projections not included	8.21 x 1.73 x 8.33 in (208.5 x 44.0 x 211.5 mm)
Weight (net)		4.18 lbs (1.9 kg)
RECEIVER		
Sensitivity	DMR (5 % BER)	0.22 μV
	DMR (1 % BER)	0.28 μV
	NXDN (3 % BER) 6.25 / 12.5 kHz	0.20 / 0.25 μV
	Analog (12 dB SINAD)	0.25 μV
Selectivity	Analog 12.5 / 25 kHz (TIA603)	77 / 83 dB
	Analog 12.5 / 25 kHz (TIA603E)	50 / 80 dB
FM Hum & Noise	Analog 12.5 / 25 kHz	50 / 55 dB
Intermodulation		80 dB
Spurious Rejection		90 dB
TRANSMITTER		
RF Output Power		50 ~ 1 W (50 W @ 50% Duty, 25 W @ 100 % Duty)
Spurious Emission		-80 dB
FM Hum & Noise	Analog @ 12.5 / 25 kHz	50 / 55 dB
Audio Distortion		1 %
Emission Designator (TIA)		16K0F3E, 11K0F3E, 7K60FXD, 7K60F7D, 7K60FXE, 7K60F7E, 7K60FXW, 7K60F7W, 8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D

Specifications are measured according to applicable standards. Specifications shown are typical.

JVCKENWOOD Corporation reserves the right to change specifications without prior notice or obligation.

*1 25 / 30 kHz in VHF Band excluding T-Band are not included in the models sold in the USA or US territories.

EN measurement compliant

GENERAL		
Frequency Range		136 ~ 174 MHz
Channel Capacity		32
Channel Spacing	Analog	12.5 / 20 / 25 kHz
	Digital	6.25 / 12.5 kHz
PLL Channel Step		2.5 / 3.125 / 5 / 6.25 kHz
Frequency Stability		± 0.5 ppm
Power Supply		10.8 ~ 15.6 V DC
Current Drain	Standby	0.6 A
	Transmitting	12.0 A (Max. power), 9.0 A (25 W)
Operating Temperature		-30°C to +60°C
Antenna Impedance		50 Ω
Dimensions (W x H x D)	Projections included	214.5 x 44.0 x 242.9 mm
	Projections not included	208.5 x 44.0 x 211.5 mm
Weight (net)		1.9 kg
RECEIVER		
Sensitivity	DMR (5 % BER)	-7 dBμV (0.22 μV)
	DMR (1 % BER)	-5 dBμV (0.28 μV)
	NXDN (3 % BER) 6.25 / 12.5 kHz	-8 dBμV (0.20 μV) / -6 dBμV (0.25 μV)
	NXDN (1 % BER) 6.25 / 12.5 kHz	-7 dBμV (0.22 μV) / -5 dBμV (0.28 μV)
	Analog (20 dB SINAD)	-3 dBμV (0.35 μV)
Selectivity	Analog 12.5 / 20 / 25 kHz	74 / 78 / 80 dB
FM Hum & Noise	Analog 12.5 / 20 / 25 kHz	50 / 53 / 55 dB
Intermodulation		72 dB
Spurious Rejection		85 dB
TRANSMITTER		
RF Output Power		50 ~ 1 W (50 W @ 50% Duty, 25 W @ 100 % Duty)
Spurious Emission		-36 dBm < 1 GHz, -30 dBm > 1 GHz
FM Hum & Noise	Analog 12.5 / 20 / 25 kHz	50 / 53 / 55 dB
Audio Distortion		1 %
Emission Designator		16K0F3E, 14K0F2D, 14K0F3E, 12K0F2D, 8K50F3E, 7K50F2D, 8K30F1E, 8K30F1D, 8K30F7W, 7K60FXE, 7K60FXD, 7K60FXW, 7K60F7E, 7K60F7D, 7K60F7W, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D

Specifications are measured according to applicable standards. Specifications shown are typical.
JVCKENWOOD Corporation reserves the right to change specifications without prior notice or obligation.

规格

“符合 TIA 测量标准” 的规格信息只有英文版。

EN 测量标准

通用		
频率范围		136 ~ 174 MHz
信道容量		32
信道间隔	模拟	12.5 / 20 / 25 kHz
	数字	6.25 / 12.5 kHz
PLL 信道步长		2.5 / 3.125 / 5 / 6.25 kHz
频率稳定度		± 0.5 ppm
工作电源电压		10.8 ~ 15.6 V DC
电流消耗	待机时	0.6 A
	发射时	12.0 A (最大功率), 9.0 A (25 W)
工作温度范围		-30 °C to +60 °C
天线阻抗		50 Ω
尺寸 (宽×高×厚)	包括凸起部分	214.5 x 44.0 x 242.9 mm
	不包括凸起部分	208.5 x 44.0 x 211.5 mm
重量 (净重)		1.9 kg
接收		
灵敏度	DMR (5 % 误码率)	-7 dBμV (0.22 μV)
	DMR (1 % 误码率)	-5 dBμV (0.28 μV)
	NXDN (3 % 误码率) 6.25 / 12.5 kHz	-8 dBμV (0.20 μV) / -6 dBμV (0.25 μV)
	NXDN (1 % 误码率) 6.25 / 12.5 kHz	-7 dBμV (0.22 μV) / -5 dBμV (0.28 μV)
	模拟 (20 dB SINAD)	-3 dBμV (0.35 μV)
选择性	模拟 12.5 / 20 / 25 kHz	74 / 78 / 80 dB
剩余调频	模拟 12.5 / 20 / 25 kHz	50 / 53 / 55 dB
互调		72 dB
杂散辐射		85 dB
发射		
发射功率		50 ~ 1 W (工作循环 50% 时 50 W, 工作循环 100% 时 25 W)
杂散辐射		-36 dBm < 1 GHz, -30 dBm > 1 GHz
剩余调频	模拟 12.5 / 20 / 25 kHz	50 / 53 / 55 dB
调制失真		1 %
调制类型		16K0F3E, 14K0F2D, 14K0F3E, 12K0F2D, 8K50F3E, 7K50F2D, 8K30F1E, 8K30F1D, 8K30F7W, 7K60FXE, 7K60FXD, 7K60FXW, 7K60F7E, 7K60F7D, 7K60F7W, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D

规格根据适用的标准测量。所示规格为典型值。

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SECTION 1

PRECAUTION / 预防措施

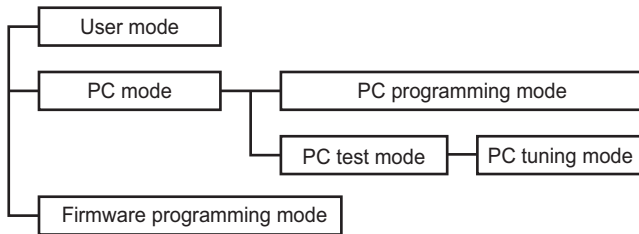
This service manual does not describe PRECAUTION.

SECTION 2

SPECIFIC SERVICE INSTRUCTIONS / 具体的维修说明

2.1 REALIGNMENT

2.1.1 Modes



Mode	Function
User mode	Use this mode for normal operation.
PC mode	Use this mode to make various settings by means of the FPU through the ethernet port.
PC programming mode	Use to communicate with the repeater in read and write the setting data. Some communications will be done at the background on User mode.
PC test mode	Used to check the repeater using the PC. This feature is included in the FPU.
Firmware programming mode	Use when changing/updating the firmware program in the flash memory.

2.1.2 How to Enter Each Mode

Mode	Operation
User mode	Power on.
PC mode	Received commands from PC.
Firmware programming mode	Automatically enter this mode by Web Tool operation.

2.1.3 PC Mode

2.1.3.1 Preface

The repeater is programmed by using a personal computer (PC), an ethernet cable and a Programming software (FPU). The programming software can be used with a PC. Fig.1 shows the setup of a PC for programming.

2.1.3.2 Connection procedure

- (1) Connect the repeater to the PC using the ethernet cable.
- (2) When power is applied, the repeater enters the user mode after completed the startup sequences.
- (3) Depends on the type of communication with PC, the repeater may communicate with keeping user mode, otherwise the repeater may get out from the user mode.

e.g.

Reading FPU data: Keeps the user mode
Writing FPU data: Gets out from the user mode
PC test mode: Gets in Test Mode with "Test Mode" on the OLED display.

Note:

- The FPU data trying to write into the repeater must match the model type and Software option.
- If the USB-LAN adapter is used, the communication may fail. It is recommended to use it via HUB.

2.1.3.3 Ethernet cable description (As PC programming interface cable)

The commercial ethernet cable is required to interface the repeater to the PC.

2.1.3.4 Programming software KPG-D7 (Ver. 2.00 or later) description

The FPU is the programming software for the repeater. This software runs under Windows 10 or 11 on a PC. The data can be created on the PC as new file or edited based on the saved data/the data read from the repeater. The programmed or edited data can be printed out. It is also possible to tune the repeater.

The default IP setting as the factory shipping condition is as follows.

- IP Address: 192.168.0.1
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.0.254

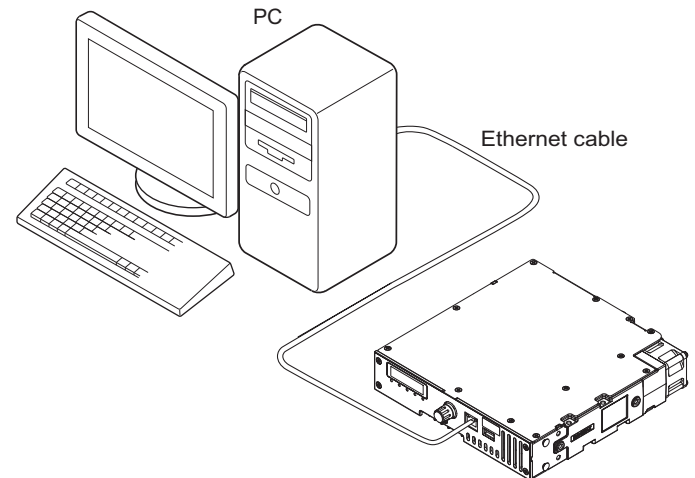


Fig.1

2.1.4 Firmware Programming Mode

2.1.4.1 Preface

The repeater uses flash memory to allow it to be easily upgraded when new features are released in the future.

2.1.4.2 Connection procedure

Connect the repeater to the PC using the ethernet cable.
(Connection is the same as in the PC Mode.)

Note:

You can only program firmware from the ethernet connector on the front panel. Using USB port on the front panel or the CONTROL I/O (D-SUB 25-pin) interface on the rear panel will not work.

2.1.4.3 Programming

- (1) Log in into the repeater by the web tool.

Note:

The webtool is available to be used by connecting to the repeater's Own IP Address with the browser.

The default values as the factory shipping condition are as follows.

- IP settings: (Refer to 2.1.3.4 Programming software KPG-D7 description)
- Log in user: admin
- Log in password: (blank)

The password setting is required for the first access.

- (2) Move/select to Maintenance > System > Firmware Update on the webtool.
- (3) Select the firmware file to be written.
Once the firmware is ready to update, the Update button will become active.
- (4) Press the Update button and follow the message.
When the repeater starts receiving data, "Please wait." is displayed on the Browser. At this time, the display information on the OLED of the repeater will change sequentially then "Firm Updating" is displayed during the writing.
When the firmware updating is successful, the repeater will shut down then restart automatically.
At this time, the web browser will be disconnected automatically too.
- (5) If you want to continue updating the firmware for the other repeaters, repeat steps (1) to (4).

2.2 OPERATING FEATURES

The Error information list is shown below.

Error Information		Error Event / Item Name
Web Tool (Error Code)	OLED Display	
E001	Unprogramming	Unprogramming
E002	USB Overcurrent	USB Overcurrent
E003	TX Freq Blank	TX Frequency Data Blank
E004	ESN Blank	ESN Blank
E005	Firmware Error	Firmware Startup Error
E006	Feature Error	Feature Error
E007	Force FirmProg	Force Firmware Programming Mode
E008	DSP Error 1	DSP Error 1
E009	DSP Error 2	DSP Error 2
E102	HSB LAN Error	Hot Standby LAN Connection Error
E103	Beacon Error	Beacon Sync Disconnect
E201	Fan Error	Fan Error
E202	PWR Sup Error	Power Supply Voltage Error
E204	RX PLL Unlock	RX PLL Unlock
E205	TX PLL Unlock	TX PLL Unlock
E206	HPA Error	Current Consumption (HPA) Error
E207	Drive Temp Error	Temperature (Drive Amp) Error
E208	TX Temp Error	Temperature (TX Block) Error
E209	TCXO Temp Error	Temperature (TCXO) Error
E210	HPA Temp Error	Temperature (HPA) Error
E211	IF IC Error	IF IC Error

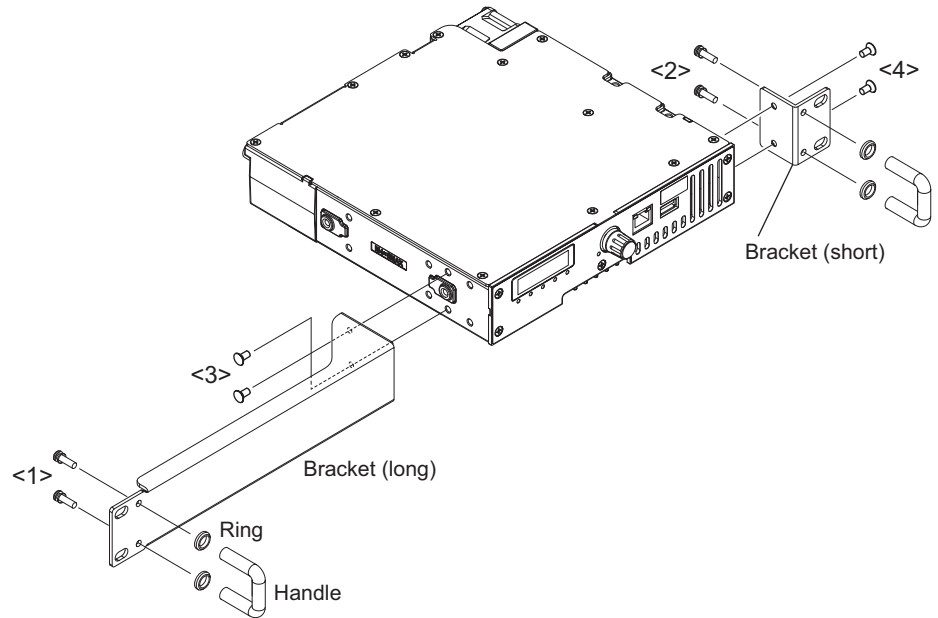
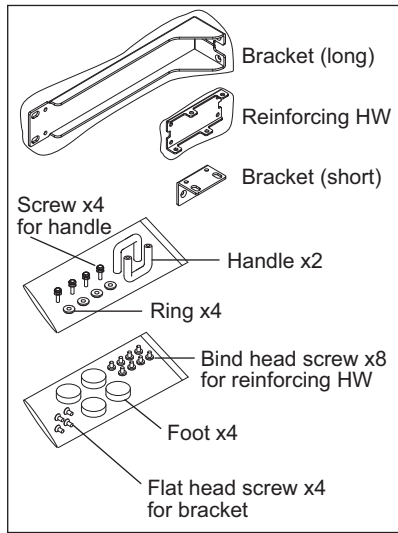
* If the above error code is displayed, refer to "5.2 TROUBLESHOOTING for the error codes".

2.3 INSTALLATION

2.3.1 Rack mounting for one repeater

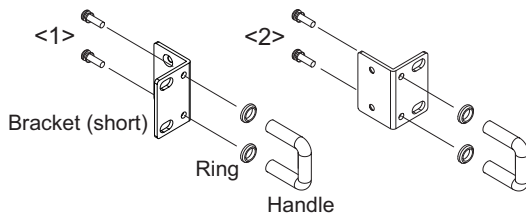
- (1) Assemble two types of brackets with handles. <1> <2>
- (2) Attach two types of brackets with handles to the repeater. <3> <4>
- (3) The bracket long / short can be attached by swapping the left and right.

Accessories for installation

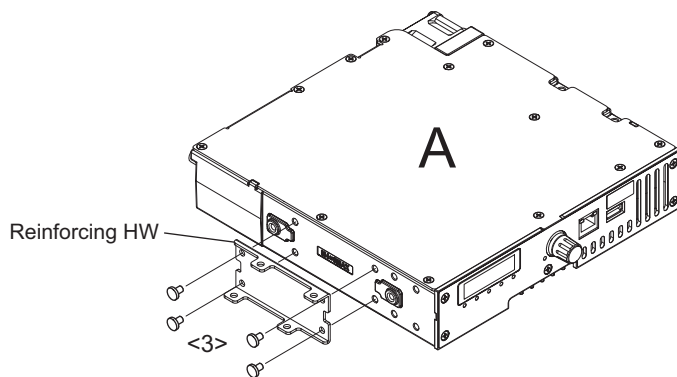


2.3.2 Rack mounting for two repeaters

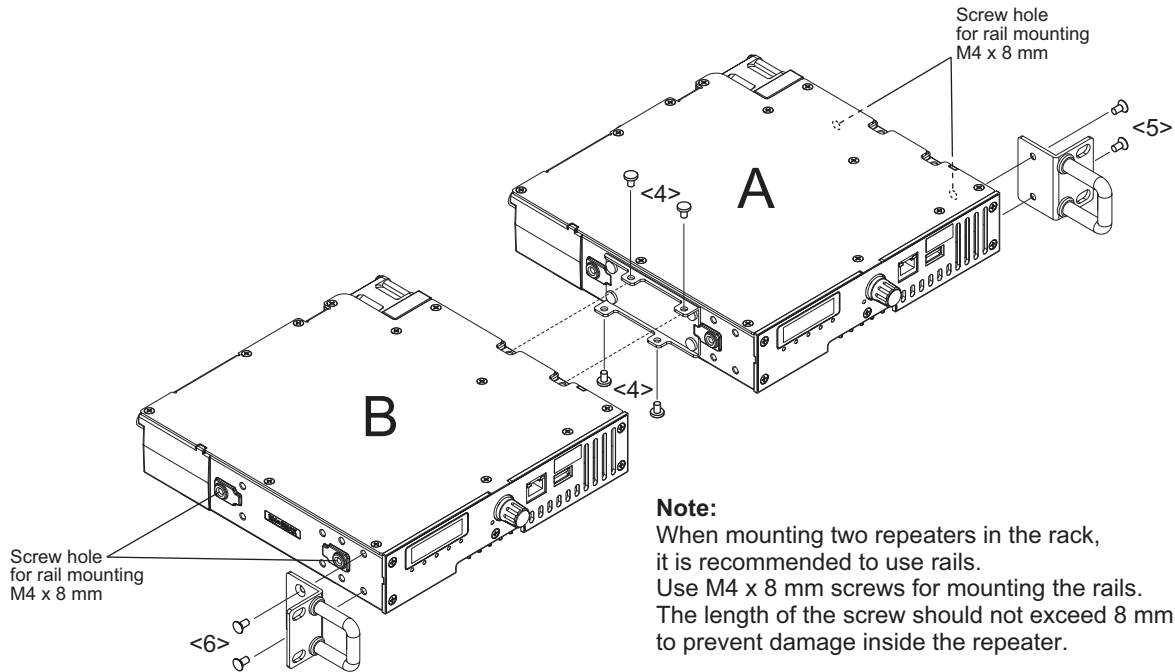
- (1) Assemble two sets of brackets (short) with handles. <1> <2>



- (2) Attach the reinforcing HW to the repeater A. <3>

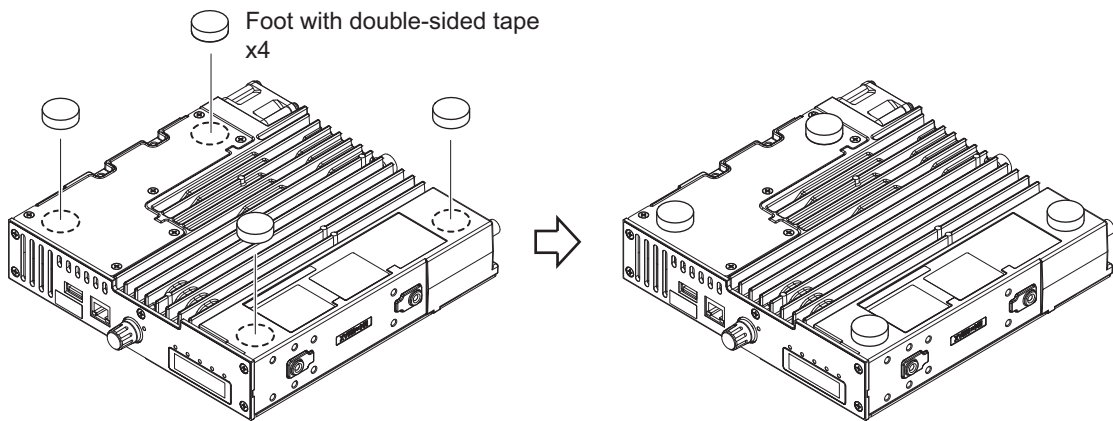


- (3) Connect repeaters A and B with reinforcing HW and fix them with screws. <4>
- (4) Attach two sets of brackets with handles to repeaters A and B. <5> <6>



2.3.3 Attaching the foot to the repeater

Remove the double-sided tape release paper of the foot, then attach the foot to the repeater.



2.4 MODIFICATION

2.4.1 Changing the AUX Port Configuration

The AUX Output Port (pins 14 and 18) on the CONTROL I/O (D-SUB 25-pin) connector is an open collector connection type as default, and this port can absorb a maximum of 200 mA.

The AUX Output Port can be used as the output port for High (5 V pull-up resistor output) and Low by changing the configuration of these pins.

Follow the procedure shown below to change the configuration.

- (1) Remove the board.
- (2) Remove the part from D558 and D560 on the board.
- (3) Mount the resistor (part number: RK73GB2A473J) on R486 and R487 of the board respectively.

Signal name	Connector Pin Number	Removing DA2J101	Installing RK73GB2A473J
AO1	14	D558	R486
AO2	18	D560	R487

2.4.2 Adding the RSSI or Reset Terminal on the CONTROL I/O (D-SUB 25-pin) Connector

The configuration for pin 1 of the CONTROL I/O (D-SUB 25-pin) connector can be changed to allow it to supply the power source for RSSI.

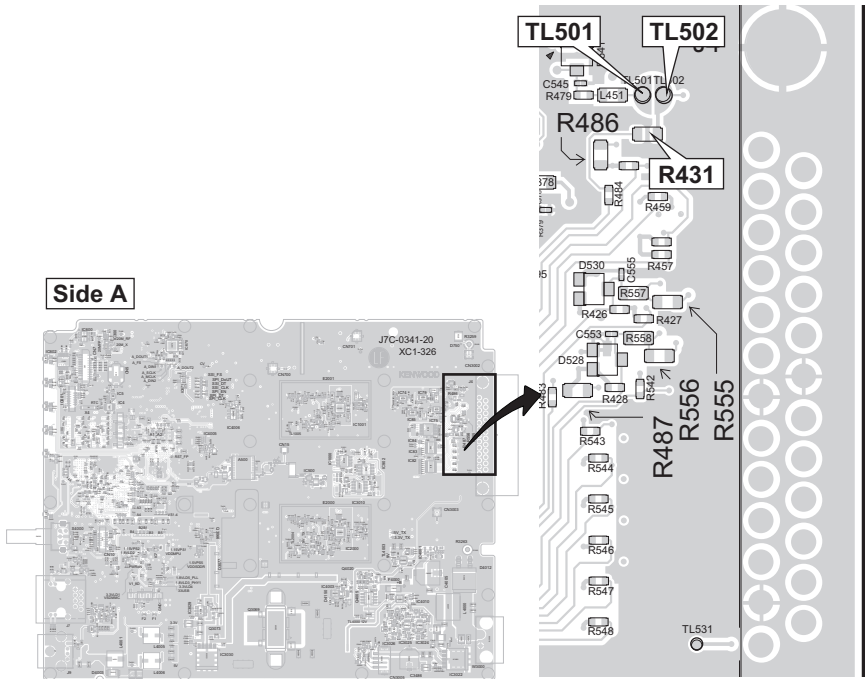
Follow the procedure shown below to change the configuration.

Case 1: Add the RSSI.

- (1)Remove the board.
- (2)Join the circular soldering pads by soldering. (TL501 and TL502)

Case 2: Add the Reset.

- (1)Remove the board.
- (2)Mount the part (part number: RK73GB2A102J) on R431 of the board.



2.4.3 Changing CONTROL I/O (D-SUB 25-pin) connector (pin 4, pin 5) configuration

The AUX Input Port (pins 4 and 5) on the CONTROL I/O (D-SUB 25-pin) connector can be used as the CTS port and RTS port.

Follow the procedure shown below to change the configuration.

- (1) Remove the board.
- (2) Remove the R557 chip jumpers and solder to R555.
- (3) Remove the R558 chip jumpers and solder to R556.

Connector Pin Number	Signal name	Installing RK73GB2A000J	NOTE
4	AI1	R557	Default
	CTS	R555	RS-232C
5	AI2	R558	Default
	RTS	R556	RS-232C

2.5.3 Receiver System

2.5.3.1 RF circuit

The receive signal from RX ANT is amplified by a RF amplifier (LNA: IC703) and passes through the variable capacitor tuned band-pass filters (BPF) to attenuate unwanted signals. The signal passing the band-pass filters (BPF) is heterodyned by the first mixer (RX 1st MIX: IC702) with the first local oscillator signal from the RX PLL frequency synthesizer circuit to produce a 45.00 MHz first intermediate frequency signal (first IF signal).

2.5.3.2 IF circuit

The first IF signal is amplified by a first IF amplifier (IF AMP: IC701) and is passed through a four-pole monolithic crystal filter (MCF: XF700) to reject adjacent channel signal. The filtered first IF signal is amplified by the first IF amplifiers (IF AMP: Q701 and Q700) and fed to the IF system IC (IF IC: IC700). The IF system IC provides a second mixer, second PLL, AGC, and A/D converter. Second mixer mixes the first IF signal with the 42.6MHz of second local oscillator (2nd VCO) output and produces the second IF 2.4MHz signal. The second IF signal is then fed into an A/D converter and generates the I and Q data. This data is in the form of SSI (Serial Synchronous Interface) and fed to the DSP built into the MPU/DSP (IC33) via FPGA (IC60).

2.5.3.3 RX Audio circuit

Audio processing (high-pass filter, low-pass filter, de-emphasized and so on) in Analog FM mode and decoding in Digital mode are processed by MPU/DSP (IC33). SSI signal from MPU/DSP is converted to audio signal by CODEC ICs (IC42, IC670).

In "Repeat" mode, the detected audio signal is converted to the modulation signal for TX VCO and TX PLL. It is fed to "VCO_MOD" terminal of TX VCO from CODEC (IC670), and also fed to "PLL_MOD" terminal of TX PLL (IC2000) from FPGA (IC60). At the same time, the detected RX audio signal can be monitored by USB Headset Speaker-Microphone from USB connector (J9).

In "Duplex/Simplex" mode (except DMR), the detected RX audio signal can be monitored only by USB Headset Speaker-Microphone. Also, the detected RX audio signal is fed to RA terminal and RD terminal in CONTROL I/O connector (D-SUB 25-pin J4) from CODEC (IC42).

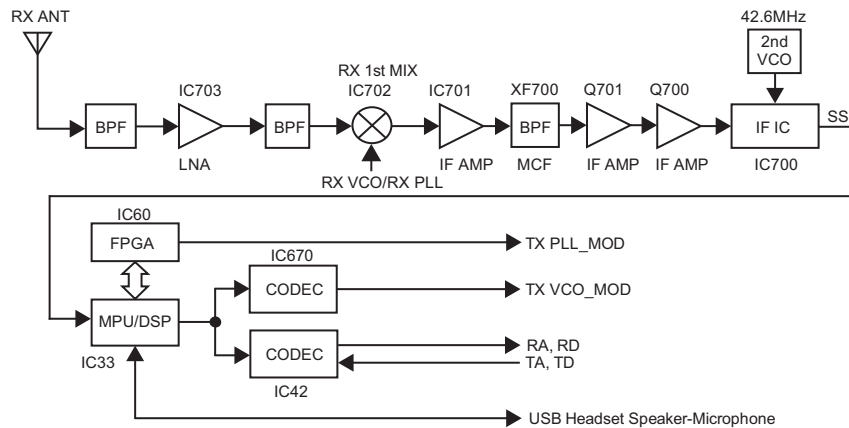


Fig.2 Receiver system

2.5.4 Transmitter System

2.5.4.1 TX Audio circuit

In "Repeat" mode, the detected RX audio signal is converted to the TX modulation signal. Refer to "2.5.3.3 RX Audio circuit".

In "Duplex/Simplex" mode (except DMR), the voice signal from USB Headset Speaker-Microphone can be modulated for transmission. It is fed to MPU/DSP (IC33) and is converted to the modulation signal for TX VCO and TX PLL. It is transferred to "VCO_MOD" terminal of TX VCO from CODEC (IC670), and also transferred to "PLL_MOD" terminal of TX PLL (IC2000) from FPGA (IC60). Also, the signal from TA terminal and TD terminal in CONTROL I/O connector (D-SUB 25-pin J4) can be modulated when transmit by external PTT switch in CONTROL I/O connector (J4).

2.5.4.2 Baseband circuit

The audio signal is processed by MPU/DSP (IC33). Voice signals of 300Hz or lower and frequencies of 3kHz or higher are cut off and an audio range 300Hz to 3kHz is extracted. The audio signal is filtering processed then synthesized with the signals, such as QT and DQT, as required, and is transferred to TX PLL Frequency Synthesizer block.

In Digital mode, the audio signal is converted to the 4-Level FSK baseband signal and is transferred to TX PLL Frequency Synthesizer block. The output level is fine-adjusted according to each modulation system.

2.5.4.3 Drive and Final amplifier

The signal from the TX PLL frequency synthesizer circuit is amplified by pre-drive amplifier (PRE DRV AMP: IC3023). The output signal of the pre-drive amplifier is amplified by the drive amplifier (DRV AMP: Q3065) and final amplifier (FINAL AMP: Q3069) to 50W. The signal amplified by final stage Q3069 passes through CM coupler circuit and harmonic filter (LPF) circuit, then it is fed to the TX ANT.

2.5.4.4 CM Coupler circuit

CM coupler circuit is a line for detecting forward wave and reflected wave. Forward wave is detected by IC3027 and is converted into DC voltage. If an abnormal antenna load is connected, reflected wave is detected by D3081 and converted into DC voltage.

2.5.4.5 Filter circuit

This circuit removes harmonics from the transmitter output and sends filtered signal to the antenna.

2.5.4.6 APC circuit

The automatic transmission power control (APC) circuit stabilizes the transmitter output power at a pre-determined level. The forward RF signal from CM coupler circuit is detected to FWD DC voltage by PA control (PA CTL: IC3027) and fed to DC amplifier (DC AMP: IC3026 (2/2)). DC amplifier (DC AMP: IC3026 (2/2)) compares the APC control voltage generated by D/A converter (DAC: IC78) and FWD DC voltage from PA control (PA CTL: IC3027) to control the gate bias voltage for the drive amplifier (DRV AMP: Q3065) and final amplifier (FINAL AMP: Q3069).

2.5.4.7 High temperature detector circuit

To prevent thermal destruction of the final amplifier (FINAL AMP: Q3069) or the components on the low-pass filter (LPF), this circuit reduces the APC control voltage when temperature rises. The MPU/DSP (IC33) detects the temperature with the thermistor (TH3001) for final amplifier (Q3069) and the thermistor (TH3000) for low-pass filter and controls the APC voltage.

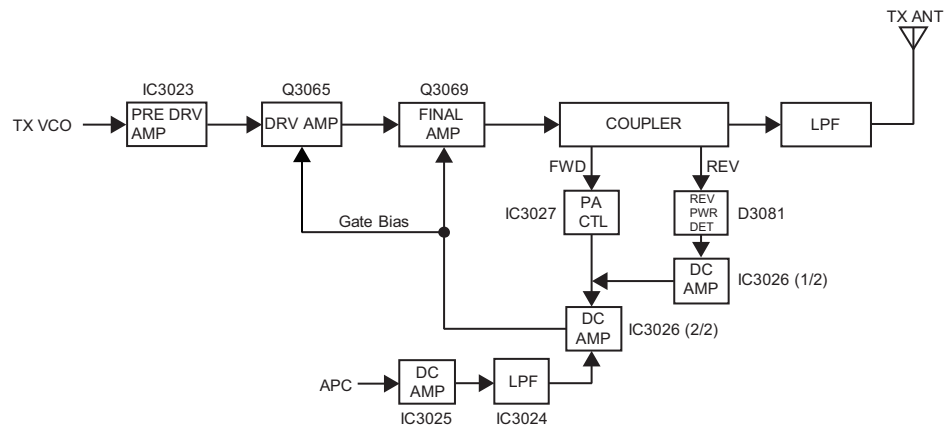


Fig.3 Transmitter system

2.5.5 PLL Frequency Synthesizer System

This model has independent two PLL systems, RX VCO/ RX PLL and TX VCO/ TX PLL.

2.5.5.1 TCXO (X900)

TCXO (X900) generates a common reference frequency of 20.0MHz for the two PLL frequency synthesizers. The reference signal is buffered by IC900 and IC901, and distributed to RX PLL (IC1001), TX PLL (IC2000), IF IC (IC700), MPU/DSP (IC33) and FPGA (IC60). The frequency adjustment is achieved by adjusting a D/A converter (DAC: IC78) output in the voltage of the control terminal of TCXO.

2.5.5.2 RX VCO/ RX PLL

2.5.5.2.1 VCO circuit

RX VCO consists of two VCOs, RX_L VCO and RX_H VCO.

RX_L VCO and RX_H VCO are switched by DC switches (DC SW: Q1002 and Q1003), according to the operating frequency.

RX VCO generates the 1st local signal for the receiver and the frequency range is 181 to 219MHz.

RX_L VCO (Q1004) oscillation frequency range is 181MHz to 200MHz, and RX_H VCO (Q1005) is 200MHz to 219MHz. The voltage control terminal "CV" is controlled by RX PLL (IC1001), and the voltage control terminal "ASSIST" is controlled by D/A converter (DAC: IC78).

2.5.5.2.2 PLL circuit

RX PLL (IC1001) compares the difference in phases of the VCO oscillation signal and the TCXO reference frequency. And it returns the difference voltage to the VCO CV terminal and realizes the "Phase Locked Loop". This allows the VCO oscillation frequency to accurately match (lock) the desired frequency.

When the frequency is controlled by the PLL, the frequency convergence time increases as the frequency difference increases when the set frequency is changed. To supplement this, the MPU/DSP (IC33) is used before control by the PLL to bring the VCO oscillation frequency close to the desired frequency. As a result, the VCO CV voltage does not change and is always stable at approximate 2.5V. The desired frequency is set for the PLL by the FPGA (IC60) through the 3-line "DT", "CLK", "/CS" serial bus for PLL. MPU/DSP monitors through the "RX_LO1_LOCK", whether the PLL is locked or not. If the VCO does not lock to desired frequency (unlock), the "RX_LO1_LOCK" logic is low.

2.5.5.3 TX VCO/ TX PLL

2.5.5.3.1 VCO circuit

TX VCO consists of two VCOs, TX_L VCO and TX_H VCO.

TX_L VCO and TX_H VCO are switched by DC switches (DC SW: Q2008 and Q2009), according to the operating frequency.

TX VCO generates the carrier for the transmitter and the frequency range is 136 to 174MHz.

TX_L VCO (Q2003) oscillation frequency range is 136MHz to 155MHz, and TX_H VCO (Q2007) is 155MHz to 174MHz. The voltage control terminal "CV" is controlled by TX PLL (IC2000), and the voltage control terminal "ASSIST" is controlled by D/A converter (DAC: IC78).

Note:

In the default condition, TX VCO stand by at a frequency a few kHz off the channel operating frequency while not transmitting.

The reason is that the nearby radios can be BUSY by radiated or conducted spurious of TX VCO, even though the repeater is not transmitting. This function "Standby on Transmit Frequency" is FPU selectable.

2.5.5.3.2 PLL circuit

The circuit of TX PLL (IC2000) is basically same as RX PLL.

For the modulation input terminal "VCO_MOD" of TX VCO, the output frequency changes according to the applied voltage. This is used to modulate the TX VCO.

The modulation input terminal "PLL_MOD" of the TX PLL (IC2000), is used to modulate the TX VCO output. The modulation data is generated by the FPGA (IC60).

2.5.6 Control Circuit

The control circuit mainly consists of MPU/DSP (IC33) and FPGA (IC60) and their peripheral circuits. Furthermore, IC33 is composed of an ARM processor based on ARM Cortex-A15 and a DSP based on C66x.

Their main tasks are as follows.

- (1) The MPU manages the operation of the Repeater and the external interface.
- (2) The DSP manages the transmit/receive data.
- (3) The FPGA manages the power supply of the Repeater and exchanges the transmit/receive data between the DSP and the RF section.

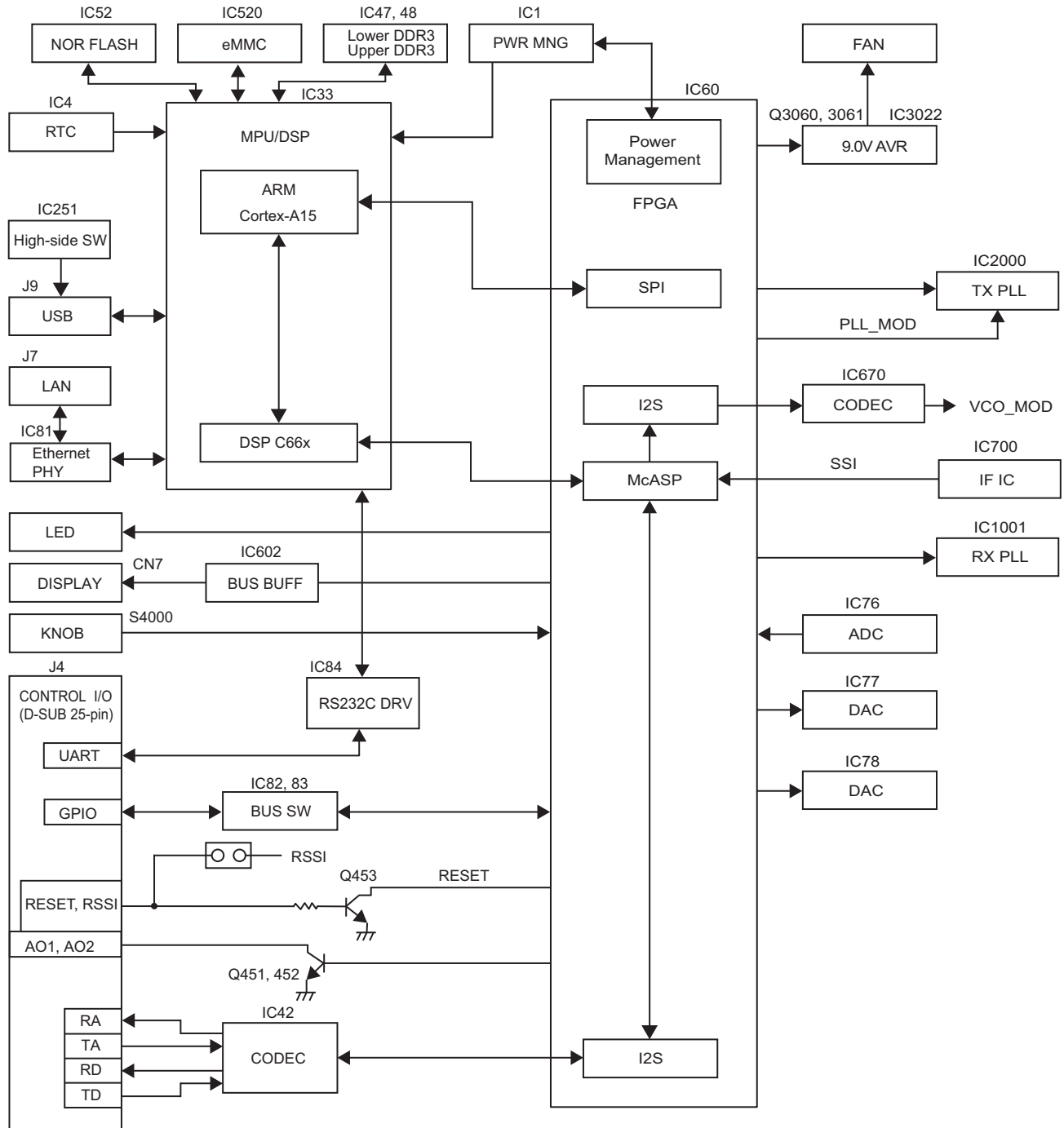


Fig.4 Control circuit

2.5.6.1 MPU/DSP

2.5.6.1.1 MPU

The MPU/DSP (IC33) consist of ARM Cortex-A15 RISC processor and floating-point VLIW DSP, and equipped with peripheral function. This MPU operates at 1.4GHz clock and power supply voltage is controlled by the power management IC (PWR MNG: IC1). The MPU/DSP controls the flash memory, DDR3, eMMC, FPGA, and various control circuits.

2.5.6.1.2 DSP

The DSP circuit consists of the MPU/DSP (IC33) and processes the baseband signal. The DSP operates at 750MHz clock, the I/O section operates at 3.3V and power supply voltage is controlled by the power management IC (PWR MNG: IC1).

The DSP performs the following processes:

- Digital processing
 - 4-Level FSK and Baseband filter processing
 - Vocoder processing between audio codecs, USB audio, audio over IP and modulation/demodulation
 - CAI processing, such as error correction encoding/decoding and interleaving
 - AFC loop control
 - Frame synchronization and Time tracking
- Analog FM processing
 - Pre-emphasis/De-emphasis
 - QT/DQT encoding/decoding
- Audio or Modulation function
 - Audio AGC processing for USB microphone
 - Audio soft mute processing
 - Modulation level processing
 - Squelch filtering
- Other function
 - Courtesy tone
 - Repeater operating
 - Analog/Digital mixed mode
 - Voting pilot tone
 - CWID

2.5.6.2 RTC (Real-time clock) circuit

The clock function is based on a real-time clock IC (RTC: IC4) and 32.768kHz crystal resonator (X4). When the power supply is off, it is backed up by an internal secondary lithium battery.

2.5.6.3 FPGA circuit

The FPGA circuit consists of a FPGA (IC60). The FPGA operates on an external clock of 20MHz, and the I/O section and the core section operates at 3.3V.

The FPGA performs the following processes:

- (1) Interface between MPU/DSP and various devices
(IF_IC, PLL_IC, LED, CODEC_IC, OLED, ADC/DAC, D-SUB 25-pin, KNOB, and FAN)
- (2) Control of various power enable
- (3) Power sequence control

2.5.6.4 Memory circuit

This repeater consist of three types of memory IC.

The MPU/DSP (IC33) control DDR3 memories (Lower DDR3: IC47, Upper DDR3: IC48), Serial NOR Flash memory (NOR FLASH: IC52) and eMMC (IC520).

2.5.6.4.1 DDR3 memory

IC47 and IC48 are 4G-bits DDR3 SDRAM, organized as 32M x 16bits x 8banks. DDR3 memory is used for work memory for program execution of the MPU/DSP. The DDR3 memory operates at 666MHz.

2.5.6.4.2 Serial NOR Flash memory

Serial NOR Flash memory has SPI interface controlled by the MPU/DSP.

IC52 is 128M bits Serial NOR Flash memory that used for boot program memory of the MPU/DSP.

2.5.6.4.3 eMMC

IC520 is 8G byte eMMC.

The eMMC (IC520) has High Speed JC64 DDR interface controlled by the MPU/DSP.

The eMMC (IC520) contains all the programs and data (including tuning data) for the MPU/DSP.

2.5.6.5 ADC, DAC circuit

The ADC/DAC circuit consists of an ADC (IC76) and DAC (IC77 and IC78).

The ADC/DAC performs the following processes:

DAC: Conversion of various RF control voltages from digital to analog.

ADC: Conversion of power supply voltage and various temperatures from analog to digital.

2.5.6.6 LAN

This repeater is equipped with a 100Base-TX or 10Base-T LAN interface.

This circuit consists of IC81 and J7. IC81 is a Ethernet PHY and J7 is LAN connector.

Ethernet PHY (LAN PHY: IC81) is controlled by MPU/DSP (IC33), and the MAC address is saved in eMMC (IC520).

2.5.6.7 OLED Display interface circuit

This repeater has a 1.7inch (128 x 32 resolution) OLED display.

