



Herotek

**MICROWAVE COMPONENTS  
& SUBSYSTEMS**  
100 KHz - 50 GHz



**Detectors • Limiters • Comb Generators • PIN Switches**  
**Impulse Generators • Multipliers • Amplifiers (Low Noise/Wideband)**  
**Transceiver Subassemblies • MIC Subassemblies**

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# ZERO-BIAS SCHOTTKY DIODE DETECTORS

100 KHz - 50 GHz

## FEATURES

- No Bias Required
  - Matched Input for Excellent VSWR\*\*
  - Extremely Flat Frequency Response\*\*
  - Very High Sensitivity (DZ Series)
- \*\* (DZR & DZM Series)



## APPLICATIONS

- Precision Test Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Radar or Missile Guidance Systems
- Lab Testing

## ENVIRONMENTAL RATINGS

Max Input Power..... 200mW CW (DZR & DZM Series)  
 100mW (DZ Series)

Temperature Range..... -55°C to +100°C (DZR Series)  
 -45°C to +85°C (DZM & DZ Series)

Shock..... 50G, 11 msec

Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL <sup>1,2</sup>	FREQUENCY RANGE	MAXIMUM VSWR	MAXIMUM FLATNESS (± dB)	LOW LEVEL SENSITIVITY (mV / μW)	CONNECTOR		SIZE (INCHES)		OUTLINE
					INPUT	OUTPUT	LENGTH	DIA	
DZR124AA	10 MHz – 12.4 GHz	1.25:1	0.3	0.5	SMA (M)	SMA (F)	1.05	0.32	A
DZR124AC					SMA (M)	SMC (M)	1.47	0.32	AC2
DZR185AA	10 MHz – 18.5 GHz	1.25:1	0.5	0.5	SMA (M)	SMA (F)	1.05	0.32	A
DZR185AC					SMA (M)	SMC (M)	1.47	0.32	AC2
DZR265AA	10 MHz – 26.5 GHz	1.3:1 (to 18.5 GHz)	0.5 (to 18.5 GHz)	0.5	SMA (M)	SMA (F)	1.05	0.32	A
DZR265AC		2.0:1 (to 26.5 GHz)	1.0 (to 26.5 GHz)		SMA (M)	SMC (M)	1.47	0.32	AC2
DZM020BB	100 KHz - 2.0 GHz	1.3:1	0.1 (per 100 KHz) 0.3 (overall)	0.5	BNC (M)	BNC (F)	2.48	0.68	BB <sup>3</sup>
DZM040AA	100 KHz - 4.0 GHz				SMA (M)	SMA (F)	1.05	0.32	A
DZM040BB					BNC (M)	BNC (F)	2.48	0.68	BB <sup>3</sup>
DZM124AA	10 MHz – 12.4 GHz	1.2:1 (to 4.5 GHz)	0.2 (per octave) 0.5 (overall)	0.5	SMA (M)	SMA (F)	1.05	0.32	A
DZM124AB		1.3:1 (to 7 GHz)			SMA (M)	BNC (F)	2.50	0.56	AB <sup>3</sup>
DZM124NB		1.4:1 (to 12.4 GHz)			Type N (M)	BNC (F)	2.46	0.75	NB <sup>3</sup>
DZM185AA	10 MHz – 18.5 GHz	1.2:1 (to 4 GHz) 1.5:1 (to 18.5 GHz)	0.2 (per octave to 8 GHz) 0.3 (for 10 MHz to 8 GHz) 0.5 (overall)	0.5	SMA (M)	SMA (F)	1.05	0.32	A
DZM185AB					SMA (M)	BNC (F)	2.50	0.56	AB1 <sup>3</sup>
DZM185AB2					SMA (M)	BNC (F)	1.89	0.39	AB2 <sup>3</sup>
DZM185AC					SMA (M)	SMC (M)	1.20	0.32	AC1
DZM185NB					Type N (M)	BNC (F)	2.46	0.75	NB <sup>3</sup>
DZM1857B					APC-7	BNC (F)	2.59	0.75	7B <sup>3</sup>

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: Matched pairs available at extra change for frequency response within +/- 0.3 dB below 18.5 GHz and +/- 0.5 dB from 18.5 to 26.5 GHz. Add "M" to end of model number.  
 Note 3: Consult factory for more details.



# ZERO-BIAS SCHOTTKY DIODE DETECTORS

100 KHz - 50 GHz

## Specifications: (@ +25°C)

MODEL <sup>1,2</sup>	FREQUENCY RANGE	MAXIMUM VSWR	MAXIMUM FLATNESS (± dB)	LOW LEVEL SENSITIVITY (mV / μW)	CONNECTOR		SIZE (INCHES)		OUTLINE
					INPUT	OUTPUT	LENGTH	DIA	
DZM265AA	10 MHz-26.5 GHz	1.2:1 (to 4 GHz) 1.5:1 (to 18 GHz) 1.8:1 (to 26.5 GHz)	0.2 (per octave to 8 GHz) 0.5 (for 10 MHz to 18 GHz) 1.0 (overall)	0.5	SMA (M)	SMA (F)	1.05	0.32	A
DZM265AB					SMA (M)	BNC (F)	1.89	0.39	AB2 <sup>3</sup>
DZM265AC					SMA (M)	SMC (M)	1.20	0.32	AC1
DZM2653B					APC3.5 (M)	BNC (F)	1.89	0.39	3B <sup>3</sup>
DZM2653C					APC3.5 (M)	SMC (M)	1.70	0.38	3C <sup>3</sup>
DZR400KA	10 MHz – 40 GHz	1.3:1 (to 18 GHz) 1.8:1 (to 40 GHz)	0.3 (to 18 GHz) 0.6 (to 26 GHz) 1.0 (to 40 GHz)	0.4	K* (M) (2.9mm)	SMA (F)	1.30	0.32	C1
DZR400KB					K* (M) (2.9mm)	BNC (F)	1.89	0.39	KB <sup>3</sup>
DZR400KC					K* (M) (2.9mm)	SMC (M)	1.35	0.32	KC <sup>3</sup>
DZR50024A	10 MHz – 50 GHz	1.3:1 (to 18 GHz) 1.6:1 (to 26 GHz) 1.8:1 (to 40 GHz) 2.1:1 (to 50 GHz)	0.3 (to 18 GHz) 0.6 (to 26 GHz) 1.0 (to 40 GHz)	0.5	2.4mm (M)	SMA (F)	1.32	0.32	24A <sup>3</sup>
DZR50024B					2.4mm (M)	BNC (F)	1.91	0.39	24B <sup>3</sup>
DZR50024C					2.4mm (M)	SMC (M)	1.36	0.32	24C <sup>3</sup>
DZ1018	1 GHz – 18.0 GHz	8.0:1 (Typical)	1.0 (Typical)	1.8	SMA (M)	SMA (F)	1.16	0.32	B
DZ1026	1 GHz – 26.0 GHz	8.0:1 (Typical)	1.5 (Typical)	1.6	SMA (M)	SMA (F)	1.16	0.32	B

\*K Connector Trademark of Wiltron Co.

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity

Note 2: Matched pairs available at extra charge for frequency response within +/- 0.3 dB below 18.5 GHz and +/- 0.5 dB from 18.5 to 26.5 GHz. Add "M" to end of model number.

Note 3: Consult factory for more details.

For Package Outlines see Outline Drawings Page



# HIGH SENSITIVITY ZERO-BIAS SCHOTTKY DIODE DETECTORS

100 KHz - 26.5 GHz

## FEATURES

- No Bias Required
- Matched Input for Excellent VSWR
- 3 dB More Sensitive (1.0 mV /  $\mu$ W) Than Traditional Matched Zero Bias Detectors
- Very Wide Dynamic Range, 10  $\mu$ V to 5V (For Input Power - 50 dBm to +20 dBm)
- Extremely Flat Frequency Response



## APPLICATIONS

- Precision Test Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Radar or Missile Guidance Systems
- Lab Testing

## ENVIRONMENTAL RATINGS

Max Input Power..... 200 mW  
 Temperature Range.....-55°C to +100°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000

## Specifications: (@ +25°C)

MODEL	FREQUENCY RANGE (GHz)	MAX VSWR	MAXIMUM FLATNESS ( $\pm$ dB)	LOW LEVEL SENSITIVITY (mV / $\mu$ W)	HIGH LEVEL OUTPUT @ +13dBm (V)	CONNECTOR		SIZE (INCHES)		OUTLINE
						INPUT	OUTPUT	LENGTH	DIA	
DHM020BB	100 KHz - 2.0 GHz	1.3:1	0.1 (per 100KHz) 0.3 (overall)	1.0	2	BNC (M)	BNC (F)	2.48	0.68	BB <sup>3</sup>
DHM040BB	100 KHz - 4.0 GHz									
DHM124AA	10 MHz - 12.4 GHz	1.4:1	0.5	1.0	2	SMA (M)	SMA (F)	1.05	0.32	A
DHM124AB						SMA (M)	BNC (F)	2.50	0.56	AB <sup>3</sup>
DHM124NB						N (M)	BNC (F)	2.46	0.75	NB <sup>3</sup>
DHMA18AB	10 MHz - 18.5 GHz	1.5:1	0.5	1.0	2	SMA (M)	BNC (F)	1.89	0.39	AB2 <sup>3</sup>
DHM185AB								2.50	0.56	AB1 <sup>3</sup>
DHM185AC						SMA (M)	SMC (M)	1.20	0.32	AC1
DHM185AA	10 MHz - 18.5 GHz	1.4:1	0.5	1.0	2	SMA (M)	SMA (F)	1.05	0.32	A
DHM185NB						N (M)	BNC (F)	2.46	0.75	NB <sup>3</sup>
DHM1857B						APC-7	BNC (F)	2.59	0.75	7B <sup>3</sup>
DHM265AA	10 MHz - 26.5 GHz	1.5:1 (to 18.5 GHz) 2:1 (to 26.5 GHz)	0.5 (to 18.5 GHz) 1.0 (to 26.5 GHz)	1.0	2	SMA (M)	SMA (F)	1.05	0.32	A
DHMA26AB							BNC (F)	1.89	0.39	AB2 <sup>3</sup>
DHM265AC							SMC (M)	1.20	0.32	AC1
DHM2653B							APC 3.5 (M)	BNC (F)	1.89	0.39
DHM2653C			SMC (M)	1.70	0.38	3C <sup>3</sup>				

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity  
 Note 2: Matched pairs available at extra charge for frequency response within +/- 0.3 dB below 18.5 GHz and +/- 0.5 dB from 18.5 to 26.5 GHz. Add "M" to end of model number.  
 Note 3: Consult Factory for more details.

