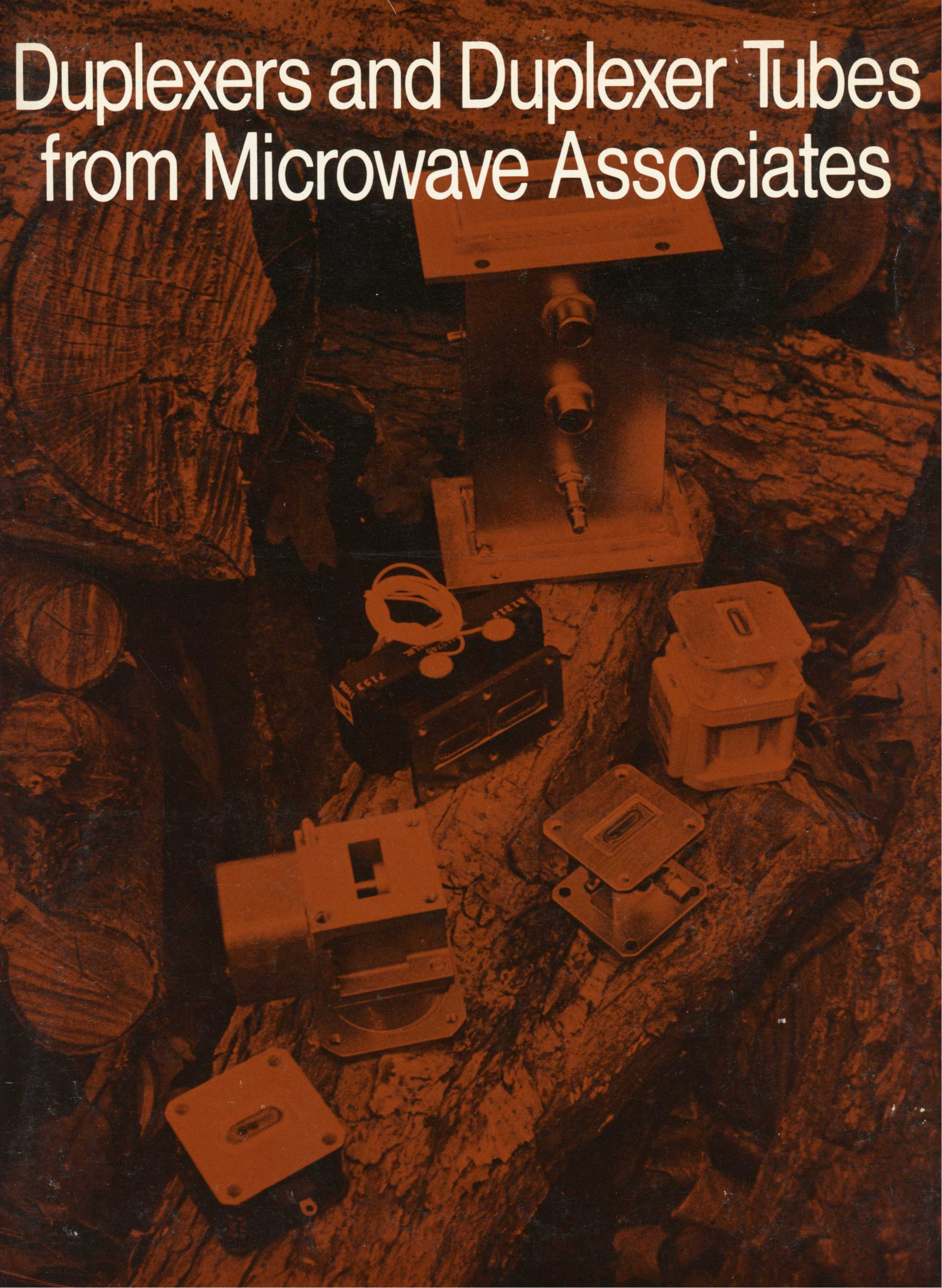


Duplexers and Duplexer Tubes from Microwave Associates





A B C D'S OF
PASSIVE HARDBRAZED TR LIMITERS

A. PASSIVE

1. ELIMINATES IGNITOR WEAROUT
2. ELIMINATES IGNITOR SUPPLIES AND CIRCUITRY
3. ELIMINATES SHUTTERS IN SYSTEM
4. ELIMINATES SHUTTER SUPPLIES AND CIRCUITRY
5. ELIMINATES IGNITOR NOISE, IGNITOR INTERACTION, AND IGNITOR PHASE INSTABILITY
6. REMOVES IGNITOR CONSTRAINT ON GAS FILL

B. HARDBRAZED

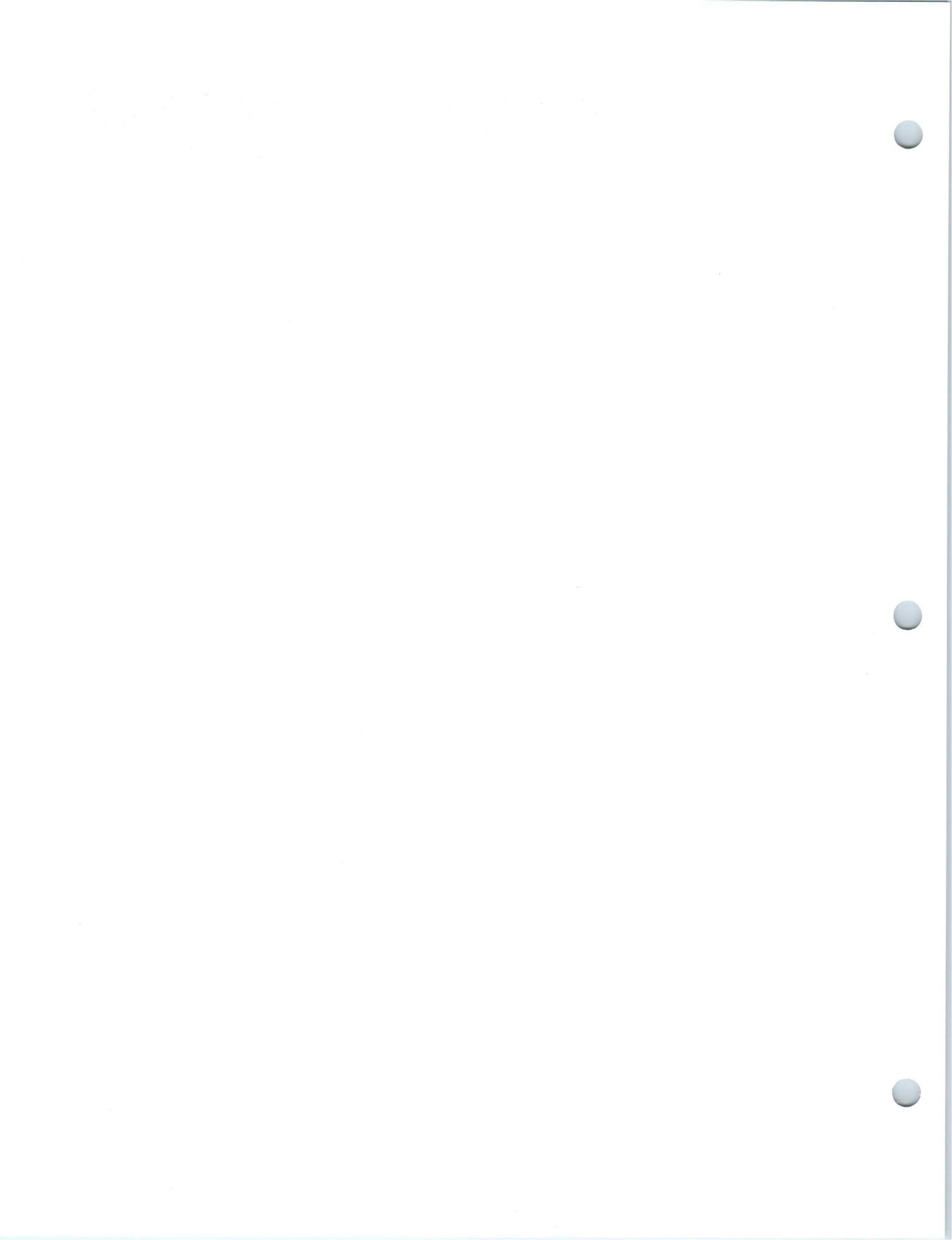
1. TEMPERATURE INDEPENDENCE OF LEAKAGE AND RECOVERY TIME
2. CLEAN, CONTROLLABLE, MORE REPRODUCIBLE VEHICLE
3. LOWER INSERTION LOSS
4. IMPROVED VACUUM INTEGRITY
5. LONGER OPERATING LIFE
6. LONGER SHELF LIFE

C. TR

1. HIGH POWER HANDLING CAPABILITY WITH LOW LOSS
2. SUBSTANTIAL MOMENTARY OVERLOAD PROTECTION

D. LIMITER

1. LOWER LEAKAGE, POSITIVE RECEIVER PROTECTION
2. ALLOWS PASSIVE OPERATION OF TR TUBE





MICROWAVE ASSOCIATES
TYPICAL TR-TR LIMITER CAPABILITY
(Single Tube, Shunt Mount)¹

<u>Capability</u>		<u>Frequency Band</u>					
		L	S	C	X	Ku	Ka
Frequency Range	GHz	1.2-1.4	2.7-3.6	4.9-5.9	8.4-10.5	15.5-17.5	32.5-35.0
Bandwidth	MHz	150	200	500	1000	1000	1000
Peak Power	kW	3000+	1000+	500	250	50	10
Average Power	W	6000+	1000+	500	250	50	10
Recovery Time ²	μ s	5	3	2	<1	<1	<1
Loss – TR	dB	0.3	0.2	0.2	0.3	0.4	0.8
TRL		0.6 ⁴	0.4	0.4	0.5	0.8	–
TRLL		0.8 ⁴	0.6	0.6	0.8	1.4	–
Spike Leakage ³ –							
TR	ergs	1.0	0.30	0.25	0.25	0.25	0.15
TRL	Watts	2.0	5.0	5.0	5.0	5.0	–
TRLL	Watts	0.5	1.0	1.0	1.0	1.0	–
Phase Equality	Degrees	–	± 3	± 3	± 3	± 3	–
VSWR		1.3	1.3	1.3	1.3	1.3	1.3
Hard Braze		No	Yes	Yes	Yes	Yes	Yes
Quartz Pre TR		Yes	Yes	Yes	Yes	No	No
Passive TRL		Yes	Yes	Yes	Yes	Yes	No

NOTES:

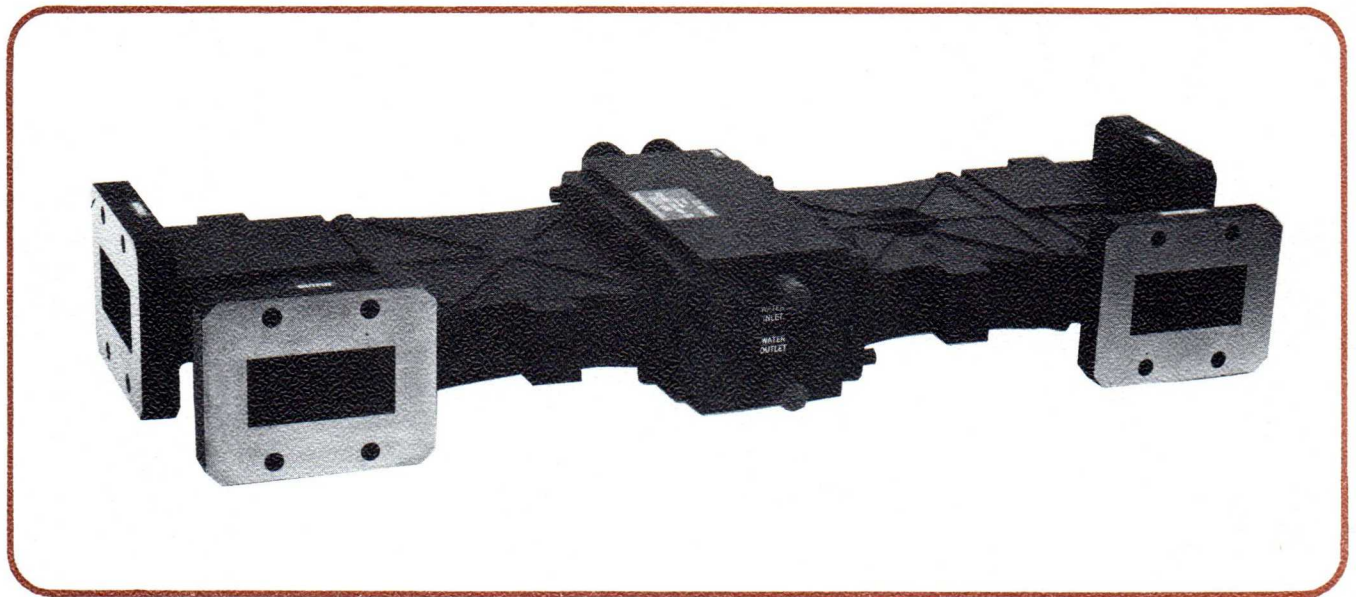
1. Double power for dual TR, Triple power for single series mount.
2. 3 dB amplitude recovery.
3. TR spike leakage is traditionally measured in ergs.
4. Coaxial limiter.



MA-3252 (EIA-8835)

High Power Balanced ATR Duplexer

Bulletin 139



DESCRIPTION

The MA-3252 is a high power, balanced ATR Duplexer. This fixed tuned device was designed to operate over the 2.9 to 3.1 GHz frequency range and features liquid cooling and four ATR cells¹ which are field replaceable without disassembly of any waveguide connections.

APPLICATIONS

The MA-3252 is ideally suited for high power surveillance radar systems where highly reliable duplexing is required.

NOTE:

1. See Microwave Associates' Bulletin 140.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

Frequency Range	2.9 to 3.1 GHz
Peak Power	3.0 mW, Max.
Average Power	20.0 kW, Max.
Pulse Width	30.0 μ s
Insertion Loss:	
Transmit	0.15 dB, Max.
Receive	0.25 dB, Max.
Isolation, Transmitter to Receiver:	
Transmit	26 dB, Min.
Receive	30 dB, Min.

Isolation, Transmitter to Load:

Transmit	26 dB, Min.
Recovery Time	20 μ s

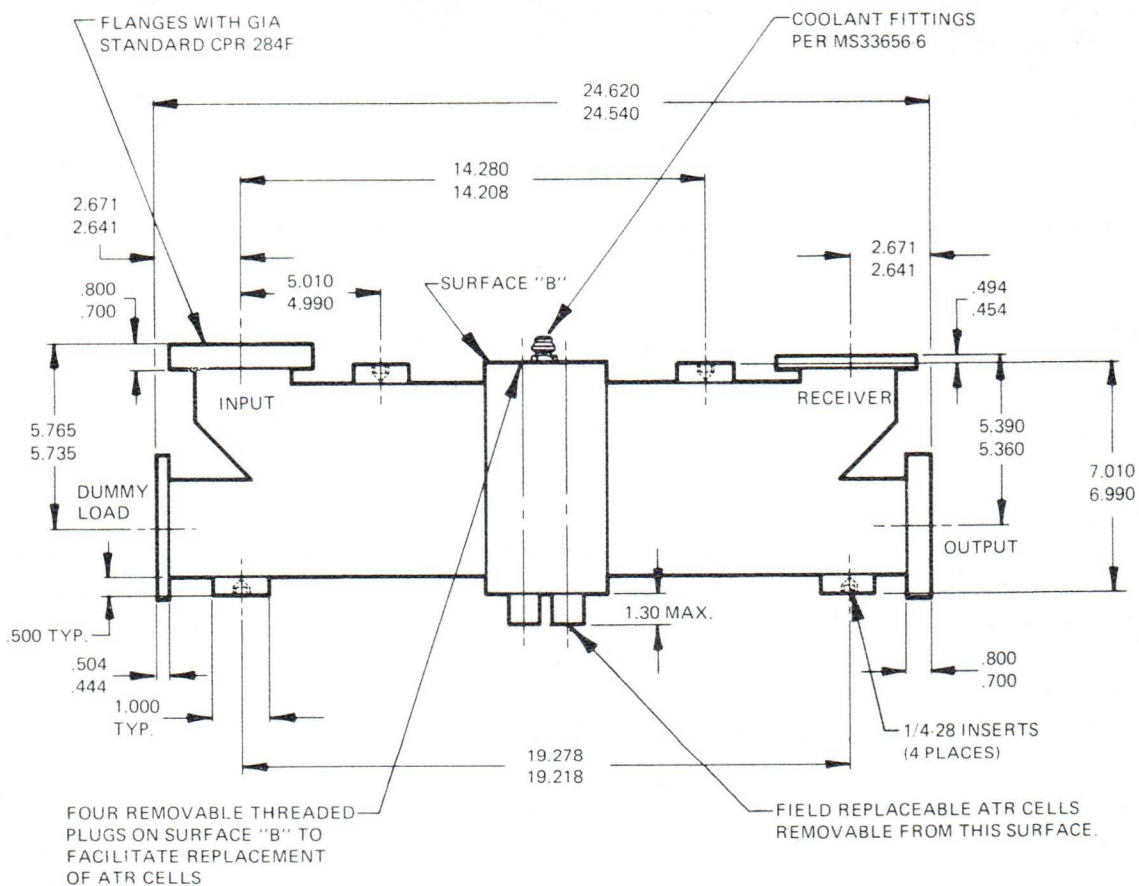
Mechanical Characteristics

Size	Refer to Outline Drawing
Weight (Approx.)	15 lbs.

Environmental Characteristics

Life Test	1000 hrs., Min.
Temperature Range, Operating	-54 to + 65°C
Altitude	10,000 Ft., Max.

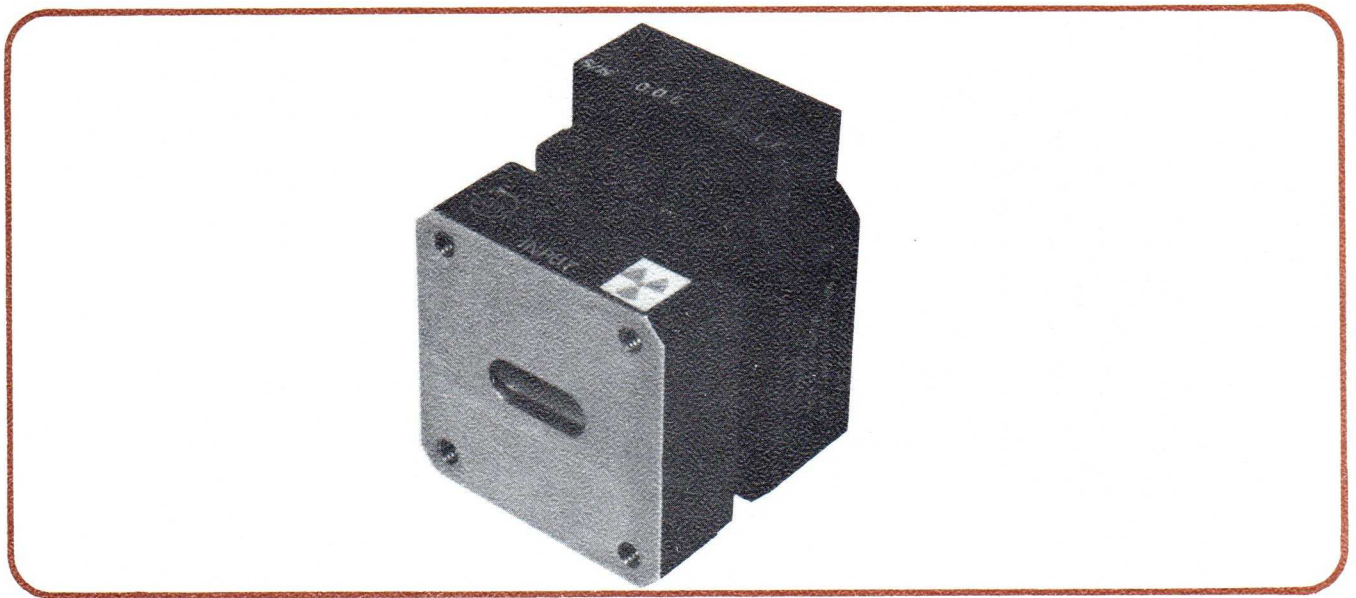
OUTLINE DRAWING



MA-3909X

***X-Band Passive TR Limiter
for Monopulse Radar***

Bulletin 141



DESCRIPTION

The MA-3909X is a single channel, hardbrazed, phase controlled, passive TR Limiter designed to provide positive mixer diode protection in the 8.5 to 9.6 GHz frequency range.

APPLICATION

The MA-3909X is specifically designed to be used in conjunction with the dual TR Limiter MA-3910X in monopulse radars where long life, extended temperature range, and reliable receiver protector operation is required.