The OLED display is controlled from the MPU/DSP (IC33) via the FPGA (IC60) using the SPI interface.

The SPI signal output from the FPGA enters the buffer IC (BUS BUFF: IC602), where waveform shaping is performed and transferred to the OLED display. CN7 is an interface connector for connecting the flexible cable of the OLED display module.

2.5.6.8 USB

This repeater has a USB host function and supports USB 2.0. This circuit consists of IC33, J9 and IC251.

IC33 is a MPU/DSP equipped with a USB controller function. J9 is a USB-A connector on the front panel.

The USB bus power supply uses the High side switch (High-side SW: IC251) for overcurrent detection.

The USB host feature is for connecting USB headset speaker-microphone, allowing to monitor the received audio or communicate with the radio in the system.

2.5.6.9 CONTROL I/O interface (D-SUB 25-pin) circuit

The CONTROL I/O works for the interface between the various external equipment and the repeater.

The circuit consists of a CONTROL I/O connector (D-SUB 25-pin J4), level shifter (BUS SW: IC82 and IC83), RS-232C driver (RS232C DRV: IC84), and DC switch (DC SW: Q451 and Q452).

For more detail information such as the terminal specification and the function, please refer to "2.7.4 CONTROL I/O D-SUB 25-pin CONNECTOR".

2.5.6.10 Knob

The knob on the front panel is a Rotary encoder type with Push switch, and it is used for the following:

- (1) Turn on the power by pressing and holding knob.
- (2) Select a menu by turning knob and determine the menu by pressing knob.

2.5.6.11 FAN control circuit

The FAN control circuit consists of a voltage regulator (9.0V AVR: IC3022) and FET (Q3060 and Q3061).

The circuit performs the following processes:

- (1) Switching FAN ON and OFF.
- (2) Switching between high speed and low speed of FAN rotation speed by controlling PWM.
- (3) Detect FAN failure.

They are controlled by FPGA. And the FAN is turned ON, OFF, high speed of FAN rotation speed or low speed of FAN rotation speed according to temperature.

2.5.7 Power Supply Circuit

[+ B] is directly connected to the final amplifier (FINAL AMP: Q3069), 9.0V AVR (IC3022), and 9.0V AVR (IC3030).

It is also connected to a 10V AVR (IC600) via a DC SW (IC4010) and to a 9.0V AVR (IC4001) and 3.3V, 5.0V DC/DC (IC4000) via a fuse (F4000).

The output of the 9.0V AVR (IC3030) is controlled by the DC SW (Q3073) and supplies 9V to the transmitter as [9V_2]. And [5V_2] is supplied to the transmitter via the 5.0V AVR (IC3029).

The 9.0V AVR (IC4001) supplies [9V] to the RX VCO block and TX VCO block by turning on the DC SW (Q4006). 9V to the TX VCO block is controlled by the DC SW (Q4008).

And IC4001 supplies to the receive 5V block via 5.0V AVR (IC4006).

The 3.3V output of 3.3V, 5.0V DC/DC (IC4000) is supplied to the following circuits.

- TX PLL (IC2000)
- MPU/DSP (IC33) turned on by DC SW (Q3) via fuse (F1)
- Serial NOR FLASH (IC52)
- eMMC (IC520)
- Ethernet PHY (IC81) turned on by DC SW (Q2) via fuse (F2)
- LAN connector (J7)

Furthermore, 3.3V output is also supplied to the following control system blocks.

- Power management IC (PWR MNG: IC1) for MPU/DSP (IC33)
- Terminal power supply for DDR3 (IC47, IC48, IC301)
- FPGA (IC65)
- ADC (IC76) etc.

And the 5V output of 3.3V, 5.0V DC/DC (IC4000) is supplied to the following circuits.

- TX PLL (IC2000)
- 20V DC/DC (IC3011)
- 3.3V AVR (IC671)
- USB High-Side SW (IC251)
- 3.1V AVR (IC5) and the control system block
- 3.3V AVR (IC4005) and the receive 3.3V block

The power management IC (PWR MNG: IC1) is a dedicated IC for MPU/DSP (IC33) and supplies the various power required by IC33: ([V3_3USB], [VSDMMC], [V1_8PHY2], [V1_8PHY1], [V1_8PLL] / [V1_8PLLA] / [V1_8PLLB], [VDD_MPU], [1.15V_SMPS2], [1.06V_SMPS3], [V1_8D], [VDDS_DDR])

When the power is turned on, IC4010 monitors [+ B] and if it is 17.4V or higher, Q4005 and IC4000 will not turn on, so the repeater will not start.

When [+B] is 17.4V or less, the [MAIN_SHDN] signal becomes Hi and Q4005, IC4000 is turned on, so the repeater will start.

The FPGA (IC60) then turns on power management IC (PWR MNG: IC1) with the [ENABLE_PMIC] signal and supplies power to MPU/DSP (IC33). Next, turn on each power supply of the RF circuit blocks by [5V_TX_EN], [5V_RX_EN], [LNA_ON], [10V_TX_EN]. These are performed by command instructions from the MPU/DSP.

When [+ B] becomes 8.2V or less, BINT detector (BINT DET: IC300) generates Lo level interrupt signal [BINTS] / [BINTF] to MPU/DSP (IC33) and FPGA (IC60), and the shutdown operation is started.

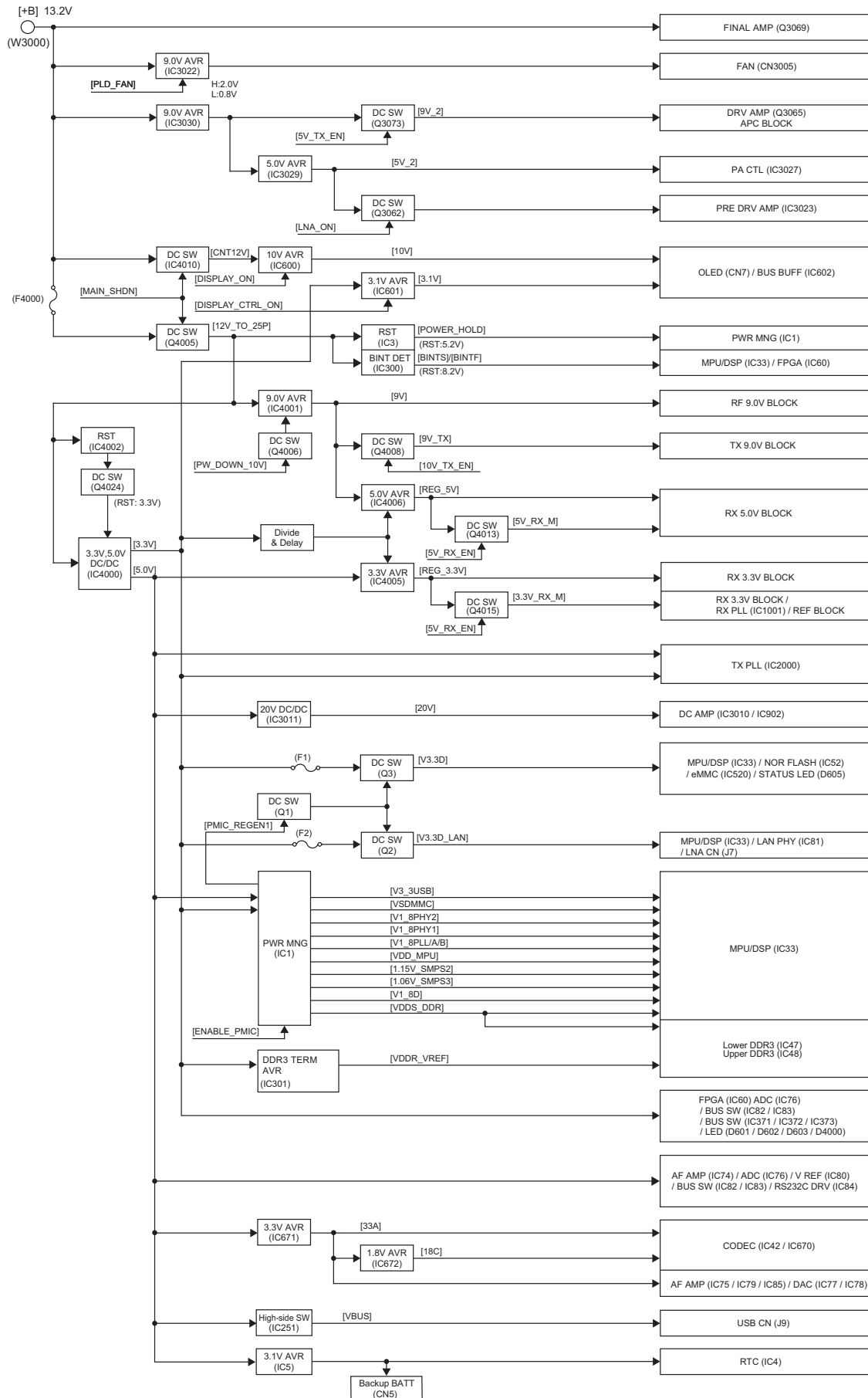


Fig.5 Power supply circuit

2.6 COMPONENTS DESCRIPTION

TX-RX UNIT (XC1-326E-00)

Ref. No.	Part Name	Use / Function
IC1	IC	Power management [PWR MNG]
IC2	IC	Voltage control [V CTL]
IC3	IC	Reset (PM IC_POWER_HOLD) [RST]
IC4	IC	Real-time clock IC [RTC]
IC5	IC	Voltage regulator (3.1V) [3.1 AVR]
IC6	IC	CLK buffer [CLK BUFF]
IC7	IC	AND gate [AND]
IC8	IC	Bus buffer [BUS BUFF]
IC33	IC	MPU/DSP
IC42	IC	CODEC
IC47	IC	Lower [DDR3]
IC48	IC	Upper [DDR3]
IC52	IC	NOR [FLASH]
IC60	IC	FPGA
IC74	IC	AF AMP (RA) [AF AMP]
IC75	IC	AF AMP (TA) [AF AMP]
IC76	IC	A/D converter [ADC]
IC77,78	IC	D/A converter [DAC]
IC79	IC	AF AMP (TD) [AF AMP]
IC80	IC	Voltage reference [V REF]
IC81	IC	Ethernet [LAN PHY]
IC82,83	IC	Bus SW (3.3V/5V shift) [BUS SW]
IC84	IC	RS-232C driver [RS232C DRV]
IC85	IC	AF AMP (RD) [AF AMP]
IC251	IC	High-side SW
IC300	IC	BINT detector [BINT DET]
IC301	IC	DDR3 termination regulator [DDR3 TERM AVR]
IC370	IC	Bus buffer [BUS BUFF]
IC371-373	IC	Bus SW [BUS SW]
IC520	IC	eMMC
IC600	IC	Voltage regulator (OLED 10V) [10V AVR]
IC601	IC	Voltage regulator (OLED 3.1V) [3.1V AVR]
IC602	IC	Bus buffer [BUS BUFF]
IC670	IC	CODEC
IC671	IC	Voltage regulator (33A) [3.3V AVR]
IC672	IC	Voltage regulator (18C) [1.8V AVR]
IC700	IC	IF IC
IC701	IC	IF AMP
IC702	IC	RX 1st mixer [RX 1st MIX]
IC703	IC	LNA
IC900,901	IC	Buffer AMP (20MHz TCXO) [BUFF AMP]

Ref. No.	Part Name	Use / Function
IC902	IC	DC AMP (VC tune) [DC AMP]
IC1000	IC	DC AMP (CV_RX) [DC AMP]
IC1001	IC	RX PLL
IC2000	IC	TX PLL
IC3010	IC	DC AMP (ASSIST TX/RX) [DC AMP]
IC3011	IC	DC/DC converter (20V) [20V DC/DC]
IC3022	IC	Voltage regulator (FAN VCC 9V) [9.0V AVR]
IC3023	IC	Pre-drive AMP [PRE DRV AMP]
IC3024	IC	LPF
IC3025,3026	IC	DC AMP
IC3027	IC	PA control (FWD detect) [PA CTL]
IC3029	IC	Voltage regulator (5V_2) [5.0V AVR]
IC3030	IC	Voltage regulator r (9V_2) [9.0V AVR]
IC4000	IC	DC/DC converter (3.3V, 5.0V) [3.3V,5.0V DC/DC]
IC4001	IC	Voltage regulator (9V) [9.0V AVR]
IC4002	IC	Reset (DC/DC converter) [RST]
IC4003	IC	Current detector [CURR DET]
IC4005	IC	Voltage regulator (REG_3.3V) [3.3V AVR]
IC4006	IC	Voltage regulator (REG_5V) [5.0V AVR]
IC4010	IC	DC SW (CONT12V) [DC SW]
Q1-3	FET	DC SW
Q4	TRANS ISTOR	Voltage control [V CTL]
Q451	TRANS ISTOR	DC SW (AO1) [DC SW]
Q452	TRANS ISTOR	DC SW (AO2) [DC SW]
Q453	DIGI TRANS ISTOR	DC SW (EX RST) [DC SW]
Q602,603	DIGI TRANS ISTOR	DC SW
Q700,701	TRANS ISTOR	IF AMP
Q900	FET	2nd local VCO oscillation [2nd VCO]
Q901	TRANS ISTOR	Ripple filter [RIPL FIL]
Q1000	FET	DC SW
Q1001	TRANS ISTOR	Ripple filter [RIPL FIL]
Q1002,1003	FET	DC SW
Q1004	FET	RX_L VCO oscillation [RX_L VCO]
Q1005	FET	RX_H VCO oscillation [RX_H VCO]

Ref. No.	Part Name	Use / Function
Q1007	TRANS ISTOR	RX VCO buffer AMP [RX VCO BUFF AMP]
Q1008	TRANS ISTOR	RX Fin AMP
Q2000	FET	DC SW
Q2001	TRANS ISTOR	TX VCO Buffer AMP [TX VCO BUFF AMP]
Q2002	TRANS ISTOR	TX Fin AMP
Q2003	FET	TX_L VCO oscillation [TX_L VCO]
Q2006	TRANS ISTOR	Ripple filter [RIPL FIL]
Q2007	FET	TX_H VCO oscillation [TX_H VCO]
Q2008,2009	FET	DC SW
Q3035	TRANS ISTOR	Ripple filter (20V) [RIPL FIL]
Q3060	FET	Inverter (FAN_PWM) [INV(FAN_PWM)]
Q3061-3063	FET	DC SW
Q3065	FET	Drive AMP [DRV AMP]
Q3066	TRANS ISTOR	DC SW (VG_DIS) [DC SW]
Q3069	FET	Final power AMP [FINAL AMP]
Q3071	FET	DC SW (TADJ) [DC SW]
Q3072	DIGI TRANS ISTOR	DC SW
Q3073	FET	DC SW
Q3082	FET	DC SW
Q4004	TRANS ISTOR	DC SW
Q4005	FET	DC SW (12V) [DC SW]
Q4006	FET	DC SW (PW_DOWN_10V) [DC SW]
Q4007	FET	DC SW (9V_TX) [DC SW]
Q4008	FET	DC SW (9V_TX) [DC SW]
Q4010	FET	DC SW (PS_SWT_STATUS) [DC SW]
Q4013	FET	DC SW (5V_RX_M) [DC SW]
Q4014	FET	DC SW (5V_RX_EN) [DC SW]
Q4015	FET	DC SW (3.3V_RX_M) [DC SW]
Q4016,4017	FET	DC SW (/MAIN SHDN) [DC SW]
Q4018	FET	DC SW (PLD_PS_SWT_CTRL) [DC SW]
Q4020	FET	DC SW (BASW) [DC SW]
Q4021	DIGI TRANS ISTOR	DC SW
Q4022	DIGI TRANS ISTOR	DC SW(DC/DC Reset) [DC SW]

Ref. No.	Part Name	Use / Function
Q4024	TRANS ISTOR	DC SW(DC/DC Reset) [DC SW]
D1	LED	LED (Power ON indicator) [PWR ON IND LED]
D2	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D53	DIODE	DC SW (RTC backup battery) [DC SW]
D100,101	SCHOT TKY DIODE	Reverse current prevention [REV CURR PREV]
D250	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D252-257	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D260-262	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D300	ZENER DIODE	Voltage reference [V REF]
D521-531	DIODE	Surge protection [SRG PRTCT]
D533-536	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D539	DIODE	Surge protection [SRG PRTCT]
D541	DIODE	Surge protection [SRG PRTCT]
D544	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D550-557	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D558	DIODE	Reverse current prevention [REV CURR PREV]
D559	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D560	DIODE	Reverse current prevention [REV CURR PREV]
D561	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D600	LED	LED (TX1) [TX1 LED]
D601	LED	LED (TX2) [TX2 LED]
D602	LED	LED (RX1) [RX1 LED]
D603	LED	LED (RX2) [RX2 LED]
D605	LED	LED (Status) [STATUS LED]
D606-610	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D700	VARI CAP DIODE	IF CLK VCO frequency control [IF CLK VCO F CTL]

Ref. No.	Part Name	Use / Function
D701,702	DIODE	IF limiter [IF LMT]
D703,704	VARI CAP DIODE	RX Band-pass filter tuning [RX BPF TUN]
D705,706	DIODE	RF limiter [RF LMT]
D709-712	VARI CAP DIODE	RX Band-pass filter tuning [RX BPF TUN]
D715-718	VARI CAP DIODE	RX Band-pass filter tuning [RX BPF TUN]
D750	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D900	VARI CAP DIODE	2nd_VCO frequency control [2nd VCO F CTL]
D901	DIODE	DC SW
D1000	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D1001	VARI CAP DIODE	RX_L VCO frequency control [RX_L VCO F CTL]
D1003,1004	VARI CAP DIODE	RX_L VCO assist tuning [RX_L VCO ASST TUN]
D1005	VARI CAP DIODE	RX_H VCO frequency control [RX_H VCO F CTL]
D1007,1008	VARI CAP DIODE	RX_H VCO assist tuning [RX_H VCO ASST TUN]
D1009	DIODE	DC SW
D1010,1011	VARI CAP DIODE	RX_L VCO assist tuning [RX_L VCO ASST TUN]
D1013,1014	VARI CAP DIODE	RX_H VCO assist tuning [RX_H VCO ASST TUN]
D2000	VARI CAP DIODE	TX_L VCO frequency control [TX_L VCO_F CTL]
D2002-2005	VARI CAP DIODE	TX_L VCO assist tuning [TX_L VCO ASST TUN]
D2006	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D2007	VARI CAP DIODE	TX modulation [TX MOD]
D2010	DIODE	DC SW
D2011	VARI CAP DIODE	TX modulation [TX MOD]

Ref. No.	Part Name	Use / Function
D2012-2015	VARI CAP DIODE	TX_H VCO assist tuning [TX_H VCO ASST TUN]
D2017	VARI CAP DIODE	TX_H VCO frequency control [TX_H VCO F CTL]
D3016	SCHOT TKY DIODE	DC/DC converter (20V) [20V DC/DC]
D3017	DIODE	DC SW
D3074	DIODE	Inductive kickback protection [KB PRTCT]
D3075	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D3077	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D3079	DIODE	Reverse current prevention [REV CURR PREV]
D3081	SCHOT TKY DIODE	REV power detection [REV PWR DET]
D3091	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D3095	DIODE	Reverse current prevention [REV CURR PREV]
D4000	LED	LED (Power) [PWR LED]
D4003	DIODE	Inductive kickback protection [KB PRTCT]
D4004,4005	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4007	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4008,4009	DIODE	Reverse current prevention [REV CURR PREV]
D4010,4011	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4012	ZENER DIODE	Surge protection [SRG PRTCT]
D4150	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4151	DIODE	Voltage reference [V REF]
D4152	DIODE	Reverse current prevention [REV CURR PREV]

2.7 TERMINAL FUNCTION

2.7.1 TX-RX UNIT (XC1-326E-00)

Pin No.	Name	I/O	Function
CN7 (OLED)			
1	GND	-	GND
2	VCC	O	Power supply for OLED panel
3	VLSS	-	Ground of analog circuit
4	VSS	-	Ground of logic circuit
5	VDD	O	Power supply for logic
6	CSn	O	Chip select
7	RESn	O	Power reset for controller and driver
8	D/Cn	O	Data/Command control
9	D0	I/O	Host data In/Out bus
10	D1	I/O	Host data In/Out bus
11	D2	I/O	Host data In/Out bus
12	IREF	-	Current reference for brightness adjustment

Pin No.	Name	I/O	Function
13	VCOMN	-	Voltage output high level for COM signal
14	VCC	O	Power supply for OLED panel
15	BS0	O	Communication protocol select
16	BS1	O	Communication protocol select
17	VLSS	-	Ground of analog circuit
18	GND	-	GND
CN3005 (FAN)			
1	VCC	O	Switched power supply for FAN
2	GND	-	GND
3	SENSOR	I	FAN lock detection pulse
4	CONTROL	O	PWM signal to define the number of FAN rotation
CN10 (for production)			
1~13	micro SD	-	micro SD

2.7.2 LAN CONNECTOR

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
1	TD+	O	Analog	NO	TX Signal +	100Base-TX					Conform to IEEE802.3 MLT-3 (4B/5B Encoding) 100Base-TX =125Mbps*4/5
						+Vout@100Ω	0.95	-	1.05	V	
						-Vout@100Ω	-1.05	-	-0.95	V	
						Data rate (100Base-TX)	-	125.0	-	Mbps	
						10Base-T					
						Vout@100Ω	2.2	2.5	2.8	V	
						Data rate (10Base-T)		10.0		Mbps	
						Impedance					
						Output Impedance		100		Ω	
2	TD-	O	Analog	NO	TX Signal -	100Base-TX					Conform to IEEE802.3 MLT-3 (4B/5B Encoding) 100Base-TX =125Mbps*4/5
						+Vout@100Ω	0.95	-	1.05	V	
						-Vout@100Ω	-1.05	-	-0.95	V	
						Data rate (100Base-TX)	-	125.0	-	Mbps	
						10Base-T					
						Vout@100Ω	2.2	2.5	2.8	V	
						Data rate (10Base-T)	-	10.0	-	Mbps	
						Impedance					
						Output Impedance	-	100	-	Ω	
3	RD+	I	Analog	NO	RX Signal +	Impedance					Conform to IEEE802.3
						Input Impedance	-	100	-	Ω	
4	NC	-	-	-	-		-	-	-	-	
5	NC	-	-	-	-		-	-	-	-	

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
6	RD-	I	Analog	NO	RX Signal -	Impedance					Conform to IEEE802.3
						Input Impedance	-	100	-	Ω	
7	NC	-	-	-	-		-	-	-	-	
8	NC	-	-	-	-		-	-	-	-	

2.7.3 USB CONNECTOR (Type A)

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
1	VBUS	O	Power	NO	USB VBUS(5V) Power	VOUT	4.75	-	5.25	V	
						IOUT		-	500	mA	
2	D-	I/O	Analog	NO	USB Data Minus	High-speed					Conform to Universal Serial Bus Specification (Revision 2.0 April 27, 2000)
						VOH	360	-	440	mV	
						VOL	-10.0	-	10.0	mV	
						Baud Rate		480		Mbps	
						Low-/Full-speed					
						VIH	2.7	-	3.6	V	
						VIL			0.8	V	
						VOH	2.8	-	3.6	V	
						VOL	0.0	-	0.3	V	
						Baud Rate (Low-speed)		1.5		Mbps	
						Baud Rate (Full-speed)		12		Mbps	
3	D+	I/O	Analog	NO	USB Data Plus	High-speed					Conform to Universal Serial Bus Specification (Revision 2.0 April 27, 2000)
						VOH	360	-	440	mV	
						VOL	-10.0	-	10.0	mV	
						Baud Rate		480		Mbps	
						Low-/Full-speed					
						VIH	2.7	-	3.6	V	
						VIL		-	0.8	V	
						VOH	2.8	-	3.6	V	
						VOL	0.0	-	0.3	V	
						Baud Rate (Low-speed)		1.5		Mbps	
						Baud Rate (Full-speed)		12		Mbps	
4	GND	-	GND		USB GND		-	-	-	-	

2.7.4 CONTROL I/O D-SUB 25-pin CONNECTOR

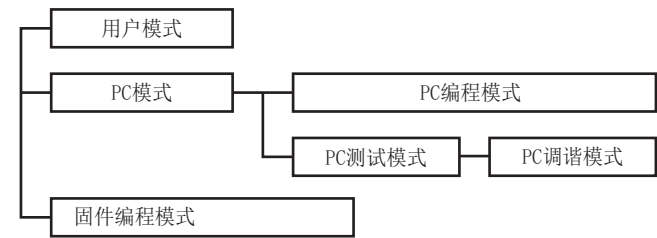
Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
1	NC	-		No							
	RSSI	O	Analog	Yes	RSSI Voltage	Range	0.0		3.3	V	
	RESET	I	Digital	Yes	Reset	VIH	3.0	5.0	+B	V	
						VIL			0.5	V	
						High Pulse Width	100			ms	
2	RXD2	I	Digital	No	Asynchronous Receive Data	Voltage Range	-30		30	V	Conform to RS-232C
						Baud Rate			230	kbps	
3	TXD2	O	Digital	No	Asynchronous Send Data	RL=3kΩ	+/-5.0	+/-9.0		V	Conform to RS-232C
						Baud Rate			230	kbps	Conform to RS-232C
4	AI1	I	Digital	No	Programmable Function Input1	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	Conform to RS-232C
	CTS	I	Digital	Yes	Clear to Send	Voltage Range	-30		30	V	
5	AI2	I	Digital	No	Programmable Function Input2	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	Conform to RS-232C
	RTS	O	Digital	Yes	Request to Send	Voltage Swing RL=3kΩ	+/-5.0	+/-9.0		V	
6	AI3	I	Digital	No	Programmable Function Input3	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
7	DG	-	GND		Digital Ground	-	-	-	-		
8	TD	I	Analog	No	TX Data Input (Signaling)	0.1kHz/0.5Vp-p	0.70	0.75	0.80	kHzDEV	NFW WFM
						Input Impedance		600		Ω	600Ω PD to GND
9	TA	I	Analog	No	TX Audio Input (Voice)	1kHz/60%Dev. Input Max =2.0Vrms	270	280	290	mVrms	NFW WFM
						Input Impedance		600		Ω	600Ω PD to GND
10	RD	O	Analog	No	RX Data Output (Signaling) Not Squelched	Output Voltage /60%Dev.	75	80	85	mVrms	Allowable Load 47kΩ
11	RA	O	Analog	No	RX Audio Output (Voice) Squelched	Output Voltage /60%Dev.	380	400	420	mVrms	Allowable Load 47kΩ
12	RXG	-	GND	No	RX Signal Ground	-	-	-	-		
13	NC	-	-	No	-	-	-	-	-		
14	AO1	O	Digital	No	Auxiliary Output1 Open Collector	External Voltage			16	V	
						Allowable Current			200	mA	
				Yes	Auxiliary Output1 Open Collector With PU	PU Resistor	4.7k	47k		Ω	
						VOL(IO=0mA)			0.1	V	

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
15	EMON	I	Digital	No	External Monitor Switch	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
16	EPTT	I	Digital	No	External PTT Switch	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
17	SC	O	Digital	No	Squelch Control	VOH		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%
						VOL			0.4	V	
18	AO2	O	Digital	No	Auxiliary Output2	External Voltage			16	V	VCC 5V+/-3%
						Allowable Current			200	mA	
				Yes	Auxiliary Output2 Open Collector With PU	PU Resistor	4.7k	47k		Ω	
						VOL(IO=0mA)			0.1	V	
19	TXG	-	GND	No	TX Signal Ground	-	-	-	-	-	
20	IO1	I	Digital	No	Programmable Function I/O1	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
						Input Impedance		47k		Ω	
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%
						VOL(IO=0mA)			0.4	V	
21	IO2	I	Digital	No	Programmable Function I/O2	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
						Input Impedance		47k		Ω	
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC
						VOL(IO=0mA)			0.4	V	
22	IO3	I	Digital	No	Programmable Function I/O3	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
						Input Impedance		47k		Ω	
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%
						VOL(IO=0mA)			0.4	V	
23	IO4	I	Digital	No	Programmable Function I/O4	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
						Input Impedance		47k		Ω	
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%
						VOL(IO=0mA)			0.4	V	
24	IO5	I	Digital	No	Programmable Function I/O5	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
						Input Impedance		47k		Ω	
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%
						VOL(IO=0mA)			0.4	V	

Pin No.	Pin Name	I/O	Signal Type	Modifi- cation	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
25	IO6	I	Digital	No	Programmable Function I/O6	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
						Input Impedance		47k		Ω	
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%
						VOL(IO=0mA)			0.4	V	

2.8 模式组合

2.8.1 模式



模式	功能
用户模式	使用此模式可进行常规操作。
PC 模式	使用此模式可通过以太网端口利用 FPU 进行各种设置。
PC 编程模式	用于在读写设置数据时与中继台进行通信。 有些通信将在用户模式的后台进行。
PC 测试模式	用于通过 PC 检查中继台。该功能内置于 FPU 中。
固件编程模式	在更改 / 更新闪存中的固件程序时使用。

2.8.2 如何进入每一种模式

模式	操作
用户模式	接通电源。
PC 模式	从 PC 接收指令。
固件编程模式	通过 Web 工具操作，自动进入此模式。

2.8.3 PC 模式

2.8.3.1 前言

本中继台采用个人电脑 (PC)、以太网电缆和编程软件 (FPU) 进行编程。
编程软件可在 PC 上使用。图 1 说明了采用 PC 进行编程的设置。

2.8.3.2 连接操作

- (1) 使用以太网电缆将中继台连接到 PC。
- (2) 通电时，中继台在完成启动序列后将进入用户模式。
- (3) 取决于与 PC 之间的通信类型，中继台可能会保持用户模式进行通信，也可能会退出用户模式。

示例

读取 FPU 数据：保持用户模式
写入 FPU 数据：退出用户模式
PC 测试模式：进入测试模式，并在 OLED 上显示“测试模式”。

注：

- 试图写入到中继台中的 FPU 数据必须与机型和软件选项相匹配。
- 如果使用 USB-LAN 适配器，通信可能会失败。建议通过 HUB（集线器）使用。

2.8.3.3 以太网电缆说明（作为 PC 编程接口电缆）

需要商用以太网电缆将中继台连接到 PC。

2.8.3.4 编程软件 KPG-D7（版本 2.00 或更高版本）说明

FPU 是用于中继台的编程软件。该软件在 PC 的 Windows 10 或 Windows 11 下运行。
数据可以在 PC 上创建为新文件，也可以根据所保存的数据 / 从中继台读取的数据进行编辑。编程或编辑后的数据可以打印出来。也可以对中继台进行调谐。

作为出厂装运条件的默认 IP 设置如下所示。

- IP 地址：192.168.0.1
- 子网掩码：255.255.255.0
- 默认网关：192.168.0.254

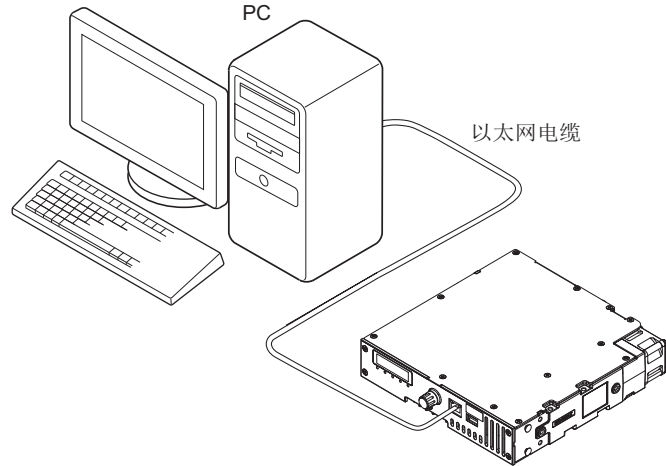


图 1

2.8.4 固件编程模式

2.8.4.1 前言

中继台使用了闪存，以便能在未来发布新功能时轻松升级。

2.8.4.2 连接操作

使用以太网电缆将中继台连接到 PC。（连接方式与 PC 模式下相同。）

注：

只能通过前面板上的以太网连接器对固件进行编程。如果使用前面板上的 USB 端口或后面板上的 CONTROL I/O（D-SUB 25 针）接口，将无法工作。

2.8.4.3 编程

- (1) 通过 Web 工具登录中继台。

注：

要使用 Web 工具，请通过浏览器连接至中继台的自身 IP 地址。

作为出厂装运条件的默认值如下所示。

- IP 设置：（请参见 2.8.3.4 编程软件 KPG-D7 说明）
- 登录用户名：admin
- 登录密码：（空）

第一次访问时需要此密码设置。

- (2) 在 Web 工具上移动 / 选择“维护”>“系统”>“固件更新”。
- (3) 选择要写入的固件文件。
固件更新准备就绪时，“更新”按钮将变为活动状态。
- (4) 按下“更新”按钮并按照信息所示进行操作。
当中继台开始接收数据时，浏览器上会显示“请稍候”。此时，中继台 OLED 上的显示信息将依次发生变化，继而在写入过程中显示“固件正在更新”。
当固件更新成功时，中继台将关闭，然后自动重新启动。此时，Web 浏览器也将自动断开连接。
- (5) 若要继续为其他中继台更新固件，请重复步骤 (1) 至 (4)。

2.9 操作功能

错误信息列表如下所示。

错误信息		错误事件 / 项目名称
Web 工具 (错误代码)	OLED 显示	
E001	未编程	未编程
E002	USB 过电流	USB 过电流
E003	TX 频率空白	TX 频率数据为空白
E004	ESN 空白	ESN 空白
E005	固件错误	固件启动错误
E006	功能错误	功能错误
E007	强制固件编程	强制固件编程模式
E008	DSP 错误 1	DSP 错误 1
E009	DSP 错误 2	DSP 错误 2
E102	HSB LAN 错误	热备局域网连接错误

错误信息		错误事件 / 项目名称
Web 工具 (错误代码)	OLED 显示	
E103	信标错误	信标同步断开
E201	风扇错误	风扇错误
E202	PWR Sup 错误	电源电压错误
E204	RX PLL 失锁	RX PLL 失锁
E205	TX PLL 失锁	TX PLL 失锁
E206	HPA 错误	电流消耗 (HPA) 错误
E207	驱动器温度错误	温度 (驱动放大器) 错误
E208	TX 温度错误	温度 (TX 模块) 错误
E209	TCXO 温度错误	温度 (TCXO) 错误
E210	HPA 温度错误	温度 (HPA) 错误
E211	IF IC 错误	IF IC 错误

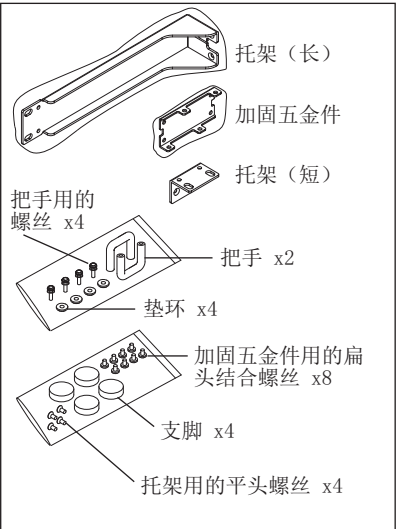
* 如果显示上述错误代码，请参见“5.5 错误代码的故障排除”。

2.10 安装

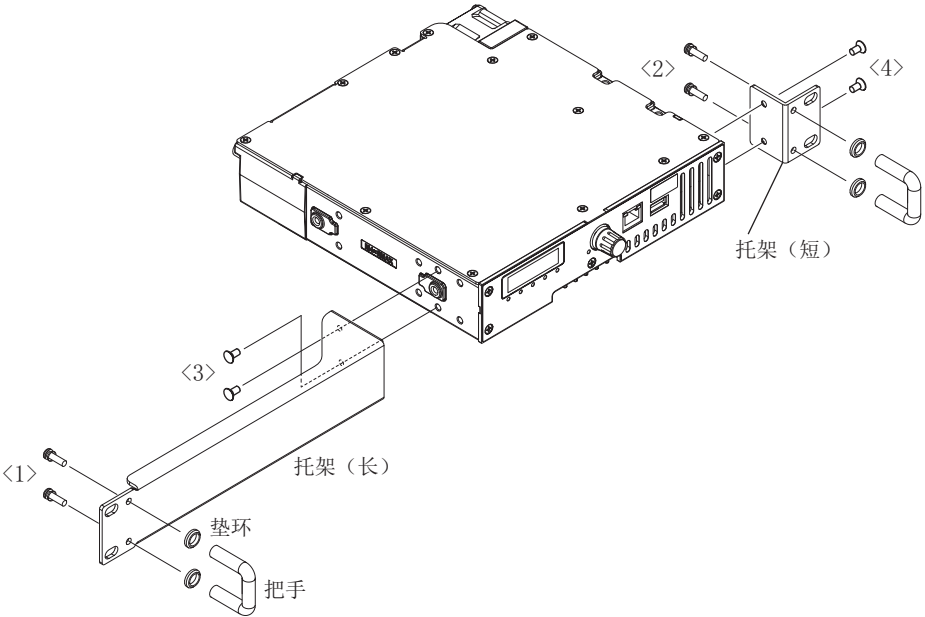
2.10.1 一个中继台的机架安装

- (1) 将两种类型的托架与把手组装在一起。<1> <2>
- (2) 将两种类型的托架和把手一起安装到中继台上。<3> <4>
- (3) 安装托架（长 / 短）时，可以左右交换。

安装用的配件

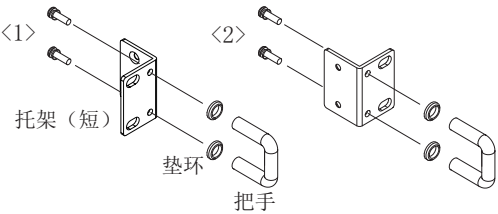


螺丝刀类型： M4

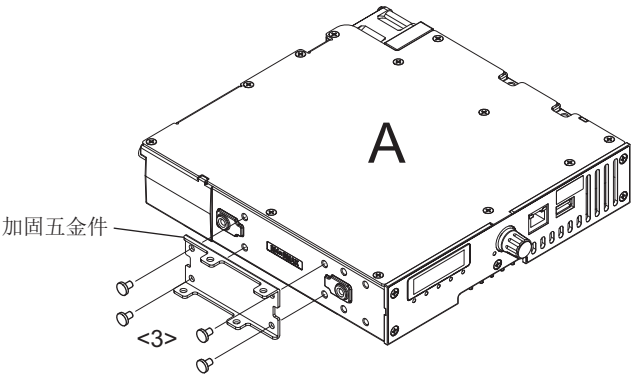


2.10.2 两个中继台的机架安装

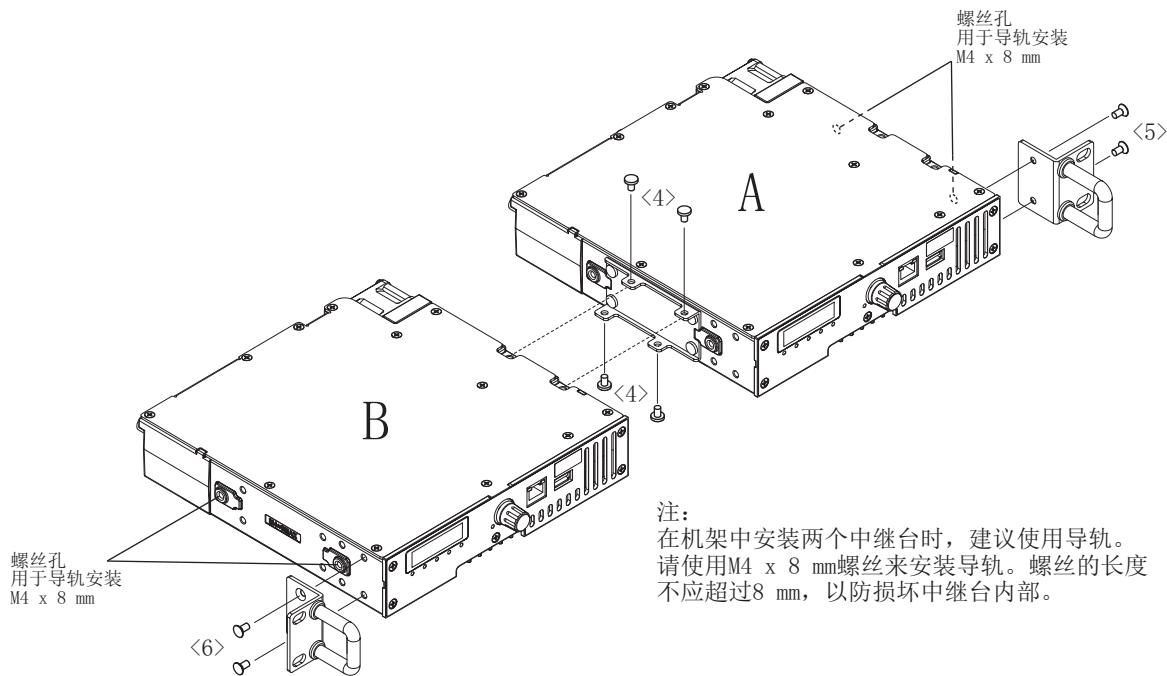
- (1) 将两组托架（短）与把手组装在一起。<1> <2>



- (2) 将加固五金件安装到中继台 A 上。<3>

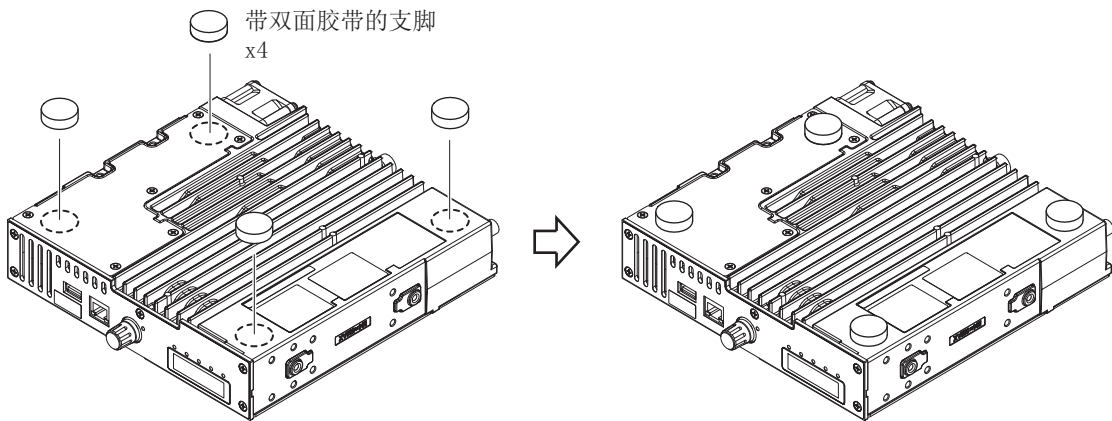


- (3) 利用加固五金件将中继台 A 和中继台 B 连接在一起，并用螺丝固定好。 <4>
- (4) 将两组托架和把手一起安装到中继台 A 和 B 上。 <5> <6>