For Package Outlines see Outline Drawings Page



# BIASED SCHOTTKY DIODE DETECTORS

## MULTI-DIODE HIGH SENSITIVITY DQS & DDS SERIES

0.1 - 18 GHz

### FEATURES

- Extremely High Sensitivity
- Low VSWR In Square Law Range
- Very Flat Frequency Response
- Hermetically-Sealed Module



### APPLICATIONS

- Radar Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Missile Guidance Systems

### ENVIRONMENTAL RATINGS

Max Input Power ..... 100mW CW  
 Operating Temperature Range.....-55°C to +125°C  
 Storage Temperature Range.....-55°C to +150°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

### Specifications: (@ +25°C, up to -20dBm Power Input)

MODEL <sup>1</sup>	FREQ RANGE (GHz)	MIN SENSITIVITY K (mV / mW)	TYP <sup>2</sup> TSS (+dBm)	MAX FLATNESS (± dB)	MAX VSWR	NOMINAL BIAS (µA)	TYPICAL OUTPUT		PACKAGE <sup>3</sup> STYLE
							RESISTANCE (OHMS)	CAPACITANCE (pF)	
DQS004	0.1 - 4.0	3800	-55	0.4	2:1	100	1600	100	C
		2000	-52	0.3	1.5:1	180	800		
DQS104	1.0 - 4.0	3800	-55	0.4	2:1	100	1600	20	C
		2000	-52	0.3	1.5:1	180	800		
DQS010	0.1 - 10.0	3500	-55	0.8	2.5:1	100	1600	100	C
		1800	-52	0.6	1.8:1	180	800		
DQS110	1.0 - 10.0	3300	-54	0.8	2.5:1	100	1600	20	C
		1800	-52	0.6	1.8:1	180	800		
DDS018	0.1 - 18.0	2200	-53	1.0	4.5:1	100	800	100	B
		1500	-51	0.8	2.5:1	200	400		
DDS118	1.0 - 18.0	2200	-53	1.0	4.5:1	100	800	20	B
		1500	-51	0.8	2.5:1	200	400		
DDS218	2.0 - 18.0	2200	-53	1.0	4.5:1	100	800	10	B
		1500	-51	0.8	2.5:1	200	400		

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: TSS based on 2 MHz video bandwidth and 2 dB amplifier NF.  
 Note 3: See detector package outlines.

For Outlines see Outline Drawings Page



# BIASED SCHOTTKY DIODE DETECTORS

## SINGLE-DIODE GENERAL PURPOSE DS SERIES

0.1 - 40 GHz

### FEATURES

- Low Output Resistance (350 Ohm Typical)
- Optimized Performance In Octave-Band Models
- Extremely Wideband and High Frequency Performance Available In a Single Unit (1 to 40 GHz)
- Hermetically-Sealed Module



### APPLICATIONS

- Radar Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Missile Guidance Systems

### ENVIRONMENTAL RATINGS

Max Input Power ..... 100mW CW  
 Operating Temperature Range.....-55°C to +125°C  
 Storage Temperature Range.....-55°C to +150°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

### Specifications: (@ +25°C, 100 µA Bias, up to -20dBm Power Input)

MODEL <sup>1</sup>	FREQUENCY RANGE (GHz)	MINIMUM SENSITIVITY K (mV / mW)	TYPICAL TSS <sup>2</sup> (dBm)	MAXIMUM FLATNESS (+/- dB)	TYPICAL OUTPUT CAPACITANCE (pF)	PACKAGE <sup>3</sup> STYLE
DS0105	0.1 - 0.5	1800	-52	0.5	100	C
DS0510	0.5 - 1.0	1800	-52	0.5	50	C
DS1020	1.0 - 2.0	2000	-52	0.5	20	C
DS2040	2.0 - 4.0	2000	-52	0.5	10	C
DS4080	4.0 - 8.0	2000	-52	0.5	10	C
DS8012	8.0 - 12	1800	-52	0.5	10	B
DS8016	8.0 - 16	1800	-52	0.6	10	B
DS8018	8.0 - 18	1600	-52	0.7	10	B
DS1826	18.0 - 26	1500	-51	1.0	10	B
DS1840	18.0 - 40	1000	-48	2.0	10	C1
DS2640	26.0 - 40	1000	-48	1.5	10	C1
DS1018	1.0 - 18	1600	-52	1.0	20	B
DS2018	2.0 - 18	1600	-52	1.0	10	B
DS1026	1.0 - 26	1400	-50	1.5	20	B
DS2026	2.0 - 26	1400	-50	1.5	10	B
DS1-40	1.0 - 40	1000	-48	2.0	20	C1
DS2-40	2.0 - 40	1000	-48	2.0	10	C1

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.

Note 2: TSS based on 2 MHz video bandwidth and 2 dB amplifier NF.

Note 3: See detector package outlines.

For Package Outlines see Outline Drawings Page



# LIMITER-SCHOTTKY DIODE DETECTORS

## DSL SERIES

1 - 18 GHz

### FEATURES

- 1 Watt CW, 100 Watts Peak Power Capability
- Optimum Limiter-Detector Interface Design
- Flat Frequency Response
- High Output Sensitivity
- Hermetically-Sealed Module



### APPLICATIONS

- Radar Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Missile Guidance Systems

### ENVIRONMENTAL RATINGS

Max Input Power..... 1 Watt CW  
 100 Watt Peak Power Capability  
 Operating Temperature Range.....-55°C to +125°C  
 Storage Temperature Range.....-55°C to +150°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

### Specifications: (@ +25°C, Up to -20dBm Power Input)

MODEL <sup>1</sup>	FREQUENCY RANGE (GHz)	MINIMUM SENSITIVITY K (mV / mW)	TYPICAL TSS <sup>2</sup> (dBm)	TYPICAL FLATNESS (+/- dB)	NOMINAL BIAS (µA)	TYPICAL OUTPUT CAPACITANCE (pF)	PACKAGE <sup>3</sup> STYLE
DSL102	1.0 – 2.0	1500	-51	0.5	100	20	C
DSL204	2.0 – 4.0	1500	-51	0.5	100	10	C
DSL408	4.0 – 8.0	1500	-51	0.5	100	10	C
DSL812	8.0 – 12	1200	-50	0.5	100	10	C
DSL816	8.0 – 16	1200	-50	0.8	100	10	C
DSL818	8.0 – 18	1000	-49	0.8	150	10	C
DSL718	7.0 – 18	1000	-49	0.8	150	10	C
DSL218	2.0 – 18	1000	-49	1.25	150	10	C

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: TSS based on 2 MHz video bandwidth and 2 dB amplifier NF.  
 Note 3: See detector package outlines.

For Package Outlines see Outline Drawings Page



### FEATURES

- No Bias Required
- Very Low Output Resistance (125 Ohm Typical)
- Fast Pulse Detecting Capability (Less Than 5 nsec Typical Rise Time)
- Broadband, Flat Frequency Response
- Excellent Temperature Stability ( $\pm 0.5$  dB Typical Over Temperature Extremes)
- Very Low 1/f Noise



### APPLICATIONS

- Radar Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Missile Guidance Systems

### ENVIRONMENTAL RATINGS

Max Input Power..... 50 mW CW  
 Operating Temperature Range.....-55°C to +100°C  
 Storage Temperature Range.....-55°C to +100°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

### Specifications: (@ +25°C, Up to -20 dBm Power Input)

MODEL <sup>1</sup>	FREQUENCY RANGE (GHz)	MINIMUM SENSITIVITY K (mV / mW)	TYPICAL TSS <sup>2</sup> (dBm)	MAXIMUM FLATNESS (+/- dB)	TYPICAL VSWR	TYPICAL OUTPUT CAPACITANCE (pF)	PACKAGE <sup>3</sup> STYLE
DT0105 DT0110	0.1 - 0.5 0.1 - 1.0	1000 800	-51 -50	0.75 0.75	2.0:1 2.0:1	200 200	B
DT0510 DT0520	0.5 - 1.0 0.5 - 2.0	1000 800	-51 -50	0.5 0.7	2.0:1 2.0:1	50 50	B
DT1020 DT1040	1.0 - 2.0 1.0 - 4.0	1000 800	-51 -50	0.5 0.7	2.0:1 2.5:1	20 20	B
DT1080 DT1012	1.0 - 8.0 1.0 - 12.0	750 750	-50 -50	0.8 0.85	3.5:1 3.5:1	20 20	B
DT2040 DT2080	2.0 - 4.0 2.0 - 8.0	1000 800	-51 -50	0.5 0.75	2.0:1 3.0:1	10 10	B
DT4080 DT7011	4.0 - 8.0 7.0 - 11.0	900 800	-51 -50	0.6 0.5	2.5:1 2.0:1	10 10	B
DT6018 DT8018	6.0 - 18.0 8.0 - 18.0	700 750	-50 -50	0.9 0.8	3.0:1 3.0:1	10 10	B
DT8012 DT8016	8.0 - 12.0 8.0 - 16.0	800 800	-50 -50	0.5 0.7	2.5:1 2.5:1	10 10	B
DT1218 DT1018	12.0 - 18.0 1.0 - 18.0	750 700	-50 -50	0.7 1.0	2.5:1 3.5:1	10 20	B
DT2018 DT1826	2.0 - 18.0 18.0 - 26.5	700 400	-50 -47	1.0 1.0	3.5:1 3.0:1	10 10	B
DT1026 DT2026	1.0 - 26.5 2.0 - 26.5	400 400	-47 -47	1.5 1.5	3.5:1 3.5:1	20 10	B
DT1840 DT2640	18.0 - 40.0 26.0 - 40.0	300 300	-46 -46	1.75 1.5	4.0:1 4.0:1	10 10	C1
DT1-40 DT2-40	1.0 - 40.0 2.0 - 40.0	250 250	-45 -45	2.0 2.0	4.0:1 4.0:1	20 10	C1

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: TSS based on 2 MHz video bandwidth and 2 dB amplifier NF.  
 Note 3: See detector package outlines.