FEATURES

- Passive Operation: No ignitor bias or shutter required.
- Hardbrazed Construction: Performance independent of temperature.
- Mixer Diode Protection: Spike amplitude 5 watts maximum.
- Physical Configuration: 1.555 inch length fits most conventional TR sockets.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

	Min.	Typ.	Max.	Units
Frequency Range	8.5	—	9.6	GHz
Peak Power	0	—	25	kW
Average Power	0	—	25	W
Pulse Width	—	—	5	μ s
Spike Leakage Amplitude	—	2	5	W
Spike Leakage Energy	—	.04	.10	ergs
Flat Leakage Power	—	25	100	mW
Breakdown Power	—	50	100	mW
Recovery Time, 3 dB	—	0.5	1.0	μ s
Insertion Loss	—	0.7	1.0	dB
Low Level VSWR	—	1.2	1.4	—
Phase Equality	-5	—	+5	Degrees
Life	2000	4000	—	Hours

Environmental Characteristics

Operating Temperature	-55	—	+71	$^{\circ}$ C
Storage Temperature	-55	—	+80	$^{\circ}$ C

Mechanical Characteristics

Finish:

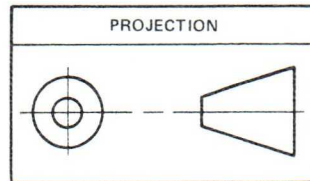
Input Flange	Cadmium Plate, Iridite
Output Flange	Aluminum, Iridite
Body	Black Lacquer

Dimensions
Weight

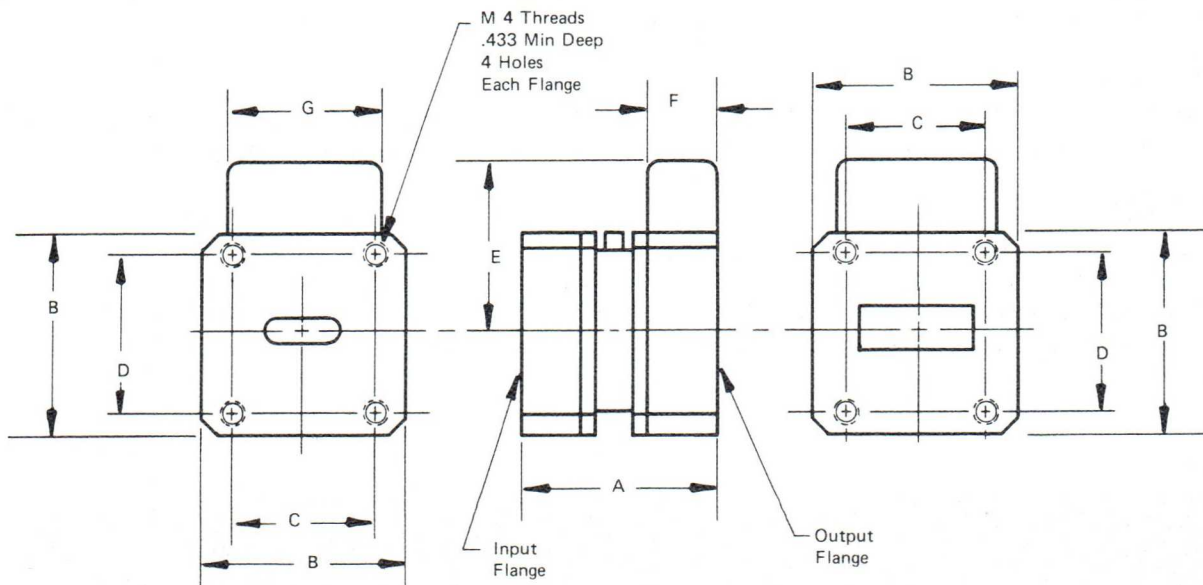
See Outline Drawing
10.0 oz.
(284 gr.)

OUTLINE DRAWING

DIMENSIONS



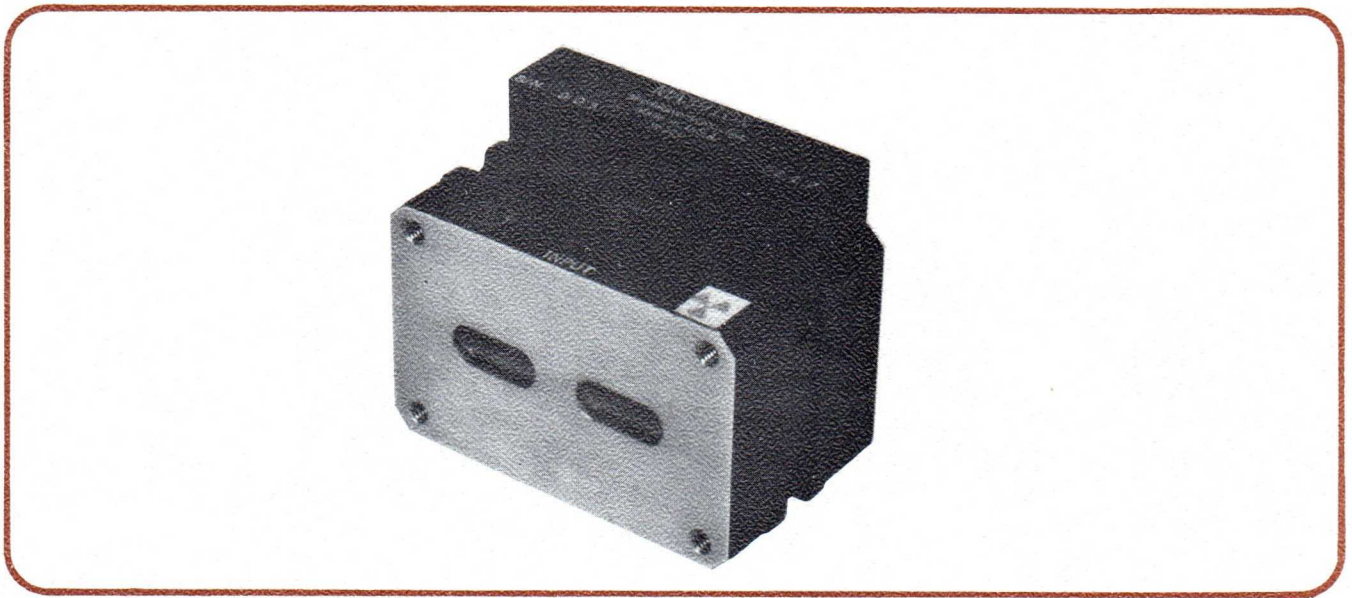
Dim.	Inches		M.M.	
	Min.	Max.	Min.	Max.
A	1.545	1.565	39.24	39.75
B	1.610	1.640	40.89	41.66
C	1.216	1.224	30.89	31.09
D	1.276	1.284	32.41	32.61
E	—	1.262	—	32.05
F	—	.600	—	15.24
G	—	1.640	—	41.66



MA-3910X

Dual X-Band Passive TR Limiter for Monopulse Radar

Bulletin 142



DESCRIPTION

The MA-3910X is a dual channel, hardbrazed, phase controlled, passive TR Limiter designed to provide positive mixer diode protection in the 8.5 to 9.6 GHz frequency range.

APPLICATION

The MA-3910X is specifically designed to be used in conjunction with the single TR Limiter MA-3909X in monopulse radars where long life, extended temperature range, and reliable receiver protector operation is required.

FEATURES

- Pre TR Input: High power handling with long life and fast recovery time.
- Passive Operation: No ignitor bias or shutter required.
- Hardbrazed Construction: Performance independent of temperature.
- Mixer Diode Protection: Spike amplitude 5 watts maximum.
- Physical Configuration: 1.555 inch length fits most conventional TR sockets.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

	Min.	Typ.	Max.	Units
Frequency Range	8.5	—	9.6	GHz
Peak Power	0	—	250	kW
Average Power	0	—	250	W
Pulse Width	—	—	5	μ s
Arc Loss	—	0.4	0.6	dB
High Level VSWR	—	1.15	1.3	—
Spike Leakage Amplitude	—	2	5	W
Spike Leakage Energy	—	.04	.10	ergs
Flat Leakage Power	—	50	100	mW
Breakdown Power	—	80	100	mW
Recovery Time, 3 dB	—	0.5	1.0	μ s
Insertion Loss	—	0.7	1.0	dB
Low Level VSWR	—	1.15	1.30	—
Phase Equality	-5	—	+5	Degrees
Life	2000	4000	—	Hours

Environmental Characteristics

	Min.	Typ.	Max.	Units
Operating Temperature	-55	—	+71	$^{\circ}$ C
Storage Temperature	-55	—	+80	$^{\circ}$ C

Mechanical Characteristics

Finish:

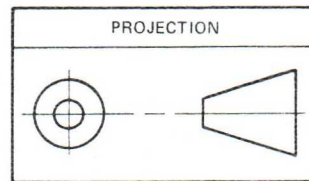
Input Flange	Cadmium Plate, Iridite
Output Flange	Aluminum, Iridite
Body	Black Lacquer

Dimensions
Weight

See Outline Drawing

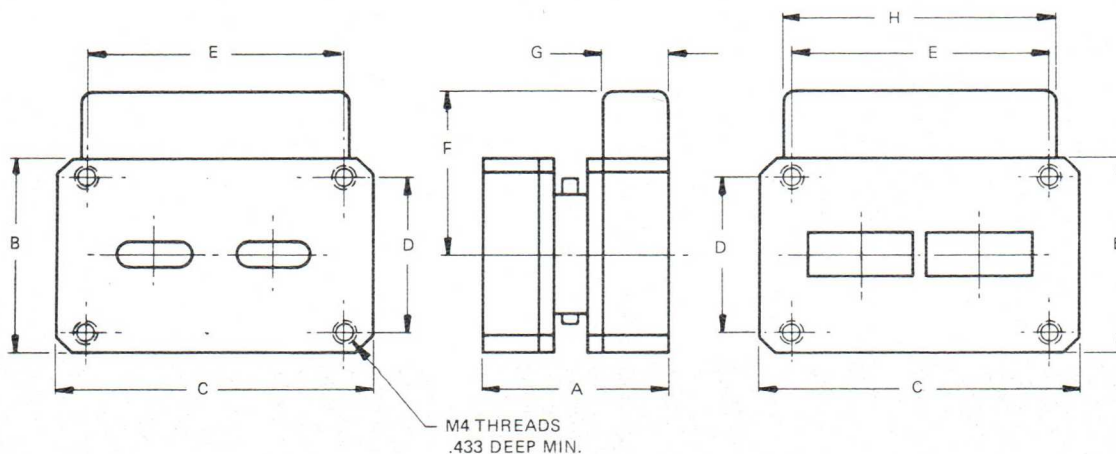
16.0 oz.
(455 gr.)

OUTLINE DRAWING



DIMENSIONS

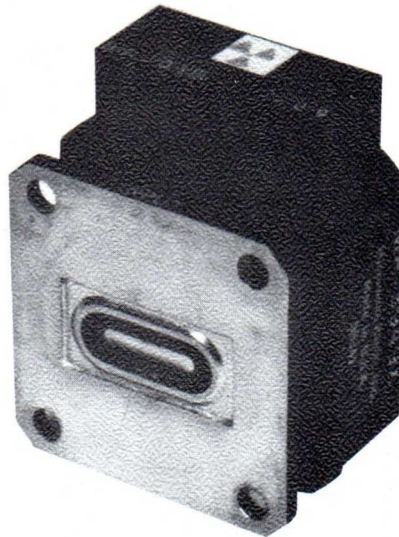
Dim.	Inches		M.M.	
	Min.	Max.	Min.	Max.
A	1.545	1.565	39.24	39.75
B	1.610	1.640	29.46	41.66
C	2.560	2.590	65.02	65.79
D	1.276	1.284	32.41	32.61
E	2.165	2.175	54.99	55.25
F	—	1.262	—	32.05
G	—	.600	—	15.24
H	—	2.590	—	65.79



MA-3949X

X-Band Passive TR Limiter for Airborne Radar

Bulletin 143



DESCRIPTION

The MA-3949X is a single channel, hardbrazed, passive TR Limiter designed to provide positive mixer diode protection in the 8.5 to 9.6 GHz frequency range.

APPLICATION

The MA-3949X is specifically designed to retrofit existing 1.070 inch conventional TR tube sockets in airborne and other radars where long life, extended temperature range, and reliable receiver protector operation is required.