2.10.3 将支脚安装至中继台

撕下支脚的双面胶带离型纸，然后将支脚安装到中继台上。



2.11 改装

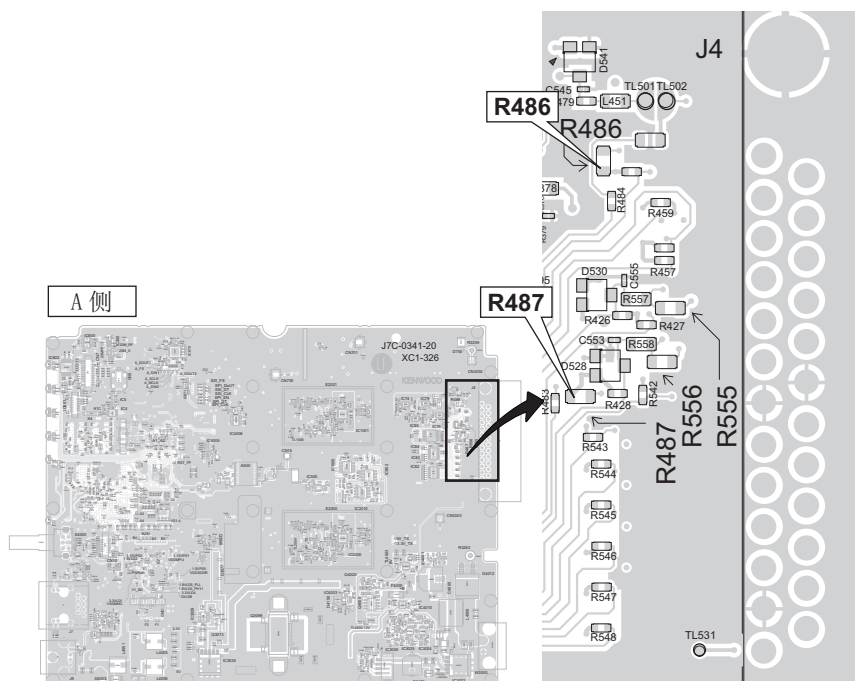
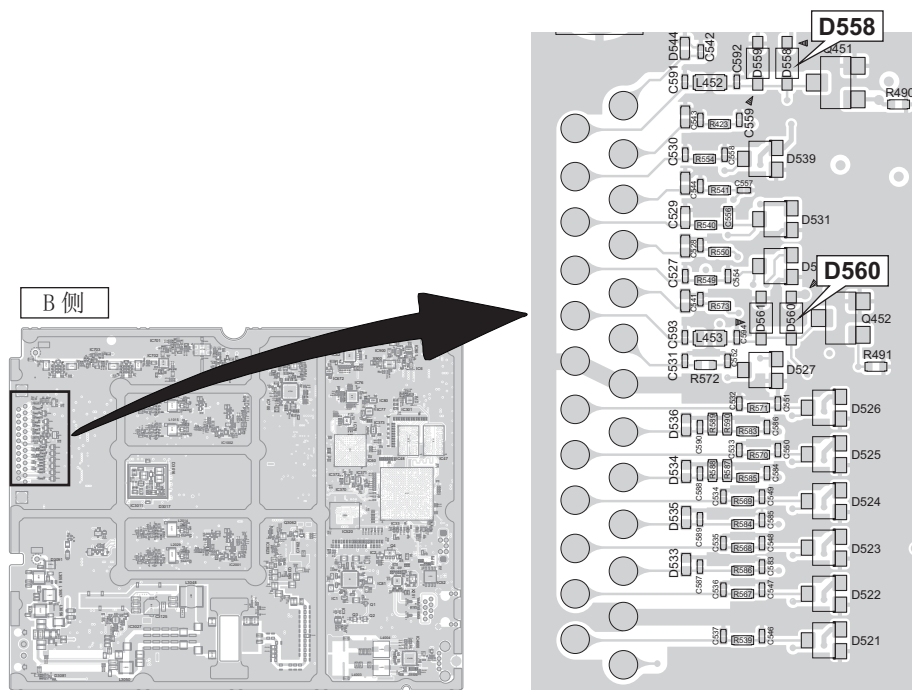
2.11.1 更改 AUX 端口配置

CONTROL I/O (D-SUB 25针) 连接器上的AUX输出端口（针14和18）默认为集电极开路连接类型，该端口最大可承受200 mA的电流。通过更改这些针的配置，AUX 输出端口可以用作“高”端（5V 上拉电阻输出）和“低”端的输出端口。

请按照如下所示的步骤更改配置。

- 拆下电路板。
- 从电路板的 D558 和 D560 上拆下零件。
- 将电阻器（零件号：RK73GB2A473J）分别安装在电路板的 R486 和 R487 上。

信号名称	连接器管脚号码	拆下 DA2J101	安装 RK73GB2A473J
AO1	14	D558	R486
AO2	18	D560	R487



2.11.2 在 CONTROL I/O（D-SUB 25 针）连接器上添加 RSSI 或复位端子

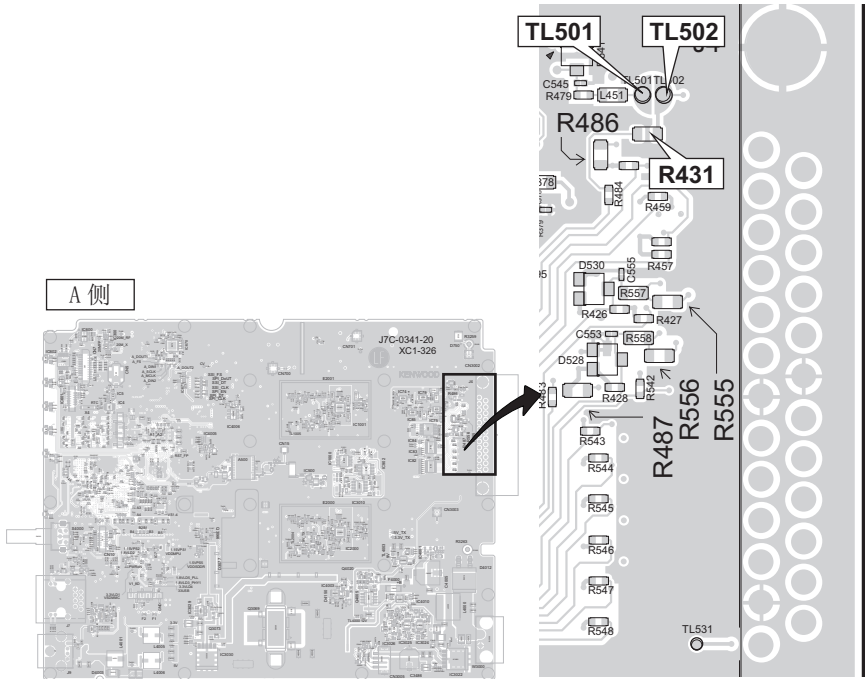
您可以更改 CONTROL I/O（D-SUB 25 针）连接器针 1 的配置，以便为 RSSI 提供电源。
请按照如下所示的步骤更改配置。

情况 1：添加 RSSI。

- (1) 拆下电路板。
- (2) 通过焊接，将圆形焊盘连接在一起。（TL501 和 TL502）

情况 2：添加复位端子。

- (1) 拆下电路板。
- (2) 将零件（零件号：RK73GB2A102J）安装在电路板的 R431 上。



2.11.3 更改 CONTROL I/O（D-SUB 25 针）连接器（针 4、针 5）的配置

CONTROL I/O（D-SUB 25 针）连接器上的 AUX 输入端口（针 4 和 5）可用作 CTS 端口和 RTS 端口。
请按照如下所示的步骤更改配置。

- (1) 拆下电路板。
- (2) 拆下 R557 芯片跳线并将其焊接到 R555 上。
- (3) 拆下 R558 芯片跳线并将其焊接到 R556 上。

连接器管脚号码	信号名称	安装 RK73GB2A000J	备注
4	AI1	R557	默认值
	CTS	R555	RS-232C
5	AI2	R558	默认值
	RTS	R556	RS-232C

2.12.3 接收部系统

2.12.3.1 RF 电路

RX ANT 的接收信号由 RF 放大器（LNA: IC703）放大，并通过可变电容调谐带通滤波器 (BPF) 来衰减不需要的信号。通过带通滤波器 (BPF) 的信号由第一混频器（RX 1st MIX: IC702）与 RX PLL 频率合成器电路的第一本地振荡器信号进行外差，以生成 45.00MHz 的第一中频信号（第一 IF 信号）。

2.12.3.2 IF 电路

第一 IF 信号由第一 IF 放大器（IF AMP: IC701）放大，并通过四极单片石英晶体滤波器（MCF: XF700）以抑制相邻信道信号。滤波后的第一 IF 信号由第二 IF 放大器（IF AMP: Q701 和 Q700）放大，并发送到 IF 系统 IC（IF IC: IC700）。IF 系统 IC 提供第二混频器、第二 PLL、AGC 和 A/D 转换器。第二混频器将第一 IF 信号与第二本地振荡器（第二 VCO）的 42.6MHz 输出进行混频，并生成第二中频 2.4MHz 信号。然后，第二 IF 信号被发送到 A/D 转换器并生成 I 和 Q 数据。该数据采用 SSI（串行同步接口）的形式，并通过 FPGA (IC60) 发送到内置于 MPU/DSP (IC33) 中的 DSP。

2.12.3.3 RX 音频电路

模拟 FM 模式下的音频处理（高通滤波器、低通滤波器、去加重等）和数字模式下的解码由 MPU/DSP (IC33) 进行处理。MPU/DSP 的 SSI 信号由编解码器 IC（IC42、IC670）转换为音频信号。

在“中继”模式下，检测到的音频信号被转换为 TX VCO 和 TX PLL 的调制信号。它被从编解码器 (IC670) 发送到 TX VCO 的“VCO_MOD”端子，并从 FPGA (IC60) 发送到 TX PLL (IC2000) 的“PLL_MOD”端子。同时，所检测到的 RX 音频信号可以通过 USB 耳机扬声器 - 麦克风从 USB 接口 (J9) 进行监听。

在“双工 / 单工”模式下（DMR 除外），所检测到的 RX 音频信号只能通过 USB 耳机扬声器 - 麦克风进行监听。此外，所检测到的 RX 音频信号将从编解码器 (IC42) 发送到 CONTROL I/O 连接器（D-SUB 25 针: J4）中的 RA 端子和 RD 端子。

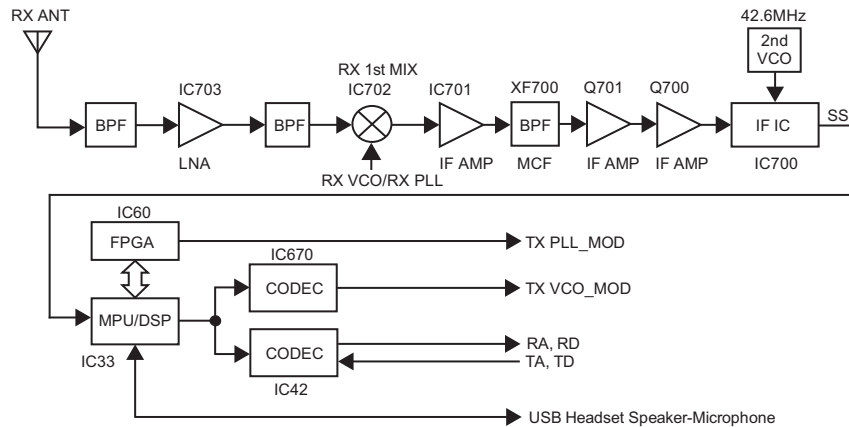


图 2 接收部系统

2.12.4 发射部系统

2.12.4.1 TX 音频电路

在“中继”模式下，所检测到的 RX 音频信号被转换为 TX 调制信号。请参见“2.12.3.3 RX 音频电路”。

在“双工 / 单工”模式下（DMR 除外），USB 耳机扬声器 - 麦克风的语音信号可予以调制，以进行传输。该信号会发送到 MPU/DSP (IC33)，并转换为 TX VCO 和 TX PLL 的调制信号。它被从编解码器 (IC670) 传输到 TX VCO 的“VCO_MOD”端子，并从 FPGA (IC60) 传输到 TX PLL (IC2000) 的“PLL_MOD”端子。此外，在由 CONTROL I/O 连接器 (J4) 的外部 PTT 开关发射时，CONTROL I/O 连接器（D-SUB 25 针: J4）中 TA 端子和 TD 端子的信号可进行调制。

2.12.4.2 基带电路

音频信号由 MPU/DSP (IC33) 处理。300Hz 或更低的语音信号和 3kHz 或更高的频率被截止，并选取 300Hz 至 3kHz 的音频范围。音频信号经滤波处理，继而根据需要与 QT 和 DQT 等信号合成，然后被传输到 TX PLL 频率合成器模块。

在数字模式下，音频信号被转换为 4 级 FSK 基带信号，然后被传输到 TX PLL 频率合成器模块。输出电平则会根据每个调制系统进行微调。

2.12.4.3 驱动和末级放大器

来自 TX PLL 频率合成器电路的信号由预驱动放大器（PRE DRV AMP: IC3023）放大。预驱动放大器的输出信号由驱动放大器（DRV AMP: Q3065）和末级放大器（FINAL AMP: Q3069）放大至 50W。由末级 Q3069 放大的信号经过 CM 耦合器电路和谐波滤波器 (LPF) 电路，然后被发送到 TX ANT。

2.12.4.4 CM 耦合器电路

CM 耦合器电路是一条用于检测正向波和反射波的线路。正向波由 IC3027 检测并转换为直流电压。如果连接了异常天线负载，则反射波由 D3081 检测并转换为直流电压。

2.12.4.5 滤波电路

该电路从发射器输出中去除谐波，并将滤波后的信号发送到天线。

2.12.4.6 APC 电路

自动发射功率控制 (APC) 电路将发射器输出功率稳定在一个预定水平。来自 CM 耦合器电路的正向 RF 信号由 PA 控制 (PA CTL: IC3027) 检测为 FWD DC 电压, 并发送给 DC 放大器 (DC AMP: IC3026 (2/2))。DC 放大器 (DC AMP: IC3026 (2/2)) 对比 D/A 转换器 (DAC: IC78) 生成的 APC 控制电压和来自 PA 控制 (PA CTL: IC3027) 的 FWD DC 电压, 以控制驱动放大器 (DRV AMP: Q3065) 和末级放大器 (FINAL AMP: Q3069) 的栅极偏置电压。

2.12.4.7 高温检测器电路

为了防止末级放大器 (FINAL AMP: Q3069) 或低通滤波器 (LPF) 上的元件发生热破坏, 当温度上升时, 该电路会降低 APC 控制电压。MPU/DSP (IC33) 会通过末级放大器 (Q3069) 的热敏电阻 (TH3001) 和低通滤波器的热敏电阻 (TH3000) 来检测温度并控制 APC 电压。

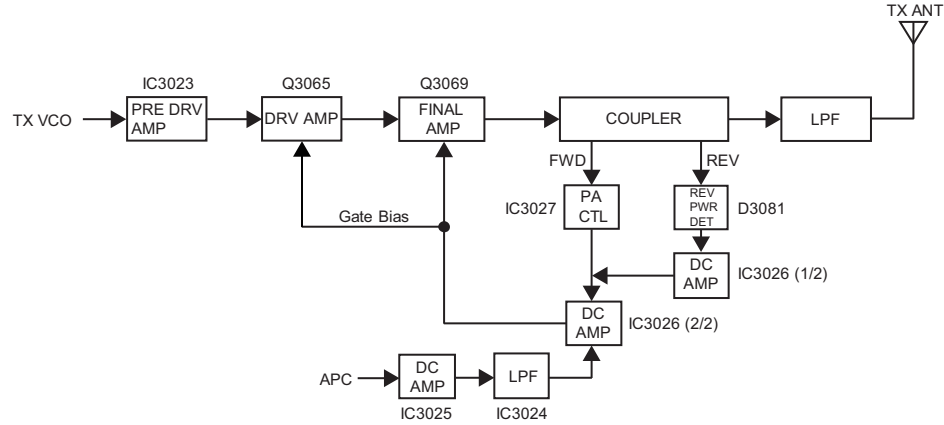


图 3 发射部系统

2.12.5 PLL 频率合成器系统

本机具有两个独立的 PLL 系统: RX VCO/RX PLL 和 TX VCO/TX PLL。

2.12.5.1 TCXO (X900)

TCXO (X900) 为两个 PLL 频率合成器生成 20.0MHz 的通用基准频率。基准信号由 IC900 和 IC901 进行缓冲, 并分配到 RX PLL (IC1001)、TX PLL (IC2000)、IF IC (IC700)、MPU/DSP (IC33) 和 FPGA (IC60)。频率调整是通过调整 TCXO 控制端子电压中的 D/A 转换器 (DAC: IC78) 输出实现的。

2.12.5.2 RX VCO/ RX PLL

2.12.5.2.1 VCO 电路

RX VCO 由两个 VCO 组成: RX_L VCO 和 RX_H VCO。

RX_L VCO 和 RX_H VCO 由 DC 开关 (DC SW: Q1002 和 Q1003) 根据工作频率进行切换。RX VCO 为接收器生成第一本地信号, 频率范围为 181~219MHz。

RX_L VCO (Q1004) 的振荡频率范围为 181~200MHz, 而 RX_H VCO (Q1005) 的则为 200~219MHz。电压控制端子 “CV” 由 RX PLL (IC1001) 控制, 而电压控制端子 “ASSIST” 则由 D/A 转换器 (DAC: IC78) 控制。

2.12.5.2.2 PLL 电路

RX PLL (IC1001) 对比 VCO 振荡信号和 TCXO 基准频率的相位差, 并将压差返回 VCO CV 端子, 实现 “锁相环路”。这可以使 VCO 震荡频率与所需的频率精确匹配 (锁定)。

当频率由 PLL 控制时, 频率锁定时间将随着设定频率改变时频率差的增大而增加。为对此进行补充, 在由 PLL 控制之前会使用 MPU/DSP (IC33), 以使 VCO 振荡频率接近所需的频率。因此, VCO CV 的电压会保持不变, 始终稳定在 2.5V 左右。PLL 所需的频率由 FPGA (IC60) 通过 PLL 的 3 线路 “DT”、“CLK”、“/CS” 串行总线进行设置。PLL 是否锁定由 MPU/DSP 通过 “RX_LO1_LOCK” 进行监测。如果 VCO 没有锁定到所需的频率 (失锁), 则 “RX_LO1_LOCK” 逻辑为低。

2.12.5.3 TX VCO/ TX PLL

2.12.5.3.1 VCO 电路

TX VCO 由两个 VCO 组成: TX_L VCO 和 TX_H VCO。

TX_L VCO 和 TX_H VCO 由 DC 开关 (DC SW: Q2008 和 Q2009) 根据工作频率进行切换。TX VCO 为发射器生成载波, 频率范围为 136~174MHz。

TX_L VCO (Q2003) 的振荡频率范围为 136~155MHz, 而 TX_H VCO (Q2007) 的则为 155~174MHz。电压控制端子 “CV” 由 TX PLL (IC2000) 控制, 而电压控制端子 “ASSIST” 则由 D/A 转换器 (DAC: IC78) 控制。

注:

在默认情况下, TX VCO 在不发射时将以偏离信道工作频率几 kHz 的频率待机。原因是, 即使中继台未发射, 附近的无线电也可能因 TX VCO 的辐射或传导杂散而处于繁忙状态。FPU 可选择 “在发射频率上待机” 功能。

2.12.5.3.2 PLL 电路

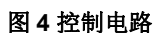
TX PLL (IC2000) 的电路与 RX PLL 基本相同。

对于 TX VCO 的调制输入端子 “VCO_MOD”, 输出频率将根据施加的电压而变化。它用于调制 TX VCO。

TX PLL (IC2000) 的调制输入端子 “PLL_MOD” 用于调制 TX VCO 输出。调制数据由 FPGA (IC60) 生成。

控制电路主要由 MPU/DSP (IC33) 和 FPGA (IC60) 及其外围电路组成。此外, IC33 由基于 ARM Cortex-A15 的 ARM 处理器和基于 C66x 的 DSP 组成。

- (1) MPU 管理中继台和外部接口的操作。
- (2) DSP 管理发射 / 接收数据。
- (3) FPGA 管理中继台的电源, 并在 DSP 和 RF 部分之间交换发射 / 接收数据。



2.12.6.1 MPU/DSP

2.12.6.1.1 MPU

MPU/DSP (IC33) 由 ARM Cortex-A15 RISC 处理器和浮点型 VLIM DSP 组成，且具备外围功能。该 MPU 以 1.4GHz 的时钟运行，其电源电压由电源管理 IC (PWR MNG: IC1) 控制。MPU/DSP 控制着闪存、DDR3、eMMC、FPGA 和各种控制电路。

2.12.6.1.2 DSP

DSP 电路由 MPU/DSP (IC33) 组成，可处理基带信号。DSP 以 750MHz 的时钟运行，I/O 部分以 3.3V 运行，电源电压由电源管理 IC (PWR MNG: IC1) 控制。

DSP 执行以下处理：

- 数字化处理
 - 4 级 FSK 和基带滤波处理
 - 音频编解码器、USB 音频、IP 音频和调制 / 解调之间的声码器处理
 - CAI 处理，例如纠错编码 / 解码和交织
 - AFC 回路控制
 - 帧同步和时间跟踪
- 模拟 FM 处理
 - 预加重 / 去加重
 - QT/DQT 编码 / 解码
- 音频或调制功能
 - USB 麦克风的音频 AGC 处理
 - 音频软静音处理
 - 调制电平处理
 - 静噪滤波
- 其他功能
 - 礼貌音
 - 中继台运转
 - 模拟 / 数字混合模式
 - 表决引导音
 - CWID

2.12.6.2 RTC (实时时钟) 电路

时钟功能基于实时时钟 IC (RTC: IC4) 和 32.768kHz 晶体谐振器 (X4)。当电源关闭时，它由内部备用锂电池供电。

2.12.6.3 FPGA 电路

FPGA 电路由 FPGA (IC60) 组成。FPGA 以 20MHz 的外部时钟运行，I/O 部分和核心部分以 3.3V 运行。

FPGA 执行以下处理：

- (1) MPU/DSP 与各种设备之间的接口
(IF_IC、PLL_IC、LED、CODEC_IC、OLED、ADC/DAC、D-SUB 25 针、KNOB 和 FAN)
- (2) 各种电源启用的控制
- (3) 开关时序控制

2.12.6.4 存储电路

该中继台由三种类型的存储 IC 组成。

MPU/DSP (IC33) 控制着 DDR3 存储器 (Lower DDR3: IC47, Upper DDR3: IC48)、串行 NOR 闪存 (NOR FLASH: IC52) 和 eMMC (IC520)。

2.12.6.4.1 DDR3 存储器

IC47 和 IC48 是 4G 位 DDR3 SDRAM，其组织方式为 32M x 16 位 x 8 个内存库。DDR3 存储器用于 MPU/DSP 程序执行的工作状态存储。DDR3 存储器的工作频率为 666MHz。

2.12.6.4.2 串行 NOR 闪存

串行 NOR 闪存配备了由 MPU/DSP 控制的 SPI 接口。

IC52 是 128M 位串行 NOR 闪存，用于 MPU/DSP 的引导程序存储。

2.12.6.4.3 eMMC

IC520 是 8GB eMMC。

eMMC (IC520) 配备了由 MPU/DSP 控制的高速 JC64DDR 接口。

eMMC (IC520) 中包含 MPU/DSP 的所有程序和数据 (包括调谐数据)。

2.12.6.5 ADC、DAC 电路

ADC/DAC 电路由 ADC (IC76) 和 DAC (IC77 和 IC78) 组成。ADC/DAC 执行以下处理：

DAC: 将各种射频控制电压从数字转换为模拟。

ADC: 将电源电压和各种温度从模拟转换为数字。

2.12.6.6 LAN

本中继台配备 100Base-TX 或 10Base-T LAN 接口。

该电路由 IC81 和 J7 组成。IC81 为以太网 PHY，而 J7 为 LAN 连接器。

以太网 PHY (LAN PHY: IC81) 由 MPU/DSP (IC33) 控制，MAC 地址保存在 eMMC (IC520) 中。

2.12.6.7 OLED 显示接口电路

本中继台采用的是 1.7 英寸（128 x 32 分辨率）OLED 显示器。

OLED 显示器通过 FPGA (IC60) 从 MPU/DSP (IC33) 进行控制（使用 SPI 接口）。

从 FPGA 输出的 SPI 信号进入缓冲 IC（BUS BUFF: IC602），在那里执行波形整形并传输到 OLED 显示器。CN7 是一个接口连接器，用于连接 OLED 显示模块的柔性电缆。

2.12.6.8 USB

本中继台具有 USB 主机功能，且支持 USB 2.0。该电路由 IC33、J9 和 IC251 组成。IC33 是一个具有 USB 控制器功能的 MPU/DSP。

J9 是前面板上的 USB-A 连接器。USB 总线电源使用高端开关（High-side SW: IC251）进行过电流检测。

USB 主机功能用于连接 USB 耳机扬声器 - 麦克风，以监听接收到的音频或与系统中手持对讲机的通信。

2.12.6.9 CONTROL I/O 接口（D-SUB 25 针）电路

CONTROL I/O 用于各种外部设备与中继台之间的接口。

该电路由 CONTROL I/O 连接器（D-SUB 25 针: J4）、电平转换器（BUS SW: IC82 和 IC83）、RS-232C 驱动器（RS232C DRV: IC84）和 DC 开关（DC SW: Q451 和 Q452）组成。

有关端子规格和功能等更多详细信息，请参见“2.14.4 CONTROL I/O D-SUB 25 针连接器”。

2.12.6.10 旋钮

前面板上的旋钮为带有按压开关的旋转式编码器类型，用于以下用途：

- (1) 按住旋钮打开电源。
- (2) 转动旋钮选择菜单，按下旋钮确定菜单选择。

2.12.6.11 FAN 控制电路

FAN 控制电路由稳压器（9.0V AVR: IC3022）和 FET（Q3060 和 Q3061）组成。

该电路执行以下处理：

- (1) 打开和关闭风扇。
- (2) 通过控制 PWM，在风扇转速（高速和低速）之间切换。
- (3) 检测风扇故障。

这些都由 FPGA 控制。风扇会根据温度开启、关闭、选择高转速或低转速。

2.12.7 电源电路

[+ B] 直接连接到末级放大器（FINAL AMP: Q3069）、9.0V AVR (IC3022) 和 9.0V AVR (IC3030)。

此外，它还通过 DC SW (IC4010) 连接到 10V AVR (IC600)，并通过保险丝 (F4000) 连接到 9.0V AVR (IC4001) 和 3.3V、5.0V DC/DC (IC4000)。

9.0V AVR (IC3030) 的输出由 DC SW (Q3073) 控制，并将 9V 作为 [9V_2] 提供给发射器。[5V_2] 通过 5.0V AVR (IC3029) 提供给发射器。通过打开 DC SW (Q4006)，9.0V AVR (IC4001) 将 [9V] 提供给 RX VCO 块和 TX VCO 模块。提供给 TX VCO 模块的 9V 由 DC SW (Q4008) 进行控制。

IC4001 通过 5.0V AVR (IC4006) 向接收 5V 模块供电。

3.3V、5.0V DC/DC (IC4000) 的 3.3V 输出将提供给以下电路。

- TX PLL (IC2000)
- MPU/DSP (IC33)（由 DC SW (Q3) 通过保险丝 (F1) 打开）
- 串行 NOR 闪存 (IC52)
- eMMC (IC520)
- 以太网 PHY (IC81)（由 DC SW (Q2) 通过保险丝 (F2) 打开）
- LAN 连接器 (J7)

此外，3.3V 输出还被提供给以下控制系统模块。

- MPU/DSP (IC33) 的电源管理 IC（PWR MNG: IC1）
- DDR3（IC47、IC48、IC301）的终端电源
- FPGA (IC65)
- ADC (IC76) 等

3.3V、5.0V DC/DC (IC4000) 的 5V 输出将提供给以下电路。

- TX PLL (IC2000)
- 20V DC/DC (IC3011)
- 3.3V AVR (IC671)
- USB High-Side SW (IC251)
- 3.1V AVR (IC5) 和控制系统模块
- 3.3V AVR (IC4005) 和接收 3.3V 模块

电源管理 IC（PWR MNG: IC1）是 MPU/DSP (IC33) 的一个专用 IC，它提供 IC33 所需的各种电源：（[V3_3USB]、[VSDMMC]、[V1_8PHY2]、[V1_8PHY1]、[V1_8PLL] / [V1_8PLLA] / [V1_8PLLb]、[VDD_MPU]、[1.15V_SMPS2]、[1.06V_SMPS3]、[V1_8D]、[VDDS_DDR]）

打开电源时，IC4010 会监测 [+B]。如果电压为 17.4V 或更高，则不会打开 Q4005 和 IC4000，因此也就不会启动中继台。

当 [+B] 为 17.4V 或以下时，[MAIN_SHDN] 信号变为 Hi，此时将打开 Q4005 和 IC4000，从而启动中继台。

随后，FPGA (IC60) 利用 [ENABLE_PMIC] 信号打开电源管理 IC（PWR MNG: IC1）并向 MPU/ DSP (IC33) 供电。接着，通过 [5V_TX_EN]、[5V_RX_EN]、[LNA_ON]、[10V_TX_EN] 打开 RF 电路模块的每个电源。这些都是通过 MPU/DSP 的命令指令来执行的。

当 [+B] 变为 8.2V 或以下时，BINT 检测器（BINT DET: IC300）向 MPU/ DSP (IC33) 和 FPGA (IC60) 生成低电平中断信号 [BINTS] / [BINTF]，并启动关机操作。

2.13 元件说明

收发单元 (XC1-326E-00)

Ref. No.	Part Name	Use / Function
IC1	IC	Power management [PWR MNG]
IC2	IC	Voltage control [V CTL]
IC3	IC	Reset (PM IC_POWER_HOLD) [RST]
IC4	IC	Real-time clock IC [RTC]
IC5	IC	Voltage regulator (3.1V) [3.1 AVR]
IC6	IC	CLK buffer [CLK BUFF]
IC7	IC	AND gate [AND]
IC8	IC	Bus buffer [BUS BUFF]
IC33	IC	MPU/DSP
IC42	IC	CODEC
IC47	IC	Lower [DDR3]
IC48	IC	Upper [DDR3]
IC52	IC	NOR [FLASH]
IC60	IC	FPGA
IC74	IC	AF AMP (RA) [AF AMP]
IC75	IC	AF AMP (TA) [AF AMP]
IC76	IC	A/D converter [ADC]
IC77,78	IC	D/A converter [DAC]
IC79	IC	AF AMP (TD) [AF AMP]
IC80	IC	Voltage reference [V REF]
IC81	IC	Ethernet [LAN PHY]
IC82,83	IC	Bus SW (3.3V/5V shift) [BUS SW]
IC84	IC	RS-232C driver [RS232C DRV]
IC85	IC	AF AMP (RD) [AF AMP]
IC251	IC	High-side SW
IC300	IC	BINT detector [BINT DET]
IC301	IC	DDR3 termination regulator [DDR3 TERM AVR]
IC370	IC	Bus buffer [BUS BUFF]
IC371-373	IC	Bus SW [BUS SW]
IC520	IC	eMMC
IC600	IC	Voltage regulator (OLED 10V) [10V AVR]
IC601	IC	Voltage regulator (OLED 3.1V) [3.1V AVR]
IC602	IC	Bus buffer [BUS BUFF]
IC670	IC	CODEC
IC671	IC	Voltage regulator (33A) [3.3V AVR]
IC672	IC	Voltage regulator (18C) [1.8V AVR]
IC700	IC	IF IC
IC701	IC	IF AMP
IC702	IC	RX 1st mixer [RX 1st MIX]
IC703	IC	LNA
IC900,901	IC	Buffer AMP (20MHz TCXO) [BUFF AMP]

Ref. No.	Part Name	Use / Function
IC902	IC	DC AMP (VC tune) [DC AMP]
IC1000	IC	DC AMP (CV_RX) [DC AMP]
IC1001	IC	RX PLL
IC2000	IC	TX PLL
IC3010	IC	DC AMP (ASSIST TX/RX) [DC AMP]
IC3011	IC	DC/DC converter (20V) [20V DC/DC]
IC3022	IC	Voltage regulator (FAN VCC 9V) [9.0V AVR]
IC3023	IC	Pre-drive AMP [PRE DRV AMP]
IC3024	IC	LPF
IC3025,3026	IC	DC AMP
IC3027	IC	PA control (FWD detect) [PA CTL]
IC3029	IC	Voltage regulator (5V_2) [5.0V AVR]
IC3030	IC	Voltage regulator r (9V_2) [9.0V AVR]
IC4000	IC	DC/DC converter (3.3V, 5.0V) [3.3V,5.0V DC/DC]
IC4001	IC	Voltage regulator (9V) [9.0V AVR]
IC4002	IC	Reset (DC/DC converter) [RST]
IC4003	IC	Current detector [CURR DET]
IC4005	IC	Voltage regulator (REG_3.3V) [3.3V AVR]
IC4006	IC	Voltage regulator (REG_5V) [5.0V AVR]
IC4010	IC	DC SW (CONT12V) [DC SW]
Q1-3	FET	DC SW
Q4	TRANS ISTOR	Voltage control [V CTL]
Q451	TRANS ISTOR	DC SW (AO1) [DC SW]
Q452	TRANS ISTOR	DC SW (AO2) [DC SW]
Q453	DIGI TRANS ISTOR	DC SW (EX RST) [DC SW]
Q602,603	DIGI TRANS ISTOR	DC SW
Q700,701	TRANS ISTOR	IF AMP
Q900	FET	2nd local VCO oscillation [2nd VCO]
Q901	TRANS ISTOR	Ripple filter [RIPL FIL]
Q1000	FET	DC SW
Q1001	TRANS ISTOR	Ripple filter [RIPL FIL]
Q1002,1003	FET	DC SW
Q1004	FET	RX_L VCO oscillation [RX_L VCO]
Q1005	FET	RX_H VCO oscillation [RX_H VCO]

Ref. No.	Part Name	Use / Function
Q1007	TRANS ISTOR	RX VCO buffer AMP [RX VCO BUFF AMP]
Q1008	TRANS ISTOR	RX Fin AMP
Q2000	FET	DC SW
Q2001	TRANS ISTOR	TX VCO Buffer AMP [TX VCO BUFF AMP]
Q2002	TRANS ISTOR	TX Fin AMP
Q2003	FET	TX_L VCO oscillation [TX_L VCO]
Q2006	TRANS ISTOR	Ripple filter [RIPL FIL]
Q2007	FET	TX_H VCO oscillation [TX_H VCO]
Q2008,2009	FET	DC SW
Q3035	TRANS ISTOR	Ripple filter (20V) [RIPL FIL]
Q3060	FET	Inverter (FAN_PWM) [INV(FAN_PWM)]
Q3061-3063	FET	DC SW
Q3065	FET	Drive AMP [DRV AMP]
Q3066	TRANS ISTOR	DC SW (VG_DIS) [DC SW]
Q3069	FET	Final power AMP [FINAL AMP]
Q3071	FET	DC SW (TADJ) [DC SW]
Q3072	DIGI TRANS ISTOR	DC SW
Q3073	FET	DC SW
Q3082	FET	DC SW
Q4004	TRANS ISTOR	DC SW
Q4005	FET	DC SW (12V) [DC SW]
Q4006	FET	DC SW (PW_DOWN_10V) [DC SW]
Q4007	FET	DC SW (9V_TX) [DC SW]
Q4008	FET	DC SW (9V_TX) [DC SW]
Q4010	FET	DC SW (PS_SWT_STATUS) [DC SW]
Q4013	FET	DC SW (5V_RX_M) [DC SW]
Q4014	FET	DC SW (5V_RX_EN) [DC SW]
Q4015	FET	DC SW (3.3V_RX_M) [DC SW]
Q4016,4017	FET	DC SW (/MAIN SHDN) [DC SW]
Q4018	FET	DC SW (PLD_PS_SWT_CTRL) [DC SW]
Q4020	FET	DC SW (BASW) [DC SW]
Q4021	DIGI TRANS ISTOR	DC SW
Q4022	DIGI TRANS ISTOR	DC SW(DC/DC Reset) [DC SW]

Ref. No.	Part Name	Use / Function
Q4024	TRANS ISTOR	DC SW(DC/DC Reset) [DC SW]
D1	LED	LED (Power ON indicator) [PWR ON IND LED]
D2	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D53	DIODE	DC SW (RTC backup battery) [DC SW]
D100,101	SCHOT TKY DIODE	Reverse current prevention [REV CURR PREV]
D250	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D252-257	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D260-262	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D300	ZENER DIODE	Voltage reference [V REF]
D521-531	DIODE	Surge protection [SRG PRTCT]
D533-536	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D539	DIODE	Surge protection [SRG PRTCT]
D541	DIODE	Surge protection [SRG PRTCT]
D544	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D550-557	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D558	DIODE	Reverse current prevention [REV CURR PREV]
D559	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D560	DIODE	Reverse current prevention [REV CURR PREV]
D561	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D600	LED	LED (TX1) [TX1 LED]
D601	LED	LED (TX2) [TX2 LED]
D602	LED	LED (RX1) [RX1 LED]
D603	LED	LED (RX2) [RX2 LED]
D605	LED	LED (Status) [STATUS LED]
D606-610	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D700	VARI CAP DIODE	IF CLK VCO frequency control [IF CLK VCO F CTL]

Ref. No.	Part Name	Use / Function
D701,702	DIODE	IF limiter [IF LMT]
D703,704	VARI CAP DIODE	RX Band-pass filter tuning [RX BPF TUN]
D705,706	DIODE	RF limiter [RF LMT]
D709-712	VARI CAP DIODE	RX Band-pass filter tuning [RX BPF TUN]
D715-718	VARI CAP DIODE	RX Band-pass filter tuning [RX BPF TUN]
D750	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D900	VARI CAP DIODE	2nd_VCO frequency control [2nd VCO F CTL]
D901	DIODE	DC SW
D1000	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D1001	VARI CAP DIODE	RX_L VCO frequency control [RX_L VCO F CTL]
D1003,1004	VARI CAP DIODE	RX_L VCO assist tuning [RX_L VCO ASST TUN]
D1005	VARI CAP DIODE	RX_H VCO frequency control [RX_H VCO F CTL]
D1007,1008	VARI CAP DIODE	RX_H VCO assist tuning [RX_H VCO ASST TUN]
D1009	DIODE	DC SW
D1010,1011	VARI CAP DIODE	RX_L VCO assist tuning [RX_L VCO ASST TUN]
D1013,1014	VARI CAP DIODE	RX_H VCO assist tuning [RX_H VCO ASST TUN]
D2000	VARI CAP DIODE	TX_L VCO frequency control [TX_L VCO_F CTL]
D2002-2005	VARI CAP DIODE	TX_L VCO assist tuning [TX_L VCO ASST TUN]
D2006	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D2007	VARI CAP DIODE	TX modulation [TX MOD]
D2010	DIODE	DC SW
D2011	VARI CAP DIODE	TX modulation [TX MOD]

Ref. No.	Part Name	Use / Function
D2012-2015	VARI CAP DIODE	TX_H VCO assist tuning [TX_H VCO ASST TUN]
D2017	VARI CAP DIODE	TX_H VCO frequency control [TX_H VCO F CTL]
D3016	SCHOT TKY DIODE	DC/DC converter (20V) [20V DC/DC]
D3017	DIODE	DC SW
D3074	DIODE	Inductive kickback protection [KB PRTCT]
D3075	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D3077	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D3079	DIODE	Reverse current prevention [REV CURR PREV]
D3081	SCHOT TKY DIODE	REV power detection [REV PWR DET]
D3091	SURGE ABSOR BER	Surge protection [SRG PRTCT]
D3095	DIODE	Reverse current prevention [REV CURR PREV]
D4000	LED	LED (Power) [PWR LED]
D4003	DIODE	Inductive kickback protection [KB PRTCT]
D4004,4005	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4007	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4008,4009	DIODE	Reverse current prevention [REV CURR PREV]
D4010,4011	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4012	ZENER DIODE	Surge protection [SRG PRTCT]
D4150	ZENER DIODE	Over voltage protection [OVR V PRTCT]
D4151	DIODE	Voltage reference [V REF]
D4152	DIODE	Reverse current prevention [REV CURR PREV]

2.14 端子功能

2.14.1 收发单元 (XC1-326E-00)

Pin No.	Name	I/O	Function
CN7 (OLED)			
1	GND	-	GND
2	VCC	O	Power supply for OLED panel
3	VLSS	-	Ground of analog circuit
4	VSS	-	Ground of logic circuit
5	VDD	O	Power supply for logic
6	CSn	O	Chip select
7	RESn	O	Power reset for controller and driver
8	D/Cn	O	Data/Command control
9	D0	I/O	Host data In/Out bus
10	D1	I/O	Host data In/Out bus
11	D2	I/O	Host data In/Out bus
12	IREF	-	Current reference for brightness adjustment

Pin No.	Name	I/O	Function
13	VCOMN	-	Voltage output high level for COM signal
14	VCC	O	Power supply for OLED panel
15	BS0	O	Communication protocol select
16	BS1	O	Communication protocol select
17	VLSS	-	Ground of analog circuit
18	GND	-	GND
CN3005 (FAN)			
1	VCC	O	Switched power supply for FAN
2	GND	-	GND
3	SENSOR	I	FAN lock detection pulse
4	CONTROL	O	PWM signal to define the number of FAN rotation
CN10 (for production)			
1~13	micro SD	-	micro SD

2.14.2 LAN 连接器

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
1	TD+	O	Analog	NO	TX Signal +	100Base-TX					Conform to IEEE802.3 MLT-3 (4B/5B Encoding) 100Base-TX =125Mbps*4/5
						+Vout@100Ω	0.95	-	1.05	V	
						-Vout@100Ω	-1.05	-	-0.95	V	
						Data rate (100Base-TX)	-	125.0	-	Mbps	
						10Base-T					
						Vout@100Ω	2.2	2.5	2.8	V	
						Data rate (10Base-T)		10.0		Mbps	
						Impedance					
						Output Impedance		100		Ω	
2	TD-	O	Analog	NO	TX Signal -	100Base-TX					Conform to IEEE802.3 MLT-3 (4B/5B Encoding) 100Base-TX =125Mbps*4/5
						+Vout@100Ω	0.95	-	1.05	V	
						-Vout@100Ω	-1.05	-	-0.95	V	
						Data rate (100Base-TX)	-	125.0	-	Mbps	
						10Base-T					
						Vout@100Ω	2.2	2.5	2.8	V	
						Data rate (10Base-T)	-	10.0	-	Mbps	
						Impedance					
						Output Impedance	-	100	-	Ω	
3	RD+	I	Analog	NO	RX Signal +	Impedance					Conform to IEEE802.3
						Input Impedance	-	100	-	Ω	
4	NC	-	-	-	-		-	-	-	-	
5	NC	-	-	-	-		-	-	-	-	

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
6	RD-	I	Analog	NO	RX Signal -	Impedance					Conform to IEEE802.3
						Input Impedance	-	100	-	Ω	
7	NC	-	-	-	-		-	-	-	-	
8	NC	-	-	-	-		-	-	-	-	

2.14.3 USB 连接器（类型 A）

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
1	VBUS	O	Power	NO	USB VBUS(5V) Power	VOUT	4.75	-	5.25	V	
						IOUT		-	500	mA	
2	D-	I/O	Analog	NO	USB Data Minus	High-speed					Conform to Universal Serial Bus Specification (Revision 2.0 April 27, 2000)
						VOH	360	-	440	mV	
						VOL	-10.0	-	10.0	mV	
						Baud Rate		480		Mbps	
						Low-/Full-speed					
						VIH	2.7	-	3.6	V	
						VIL			0.8	V	
						VOH	2.8	-	3.6	V	
						VOL	0.0	-	0.3	V	
						Baud Rate (Low-speed)		1.5		Mbps	
						Baud Rate (Full-speed)		12		Mbps	
3	D+	I/O	Analog	NO	USB Data Plus	High-speed					Conform to Universal Serial Bus Specification (Revision 2.0 April 27, 2000)
						VOH	360	-	440	mV	
						VOL	-10.0	-	10.0	mV	
						Baud Rate		480		Mbps	
						Low-/Full-speed					
						VIH	2.7	-	3.6	V	
						VIL		-	0.8	V	
						VOH	2.8	-	3.6	V	
						VOL	0.0	-	0.3	V	
						Baud Rate (Low-speed)		1.5		Mbps	
						Baud Rate (Full-speed)		12		Mbps	
4	GND	-	GND		USB GND		-	-	-	-	

2.14.4 CONTROL I/O D-SUB 25 针连接器

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note
						Parameter	Min	Typ	Max	Unit	
1	NC	-		No							
	RSSI	O	Analog	Yes	RSSI Voltage	Range	0.0		3.3	V	
	RESET	I	Digital	Yes	Reset	VIH	3.0	5.0	+B	V	
						VIL			0.5	V	
						High Pulse Width	100			ms	
2	RXD2	I	Digital	No	Asynchronous Receive Data	Voltage Range	-30		30	V	Conform to RS-232C
						Baud Rate			230	kbps	
3	TXD2	O	Digital	No	Asynchronous Send Data	RL=3kΩ	+/-5.0	+/-9.0		V	Conform to RS-232C
						Baud Rate			230	kbps	Conform to RS-232C
4	AI1	I	Digital	No	Programmable Function Input1	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	Conform to RS-232C
	CTS	I	Digital	Yes	Clear to Send	Voltage Range	-30		30	V	
5	AI2	I	Digital	No	Programmable Function Input2	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	Conform to RS-232C
	RTS	O	Digital	Yes	Request to Send	Voltage Swing RL=3kΩ	+/-5.0	+/-9.0		V	
6	AI3	I	Digital	No	Programmable Function Input3	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%
						VIL	VSS		0.8	V	
7	DG	-	GND		Digital Ground	-	-	-	-		
8	TD	I	Analog	No	TX Data Input (Signaling)	0.1kHz/0.5Vp-p	0.70	0.75	0.80	kHzDEV	NFW WFM
						Input Impedance		600		Ω	600Ω PD to GND
9	TA	I	Analog	No	TX Audio Input (Voice)	1kHz/60%Dev. Input Max =2.0Vrms	270	280	290	mVrms	NFW WFM
						Input Impedance		600		Ω	600Ω PD to GND
10	RD	O	Analog	No	RX Data Output (Signaling) Not Squelched	Output Voltage /60%Dev.	75	80	85	mVrms	Allowable Load 47kΩ
11	RA	O	Analog	No	RX Audio Output (Voice) Squelched	Output Voltage /60%Dev.	380	400	420	mVrms	Allowable Load 47kΩ
12	RXG	-	GND	No	RX Signal Ground	-	-	-	-		
13	NC	-	-	No	-	-	-	-	-		
14	AO1	O	Digital	No	Auxiliary Output1 Open Collector	External Voltage			16	V	
						Allowable Current			200	mA	
				Yes	Auxiliary Output1 Open Collector With PU	PU Resistor	4.7k	47k		Ω	
						VOL(IO=0mA)			0.1	V	