For Package Outlines see Outline Drawings Page





# LIMITER-PROTECTED TUNNEL DIODE DETECTORS

0.5 - 18 GHz

## FEATURES

- Limiter Protected Up to 1 Watt CW
- Broadband Flat Frequency Response
- Optimum Limiter-Detector Interface Design
- Hermetically-Sealed Package
- Fast Pulse Detecting Capability (less than 5nsec Typical Rise Time)
- Excellent Temperature Stability (+/- 0.5dB Typical over Temperature Extremes)



## APPLICATIONS

- Radar Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Missile Guidance Systems

## ENVIRONMENTAL RATINGS

Max Input Power..... 1 Watt CW  
 Operating Temperature Range.....-55°C to +100°C  
 Storage Temperature Range.....-55°C to +100°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C, Up to -20 dBm Power Input)

MODEL <sup>1</sup>	FREQUENCY RANGE (GHz)	TYPICAL SENSITIVITY K (mV / mW)	TYPICAL <sup>2</sup> TSS (dBm)	MAXIMUM FLATNESS (+/- dB)	MAXIMUM INPUT POWER (dBm)	TYPICAL OUTPUT CAPACITANCE (pF)	PACKAGE <sup>3</sup> STYLE
DTL0520	0.5 – 2.0	800	-50	1.0	+ 27	50	B
DTL0520H	0.5 – 2.0	500	-48	1.0	+ 30	50	C
DTL2018	2.0 – 18	600	-49	1.2	+ 27	10	B
DTL2018H	2.0 – 18	300	-46	1.5	+30	10	C
DTL1018	1.0 – 18	600	-49	1.5	+27	20	B
DTL1018H	1.0 – 18	300	-46	1.5	+ 30	20	C

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: TSS based on 2 MHz video bandwidth and 2 dB amplifier NF.  
 Note 3: See detector package outlines.

For Package Outlines see Outline Drawings Page

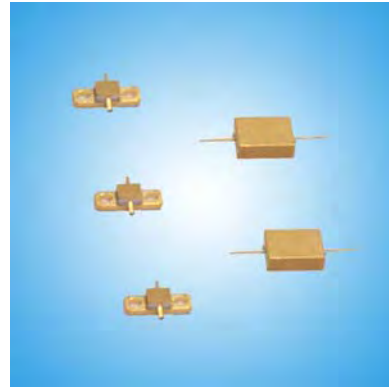


# TUNNEL (BACK) DIODE DETECTORS FOR STRIPLINE/MICROSTRIP ASSEMBLIES

0.1 - 18 GHz

## FEATURES

- Drop-In Miniature Construction
- Very Low Output Resistance
- Fast Pulse Detecting Capability (less than 5nsec Typical Rise Time)
- Broadband, Flat Frequency Response
- Excellent Temperature Stability
- Very Low 1/f Noise



## APPLICATIONS

- Radar Equipment
- Transmitter Monitoring
- Power and Signal Monitoring
- Missile Guidance Systems

## ENVIRONMENTAL RATINGS

Max Input Power.....+17dBm or 50 mW  
 Operating Temperature Range.....-54°C to +100°C  
 Storage Temperature Range.....-54°C to +100°C  
 Soldering Temperate..... 230°C, 5 sec

## Specifications: (@ +25°C, Up to -20 dBm Power Input)

MODEL <sup>1,3</sup>	FREQ. RANGE (GHz)	MINIMUM SENSITIVITY K (mV / mW)	TYPICAL <sup>2</sup> TSS (dBm)	MAXIMUM FLATNESS (+/-dB)	TYPICAL VSWR	NOMINAL OUTPUT		PACKAGE <sup>3</sup> STYLE
						CAP. (pF)	RES. (OHM)	
DDT002 DDT004	0.1 - 2.0 0.1 - 4.0	1000 900	-51 -50	0.3 0.5	1.5:1 2:1	150 150	250 250	K, Z1 K, Z1
DT0105 DT0110	0.1 - 0.5 0.1 - 1.0	1000 800	-51 -50	0.75 0.75	2:1 2:1	150 150	150 130	K K
DT0520 DT2060	0.5 - 2.0 2.0 - 6.0	800 800	-50 -50	0.7 0.7	3:1 4:1	50 10	130 130	K K, Z1
DT2080 DT2012	2.0 - 8.0 2.0 - 12.0	750 700	-50 -50	1.0 1.2	4:1 4:1	10 10	130 130	K, Z1 K, Z1
DT6018 DT2018 DT1018	6.0 - 18.0 2.0 - 18.0 1.0 - 18.0	600 600 550	-49 -49 -48	1.0 1.5 1.5	3:1 4:1 4:1	10 10 20	130 130 130	K, Z1 K, Z1 K, Z1

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: TSS based on 2 MHz video bandwidth and 2 dB amplifier NF.  
 Note 3: Add "K" or "Z1" to the end model number for package style desired.

For Package Outlines see Outline Drawings Page



# TUNNEL DIODE DETECTOR WITH INTEGRAL PREAMPLIFIER

1.0 – 18.0 GHz

## FEATURES

- Extended TSS to -60 dBm Minimum
- Subminiature Sizes for Drop-In Applications
- Extremely Low Power Consumption (0.1 Watt Typical)
- Matched Input for Low VSWR (2.0:1 Max)
- Flat Frequency Response (+/- 1 dB Typical)
- High Voltage Sensitivity (K = 10000 mV/mW Min)
- Hermetically Sealed Package for Military Application



## APPLICATIONS

- Direct detection for very weak signals
- Extended radar detection range
- Ideal RF leakage monitoring

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW CW  
 Operating Temperature..... -55°C to +100°C  
 Storage Temperature..... -55°C to +100°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL <sup>1,4</sup>	FREQUENCY RANGE (GHz)	MINIMUM <sup>2</sup> SENSITIVITY K (mV / mW)	MINIMUM <sup>3</sup> TSS (dBm)	MAXIMUM FLATNESS (+ dB)	MAXIMUM VSWR	OUTLINE <sup>5</sup>
DTA182544	1 – 18	10000	-60	1.5	2:1	1A, L3

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: Sensitivity K for square law range up to -25 dBm input.  
 Note 3: TSS based on 2 MHz video bandwidth and 2 dB video amplifier.  
 Note 4: DC bias requirement: +3.2 +/- 0.2 V, 30 mA nominal. (To avoid permanent damage the bias voltage shall not be greater than +3.4 V)  
 Note 5: Standard package style 1A add letter "L3" to the end of model number for subminiature package.

For Package Outlines see Outline Drawings Page



# TUNNEL DIODE DETECTORS

## WITH PREAMPLIFIERS FOR VERY LOW SIGNALS

1.0 - 40.0 GHz

### FEATURES

- Extended TSS to -60 dBm, -70 dBm or -80 dBm
- Octave Band or Wide Band up to 40 GHz
- Very High Voltage Sensitivity of 1000mV/μW (-80 dBm model)
- Stable and Quiet Low 1/f Noise (output resistance 100-200 ohms typical)
- Matched Input for Low VSWR (2.0:1 Maximum)
- Extremely Fast Pulse Response (1 nsec rise time typical)
- Flat Frequency Response
- Hermetically Sealed Package for Military Application
- Removable Connectors for MIC Assembly



### APPLICATIONS

- Direct detection for very extremely low signals
- Extended radar detection range
- Ideal RF leakage monitoring

### ENVIRONMENTAL RATINGS

Max Input Power.....100mW CW for 1-18 GHz  
 40mW CW for all other models  
 Operating Temperature..... -55°C to +100°C  
 Storage Temperature..... -55°C to +100°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

### Specifications: (@ +25°C)

MODEL <sup>1</sup>	FREQ RANGE (GHz)	MINIMUM VOLTAGE SENSITIVITY K (mV / μW)	TYP TSS <sup>2</sup> (dBm)	TYP FLATNESS (+/- dB)	MAX INPUT VSWR	NOM DC <sup>3</sup> CURRENT @ +12 (mA)	OUTLINE
DTA1-1860A DTA1-1870A DTA1-1880A	1-18	10 100 1000	-60 -70 -80	1.0 1.5 2.0	2:1	30 60 100	1D, L3 <sup>4</sup> 1D 2A
DTA182660A DTA182670A DTA182680A	18-26	10 100 1000	-60 -70 -80	1.0 1.5 2.0	2:1	120 200 300	1D 1D 2A
DTA264060A DTA264070A DTA264080A	26-40	10 100 1000	-60 -70 -80	2.0 2.5 3.0	2:1	150 240 350	1C 2C 2C
DTA184060A DTA184070A DTA184080A	18-40	10 100 1000	-60 -70 -80	2.5 3.0 3.5	2:1	150 240 350	1C 2C 2C

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: TSS based on 2 MHz video bandwidth and 2 dB video amplifier.  
 Note 3: Options available for other bias voltages, i.e. +15, +8 or +5 Volts.  
 Note 4: Standard Outline is 1D for DTA1-1860A. If L3 outline is desired, add L3 to the end of the model number. Note that bias voltage 3.2 ± 0.2 V for L3 option.