FEATURES

- Passive Operation: No ignitor bias or shutter required.
- Hardbrazed Construction: Performance independent of temperature.
- Mixer Diode Protection: Spike amplitude 5 watts maximum.
- Physical Configuration: 1.070 inch length fits conventional TR sockets.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

	Min.	Typ.	Max.	Units
Frequency Range	8.5	—	9.6	GHz
Peak Power	0	—	10	kW
Average Power	0	—	10	W
Pulse Width	—	—	5	μ s
Spike Leakage Amplitude	—	2	5	W
Spike Leakage Energy	—	.04	.10	ergs
Flat Leakage Power	—	25	50	mW
Breakdown Power	—	50	100	mW
Recovery Time, 3 dB	—	0.5	1.5	μ s
Insertion Loss	—	0.5	0.8	dB
Low Level VSWR	—	1.2	1.4	—
Life	2000	4000	—	Hours

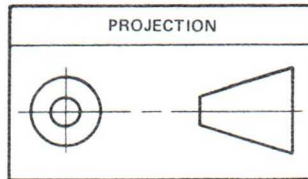
Environmental Characteristics

	Min.	Typ.	Max.	Units
Operating Temperature	-55	—	+85	$^{\circ}$ C
Storage Temperature	-55	—	+85	$^{\circ}$ C

Mechanical Characteristics

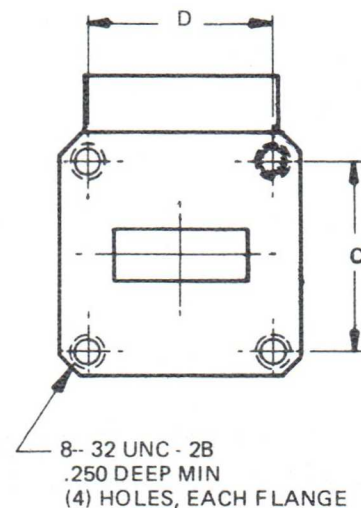
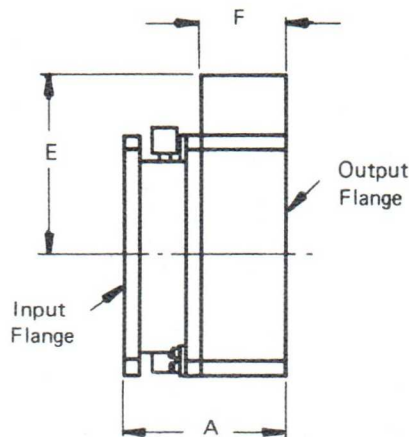
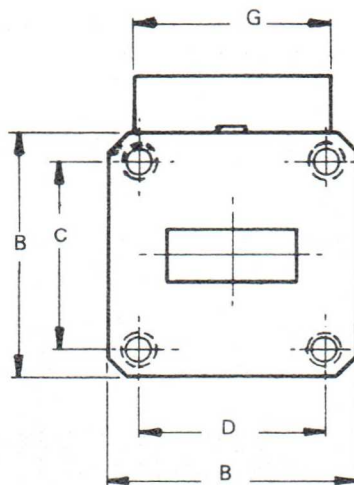
Finish:		Dimensions	See Outline Drawing
Input Flange	Cadmium Plate, Iridite	Weight	5.3 oz.
Output Flange	Aluminum, Iridite		(145 gr.)
Body	Black Lacquer		

OUTLINE DRAWING



DIMENSIONS

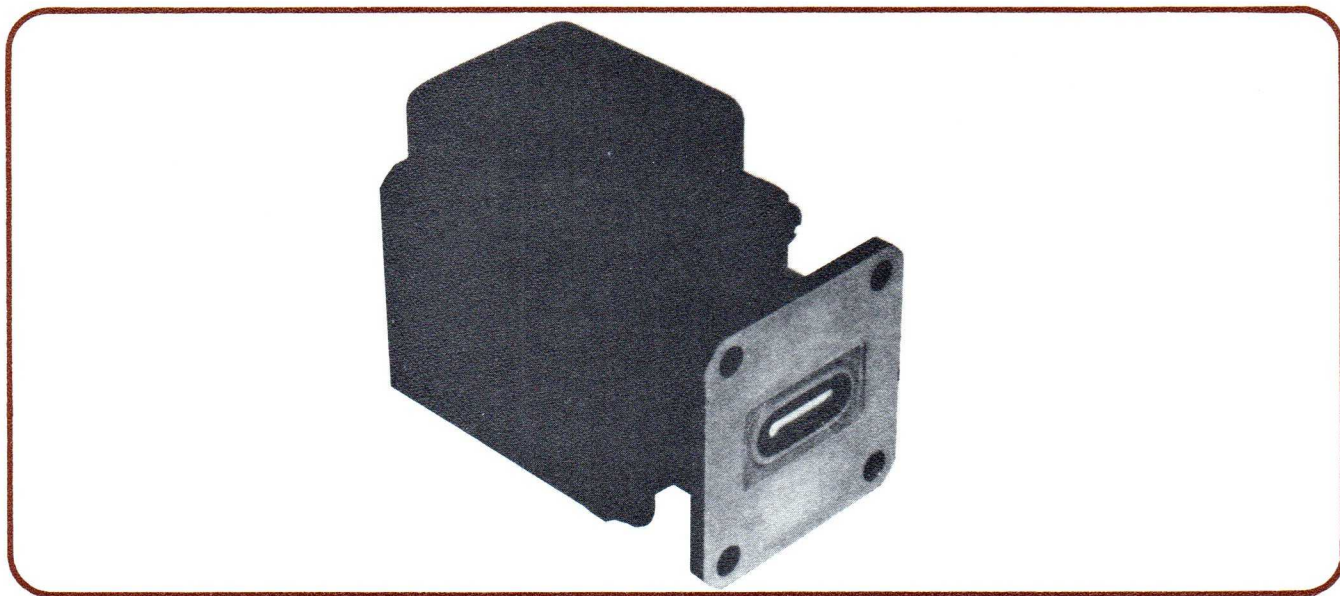
Dim.	Inches		M.M.	
	Min.	Max.	Min.	Max.
A	1.060	1.080	26.92	27.43
B	1.610	1.640	40.89	41.66
C	1.276	1.284	32.41	32.61
D	1.216	1.224	30.89	31.09
E	—	1.228	—	31.19
F	—	.600	—	15.24
G	—	1.640	—	41.66



MA-3940X

***X-Band Passive TR Limiter for
Tunnel Diode Amplifier or
Low Noise Schottky Barrier Diode Protection***

Bulletin 144



DESCRIPTION

The MA-3940X is a single channel, hardbrazed, passive TR Limiter designed to provide positive receiver protection in the 8.5 to 9.6 GHz frequency range.

APPLICATION

The MA-3940X is specifically designed with a two stage limiter to protect either tunnel diode amplifiers or low noise Schottky barrier diodes in radars where long life, extended temperature range, and reliable receiver protector operation is required.

FEATURES

- Passive Operation: No ignitor bias or shutter required.
- Hardbrazed Construction: Performance independent of temperature.
- Two Stage Limiter: Spike amplitude less than one watt.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

Western Union Fax
TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

	Min.	Typ.	Max.	Units
Frequency Range	8.5	—	9.6	GHz
Peak Power	0	—	30	kW
Average Power	0	—	30	W
Pulse Width	—	—	5	μ s
Spike Leakage Amplitude	—	0.5	1.0	W
Spike Leakage Energy	—	.01	.02	ergs
Flat Leakage Power	—	10	20	mW
Breakdown Power	—	20	40	mW
Recovery Time, 3 dB	—	0.5	1.0	μ s
Insertion Loss	—	0.8	1.0	dB
Low Level VSWR	—	1.3	1.5	—
Life	2000	4000	—	Hours

Environmental Characteristics

Operating Temperature	-55	—	+71	$^{\circ}$ C
Storage Temperature	-55	—	+80	$^{\circ}$ C

Mechanical Characteristics

Finish:

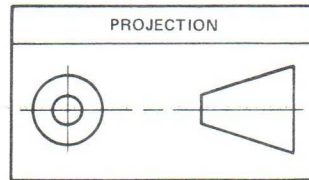
Input Flange	Cadmium Plate, Iridite
Output Flange	Aluminum, Iridite
Body	Black Lacquer

Dimensions
Weight

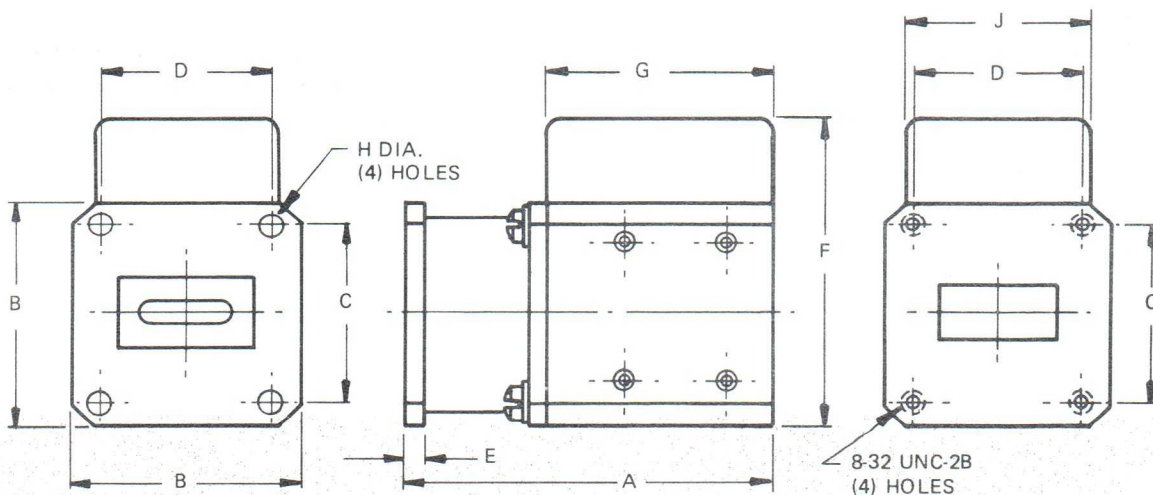
See Outline Drawing
10.8 oz.
(302 gr.)