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note	
						Parameter	Min	Typ	Max	Unit		
15	EMON	I	Digital	No	External Monitor Switch	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%	
						VIL	VSS		0.8	V		
16	EPTT	I	Digital	No	External PTT Switch	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%	
						VIL	VSS		0.8	V		
17	SC	O	Digital	No	Squelch Control	VOH		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%	
						VOL			0.4	V		
18	AO2	O	Digital	No	Auxiliary Output2	External Voltage			16	V		
						Allowable Current			200	mA		
				Yes	Auxiliary Output2 Open Collector With PU	PU Resistor	4.7k	47k		Ω		VCC 5V+/-3%
						VOL(IO=0mA)			0.1	V		
19	TXG	-	GND	No	TX Signal Ground	-	-	-	-	-		
20	IO1	I	Digital	No	Programmable Function I/O1	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%	
						VIL	VSS		0.8	V		
						Input Impedance		47k		Ω		
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%	
						VOL(IO=0mA)			0.4	V		
21	IO2	I	Digital	No	Programmable Function I/O2	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%	
						VIL	VSS		0.8	V		
						Input Impedance		47k		Ω		
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC	
						VOL(IO=0mA)			0.4	V		
22	IO3	I	Digital	No	Programmable Function I/O3	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%	
						VIL	VSS		0.8	V		
						Input Impedance		47k		Ω		
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%	
						VOL(IO=0mA)			0.4	V		
23	IO4	I	Digital	No	Programmable Function I/O4	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%	
						VIL	VSS		0.8	V		
						Input Impedance		47k		Ω		
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%	
						VOL(IO=0mA)			0.4	V		
24	IO5	I	Digital	No	Programmable Function I/O5	VIH	0.7*V CC		VCC	V	47kΩ PU to VCC 5V+/-3%	
						VIL	VSS		0.8	V		
						Input Impedance		47k		Ω		
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%	
						VOL(IO=0mA)			0.4	V		

Pin No.	Pin Name	I/O	Signal Type	Modification	Function	Rating and Condition					Note			
						Parameter	Min	Typ	Max	Unit				
25	IO6	I	Digital	No	Programmable Function I/O6	VIH	0.7*VCC		VCC	V	47kΩ PU to VCC 5V+/-3%			
						VIL	VSS		0.8	V				
						Input Impedance		47k		Ω				
		O				VOH(IO=0mA)		VCC		V	Open Drain 47kΩ PU to VCC 5V+/-3%			
						VOL(IO=0mA)			0.4	V				

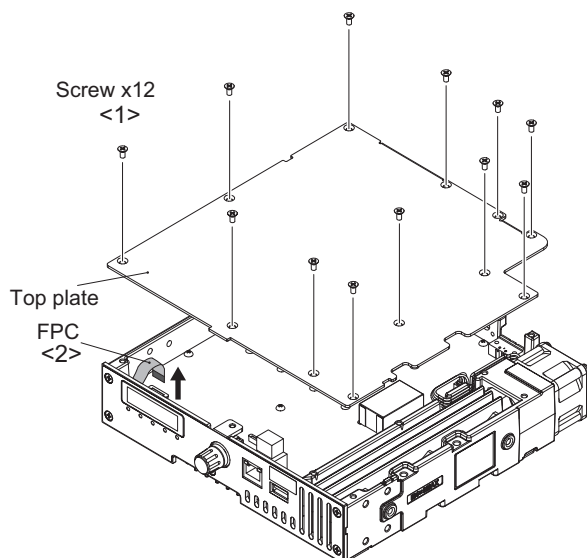
SECTION 3

DISASSEMBLY / 拆卸

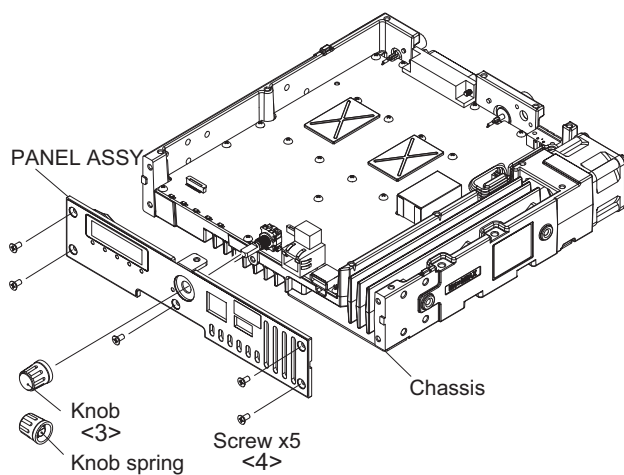
3.1 Precautions for Disassembly

3.1.1 TX-RX UNIT disassembly procedure

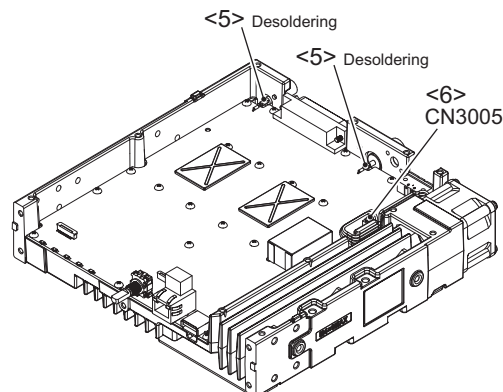
- (1) Remove the 12 screws on the top of the repeater and remove the top plate. <1>
- (2) Disconnect the FPC from the TX-RX UNIT connector. <2>



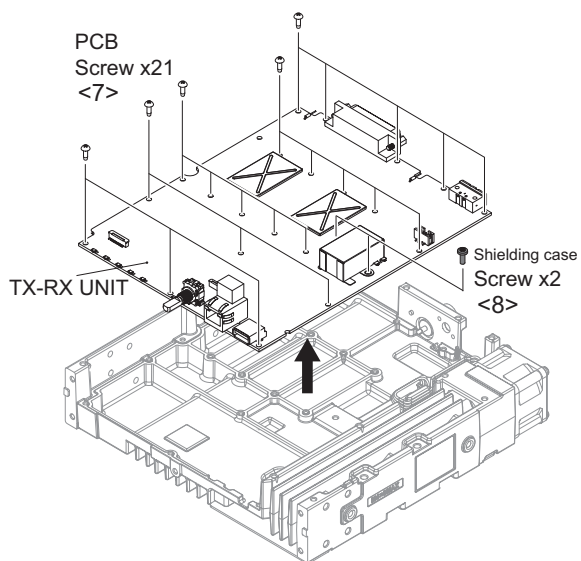
- (3) Pull out the knob and remove the 5 screws then remove the PANEL ASSY from the chassis. <3> <4>
When the knob is pulled out, the spring inside the knob is removed at the same time.



- (4) Remove the solder connecting the two receptacles and TX-RX UNIT. <5>
- (5) Disconnect the fan motor wire from the TX-RX UNIT CN3005. <6>

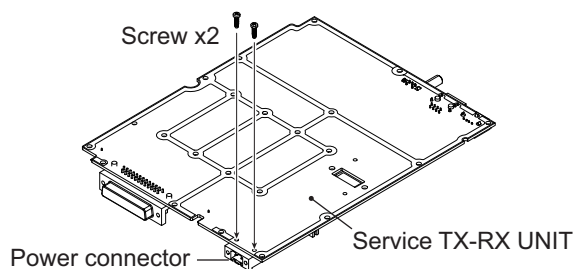


- (6) Remove the 21 PCB screws and the 2 shielding case screws. <7> <8>
- (7) Remove the TX-RX UNIT from the chassis.



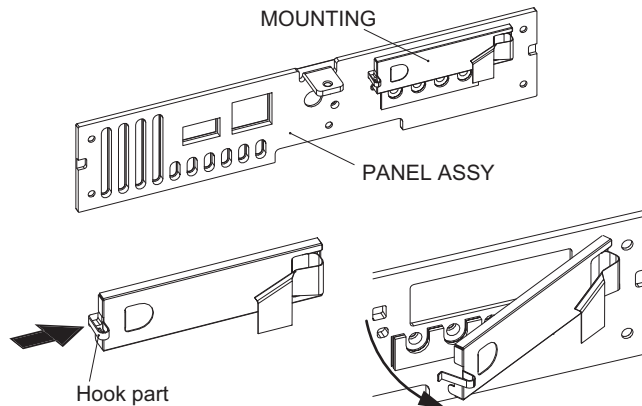
Note:

The power connector of the service TX-RX UNIT is not fixed with screws. When replacing a defective TX-RX UNIT with a service TX-RX UNIT, the power connector should be fixed with the reuse screws of the TX-RX UNIT.



3.1.2 LCD ASSY disassembly procedure

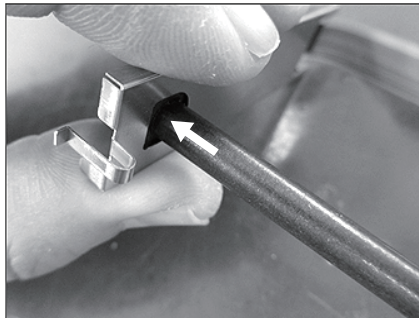
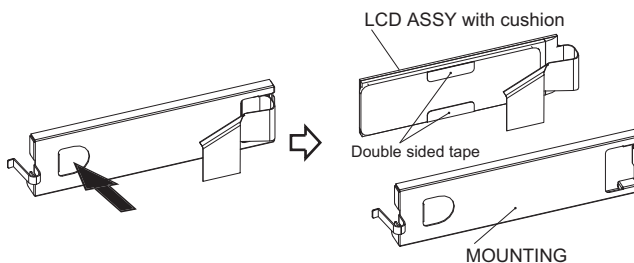
- (1) While pushing the hook part of MOUNTING in the direction of the arrow, remove the MOUNTING as shown in the figure.



- (2) The LCD ASSY is fixed to the MOUNTING with double sided tape. Separate the LCD ASSY by pushing it from the hole in the MOUNTING in the direction of the arrow using a rod-shaped jig (about Ø6-Ø7).

Note:

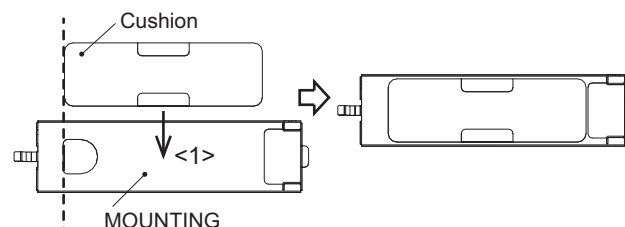
Be careful when separating the LCD ASSY from the MOUNTING as it may cause the glass to chip and the FPC to be damaged.



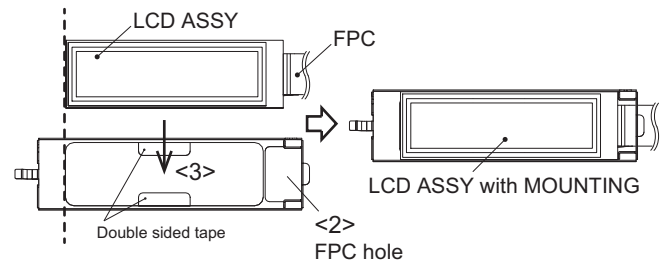
3.2 Precautions for Reassembly

3.2.1 LCD ASSY reassembly procedure

- (1) Attach the cushion to the MOUNTING. <1>

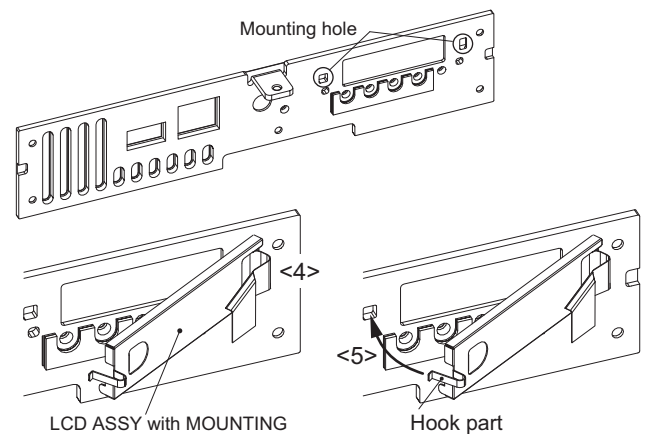


- (2) Pass the FPC of LCD ASSY through the hole in the MOUNTING and then attach it to the MOUNTING. <2> <3>

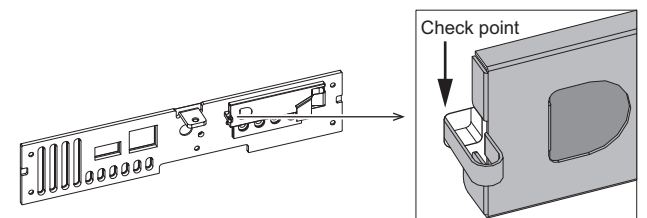


3.2.2 Attach the LCD ASSY with MOUNTING to the PANEL ASSY

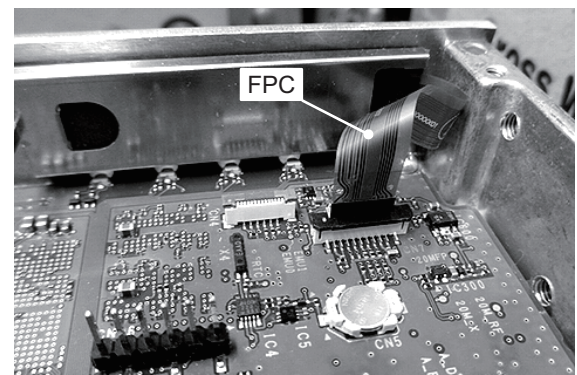
- (1) Insert the hook part on the FPC side of the MOUNTING into the hole in the PANEL ASSY. <4>
- (2) Insert while pressing the hook part of the MOUNTING to pass the mounting hole, and fix it to the PANEL ASSY. <5>



- (3) Make sure that there is no gap between the hook part of the MOUNTING and the hole of the PANEL ASSY and MOUNTING is fixed to the PANEL ASSY.

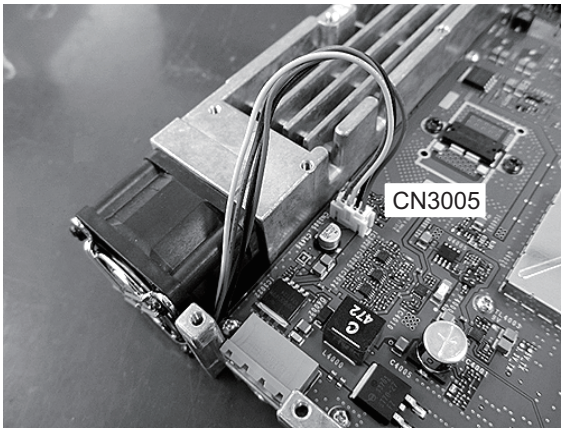


- (4) After attaching the PANEL ASSY to the chassis, form the FPC as shown in the figure and connect it to the connector.



3.2.3 Forming of the fan motor wire

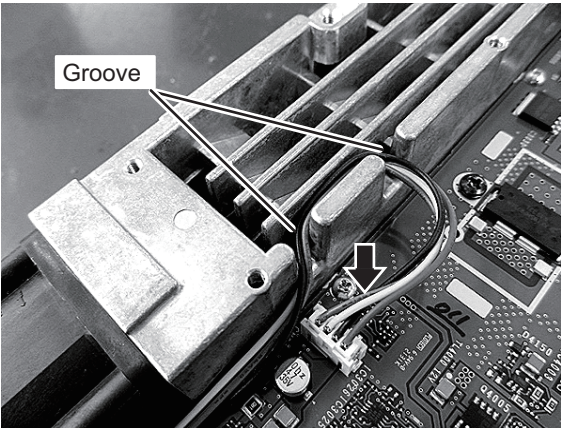
- (1) Attach the fan motor to the chassis and insert its connector into the CN3005 housing.



- (2) Form the wire so as to pass through the two grooves of the chassis.

Note:

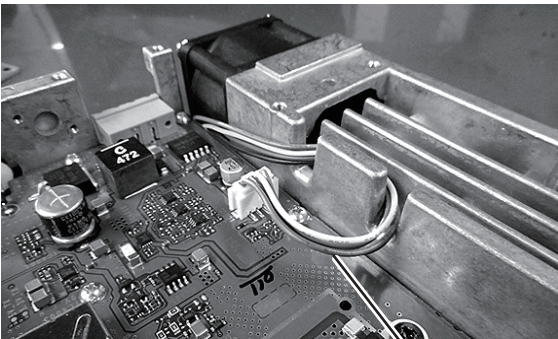
Press the part around the arrow of the wire and form it not to protrude from the groove of the chassis.



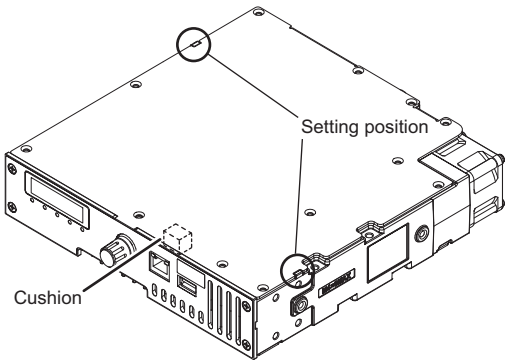
3.2.4 Attaching the top plate

Note:

Make sure the fan motor wire fits in the grooves of the chassis.



- (1) Set the top plate on the chassis.
Attach the screws while pressing the top plate where the cushion contacts.



3.3 Assembly Information (Non-reusable parts)

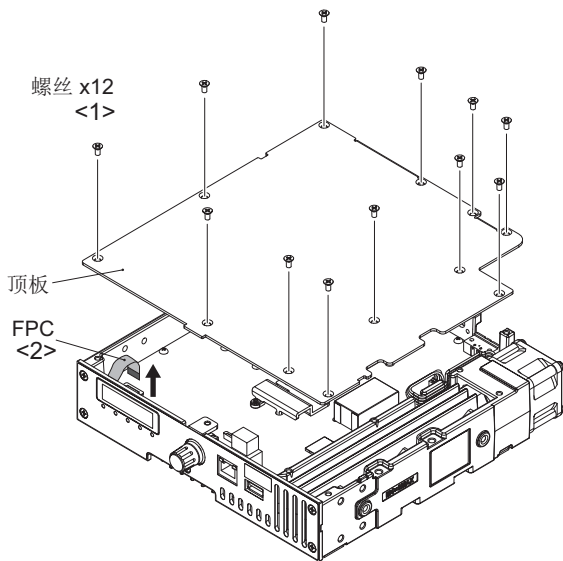
When "Main Parts" is changed (ordered), "Non-reusable parts" should also be changed (ordered) together. Especially the parts with adhesive such as Cushion and Sheet etc. cannot be reused. Use new ones regardless of whether they have been used in locations that affect performance of the products.

Main Parts		Non-reusable parts		
Part Name	Part Number	Part Name	Part Number	Remarks
PANEL ASSY	A6C-0154-10	FRONT GLASS	B1A-0130-00	
		CAUTION STICKER	B4B-0008-00	FCC
		SHADE	F1E-0071-00	
LCD ASSY	B3H-0149-00	CUSHION	G1D-0419-00	
		MOUNTING	J2B-0659-00	
LAN CONNECTOR	E5J-0262-00	CONDUCT CUSHION	G1D-0482-00	
TX-RX UNIT	XCA-095E-00S	SHIELDING COVER	F1B-0021-00	QTY:2
		CONDUCT CUSHION	G1D-0482-00	LAN

3.4 拆卸注意事项

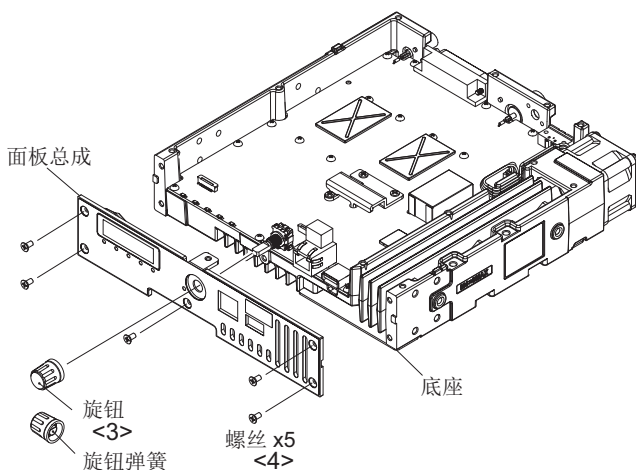
3.4.1 收发单元拆卸过程

- (1) 拧下中继台顶部的 12 颗螺丝，然后拆下顶板。<1>
- (2) 从收发单元连接器上断开 FPC。<2>

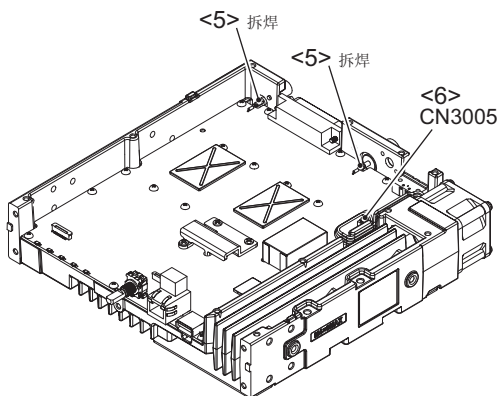


- (3) 拉出旋钮并拧下 5 颗螺丝，然后从底座上拆下面板总成。<3> <4>

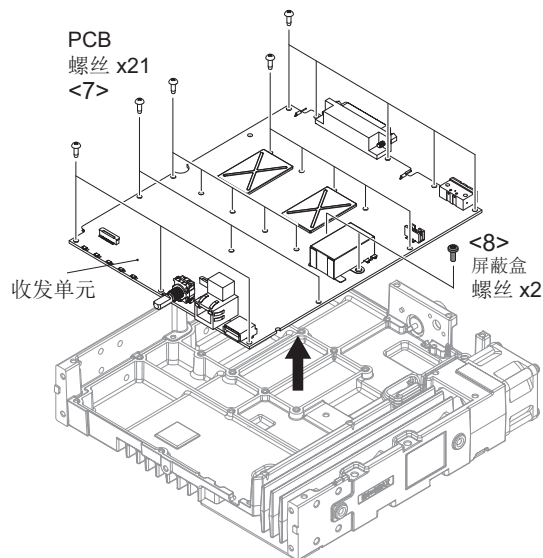
当拉出旋钮时，旋钮内的弹簧被同时拆下。



- (4) 去除用于连接两个插口和收发单元的焊料。<5>
- (5) 从收发单元 CN3005 上断开风扇电机导线。<6>

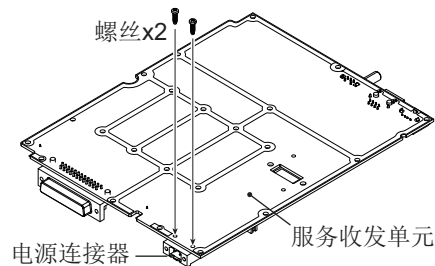


- (6) 拆下 21 个 PCB 螺丝和 2 个屏蔽盒螺丝。<7> <8>
- (7) 从底座上拆下收发单元。



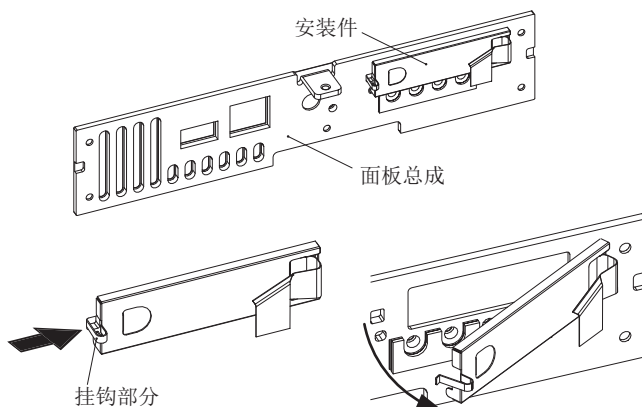
注：

服务收发单元的电源连接器没有用螺丝固定。用服务收发单元更换有故障的收发单元时，应使用收发单元的重复使用螺丝来固定电源连接器。



3.4.2 LCD 组件拆卸过程

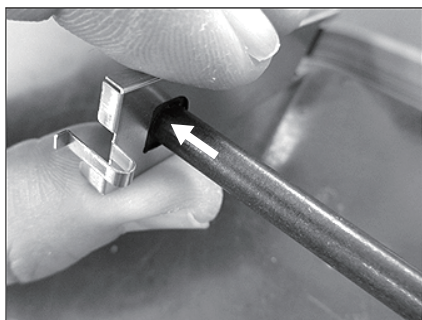
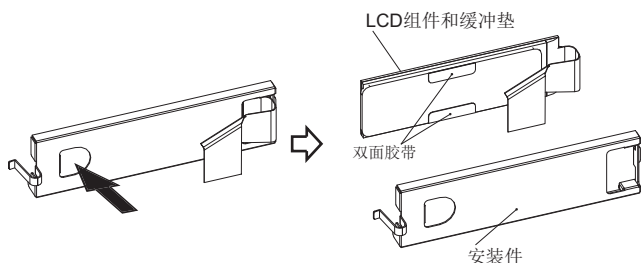
- (1) 沿箭头方向按压安装件的挂钩部分时，如图所示拆下安装件。



- (2) LCD 组件用双面胶带固定在安装件上。
使用杆状夹具（约 Ø6-Ø7），沿箭头方向将 LCD 组件从安装件的孔中推出，从而分离 LCD 组件。

注：

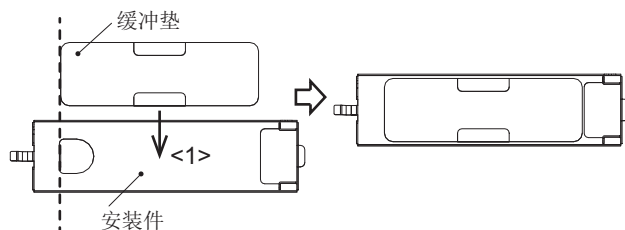
在将 LCD 组件与安装件分离时要小心，因为这可能会导致玻璃碎裂以及 FPC 损坏。



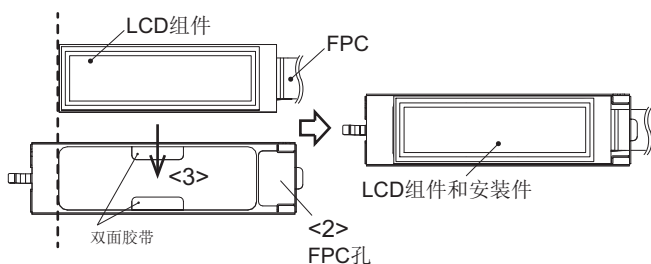
3.5 重新组装注意事项

3.5.1 LCD 组件重新组装过程

- (1) 将缓冲垫安装到安装件上。 <1>

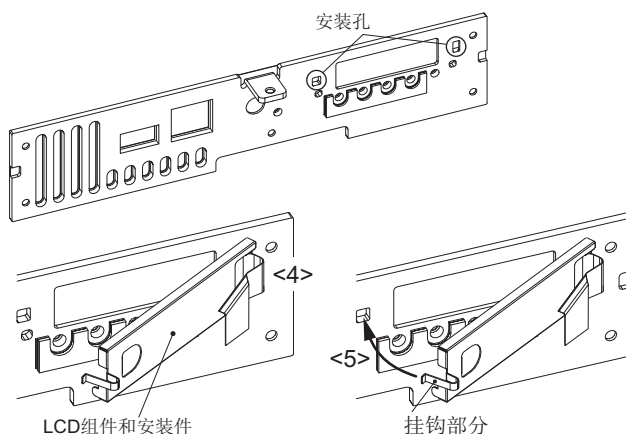


- (2) 将 LCD 组件的 FPC 穿过安装件上的孔，然后将其安装到安装件上。 <2> <3>

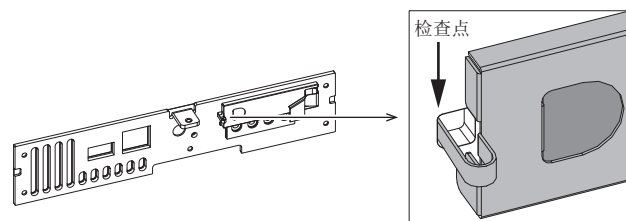


3.5.2 将 LCD 组件和安装件一起安装至面板总成

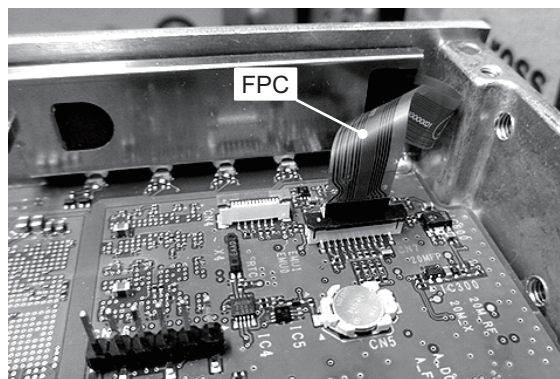
- (1) 将安装件 FPC 侧的挂钩部分插入面板总成的孔中。 <4>
(2) 在按压安装件挂钩部分的同时进行插入，以穿过安装孔，然后将其固定到面板总成上。 <5>



- (3) 确保安装件的挂钩部分和面板总成的孔之间没有间隙，并且安装件固定在面板总成上。

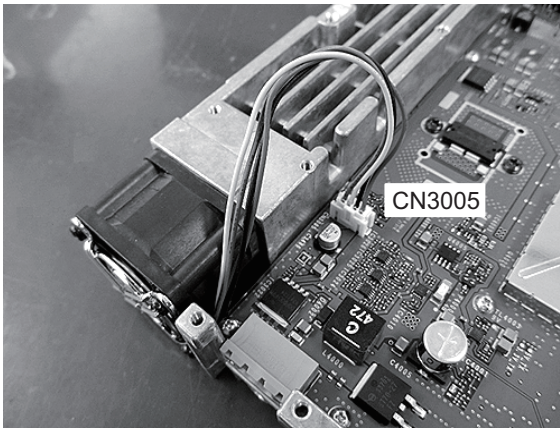


- (4) 将面板总成安装至底座后，如图所示形成 FPC 并将它连接到连接器上。



3.5.3 搭接风扇电机导线

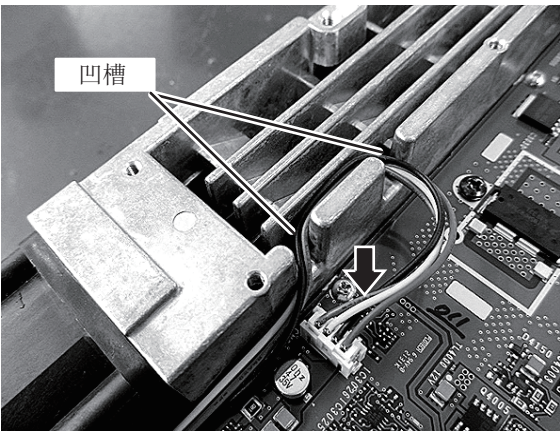
- (1) 将风扇电机安装到底座上，同时将其连接器插入 CN3005 外壳中。



- (2) 搭接导线，使其穿过底座上的两个凹槽。

注：

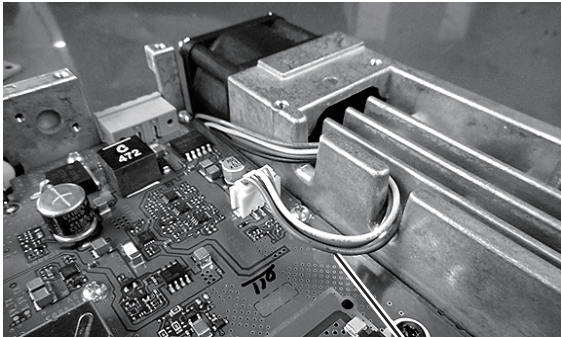
按压导线箭头所示的部分，使其不要突出到底座凹槽的外面。



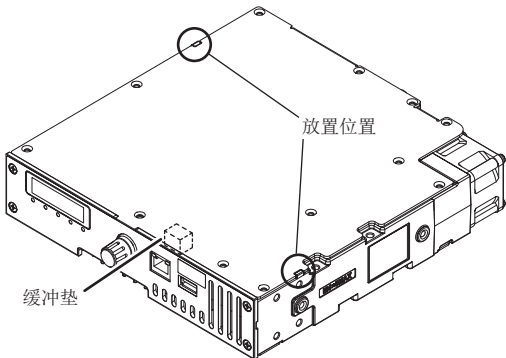
3.5.4 安装顶板

注：

确保风扇电机导线固定在底座的凹槽中。



- (1) 将顶板放置在底座上。
安装螺丝，同时按压顶板（抵住缓冲垫）。



3.6 组装信息（非可再用零件）

在更换（订购）“主要零件”时，应同时更换（订购）“非可再用零件”。尤其是带有粘合剂的零件（如缓冲垫和垫片等），它们是不能重复使用的。
无论此类零件是否用在那些会影响产品性能的位置，都应使用新的零件。

主要零件		非可再用零件		
零件名称	零件号	零件名称	零件号	备注
PANEL ASSY	A6C-0154-10	FRONT GLASS	B1A-0130-00	
		CAUTION STICKER	B4B-0008-00	FCC
		SHADE	F1E-0071-00	
LCD ASSY	B3H-0149-00	CUSHION	G1D-0419-00	
		MOUNTING	J2B-0659-00	
LAN CONNECTOR	E5J-0262-00	CONDUCT CUSHION	G1D-0482-00	
TX-RX UNIT	XCA-095E-00S	SHIELDING COVER	F1B-0021-00	数量：2
		CONDUCT CUSHION	G1D-0482-00	LAN

SECTION 4

ADJUSTMENT / 調整

4.1 Test Equipment Required for Alignment

Test Equipment	Major Specifications			
1. Standard Signal Generator (SSG)	Frequency Range	136 to 174MHz		
	Modulation	Frequency modulation and external modulation		
	Output	-127dBm/0.1uV to greater than -20dBm/22.4mV		
	When performing the Frequency adjustment, the following accuracy is necessary. • 0.003ppm Use a standard oscillator for adjustments, if necessary.			
2. Power Meter	Input Impedance	50Ω		
	Operation Frequency	136 to 174MHz or more		
	Measurement Capability	Vicinity of 100W		
3. Deviation Meter	Frequency Range	136 to 174MHz		
4. Digital Volt Meter (DVM)	Measuring Range	1V to 20V DC		
	Input Impedance	High input impedance for minimum circuit loading		
5. Oscilloscope		DC through 30MHz		
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 600MHz		
	Frequency Stability	0.2ppm or less		
7. Ammeter		15A or more		
8. Audio Analyzer	Frequency Range	50Hz to 10kHz	Capability	2% or less at 1kHz
	Voltage Range	3mV to 3V	Input Level	50mV to 10Vrms
9. Audio Generator (AG)	Frequency Range	50Hz to 5kHz		
	Output	0 to 1V		
10. Voltmeter	Measuring Range	10V to 1.5V DC or less		
	Input Impedance	50kΩ/V or greater		

4.2 Test Channel

No.	RX (MHz)	TX (MHz)
1	155.050000	155.100000
2	136.050000	136.100000
3	173.950000	173.900000
4	155.000000	155.000000
5	155.200000	155.200000
6	155.400000	155.400000
7~16	-	-

4.3 Test Signaling

■Analog

No.	RX	TX
1	None	None
2	None	100Hz Square Wave
3	QT:67.0Hz	QT:67.0Hz
4	QT:151.4Hz	QT:151.4Hz
5	QT:210.7Hz	QT:210.7Hz
6	QT:254.1Hz	QT:254.1Hz
7	DQT:D023N	DQT:D023N
8	DQT:D754I	DQT:D754I
9	None	Test Tone Encode
10	None	CW ID Encode (ID:VVV)
11	None	Courtesy Tone

■DMR

No.	RX	TX
1	CC 00 Burst	CC 00 Burst
2	None	PN 9 Continuous Pattern
3	None	Maximum Deviation Continuous Pattern
6	None	SYNC (Each Slot)+PN9 Burst Pattern

- Signaling number 2 is used for TX modulation signal quality test. i.e., TX adjacent channel power, FSK error, Occupied bandwidth, Emission mask, etc.
- Signaling number 3 is used for TX deviation test.

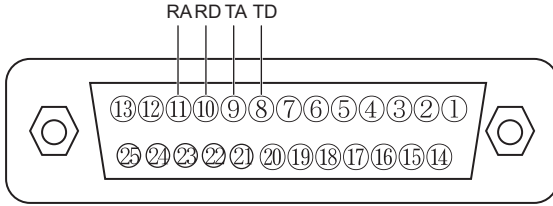
■NXDN

No.	RX	TX
1	RAN 1	RAN 1
2	RAN 1	PN9
3	RAN 1	Maximum Deviation Pattern

RAN: Radio Access Number

PN9: Pseudo-Random Pattern

4.4 Test Pin of CONTROL I/O (D-SUB 25-pin) Connector



4.5 Common Section

Item	PC tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC voltage: 13.2V 2) SSG standard modulation Narrow MOD: 1kHz, DEV: 1.5kHz Wide 5k MOD: 1kHz, DEV: 3kHz Wide 4k MOD: 1kHz, DEV: 2.4kHz	SSG Audio Analyzer Oscilloscope				PC ADJ		
2. Receive Assist	1) Adj item: [Receive Assist] 2) Adj item: [Low1],[Low2],[Low3],[Center1], [Center2],[Center3],[High1], [High2],[High3],[Overlap] *(Hereinafter referred to as [L1],[L2],[L3],[C1],[C2],[C3], [H1],[H2],[H3],[OL].)					PC ADJ	[Automatic Adjustment] 1) Press [Tune Assist Voltage] button. 2) Press [Apply All] button to store the adjustment value after the automatic adjustment has finished.	2.5V±0.1V [Automatic Adjustment] After the automatic adjustment is performed, verify that the VCO lock voltage is within the voltage range which is specified by the manual adjustment.
3. Transmit Assist	1) Adj item: [Transmit Assist] 2) Adj item: [L1],[L2],[L3],[C1],[C2],[C3], [H1],[H2],[H3],[OL]					PC ADJ	[Manual Adjustment] [V] Indicator on the PC window shows VCO lock voltage. Change the adjustment value to get VCO lock voltage within the limit of the specified voltage. Note: Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.	[Manual Adjustment] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

Item	PC tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Frequency	1) Test Channel: Channel 1 2) Adj item: [Frequency] SSG output : -20dBm (22.4mv) (CW (without modulation)) SSG: Use an accuracy of 0.003ppm for the SSG. (Use a standard oscillator if necessary.)			RX ANT		PC ADJ	Press [Start] button of "Auto Tuning". Press [Apply] button to store the adjustment value after the automatic adjustment has finished.	"IF20" value = Within 0±12 digits. The value of "IF20" will become around "0" after the adjustment has finished. Remark: • "Frequency" is adjusted under receiving condition with SSG. • Temperature range of +23°C to +27°C (+73.4°F to +80.6°F). (The temperature is displayed on the Frequency adjustment screen of the KPG- D7.)
5. Sensitivity 1	1) Adjust Item: [Sensitivity 1] 2) Adjust Item: [L1], [L3], [C2], [H1], [H3]					PC ADJ	Write the value as followings (Fixed value). [L1] = 33 [L3] = 53 [C2] = 68 [H1] = 115 [H3] = 153	Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: This is Variable Capacitor Tune voltage adjustment.
6. Sensitivity 2	1) Adjust Item: [Sensitivity 2] 2) Adjust Item: [L1], [L3], [C2], [H1], [H3]					PC ADJ	Write the value as followings (Fixed value). [L1] = 20 [L3] = 33 [C2] = 64 [H1] = 120 [H3] = 170	Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: This is Variable Capacitor Tune voltage adjustment.
7. RD Level (Analog Narrow)	1) Test Channel: Channel 1 2) Adj item: [RD Level (Analog Narrow)] SSG output: -53dBm (501uV) (MOD: 1kHz/±1.5kHz) Audio load:100kΩ	SSG Audio Analyzer Oscilloscope		RX ANT RD (D- SUB25 Pin No.10)		PC ADJ	Change the adjustment value to become 80mVrms within the specified range.	80mVrms±5mV Press [Apply] button to store the adjustment value after adjustment point was adjusted. Caution: This model doesn't have the speaker output. Note: This adjusts the level of the RX Data Output at D-SUB 25-pin.

Item	PC tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
8. RA Level (Analog Narrow)	1) Test Channel: Channel 1 2) Adj item: [RA Level (Analog Narrow)] SSG output: -53dBm (501uV) (MOD: 1kHz/±1.5kHz) Audio load:100kΩ	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	Change the adjustment value to become 400mVrms within the specified range.	400mVrms±20mV Press [Apply] button to store the adjustment value after adjustment point was adjusted. Caution: This model doesn't have the speaker output. Note: This adjusts the level of the RX Audio output at D-SUB 25-pin.