For Package Outlines see Outlines Drawing Page



# MICROWAVE PULSE / CW POWER MONITORS

1.0 - 18 GHz

## FEATURES

- 1 nsec Typical Rise Time Response (into 50 Ohm load through 50 Ohm cable)
- Built-in 1 Watt CW Protection Circuit
- Flat Frequency Response ( $\pm 0.5$  dB typical)
- Matched Input for Low VSWR (2:1 max for power up to +10dBm)
- Stable Output Over Temperature Range ( $\pm 0.5$  dB typical,  $-15^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ )
- Miniature Size Available
- Hermetically Sealed Module for Ruggedness



## APPLICATIONS

- Direct Measurement of Pulse Rise Time, Pulse Width and Pulse Power
- CW Power Measurements
- Fast Feedback Leveling Circuit

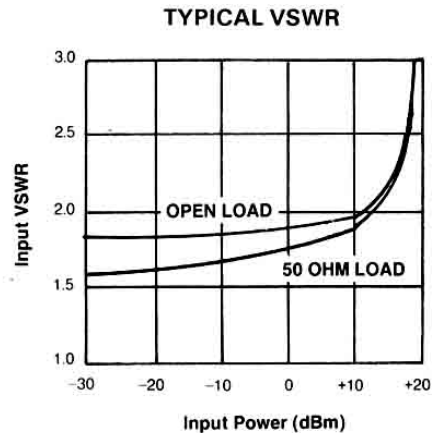
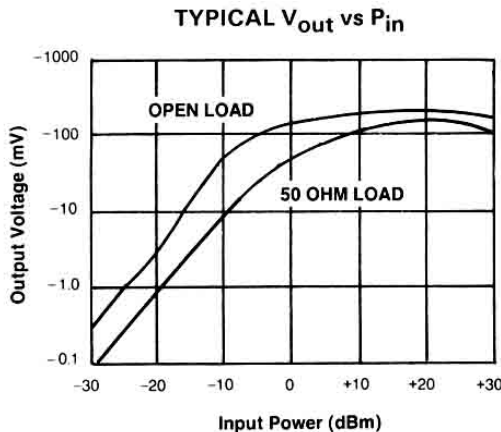
## ENVIRONMENTAL RATINGS

Max Input Power..... 1 Watt CW or pulse  
(built-in protection circuit)  
 Operating Temperature Range..... $-55^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$   
 Storage Temperature Range..... $-55^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$   
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ $+25^{\circ}\text{C}$ )

MODEL <sup>1</sup>	FREQUENCY RANGE <sup>2</sup> (GHz)	OUTPUT		MAXIMUM INPUT POWER <sup>3</sup> (WATTS)	MAXIMUM VSWR <sup>4</sup>	CONNECTOR		SIZE (INCHES)	
		TYPICAL SENSITIVITY K (mV / mW)	RISE TIME (nsec)			INPUT	OUTPUT	LENGTH	DIA.
DTM180AA	1.0 – 18.0	300 (open load) 90 (50 ohm load)	2 (max) 1 (typical; 50 ohm, 10 pF max load)	1	2:1	SMA (M)	SMA (F)	1.15	0.32
DTM180AB				1	2:1	SMA (M)	BNC (F)	2.46	0.56
DTM180NB				1	2:1	Type N (M)	BNC (F)	2.46	0.75
DTM1807B				1	2:1	APC-7	BNC (F)	2.60	0.75

Note 1: Negative output polarity standard. Add "P" to end of model number for positive output polarity.  
 Note 2: Usable over 0.5 to 20 GHz.  
 Note 3: CW or pulse.  
 Note 4: VSWR listed for up to +10dBm input.





# PIN DIODE LIMITERS

LOW LEAKAGE LS SERIES

1W CW, 0.1 - 18 GHz

## FEATURES

- Low Limiting Threshold (+6 dBm Typical)
- Low Leakage Level (+13 dBm Typical)
- 1 Watt CW and 200 Watt Peak (1  $\mu$ sec) Power Handling Capability
- Built-In DC Block @ Input and Output
- Hermetically Sealed Module
- Typical Recovery Time is Less Than 10  $\mu$ sec



## APPLICATIONS

- Front End Protection for LNA's
- Power Leveling (Limiting)
- Receiver Protection

## ENVIRONMENTAL RATINGS

Max Input Power.....1 Watt CW &  
 200 Watt Peak ( $\mu$ sec) Power Handling Capability  
 Operating Temperature Range.....-55°C to +125°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQUENCY RANGE (GHz)	MAXIMUM INSERTION LOSS (dB)	MAX VSWR	TYP LIM THRESHOLD (dBm)	MAX LEAKAGE @ 1W CW INPUT (dBm)	PACKAGE STYLE
LS0105	0.1 – 0.5	0.4	1.3:1	+6	+14	B, BF, L
LS0110	0.1 – 1.0	0.5	1.4:1	+6	+14	B, BF, L
LS0120	0.1 – 2.0	0.6	1.4:1	+6	+14	B, BF, L
LS0140	0.1 – 4.0	0.8	1.5:1	+6	+14	B, BF, L
LS01012	0.1 – 12.0	1.7	1.6:1	+6	+14	B, BF, L
LS01018	0.1 – 18.0	2.2	2.0:1	+6	+14	B, BF, L
LS0510	0.5 – 1.0	0.5	1.4:1	+6	+14	B, BF, L
LS0520	0.5 – 2.0	0.6	1.4:1	+6	+14	B, BF, L
LS0540	0.5 – 4.0	0.7	1.4:1	+6	+14	B, BF, L
LS0560	0.5 – 6.0	1.2	1.5:1	+6	+14	B, BF, L
LS05012	0.5 – 12.0	1.6	1.6:1	+6	+14	B, BF, L
LS05018	0.5 – 18.0	2.0	2.0:1	+6	+14	B, BF, L
LS1020	1.0 – 2.0	0.6	1.4:1	+6	+14	B, BF, L
LS1060	1.0 – 6.0	1.2	1.5:1	+6	+14	B, BF, L
LS1012	1.0 – 12.0	1.6	1.6:1	+6	+14	B, BF, L
LS1018	1.0 – 18.0	2.0	2.0:1	+6	+14	B, BF, L
LS2040	2.0 – 4.0	0.7	1.4:1	+6	+14	B, BF, L
LS2060	2.0 – 6.0	1.2	1.5:1	+6	+14	B, BF, L
LS2080	2.0 – 8.0	1.3	1.6:1	+6	+14	B, BF, L
LS2018	2.0 – 18.0	2.0	2.0:1	+6	+14	B, BF, L
LS4080	4.0 – 8.0	1.3	1.5:1	+6	+13	B, BF, L
LS6018	6.0 – 18.0	2.0	2.0:1	+6	+13	B, BF, L
LS7012	7.0 – 12.0	1.6	1.6:1	+6	+13	B, BF, L
LS8016	8.0 – 16.0	1.8	1.8:1	+6	+13	B, BF, L
LS8018	8.0 – 18.0	2.0	2.0:1	+6	+13	B, BF, L
LS1118	11.0 – 18.0	2.0	2.0:1	+6	+13	B, BF, L

Note 1: Insertion loss and VSWR tested @ -10dBm

Note 2: Minimum power handling capability -1 Watt CW or 200 Watts peak (1  $\mu$ sec, 0.1% duty) derated to 20% @ +125°C.

Note 3: Standard outline in "B" style add suffix "BF" or "L" to the model number for optional outlines.

Consult factory for higher power limiters (up to 25 Watt CW or 1 KWatt pulse peak power)

For Package Outlines see Outline Drawings Page



# PIN DIODE LIMITERS

## PASSIVE PIN DIODE TYPE, LP SERIES

0.5 - 18 GHz

### FEATURES

- Low Insertion Loss
- 1 Watt CW and 100 Watt Peak (1  $\mu$ sec) Power Handling Capability
- Fast Response & Short Recovery Time (10 to 20 nsec typical)
- Built-In DC Return
- Hermetically Sealed Module
- Moderate Cost



### APPLICATIONS

- Receiver Protection
- Power Leveling (Limiting)

### ENVIRONMENTAL RATINGS

Max Input Power..... 1 Watt CW & 100 Watt Peak ( $\mu$ sec) Power Handling Capability  
 Operating Temperature Range.....-55°C to +125°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

### Specifications: (@ +25°C)

MODEL	FREQUENCY RANGE (GHz)	MAXIMUM INSERTION LOSS (dB)	MAX VSWR	TYP LIM THRESHOLD (dBm)	MAX LEAKAGE @ 1W CW INPUT (dBm)	PACKAGE STYLE
LP0510	0.5 – 1.0	0.4	1.3:1	+9	+20	B, BF, L
LP0520	0.5 – 2.0	0.5	1.3:1	+9	+20	B, BF, L
LP1020	1.0 – 2.0	0.4	1.3:1	+9	+19	B, BF, L
LP2040	2.0 – 4.0	0.5	1.4:1	+9	+19	B, BF, L
LP2080	2.0 – 8.0	1.2	1.5:1	+9	+19	B, BF, L
LP05018	0.5 – 18.0	1.8	2.0:1	+9	+20	B, BF, L
LP1018	1.0 – 18.0	1.8	2.0:1	+9	+20	B, BF, L
LP2018	2.0 – 18.0	1.8	2.0:1	+9	+20	B, BF, L
LP4080	4.0 – 8.0	1.2	1.5:1	+9	+19	B, BF, L
LP7012	7.0 – 12.0	1.5	1.6:1	+9	+19	B, BF, L
LP8016	8.0 – 16.0	1.6	1.8:1	+9	+19	B, BF, L
LP8018	8.0 – 18.0	1.8	2.0:1	+9	+19	B, BF, L
LP1118	11.0 – 18.0	1.8	2.0:1	+9	+19	B, BF, L

Note 1: Insertion loss and VSWR tested @ -10dBm

Note 2: Minimum power handling capability -1 Watt CW or 100 Watts peak (1  $\mu$ sec, 0.1% duty) derated to 20% @ +125°C.