OUTLINE DRAWING

DIMENSIONS



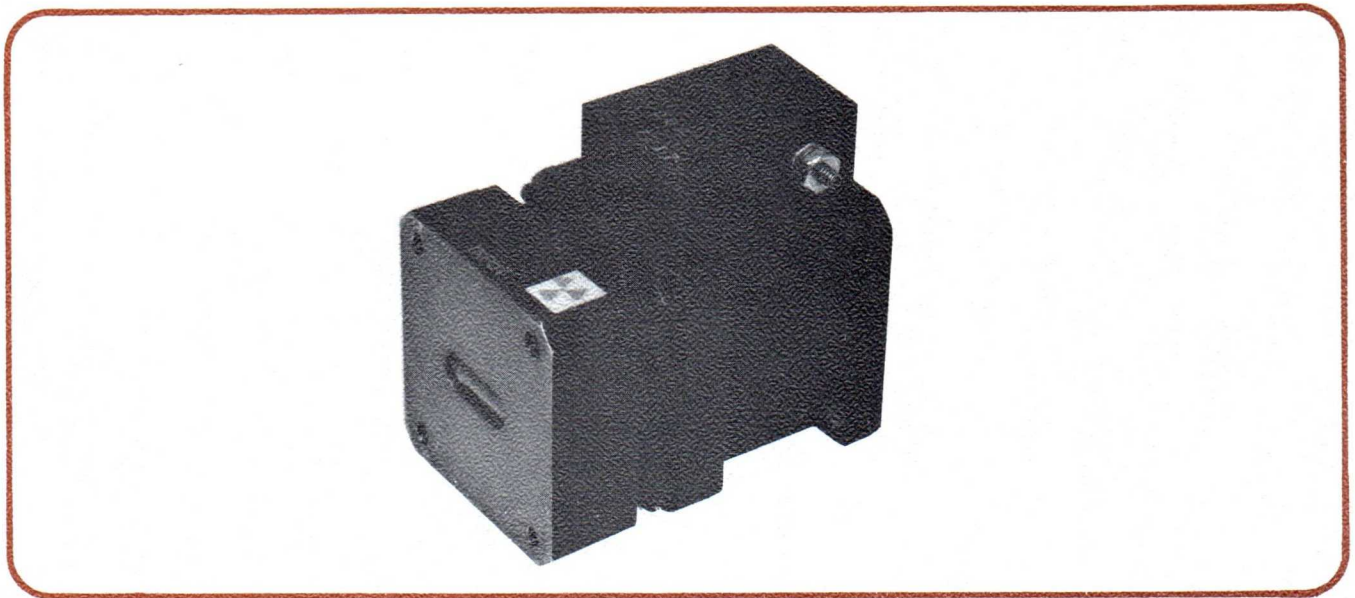
Dim.	Inches		M.M.	
	Min.	Max.	Min.	Max.
A	2.615	2.635	66.42	66.93
B	1.610	1.640	40.89	41.66
C	1.276	1.284	32.41	32.61
D	1.215	1.225	30.86	31.12
E	.100	—	2.54	—
F	—	2.250	—	57.15
G	—	1.600	—	40.64
H	.169	.179	4.29	4.55
J	—	1.400	—	35.56



MA-3918X

***X-Band Passive TR Limiter and STC Attenuator
for Tunnel Diode Amplifier or Low Noise
Schottky Barrier Diode Protection***

Bulletin 145



DESCRIPTION

The MA-3918X is a single channel, hardbrazed, phase controlled, passive TR Limiter with integral, one step STC attenuator.

APPLICATION

The MA-3918X is specifically designed to allow external biasing of its two stage limiter to provide an additional 25 dB of attenuation for sensitivity time control. Two stages of limiting provide low leakage consistent with positive protection of tunnel diode amplifiers or low noise Schottky barrier diodes.

FEATURES

- STC Attenuation: 25 dB minimum attenuation with external bias.
- Passive Operation: No ignitor bias or shutter required.
- Hardbrazed Construction: Performance independent of temperature.
- Two Stage Limiter: Spike amplitude less than one watt.
- Pre TR Input: High power handling with long life and fast recovery time.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

	Min.	Typ.	Max.	Units
Frequency Range	8.5	—	9.6	GHz
Peak Power	0	—	5	kW
Average Power	0	—	50	W
Pulse Width	—	—	5	μs
Spike Leakage Amplitude	—	0.5	1.0	W
Spike Leakage Energy	—	.01	.02	ergs
Flat Leakage Power	—	20	50	mW
Breakdown Power	—	25	50	mW
Recovery Time, 3 dB	—	0.5	0.8	μs
Insertion Loss	—	0.8	1.2	dB
Low Level VSWR	—	1.3	1.4	—
Life	2000	4000	—	Hours
STC Attenuation	25	30	—	dB
STC Bias Current	30	50	—	mA dc

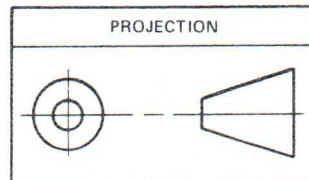
Environmental Characteristics

Operating Temperature	-40	—	+70	°C
Storage Temperature	-55	—	+85	°C

Mechanical Characteristics

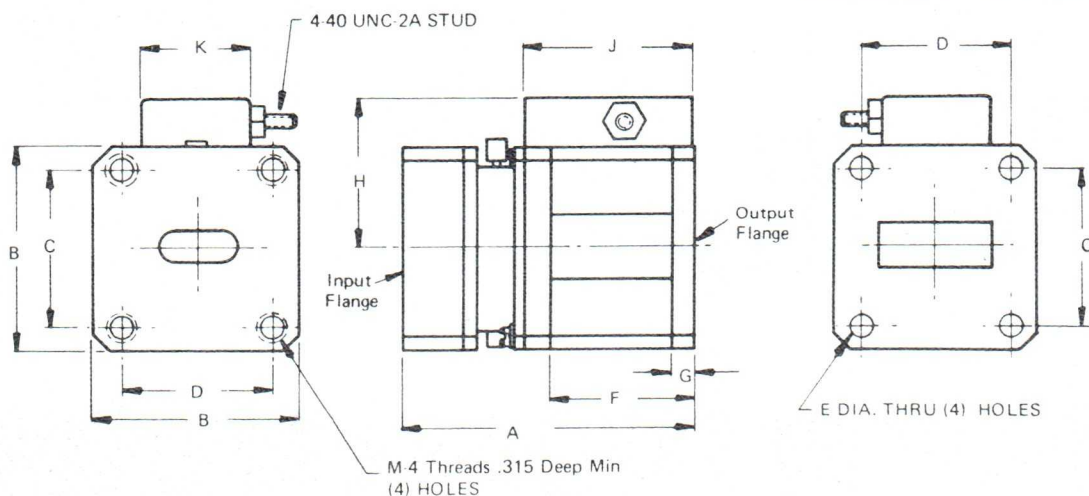
Finish:		Dimensions	See Outline Drawing
Input Flange	Cadmium Plate, Iridite	Weight	11.5 oz.
Output Flange	Aluminum, Iridite		(324 gr.)
Body	Black Lacquer		

OUTLINE DRAWING



DIMENSIONS

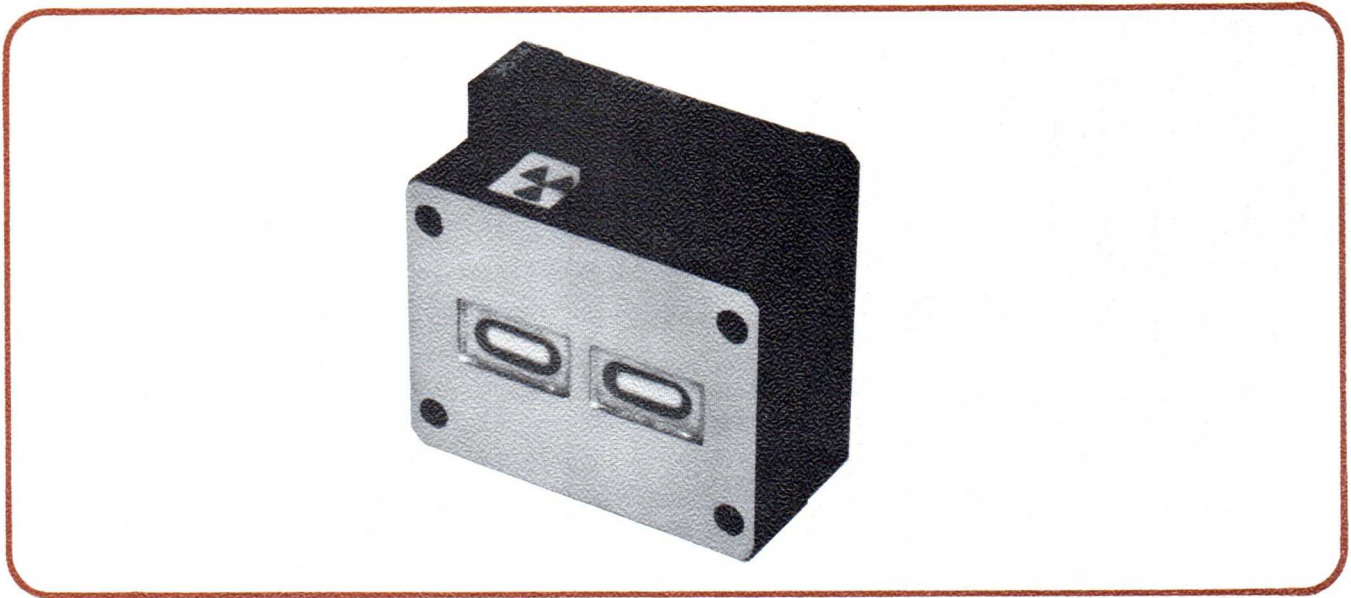
Dim.	Inches		M.M.	
	Min.	Max.	Min.	Max.
A	2.358	2.366	59.89	60.10
B	1.610	1.640	40.89	41.66
C	1.276	1.284	32.41	32.61
D	1.216	1.224	30.89	31.09
E	.160	.170	4.06	4.32
F	.787	—	19.99	—
G	.192	.202	4.88	5.13
H	—	1.325	—	33.66
J	—	1.400	—	35.56
K	—	.900	—	22.86



MA-3926Z

Dual Ku-Band Passive TR Limiter for Monopulse Radar

Bulletin 146



DESCRIPTION

The MA-3926Z is a dual channel, hardbrazed, phase controlled, passive TR Limiter designed to provide positive mixer diode protection in the 15.5 to 17.5 GHz frequency range.

APPLICATION

The MA-3926Z is specifically designed to be used in conjunction with the single TR Limiter MA-3927Z in monopulse radars where long life, extended temperature range, and reliable receiver protector operation is required.

FEATURES

- Passive Operation: No ignitor bias or shutter required.
- Hardbrazed Construction: Performance independent of temperature.
- Mixer Diode Protection: Spike amplitude 5 watts maximum.
- Physical Configuration: .807 inch length fits most conventional TR sockets.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

	Min.	Typ.	Max.	Units
Frequency Range	15.5	—	17.5	GHz
Peak Power	0	—	100	kW
Average Power	0	—	100	W
Pulse Width	—	—	3	μ s
Spike Leakage Amplitude	—	1	2	W
Spike Leakage Energy	—	.02	.05	ergs
Flat Leakage Power	—	10	20	mW
Breakdown Power	—	50	100	mW
Recovery Time, 3 dB	—	0.5	1.0	μ s
Insertion Loss	—	0.8	1.2	dB
Low Level VSWR	—	1.15	1.2	—
Life	2000	4000	—	Hours
Phase Equality	-5	—	+5	Degrees

Environmental Characteristics

Operating Temperature	-40	—	+100	$^{\circ}$ C
Storage Temperature	-55	—	+100	$^{\circ}$ C

Mechanical Characteristics

Finish:

Input Flange

Output Flange

Body

Cadmium Plate, Iridite

Aluminum, Iridite

Black Lacquer

Dimensions

Weight

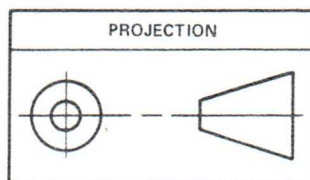
See Outline Drawing

4.5 oz.