4.6 Transmitter Section

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1.High Transmit Power Limit	1) Adj item: [High Transmit Power Limit] 2) Adj item: [L1],[L3],[C2], [H1], [H3] 3) Press [Transmit] button.	Power meter Ammeter		TX ANT		PC ADJ	Change the adjustment value to become 56W within the specified range.	56W±2.5W ≤13A Current Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: Power spec is the factory adjustment condition. However, it should not exceed 56W in any case.
2.Low Transmit Power Limit	1) Adj item: [Low Transmit Power Limit] 2) Adj item: [L1],[L3],[C2], [H1], [H3] 3) Press [Transmit] button.	Power meter Ammeter		TX ANT		PC ADJ	Change the adjustment value to become 5W within the specified range.	5W±1.5W ≤5A Current Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: Power spec is the factory adjustment condition.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
3.High Transmit Power	1) Adj item: [High Transmit Power] 2) Adj item: [L1],[L3],[C2], [H1], [H3] 3) Press [Transmit] button.	Power meter Ammeter		TX ANT		PC ADJ	Change the adjustment value to become 50W within the specified range.	50W±0.5W ≤12A Current Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: Power spec is the factory adjustment condition. However, it should not exceed 50W in any case.
4.Low Transmit Power	1) Adj item: [Low Transmit Power] 2) Adj item: [L1],[L3],[C2], [H1], [H3] 3) Press [Transmit] button.	Power meter Ammeter		TX ANT		PC ADJ	Change the adjustment value to become 1W within the specified range.	1W±0.1W ≤3A Current Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: Power spec is the factory adjustment condition.
5. High RF Power Down Detection	1) Test Channel: Channel 1 2) Adj item: [High RF Power Down Detection] 3) Press [Transmit] button.	Power meter Ammeter		TX ANT		PC ADJ	Change the adjustment value to become 20W within the specified range.	20W±0.5W Press [Apply] button to store the adjustment value. Note: Power spec is the factory adjustment condition.
6. Low RF Power Down Detection	1) Test Channel: Channel 1 2) Adj item: [Low RF Power Down Detection] 3) Press [Transmit] button.	Power meter Ammeter		TX ANT		PC ADJ	Change the adjustment value to become 0.3W within the specified range.	0.3W±0.1W Press [Apply] button to store the adjustment value. Note: Power spec is the factory adjustment condition.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Ramp Offset	1) Test Channel: Channel 1 2) Adj item: [Ramp Offset] 3) Press [Transmit] button.	Power meter Ammeter				PC ADJ	[Automatic Adjustment] 1) Press [Tune Rump Offset] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished. [Manual Adjustment] 1) Set the adjustment value to "0". 2) Increase the adjustment value slowly while monitoring the offset monitor value. 3) Set the adjustment value when the offset monitor value exceeds "50".	
8. Balance	1) Adj item: [Balance] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 3kHz HPF: OFF 3) Press [Transmit] button.	Deviation meter Oscilloscope		TX ANT		PC ADJ	The Deviation of 20Hz tone frequency is fixed approx. at 2.5kHz. Change the adjustment value of 2kHz tone to become the same deviation of 20Hz tone (approx. 2.5kHz) within the specified range. While transmitting, click the check box "2kHz Sine Wave" to change the tone between 20Hz and 2kHz.	Within ± 15Hz difference to the deviation of 20Hz tone. Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. Maximum Deviation (Analog)	1) Adj item: [Maximum Deviation (Analog Narrow)] [Maximum Deviation (Analog Wide 5k)] [Maximum Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 15kHz HPF: OFF 3) Press [Transmit] button.	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 520 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 520 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 492 Transmit at each adjustment point and check that the deviation within the specified range.	[Analog Narrow] 2.1kHz±0.05kHz [Analog Wide 5k] 4.1kHz±0.05kHz [Analog Wide 4k] 3.2kHz±0.05kHz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.
10. Maximum Deviation (DMR)	1) Adj item: [Maximum Deviation (DMR)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 3kHz HPF: OFF	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point. Reference Value: [Maximum Deviation (DMR)] [L1],[L3],[C2],[H1],[H3],[OL] 515 Transmit at each adjustment point and check that the deviation is within the specified range.	[DMR] 2749Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.
11. Maximum Deviation (NXDN Narrow)	1) Adj item: [Maximum Deviation (NXDN Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 3kHz HPF: OFF	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point. Reference Value: [Maximum Deviation (NXDN Narrow)] [L1],[L3],[C2],[H1],[H3],[OL] 515 Transmit at each adjustment point and check that the deviation is within the specified range.	[NXDN Narrow] ±2750~±3362Hz (±3056Hz±10%) Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. Maximum Deviation (NXDN Very Narrow)	1) Adj item: [Maximum Deviation (NXDN Very Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 3kHz HPF: OFF	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point. Reference Value: [Maximum Deviation (NXDN Very Narrow)] [L1],[L3],[C2],[H1],[H3],[OL] 530 Transmit at each adjustment point and check that the deviation is within the specified range.	[NXDN Very Narrow] $\pm 1203 \sim \pm 1471 \text{ Hz}$ $(\pm 1337 \text{ Hz} \pm 10\%)$ Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.
13.TD Deviation (Analog)	1) Adj item: [TD Deviation (Analog Narrow)] [TD Deviation (Analog Wide 5k)] [TD Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 3kHz HPF: OFF AG:100Hz/177mVrms (0.5Vp-p) From "TD" terminal of D-SUB25 Pin No.8	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 213 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 106 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 140 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] $750 \text{ Hz} \pm 50 \text{ Hz}$ [Analog Wide 5k] $750 \text{ Hz} \pm 50 \text{ Hz}$ [Analog Wide 4k] $750 \text{ Hz} \pm 50 \text{ Hz}$ Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: This adjusts the level of the TX Data input at D-SUB 25-pin.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
14. TA Deviation (Analog)	1) Adj item: [TA Deviation (Analog Narrow)] [TA Deviation (Analog Wide 5k)] [TA Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 15kHz HPF: OFF AG:1kHz/280mVrms From "TA" terminal of D-SUB25 Pin No.9	Deviation meter Oscilloscope		TX ANT TA (D-SUB25 Pin No.9)		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 100 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 100 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 106 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] 1500Hz±50Hz [Analog Wide 5k] 3000Hz±50Hz [Analog Wide 4k] 2400Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted. Note: This adjusts the level of the TX Audio input at D-SUB 25-pin.
15. QT Deviation (Analog)	1) Adj item: [QT Deviation (Analog Narrow)] [QT Deviation (Analog Wide 5k)] [QT Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 3kHz HPF: OFF	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 560 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 560 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 593 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] 350Hz±50Hz [Analog Wide 5k] 750Hz±50Hz [Analog Wide 4k] 600Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
16. DQT Deviation (Analog)	1) Adj item: [DQT Deviation (Analog Narrow)] [DQT Deviation (Analog Wide 5k)] [DQT Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 3kHz HPF: OFF Peak Hold	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 410 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 410 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 435 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] 350Hz±50Hz [Analog Wide 5k] 750Hz±50Hz [Analog Wide 4k] 600Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.
17. Test Tone Deviation (Analog)	1) Adj item: [Test Tone Deviation (Analog Narrow)] [Test Tone Deviation (Analog Wide 5k)] [Test Tone Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 15kHz HPF: OFF	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 512 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 512 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 540 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] 1500Hz±50Hz [Analog Wide 5k] 3000Hz±50Hz [Analog Wide 4k] 2400Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
18. Courtesy Tone Deviation (Analog)	1)Adj item: [Courtesy Tone Deviation (Analog Narrow)] [Courtesy Tone Deviation (Analog Wide 5k)] [Courtesy Tone Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 15kHz HPF: OFF	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 168 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 171 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 180 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] 500Hz±50Hz [Analog Wide 5k] 1000Hz±50Hz [Analog Wide 4k] 800Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.
19. CW ID Deviation (Analog)	1)Adj item: [CW ID Deviation (Analog Narrow)] [CW ID Deviation (Analog Wide 5k)] [CW ID Deviation (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 15kHz HPF: OFF	Deviation meter Oscilloscope		TX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 470 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 470 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 495 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] 1000Hz±50Hz [Analog Wide 5k] 2000Hz±50Hz [Analog Wide 4k] 1600Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.

Item	Tuning mode	Measurement			Adjustment			Specifications/ Remarks
		Test- equipment	Unit	Termi nal	Unit	Parts	Method	
20. Repeater Gain (Analog)	1)Adj item: [Repeater Gain (Analog Narrow)] [Repeater Gain (Analog Wide 5k)] [Repeater Gain (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3],[OL] Deviation meter LPF: 15kHz HPF: OFF SSG Audio:1kHz, Modulation Wide 5k/Wide 4k/Narrow: 1.0kHz Output Level: -53dBm (501uV)	Deviation meter Oscilloscope		TX ANT RX ANT		PC ADJ	Write Reference value for each adjustment point as follows. Reference Value: [Analog Narrow] [L1],[L3],[C2],[H1],[H3],[OL] 535 [Analog Wide 5k] [L1],[L3],[C2],[H1],[H3],[OL] 537 [Analog Wide 4k] [L1],[L3],[C2],[H1],[H3],[OL] 575 Transmit at each adjustment point and check that the deviation is within the specified range.	[Analog Narrow] [Analog Wide 5k] [Analog Wide 4k] 1000Hz±50Hz Press [Apply All] button to store the adjustment values after all adjustment points have been adjusted.

4.6.1 Necessary Deviation adjustment item for each signaling and mode

The following shows the necessary adjustment items for each signaling deviation. Please read the following table like the following example. In the case of the signaling "QT (Wide 5k)", this signaling is composed of three elements [Balance, Maximum Deviation, and QT Deviation (Wide 5k)]. Please adjust Balance and Maximum Deviation before adjusting QT Deviation (Wide 5k).

Mode	Signaling	Necessary adjustment and order				
		Wide 5k	Wide 4k	Narrow	Very Narrow	DMR
Analog	Audio	1.Balance 2.Maximum Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow]	---	---
	TD	1.Balance 2.Maximum Deviation [Analog Wide 5k] 3.TD Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k] 3.TD Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow] 3.TD Deviation [Analog Narrow]	---	---
	TA	1.Balance 2.Maximum Deviation [Analog Wide 5k] 3.TA Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k] 3.TA Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow] 3.TA Deviation [Analog Narrow]	---	---
	QT	1.Balance 2.Maximum Deviation [Analog Wide 5k] 3.QT Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k] 3.QT Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow] 3.QT Deviation [Analog Narrow]	---	---
	DQT	1.Balance 2.Maximum Deviation [Analog Wide 5k] 3.DQT Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k] 3.DQT Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow] 3.DQT Deviation [Analog Narrow]	---	---
	Test Tone	1.Balance 2.Maximum Deviation [Analog Wide 5k] 3.Test Tone Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k] 3.Test Tone Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow] 3.Test Tone Deviation [Analog Narrow]	---	---
	Courtesy Tone	1.Balance 2.Maximum Deviation [Analog Wide 5k] 3.Courtesy Tone Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k] 3.Courtesy Tone Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow] 3.Courtesy Tone Deviation [Analog Narrow]	---	---
	CWID	1.Balance 2.Maximum Deviation [Analog Wide 5k] 3.CW ID Deviation [Analog Wide 5k]	1.Balance 2.Maximum Deviation [Analog Wide 4k] 3.CW ID Deviation [Analog Wide 4k]	1.Balance 2.Maximum Deviation [Analog Narrow] 3.CW ID Deviation [Analog Narrow]	---	---
NXDN	Audio	---	---	1.Balance 2.Maximum Deviation [NXDN Narrow]	1.Balance 2.Maximum Deviation [NXDN Very Narrow]	---
DMR	Audio	---	---	---	---	1.Balance 2.Maximum Deviation [DMR]

- Balance and Maximum Deviation are common with all the above deviation adjustments. If Balance (Transmitter Section 8) has already adjusted, please skip Step 1. If Maximum Deviation (Transmitter Section 9, 10, 11, 12) has already adjusted, please skip Step 2.

4.7 Receiver Section

Item	Tuning mode	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF level setting	Test Channel Channel: 1 Test Signaling Mode: Analog Narrow Signaling: 1 SSG output: -53dBm (501uV) MOD: 1kHz/±1.5kHz	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		--	Follow RA output level adjustment at "8. RA Level (Analog Narrow)" in 4.5 Common Section.	Follow RA output level adjusted at "8. RA Level (Analog Narrow)" in 4.5 Common Section.
2. Open Squelch adjust [Analog Narrow]	1) Adj item: [Open Squelch (Analog Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dBSINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
3. Open Squelch adjust [Analog Wide 5k]	1) Adj item: [Open Squelch (Analog Wide 5k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dBSINAD level -3dB (MOD: 1kHz/±3kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
4. Open Squelch adjust [Analog Wide 4k]	1) Adj item: [Open Squelch (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dBSINAD level -3dB (MOD: 1kHz/±2.4kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
5. Open Squelch adjust [DMR]	1) Adj item: [Open Squelch (DMR)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/±1.1kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
6. Open Squelch adjust [NXDN Narrow]	1) Adj item: [Open Squelch (NXDN Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dB SINAD level at Analog Narrow -1dB (MOD: 400Hz/±2.5kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	

Item	Tuning mode	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Open Squelch adjust [NXDN Very Narrow]	1) Adj item: [Open Squelch ((NXDN Very Narrow))] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dB SINAD level at Analog Narrow -3dB (MOD: 400Hz/±1.2kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
8. Tight Squelch adjust [Analog Narrow]	1) Adj item: [Tight Squelch (Analog Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±1.5kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
9. Tight Squelch adjust [Analog Wide 5k]	1) Adj item: [Tight Squelch (Analog Wide 5k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±3kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
10. Tight Squelch adjust [Analog Wide 4k]	1) Adj item: [Tight Squelch (Analog Wide 4k)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±2.4kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
11. RSSI reference [Analog Narrow]	1) Adj item: [RSSI Reference (Analog Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Audio Analyzer Oscilloscope		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	
12. Low RSSI	1) Adj item: [Low RSSI (Analog Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: -118dBm (0.28uV) (MOD: 1kHz/±1.5kHz)	SSG		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	

Item	Tuning mode	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
13. High RSSI	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [L1],[L3],[C2],[H1],[H3] SSG output: -80dBm (22.4uV) (MOD: 1kHz/±1.5kHz)	SSG		RX ANT RA (D-SUB25 Pin No.11)		PC ADJ	After input signal from SSG, press [Apply] button to store the adjustment value.	

4.8 调整所需的测量装置

测量装置	主要规格		
1. 标准信号发生器 (SSG)	频率范围	136~174MHz	
	调制	调频和外部调制	
	输出	-127dBm/0.1uV 到大于 -20dBm/22.4mV	
	进行频率调整时，需要以下精度。 • 0.003ppm 如有必要，请使用标准振荡器进行调整。		
2. 功率计	输入阻抗	50Ω	
	操作频率	136~174MHz 或以上	
	测量范围	100W 左右	
3. 频偏仪	频率范围	136~174MHz	
4. 数字电压表 (DVM)	测量范围	1V ~ 20V DC	
	输入阻抗	为最小电路负载高输入阻抗	
5. 示波器		直流到 30MHz	
6. 高灵敏度频率计数器	频率范围	10Hz~600MHz	
	频率稳定性	0.2ppm 或更低	
7. 电流表		15A 或以上	
8. 音频分析仪	频率范围	50Hz~10kHz	能力 在 1kHz 时为 2% 或
	电压范围	更低 3mV~3V	输入电平 50mV~10Vrms
9. 音频发生器 (AG)	频率范围	50Hz ~ 5kHz	
	输出	0 ~ 1V	
10. 电压表	测量范围	10V~1.5V DC 或更低	
	输入阻抗	50kΩ/V 或更高	

4.9 测试信道

编号	接收 (MHz)	发射 (MHz)
1	155.050000	155.100000
2	136.050000	136.100000
3	173.950000	173.900000
4	155.000000	155.000000
5	155.200000	155.200000
6	155.400000	155.400000
7~16	-	-

4.10 测试信令

■ 模拟

编号	接收	发射
1	无	无
2	无	100Hz 方波
3	QT:67.0Hz	QT:67.0Hz
4	QT:151.4Hz	QT:151.4Hz
5	QT:210.7Hz	QT:210.7Hz
6	QT:254.1Hz	QT:254.1Hz
7	DQT:D023N	DQT:D023N
8	DQT:D754I	DQT:D754I
9	无	测试音编码
10	无	CW ID 编码 (ID:VVV)
11	无	礼貌音

■DMR

编号	接收	发射
1	CC 00 脉冲	CC 00 脉冲
2	无	PN 9 连续模式
3	无	最大频偏连续模式
6	无	SYNC（每个时隙）+ PN9 脉冲模式

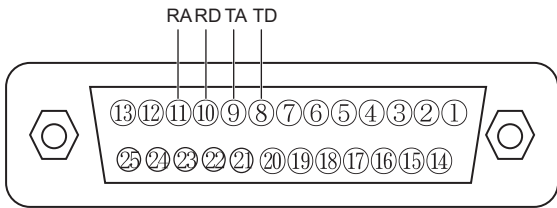
- 信令 2 用于发射调制信号质量测试，即发射相邻信道功率、FSK 误差、占用带宽、辐射掩蔽等。
- 信令 3 用于发射频偏测试。

■NXDN

编号	接收	发射
1	RAN 1	RAN 1
2	RAN 1	PN9
3	RAN 1	最大频偏模式

RAN: 无线接入编号
PN9: 伪随机模式

4.11 CONTROL I/O（D-SUB 25 针）连接器的测试针



4.12 共通部分

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
1. 设置	1) DC 电压: 13.2V 2) SSG 标准调制 窄带 MOD: 1kHz, DEV: 1.5kHz 宽带 5k MOD: 1kHz, DEV: 3kHz 宽带 4k MOD: 1kHz, DEV: 2.4kHz	SSG 音频分析仪 示波器				PC 调整		
2. 接收辅助	1) 调整项目: [接收辅助] 2) 调整项目: [低 1]、[低 2]、[低 3]、 [中 1]、[中 2]、[中 3]、 [高 1]、[高 2]、[高 2]、 [重叠] * (以下简称 [L1], [L2], [L3], [C1], [C2], [C3], [H1], [H2], [H3], [OL]。)					PC 调整	【自动调整】 (1) 按 [调整辅助电压] 按钮。 (2) 自动调整完成后, 按 [全部应用] 按钮 储存调整值。 【手动调整】 PC 窗口上的 [V] 指示 显示了 VCO 锁定电 压。更改调整值, 以获 得指定电压范围内的 VCO 锁定电压。	2.5V±0.1V 【自动调整】 执行自动调整后, 确认 VCO 锁定电压是否在 手动调整所指定的电压 范围内。 【手动调整】 调整完所有调整点后, 按 [全部应用] 按钮储 存调整值。
3. 发射辅助	1) 调整项目: [发射辅助] 2) 调整项目: [L1], [L2], [L3], [C1], [C2], [C3], [H1], [H2], [H3], [OL]					PC 调整	注: 在更改调整值约 3 秒后, 确认 VCO 锁定 电压。	
4. 频率	1) 测试信道: 信道 1 2) 调整项目: [频率] SSG 输出: -20dBm (22.4mv) (CW (无调制)) SSG: 使用 0.003ppm 的 SSG 精度。 (如有必要, 请使用标准振荡 器。)			接收 天线		PC 调整	按“自动调谐”的 [开 始] 按钮。按 [应用] 按钮储存调整值 (在 完成自动调整之后)。	“IF20”值 = 0 ± 12 之内。“IF20”的值将 变为“0”左右 (在完 成调整之后)。 备注: • “频率”是在 SSG 接收条件下进行调整 的。 • 温度范围 +23°C 至 +27°C。 (KPG-D7 的频率调整 屏幕上显示温度)。
5. 灵敏度 1	1) 调整项目: [灵敏度 1] 2) 调整项目: [L1], [L3], [C2], [H1], [H3]					PC 调整	写入 以下值 (固定值)。 [L1] = 33 [L3] = 53 [C2] = 68 [H1] = 115 [H3] = 153	按 [全部应用] 按钮储 存调整值 (在调整完 所有调整点之后)。 注: 此为可变电容调谐电压 调整。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
6. 灵敏度 2	1) 调整项目: [灵敏度 2] 2) 调整项目: [L1], [L3], [C2], [H1], [H3]					PC 调整	写入以下值 (固定值)。 [L1] = 20 [L3] = 33 [C2] = 64 [H1] = 120 [H3] = 170	按 [全部应用] 按钮储存调整值 (在调整完所有调整点之后)。 注: 此为可变电容调谐电压调整。
7. RD 电平 (模拟窄带)	1) 测试信道: 信道 1 2) 调整项目: [RD 电平 (模拟窄带)] SSG 输出: -53dBm (501uV) (MOD: 1kHz/ ± 1.5kHz) 音频负载: 100kΩ	SSG 音频 分析仪 示波器		接收 天线 RD (D-SUB25 针号码 10)		PC 调整	更改调整值, 以获得 80mVrms (在指定范围内)	80mVrms±5mV 按 [应用] 按钮储存调整值 (在调整完调整点之后)。 注意: 本机型没有扬声器输出。 注: 这将调整接收数据输出的电平 (D-SUB 25 针上)。
8. RA 电平 (模拟窄带)	1) 测试信道: 信道 1 2) 调整项目: [RA 电平 (模拟窄带)] SSG 输出: -53dBm (501uV) (MOD: 1kHz/ ± 1.5kHz) 音频负载: 100kΩ	SSG 音频 分析仪 示波器		接收 天线 RA (D-SUB25 针号码 10)		PC 调整	更改调整值, 以获得 400mVrms (在指定范围内)	400mVrms±20mV 按 [应用] 按钮储存调整值 (在调整完调整点之后)。 注意: 本机型没有扬声器输出。 注: 这将调整接收数据输出的电平 (D-SUB 25 针上)。

4.13 发射器部分

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
1. 高发射 功率限制	1) 调整项目: [高发射功率限制] 2) 调整项目: [L1],[L3],[C2], [H1], [H3] 3) 按 [发射] 按钮。	功率计 电流表		发射 天线		PC 调整	更改调整值, 以获得 56W 功率 (在指定范围内)。	56W±2.5W ≤13A 电流 调整完所有调整点后, 按 [全部应用] 按钮储存调整值。 注: 功率规格对应于出厂装运条件。 但是, 在任何情况下都不应超过 56W。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
2. 低发射功率限制	1) 调整项目： [低发射功率限制] 2) 调整项目： [L1],[L3],[C2], [H1], [H3] 3) 按 [发射] 按钮。	功率计 电流表		发射 天线		PC 调整	更改调整值，以获得 5W 功率（在指定范围内）。	5W±1.5W ≤5A 电流 调整完所有调整点后，按 [全部应用] 按钮储存调整值。 注： 功率规格对应于出厂装运条件。 但是，在任何情况下都不应超过 56W。
3. 高发射功率	1) 调整项目： [高发射功率] 2) 调整项目： [L1],[L3],[C2], [H1], [H3] 3) 按 [发射] 按钮。	功率计 电流表		发射 天线		PC 调整	更改调整值，以获得 50W 功率（在指定范围内）。	50W±0.5W ≤12A 电流 调整完所有调整点后，按 [全部应用] 按钮储存调整值。 注： 功率规格对应于出厂装运条件。 但是，在任何情况下都不应超过 50W。
4. 低发射功率	1) 调整项目： [低发射功率] 2) 调整项目： [L1],[L3],[C2], [H1], [H3] 3) 按 [发射] 按钮。	功率计 电流表		发射 天线		PC 调整	更改调整值，以获得 1W 功率（在指定范围内）。	1W±0.1W ≤3A 电流 调整完所有调整点后，按 [全部应用] 按钮储存调整值。 注： 功率规格对应于出厂装运条件。
5. 高 RF 功率下降检测	1) 测试信道：信道 1 2) 调整项目： [高 RF 功率下降检测] 3) 按 [发射] 按钮。	功率计 电流表		发射 天线		PC 调整	更改调整值，以获得 20W 功率（在指定范围内）。	20W±0.5W 按 [应用] 按钮储存调整值。 注： 功率规格对应于出厂装运条件。
6. 低 RF 功率下降检测	1) 测试信道：信道 1 2) 调整项目： [低 RF 功率下降检测] 3) 按 [发射] 按钮。	功率计 电流表		发射 天线		PC 调整	更改调整值，以获得 0.3W 功率（在指定范围内）。	0.3W±0.1W 按 [应用] 按钮储存调整值。 注： 功率规格对应于出厂装运条件。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
7. 斜率 偏移	1) 测试信道: 信道 1 2) 调整项目: [斜率偏移] 3) 按 [发射] 按钮。	功率计 电流表				PC 调整	【自动调整】 1) 按 [调整斜率偏移] 按钮。 2) 自动调整完成后, 按 [应用] 按钮储存调整值。 【手动调整】 1) 将调整值设为 “0”。 2) 在监控偏移监测仪的值的同时, 缓慢增大调整值。 3) 当偏移监测值超过 “50” 时, 设定调整值。	
8. 平衡	1) 调整项目: [平衡] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 3kHz HPF: 关闭 3) 按 [发射] 按钮。	频偏仪 示波器		发射 天线		PC 调整	20Hz 音频率的频偏大约固定为 2.5kHz。 更改 2kHz 音的调整值, 以获得 20Hz 音的同一频偏 (约 2.5kHz) (在指定范围内)。 发射时, 单击 “2kHz 正弦波” 复选框, 更改位于 20Hz 和 2kHz 之间的音。	与 20Hz 音的频偏相差 ± 15Hz 以内。 调整完所有调整点后, 按 [全部应用] 按钮储存调整值。
9. 最大频偏 (模拟)	1) 调整项目: [最大频偏 (模拟窄带)] [最大频偏 (模拟宽带 5k)] [最大频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 15kHz HPF: 关闭 3) 按 [发射] 按钮。	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 520 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 520 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 492 在每个调整点执行发射, 检查频偏是否位于指定范围内。	[模拟窄带] 2.1kHz ± 0.05kHz [模拟宽带 5k] 4.1kHz ± 0.05kHz [模拟宽带 4k] 3.2kHz ± 0.05kHz 调整完所有调整点后, 按 [全部应用] 按钮储存调整值。
10. 最大频偏 (DMR)	1) 调整项目: [最大频偏 (DMR)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 3kHz HPF: 关闭	频偏仪 示波器		发射 天线		PC 调整	为每个调整点写入基准值。 基准值: [最大频偏 (DMR)] [L1], [L3], [C2], [H1], [H3], [OL] 515 在每个调整点执行发射, 检查频偏是否位于指定范围内。	[DMR] 2749Hz±50Hz 调整完所有调整点后, 按 [全部应用] 按钮储存调整值。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
11. 最大频偏 (NXDN 窄带)	1) 调整项目: [最大频偏 (NXDN 窄带)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 3kHz HPF: 关闭	频偏仪 示波器		发射 天线		PC 调整	为每个调整点写入基准值。 基准值: [最大频偏 (NXDN 窄带)] [L1], [L3], [C2], [H1], [H3], [OL] 515 在每个调整点执行发射, 检查频偏是否位于指定范围内。	[NXDN 窄带] ±2750~±3362Hz (±3056Hz±10%) 调整完所有调整点后, 按 [全部应用] 按钮储存调整值。
12. 最大频偏 (NXDN 甚窄带)	1) 调整项目: [最大频偏 (NXDN 甚窄带)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 3kHz HPF: 关闭	频偏仪 示波器		发射 天线		PC 调整	为每个调整点写入基准值。 基准值: [最大频偏 (NXDN 甚窄带)] [L1], [L3], [C2], [H1], [H3], [OL] 530 在每个调整点执行发射, 检查频偏是否位于指定范围内。	NXDN 甚窄带 ±1203~±1471Hz (±1337Hz±10%) 调整完所有调整点后, 按 [全部应用] 按钮储存调整值。
13.TD 频偏 (模拟)	1) 调整项目: [TD 频偏 (模拟窄带)] [TD 频偏 (模拟宽带 5k)] [TD 频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 3kHz HPF: 关闭 AG:100Hz/177mVrms (0.5Vp-p) 来自 D-SUB25 针号码 8 的“TD”端子	频偏仪 示波器		发射 天线 TD (D-SUB25 针号码 8)		PC 调整	按如下所示为每个调整点写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 213 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 106 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 140 在每个调整点执行发射, 检查频偏是否位于指定范围内。	[模拟窄带] 750Hz±50Hz [模拟宽带 5k] 750Hz±50Hz [模拟宽带 4k] 750Hz±50Hz 调整完所有调整点后, 按 [全部应用] 按钮储存调整值。 注: 这将调整 D-SUB 25 针上发射数据输入的电平。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
14.TA 频偏 (模拟)	1) 调整项目: [TA 频偏 (模拟窄带)] [TA 频偏 (模拟宽带 5k)] [TA 频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 15kHz HPF: 关闭 AG:1kHz/280mVrms 来自 D-SUB25 针号码 9 的 “TA” 端子	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点 写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 100 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 100 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 106 在每个调整点执行发射, 检查频偏是否位于指定范 围内。	[模拟窄带] 1500Hz±50Hz [模拟宽带 5k] 3000Hz±50Hz [模拟宽带 4k] 2400Hz±50Hz 调整完所有调整点 后, 按 [全部应用] 按钮储存调整值。 注: 这将调整 D-SUB 25 针上发射音频输入的电 平。
15.QT 频偏 (模拟)	1) 调整项目: [QT 频偏 (模拟窄带)] [QT 频偏 (模拟宽带 5k)] [QT 频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 3kHz HPF: 关闭	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点 写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 560 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 560 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 593 在每个调整点执行发射, 检查频偏是否位于指定范 围内。	[模拟窄带] 350Hz±50Hz [模拟宽带 5k] 750Hz±50Hz [模拟宽带 4k] 600Hz±50Hz 调整完所有调整点 后, 按 [全部应用] 按钮储存调整值。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
16.DQT 频偏 (模拟)	1) 调整项目: [DQT 频偏 (模拟窄带)] [DQT 频偏 (模拟宽带 5k)] [DQT 频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 3kHz HPF: 关闭 峰值保持	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点 写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 410 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 410 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 435 在每个调整点执行发射, 检查频偏是否位于指定范 围内。	[模拟窄带] 350Hz±50Hz [模拟宽带 5k] 750Hz±50Hz [模拟宽带 4k] 600Hz±50Hz 调整完所有调整点 后, 按 [全部应用] 按钮储存调整值。
17. 测试 音频偏 (模拟)	1) 调整项目: [测试音频偏 (模拟窄带)] [测试音频偏 (模拟宽带 5k)] [测试音频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 15kHz HPF: 关闭	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点 写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 512 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 512 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 540 在每个调整点执行发射, 检查频偏是否位于指定范 围内。	[模拟窄带] 1500Hz±50Hz [模拟宽带 5k] 3000Hz±50Hz [模拟宽带 4k] 2400Hz±50Hz 调整完所有调整点 后, 按 [全部应用] 按钮储存调整值。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
18. 礼貌音频偏 (模拟)	1) 调整项目: [礼貌音频偏 (模拟窄带)] [礼貌音频偏 (模拟宽带 5k)] [礼貌音频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 15kHz HPF: 关闭	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点 写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 168 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 171 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 180 在每个调整点执行发射, 检查频偏是否位于指定范 围内。	[模拟窄带] 500Hz±50Hz [模拟宽带 5k] 1000Hz±50Hz [模拟宽带 4k] 800Hz±50Hz 调整完所有调整点 后, 按 [全部应用] 按钮储存调整值。
19. CW ID 频偏 (模拟)	1) 调整项目: [CW ID 频偏 (模拟窄带)] [CW ID 频偏 (模拟宽带 5k)] [CW Id 频偏 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 15kHz HPF: 关闭	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点 写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 470 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 470 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 495 在每个调整点执行发射, 检查频偏是否位于指定范 围内。	[模拟窄带] 1000Hz±50Hz [模拟宽带 5k] 2000Hz±50Hz [模拟宽带 4k] 1600Hz±50Hz 调整完所有调整点 后, 按 [全部应用] 按钮储存调整值。

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
20. 中继台 增益 (模拟)	1) 调整项目: [中继台增益 (模拟窄带)] [中继台增益 (模拟宽带 5k)] [中继台增益 (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2], [H1], [H3], [OL] 频偏仪 LPF: 15kHz HPF: 关闭 SSG 音频: 1kHz, 调制 宽带 5k/ 宽带 4k/ 窄带: 1.0kHz 输出电平: -53dBm (501uV)	频偏仪 示波器		发射 天线		PC 调整	按如下所示为每个调整点 写入基准值。 基准值: [模拟窄带] [L1], [L3], [C2], [H1], [H3], [OL] 535 [模拟宽带 5k] [L1], [L3], [C2], [H1], [H3], [OL] 537 [模拟宽带 4k] [L1], [L3], [C2], [H1], [H3], [OL] 575 在每个调整点执行发射, 检查频偏是否位于指定范 围内。	[模拟窄带] [模拟宽带 5k] [模拟宽带 4k] 1000Hz±50Hz 调整完所有调整点 后, 按 [全部应用] 按钮储存调整值。

4.13.1 各信令和模式所需的频偏调整项目

下表显示了各信令频偏所需的调整项目。请按照以下示例阅读下表。对于信令“QT（宽带 5k）”，该信令包含三个组成部分：[平衡、最大频偏和 QT 频偏（宽带 5k）]。请在调整 QT 频偏（宽带 5k）之前调整平衡和最大频偏。

模式	信令	所需的调整和顺序				DMR
		宽带 5k	宽带 4k	窄带	甚窄带	
模拟	音频	1. 平衡 2. 最大频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带]	---	---
	TD	1. 平衡 2. 最大频偏 [模拟宽带 5k] 3. TD 频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k] 3. TD 频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带] 3. TD 频偏 [模拟窄带]	---	---
	TA	1. 平衡 2. 最大频偏 [模拟宽带 5k] 3. TA 频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k] 3. TA 频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带] 3. TA 频偏 [模拟窄带]	---	---
	QT	1. 平衡 2. 最大频偏 [模拟宽带 5k] 3. QT 频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k] 3. QT 频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带] 3. QT 频偏 [模拟窄带]	---	---
	DQT	1. 平衡 2. 最大频偏 [模拟宽带 5k] 3. DQT 频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k] 3. DQT 频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带] 3. DQT 频偏 [模拟窄带]	---	---
	测试音	1. 平衡 2. 最大频偏 [模拟宽带 5k] 3. 测试音 频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k] 3. 测试音 频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带] 3. 测试音 频偏 [模拟窄带]	---	---
	礼貌音	1. 平衡 2. 最大频偏 [模拟宽带 5k] 3. 礼貌音 频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k] 3. 礼貌音 频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带] 3. 礼貌音 频偏 [模拟窄带]	---	---
	CWID	1. 平衡 2. 最大频偏 [模拟宽带 5k] 3. CWID 频偏 [模拟宽带 5k]	1. 平衡 2. 最大频偏 [模拟宽带 4k] 3. CWID 频偏 [模拟宽带 4k]	1. 平衡 2. 最大频偏 [模拟窄带] 3. CWID 频偏 [模拟窄带]	---	---
NXDN	音频	---	---	1. 平衡 2. 最大频偏 [NXDN 窄带]	1. 平衡 2. 最大频偏 [NXDN 甚窄带]	---
DMR	音频	---	---	---	---	1. 平衡 2. 最大频偏 [DMR]

- 上述所有频偏调整的平衡和最大频偏均共用。如果已经调整了平衡（发射器部分 8），请跳过步骤 1。如果已经调整了最大频偏（发射器部分 9、10、11、12），请跳过步骤 2。

4.14 接收器部分

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
1.AF 电平 设置	测试信道 信道: 1 测试信令 模式: 模拟窄带 信令: 1 SSG 输出: -53dBm (501uV) MOD: 1kHz/±1.5kHz	SSG 音频分析仪 示波器		接收 天线 RA (D-SUB25 针 号码 11)		--	按照以下说明, 执行 RA 输出电平调整: 4.12 共通部分中的 “8.RA 电平 (模拟窄 带)”, 执行 RA 输出 电平调整。	按照以下说明, 执行 RA 输出 电平调整: 4.12 共通部分 中的 “8.RA 电 平 (模拟窄 带)”, 执行 RA 输出电平调 整。
2. 静噪 (浅) 调整 [模 拟窄带]	1) 调整项目: [静噪 (浅) (模拟窄带)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 -3dB (MOD: 1kHz/±1.5kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D-SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
3. 静噪 (浅) 调整 [模 拟宽带 5k]	1) 调整项目: [静噪 (浅) (模拟宽带 5k)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 -3dB (MOD: 1kHz/±3kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D-SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
4. 静噪 (浅) 调整 [模 拟宽带 4k]	1) 调整项目: [静噪 (浅) (模拟宽带 4k)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 -3dB (MOD: 1kHz/±2.4kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D-SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
5. 静噪 (浅) 调整 [DMR]	1) 调整项目: [静噪 (浅) (DMR)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 (模拟窄带) -4dB (MOD: 400Hz/±1.1kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D-SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
6. 静噪 (浅) 调整 [NXDN 窄 带]	1) 调整项目: [静噪 (浅) (NXDN 窄带)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 (模拟窄带) -1dB (MOD: 400Hz/±2.5kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D-SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	

项目	PC 调谐模式	测量			调整			规格 / 备注
		测量装置	单元	端子	单元	部件	方法	
7. 静噪 (浅) 调整 [NXDN 甚 窄带]	1) 调整项目: [静噪 (浅) (NXDN 甚窄带)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 (模拟窄带) -3dB (MOD: 400Hz/±1.2kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D- SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
8. 静噪 (深) 调整 [模 拟窄带]	1) 调整项目: [静噪 (深) (模拟窄带)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 +6dB (MOD: 1kHz/±1.5kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D- SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
9. 静噪 (深) 调整 [模 拟宽带 5k]	1) 调整项目: [静噪 (深) (模拟宽带 5k)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 +6dB (MOD: 1kHz/±3kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D- SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
10. 静噪 (深) 调整 [模 拟宽带 4k]	1)调整项目: [静噪 (深) (模拟宽带 4k)] 2)调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 +6dB (MOD: 1kHz/±2.4kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D- SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
11. RSSI 参考 [模 拟窄带]	1) 调整项目: [RSSI 参考 (模拟窄带)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: 12dB SINAD 电平 -3dB (MOD: 1kHz/±1.5kHz)	SSG 音频分析仪 示波器		接收 天线 RA (D- SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
12. 低 RSSI	1) 调整项目: [低 RSSI (模拟窄带)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: -118dBm (0.28uV) (MOD: 1kHz/±1.5kHz)	SSG		接收 天线 RA (D- SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	
13. 高 RSSI	1) 调整项目: [高 RSSI (模拟窄带)] 2) 调整项目: [L1],[L3],[C2],[H1],[H3] SSG 输出: -80dBm (22.4uV) (MOD: 1kHz/±1.5kHz)	SSG		接收 天线 RA (D- SUB25 针 号码 11)		PC 调整	从 SSG 输入信号之 后, 按 [应用] 按钮储 存调整值。	

SECTION 5

TROUBLESHOOTING / 故障排除

5.1 Fault diagnosis of the BGA (Ball Grid Array) IC

■Overview

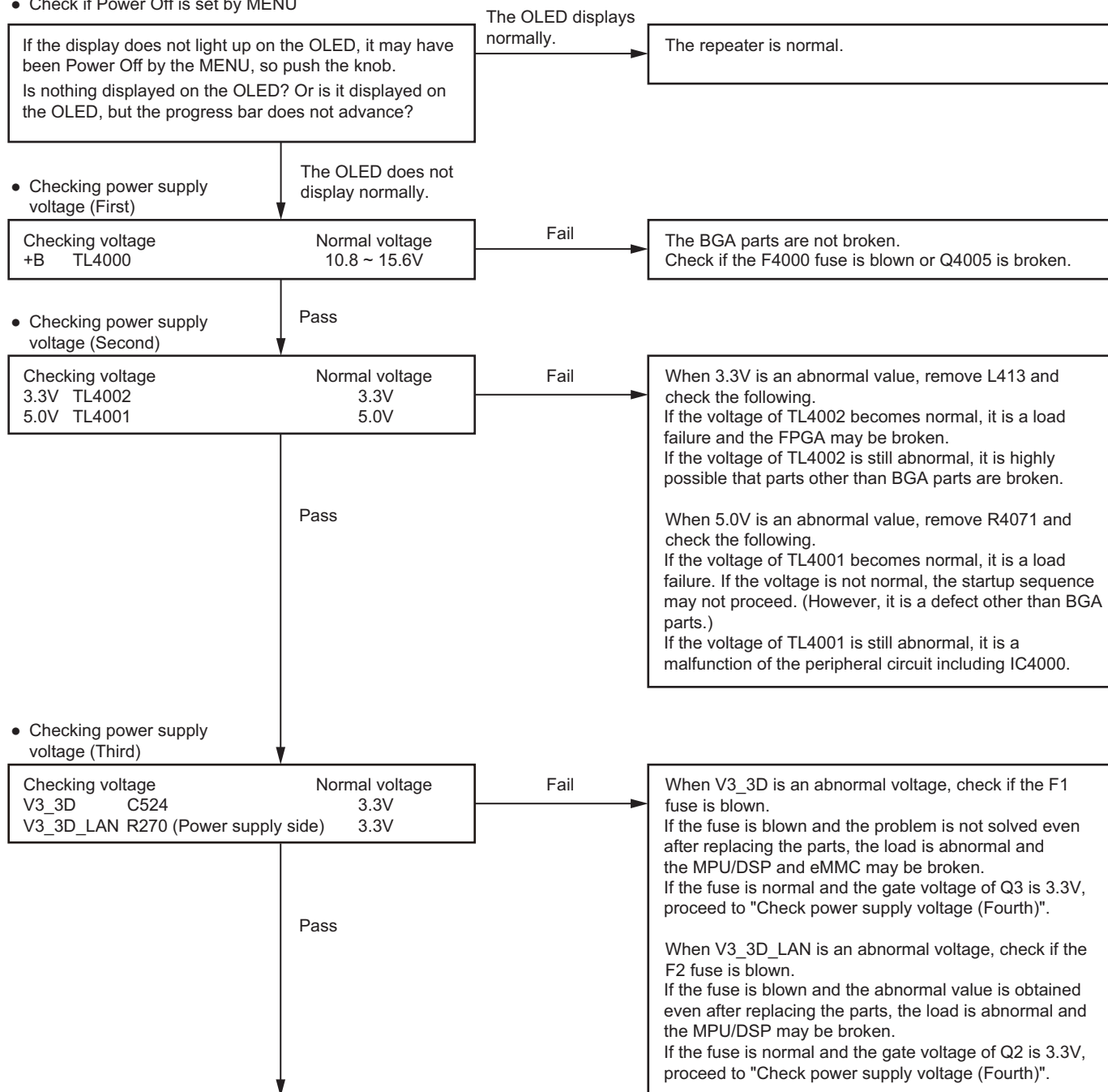
When the IC treated as Non-replaceable parts (e.g., BGA IC part) seems to be problematic, there is no way to recover/repair it and need to proceed the unit replacement. Before proceeding the unit replacement, the following flowchart may help you to judge it. It may be effective to try it in the following case as example, but please note that the work reliability is required because the parts need to be removed and remount during this troubleshooting.

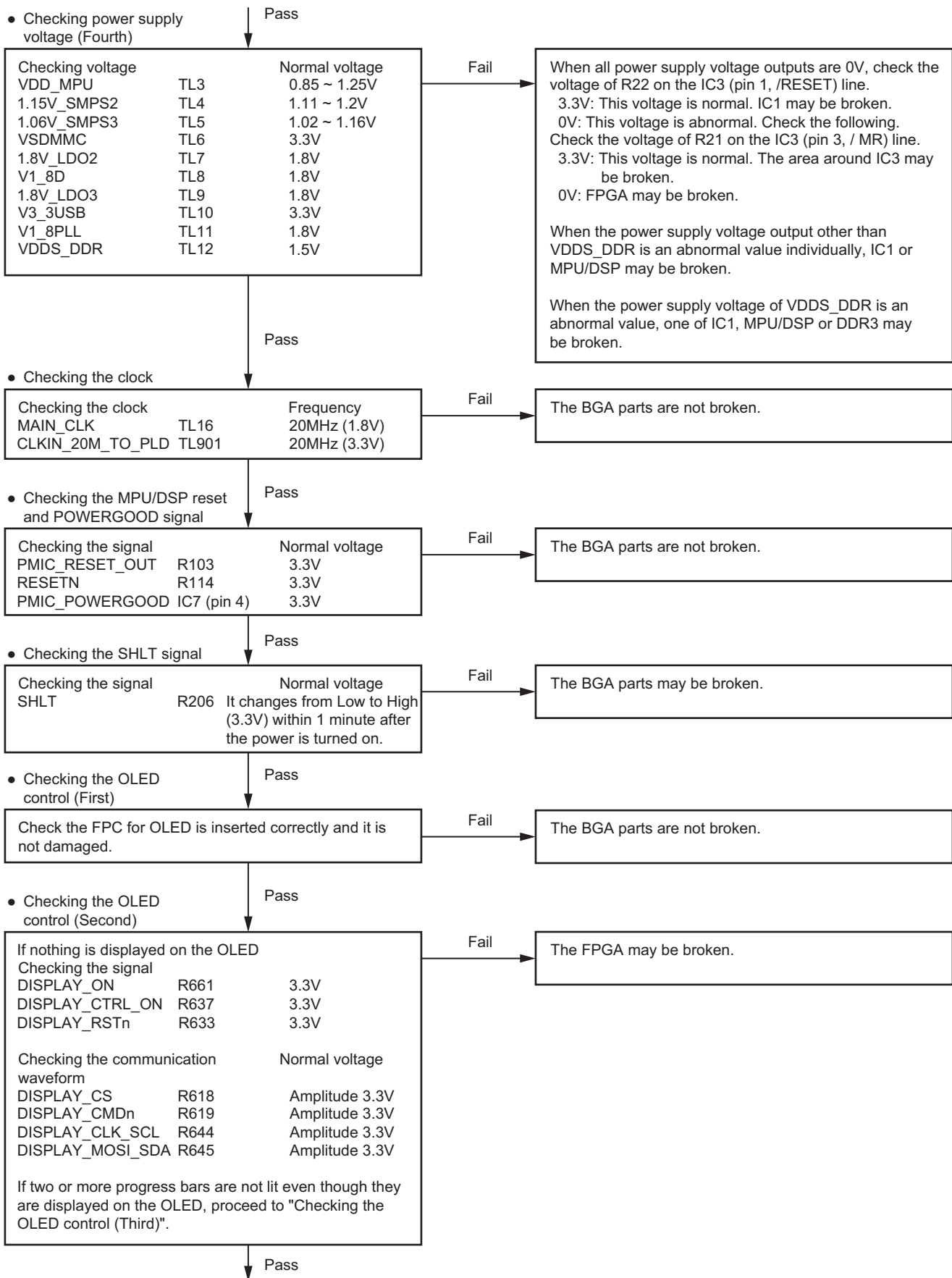
case: The unit seems to work as circuitry but no Power ON process visually.