Note 3: Standard outline in "B" style add suffix "BF" or "L" to the model number for optional outlines.

Consult factory for higher power limiters (up to 25 Watt CW or 1 KWatt pulse peak power)

For Package Outlines see Outline Drawings Page



# PIN DIODE TRANSFER SWITCHES

0.5 - 18 GHz

## FEATURES

- Low Insertion Loss
- Multi Octave Band
- Integral Driver
- Single TTL Control Input



## APPLICATIONS

- Communications Systems
- EW Systems
- Test Equipment
- Electronic Simulators
- Modulators

## ENVIRONMENTAL RATINGS

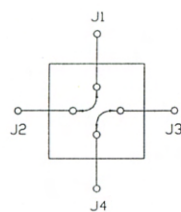
Max Input Power.....1 W Average  
 Operating Temperature Range.....-55°C to +95°C  
 Storage Temperature Range.....-65°C to +120°C

## Specifications: (@ +25°C, 0 dBm)

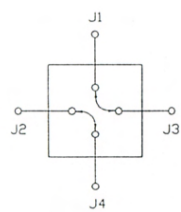
MODEL	FREQUENCY RANGE (GHz)	MAXIMUM INSERTION LOSS (dB)	MINIMUM ISOLATION (dB)	MAXIMUM VSWR	TYPICAL SWITCHING SPEED
STD0520A	0.5 – 2.0	1.3	50	1.5:1	1 μsec (50% of TTL to 90% of RF)
STD2080A	2.0 – 8.0	1.5	45	1.8:1	
STD8018A	8.0 – 18	2.5	35	2:1	
STD2018A	2.0 – 18	2.5	35	2:1	
STD0518A	0.5 – 18	2.7	35	2:1	

### NOTES:

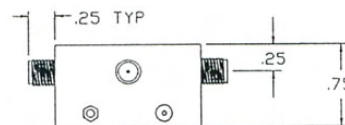
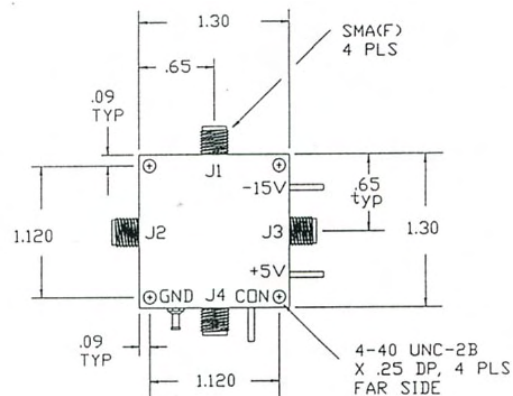
1. DRIVER POWER SUPPLY  
 +5V ± 0.2V DC, 100 mA NOMINAL  
 -15V ± 0.5V DC, 50 mA NOMINAL
2. MODE CONTROL



TTL "LOW"



TTL "HIGH"



OUTLINE





# SPST PIN DIODE SWITCHES

0.5 - 18 GHz

## FEATURES

- Field Removable Connectors for Drop-In Assembly
- High Isolation Models Available
- Wideband Performance
- Option for Integral Driver



## APPLICATIONS

- Communications Systems
- EW Systems
- Test Equipment
- Electronic Simulators
- Modulators

## ENVIRONMENTAL RATINGS

Max Input Power.....1 W Average  
 Operating Temperature Range.....-55°C to +125°C  
 Storage Temperature Range.....-65°C to +125°C

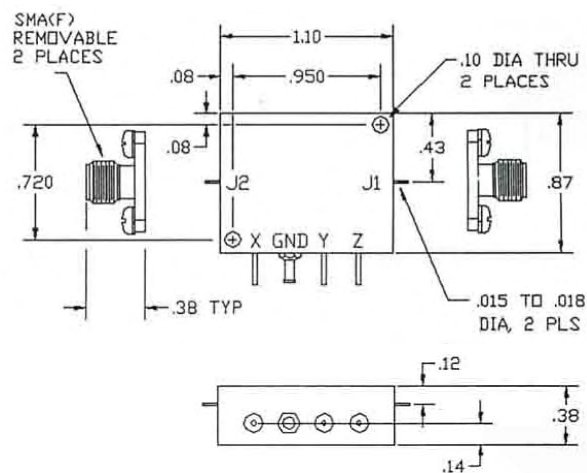
## Specifications: (@ +25°C, 0 dBm)

MODEL	MAXIMUM INSERTION LOSS (dB)			MINIMUM ISOLATION (dB)	MAXIMUM VSWR	INTEGRAL WITH DRIVER
	0.5 – 2.0 GHz	2.0 – 8.0 GHz	8.0 – 18 GHz			
S1S0518A4	1.2	1.8	2.5	40	2:1	NO
S1D0518A4	1.2	1.8	2.5	40	2:1	YES
S1S0518A6	1.4	2.0	3.0	60	2:1	NO
S1D0518A6	1.4	2.0	3.0	60	2:1	YES
S1S2018A4	--	1.6	2.2	40	2:1	NO
S1D2018A4	--	1.6	2.2	40	2:1	YES
S1S2018A5	--	1.8	2.5	55	2:1	NO
S1D2018A5	--	1.8	2.5	55	2:1	YES

### NOTES:

1. Typical switching speed: 50 nsec.
2. Isolation ports are reflective
3. Power supply and mode control:

- Unit without driver
  - X....No connection
  - Y....Bias input:
    - 10V for insertion loss
    - +60 mA for isolation
  - Z....No connection
- Unit with integral driver
  - X....+5 ± 0.2 V DC, 100 mA nominal
  - Y....TTL control input:
    - "Low" for insertion loss
    - "High" for isolation
  - Z....-15 ± -0.5V DC, 100 mA nominal





# SPDT PIN DIODE SWITCHES

0.5 - 18 GHz

## FEATURES

- Field Removable Connectors for Drop-In Assembly
- High Isolation Models Available
- Wideband Performance
- Option for Integral Driver



## APPLICATIONS

- Communications Systems
- EW Systems
- Test Equipment
- Electronic Simulators
- Modulators

## ENVIRONMENTAL RATINGS

Max Input Power.....1 W Average  
 Operating Temperature Range.....-55°C to +125°C  
 Storage Temperature Range.....-65°C to +125°C

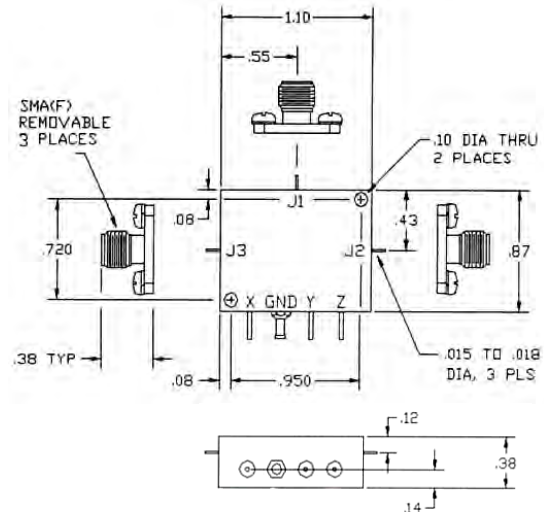
## Specifications: (@ +25°C, 0 dBm)

MODEL	MAXIMUM INSERTION LOSS (dB)			MINIMUM ISOLATION (dB)	MAXIMUM VSWR	INTEGRAL WITH DRIVER
	0.5 – 2.0 GHz	2.0 – 8.0 GHz	8.0 – 18 GHz			
S2S0518A4	1.3	1.6	2.2	40	2:1	NO
S2D0518A4	1.3	1.6	2.2	40	2:1	YES
S2S0518A5	1.5	1.8	2.5	55	2:1	NO
S2D0518A5	1.5	1.8	2.5	55	2:1	YES
S2S0518A6	1.5	2.0	3.0	60	2:1	NO
S2D0518A6	1.5	2.0	3.0	60	2:1	YES
S2S2018A4	--	1.6	2.2	40	2:1	NO
S2D2018A4	--	1.6	2.2	40	2:1	YES
S2S2018A5	--	1.8	2.5	55	2:1	NO
S2D2018A5	--	1.8	2.5	55	2:1	YES
S2S2018A6	--	2.0	3.0	60	2:1	NO
S2D2018A6	--	2.0	3.0	60	2:1	YES

NOTES:

1. Typical switching speed: 100 nsec.
2. Isolation ports are reflective
3. Power supply and mode control:

	X	Y	Z	INSERTION LOSS	ISOLATION
UNIT WITHOUT DRIVER	-40mA	NO CONNECT-ION	+40mA	J1-J3	J1-J2
	+40mA		-40mA	J1-J2	J1-J3
UNIT WITH DRIVER	+5V DC, 80mA	TTL LOW	-15V DC, 40mA	J1-J3	J1-J2
		TTL HIGH		J1-J2	J1-J3