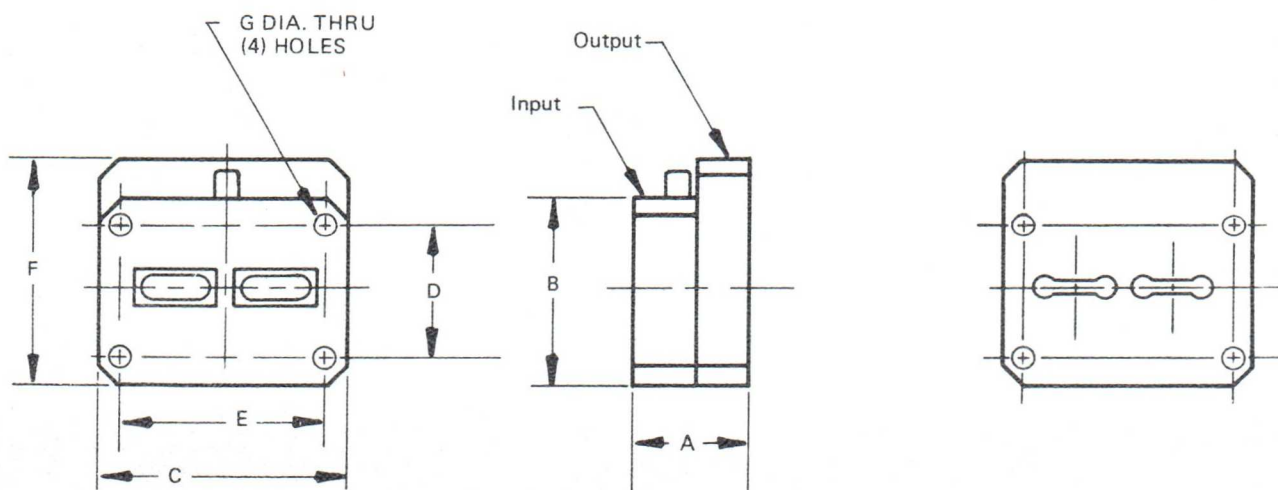
(127 gr.)

OUTLINE DRAWING

DIMENSIONS



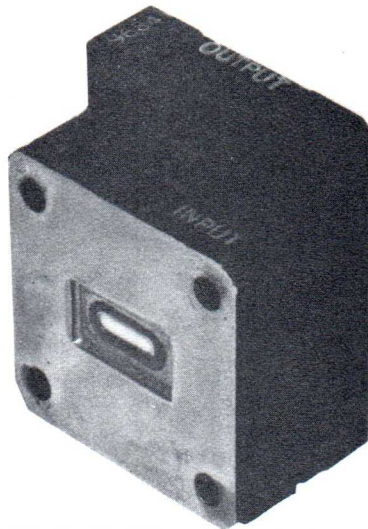
Dim.	Inches		M.M.	
	Min.	Max.	Min.	Max.
A	.802	.812	20.37	20.62
B	1.292	1.332	32.82	33.83
C	.952	.960	24.18	24.38
D	.990	.998	25.15	25.35
E	1.297	1.812	32.94	46.02
F	.142	.149	3.61	3.78



MA-3927Z

***Ku-Band Passive TR Limiter
for Monopulse Radars***

Bulletin 147



DESCRIPTION

The MA-3927Z is a single channel, hardbrazed, phase controlled, passive TR Limiter designed to provide positive mixer diode protection in the 15.5 to 17.5 GHz frequency range.

APPLICATION

The MA-3927Z is specifically designed to be used in conjunction with the dual TR Limiter MA-3926Z in monopulse radars where long life, extended temperature range, and reliable receiver protector operation is required.

FEATURES

- Passive Operation: No ignitor bias or shutter required.
- Hardbrazed Construction: Performance independent of temperature.
- Mixer Diode Protection: Spike amplitude 5 watts maximum.
- Physical Configuration: .807 inch length fits most conventional TR sockets.



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

Western Union Fax
TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

	Min.	Typ.	Max.	Units
Frequency Range	15.5	—	17.5	GHz
Peak Power	0	—	20	kW
Average Power	0	—	20	W
Pulse Width	—	—	3	μ s
Spike Leakage Amplitude	—	2	5	W
Spike Leakage Energy	—	.04	.10	ergs
Flat Leakage Power	—	25	100	mW
Breakdown Power	—	50	100	mW
Recovery Time, 3 dB	—	0.5	1.0	μ s
Insertion Loss	—	0.8	1.2	dB
Low Level VSWR	—	1.3	1.5	—
Life	2000	4000	—	Hours
Phase Equality	-5	—	+5	Degrees

Environmental Characteristics

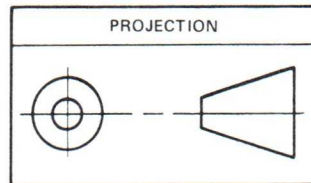
Operating Temperature	-40	—	+100	$^{\circ}$ C
Storage Temperature	-55	—	+100	$^{\circ}$ C

Mechanical Characteristics

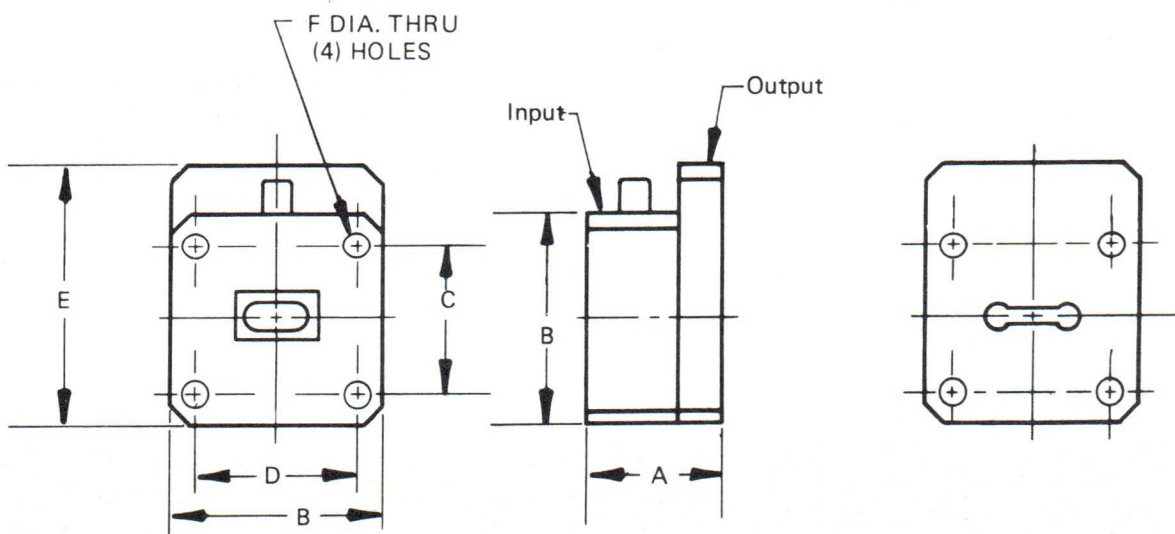
Finish:		Dimensions	See Outline Drawing
Input Flange	Cadmium Plate, Iridite	Weight	3.5 oz.
Output Flange	Aluminum, Iridite		(98 gr.)
Body	Black Lacquer		

OUTLINE DRAWING

DIMENSIONS



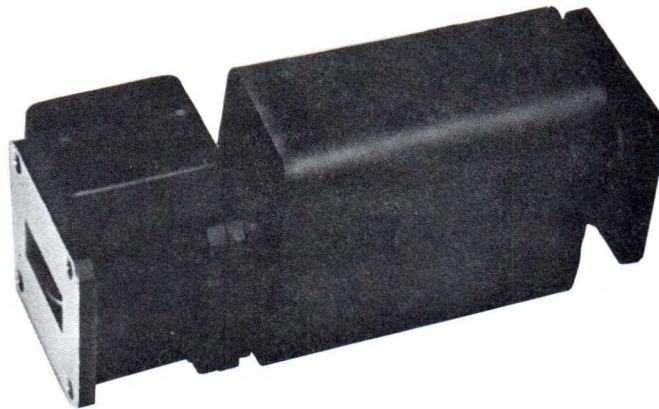
Dim.	Inches		M.M.	
	Min.	Max.	Min.	Max.
A	.802	.812	20.37	20.62
B	1.297	1.327	32.94	33.71
C	1.735	1.765	44.07	44.83
D	.952	.960	24.18	24.38
E	1.495	1.505	37.97	38.23
F	1.297	1.812	32.94	46.02
G	.142	.149	3.61	3.78



MA-31002X

X-Band Ferrite Diode Limiter

Bulletin 148



DESCRIPTION

Microwave Associates' new ferrite diode limiter (the MA-31002X) is an all solid-state, completely passive and superior performing device covering the 9.2 to 9.4 GHz frequency range. It is designed chiefly to provide receiver protection at all times -- either from the transmitter or other external sources. This device eliminates the need for power supplies and shutters and, since it is absorptive, four-port circulators and dummy loads are not required in some systems utilizing the new "FDL".

APPLICATIONS

The MA-31002X is a boon to the system which requires high power, long life and reliability . . . together with a limited space factor.

FEATURES

- Extremely long lifetime
- Fast recovery time
- High power capabilities



Microwave Associates, Inc. Burlington, Massachusetts Tel. (617) 272-3000

TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

Frequency Range	9.2-9.4 GHz
Peak Power	80 kW
Average Power	80 W
Pulsewidth	5.0 μ s
Spike Leakage Amplitude	0.5 W
Spike Leakage Energy	0.05 ergs
Flat Leakage Power	20 mW
Recovery Time, 3 dB	0.05 μ s
Insertion Loss	1.0 dB
Low Level VSWR	1.3
Life	10,000 + Hours

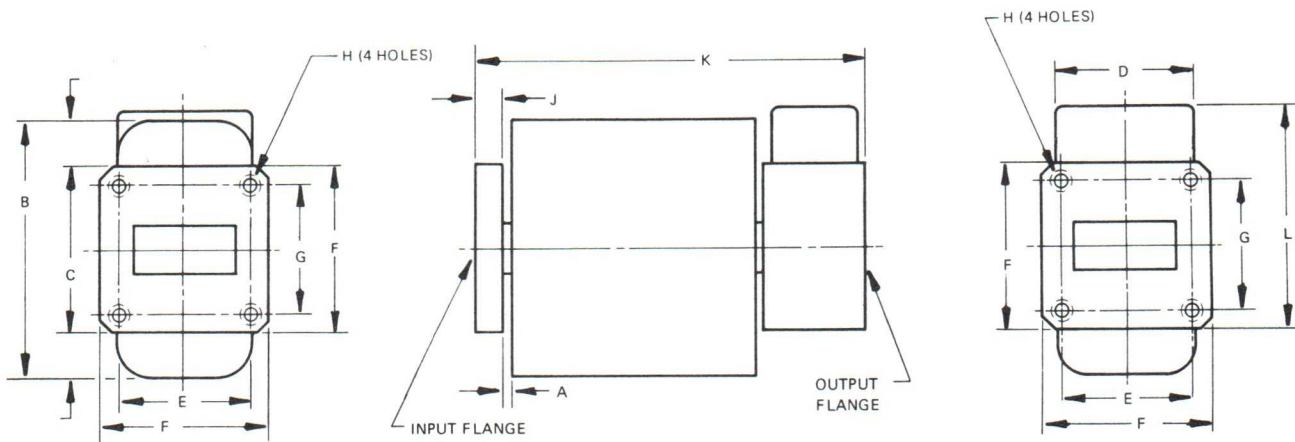
Mechanical Characteristics

Insertion Length	5.50 Inches
Weight	32 oz.
Finish	
Flanges (Input and Output)	Aluminum Iridite
Body	Black Lacquer

Environmental Characteristics

Temperature	
Operating	-55 to +71°C
Storage	-55 to +85°C

OUTLINE DRAWING



DIM.	LIMITS		
	MIN.	NOM.	MAX.
A	.060	—	—
B	—	—	1.875
C	—	—	.563
D	—	—	1.640
E	1.215	1.220	1.224
F	1.610	1.625	1.640
G	1.276	1.280	1.284
H	#8-32 UNC-2B X .250 DP ¹		
J	.235	.250	.265
K	—	—	5.50 ^{±.01}
L	—	—	2.200

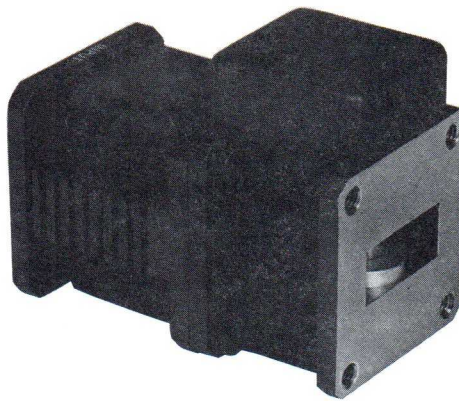
NOTE:

- The AQL for the combined mechanical defectives in quality conformance inspection shall be one per cent. MIL-STD-105 applies.