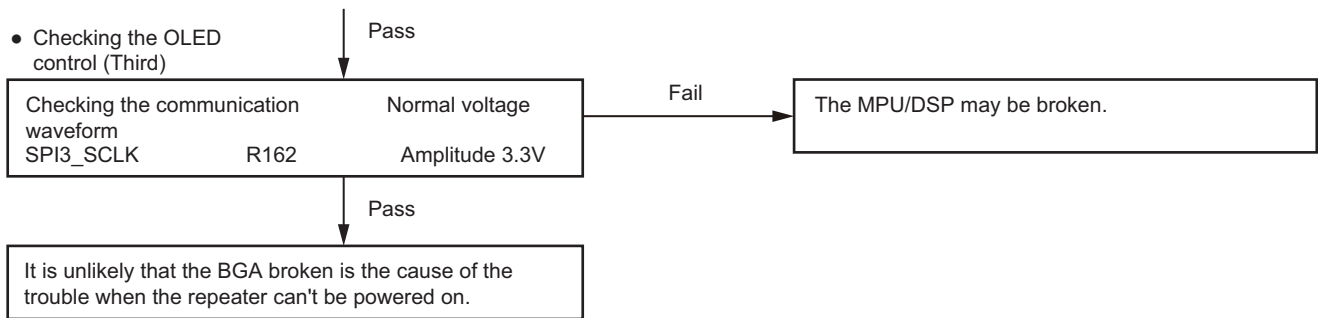
■BGA parts

MPU/DSP (IC33), DDR3 (IC47, IC48), eMMC (IC520), FPGA (IC60)

- Check if Power Off is set by MENU







■ Descriptions of signal names

1) MAIN_CLK	: Reference clock for MPU/DSP	20MHz (1.8V)
2) CLKIN_20M_TO_PLD	: Reference clock for FPGA	20MHz (3.3V)
3) PMIC_RESET_OUT	: MPU/DSP reset signal controlled by IC1	LOW → RESET cancel
4) RESETN	: MPU/DSP reset signal controlled by V3_3D	LOW → RESET cancel
5) PMIC_POWERGOOD	: IC1 output voltage judgment signal	LOW → Active
6) SHLT	: MPU/DSP state transition signal. Signal sent from MPU/DSP to FPGA.	LOW → Active
7) DISPLAY_ON	: OLED power supply signal	LOW → Active
8) DISPLAY_CTRL_ON	: Power supply signal of logic IC for OLED display data	LOW → Active
9) DISPLAY_RSTn	: OLED reset signal controlled by FPGA	LOW → RESET cancel
10) DISPLAY_CS	: Chip select signal for OLED display data controlled by FPGA	4 wire SPI communication
11) DISPLAY_CMDn	: Data/ command control signals for OLED display data controlled by FPGA	4 wire SPI communication
12) DISPLAY_CLK_SCL	: Clock signal for OLED display data controlled by FPGA	4 wire SPI communication
13) DISPLAY_MOSI_SDA	: Data signal for OLED display data controlled by FPGA	4 wire SPI communication
14) SPI3_SCLK	: Clock signal for OLED display data controlled by MPU/DSP	4 wire SPI communication

5.2 TROUBLESHOOTING for the error codes

Error Information		Error Event / Item Name	Assumed Condition / Measures
Web Tool (Error Code)	OLED Display		
E001	Unprogrammed	Unprogrammed	FPU Data may not be written or all channel data may be blank. Try to write the suitable FPU Data.
E002	USB Overcurrent	USB Overcurrent	The USB port detects an overcurrent and the repeater forces the USB port to shut down. To recover this condition, try to the following processes. 1.Remove the USB device. 2.Execute "USB Port Recovery" prepared in OLED Menu>Control> USB Port Recovery. If happens again with same device, check the USB device failure or not.
E003	TX Freq Blank	TX Frequency Data Blank	TX Frequency of this channel is blank condition. Make sure whether operating channel is correct or check TX FPU data.
E004	ESN Blank	ESN Blank	ESN Data may be lost accidentally. Contact to our service center for further assistance.
E005	Firmware Error	Firmware Startup Error	The repeater cannot start the power on process due to the firmware problem used in the error code E005 and the main both. Contact to our service center for further assistance.
E006	Feature Error	Feature Error	There may be gap between the Enhanced Features setting and the Software Option authenticated in the repeater. Check the Enhanced Features setting and the Software Option.
E007	Force FirmProg	Force Firmware Programming Mode	The repeater cannot start the power on process due to the main firmware problem and gets in this mode. Also, the repeater gets in this mode when the firmware writing failure happens. Write down the firmware.
E008	DSP Error 1	DSP Error 1	The repeater cannot continue the process due to the DSP related error. There may be possible to be recovered by writing the latest firmware. If not recover, it may be required to replace the whole unit.
E009	DSP Error 2	DSP Error 2	The repeater cannot continue the process due to the DSP library related error. There may be possible to be recovered by writing the latest firmware. If not recover, it may be required to replace the whole unit.

Error Information		Error Event / Item Name	Assumed Condition / Measures
Web Tool (Error Code)	OLED Display		
E102	HSB LAN Error	Hot Standby LAN Connection Error	The LAN connection between the Main and Sub repeaters under Hot Standby fails. This error will be displayed when the following cases. Case1. Detection Error between the Main and Sub repeaters at the start up process. This error is displayed to both repeaters in this case. Case2. Detection Error of the standby repeater at the active repeater when the hot standby works as normal. This error is displayed to the repeater that was acting as the active repeater. Then the standby repeater will start working as the active repeater. Check the network connection, IP Address of Private IP and Virtual IP, or the network equipment / port permission.
E103	Beacon Error	Beacon Sync Disconnect	The sync signal from the Host Repeater (Primary) for Beacon fails under Conventional IP Network. This error is not applicable for the repeater working as the host itself. The below is the case depends on the setting of Host Repeater. Secondary: When starting as the host due to the primary repeater failure. Deselected: When failing to receive the sync from the host (or the secondary) Check the networking connection.
E201	Fan Error	Fan Error	The pulse detection of the cooling fan rotation fails. Check the cooling fan itself or the related circuit around it.
E202	PWR Sup Error	Power Supply Voltage Error	The power supply voltage is below than the voltage preconfigured in "Power Supply Lower Level" on FPU. The default value is "12.2V". Check the power supply equipment or the FPU setting.
E204	RX PLL Unlock	RX PLL Unlock	The circuit block of RX PLL may have a problem. Proceed the general circuit troubleshooting as the receiver.
E205	TX PLL Unlock	TX PLL Unlock	The circuit block of TX PLL may have a problem. Proceed the general circuit troubleshooting as the transmitter.
E206	HPA Error	Current Consumption (HPA) Error	The current consumption of HPA (High Power Amp) is abnormal. There may be a possibility of an abnormality in VSWR, abnormality of the TX block circuit (Drive Amp, High Power Amp), or abnormality of Fan action. Proceed the general circuit troubleshooting.
E207	Drive Temp Error	Temperature (Drive Amp) Error	The temperature of Drive Amp is abnormal (too high). There may be a possibility of excessive transmission continuation, abnormality of the cooling fan action or an abnormality in the TX block circuit.
E208	TX Temp Error	Temperature (TX Block) Error	The temperature of TX Block is abnormal (too high). There may be a possibility of excessive transmission continuation, abnormality of the cooling fan action, or an abnormality in the TX block circuit. Proceed the general circuit troubleshooting.
E209	TCXO Temp Error	Temperature (TCXO) Error	The temperature of TCXO is abnormal (too high). There may be a possibility of excessive transmission continuation, abnormality of the cooling fan action, or an abnormality in the TX block circuit. Proceed the general circuit troubleshooting.
E210	HPA Temp Error	Temperature (HPA) Error	The temperature of HPA (High Power Amp) is abnormal (too high). There may be a possibility of excessive transmission continuation, abnormality of the cooling fan action, or an abnormality in the TX block circuit. Proceed the general circuit troubleshooting.
E211	IF IC Error	IF IC Error	The calibration of IF IC is failed. Contact to our service center for further assistance.

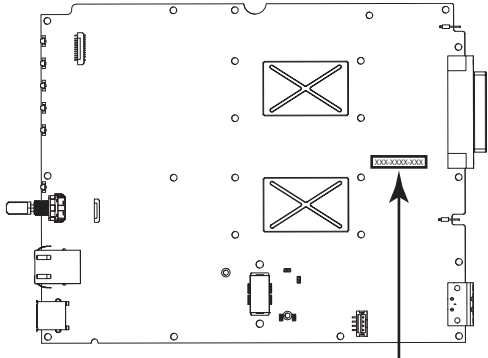
* If any of E207, E208, or E210 occurs before or during the transmission, the repeater will transmit with the reduced transmit power than normal. Even if all of these errors are cleared during in this transmission, the transmit power in this state is continued until the end of this transmission.

5.3 Replacing TX-RX UNIT

5.3.1 TX-RX UNIT Information

Model Name	Service TX-RX UNIT	Original TX-RX UNIT
NXR-1700 (E)	XCA-095E-00S	XC1-326E-00

5.3.2 Method of confirming "Original TX-RX UNIT" and "Service TX-RX UNIT"



The marking seal (XCA-095E-00) is affixed at the position of the arrow on the service TX-RX UNIT.

5.3.3 Supplied Accessories of "Service TX-RX UNIT"

Item (Including Parts Number)	Quantity
TX-RX UNIT (XC1-326)	1
KENWOOD ESN / NXDN ESN / MAC address Label	1

5.3.4 "Service TX-RX UNIT" Data

The following data is written into the Service TX-RX UNIT.

Data Type	Description
Firmware	NXR-1700 Firmware
FPU Data (PC programming mode)	Matching type Data (E)
Various Adjustment Data (PC test mode)	General adjustment values for the NXR-1700

Data Type	Description
KENWOOD ESN	Model Name: NXR-1700S1 Type: E KENWOOD ESN: The same number of the attached label is written.
NXDN ESN	The same number of the attached label is written.
Media Access Control address	The number is on the Chassis. The MAC address number is on a sticker which is applied to the Chassis. It can't be rewritten number.

5.3.5 After Changing the PCB

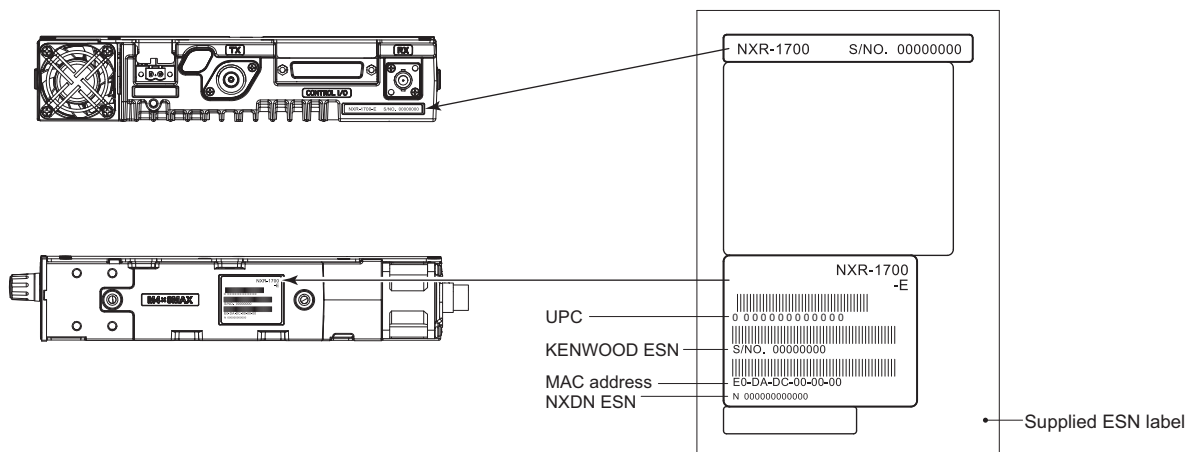
- (1) After changing the printed circuit board, write the up-to-date Firmware.
- (2) Using the KPG-D7, select your desired item (Model Name and Frequency) from the Model > Product Information menu, then use Program > Write Data to the repeater to write the FPU data (PC Programming mode).
When writing to the repeater, a Warning Message, corresponding to the item selected, appears. Click [OK] to continue writing the data.
- (3) Enter Program > Test mode, then adjust the various adjustment data (PC Test mode) as described in the "ADJUSTMENT".
- (4) For the XC1-326, attach the new labels corresponding to the new printed circuit board. (Refer to the images next ESN Label Layout.)
- (5) If necessary, write the FPU data used by the customer with the KPG-D7.

Note:

- When a new printed circuit board is used, the KENWOOD ESN changes, as does the Repeater Information display of the KPG-D7, but this does not have any effect on the operation of the repeater.
- If changing to the original KENWOOD ESN and NXDN ESN, please contact our service center.
- Re-installing other parts from original unit to Service unit is not required after changing to Service unit.

5.3.6 ESN Label Layout

Stick the supplied ESN label to the position shown in the figure.



5.4 BGA（球状矩阵排列）IC 的故障诊断

■ 概述

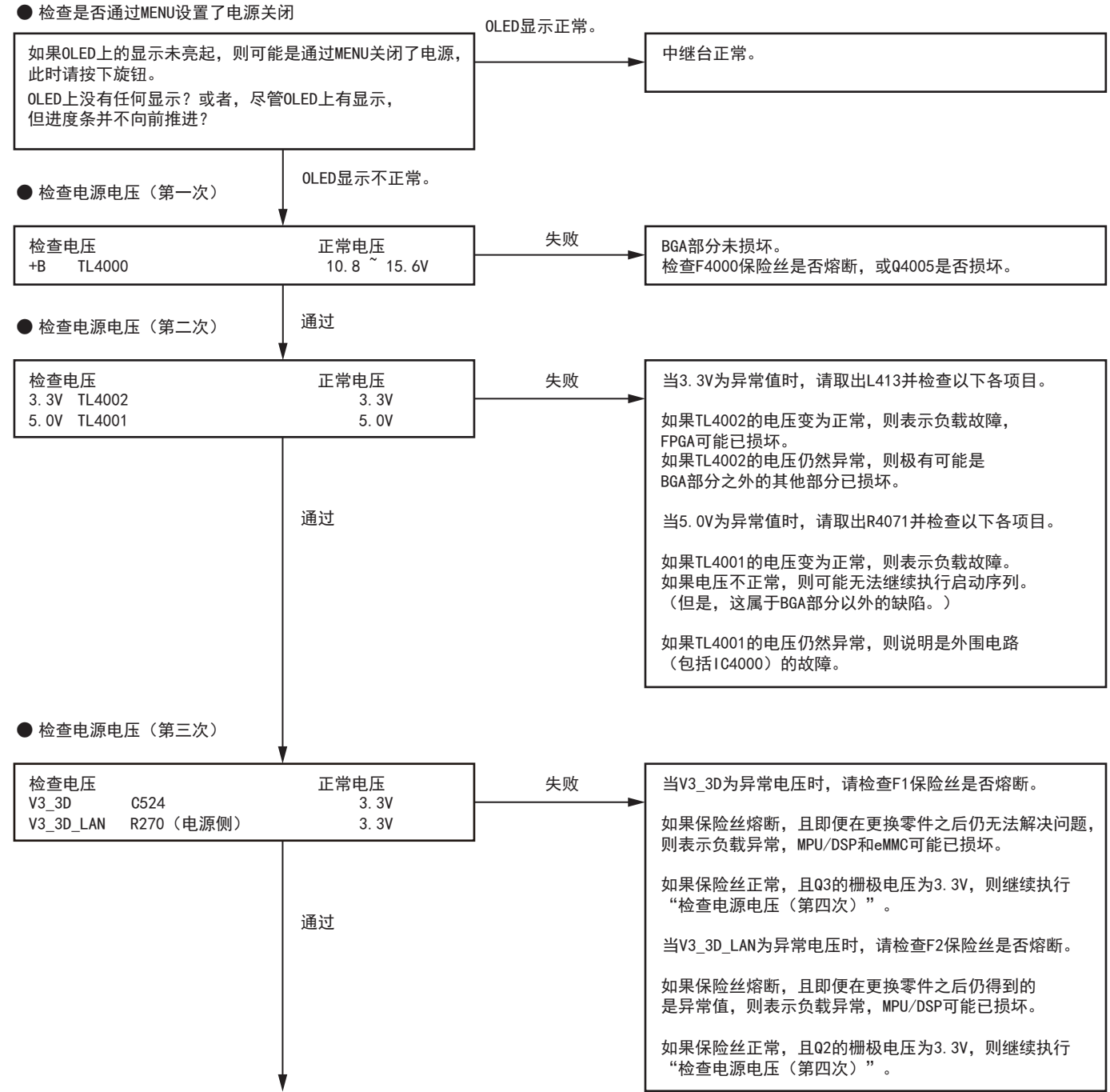
当被视为不可更换部分的 IC（如 BGA IC 部分）出现问题时，将无法恢复 / 维修，而是需要进行单元更换。在进行单元更换之前，以下流程图可能有助于您做出判断。

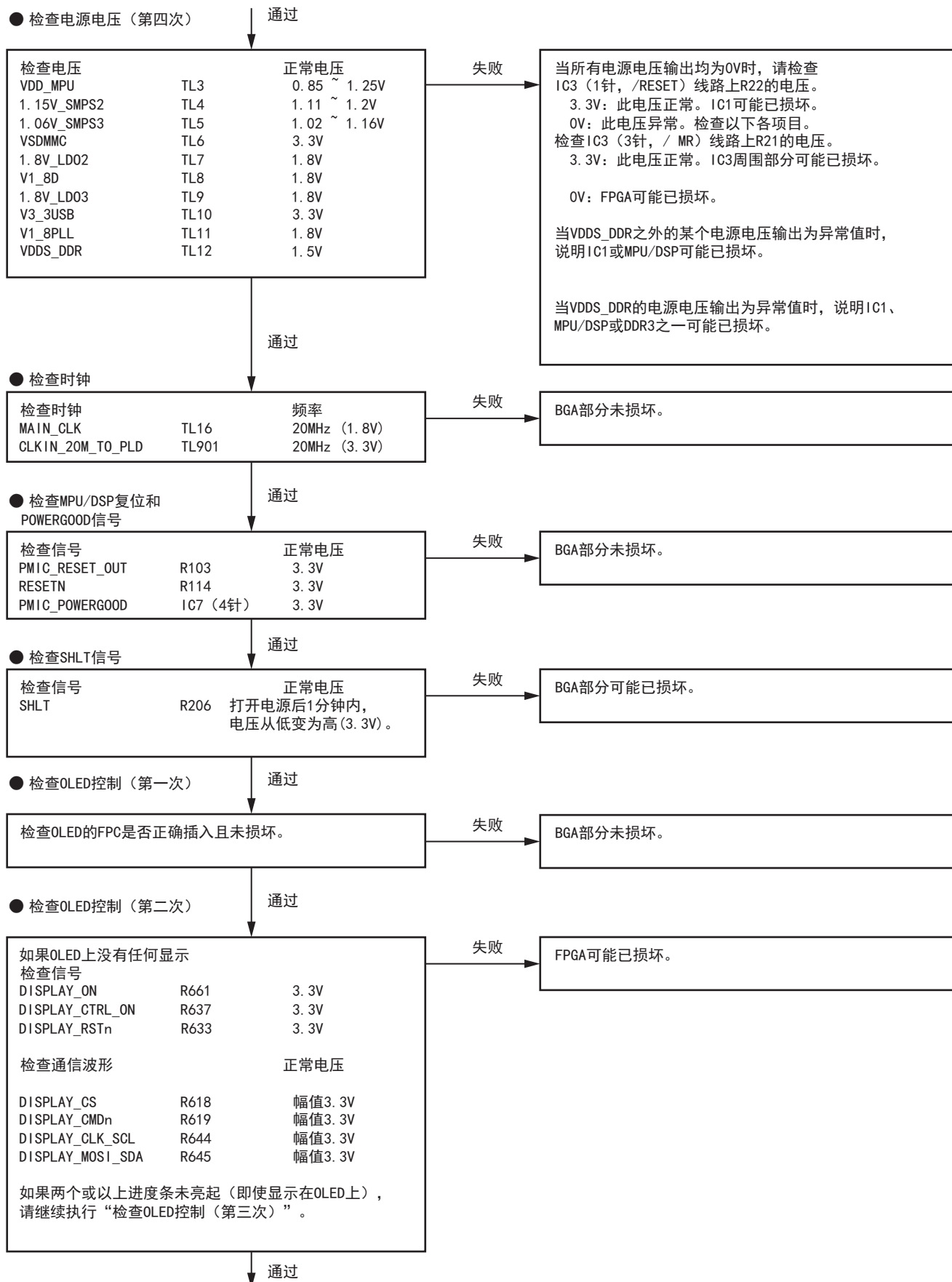
例如，在以下情况下可以进行尝试，但要注意：此时需要确保工作的可靠性，因为在故障排除过程中需要拆卸和重新安装相应部分。

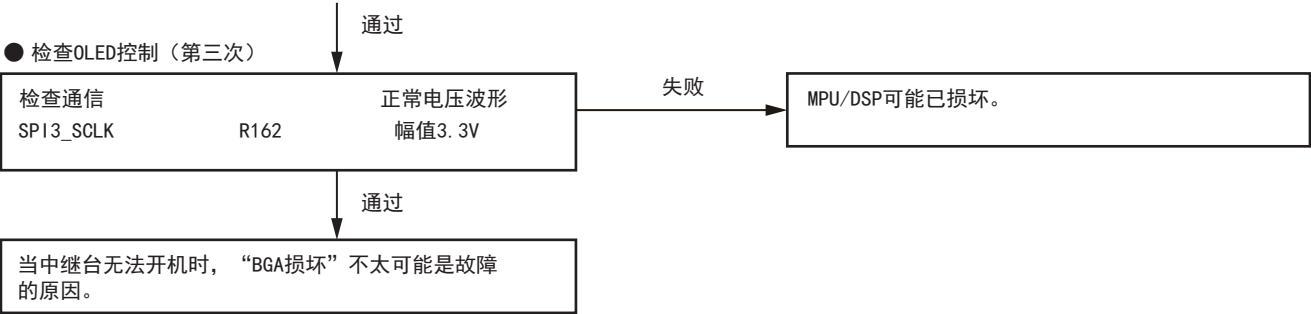
情况举例：单元电路似乎在工作，但看不到正常的开机动作。

■ BGA 部分

MPU/DSP (IC33)、DDR3（C47、IC48）、eMMC (IC520)、FPGA (IC60)







- 信号名称说明
- | | | |
|----------------------|-------------------------------------|--------------|
| 1) MAIN_CLK | : MPU/DSP的参考时钟 | 20MHz (1.8V) |
| 2) CLKIN_20M_TO_PLD | : FPGA的参考时钟 | 20MHz (3.3V) |
| 3) PMIC_RESET_OUT | : 由IC1控制的MPU/DSP复位信号 | 低 → 复位取消 |
| 4) RESETN | : 由V3_3D控制的MPU/DSP复位信号 | 低 → 复位取消 |
| 5) PMIC_POWERGOOD | : IC1输出电压判定信号 | 低 → 有效 |
| 6) SHLT | : MPU/DSP状态转换信号。从MPU/DSP发送到FPGA的信号。 | 低 → 有效 |
| 7) DISPLAY_ON | : OLED电源信号 | 低 → 有效 |
| 8) DISPLAY_CTRL_ON | : 逻辑IC的电源信号（用于OLED显示数据） | 低 → 有效 |
| 9) DISPLAY_RSTn | : 由FPGA控制的OLED复位信号 | 低 → 复位取消 |
| 10) DISPLAY_CS | : 由FPGA控制的芯片选择信号（用于OLED显示数据） | 4线SPI通信 |
| 11) DISPLAY_CMDn | : 由FPGA控制的数据/命令控制信号（用于OLED显示数据） | 4线SPI通信 |
| 12) DISPLAY_CLK_SCL | : 由FPGA控制的时钟信号（用于OLED显示数据） | 4线SPI通信 |
| 13) DISPLAY_MOSI_SDA | : 由FPGA控制的数据信号（用于OLED显示数据） | 4线SPI通信 |
| 14) SPI3_SCLK | : 由MPU/DSP控制的时钟信号（用于OLED显示数据） | 4线SPI通信 |

5.5 错误代码的故障排除

错误信息		错误事件 / 项目名称	假定条件 / 措施
Web 工具 (错误代码)	OLED 显示		
E001	未编程	未编程	FPU 数据可能未写入，或者所有信道数据可能为空。请尝试写入适合的 FPU 数据。
E002	USB 过电流	USB 过电流	USB 端口检测到过电流，中继台强制关闭 USB 端口。 若要从这种条件下恢复，请尝试以下过程。 1.拆下 USB 设备。 2.执行 OLED “菜单” > “控制” > “USB 端口恢复” 中的 “USB 端口恢复”。 如果同一设备再次发生此情况，请检查 USB 设备是否存在故障。
E003	TX 频率空白	TX 频率数据为空白	此信道的发射频率为空白。 请确认工作信道是否正确，或检查 TX FPU 数据。
E004	ESN 空白	ESN 空白	ESN 数据可能被意外丢失。 请联系我们的服务中心以寻求进一步帮助。
E005	固件错误	固件启动错误	中继台无法启动 “接通电源” 流程，原因是错误代码 E005 和主设备中有固件问题。 请联系我们的服务中心以寻求进一步帮助。
E006	功能错误	功能错误	在中继台中验证的增强功能设置与软件选项之间可能存在差异。 请检查增强功能设置和软件选项。
E007	强制固件编程	强制固件编程模式	由于主设备固件问题，中继台无法启动 “接通电源” 流程，于是进入此模式。此外，当固件写入失败时，中继台也会进入此模式。 请执行固件写入。
E008	DSP 错误 1	DSP 错误 1	由于 DSP 相关错误，导致中继台无法继续处理。有时可通过写入最新固件来进行恢复。 如果无法恢复，可能需要更换整个单元。
E009	DSP 错误 2	DSP 错误 2	由于 DSP 库相关错误，导致中继台无法继续处理。有时可通过写入最新固件来进行恢复。 如果无法恢复，可能需要更换整个单元。

错误信息		错误事件 / 项目名称	假定条件 / 措施
Web 工具 (错误代码)	OLED 显示		
E102	HSB LAN 错误	热备用局域网连接错误	处于热备用状态的主中继台和副中继台之间的 LAN 连接出现故障。在以下情况下，将显示此错误。 情况 1: 启动过程中，发生主中继台和副中继台之间的检测错误。在这种情况下，此错误会同时显示给两个中继台。 情况 2: 当热备用正常工作时，活动中继台发生备用中继台检测错误。此错误会显示给充当活动中继台的中继台。然后，备用中继台将开始作为活动中继台工作。 请检查网络连接、专用 IP 和虚拟 IP 的 IP 地址，或网络设备 / 端口的权限。
E103	信标错误	信标同步断开	来自信标主中继台（主要）的同步信号在常规 IP 网络下失败。此错误不适用于作为主机工作的中继台。 以下情况取决于主中继台的设置。辅助：由于主中继台故障而作为主机启动时。 未选择：当无法从主机（或辅助中继台）接收同步信号时。请检查网络连接。
E201	风扇错误	风扇错误	针对冷却风扇旋转的脉冲检测失败。请检查冷却风扇本身或其周围的相关电路。
E202	PWR Sup 错误	电源电压错误	电源电压低于 FPU 上“供电低位电压”中预先配置的电压。默认值为“12.2V”。请检查电源设备或 FPU 设置。
E204	RX PLL 失锁	RX PLL 失锁	RX PLL 的电路模块可能存在问题。请继续执行一般电路故障排除（作为接收器）。
E205	TX PLL 失锁	TX PLL 失锁	TX PLL 的电路模块可能存在问题。请继续执行一般电路故障排除（作为发射器）。
E206	HPA 错误	电流消耗 (HPA) 错误	HPA（高功率放大器）的电流消耗异常。可能存在 VSWR 异常、TX 模块电路（驱动放大器、高功率放大器）异常或风扇工作异常。请继续执行一般电路故障排除。
E207	驱动器温度错误	温度（驱动放大器）错误	驱动放大器温度异常（过高）。可能存在持续发射时间过长、冷却风扇工作异常或 TX 模块电路异常等情况。
E208	TX 温度错误	温度（TX 模块）错误	TX 模块温度异常（过高）。可能存在持续发射时间过长、冷却风扇工作异常或 TX 模块电路异常等情况。请继续执行一般电路故障排除。
E209	TCXO 温度错误	温度 (TCXO) 错误	TCXO 温度异常（过高）。可能存在持续发射时间过长、冷却风扇工作异常或 TX 模块电路异常等情况。请继续执行一般电路故障排除。
E210	HPA 温度错误	温度 (HPA) 错误	HPA（高功率放大器）温度异常（过高）。可能存在持续发射时间过长、冷却风扇工作异常或 TX 模块电路异常等情况。请继续执行一般电路故障排除。
E211	IF IC 错误	IF IC 错误	IF IC 校准失败。 请联系我们的服务中心以寻求进一步帮助。

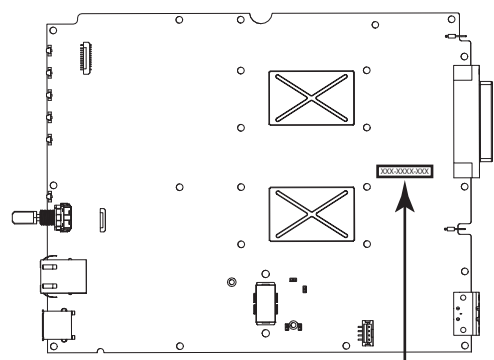
* 如果在发射之前或发射期间发生 E207、E208 或 E210 错误中的任何一个，中继台将以比常规情况更低的发射功率进行发射。即使在发射期间清除了所有这些错误，该状态下的发射功率也将持续到发射结束。

5.6 更换收发单元

5.6.1 收发单元信息

机型名称	服务收发单元	原始收发单元
NXR-1700 (E)	XCA-095E-00S	XC1-326E-00

5.6.2 确认“原始收发单元”和“服务收发单元”的方法



标记用的封印 (XCA-095E-00) 贴于服务收发单元上的箭头位置。

5.6.3 “服务收发单元”的附件

项目（包括零件号）	数量
收发单元 (XC1-326)	1
KENWOOD ESN / NXDN ESN / MAC 地址标签	1

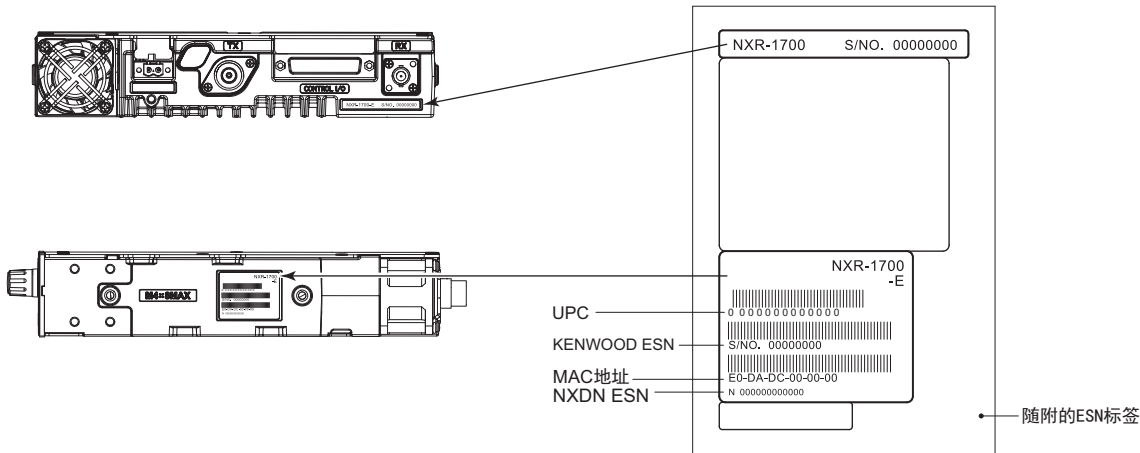
5.6.4 “服务收发单元”数据

以下数据将被写入服务收发单元。

数据类型	说明
固件	NXR-1700 固件
FPU 数据 (PC 编程模式)	匹配的类型数据 (E)

5.6.6 ESN 标签布局

将随附的 ESN 标签粘贴到图中所示的位置。



数据类型	说明
各种调整数据 (PC 测试模式)	NXR-1700 的一般调整值
KENWOOD ESN	机型名称: NXR-1700S1 类型: E KENWOOD ESN: 所贴标签的编号相同。
NXDN ESN	所贴标签的编号相同。
介质访问控制地址	数字位于底座上。MAC 地址编号就在贴于底座的标签上。此编号不能改写。

5.6.5 更换 PCB 后

- 更换印刷电路板后，请写入最新的固件。
- 利用 KPG-D7，从“型号”>“产品信息”菜单中选择所需的项目（“机型名称”和“频率”），然后使用“程序”>“向中继台写入数据”来写入 FPU 数据（PC 编程模式）。
向中继台写入时，会显示与所选项目相对应的警告信息。单击 [确定] 继续写入数据。
- 进入“程序”>“测试模式”，然后按照“调整”中的说明来调整各种调整数据（PC 测试模式）。
- 对于 XC1-326，请贴上与新印刷电路板相对应的新标签。（请参见“ESN 标签布局”旁边的图片。）
- 如有必要，请利用 KPG-D7 写入客户所使用的 FPU 数据。

注：

- 当使用新的印刷电路板时，KENWOOD ESN 会发生变化，而 KPG-D7 的中继台信息显示也会发生变化，但这不会对中继台的操作造成任何影响。
- 如果更改为原来的 KENWOOD ESN 和 NXDN ESN，请联系我们的服务中心。
- 更换服务单元后，无需将原始单元的其他部分重新安装至服务单元。

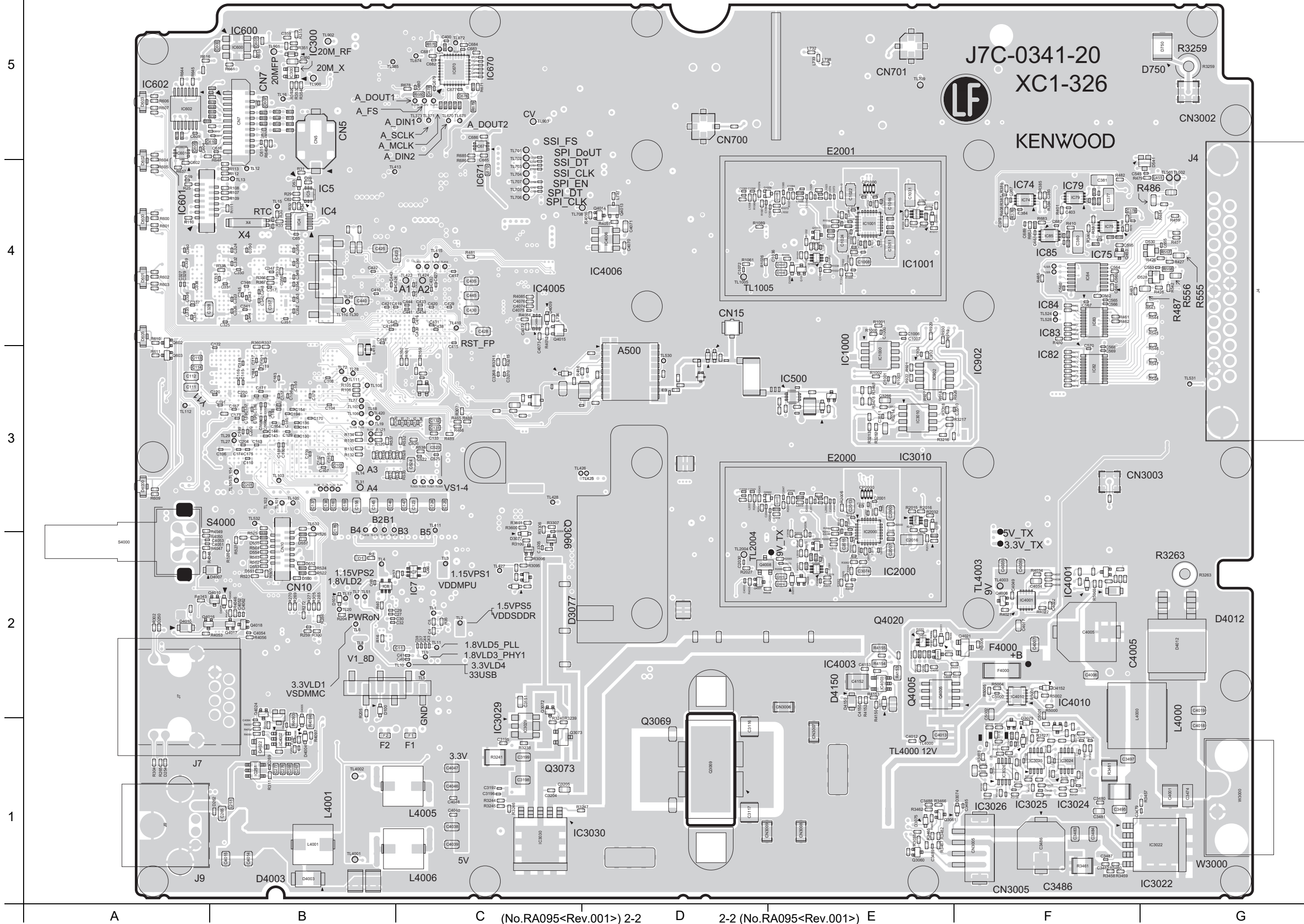
PRECAUTIONS ON SCHEMATIC DIAGRAMS

- * Due to the improvement in performance, some part numbers shown in the circuit diagrams may not agree with those indicated in the Parts List.
- * The parts numbers, values and rated voltage etc. in the Schematic Diagrams are for reference only.
- * Since the circuit diagrams are standard ones, the circuits and circuit constants may be subject to change for improvement without any notice.
- * The parts of the symbol with " * " may vary depending on model. Refer to the parts list for details.
- * The parts of the symbol with " \$ " are unmounted parts.

原理图的注意事项

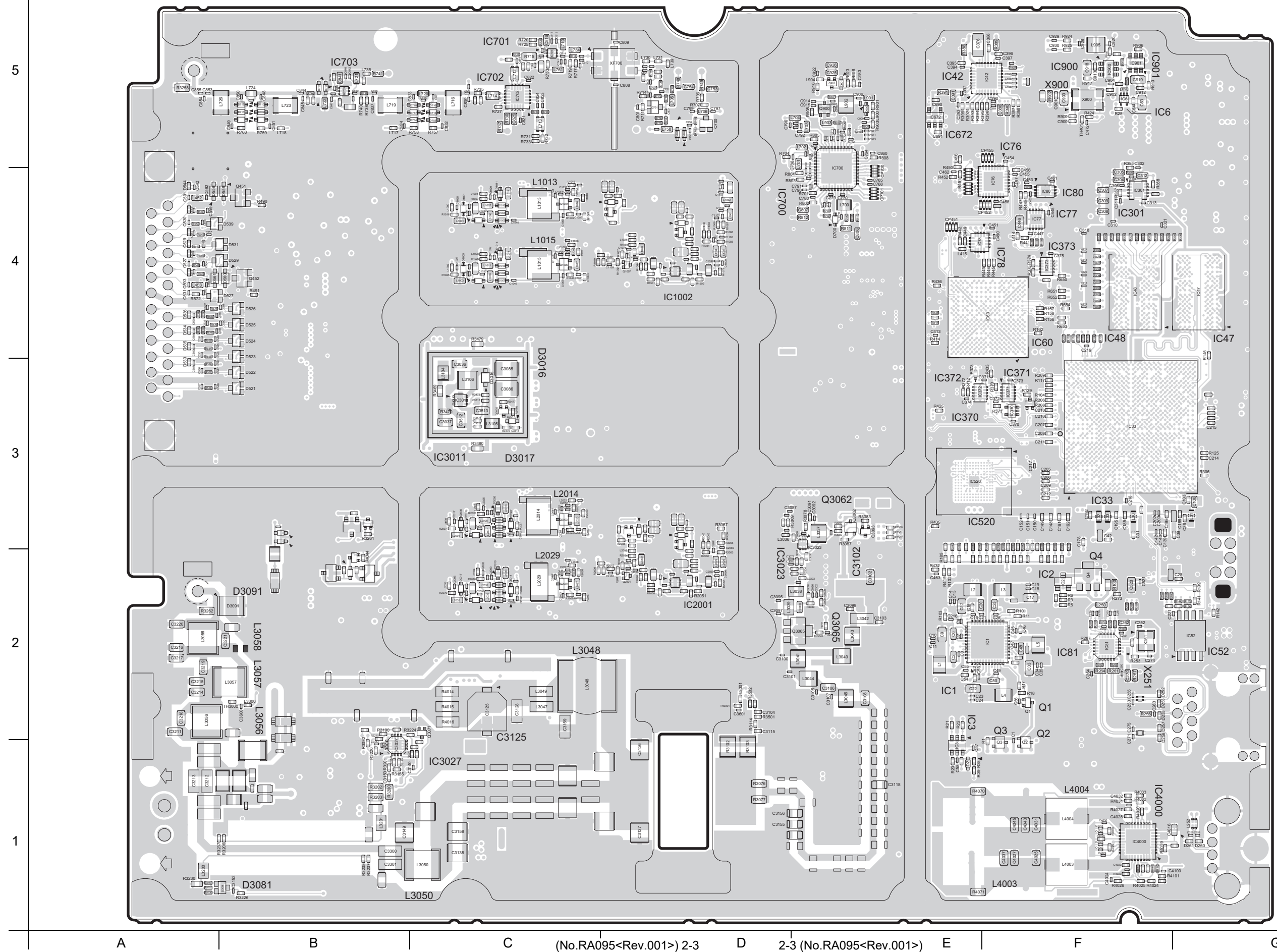
- * 鉴于性能的提高，电路图中显示的部分零件号可能与零件表中所示的零件号不一致。
- * 原理图中的零件号、数值和额定电压等仅供参考。
- * 由于这些电路图为标准电路图，因此电路及电路常数可能会因性能改进而有所更改，恕不另行通知。
- * 带有符号 “*” 的零件可能会因型号而异。有关详情，请参见零件表。
- * 带有符号 “\$” 的零件为未安装的零件。

--- Component side view/Side A (J7C-0341-20) ---



■ TX-RX UNIT/收发单元 (XC1-326E-00 (NXR-1700 E type))

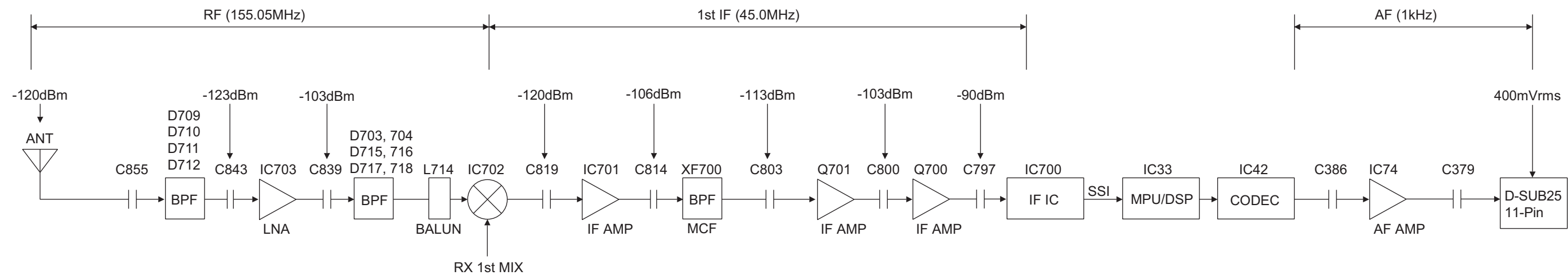
--- Foil side view/Side B (J7C-0341-20) ---



LEVEL DIAGRAM/电平图

TX-RX UNIT/收发单元

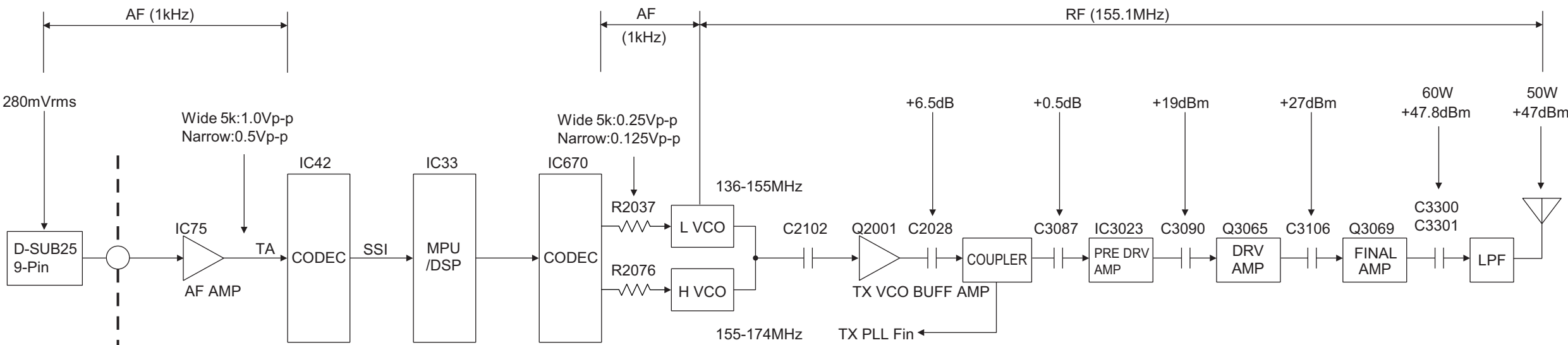
Receiver Section/接收部分



To make measurements in the AF section, connect the AC level meter.
(ANT input: -53dBm, 1kHz FM, 1.5kHz DEV (Narrow).)
This model doesn't have Audio AMP and SP. AF load must be 100kΩ (Audio analyzer input).
In the RF section, use 1000pF coupling capacitor.
(The display shows the SSG input value required to obtain 12dB SINAD.)

