

TONE "PRIVATE-LINE"
ENCODER/DECODER
MODEL HLN4020B

FUNCTION

Encodes and decodes sub-audible "Private-Line" tones. Encoder modulates transmitter and delays transmitter turn-off 200 ms to allow transmission of turn-off reverse tone burst. Decoder detects received tone and unsculches receiver when proper tone is received.

TONE "PRIVATE-LINE" ENCODER-DECODER/"DIGITAL PRIVATE-LINE" ENCODER-DECODER

68P81039E22-F
9-12-84 GGI

parts list

HLN4020B Tone "Private-Line" Encoder/Decoder Board PL-6029-G

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C1 thru 10	21-83596E10	capacitor, fixed: 220 pF ± 20%; 500 V
C11	23-84538G01	1 μF ± 20%; 35 V
C12	21-82187B44	.001 μF ± 10%; 100 V
C13	21-82187B48	.003 μF ± 10%; 100 V
C14, 15, 16	21-83596E38	.0047 μF ± 10%; 100 V
C17	8-83813H38	.006 μF ± 10%; 100 V
C18	23-84665F01	10 μF ± 10%; -10%; 32 V
C19, 20	8-84637L31	.047 μF ± 10%; 250 V
C21	21-82428B28	.002 μF ± 10%; 200 V
C22	21-82372C09	0.1 μF + 80, -20%; 25 V
C23	23-84665F01	10 μF ± 10%; -10%; 25 V
C24 thru 28	8-84637L22	0.22 μF ± 10%; 100 V
C29	23-84665F04	1 μF ± 150, -10%; 50 V
C31	23-84538G22	6.8 μF ± 10%; 20 V
C32 thru 36	23-84665F01	10 μF ± 10%; -10%; 25 V
C37	23-84538G04	15 μF ± 20%; 20 V
C38	8-84637L37	0.1 μF ± 5%; 100 V
C39	8-84637L36	.082 μF ± 5%; 100 V
C40	23-84665F01	10 μF ± 10%; -10%; 25 V
C41 thru 44	21-83596E10	220 pF ± 20%; 500 V
C46	21-82372C09	0.1 μF + 80, -20%; 25 V
C47	23-84665F01	10 μF ± 10%; -10%; 25 V
C48	21-83596E10	220 pF ± 20%; 500 V
C49	8-84637L22	0.22 μF ± 10%; 100 V
C50	21-82187B44	.001 μF ± 10%; 100 V
C51	21-83596E10	220 pF ± 20%; 500 V
C52	21-84493B41	100 pF ± 10%; N750
C53	23-84665F01	10 μF ± 10%; -10%; 25 V
CR1, 2, 3	48-83654H01	silicon
CR4	48-82178A01	germanium
CR5, 6, 7	48-83654H01	silicon
J1,2	9-80132A01	connector, receptacle: J1 & J2 each consist of four 9-80132A01 parts
P3	28-80181B02	connector, plug: male, 9-contact

SHOWN FROM SOLDER SIDE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Q1, 2	48-134674	transistor: (see note)
Q3 thru 8	48-869642	NPN; type M54
Q9	48-869568	NPN; type M9568
Q10, 11	48-869642	NPN; type M9642
Q12	48-869643	PNP; type M9643
Q13, 14	48-869642	NPN; type M9642
Q15	48-869467	PNP; type M9467
R1	6-124A37	330
R2	6-124A44	620 ± 5%
R3	6-124C43	560
R4	6-124C47	820
R5	6-124A59	2.7k ± 5%
R6	6-124C61	3.3k
R7	6-124A53	1k ± 5%
R8	6-124A80	3k ± 5%
R9	6-124C57	2k
R10	6-124C49	1k
R11	6-124A53	1.5k ± 5%; 1/4 W
R12	6-124A81	22k ± 5%
R13	6-124A61	3.3k ± 5%
R14	6-124A61	3.3k ± 5%
R15	6-124A65	4.7k ± 5%
R16	6-124C55	1.8k
R17	6-124A71	8.2k ± 5%
R18	6-124A65	4.7k ± 5%
R19	6-124A85	33k ± 5%; 1/4 W
R20	6-124C71	8.2k
R21	6-124A71	8.2k ± 5%
R22	6-124C73	10k
R23 thru 24	6-124A73	10k ± 5%;
R25	6-124A73	15k ± 5%
R26	6-124A77	15k ± 5%
R27	6-124C85	33k
R28, 29	6-124A67	5.6k ± 5%
R30	6-124A77	15k ± 5%
R32	6-124A61	22k ± 5%
R33	6-10621C79	7.5k ± 1%; 1/8 W
R34	6-124C81	22k
R35	6-124C83	27k

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R36	6-124C57	2.2k
R37, 38	6-124C89	47k
R39	6-124A89	47k ± 5%; 1/4 W
R40	6-124A73	10k ± 5%
R41	6-124C97	100k
R42	6-124A78	16k ± 5%
R43	6-124A99	120k ± 5%
R44	6-124A80	20k ± 5%
R45	6-124A99	120k ± 5%
R46	6-124D02	150k
R47	6-124C99	120k
R48	6-124C73	10k
R49	6-124A99	120k ± 5%
R50	6-124A93	68k ± 5%
R51	6-124C93	68k
R53	6-10621C79	7.5k ± 1%; 1/8 W
R54	6-124C73	10k
R55	6-124A49	1k ± 5%
R56	6-124C25	100
R57, 58	6-10621C91	10k ± 1%; 1/8 W
R59	6-124A61	3.3k ± 5%
R60	6-10621D18	18.7k ± 1%; 1/8 W
R61	6-124C73	10k
R62	6-124C57	2.2k
R63	6-124C61	3.3k
R64	6-124C85	33k
U1	51-84768F76	integrated circuit: (see note) type M6876
U2	51-84621K76	type M2176
VR5	48-82256C38	voltage regulator: zener type; 9.1 V
mechanical parts		
3-10904A02	SCREW, machine (M3.5 x 0.6 x 6) 3 used	
3-10904A15	SCREW, machine (M3.5 x 0.6 x 13) 3 used	
4-80149A01	WASHER, captive; 4 used	
7-80023A01	BRACKET, reed hold-down	
28-10271A15	TERMINAL, pin: 3 used	
46-80174A01	STUD	
75-80173A01	COMPRESSION PAD: 2 used	

note: for optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