MA-31003X

X-Band Ferrite Diode Limiter

Bulletin 149



DESCRIPTION

Microwave Associates' new ferrite diode limiter (the MA-31003X) is an all solid-state, completely passive and superior performing device covering the 9.0 to 9.6 GHz frequency range. Similar to its co-worker, the MA-31002X in the 9.2 to 9.4 GHz range, this device is designed chiefly to provide receiver protection with performance characteristics surpassing those of the gas or gas solid-state TR model.

APPLICATIONS

The MA-31003X is ideally suited for weather radar or other types of airborne environments where reliable receiver protection is required.

FEATURES

- Extremely long lifetime
- Fast recovery time
- High power capabilities
- Light weight
- Compact size



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TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

Frequency Range	9.0-9.6 GHz
Peak Power	10 kW
Average Power	10 W
Pulsewidth	5 μ s
Spike Leakage Amplitude	.5 W, Max.
Spike Leakage Energy	.05 ergs, Max.
Flat Leakage Power	20 mW, Max.
Breakdown Power	40 mW, Max.
Recovery Time, (3 dB)	.05 μ s
Insertion Loss	1.0 dB
Low Level VSWR	1.4
Life	10,000 + Hours

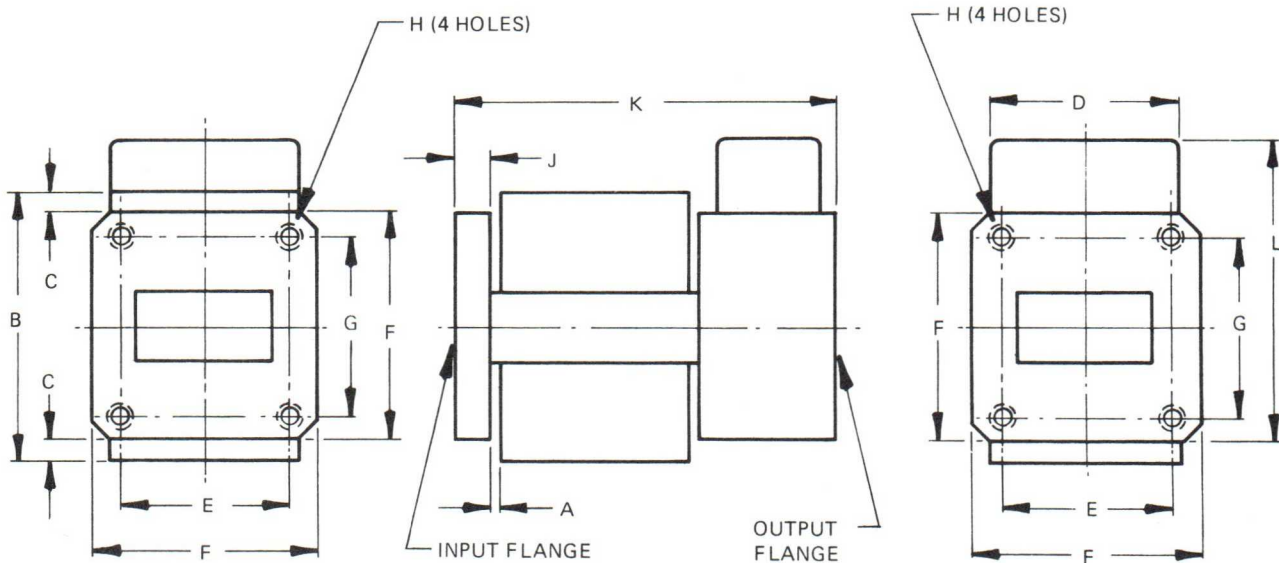
Mechanical Characteristics

Insertion Length	2.750 \pm .01 Inches
Weight	12.0 oz.
Finish	
Flanges (Input and Output)	Aluminum Iridite
Body	Black Lacquer

Environmental Characteristics

Temperature	
Operating	-55 to +71°C
Storage	-55 to +80°C

OUTLINE DRAWING



DIM.	LIMITS		
	MIN.	NOM.	MAX.
A	.060	--	--
B	--	--	1.875
C	--	--	.125
D	--	--	1.640
E	1.216	1.220	1.224
F	1.610	1.625	1.640
G	1.276	1.280	1.284
H	# 8-32 UNC-2B X .250 DP		
J	.235	.250	.265
K	2.740	2.750	2.760
L	--	--	2.200

NOTE:

1. The AQL for the combined mechanical defectives in quality conformance inspection shall be one per cent, MIL-STD-105 applies.

MA-31006Z

Ku-Band Ferrite Diode Limiter

Bulletin 150



DESCRIPTION

The MA-31006Z ferrite diode limiter is an all solid-state, completely passive device covering the 16.0 to 17.0 GHz frequency range. Similar to the X-band models designed by Microwave Associates, this Ku-band unit is designed chiefly to provide superior receiver protection with performances surpassing those of the gas or gas solid-state TR models.

APPLICATIONS

This new Ku-band device is ideally suited for requirements demanding high reliability receiver protection.

FEATURES

- Fast recovery time
- Extremely long lifetime
- Light weight
- High reliability



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TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

Frequency Range	16.0-17.0 GHz
Peak Power	4.0 kW
Average Power	4 W
Duty Cycle	0.001
Spike Leakage Amplitude	1.0 W
Flat Leakage Power	40 mW
Breakdown Power	40 mW
Recovery Time, (3 dB)	.05 μ s
Insertion Loss	1.40 dB
VSWR	1.4:1
Life	10,000 + Hours

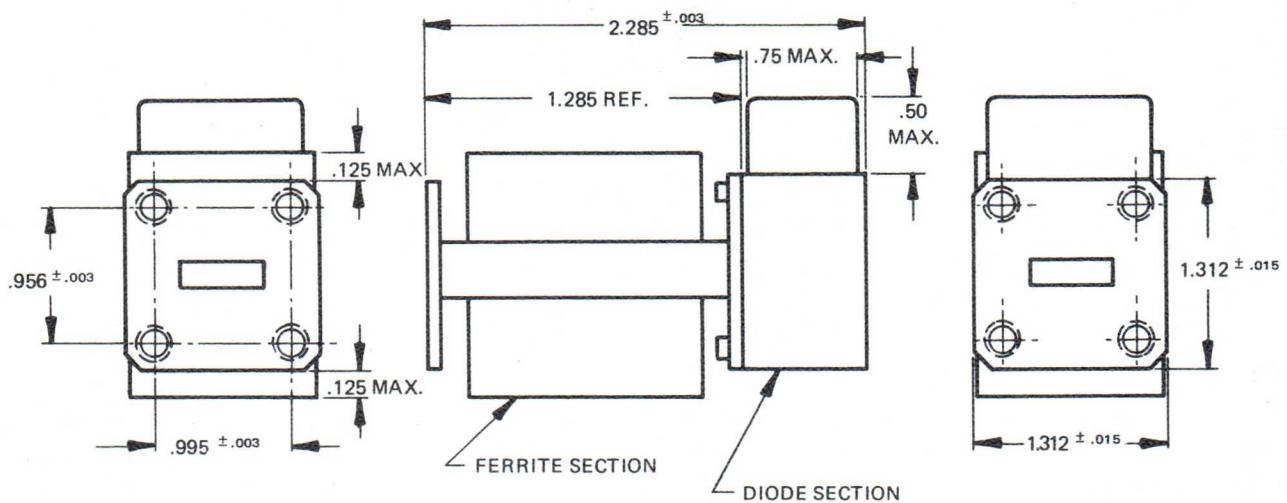
Mechanical Characteristics

Insertion Length	2.285 \pm .01 Inches
Weight	7.0 oz.
Finish	
Flanges (Input and Output)	Aluminum Iridite
Body	Black Lacquer

Environmental Characteristics

Temperature	
Operating	-55 to +71°C
Storage	-55 to +85°C

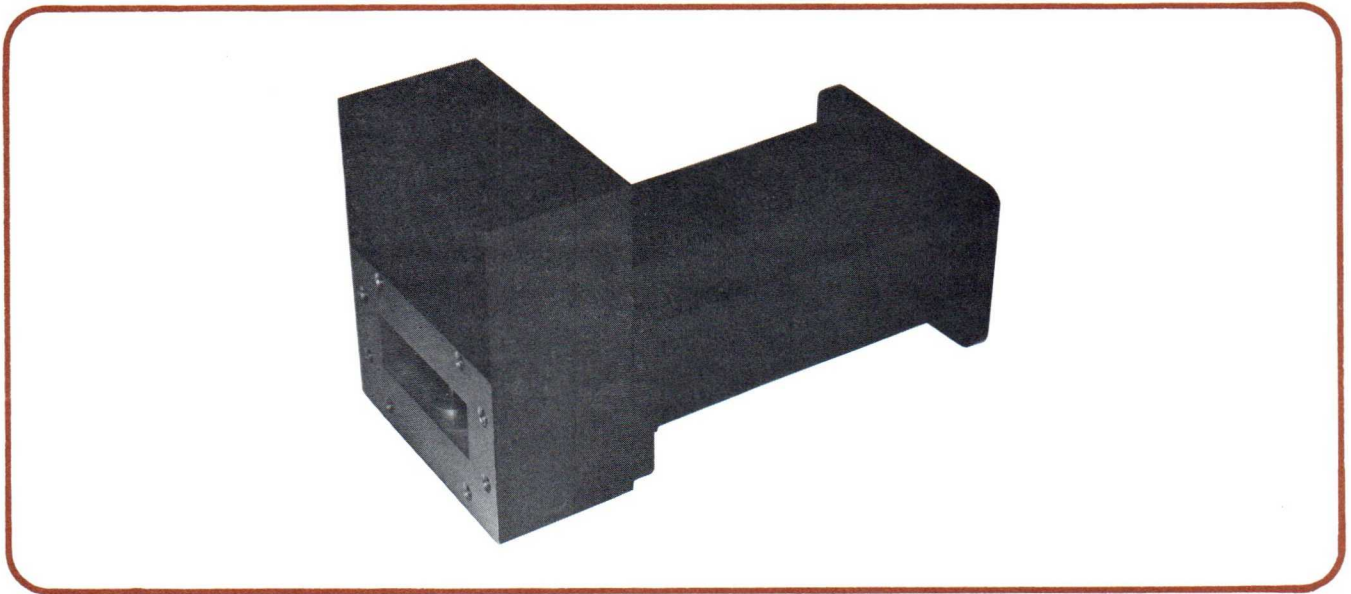
OUTLINE DRAWING



MA-31005S

S-Band Ferrite Diode Limiter

Bulletin 151A



DESCRIPTION

Microwave Associates' new ferrite diode limiter (the MA-31005S) is an all solid-state, completely passive, superior performance device covering the 2.9 to 3.1 GHz frequency range. It is designed to provide receiver protection at all times — either from the transmitter or from other external sources. This device eliminates the need for power supplies and shutters. Since it is absorptive, four-port circulators and dummy loads are not required in some systems utilizing the new "FDL" as part of the duplexer.

