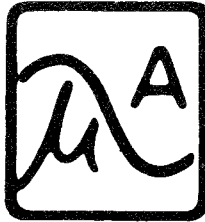


**LAND MOBILE  
COMMUNICATIONS DIVISION**



MICROWAVE ASSOCIATES A **MACOM** COMPANY  
1362 Borregas Avenue, Sunnyvale, CA 94086  
TWX 910-339-0248 PHONE (408) 734-4220

## ***ISOLATORS and CIRCULATORS***

***Low Band***

***Midband***

***Highband***

***UHF***

A circulator is recommended for every system.  
When properly terminated to form an isolator it will  
provide:

- The maximum isolation for intermodulation elimination.
- A constant impedance at the transmitter output to achieve maximum transmitter performance.
- Full protection for the transmitter if the antenna shorts, opens or the VSWR changes.

# General Information

## Application:

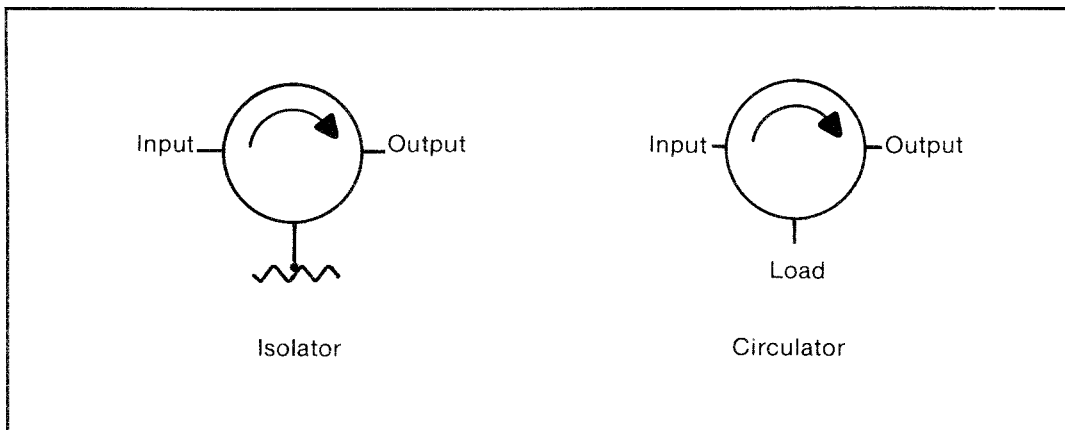
The intermodulation (I/M) eliminating devices offered in this brochure are classified as circulators and are not terminated. To provide an isolator, a termination, for power dissipation, would be connected to the "load" port of a circulator. The circulator or isolator, as a terminated circulator is called, is a unique device allowing R.F. power to flow in only one direction. Power entering at the "input" port will go to the "output" port with small loss (0.4 dB typical). Power entering the "output" port will go to the "load" port to be dissipated in a termination, providing isolation (25 dB typical).

It is our recommendation that the isolator closest to the antenna have a termination, or load, capable of dissipating the maximum output power of the transmitter. This will allow absolute protection for your transmitter against an open or shorted antenna line condition. Additional isolators may be required to

provide adequate isolation, but require smaller termination power capacity. Microwave Associates' Model 44001, a 20-watt field-replaceable load is available for this purpose; and, thus, the isolator will provide maximum isolation for I/M elimination. Add "T" to the model number for this option. Other terminations are available.

Additional intermodulation suppression may be obtained by the installation of a low pass filter in the circuit between the antenna and the isolator. Our filters are designed to minimize the effects of second and third harmonics and transmitter generated noise.

I/M Suppression panels are available which include all necessary circulators, terminations, filters and cables assembled on one easy-to-install 19" panel, engineered to fit your individual needs of frequency, power and attenuation. See IM SUPPRESSION PANEL data sheet.



## Tuning Procedures:

Microwave Associates manufactures both fixed-tuned and field-tunable circulators. Both types will be shipped tuned exactly to your specified frequency. The tunable devices will tune over the entire frequency band specified and each one is shipped with simple to follow, explicit tuning instructions.

## Ordering Information:

When ordering please state model number desired, transmitter frequency and the rated power output. Add suffix "T" if termination is desired.