# MINIATURE WIDEBAND RF AMPLIFIERS

0.5 – 10 GHz

## FEATURES

- Very Wideband Frequency Coverage
- Subminiature Size for Drop-In Application
- Low Power Consumption Options
- Flat Gain Response
- Internal Regulator Circuit for Unregulated Power Supplies



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX N. F. (dB)	MAX VSWR	P OUT @ 1 dB COMP (dBm)	NOM DC <sup>1</sup> CURRENT @ +12V (mA)	OUTLINE
A0540164A A0540244A A0540324A	0.5 - 4.0	16 24 32	0.5 0.5 0.75	4.0	2:1	+ 15	140 180 220	2A
A1040164A A1040244A A1040324A	1.0 - 4.0	16 24 32	0.5 0.5 0.75	4.0	2:1	+ 15	140 180 220	2A
A2060163A A2060243A A2060323A	2.0 - 6.0	16 24 32	0.5 0.5 0.75	3.5	2:1	+ 15	140 180 220	1B 1B 2A
A2080153A A2080223A A2080303A	2.0 - 8.0	15 22 30	0.5 0.75 1.0	3.5	2:1	+ 15	140 180 220	1B 1B 2A
A1080154A A1080224A A1080304A	1.0 - 8.0	15 22 30	0.5 0.75 1.0	4.0	2:1	+ 15	140 180 220	2A
A0580145A A0580215A A0580285A	0.5 - 8.0	15 22 30	0.75 0.80 1.2	5.0	2:1	+15	140 180 220	2A
A3090144A A3090214A A3090284A	3.0 - 9.0	14 21 28	0.5 0.5 0.75	4.0	2:1	+ 12	120 180 200	1B 1B 2A
A2-10125A A2-10185A A2-10245A	2.0 - 10.0	12 18 24	0.75 1.0 1.25	5.5	2:1	+ 15	90 120 150	1B
A1-10126A A1-10186A A1-10246A	1.0 - 10.0	12 14 24	0.75 1.0 1.25	6.0	2:1	+ 15	90 120 150	1B
A05-10126A A05-10186A A05-10246A	0.5 - 10.0	12 18 24	0.75 1.0 1.25	6.0	2:1	+ 15	90 120 150	1B

Note 1: Options for lower bias voltage are available

For Package Outlines see Outline Drawings Page



# MINIATURE WIDEBAND RF AMPLIFIERS

0.1 – 2.0 GHz

## FEATURES

- More Than One Octave Band Frequency Range
- Small Size With Removable Connectors for Drop-In Integration
- Low Power Consumption Options
- Flat Gain Response
- Internal Regulator Circuit for Unregulated Power Supplies



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX N. F. (dB)	MAX VSWR	P OUT @ 1 dB COMP (dBm)	NOM DC <sup>1</sup> CURRENT @ +12V (mA)	OUTLINE
A0105116A A0105216A A0105316A	0.1 - 0.5	11 21 31	0.5 0.5 0.75	6	2:1	+ 15	80 140 180	2A 2A 3B
A0215115A A0205215A A0205315A	0.2 - 1.0	11 21 31	0.5 0.5 0.75	5	2:1	+ 15	80 140 180	2A
A0110106A A0110206A A0110306A	0.1 - 1.0	10 20 30	0.5 0.75 0.75	6	2:1	+ 15	80 140 180	2A 2A 3B
A0515104A A0515204A A0515304A	0.5 - 1.5	10 20 30	0.5 0.5 0.75	4	2:1	+ 15	80 140 180	2A
A0520104A A0520204A A0520304A	0.5 - 2.0	10 20 30	0.5 0.5 0.75	4	2:1	+ 15	80 140 180	2A
A0220105A A0220205A A0220305A	0.2 - 2.0	10 20 30	0.5 0.75 0.75	5	2:1	+ 15	80 140 180	2A
A0120106A A0120206A A0120306A	0.1 - 2.0	10 20 30	0.5 0.75 1.0	6	2:1	+ 15	80 140 180	2A 2A 3B

Note 1: For proper operation the bias voltage shall be limited to +12 V. For lower DC power consumption consideration options are available for DC supplies +7 to +10 V or for regulated +5 V DC supply.

For Package Outlines see Outline Drawings Page

## FEATURES

- Wide Bandwidth
- Low Power Consumption
- Low Noise Figure
- Flat Gain Response
- Miniature Sizes for Drop-In Assembly
- Hermetically Sealed Package for Military Application



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX N. F. (dB)	MAX VSWR	P OUT @ 1 dB COMP (dBm)	NOM DC <sup>1</sup> CURRENT @ +12V (mA)	OUTLINE
AF01-4151510B	0.1 – 4.0	15	0.5	1.5	2:1	+10	60	0A
AF01-4281512B		28	0.6			+12	90	1D
AF01-4401512B		40	0.75			+12	120	0A
AF01-4142013B	0.1 – 4.0	14	0.5	2.0	2:1	+13	60	0A
AF01-4272013B		27	0.6			+13	90	1D
AF01-4402013B		40	0.75			+13	120	1D
AF01-4142016B	0.1 – 4.0	14	0.5	2.0	2:1	+16	60	0A
AF01-4272016B		27	0.6			+16	90	1D
AF01-4402016B		40	0.75			+16	120	1D
A01-4132515B	0.1 – 4.0	13	0.5	2.5	2:1	+15	40	0A
A01-4262515B		26	0.6			+15	80	1D
A01-4392515B		39	0.75			+15	120	1D
A01-4142518B	0.1 – 4.0	14	0.5	2.5	2:1	+18	80	0A
A01-4262518B		26	0.6			+18	120	1D
A01-4382518B		38	0.75			+18	160	1D
AF01-6141810B	0.1 – 6.0	14	0.5	1.8	2:1	+10	60	0A
AF01-6261810B		26	0.6			+10	90	1D
AF01-6371810B		37	0.8			+10	120	1D
AF01-6132513B	0.1 – 6.0	13	0.5	2.5	2:1	+13	60	0A
AF01-6252513B		25	0.6			+13	90	1D
AF01-6362513B		36	0.8			+13	120	1D
A01-6113012B	0.1 – 6.0	11	0.5	3.0	2:1	+12	40	0A
A01-6223013B		22	0.6			+13	70	1D
A01-6333013B		33	0.8			+13	100	1D
AF01-6132516B	0.1 – 6.0	13	0.5	2.5	2:1	+16	80	0A
AF01-6262516B		26	0.6			+16	110	1D
AF01-6372516B		37	0.8			+16	140	1D
AF01-6132518B	0.1 – 6.0	13	0.5	2.5	2:1	+18	90	0A
AF01-6252518B		25	0.6			+18	120	1D
AF01-6372518B		37	0.8			+18	150	1D

Note 1: Noise figure higher @ frequencies below 500 MHz

Note 2: Options for other bias voltages +15, +8, or +5V available for total power consumption budget

For Package Outlines see Outline Drawings Page



# MULTI-OCTAVE WIDEBAND MICROWAVE AMPLIFIERS

0.1 – 12 GHz

## FEATURES

- Wide Bandwidth
- Low Power Consumption
- Low Noise Figure
- Flat Gain Response
- Miniature Sizes for Drop-In Assembly
- Hermetically Sealed Package for Military Application



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX <sup>1</sup> N. F. (dB)	MAX VSWR	MIN P OUT @ 1 dB COMP (dBm)	NOM DC <sup>2</sup> CURRENT @ +12V (mA)	OUTLINE
AF01-80183013B AF01-80273013B AF01-80363013B	0.1 - 8.0	18 27 36	0.5 0.75 1.0	3.0	2:1	+13 +13 +13	80 110 140	1D 1D 2A
A01-80183516B A01-80273516B A01-80363516B	0.1 - 8.0	18 27 36	0.5 0.75 1.0	3.5	2:1	+16 +16 +16	80 110 140	1D 1D 2A
A01-80173518B A01-80263518B A01-80353518B	0.1 - 8.0	17 26 35	0.75 1.0 1.25	3.5	2:1	+18 +18 +18	100 130 160	1D 1D 2A
AF0110163013B AF0110243013B AF0110323013B	0.1 - 10.0	16 24 32	0.5 0.75 1.0	3.0	2:1	+13 +13 +13	80 110 140	1D 1D 2A
A0110153516B A0110233516B A0110313016B	0.1 - 10.0	15 23 31	0.5 0.75 1.0	3.5	2:1	+16 +16 +16	80 110 140	1D 1D 2A
A0110153518B A0110233518B A0110313518B	0.1 - 10.0	15 23 31	0.5 0.75 1.0	3.5	2:1	+18 +18 +18	100 130 160	1D 1D 2A
AF0112153013B AF0112223013B AF0112303013B	0.1 - 12.0	15 22 30	0.5 0.75 1.0	3.0	2:1	+13 +13 +13	80 110 140	1D 1D 2A
A0112153516B A0112223516B A0112293516B	0.1 - 12.0	15 22 29	0.5 0.75 1.0	3.5	2:1	+16 +16 +16	80 110 140	1D 1D 2A
A0112153518B A0112223518B A0112293518B	0.1 - 12.0	15 22 29	0.5 0.75 1.0	3.5	2:1	+18 +18 +18	100 140 180	1D 1D 2A

Note 1: Noise figure higher @ frequencies below 500 MHz

Note 2: Options for other bias voltages +15, +8, or +5V available for total power consumption budget