APPLICATIONS

The MA-31005S is a boon to systems which require high power protection, long life and reliability.

FEATURES

- Extremely long lifetime
- Fast recovery time
- High power capabilities
- Absorptive



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TWX: 710-332-6789
Telex: 94-9464

SPECIFICATIONS

Electrical Characteristics

Frequency Range	2.9 - 3.1 GHz
Peak Power	15 kW
Average Power	15 W
Pulsewidth	20 μ s
Spike Leakage Amplitude	0.5 W
Spike Leakage Energy	0.05 ergs
Flat Leakage Power	40 mW
Recovery Time, 3 dB	0.5 μ s
Insertion Loss	1.0 dB
Low Level VSWR	1.4
Life	10,000 Hours

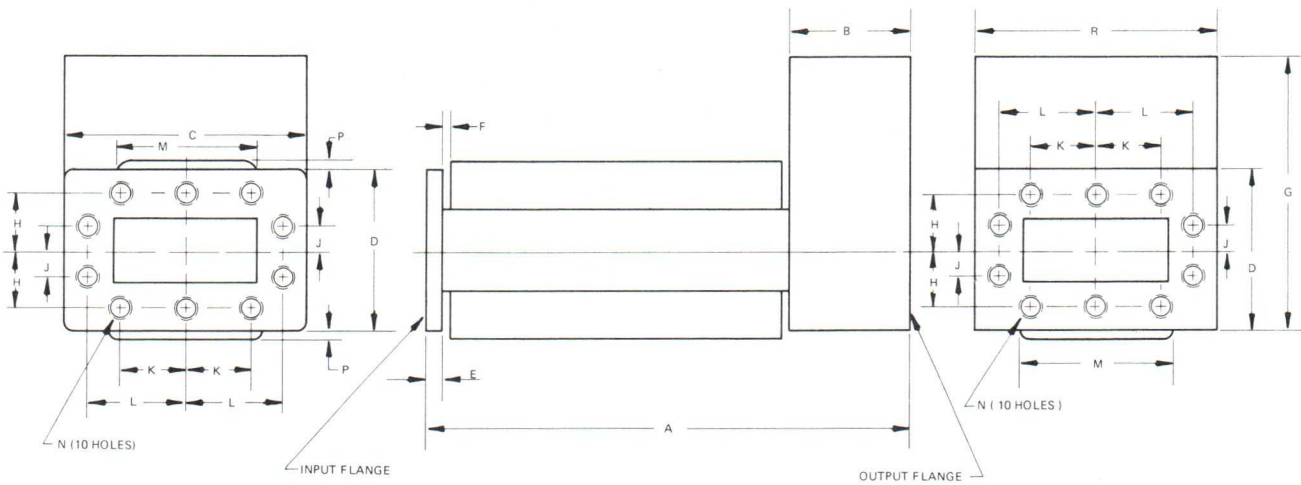
Mechanical Characteristics

Insertion Length	9.75 Inches
Weight	130 oz.
Finish	
Flanges (Input and Output)	Aluminum Iridite
Body	Black Lacquer

Environmental Characteristics

Temperature	
Operating	-40 to +70° C
Storage	-55 to +85° C

OUTLINE DRAWING

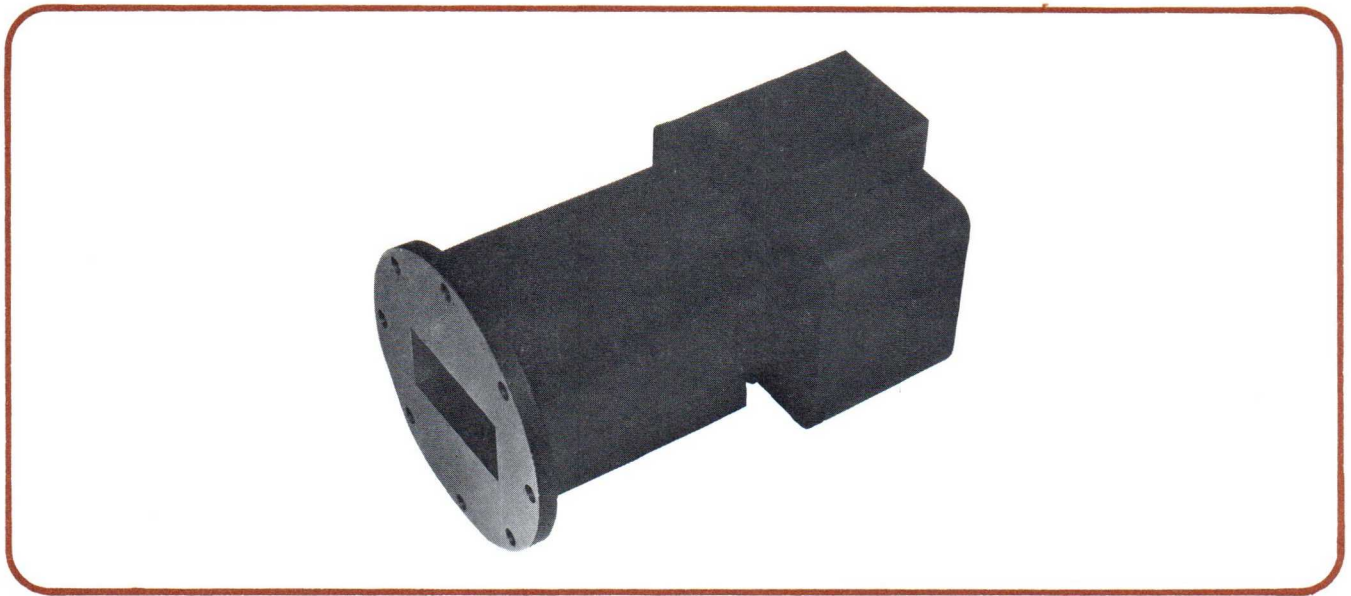


DIM.	LIMITS		
	MIN.	NOM.	MAX.
A	9.635	9.750	9.765
B	2.835	2.850	2.865
C	—	—	2.500
D	2.980	3.000	3.020
E	0.360	0.380	0.400
F	.125	—	—
G	—	—	4.500
H	1.159	1.164	1.169
J	0.576	0.578	0.580
K	1.279	1.281	1.283
L	1.912	1.914	1.916
M	—	—	4.00
N	¼ - 20 UNC-2B x .35 DP		
P	—	—	0.50
R	—	—	4.52

MA-31008C

C-Band Ferrite Diode Limiter

Bulletin 152



DESCRIPTION

Microwave Associates' new ferrite diode limiter (the MA-31008C) is an all solid-state, completely passive, superior performance device covering the 5.5 to 5.9 GHz frequency range. It is designed to provide receiver protection at all times — either from the transmitter or from other external sources. This device eliminates the need for power supplies and shutters. Since it is absorptive, four-port circulators and dummy loads are not required in some systems utilizing the new "FDL" as part of the duplexer.

APPLICATIONS

The MA-31008C is a boon to systems which require high power protection, long life and reliability.

FEATURES

- Extremely long lifetime
- Fast recovery time
- High power capabilities
- Absorptive



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SPECIFICATIONS

Electrical Characteristics

Frequency Range	5.4 - 5.9 GHz
Peak Power	15 kW
Average Power	15 W
Pulsewidth	5 μ s
Spike Leakage Amplitude	0.5 W
Spike Leakage Energy	0.05 ergs
Flat Leakage Power	40 mW
Recovery Time, 3 dB	0.1 μ s
Insertion Loss	0.8 dB
Low Level VSWR	1.4
Life	10,000 Hours

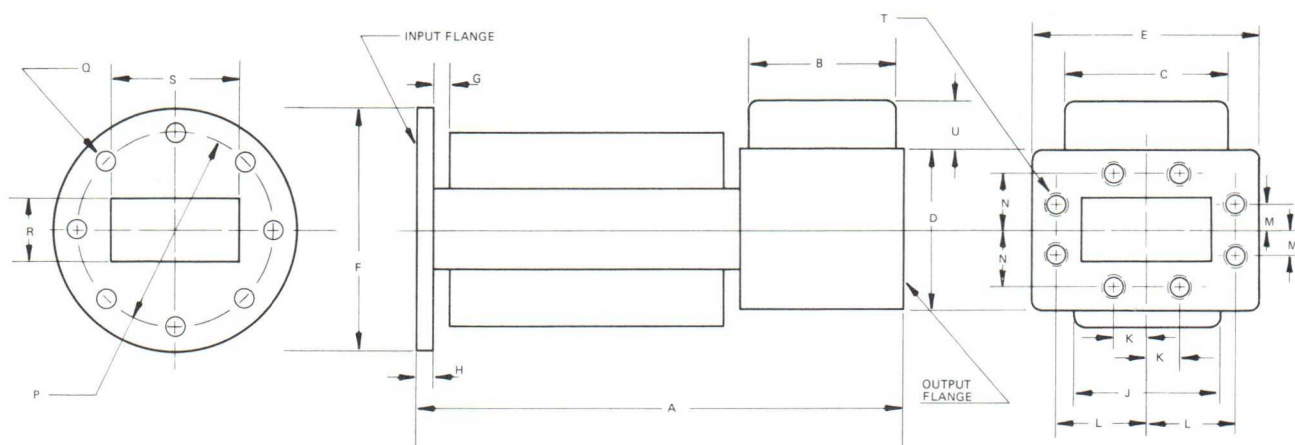
Mechanical Characteristics

Insertion Length	6.00 Inches
Weight	60 oz.
Finish	
Flanges (Input and Output)	Aluminum Iridite
Body	Black Lacquer

Environmental Characteristics

Temperature	
Operating	-40 to +70°C
Storage	-55 to +85°C

OUTLINE DRAWING



DIM.	LIMITS		
	MIN.	NOM.	MAX.
A	5.985	6.000	6.015
B	-	-	2.25
C	-	-	1.75
D	2.48	2.50	2.52
E	3.48	3.50	3.52
F	3.60	3.625	3.65
G	0.125	-	-
H	0.23	0.25	0.27
J	-	-	2.25
K	0.561	0.563	0.565
L	1.412	1.414	1.416
M	0.436	0.438	0.440
N	0.911	0.914	0.917
P	3.245	3.250	3.255
Q	.221D (8) HOLES SPACED EQUALLY WITHIN .005 μ f TRUE POSITION		
R	0.867	0.872	0.877
S	1.867	1.872	1.877
T	¼-20 UNC-2B .25 DEEP		
U	-	-	1.00



Microwave Associates, Inc.

South Avenue
Burlington, Mass. 01803
Tel. (617) 272-3000
TWX 710-332-6789
Western Union FAX
TELEX 94-9464