## Terms:

Prices are F.O.B. Sunnyvale. Invoices are due Net 30 days and standard delivery is 30 days A.R.O. unless otherwise stated.

## Warranty:

Microwave Associates warrants all items against defective material and/or workmanship for a period of one year.

NOTE: When the 20-watt field replaceable termination is used, minimum dissipation occurs and no long-term protection is achieved. Reflected power in excess of 20 watts will occur if the antenna or antenna cable is removed during transmitter operation and may occur during extended periods of antenna ice loading or from rain penetration of antenna cable or connectors. Units failing due to termination burn-out are not covered under the warranty.

## Low Band: 25-50 MHz

Description	Power Watts	Isolation dB		Insertion Loss dB		Bandwidth MHz	Model*
		Min.	Typ.	Max.	Typ.		
Circulator	150	17	22	1.0	.75	.75	7N047
Circulator	350	17	22	1.0	.75	.75	7N053

The 25-50 MHz circulators are pretuned at the factory for optimum performance on your exact frequency and for the power of your transmitter. Please specify frequency and power range for each unit ordered.

### POWER RANGES

7N047

A. 50-90 Watts

B. 90-125 Watts

C. 125-150 Watts

7N053

A. 150-250 Watts

B. 250-350 Watts

## Mid Band: 66-88 MHz

Description	Power Watts	Isolation dB		Insertion Loss dB		Bandwidth MHz	Model*
		Min.	Typ.	Max.	Typ.		
Circulator	125	21	25	1.2	1.0	2.0	H350
Circulator, Tunable	125	23	28	1.2	1.0	2.0	H360

## Hi Band VHF: 146-174 MHz

Description	Power Watts	Isolation dB		Insertion Loss dB		Bandwidth MHz	Mode *
		Min.	Typ.	Max.	Typ.		
Circulator	125	25	28	.8	.6	4.0	H350
Circulator, Tunable	125	27	30	.8	.6	4.0	H360
Circulator, Tunable	125	50	60	1.2	.9	4.0	7R021
Circulator	400	21	25	.5	.4	9.0	XH4196Q

The H-360- model is also available covering 108-118, 118-136 and 136-150 MHz.

## UHF: 406-512 MHz

Description	Power Watts	Isolation dB		Insertion Loss dB		Bandwidth MHz	Model*
		Min.	Typ.	Max.	Typ.		
Circulator	125	25	28	.6	.4	12.0	H350
Circulator, Tunable	125	27	30	.6	.4	12.0	H360
Circulator, Tunable	125	50	60	1.1	.8	12.0	7R011
Circulator	350	25	28	.5	.4	62.0	7N013
Circulator	350	50	60	1.0	.8	62.0	7R016
Circulator	150	75	90	1.0	.75	62.0	7R037
Circulator	400	75	90	1.0	.75	62.0	7R038

## UHF: 806-960 MHz

Description	Power Watts	Isolation dB		Insertion Loss dB		Bandwidth MHz	Model*
		Min.	Typ.	Max.	Typ.		
Circulator	200	22	25	.5	.35	Full	7N034
Circulator	200	50	55	.75	.55	Full	7R040
Circulator	200	70	75	1.2	.8	Full	7R032

Typical VSWR for all units is 1.25:1.  
Operational temperature range is -30° to +70° C.  
\*Add suffix "T" for 20W load isolator configuration.  
Other loads available; see TERMINATION data sheet.

Type "N" connectors are standard.  
\*Always specify center frequency when ordering.

# Dimensions

<p><b>H350/360</b></p>	<p><b>7R021/7R011</b></p>	<p><b>7N013</b></p>
<p><b>7N034</b></p>	<p><b>XH4196Q</b></p>	<p><b>7R037/7R038</b></p>
<p><b>7R040</b></p>	<p><b>7N047</b></p>	<p><b>7N053</b></p>
<p><b>7R032</b></p>	<p><b>7R016</b></p>	<p>Due to the many electrical and mechanical characteristics possible in circulator design, we may not list a unit that meets your specific requirements. If we don't, contact us. Many variations of these components are possible.</p>



## MICROWAVE ASSOCIATES

A MACOM COMPANY Land Mobile Communications Division

1362 BORREGAS AVE., P. O. BOX 463, SUNNYVALE, CA 94086 / TWX 910-339-9248 / PHONE (408) 734-4220

All specifications are subject to change without notice.