For Package Outlines see Outline Drawings Page

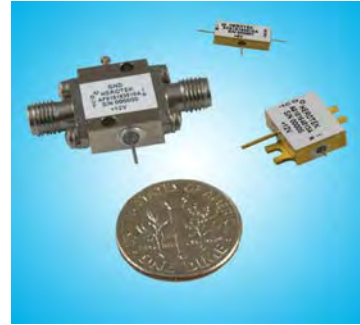


# MINIATURE WIDEBAND MICROWAVE LOW NOISE AMPLIFIERS

6.0 – 18.0 GHz

## FEATURES

- Very High Optimized Gain
- Low Power Consumption
- Low Noise Figure
- Very Flat Gain Response
- Miniature Sizes for Drop-In Assembly
- Hermetically Sealed Package for all Applications



## APPLICATIONS

- Microwave Radio & VSAT
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure
- Military & Space

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

### Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX N. F. (dB)	MAX IN / OUT VSWR	MIN P OUT @ 1 dB COMP (dBm)	NOM DC <sup>1, 2</sup> CURRENT @ +12V (mA)	OUTLINE <sup>3</sup>
AF818183008A AF818263008A AF818343008A	8.0 – 18.00	18 26 34	± 0.75 ± 1.0 ± 1.25	3.0	2:1	+ 8 + 8 + 8	90 130 170	0A, M2, L3 1D, M4, L3 1D, M5, L5
AF818183510A AF818263510A AF818333510A	8.0 – 18.00	18 26 33	± 0.75 ± 1.0 ± 1.25	3.5	2:1	+ 10 + 10 + 10	90 130 170	0A, M2, L3 1D, M4, L3 1D, M5, L5
A818164013A A818244013A A818324013A	8.0 – 18.00	16 24 32	± 0.75 ± 1.0 ± 1.25	4.0	2:1	+ 13 + 13 + 13	90 130 170	0A, M2, L3 1D, M4, L3 1D, M5, L5
A818164016A A818244016A A818324016A	8.0 – 18.00	16 24 32	± 0.75 ± 1.0 ± 1.25	4.0	2:1	+ 16 + 16 + 16	120 160 200	0A, M2, L3 1D, M4, L3 1D, M5, L5
AF618183008A AF618263008A AF618343008A	6.0 – 18.00	18 26 34	± 1.0 ± 1.25 ± 1.5	3.0	2:1	+ 8 + 8 + 8	90 130 170	0A, M2, L3 1D, M4, L3 1D, M5, L5
AF618183510A AF618263510A AF618333510A	6.0 – 18.00	18 26 33	± 0.75 ± 1.0 ± 1.25	3.5	2:1	+ 10 + 10 + 10	90 130 170	0A, M2, L3 1D, M4, L3 1D, M5, L5
A618164013A A618244013A A618314013A	6.0 – 18.00	16 24 31	± 0.75 ± 1.0 ± 1.25	4.0	2:1	+ 13 + 13 + 13	90 130 170	0A, M2, L3 1D, M4, L3 1D, M5, L5
A618184015A A618264015A A618334015A	6.0 – 18.00	18 26 33	± 1.0 ± 1.25 ± 1.5	4.0	2:1	+ 15 + 15 + 15	100 140 180	0A, M2, L3 1D, M4, L3 1D, M5, L5

NOTES:  
 Note 1 : DC bias voltage +5V for L3, L5 Outline.  
 Note 2 : Options for other bias voltages +15, +8, or +5V available for total power consumption budget.  
 Note 3 : Add the desired outline to the end of the model number.

For Package Outlines see Outline Drawings Page



# MULTI-OCTAVE WIDEBAND MICROWAVE AMPLIFIERS

0.1 – 20 GHz

## FEATURES

- Wide Bandwidth
- Low Power Consumption
- Low Noise Figure
- Flat Gain Response
- Miniature Sizes for Drop-In Assembly
- Hermetically Sealed Package for Military Application



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX <sup>1</sup> N. F. (dB)	MAX VSWR	MIN P OUT @ 1 dB COMP (dBm)	NOM DC <sup>2</sup> CURRENT @ +12V (mA)	OUTLINE
AF0116153013B AF0116223013B AF0116293013B	0.1 -16	15 22 29	0.75 1.0 1.25	3.0	2:1	+13 +13 +13	80 110 140	1D 1D 2A
A0116153516B A0116223516B A0116293616B	0.1 -16	15 22 29	0.75 1.0 1.25	3.5	2:1	+16 +16 +16	80 110 140	1D 1D 2A
A0116153518B A0116223518B A0116293518B	0.1 -16	15 22 29	0.75 1.0 1.25	3.5	2:1	+18 +18 +18	100 130 160	1D 1D 2A
AF0118153513B AF0118223513B AF0118293513B	0.1 – 18	15 22 29	1.0 1.25 1.5	3.5	2:1	+13 +13 +13	80 110 140	1D 1D 2A
AF0118153515B AF0118223516B AF0118293516B	0.1 – 18	15 22 29	1.0 1.25 1.5	3.5	2:1	+15 +16 +16	80 110 140	1D 1D 2A
A0118144018B A0118214018B A0118284018B	0.1 – 18	14 21 28	1.0 1.25 1.5	4.0	2:1	+18 +18 +18	100 150 200	1D 1D 2A
AF0120163508B AF0120233510B AF0120303510B	0.1 – 20	16 23 30	1.0 1.5 1.75	3.5	2:1	+8 +10 +10	80 110 140	1D 1D 2A
AF0120153511B AF0120233513B AF0120303513B	0.1 – 20	15 23 30	1.0 1.5 1.75	3.5	2:1	+11 +13 +13	80 110 140	1D 1D 2A

Note 1: Noise figure higher @ frequencies below 500 Mhz

Note 2: Options for other bias voltages +15, +8, or +5V available for total power consumption budget

For Package Outlines see Outline Drawings Page





# MULTI-OCTAVE WIDEBAND MICROWAVE AMPLIFIERS

0.5 – 20 GHz

## FEATURES

- Miniature Size for Drop-In Application
- Very Low Power Consumption (requires only +3.2V bias)
- Flat Gain Response
- Low Noise Figure
- Options for Various Size Packages
- Hermetically Sealed Package for Military Application



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX N. F. (dB)	MAX VSWR	MIN P OUT @ 1 dB COMP (dBm)	DC POWER		OUTLINE <sup>2</sup>
							VOLTS <sup>1</sup>	(mA) NOM	
AF051814A	0.5 – 18	14	1.0	3.5	2:1	+5	+3.2	46	0A, 1B, 1D, L3, 1B, 1D, 1B, 1D, 2A
AF051821A		21	1.25			+5	+3.2	60	
AF051828A		28	1.5			+10	+5.0	100	
AF1-1814A	1.0 – 18	14	1.0	3.5	2:1	+5	+3.2	46	0A, 1B, 1D, L3, 1B, 1D, 1B, 1D, 2A
AF1-1821A		21	1.25			+5	+3.2	60	
AF1-1828A		28	1.5			+10	+5.0	100	
AF2-1814A	2.0 – 18	14	1.0	3.5	2:1	+5	+3.2	46	0A, 1B, 1D, L3, 1B, 1D, 1B, 1D, 2A
AF2-1821A		21	1.25			+5	+3.2	60	
AF2-1828A		28	1.5			+10	+5.0	100	
AF052013A	0.5 – 20	13	1.0	4.0	2.2:1	+5	+3.2	46	0A, 1B, 1D, L3, 1B, 1D, 1B, 1D, 2A
AF052019A		19	1.5			+5	+3.2	60	
AF052025A		25	2.0			+8	+5.0	100	
AF1-2013A	1.0 – 20	13	1.0	4.0	2.2:1	+5	+3.2	46	0A, 1B, 1D, L3, 1B, 1D, 1B, 1D, 2A
AF1-2019A		19	1.5			+5	+3.2	60	
AF1-2025A		25	2.0			+8	+5.0	100	
AF2-2013A	2.0 – 20	13	1.0	4.0	2.2:1	+5	+3.2	46	0A, 1B, 1D, L3, 1B, 1D, 1B, 1D, 2A
AF2-2019A		19	1.5			+5	+3.2	60	
AF2-2025A		25	2.0			+8	+5.0	100	

Note 1: Integral voltage regulator is available for bias voltage +8, +12, or +15V  
 Note 2: Add the desired outline to the end of the model number

For Package Outlines see Outline Drawings Page



# MULTI-OCTAVE ULTRA WIDEBAND MICROWAVE AMPLIFIERS

0.01 – 20 GHz

## FEATURES

- Extremely Broad Bandwidth
- Excellent Gain Flatness
- Very Low Noise Figure
- Uncompromised Input and Output VSWR
- Very Low Power Consumption
- Miniature Sizes for Drop-In Assembly
- Hermetically Sealed Package for Military Application



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX <sup>1</sup> N. F. (dB)	MAX VSWR	MIN P OUT @ 1 dB COMP (dBm)	NOM DC <sup>2</sup> CURRENT @ +5V (mA)	OUTLINE
AF0118193A	0.1 - 18	19	0.8	2.8	2:1	+ 8	60	0A
AF0118273A	0.1 - 18	27	1.2	2.8	2:1	+ 10	100	1D
AF0118353A	0.1 - 18	35	1.5	2.8	2:1	+ 15	150	1D
AF0120183A	0.1 - 20	18	0.8	2.8	2:1	+ 8	60	0A
AF0120253A	0.1 - 20	25	1.2	2.8	2:1	+ 10	100	1D
AF0120323A	0.1 - 20	32	1.6	3.0	2:1	+ 10	130	1D
AF00118173A	0.01 - 18	17	1.0	3.0	2:1	+ 8	60	1D
AF00118253A	0.01 - 18	25	1.4	3.0	2:1	+ 10	100	2A
AF00118333A	0.01 - 18	33	1.8	3.0	2:1	+ 12	150	2A
AF00120173A	0.01 - 20	17	1.0	3.0	2:1	+ 8	60	1D
AF00120243A	0.01 - 20	24	1.5	3.0	2:1	+ 8	90	2A
AF00120313A	0.01 - 20	31	2.0	3.0	2:1	+ 8	120	2A