如要在AF部测量，则连接AC电平表。
(天线输入: -53dBm, 1kHz FM, 1.5kHz 频偏(窄带))
该型号没有音频放大器和扬声器。音频负载必须为 100kΩ (音频分析仪输入)。
如要在RF部测量，请使用1000pF 耦合电容器。
(图中显示了获得12dB SINAD所需的SSG输入值，没有本地电平。)

Transmitter Section/发射部分



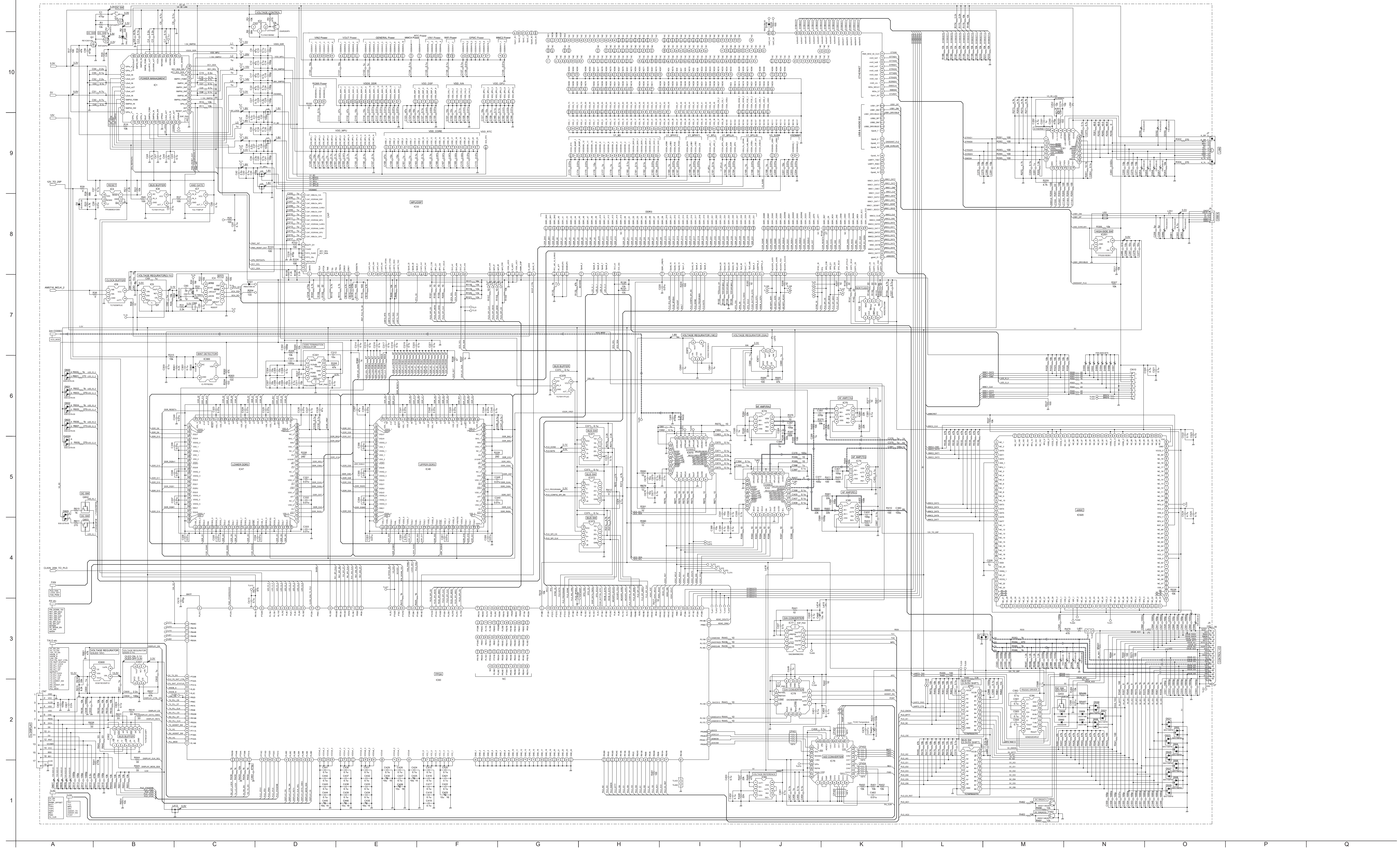
MOD: 1kHz/1.5kHz DEV (Analog Narrow) , 1kHz/3kHz DEV (Analog Wide 5k)
MOD: 1kHz/1.5kHz DEV (模拟窄带) 、1kHz/3kHz DEV (模拟宽带 5k)

1



■ TX-RX UNIT/收发单元 (XC1-326E-00 (NXR-1700 E type) (1/2)





PARTS LIST/零件表

[NXR-1700]

* SAFETY PRECAUTION

Parts identified by the $\triangle$ symbol are critical for safety. Replace only with specified part numbers.

* BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine parts be used.

* (x_) in a description column shows the number of the used part.

* 安全须知

带有 $\triangle$ 符号的零件是对于安全至关重要的零件。请务必使用指定零件号码的零件进行更换。

* 小心假冒零件

使用不符合规定的零件可能会导致安全或性能方面的问题。建议使用正品零件。

* 说明栏中的 (x_) 代表所用的零件号码。

- Contents/目录 -

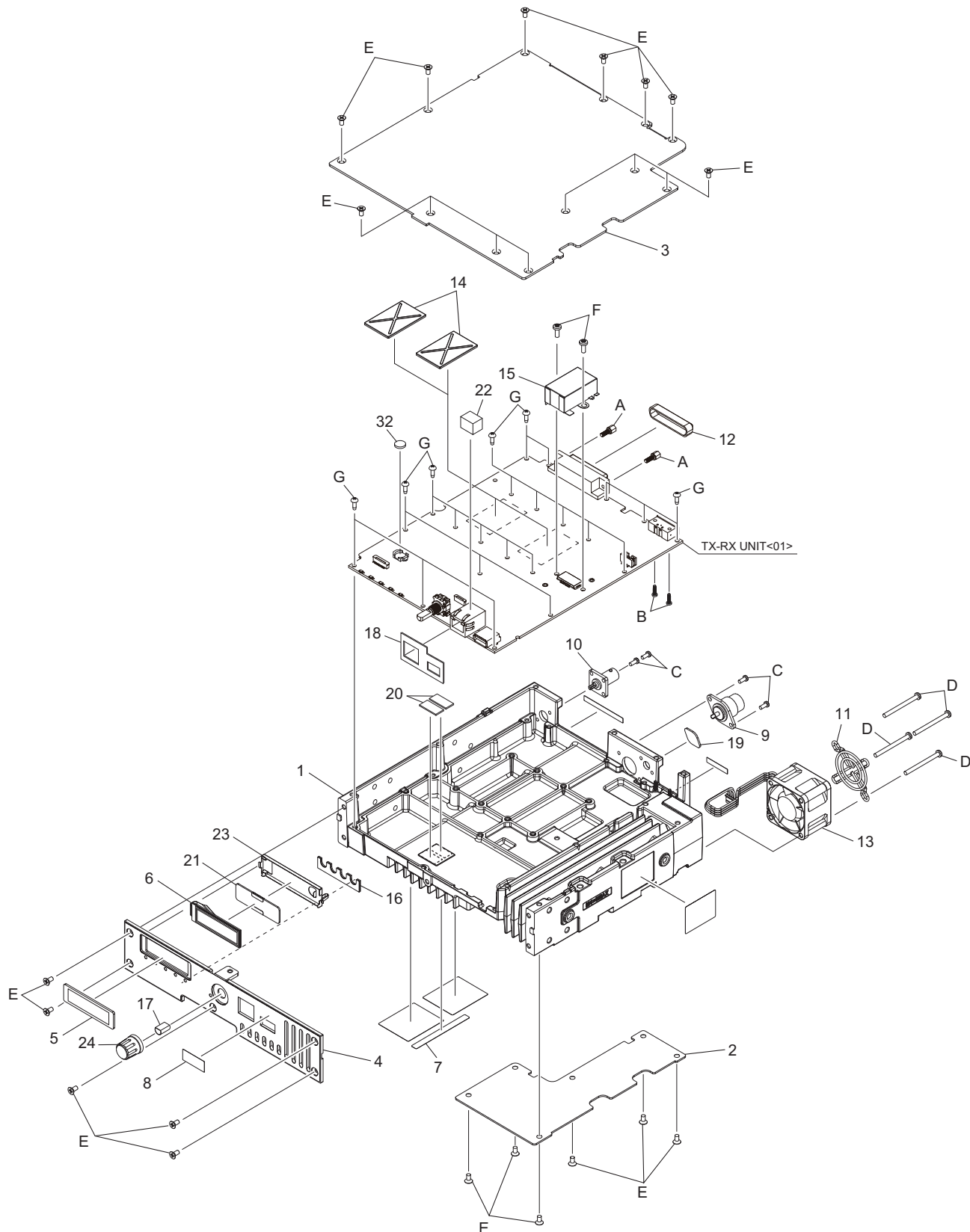
Exploded view of general assembly and parts list /总装分解图及零件表 -- 3-2

Electrical parts list /电气零件表 3-4

Packing materials and accessories parts list /包装材料及配件清单 3-22

Exploded view of general assembly and parts list / 总装分解图及零件表

Block No.M1MM



General assembly / 本体总装

Block No. [M][1][M][M]

△ Symbol No.	Part No.	Part Name	Description	Local
1	-----	CHASSIS		
2	A4A-0059-00	BOTTOM PLATE		
3	A5C-0123-20	TOP PLATE		
4	A6C-0154-10	PANEL ASSY	FRONT Note 1/ 注意 1	
5	B1A-0130-00	FRONT GLASS	OLED/WITH ADHESIVE	
6	B3H-0149-00	LCD ASSY	OLED Note 1/ 注意 1	
7	B41-1837-04	CAUTION STICKER	HOT SURFACE	
8	B4B-0008-00	CAUTION STICKER	FCC(F.PANEL)	
9	E04-0170-45	C.RECEPTACLE-N	N TYPE/TX	
10	E0E-0023-00	C.RECEPTACLE-BN	BNC/RX	
11	F07-1930-05	COVER	FAN	
12	F09-0445-15	CAP	D-SUB	
13	F0K-0082-00	FANMOTOR		
14	F1B-0021-00	SHIELDING COVER	BLS(x2)	
15	F1B-0173-10	SHIELDING CASE	FET	
16	F1E-0071-00	SHADE	LED	
17	G09-0405-05	KNOB SPRING		
18	G1A-0164-00	FIBROUS SHEET	LAN/USB-A	
19	G11-4578-14	SHEET	GPS	
20	G1B-0464-00	RUBBER SHEET	SITARA(x2)	
21	G1D-0419-00	CUSHION	OLED	
22	G1D-0482-00	CONDUCT CUSHION	LAN	
23	J2B-0659-00	MOUNTING	OLED	
24	K29-9471-13	KNOB	PUSH/ENC	
32	W09-0971-05	LITHIUM CELL		
A	N09-2409-05	HEX.HEAD SCREW	D-SUB(x2)	
B	N0Z-0387-00	SPECIAL SCREW	DC CONNECTOR(x2)	
C	N30-2606-48	P.HEAD M.SCREW	ANT(x4)	
D	N30-3035-43	P.HEAD M.SCREW	FAN(x4)	
E	N32-3006-43	F.HEAD M.SCREW	PANEL, TOP/BOTTOM PLATE(x23)	
F	N35-3008-43	BI.HEAD M.SCREW	FINAL(x2)	
G	N87-2608-48	BR.HEAD T.SCREW	PCB(x21)	
-	XCA-095E-00S	TX-RX UNIT	SERVICE UNIT Note 1/ 注意 1	

Note 1: When ordering this part, refer to “3.3 Assembly Information (Non-reusable parts)”.

注意 1: 当订购此零件时，请参考 “3.6 组装信息（非可再用零件）”。

Electrical parts list / 电气零件表

TX-RX UNIT / 收发单元

XC1-326E-00

Note 1:When ordering this part, refer to “3.3 Assembly Information (Non-reusable parts)”.

Note 2:This part cannot be replaced. Therefore, this part is not supplied as a service part.

注意 1: 当订购此零件时, 请参考 “3.6 组装信息 (非可再用零件)”。

注意 2: 该零件不可以替换。所以, 对该零件不能供应它的维修零件。

△ Symbol No.	Part No.	Part Name	Description	Local
Block No. [0][1]				
IC1	-----	MOS IC	Note 2/ 注意 2	
IC2	TLVH431BIDBZ	MOS IC		
IC3	TPS3808G01DBV	MOS IC		
IC4	R2223T	MOS IC		
IC5	-----	MOS IC		Note 2/ 注意 2
IC6	TC7SZ08FEJC	MOS IC	Note 2/ 注意 2	
IC7	7UL1T08FUF	MOS IC		
IC8	TC7SH17FUJC	MOS IC		
IC33	-----	MPU IC		Note 2/ 注意 2
IC42	-----	MOS IC		Note 2/ 注意 2
IC47	-----	DRAM IC	Note 2/ 注意 2	
IC48	-----	DRAM IC		Note 2/ 注意 2
IC52	W25Q128JVSIM	ROM IC		
IC60	-----	MOS IC		Note 2/ 注意 2
IC74	-----	MOS IC		Note 2/ 注意 2
IC75	-----	MOS IC	Note 2/ 注意 2	
IC76	-----	MOS IC		Note 2/ 注意 2
IC77	-----	MOS IC		Note 2/ 注意 2
IC78	-----	MOS IC		Note 2/ 注意 2
IC79	-----	MOS IC		Note 2/ 注意 2
IC80	-----	MOS IC	Note 2/ 注意 2	
IC81	-----	MOS IC		Note 2/ 注意 2
IC82	TC7MPB9307FK	MOS IC		
IC83	TC7MPB9307FK	MOS IC		
IC84	ADM202EARUZ	MOS IC		
IC85	-----	MOS IC	Note 2/ 注意 2	
IC251	TPS2051BDBV	MOS IC		
IC300	IC-PST8229U	MOS IC		
IC301	-----	MOS IC		Note 2/ 注意 2
IC370	TC7SH17FUJC	MOS IC		
IC371	-----	MOS IC	Note 2/ 注意 2	
IC372	-----	MOS IC		Note 2/ 注意 2
IC373	-----	MOS IC		Note 2/ 注意 2
IC520	-----	ROM IC		Note 2/ 注意 2
IC600	XC6216C202P-G	MOS IC		
IC601	-----	MOS IC	Note 2/ 注意 2	
IC602	TC74VCX125FT	MOS IC		
IC670	-----	MOS IC		Note 2/ 注意 2
IC671	-----	MOS IC		Note 2/ 注意 2
IC672	XC6221B182M-G	ANALOG IC		
IC700	-----	MOS IC	Note 2/ 注意 2	
IC701	-----	MOS IC		Note 2/ 注意 2
IC702	-----	MOS IC		Note 2/ 注意 2

△ Symbol No.	Part No.	Part Name	Description	Local
IC703	-----	MOS IC	Note 2/ 注意 2	
IC900	NJU6368PF1	MOS IC		
IC901	NJU6368PF1	MOS IC	Note 2/ 注意 2	
IC902	OPA1662AID	BIPOLAR IC		
IC1000	OPA1662AID	BIPOLAR IC		
IC1001	-----	MOS IC		Note 2/ 注意 2
IC2000	-----	MOS IC		Note 2/ 注意 2
IC3010	OPA1662AID	BIPOLAR IC	Note 2/ 注意 2	
IC3011	TPS61041DRVR	ANALOG IC		
IC3022	-----	ANALOG IC		Note 2/ 注意 2
IC3023	-----	MOS IC		Note 2/ 注意 2
IC3024	NJM2904CRB1	BIPOLAR IC		
IC3025	NJM2904CRB1	BIPOLAR IC	Note 2/ 注意 2	
IC3026	BA3472FVM	BIPOLAR IC		
IC3027	-----	MOS IC		Note 2/ 注意 2
IC3029	XC6209B502P-G	MOS IC		
IC3030	-----	ANALOG IC		Note 2/ 注意 2
IC4000	-----	MOS IC	Note 2/ 注意 2	
IC4001	-----	ANALOG IC		Note 2/ 注意 2
IC4002	TPS3808G01DBV	MOS IC		
IC4003	LTC6101BIS5-F	ANALOG IC		
IC4005	-----	MOS IC		Note 2/ 注意 2
IC4006	XC6209B502P-G	MOS IC	Note 2/ 注意 2	
IC4010	-----	MOS IC		Note 2/ 注意 2
Q1	RE1C001UN	FET		
Q2	RAF040P01	FET		
Q3	RAF040P01	FET		
Q4	2SAR293P5	TRANSISTOR		
Q451	2SD2114K(W)	TRANSISTOR		
Q452	2SD2114K(W)	TRANSISTOR		
Q453	LTC043ZEBFS8	DIGI TRANSISTOR		
Q602	LTC043ZEBFS8	DIGI TRANSISTOR		
Q603	LTC043ZEBFS8	DIGI TRANSISTOR		
Q700	BFU550WX	TRANSISTOR		
Q701	BFU550WX	TRANSISTOR		
Q900	MCH3914-H/8/	FET		
Q901	2SD2654E3/W/	TRANSISTOR		
Q1000	EM6M2	FET		
Q1001	2SD2654E3/W/	TRANSISTOR		
Q1002	EM6M2	FET		
Q1003	RE1E002SP	FET		
Q1004	MCH3914-H/8/	FET		
Q1005	MCH3914-H/8/	FET		
Q1007	BFR193F	TRANSISTOR		
Q1008	BFR193F	TRANSISTOR		
Q2000	EM6M2	FET		
Q2001	BFR193F	TRANSISTOR		
Q2002	BFR193F	TRANSISTOR		
Q2003	MCH3914-H/8/	FET		
Q2006	2SD2654E3/W/	TRANSISTOR		
Q2007	MCH3914-H/8/	FET		
Q2008	EM6M2	FET		
Q2009	RE1E002SP	FET		
Q3035	2SD2654E3/W/	TRANSISTOR		
Q3060	RE1L002SN	FET		
Q3061	RE1C001ZP	FET		
Q3062	RAF040P01	FET		
Q3063	RE1L002SN	FET		
Q3065	PD85004	FET		
Q3066	LSCR523EBFS8	TRANSISTOR	Note 2/ 注意 2	
Q3069	-----	FET		
Q3071	RE1L002SN	FET		

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
Q3072	LTC014EEBFS8	DIGI TRANSISTOR			D550	F0K-0420-00	SURGE ABSORBER		
Q3073	RQ5E035AT	FET							
Q3082	RE1C001UN	FET			D551	F0K-0420-00	SURGE ABSORBER		
Q4004	LTC023YEBFS8	TRANSISTOR			D552	F0K-0420-00	SURGE ABSORBER		
Q4005	RRH140P03	FET			D553	F0K-0420-00	SURGE ABSORBER		
Q4006	RE1L002SN	FET			D554	F0K-0420-00	SURGE ABSORBER		
Q4007	RE1L002SN	FET			D555	F0K-0420-00	SURGE ABSORBER		
Q4008	RQ5C035BC	FET							
Q4010	RE1L002SN	FET			D556	F0K-0420-00	SURGE ABSORBER		
Q4013	RAF040P01	FET			D557	F0K-0420-00	SURGE ABSORBER		
Q4014	RE1L002SN	FET			D558	1SS355VM	DIODE		
Q4015	RAF040P01	FET			D559	UDZV18B	ZENER DIODE		
Q4016	RE1L002SN	FET			D560	1SS355VM	DIODE		
Q4017	RE1L002SN	FET							
Q4018	RE1L002SN	FET			D561	UDZV18B	ZENER DIODE		
Q4020	EM6M2	FET			D600	B30-2278-05	LED		
Q4021	DTB143EC	DIGI TRANSISTOR			D601	B30-2278-05	LED		
Q4022	DTB143EC	DIGI TRANSISTOR			D602	B30-2278-05	LED		
Q4024	2SD2654E3/W/	TRANSISTOR			D603	B30-2278-05	LED		
D1	SML-D12M8W	LED							
D2	EDZV6.2B	ZENER DIODE			D605	B30-2278-05	LED		
D53	RB520SM-30	DIODE			D606	F0K-0420-00	SURGE ABSORBER		
D100	RB531SM-30	DIODE							
D101	RB531SM-30	DIODE			D607	F0K-0420-00	SURGE ABSORBER		
D250	F0K-0420-00	SURGE ABSORBER			D608	F0K-0420-00	SURGE ABSORBER		
D252	F0K-0420-00	SURGE ABSORBER			D609	F0K-0420-00	SURGE ABSORBER		
D253	F0K-0420-00	SURGE ABSORBER							
D254	F0K-0420-00	SURGE ABSORBER			D610	F0K-0420-00	SURGE ABSORBER		
D255	F0K-0420-00	SURGE ABSORBER			D700	SMV1705-079LF	VARI CAP DIODE		
D256	F0K-0420-00	SURGE ABSORBER			D701	RN142SM	DIODE		
D257	F0K-0420-00	SURGE ABSORBER			D702	RN142SM	DIODE		
D260	F0K-0420-00	SURGE ABSORBER			D703	BBY55-02V	VARI CAP DIODE		
D261	F0K-0420-00	SURGE ABSORBER			D704	BBY55-02V	VARI CAP DIODE		
D262	F0K-0420-00	SURGE ABSORBER			D705	RN142SM	DIODE		
D300	EDZV6.2B	ZENER DIODE			D706	RN142SM	DIODE		
D521	BAV199FM	DIODE			D709	BBY55-02V	VARI CAP DIODE		
D522	BAV199FM	DIODE			D710	BBY55-02V	VARI CAP DIODE		
D523	BAV199FM	DIODE							
D524	BAV199FM	DIODE			D711	BBY55-02V	VARI CAP DIODE		
D525	BAV199FM	DIODE			D712	BBY55-02V	VARI CAP DIODE		
D526	BAV199FM	DIODE			D715	BBY55-02V	VARI CAP DIODE		
D527	BAV199FM	DIODE			D716	BBY55-02V	VARI CAP DIODE		
D528	BAV199FM	DIODE			D717	BBY55-02V	VARI CAP DIODE		
D529	BAV199FM	DIODE							
D530	BAV199FM	DIODE			D718	BBY55-02V	VARI CAP DIODE		
D531	BAV199FM	DIODE			D750	CSA70-401L	SURGE ABSORBER		
D533	F0K-0420-00	SURGE ABSORBER			D900	SMV1705-079LF	VARI CAP DIODE		
D534	F0K-0420-00	SURGE ABSORBER			D901	1SS400SM	DIODE		
D535	F0K-0420-00	SURGE ABSORBER			D1000	EDZV8.2B	ZENER DIODE		
D536	F0K-0420-00	SURGE ABSORBER							
D539	BAV199FM	DIODE			D1001	BBY66-02V	VARI CAP DIODE		
D541	BAV199FM	DIODE			D1003	SMV1801-079LF	VARI CAP DIODE		
D544	F0K-0420-00	SURGE ABSORBER			D1004	SMV1801-079LF	VARI CAP DIODE		
					D1005	BBY66-02V	VARI CAP DIODE		
					D1007	SMV1801-079LF	VARI CAP DIODE		
					D1008	SMV1801-079LF	VARI CAP DIODE		
					D1009	1SS400SM	DIODE		
					D1010	SMV1801-079LF	VARI CAP DIODE		
					D1011	SMV1801-079LF	VARI CAP DIODE		
					D1013	SMV1801-079LF	VARI CAP DIODE		
					D1014	SMV1801-079LF	VARI CAP DIODE		
					D2000	BBY66-02V	VARI CAP DIODE		
					D2002	SMV1801-079LF	VARI CAP DIODE		

Symbol No.	Part No.	Part Name	Description	Local	Symbol No.	Part No.	Part Name	Description	Local
D2003	SMV1801-079LF	VARI CAP DIODE			C30	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D2004	SMV1801-079LF	VARI CAP DIODE			C31	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M	
D2005	SMV1801-079LF	VARI CAP DIODE			C32	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
D2006	EDZV8.2B	ZENER DIODE			C33	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M	
D2007	1SV323FT	VARI CAP DIODE			C34	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D2010	1SS400SM	DIODE			C35	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
D2011	1SV323FT	VARI CAP DIODE			C36	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M	
D2012	SMV1801-079LF	VARI CAP DIODE			C37	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D2013	SMV1801-079LF	VARI CAP DIODE			C38	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
D2014	SMV1801-079LF	VARI CAP DIODE			C39	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M	
D2015	SMV1801-079LF	VARI CAP DIODE			C40	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D2017	BBY66-02V	VARI CAP DIODE			C41	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
D3016	RB561VM-40	SCHOTTKY DIODE			C42	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M	
D3017	1SS400SM	DIODE			C43	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D3074	1SS400SM	DIODE			C44	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
D3075	EDZV3.6B	ZENER DIODE			C45	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D3077	EDZV6.8B	ZENER DIODE			C46	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M	
D3079	1SS400SM	DIODE			C47	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D3081	RB706FM40	SCHOTTKY DIODE			C48	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
D3091	CSA70-401L	SURGE ABSORBER			C49	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D3095	1SS400SM	DIODE			C50	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
D4000	B30-2278-05	LED			C51	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
D4003	GS1G-L	DIODE			C52	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M	
D4004	EDZV6.2B	ZENER DIODE			C53	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D4005	EDZV8.2B	ZENER DIODE			C54	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M	
D4007	TFZV12B	ZENER DIODE			C55	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D4008	1SS400SM	DIODE			C56	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
D4009	1SS400SM	DIODE			C57	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D4010	TFZV12B	ZENER DIODE			C58	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
D4011	EDZV6.8B	ZENER DIODE			C59	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
D4012	-----	ZENER DIODE	Note 2/ 注意 2		C60	CC730CC1H020B	C CAPACITOR	2pF 50V B	
D4150	TFZV5.6B	ZENER DIODE			C61	CC730CC1H010B	C CAPACITOR	1pF 50V B	
D4151	RB531SM-30	DIODE			C62	CK73HB1C105K	C CAPACITOR	1uF 16V K	
D4152	1SS400SM	DIODE			C63	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C1	CC73JCH1E471J	C CAPACITOR	470pF 25V J		C64	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C2	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		C65	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C3	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C66	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C4	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M		C68	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C5	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M		C69	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C6	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		C100	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C7	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C101	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C8	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C102	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C9	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M		C103	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C10	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C104	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C11	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C105	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C12	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M		C106	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C13	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C107	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C14	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C108	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C15	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M		C109	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C16	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C110	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C17	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M		C111	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M	
C18	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C112	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M	
C19	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C113	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C20	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		C114	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C21	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C115	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C22	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M		C116	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C23	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C117	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C24	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C118	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C25	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		C119	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C26	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C120	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C27	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C121	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C28	CK73HXR0J225M	C CAPACITOR	2.2uF 6.3V M		C122	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C29	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C123	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M	
					C124	CK73GXR1C106M	C CAPACITOR	10uF 16V M	

Symbol No.	Part No.	Part Name	Description	Local	Symbol No.	Part No.	Part Name	Description	Local
C125	CK73GXR1C106M	C CAPACITOR	10uF 16V M		C189	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C126	CK73HB1C105K	C CAPACITOR	1uF 16V K		C190	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
					C191	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C127	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K						
C128	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K		C192	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C129	CK73JXR1A223K	C CAPACITOR	0.022uF 10V K		C193	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C130	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C194	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C131	CK73GXR1C106M	C CAPACITOR	10uF 16V M		C195	CK73HB1C105K	C CAPACITOR	1uF 16V K	
					C196	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C132	CK73GXR1C106M	C CAPACITOR	10uF 16V M						
C133	CK73HB1C105K	C CAPACITOR	1uF 16V K		C197	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C134	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C198	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C135	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K		C199	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C136	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C200	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
					C201	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C137	CK73GXR1C106M	C CAPACITOR	10uF 16V M						
C138	CK73GXR1C106M	C CAPACITOR	10uF 16V M		C202	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C139	CK73HB1C105K	C CAPACITOR	1uF 16V K		C203	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C140	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C204	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C141	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C205	CK73HB1C105K	C CAPACITOR	1uF 16V K	
					C206	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C142	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K						
C143	CK73JXR1A223K	C CAPACITOR	0.022uF 10V K		C207	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C144	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C208	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C145	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M		C209	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C146	CK73GXR1C106M	C CAPACITOR	10uF 16V M		C210	CK73HB1C105K	C CAPACITOR	1uF 16V K	
					C211	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C147	CK73GXR1C106M	C CAPACITOR	10uF 16V M						
C148	CK73HB1C105K	C CAPACITOR	1uF 16V K		C212	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C149	CK73HB1C105K	C CAPACITOR	1uF 16V K		C213	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C150	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C214	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C151	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C215	CK73HB1C105K	C CAPACITOR	1uF 16V K	
					C216	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C152	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K						
C153	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K		C217	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C154	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C218	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C155	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C219	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C156	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C220	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
					C221	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C157	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K						
C158	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M		C250	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C159	CK73GXR1C106M	C CAPACITOR	10uF 16V M		C251	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C160	CK73GXR1C106M	C CAPACITOR	10uF 16V M		C252	CC730CC1H120G	C CAPACITOR	12pF 50V G	
C161	CK73HB1C105K	C CAPACITOR	1uF 16V K		C253	CC730CC1H100G	C CAPACITOR	10pF 50V G	
					C254	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C162	CK73HB1C105K	C CAPACITOR	1uF 16V K						
C163	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C255	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C164	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C258	CC730CC1H050B	C CAPACITOR	5pF 50V B	
C165	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C259	CC730CC1H050B	C CAPACITOR	5pF 50V B	
C166	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K		C260	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
					C261	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C167	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K						
C168	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K		C262	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C169	CK73JXR1A223K	C CAPACITOR	0.022uF 10V K		C263	CK73JXR1A223K	C CAPACITOR	0.022uF 10V K	
C170	CK73JXR1A223K	C CAPACITOR	0.022uF 10V K		C264	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C171	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C265	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K	
					C267	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C172	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K						
C173	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C268	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C174	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C269	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C175	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C270	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C176	CK73GXR1C106M	C CAPACITOR	10uF 16V M		C271	CC730CC1H100G	C CAPACITOR	10pF 50V G	
					C274	CC730CC1H120G	C CAPACITOR	12pF 50V G	
C177	CK73HB1C105K	C CAPACITOR	1uF 16V K						
C178	CK73HB1C105K	C CAPACITOR	1uF 16V K		C275	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C179	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C276	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C180	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C277	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C181	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C278	CC730CC1H100G	C CAPACITOR	10pF 50V G	
					C279	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C182	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K						
C183	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C280	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C184	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C281	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C185	CK73HB1C105K	C CAPACITOR	1uF 16V K		C302	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C186	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C303	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
					C304	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C187	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K						
C188	CK73HB1C105K	C CAPACITOR	1uF 16V K		C305	CK73GXR1C106M	C CAPACITOR	10uF 16V M	

Symbol No.	Part No.	Part Name	Description	Local
C306	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C307	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C308	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C309	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C310	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C311	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C312	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C313	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C314	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C315	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C316	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C317	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C318	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C319	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C320	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C321	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C323	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C324	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C325	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C326	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C327	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C328	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M	
C329	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C330	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C331	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C332	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C333	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C334	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C335	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C336	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C337	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C338	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C339	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C340	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C341	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C342	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C343	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C344	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C345	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C346	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C347	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C348	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C349	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C350	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C351	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C352	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C353	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C354	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C355	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C356	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C357	CK73FXR0J476M	C CAPACITOR	47uF 6.3V M	
C358	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C359	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C360	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C370	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C371	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C372	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C373	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C374	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C375	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C376	CK73EXR0J107M	C CAPACITOR	100uF 6.3V M	
C377	CK73EXR0J107M	C CAPACITOR	100uF 6.3V M	
C378	CK73GXR1H105K	C CAPACITOR	1uF 50V K	
C379	CK73GXR1H105K	C CAPACITOR	1uF 50V K	

Symbol No.	Part No.	Part Name	Description	Local
C380	CK73EXR0J107M	C CAPACITOR	100uF 6.3V M	
C381	CK73EXR0J107M	C CAPACITOR	100uF 6.3V M	
C382	CC730CC1H221G	C CAPACITOR	220pF 50V G	
C383	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C384	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C385	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C386	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C387	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C388	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C389	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C390	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C391	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C392	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C393	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C394	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C395	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C396	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C397	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C398	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C399	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C400	CK73JXR1C472K	C CAPACITOR	4700pF 16V K	
C401	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C402	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C403	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C405	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C407	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C408	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C410	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C413	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C415	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C416	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C417	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C418	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C419	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C420	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C421	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C422	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C423	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C424	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C425	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C426	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C427	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C428	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C429	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C430	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C431	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C432	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C433	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C434	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C435	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C436	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C437	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C438	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C439	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C440	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C441	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C442	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C443	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C444	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C445	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C446	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C447	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C448	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C449	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C450	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	

Symbol No.	Part No.	Part Name	Description	Local	Symbol No.	Part No.	Part Name	Description	Local
C451	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C587	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C452	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C588	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C453	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C589	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C454	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C590	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C455	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C591	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
					C592	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C456	CK73HB1C105K	C CAPACITOR	1uF 16V K		C593	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C457	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C594	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C458	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C595	CK73HBB1H103K	C CAPACITOR	0.01uF 50V K	
C461	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C600	CK73GXR1H105K	C CAPACITOR	1uF 50V K	
C462	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C601	CK73GXR1H105K	C CAPACITOR	1uF 50V K	
C463	CC73JCH1E471J	C CAPACITOR	470pF 25V J		C602	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C472	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C603	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C520	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K		C604	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C521	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C605	CK73GXR1E225K	C CAPACITOR	2.2uF 25V K	
C522	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C606	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C523	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K		C607	CK73GXR1E225K	C CAPACITOR	2.2uF 25V K	
C524	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K		C608	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C525	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C609	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C526	CK73HB1C105K	C CAPACITOR	1uF 16V K		C610	CK73GXR1E225K	C CAPACITOR	2.2uF 25V K	
C527	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C611	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C528	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C612	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C529	CK73HBB1H103K	C CAPACITOR	0.01uF 50V K		C613	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C530	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C614	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C531	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C615	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C532	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C616	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C533	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C670	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C534	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C671	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C535	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C672	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C536	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C673	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C537	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C674	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C541	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C675	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C542	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C676	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C543	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C677	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C544	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C678	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C545	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C679	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C546	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C680	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C547	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C681	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C548	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C682	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C549	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C683	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C550	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C684	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C551	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C685	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C552	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C686	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C553	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C687	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C554	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C688	CC73JCH1E331J	C CAPACITOR	330pF 25V J	
C555	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C689	CK73JXR1H152K	C CAPACITOR	1500pF 50V K	
C556	CK73HBB1H103K	C CAPACITOR	0.01uF 50V K		C690	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C557	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C691	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C558	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C741	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C559	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C750	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C560	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C751	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C561	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		C752	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C562	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		C753	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C563	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		C754	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C564	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		C760	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C565	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C761	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C566	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C762	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C567	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C763	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C568	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C764	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C569	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C765	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C570	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		C766	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C583	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C767	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C584	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C768	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C585	CK73JXR1H102K	C CAPACITOR	1000pF 50V K		C769	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C586	CK73JXR1H102K	C CAPACITOR	1000pF 50V K						

Symbol No.	Part No.	Part Name	Description	Local
C770	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C771	CC730CC1H390G	C CAPACITOR	39pF 50V G	
C772	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C773	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C774	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C775	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C776	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C777	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C778	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C779	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C780	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C781	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C782	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K	
C783	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C784	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C785	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C786	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C787	CC730CC1H121G	C CAPACITOR	120pF 50V G	
C788	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C789	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C790	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C791	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C792	CC730CC1H120G	C CAPACITOR	12pF 50V G	
C794	CC730CC1H470G	C CAPACITOR	47pF 50V G	
C795	CC730CC1H100G	C CAPACITOR	10pF 50V G	
C796	CC730CC1H101G	C CAPACITOR	100pF 50V G	
C797	CC73JCH1H820J	C CAPACITOR	82pF 50V J	
C799	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C800	CC73JCH1H181J	C CAPACITOR	180pF 50V J	
C801	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C802	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C803	CC730CC1H270G	C CAPACITOR	27pF 50V G	
C804	CC730CC1H220G	C CAPACITOR	22pF 50V G	
C806	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C807	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C808	CC730CC1H080B	C CAPACITOR	8pF 50V B	
C809	CC730CC1H080B	C CAPACITOR	8pF 50V B	
C810	CC730CC1H220G	C CAPACITOR	22pF 50V G	
C812	CC730CC1H121G	C CAPACITOR	120pF 50V G	
C814	CC730CC1H121G	C CAPACITOR	120pF 50V G	
C815	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C816	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C817	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C818	CC730CC1H121G	C CAPACITOR	120pF 50V G	
C819	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C820	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C821	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C822	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C823	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C824	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C825	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C829	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C830	CC730CC1H330G	C CAPACITOR	33pF 50V G	
C831	CC730CC1H470G	C CAPACITOR	47pF 50V G	
C832	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C833	CC730CC1H470G	C CAPACITOR	47pF 50V G	
C834	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C835	CC730CC1H0R5B	C CAPACITOR	0.5pF 50V B	
C836	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C837	CC730CC1H330G	C CAPACITOR	33pF 50V G	
C839	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C840	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C841	CK73GXR1C106M	C CAPACITOR	10uF 16V M	
C842	CC730CC1H270G	C CAPACITOR	27pF 50V G	

Symbol No.	Part No.	Part Name	Description	Local
C843	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C844	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C845	CC730CC1H330G	C CAPACITOR	33pF 50V G	
C846	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C847	CC730CC1H220G	C CAPACITOR	22pF 50V G	
C848	CC730CC1H151G	C CAPACITOR	150pF 50V G	
C849	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C850	CC730CC1H151G	C CAPACITOR	150pF 50V G	
C851	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C853	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C854	CC730CC1H330G	C CAPACITOR	33pF 50V G	
C855	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C860	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C900	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C901	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C902	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C903	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C904	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C906	CC730CC1H090B	C CAPACITOR	9pF 50V B	
C907	CC730CC1H4R5B	C CAPACITOR	4.5pF 50V B	
C909	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C910	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C911	CK730PM1C153K	C CAPACITOR	0.015uF 16V K	
C912	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C913	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C914	CC730CC1H390G	C CAPACITOR	39pF 50V G	
C915	CC730CC1H680G	C CAPACITOR	68pF 50V G	
C916	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C917	CC730CC1H070B	C CAPACITOR	7pF 50V B	
C918	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C919	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C920	CC730CC1H151G	C CAPACITOR	150pF 50V G	
C921	CK730PM1C153K	C CAPACITOR	0.015uF 16V K	
C922	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C923	CK73JXR1C472K	C CAPACITOR	4700pF 16V K	
C924	CK73JXR1H102K	C CAPACITOR	1000pF 50V K	
C925	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C926	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C928	CC730CC1H221G	C CAPACITOR	220pF 50V G	
C929	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C930	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C932	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C933	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C1000	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1001	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1002	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C1004	CK73JXR1C224K	C CAPACITOR	0.22uF 16V K	
C1006	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C1007	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C1008	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C1010	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1011	CS77LA1E010M	TA E CAPACITOR	1uF 25V M	
C1012	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C1013	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1014	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C1015	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1016	CS77LA1E010M	TA E CAPACITOR	1uF 25V M	
C1017	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1018	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C1019	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C1020	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C1021	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1022	CS77LA1E010M	TA E CAPACITOR	1uF 25V M	
C1023	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C1024	CS77LA1E010M	TA E CAPACITOR	1uF 25V M		C2010	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C1025	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K		C2011	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1026	CK73JXR1A473K	C CAPACITOR	0.047uF 10V K		C2012	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1028	CC73JCH1E331J	C CAPACITOR	330pF 25V J		C2013	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
					C2014	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1029	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2015	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C1030	CC73JCH1E331J	C CAPACITOR	330pF 25V J		C2016	CC730AD1H104J	C CAPACITOR	0.1uF 50V J	
C1031	CC730AD1H104J	C CAPACITOR	0.1uF 50V J		C2017	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C1032	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2018	CC730CC1H010B	C CAPACITOR	1pF 50V B	
C1034	CC73JCH1E331J	C CAPACITOR	330pF 25V J		C2019	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C1035	CC73JCH1E331J	C CAPACITOR	330pF 25V J		C2020	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C1036	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2021	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1037	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		C2022	CC730CC1H390G	C CAPACITOR	39pF 50V G	
C1038	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		C2023	CC730CC1H030B	C CAPACITOR	3pF 50V B	
C1040	CC730CC1H180G	C CAPACITOR	18pF 50V G		C2024	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1041	CC730CC1H070B	C CAPACITOR	7pF 50V B		C2025	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1046	CC730CC1H150G	C CAPACITOR	15pF 50V G		C2026	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1047	CC730CC1H3R5B	C CAPACITOR	3.5pF 50V B		C2027	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1049	CK73HB1C105K	C CAPACITOR	1uF 16V K		C2028	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C1050	CC73JCH1E471J	C CAPACITOR	470pF 25V J		C2029	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1051	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2030	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C1052	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2033	CC730CC1H390G	C CAPACITOR	39pF 50V G	
C1053	CC730CC1H180G	C CAPACITOR	18pF 50V G		C2035	CC730CC1H060B	C CAPACITOR	6pF 50V B	
C1054	CC730CC1H060B	C CAPACITOR	6pF 50V B		C2036	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C1055	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C2039	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C1056	CC730CC1H0R5B	C CAPACITOR	0.5pF 50V B		C2040	CC730CC1H270G	C CAPACITOR	27pF 50V G	
C1057	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2041	CC730CC1H040B	C CAPACITOR	4pF 50V B	
C1058	CC730CC1H070B	C CAPACITOR	7pF 50V B		C2042	CC730CC1HR75B	C CAPACITOR	0.75pF 50V B	
C1059	CC730CC1H180G	C CAPACITOR	18pF 50V G		C2047	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1060	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C2048	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C1061	CC730CC1H0R5B	C CAPACITOR	0.5pF 50V B		C2049	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1062	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2050	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1066	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C2051	CC730CC1H130G	C CAPACITOR	13pF 50V G	
C1069	CC730CC1H090B	C CAPACITOR	9pF 50V B		C2052	CC730CC1H050B	C CAPACITOR	5pF 50V B	
C1070	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2053	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C1071	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2054	CC730CC1H0R5B	C CAPACITOR	0.5pF 50V B	
C1072	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C2055	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1073	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2059	CC730CC1H270G	C CAPACITOR	27pF 50V G	
C1074	CC730CC1H270G	C CAPACITOR	27pF 50V G		C2066	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1075	CC730CC1H020B	C CAPACITOR	2pF 50V B		C2069	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C1078	CC730CC1H270G	C CAPACITOR	27pF 50V G		C2071	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C1083	CC73JCH1E471J	C CAPACITOR	470pF 25V J		C2073	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1084	CC730CC1H040B	C CAPACITOR	4pF 50V B		C2074	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C1085	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2075	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C1089	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2077	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1096	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2078	CC730CC1H0R5B	C CAPACITOR	0.5pF 50V B	
C1097	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2079	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C1098	CC730CC1H220G	C CAPACITOR	22pF 50V G		C2080	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C1099	CC730CC1H120G	C CAPACITOR	12pF 50V G		C2081	CC73JCH1E471J	C CAPACITOR	470pF 25V J	
C1100	CC730CC1H120G	C CAPACITOR	12pF 50V G		C2082	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1104	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		C2083	CC730CC1H130G	C CAPACITOR	13pF 50V G	
C1105	CC730CC1H180G	C CAPACITOR	18pF 50V G		C2084	CC730CC1H050B	C CAPACITOR	5pF 50V B	
C1106	CC730CC1H330G	C CAPACITOR	33pF 50V G		C2085	CC730CC1HR75B	C CAPACITOR	0.75pF 50V B	
C1107	CC730CC1H180G	C CAPACITOR	18pF 50V G		C2087	CC730CC1H050B	C CAPACITOR	5pF 50V B	
C1109	CC730CC1H150G	C CAPACITOR	15pF 50V G		C2088	CC730CC1H270G	C CAPACITOR	27pF 50V G	
C1200	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2089	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C1500	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2090	CC730CC1H220G	C CAPACITOR	22pF 50V G	
C2000	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M		C2091	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C2001	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C2092	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C2002	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C2093	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C2003	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C2095	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C2004	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2096	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C2007	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M		C2100	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C2008	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2101	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C2009	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		C2102	CC730CC1H150G	C CAPACITOR	15pF 50V G	

Symbol No.	Part No.	Part Name	Description	Local
C3036	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K	
C3037	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K	
C3072	CK73JXR1C224K	C CAPACITOR	0.22uF 16V K	
C3074	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
C3075	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C3079	CC730CC1H090B	C CAPACITOR	9pF 50V B	
C3085	CS77EBZ1V6R8M	TA E CAPACITOR	6.8uF 35V M	
C3086	CS77EBZ1V6R8M	TA E CAPACITOR	6.8uF 35V M	
C3087	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C3088	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3089	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3090	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C3091	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C3092	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3095	CC730ES2A560J	C CAPACITOR	56pF 100V J	
C3096	CK73JXR1C224K	C CAPACITOR	0.22uF 16V K	
C3097	CC730ES2A150J	C CAPACITOR	15pF 100V J	
C3098	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3099	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3100	CC730ES2A100D	C CAPACITOR	10pF 100V D	
C3101	CC730ES2A470J	C CAPACITOR	47pF 100V J	
C3102	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C3103	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3104	CK73HBB1H103K	C CAPACITOR	0.01uF 50V K	
C3105	CC730ES2A220J	C CAPACITOR	22pF 100V J	
C3106	CC730EP2J151J	C CAPACITOR	150pF 630V J	
C3107	CC730ES2A150J	C CAPACITOR	15pF 100V J	
C3108	CC730EP2J220J	C CAPACITOR	22pF 630V J	
C3110	CK73JXR1C472K	C CAPACITOR	4700pF 16V K	
C3111	CK73JXR1C682K	C CAPACITOR	6800pF 16V K	
C3112	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3114	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3115	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3116	CC730DF2H820G	C CAPACITOR	82pF 500V G	
C3117	CC730DF2H820G	C CAPACITOR	82pF 500V G	
C3118	CC730EP2J101J	C CAPACITOR	100pF 630V J	
C3121	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3122	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3125	CE32CL1H100M	E CAPACITOR	10uF 50V M	
C3126	CC730DF2H101G	C CAPACITOR	100pF 500V G	
C3127	CC730DF2H101G	C CAPACITOR	100pF 500V G	
C3128	CC730DZ2J102J	C CAPACITOR	1000pF 630V J	
C3131	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C3133	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3138	CC730DF2H101G	C CAPACITOR	100pF 500V G	
C3140	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C3141	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3143	CK73JXR1C472K	C CAPACITOR	4700pF 16V K	
C3144	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3145	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3146	CC730CC1H150G	C CAPACITOR	15pF 50V G	
C3147	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3149	CC730DF2H180G	C CAPACITOR	18pF 500V G	
C3150	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3151	CK73GXR1E225K	C CAPACITOR	2.2uF 25V K	
C3152	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3154	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3155	CC730EP2J181J	C CAPACITOR	180pF 630V J	
C3156	CC730EP2J181J	C CAPACITOR	180pF 630V J	
C3158	CC730DF2H220G	C CAPACITOR	22pF 500V G	
C3159	CC730DZ2J102J	C CAPACITOR	1000pF 630V J	
C3195	CK73HB1C105K	C CAPACITOR	1uF 16V K	
C3196	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3197	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	

Symbol No.	Part No.	Part Name	Description	Local
C3198	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C3199	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C3204	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C3205	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C3211	CC730DQ2E040B	C CAPACITOR	4pF 250V B	
C3212	CC730DZ2J102J	C CAPACITOR	1000pF 630V J	
C3213	CC730DZ2J102J	C CAPACITOR	1000pF 630V J	
C3214	CC730DQ2E120G	C CAPACITOR	12pF 250V G	
C3215	CC730DQ2E120G	C CAPACITOR	12pF 250V G	
C3216	CC730DQ2E080B	C CAPACITOR	8pF 250V B	
C3217	CC730DQ2E120G	C CAPACITOR	12pF 250V G	
C3218	CC730DQ2E020B	C CAPACITOR	2pF 250V B	
C3219	CC730DQ2E6R8B	C CAPACITOR	6.8pF 250V B	
C3220	CC730DQ2E100G	C CAPACITOR	10pF 250V G	
C3221	CC730DQ2E050B	C CAPACITOR	5pF 250V B	
C3266	CK73GXR1H105K	C CAPACITOR	1uF 50V K	
C3267	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C3268	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3270	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3280	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3300	CC730DP2J470J	C CAPACITOR	47pF 630V J	
C3301	CC730DP2J470J	C CAPACITOR	47pF 630V J	
C3302	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K	
C3303	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C3304	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3305	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3474	CC730DZ2J102J	C CAPACITOR	1000pF 630V J	
C3479	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3480	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C3481	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K	
C3482	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C3483	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C3484	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C3485	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3486	CE32DT1C331M	E CAPACITOR	330uF 16V M	
C3487	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K	
C3488	CC730ET2A471J	C CAPACITOR	470pF 100V J	
C3489	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3495	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C3497	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C3510	CC730CC1H330G	C CAPACITOR	33pF 50V G	
C3511	CC730CC1H330G	C CAPACITOR	33pF 50V G	
C3512	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K	
C3513	CK73FXR1H475K	C CAPACITOR	4.7uF 50V K	
C3514	CC730ET2A471J	C CAPACITOR	470pF 100V J	
C3515	CC730ET2A391J	C CAPACITOR	390pF 100V J	
C3517	CC730ET2A391J	C CAPACITOR	390pF 100V J	
C3585	CC730CC1H090B	C CAPACITOR	9pF 50V B	
C3600	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3601	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C3602	CC73JCH1E102J	C CAPACITOR	1000pF 25V J	
C4001	C93-1901-05	C CAPACITOR	0.22uF 250V	
C4004	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C4005	CE32BM1E471M	E CAPACITOR	470uF 25V M	
C4006	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C4007	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C4008	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C4009	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C4010	CC730ET2A471J	C CAPACITOR	470pF 100V J	
C4011	CC730ET2A102J	C CAPACITOR	1000pF 100V J	
C4012	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K	
C4013	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C4014	CK73FXR1E226M	C CAPACITOR	22uF 25V M	
C4015	CK73FXR1E226M	C CAPACITOR	22uF 25V M	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C4016	CK73GXR1C106M	C CAPACITOR	10uF 16V M		R18	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
C4017	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		R20	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
C4018	CC730EP2J101J	C CAPACITOR	100pF 630V J		R21	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
C4019	CC730EP2J220J	C CAPACITOR	22pF 630V J		R22	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4022	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R25	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4023	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R28	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
C4024	CC73JCH1E471J	C CAPACITOR	470pF 25V J		R29	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D	
C4025	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R30	RK73HB1J105J	MG RESISTOR	1MΩ 1/16W J	
C4026	CC730CC1H470G	C CAPACITOR	47pF 50V G		R31	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
C4027	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R32	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4028	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R33	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C4029	CK73JXR1C472K	C CAPACITOR	4700pF 16V K		R34	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4030	CK73JXR1C472K	C CAPACITOR	4700pF 16V K		R35	RK73HH1J392D	MG RESISTOR	3.9kΩ 1/16W D	
C4031	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R36	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C4032	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R37	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4033	CC73JCH1E471J	C CAPACITOR	470pF 25V J		R38	RK73HH1J563D	MG RESISTOR	56kΩ 1/16W D	
C4034	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		R39	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C4035	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R40	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4036	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R100	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
C4037	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R102	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4038	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R103	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4039	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R104	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4040	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R105	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
C4041	CC730CC1H470G	C CAPACITOR	47pF 50V G		R106	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
C4042	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R107	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
C4043	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R108	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C4044	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R109	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C4045	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R110	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
C4046	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R111	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
C4047	CK73FXR1E226M	C CAPACITOR	22uF 25V M		R112	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
C4048	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R113	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
C4049	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R114	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4051	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R115	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
C4052	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R116	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4053	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R117	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4054	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R118	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4062	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R119	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4070	CK73HB1C105K	C CAPACITOR	1uF 16V K		R120	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4071	CK73GXR1E225K	C CAPACITOR	2.2uF 25V K		R121	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4072	CK73HB1C105K	C CAPACITOR	1uF 16V K		R125	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
C4073	CK73HB1C105K	C CAPACITOR	1uF 16V K		R129	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
C4074	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R130	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4075	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		R131	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
C4076	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R132	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4084	CC73JCH1E471J	C CAPACITOR	470pF 25V J		R133	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4087	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R134	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4088	CK73JXR1C104K	C CAPACITOR	0.1uF 16V K		R135	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
C4089	CK73JXR1C103K	C CAPACITOR	0.01uF 16V K		R139	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C4100	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		R141	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C4150	CC730ET2A471J	C CAPACITOR	470pF 100V J		R142	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C4152	C93-1901-05	C CAPACITOR	0.22uF 250V		R144	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C4153	CC730ET2A471J	C CAPACITOR	470pF 100V J		R145	RK73HB1J270J	MG RESISTOR	27Ω 1/16W J	
C5000	CC73JCH1E102J	C CAPACITOR	1000pF 25V J		R150	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C5001	CK73HXR1H104K	C CAPACITOR	0.1uF 50V K		R151	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C5002	CK73GXR1E475K	C CAPACITOR	4.7uF 25V K		R152	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
					R153	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R1	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R154	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R2	RK73HB1J331J	MG RESISTOR	330Ω 1/16W J		R156	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R157	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R5	RK73HH1J471D	MG RESISTOR	470Ω 1/16W D		R158	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R6	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D		R159	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R10	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R160	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R11	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R161	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R16	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R162	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R17	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D						

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R174	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		R328	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R175	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		R329	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
					R330	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R178	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
R185	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R331	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R188	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R332	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R189	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R333	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R190	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R334	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
					R335	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R191	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
R194	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R336	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R195	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R337	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R197	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R338	RK73HH1J241D	MG RESISTOR	240Ω 1/16W D	
R198	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R339	RK73HH1J241D	MG RESISTOR	240Ω 1/16W D	
					R351	RK73HH1J822D	MG RESISTOR	8.2kΩ 1/16W D	
R199	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
R200	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R352	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R201	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R353	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R202	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R354	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R204	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R355	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
					R356	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R205	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D						
R206	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R357	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R207	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R358	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R208	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R360	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R209	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R361	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
					R362	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R253	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J						
R256	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R363	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R259	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R364	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R261	RK73GH2A49R9D	MG RESISTOR	49.9Ω 1/10W D		R365	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R262	RK73HH1J49R9D	MG RESISTOR	49.9Ω 1/16W D		R366	RK73HH1J49R9D	MG RESISTOR	49.9Ω 1/16W D	
					R367	RK73HH1J49R9D	MG RESISTOR	49.9Ω 1/16W D	
R263	RK73HH1J49R9D	MG RESISTOR	49.9Ω 1/16W D						
R264	RK73GH2A49R9D	MG RESISTOR	49.9Ω 1/10W D		R370	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R265	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R371	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R267	RK73GH2A1212D	MG RESISTOR	12.1kΩ 1/10W D		R372	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R269	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R373	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
					R374	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R270	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D						
R271	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R375	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R272	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R376	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R273	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R377	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R281	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R378	RK73HH1J224D	MG RESISTOR	220kΩ 1/16W D	
					R379	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D	
R282	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D						
R283	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R380	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R284	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R381	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R285	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R384	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R286	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R385	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
					R386	RK73HH1J333D	MG RESISTOR	33kΩ 1/16W D	
R287	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J						
R288	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R387	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R289	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R388	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R290	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R389	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R300	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R390	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
					R391	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R302	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J						
R304	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J		R392	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R305	RK73HB1J152J	MG RESISTOR	1.5kΩ 1/16W J		R393	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R306	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R394	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R307	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R395	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
					R396	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R311	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
R315	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D		R397	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R318	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R398	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R319	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R399	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R320	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R400	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
					R401	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R321	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D						
R322	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R402	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R323	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R403	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R324	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R404	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R325	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R405	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
					R407	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R326	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D						
R327	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R408	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R409	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R520	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R410	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R522	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R411	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R523	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R412	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R524	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
					R525	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R414	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R526	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R415	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R527	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R416	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R528	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R417	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R529	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R423	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R530	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R424	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		R531	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R425	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R532	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R426	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R533	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R427	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R534	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R428	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R535	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R432	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R536	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R433	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R537	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R434	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R538	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R435	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R539	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R436	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R540	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R438	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R541	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R439	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R542	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R440	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R543	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R441	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R544	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R442	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R545	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R443	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R546	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R444	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R547	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R445	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R548	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R447	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R549	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R448	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R550	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R449	RK73HH1J471D	MG RESISTOR	470Ω 1/16W D		R554	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R450	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R557	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R451	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R558	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R452	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R559	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R457	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R560	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R459	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R561	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R461	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R562	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R462	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R563	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R463	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R564	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R464	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R565	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R465	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R566	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R466	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R567	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R467	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R568	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R468	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R569	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R469	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R570	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R470	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R571	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R471	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R572	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R472	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R573	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R473	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R583	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R474	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R584	RK73HH1J471D	MG RESISTOR	470Ω 1/16W D	
R475	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R585	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R476	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R586	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R477	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R587	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
R478	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R588	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
R479	RK73HH1J471D	MG RESISTOR	470Ω 1/16W D		R589	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
R480	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		R590	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
R481	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R600	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R482	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R601	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R483	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R602	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R484	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D		R603	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R485	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R604	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R488	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R605	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R489	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R606	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R490	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R607	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R491	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R609	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	

Symbol No.	Part No.	Part Name	Description	Local
R610	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R611	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R615	RK73HH1J822D	MG RESISTOR	8.2kΩ 1/16W D	
R616	RK73HH1J333D	MG RESISTOR	33kΩ 1/16W D	
R618	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R619	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R631	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R632	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R633	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R634	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R635	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R636	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R637	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R638	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R640	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D	
R641	RK73HH1J274D	MG RESISTOR	270kΩ 1/16W D	
R642	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R643	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R644	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R645	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R648	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R649	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R650	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R651	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R652	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R653	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R654	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R661	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R670	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R671	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R672	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R673	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R674	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R675	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R676	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R677	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R678	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R679	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R680	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R681	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R682	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R683	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R685	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R686	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R700	RK73HB1J182J	MG RESISTOR	1.8kΩ 1/16W J	
R701	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R702	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R703	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J	
R704	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R706	RK73HB1J123J	MG RESISTOR	12kΩ 1/16W J	
R707	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R708	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R709	RK73HH1J563D	MG RESISTOR	56kΩ 1/16W D	
R710	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R711	RK73HH1J471D	MG RESISTOR	470Ω 1/16W D	
R712	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R713	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R714	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J	
R715	RK73FB2B000J	MG RESISTOR	0Ω 1/8W J	
R716	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R717	RK73HH1J821D	MG RESISTOR	820Ω 1/16W D	
R718	RK73HB1J5R6J	MG RESISTOR	5.6Ω 1/16W J	
R719	RK73HH1J821D	MG RESISTOR	820Ω 1/16W D	
R720	RK73HB1J6R8J	MG RESISTOR	6.8Ω 1/16W J	

R722	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R725	RK73HB1J6R8J	MG RESISTOR	6.8Ω 1/16W J	
R726	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J	
R727	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R728	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R729	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R730	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R731	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R732	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R733	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R735	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R737	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R738	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R739	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
R740	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R741	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R744	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R746	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J	
R748	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R749	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R753	RK73HB1J331J	MG RESISTOR	330Ω 1/16W J	
R754	RK73HB1J5R6J	MG RESISTOR	5.6Ω 1/16W J	
R755	RK73HH1J821D	MG RESISTOR	820Ω 1/16W D	
R756	RK73HH1J821D	MG RESISTOR	820Ω 1/16W D	
R757	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R758	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R759	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R760	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R801	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R802	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R803	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R804	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R805	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R806	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R807	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R808	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R810	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R811	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R812	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R900	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R901	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R902	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R903	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R904	RK73HB1J152J	MG RESISTOR	1.5kΩ 1/16W J	
R906	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R907	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R908	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R909	RN73H0AV471D	MF RESISTOR	470Ω D	
R910	RN73H0AU220D	MF RESISTOR	22Ω D	
R912	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R913	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R915	RK73HB1J390J	MG RESISTOR	39Ω 1/16W J	
R916	RK73HB1J390J	MG RESISTOR	39Ω 1/16W J	
R917	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R918	RK73HH1J124D	MG RESISTOR	120kΩ 1/16W D	
R919	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R921	RK73HH1J124D	MG RESISTOR	120kΩ 1/16W D	
R922	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R923	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R924	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R925	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R926	RK73HH1J333D	MG RESISTOR	33kΩ 1/16W D	
R927	RK73HH1J333D	MG RESISTOR	33kΩ 1/16W D	
R928	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R929	RK73HH1J224D	MG RESISTOR	220kΩ 1/16W D		R1087	RK73HB1J180J	MG RESISTOR	18Ω 1/16W J	
R930	RK73HH1J224D	MG RESISTOR	220kΩ 1/16W D		R1088	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
					R1089	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1000	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R1090	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R1001	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R1091	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R1002	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R1100	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R1003	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R1500	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1004	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R1501	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1005	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R2000	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R1006	RK73HB1J391J	MG RESISTOR	390Ω 1/16W J		R2001	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1007	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R2002	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R1008	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2003	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R1009	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R2005	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R1010	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R2006	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R1011	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2007	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1012	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R2009	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1013	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R2011	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D	
R1016	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2012	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D	
R1017	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2013	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R1018	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R2014	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1019	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		R2015	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R1020	RK73HB1J106J	MG RESISTOR	10MΩ 1/16W J		R2016	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1022	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R2017	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R1023	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		R2019	RK73HB1J106J	MG RESISTOR	10MΩ 1/16W J	
R1024	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2020	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1025	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2021	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R1026	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2024	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R1027	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2026	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1028	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2027	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1029	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2029	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1030	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R2031	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1031	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2032	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R1032	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2033	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R1035	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D		R2034	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R1036	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D		R2035	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1037	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R2036	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D	
R1038	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R2037	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R1039	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2038	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1040	RN73H0AV471D	MF RESISTOR	470Ω D		R2041	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R1041	RN73H0AV471D	MF RESISTOR	470Ω D		R2042	RK73HB1J560J	MG RESISTOR	56Ω 1/16W J	
R1042	RN73H0AU220D	MF RESISTOR	22Ω D		R2043	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R1043	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2044	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R1044	RN73H0AU220D	MF RESISTOR	22Ω D		R2045	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R1047	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2046	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R1049	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2047	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R1051	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D		R2048	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1052	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D		R2049	RN73H0AV471D	MF RESISTOR	470Ω D	
R1053	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2050	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1054	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R2051	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1057	RK73HH1J181D	MG RESISTOR	180Ω 1/16W D		R2052	RN73H0AU220D	MF RESISTOR	22Ω D	
R1060	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2055	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1061	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2057	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R1064	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R2063	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R1065	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2065	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1067	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J		R2066	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R1069	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R2067	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1071	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2068	RN73H0AV471D	MF RESISTOR	470Ω D	
R1073	RK73HB1J560J	MG RESISTOR	56Ω 1/16W J		R2069	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1074	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R2070	RN73H0AU220D	MF RESISTOR	22Ω D	
R1079	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R2071	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1080	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J		R2072	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1081	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J		R2073	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D	
R1083	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D		R2074	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D	
R1085	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D		R2075	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R1086	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J						

Symbol No.	Part No.	Part Name	Description	Local
R2076	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R2077	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R2078	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R2079	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R2080	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R2085	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R2100	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R2103	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3038	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3061	RK73HB1J391J	MG RESISTOR	390Ω 1/16W J	
R3062	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R3063	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R3064	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R3065	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R3066	RK73HB1J180J	MG RESISTOR	18Ω 1/16W J	
R3067	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R3069	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3076	RZ73F0BS2R2J	RESISTOR	2.2Ω J	
R3077	RZ73F0BS2R2J	RESISTOR	2.2Ω J	
R3078	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J	
R3080	RK73HB1J6R8J	MG RESISTOR	6.8Ω 1/16W J	
R3081	RK73HB1J6R8J	MG RESISTOR	6.8Ω 1/16W J	
R3082	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3083	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3087	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3088	RK73GB2A470J	MG RESISTOR	47Ω 1/10W J	
R3089	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3090	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J	
R3091	RK73HH1J224D	MG RESISTOR	220kΩ 1/16W D	
R3092	RK73HH1J183D	MG RESISTOR	18kΩ 1/16W D	
R3093	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R3094	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R3095	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R3096	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R3100	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R3102	RK73PB2H101J	MG RESISTOR	100Ω 1/2W J	
R3103	RK73PB2H101J	MG RESISTOR	100Ω 1/2W J	
R3106	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3107	RK73HH1J822D	MG RESISTOR	8.2kΩ 1/16W D	
R3109	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3111	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R3112	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3113	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3114	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3117	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3121	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3124	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R3125	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3127	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3131	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3132	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R3139	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3148	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R3150	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J	
R3151	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R3155	RK73HH1J470D	MG RESISTOR	47Ω 1/16W D	
R3171	RK73HH1J682D	MG RESISTOR	6.8kΩ 1/16W D	
R3187	RK73HH1J471D	MG RESISTOR	470Ω 1/16W D	
R3189	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D	
R3190	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3200	RK73FB2B470J	MG RESISTOR	47Ω 1/8W J	
R3201	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3202	RK73FB2B121J	MG RESISTOR	120Ω 1/8W J	
R3203	RK73FB2B121J	MG RESISTOR	120Ω 1/8W J	

Symbol No.	Part No.	Part Name	Description	Local
R3206	RK73HH1J181D	MG RESISTOR	180Ω 1/16W D	
R3207	RK73HH1J181D	MG RESISTOR	180Ω 1/16W D	
R3208	RK73HH1J181D	MG RESISTOR	180Ω 1/16W D	
R3209	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3211	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3212	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3213	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
R3214	RK73HH1J124D	MG RESISTOR	120kΩ 1/16W D	
R3215	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3216	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3217	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
R3218	RK73HH1J124D	MG RESISTOR	120kΩ 1/16W D	
R3219	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3220	RK73HH1J333D	MG RESISTOR	33kΩ 1/16W D	
R3222	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D	
R3223	RK73HH1J821D	MG RESISTOR	820Ω 1/16W D	
R3224	RK73HH1J181D	MG RESISTOR	180Ω 1/16W D	
R3226	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3230	RK73GB2A221J	MG RESISTOR	220Ω 1/10W J	
R3236	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R3237	RK73HH1J181D	MG RESISTOR	180Ω 1/16W D	
R3238	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3239	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3240	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3241	RK73PB2H1R0J	MG RESISTOR	1.0Ω 1/2W J	
R3244	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R3245	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3246	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3247	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3258	RK73FB2B224J	MG RESISTOR	220kΩ 1/8W J	
R3259	R92-1061-05	C RESISTOR	0.008Ω	
R3261	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3262	RK73FB2B224J	MG RESISTOR	220kΩ 1/8W J	
R3263	R92-1061-05	C RESISTOR	0.008Ω	
R3270	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3271	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3272	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3300	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3301	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3302	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3304	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3306	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3307	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R3457	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R3458	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D	
R3459	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3460	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R3461	RK73PB2H1R0J	MG RESISTOR	1.0Ω 1/2W J	
R3462	RK73HB1J105J	MG RESISTOR	1MΩ 1/16W J	
R3463	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3465	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R3466	RK73HH1J101D	MG RESISTOR	100Ω 1/16W D	
R3467	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3468	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3469	R92-3769-05	MG RESISTOR	10Ω 0.25W	
R3470	R92-3769-05	MG RESISTOR	10Ω 0.25W	
R3473	RK73HH1J274D	MG RESISTOR	270kΩ 1/16W D	
R3474	RK73HH1J183D	MG RESISTOR	18kΩ 1/16W D	
R3475	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3476	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3477	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3478	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3479	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R3480	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R3481	RK73PB2H4R7J	MG RESISTOR	4.7Ω 1/2W J	

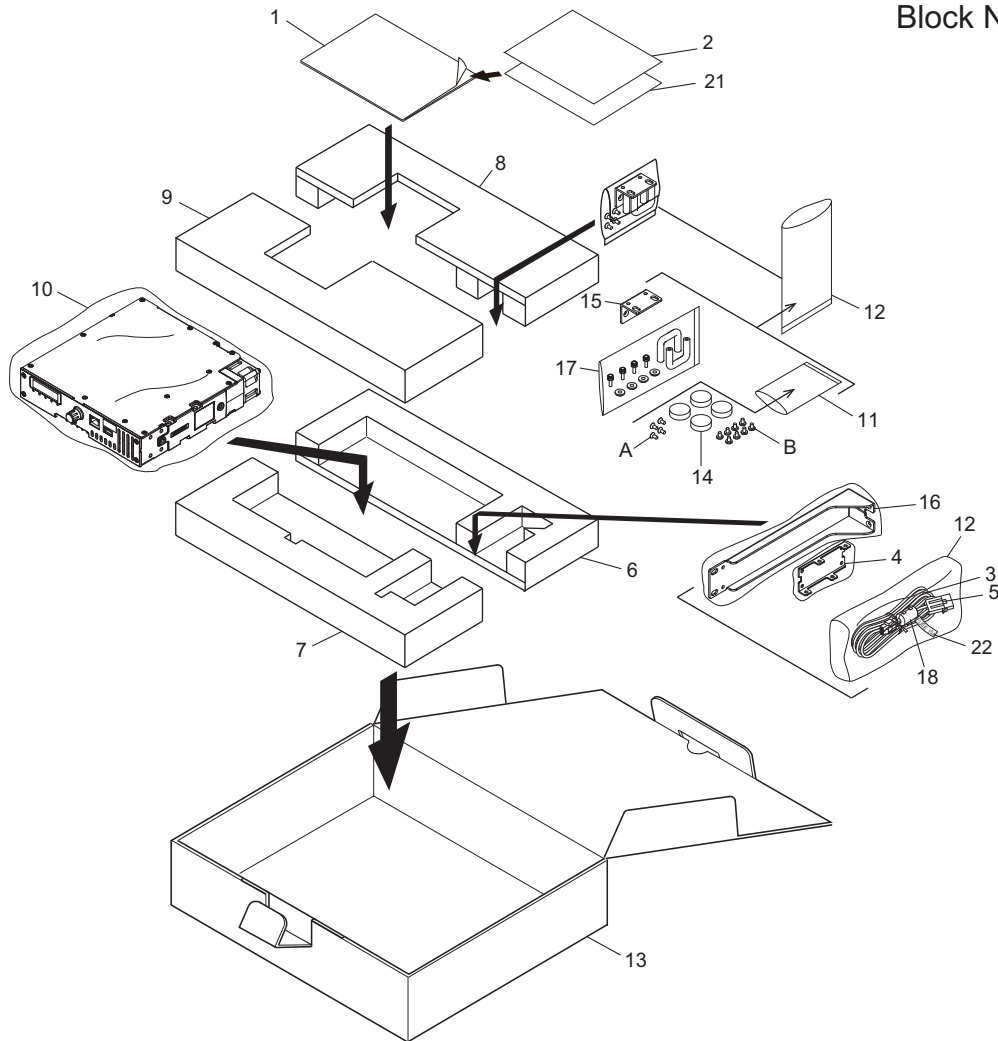
△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R3482	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R4094	RK73FB2B182J	MG RESISTOR	1.8kΩ 1/8W J	
R3500	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R4096	RK73HH1J562D	MG RESISTOR	5.6kΩ 1/16W D	
R3501	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R4097	RK73HH1J563D	MG RESISTOR	56kΩ 1/16W D	
R3502	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R4098	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R3600	RK73HH1J224D	MG RESISTOR	220kΩ 1/16W D		R4099	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
					R4100	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D	
R3601	RK73HH1J224D	MG RESISTOR	220kΩ 1/16W D		R4101	RK73HH1J224D	MG RESISTOR	220kΩ 1/16W D	
R3602	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R4150	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R3603	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R4151	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D	
R4009	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		R4152	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R4010	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D		R4153	RK73FB2B101J	MG RESISTOR	100Ω 1/8W J	
R4011	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R4154	RK73FB2B000J	MG RESISTOR	0Ω 1/8W J	
R4012	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R4155	RK73FB2B101J	MG RESISTOR	100Ω 1/8W J	
R4013	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		R5000	RK73HH1J124D	MG RESISTOR	120kΩ 1/16W D	
R4014	RZ73E0DB10LF	RESISTOR	10mΩ F		R5001	RK73HH1J153D	MG RESISTOR	15kΩ 1/16W D	
R4015	RZ73E0DB10LF	RESISTOR	10mΩ F		R5002	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R4016	RZ73E0DB10LF	RESISTOR	10mΩ F		R5003	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R4019	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R5004	RK73HB1J123J	MG RESISTOR	12kΩ 1/16W J	
R4020	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		R5005	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
R4021	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R5006	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R4022	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
					L1	LR73Z0BB1R0M	CHIP INDUCTOR		
R4023	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J		L2	LR73Z0BB1R0M	CHIP INDUCTOR		
R4024	RK73HH1J561D	MG RESISTOR	560Ω 1/16W D		L3	LR73Z0BB1R0M	CHIP INDUCTOR		
R4025	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		L4	LR73Z0BB1R0M	CHIP INDUCTOR		
R4026	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D		L5	LR73Z0BB1R0M	CHIP INDUCTOR		
R4027	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J						
					L30	L79-1947-05	FILTER		
R4028	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J		L31	L79-1947-05	FILTER		
R4029	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J		L32	L79-1947-05	FILTER		
R4030	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J		L33	L79-1947-05	FILTER		
R4031	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D		L250	LB73G0CH-001	CHIP FERRITE		
R4032	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D						
					L251	LB73G0CH-001	CHIP FERRITE		
R4033	RK73HH1J392D	MG RESISTOR	3.9kΩ 1/16W D		L252	L3D-0011-00	CHOKE COIL		
R4034	RK73HH1J913D	MG RESISTOR	91kΩ 1/16W D		L413	L79-1947-05	FILTER		
R4035	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L414	LB73H0BU-003	CHIP FERRITE		
R4036	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L415	LB73H0BU-003	CHIP FERRITE		
R4037	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
					L416	LB73H0BU-003	CHIP FERRITE		
R4038	RK73HH1J274D	MG RESISTOR	270kΩ 1/16W D		L451	LB73G0AK-001	CHIP FERRITE		
R4039	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		L452	LB73G0AK-001	CHIP FERRITE		
R4043	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L453	LB73G0AK-001	CHIP FERRITE		
R4044	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L670	LB73G0CH-001	CHIP FERRITE		
R4045	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D						
					L700	LR73Z0AE4R7J	CHIP INDUCTOR		
R4046	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L701	LK73G0BB100K	M.CHIP INDUCTOR		
R4047	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		L702	LK73G0BB100K	M.CHIP INDUCTOR		
R4048	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		L703	L41-1885-53	CHIP INDUCTOR		
R4049	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		L704	L41-2285-53	CHIP INDUCTOR		
R4050	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
					L705	LK73G0BBR33K	M.CHIP INDUCTOR		
R4051	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L706	LK73G0BBR33K	M.CHIP INDUCTOR		
R4052	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L707	LK73H0BJR18G	M.CHIP INDUCTOR		
R4053	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		L708	LK73H0BJR22G	M.CHIP INDUCTOR		
R4054	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		L710	L41-1085-53	CHIP INDUCTOR		
R4055	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D						
					L712	L1K-0032-00	BALUN TRANS		
R4056	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L713	L1K-0032-00	BALUN TRANS		
R4063	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		L714	L1K-0032-00	BALUN TRANS		
R4064	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L716	LR79Z0DD37N7J	CHIP INDUCTOR		
R4065	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L717	LB73H0BU-003	CHIP FERRITE		
R4066	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D						
					L718	LB73H0BU-003	CHIP FERRITE		
R4070	RK73FB2B000J	MG RESISTOR	0Ω 1/8W J		L719	LR79Z0DD37N7J	CHIP INDUCTOR		
R4071	RK73FB2B000J	MG RESISTOR	0Ω 1/8W J		L720	LR79G0CQR47G	CHIP INDUCTOR		
R4084	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		L721	LR79G0CQ47NG	CHIP INDUCTOR		
R4085	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D		L722	LR79G0CQ47NG	CHIP INDUCTOR		
R4089	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J						
					L723	LR79Z0DD37N7J	CHIP INDUCTOR		
R4090	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L724	LR79G0CQR47G	CHIP INDUCTOR		
R4091	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D		L726	LR79Z0DD37N7J	CHIP INDUCTOR		
R4092	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		L730	LK73H0BJ82NG	M.CHIP INDUCTOR		
R4093	RK73FB2B122J	MG RESISTOR	1.2kΩ 1/8W J						

Symbol No.	Part No.	Part Name	Description	Local	Symbol No.	Part No.	Part Name	Description	Local
L731	LK73H0BJR27G	M.CHIP INDUCTOR			L2020	LK73G0BB100K	M.CHIP INDUCTOR		
L732	LK73H0BJ82NG	M.CHIP INDUCTOR			L2022	LB73H0BU-003	CHIP FERRITE		
L733	LK73H0BJR27G	M.CHIP INDUCTOR			L2025	L41-6875-53	CHIP INDUCTOR		
L734	L41-1585-53	CHIP INDUCTOR			L2026	L41-6875-53	CHIP INDUCTOR		
L735	LB73H0BU-003	CHIP FERRITE			L2027	LK73G0BB100K	M.CHIP INDUCTOR		
L736	LB73H0BU-003	CHIP FERRITE			L2028	LB73H0BU-003	CHIP FERRITE		
L737	LB73H0BU-003	CHIP FERRITE			L2029	LR79Z0CM35N5G	CHIP INDUCTOR		
L738	LK73H0BJR27G	M.CHIP INDUCTOR			L2030	L41-1885-53	CHIP INDUCTOR		
L739	LK73H0BJR27G	M.CHIP INDUCTOR			L2031	LK73G0BB3R3K	M.CHIP INDUCTOR		
L750	LK73G0BBR68K	M.CHIP INDUCTOR			L2032	LK73G0BB3R3K	M.CHIP INDUCTOR		
L761	L41-1085-53	CHIP INDUCTOR			L2034	LB73H0BU-003	CHIP FERRITE		
L900	LB73H0BU-003	CHIP FERRITE			L2035	LK73G0BB100K	M.CHIP INDUCTOR		
L901	LK73G0BB100K	M.CHIP INDUCTOR			L2036	LB73H0BU-003	CHIP FERRITE		
L902	LR79Z0MWR39G	CHIP INDUCTOR			L2037	LK73H0BJ5N6B	M.CHIP INDUCTOR		
L903	L41-2785-53	CHIP INDUCTOR			L2050	LB73H0BU-003	CHIP FERRITE		
L904	LB73H0BU-003	CHIP FERRITE			L2051	LB73H0BU-003	CHIP FERRITE		
L905	LR79Z0MWR47J	CHIP INDUCTOR			L3031	LK73H0BJ47NJ	M.CHIP INDUCTOR		
L1000	LB73H0BU-003	CHIP FERRITE			L3036	LK73H0BJR22J	M.CHIP INDUCTOR		
L1001	LK73G0BB100K	M.CHIP INDUCTOR			L3037	LR79Z0MWR27J	CHIP INDUCTOR		
L1002	LB73H0BU-003	CHIP FERRITE			L3038	LR79Z0JG43NJ	CHIP INDUCTOR		
L1003	LK73G0BB100K	M.CHIP INDUCTOR			L3039	LR79Z0JG39NJ	CHIP INDUCTOR		
L1004	LB73H0BU-003	CHIP FERRITE			L3040	LR79Z0MW68NJ	CHIP INDUCTOR		
L1006	LK73G0BB100K	M.CHIP INDUCTOR			L3041	LR79Z0MW33NJ	CHIP INDUCTOR		
L1007	LK73G0BB100K	M.CHIP INDUCTOR			L3042	LB73E0FT-001	CHIP FERRITE		
L1008	LB73H0BU-003	CHIP FERRITE			L3043	LR79Z0MW68NJ	CHIP INDUCTOR		
L1010	LK73G0BB100K	M.CHIP INDUCTOR			L3044	LR79Z0MW47NJ	CHIP INDUCTOR		
L1011	LK73G0BB100K	M.CHIP INDUCTOR			L3045	LR79Z0MW22NG	CHIP INDUCTOR		
L1012	L41-1885-53	CHIP INDUCTOR			L3047	LB73E0FT-001	CHIP FERRITE		
L1013	LR79Z0HF27NG	CHIP INDUCTOR			L3048	LR79Z0HER146M	CHIP INDUCTOR		
L1014	L41-1885-53	CHIP INDUCTOR			L3049	LB73E0FT-001	CHIP FERRITE		
L1015	LR79Z0HF27NG	CHIP INDUCTOR			L3050	L34-4557-05	AIR CORE COIL		
L1016	LK73G0BB100K	M.CHIP INDUCTOR			L3056	L34-4520-05	AIR CORE COIL		
L1017	LK73G0BB100K	M.CHIP INDUCTOR			L3057	L34-4520-05	AIR CORE COIL		
L1018	LB73H0BU-003	CHIP FERRITE			L3058	L34-4520-05	AIR CORE COIL		
L1019	LB73H0BU-003	CHIP FERRITE			L3104	LR73Z0AE220J	CHIP INDUCTOR		
L1020	LR79G0CQ68NG	CHIP INDUCTOR			L3105	LR73Z0AE100J	CHIP INDUCTOR		
L1021	LB73H0BU-003	CHIP FERRITE			L3106	LR79Z0PF150M	CHIP INDUCTOR		
L1023	LK73H0BJ5N6B	M.CHIP INDUCTOR			L3200	LR79Z0JHR33G	CHIP INDUCTOR		
L1025	LK73H0BJ68NJ	M.CHIP INDUCTOR			L3201	LR79Z0JHR33G	CHIP INDUCTOR		
L1026	LK73H0BJ5N6B	M.CHIP INDUCTOR			L3300	LB73H0BU-003	CHIP FERRITE		
L1029	L41-2775-53	CHIP INDUCTOR			L3301	LB73H0BU-003	CHIP FERRITE		
L1032	LB73H0BU-003	CHIP FERRITE			L3302	LB73H0BU-003	CHIP FERRITE		
L1034	L41-5675-53	CHIP INDUCTOR			L4000	LR77Z0AP4R7M	CHIP INDUCTOR		
L1035	L41-5675-53	CHIP INDUCTOR			L4001	LR79Z0QS4R9M	CHIP INDUCTOR		
L1036	LK73H0BJ5N6B	M.CHIP INDUCTOR			L4003	LR79Z0QS4R9M	CHIP INDUCTOR		
L1050	LB73H0BU-003	CHIP FERRITE			L4004	LR79Z0QS4R9M	CHIP INDUCTOR		
L1051	LB73H0BU-003	CHIP FERRITE			CN5	J19-5386-05	HOLDER		
L1061	L41-3975-53	CHIP INDUCTOR			CN7	EC710AM-0518A	FFC FPC CONNE		
L1062	L41-3975-53	CHIP INDUCTOR			CN10	E40-6914-05	F.C.CONNECTOR		
L2000	LB73H0BU-003	CHIP FERRITE			CN3005	E41-2673-05	PIN ASSY		
L2001	LK73G0BB100K	M.CHIP INDUCTOR			CN3006	E23-1263-15	TERMINAL		
L2002	LB73H0BU-003	CHIP FERRITE			CN3007	E23-1263-15	TERMINAL		
L2003	LK73H0BJ5N6B	M.CHIP INDUCTOR			CN3008	E23-1263-15	TERMINAL		
L2005	LB73H0BU-003	CHIP FERRITE			CN3009	E23-1263-15	TERMINAL		
L2007	LK73G0BB3R3K	M.CHIP INDUCTOR			CP451	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L2008	LK73G0BB3R3K	M.CHIP INDUCTOR			CP452	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L2009	LR79G0CQ82NG	CHIP INDUCTOR			CP453	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L2011	LK73H0BJ82NJ	M.CHIP INDUCTOR			CP454	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L2012	LK73H0BJ5N6B	M.CHIP INDUCTOR			CP455	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L2013	L41-1885-53	CHIP INDUCTOR			CP700	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L2014	L34-4612-05	AIR CORE COIL			CP701	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L2017	L41-3975-53	CHIP INDUCTOR			CP1000	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L2018	LB73H0BU-003	CHIP FERRITE			CP2000	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L2019	LB73H0BU-003	CHIP FERRITE			E1	-----	RADIATION PLATE	Note 2/ 注意 2	

△ Symbol No.	Part No.	Part Name	Description	Local
E2000	F1B-0017-10	SHIELDING CASE		
E2001	F1B-0017-10	SHIELDING CASE		
F1	F53-0319-15	FUSE(CC)	1.0A	
F2	F53-0317-15	FUSE(CC)	0.5A	
F4000	FZA10BV-5R0	FUSE(CC)	5.0A	
J4	E58-0521-05	SUB SOCKET D		
J7	E5J-0262-00	LAN TERMINAL	Note 1/ 注意 1	
J9	E68-0424-05	JACK OTHERS		
S4000	T9K-0037-00	ROTARY ENCODER		
TH401	NCU15WF104F6S	N THERMISTOR		
TH3000	NCU15WF104F6S	N THERMISTOR		
TH3001	NCU15WF104F6S	N THERMISTOR		
TH3002	NCU15WF104F6S	N THERMISTOR		
W3000	EA120DW-5002A	W TO B CONNE		
X4	L77-1802-05	QUARTZ CRYSTAL		
X251	L7J-0164-00	QUARTZ CRYSTAL		
X900	L7H-0152-00	TCXO		
XF700	L7B-0058-00	MCF		

Packing materials and accessories parts list / 包装材料及配件清单

Block No.M2MM



Packing and accessories / 包装及配件

Block No. [M][2][M][M]
Local

Symbol No.	Part No.	Part Name	Description	
1	B5A-3612-10	INST.MANUAL		
2	-----	PAMPHLET	FOSS	
3	E3A-0772-00	DC CORD ASSY	ACC	
4	F3B-0004-00	REINFORCING HW	CONNECT SETS	
5	FZB10AU-150	BLADE FUSE(CC)	15A/DC CORD	
6	-----	PACKING FIXTURE	BOTTOM-A	
7	-----	PACKING FIXTURE	BOTTOM-B	
8	-----	PACKING FIXTURE	TOP-A	
9	-----	PACKING FIXTURE	TOP-B	
10	-----	PROTECTION BAG	SET	
11	-----	PROTECTION BAG	ACC (SCREW, FOOT)	
12	-----	PROTECTION BAG	ACC(x2)	
13	-----	ITEM CARTON		
14	J0B-0022-00	FOOT	ACC(x4)	
15	J29-0725-04	BRACKET	ACC(SHORT)	
16	J2K-0346-00	BRACKET	ACC(LONG)	
17	K01-0421-15	HANDLE	ACC	
18	L92-0471-05	CLAMP FILTER	DC CORD	
21	B5A-4393-00	INST.MANUAL	CHINA	
22	-----	RATING LABEL	FUSE 15A	
A	N32-4008-43	F.HEAD M.SCREW	ACC(x4)	
B	N35-4006-43	BI.HEAD M.SCREW	ACC/CONNECT SETS(x8)	



KENWOOD

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Communications Systems Division

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