Note 1: Noise figure higher @ frequencies below 500 MHz  
 Note 2: Options for other bias voltages +15, +12, or +8V

For Package Outlines see Outline Drawings Page



# MINIATURE ULTRA-WIDEBAND RF AMPLIFIERS

0.5 – 40 GHz

## FEATURES

- Wide Bandwidth
- Miniature Sizes For Drop-In Applications
- Low Power Consumption
- Flat Gain Response
- Low Noise Figure



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX N. F. (dB)	MAX VSWR	MIN P OUT @ 1 dB COMP (dBm)	DC POWER <sup>1</sup>		OUTLINE <sup>2</sup>
							VOLTS	(mA) NOM	
AF182055	0.5 - 18	11	1.0	5.0	2.1	+ 3	+ 3.2	30	1A, L3
AF118055	1.0 - 18								
AF218055	2.0 - 18								
AF202056	0.5 - 20	11	1.0	6.0	2.5:1	+ 3	+ 3.2	30	1A, L3
AF122056	1.0 - 20								
AF220056	2.0 - 20								
AF182093	0.5 - 18	15	1.0	5.0	2:1	+ 3	+ 3.2	45	1A, L3
AF118093	1.0 - 18								
AF218093	2.0 - 18								
AF182094	0.5 - 18	20	1.5	5.5	2.2:1	+ 10	+ 5.0	150	1A
AF118094	1.0 - 18								
AF218094	2.0 - 18								
A182275	6.0 - 18	24	1.0	4.0	2:1	+ 10	+ 6.0	120	1B
A262273	2.0 - 26	8	1.5	10.0 TYP	2.3:1	+ 15	+ 12	200	1C
A262274	2.0- 26	14	2.5	10.0 TYP	2.3:1	+ 19	+ 12	500	1C
A262276	18 - 26	28	2.0	5.0 TYP	2:1	+ 12	+ 12	250	1C
A402412	18 - 40	15	2.0	9.0 TYP	2.5:1	+ 6	+ 12	120	1C
A402277	26 - 40	29	2.5	6.0 TYP	2.5:1	+ 16	+ 12	400	1C

Note 1: DC power requirement – Current listed is the nominal value for bias voltages below 6V variation +/- 0.2V from specified. Permanent damage will occur if higher voltage is applied. Option is available for internally integrated regulator for bias voltage of +12V or +15V. (Packages size may change) Internal Regulator is provided +12V Bias Modules. Also, option is available including voltage regulator for +12V or +15V Bias.

Note 2: Standard Outline is 1A or 1C as specified. Add "L3" to end of model number for L3 Option

For Package Outlines see Outline Drawings Page

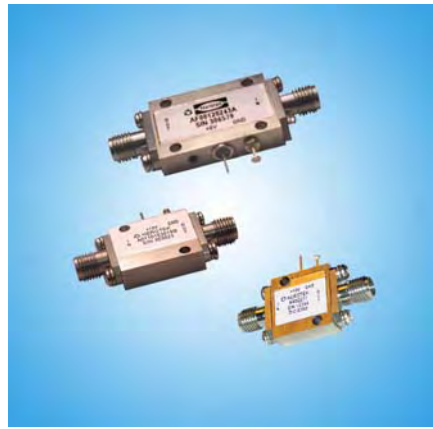


# HIGH FREQUENCY AND MILLIMETER WAVE AMPLIFIERS

18 – 45 GHz

## FEATURES

- Wide Bandwidth
- Low Noise Figure
- Matched for Low VSWR
- Miniature Sizes for Drop-In Assembly
- Hermetically Sealed Package for Military Application



## APPLICATIONS

- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation
- Fiber Optics
- Telecom Infrastructure

## ENVIRONMENTAL RATINGS

Max Input Power.....100mW  
 Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	MAX <sup>1</sup> N. F. (dB)	MAX VSWR	MIN P OUT @ 1 dB COMP (dBm)	NOM DC CURRENT @ +12V (mA)	OUTLINE
A1826153508A	18 - 26	15	1.0	3.5	2:1	+ 8	80	1D
A1826224010A	18 - 26	22	1.25	4.0	2:1	+ 10	160	1D
A1826294010A	18 - 26	29	1.5	4.0	2:1	+ 10	220	2A
A1840157008A	18 - 40	15	2.0	7	2.2:1	+ 8	120	1C
A1840227010A	18 - 40	22	2.5	7	2.2:1	+ 10	180	1C
A1840287010A	18 - 40	28	3.0	7	2.2:1	+ 10	240	2C
A2640125010A	26 - 40	12	2.0	5	2:1	+ 10	120	1C
A2640205010A	26 - 40	20	2.5	5	2:1	+ 10	180	1C
A2640285010A	26 - 40	28	3.0	5	2:1	+ 10	240	2C
A3045155010A	30 - 45	15	2.0	5	2:1	+ 10	120	1C
A3045225010A	30 - 45	22	2.5	5	2:1	+ 10	180	1C
A3045295010A	30 - 45	29	3.0	5	2:1	+ 10	240	2C

For Package Outlines see Outline Drawings Page

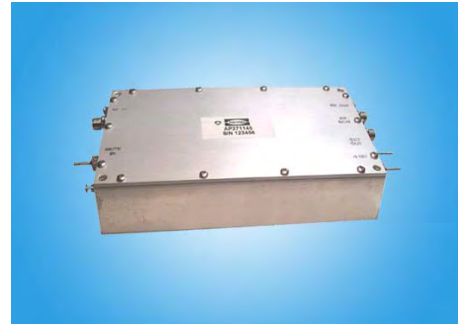


# POWER AMPLIFIERS FOR COMMERCIAL COMMUNICATIONS

1.0 – 18 GHz

## FEATURES

- Low Cost
- High Efficiency
- Mute & Monitor Functions Available
- Low Distortion Class “A” Operation
- 0.5 to 10 Watts



## APPLICATIONS

- Cellular, PCN, LAN Networking
- Hot Standby Transmitters
- Point-To-Point Communications

## ENVIRONMENTAL RATINGS

Operating Temperature Range.....-55°C to +85°C  
 Storage Temperature Range.....-65°C to +125°C  
 Shock..... 50G, 11 msec  
 Vibration..... 20G, 100 to 2000 Hz

## Specifications: (@ +25°C)

MODEL	FREQ. RANGE (GHz)	MIN GAIN (dB)	MAX GAIN VARIATION (+/- dB)	N. F. (dB)	MAX VSWR	P OUT <sup>2</sup> (dBm)	NOM DC <sup>3</sup> CURRENT @ +12V (A)	CASE SIZE LxWxH (inches)
AP231130 AP231131 AP231132 AP231133 AP231134	1.7 - 2.3	23 23 30 30 30	0.5 0.5 1.0 1.0 1.0	10	2:1	+30 +33 +35 +37 +39	1.1 1.5 3.0 3.5 5.5	5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 Note 1
AP271135 AP271136	1.7 - 2.7	23 23	1.5 1.5	10	2:1	+30 +33	1.1 1.6	5.5 X 3 X 1 5.5 X 3 X 1
AP231137 AP231138 AP231139 AP231140 AP231141	1.9 - 2.3	23 23 30 30 30	0.5 0.5 1.0 1.0 1.0	10	2:1	+30 +33 +35 +37 +39	1.1 1.5 3.0 3.5 5.5	5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 Note 1
AP271142 AP271143 AP271144 AP271145 AP271146	2.3 - 2.7	23 23 30 30 30	0.5 0.5 1.0 1.0 1.0	10	2:1	+30 +33 +35 +37 +39	1.1 1.5 3.0 3.5 5.5	5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 5.5 X 3 X 1 Note 1
AP421147 AP421148	3.7 - 4.2	40 40	0.5 0.5	6	2:1	+30 +33	1.2 2.2	Note 1
AP641149	5.9 - 6.4	40	0.5	6	2:1	+30	1.2	Note 1
AP721150	6.4 - 7.2	35	0.5	6	2:1	+30	1.2	Note 1
AP791151	7.1 - 7.9	35	0.5	6	2:1	+30	1.2	Note 1
AP153152 AP153153	14.0 - 15.3	23 23	0.5 0.5	8	2:1	+28 +30	1.2 1.8	2.7 X 2 X 0.6 2.7 X 2 X 0.6
AP175154	16.0 - 17.5	42	1.0	9	2:1	+31	3.5	3.4 X 3 X 1

Note 1: Consult factory for available outlines

Note 2: Pout @ 1 dB compression will typically be 0 to 3 dB lower than the stated P out. Consult factory for actual value for each model.

Note 3: Regulated +12V is required. Unit with integral regulator can be supplied for +15V power supply, add letter "R" to end of model number.



# STEP RECOVERY DIODE COMB (HARMONIC) GENERATORS

0.1 – 26 GHz

## FEATURES

- Broadband Output Frequency Spectrum (from second harmonic to 26 GHz)
- No Bias Required
- Input Matched to 50 Ohms
- Very Low Phase Noise
- Hermetically Sealed Module
- Available in Drop-In Type Package
- Custom Input Freq Available From 10MHz to 10GHz
- Option for Enhanced Assembly for Severe Vibration Environment



## APPLICATIONS

- Impulse Generator
- Frequency Multipliers
- Frequency Synthesizers
- Built-In-Self-Test Sources

## ENVIRONMENTAL RATINGS

Max Input Power..... 1 Watt  
 Operating Temperature..... -55°C to +95°C  
 Storage Temperature..... -65°C to +150°C  
 Temperature Cycling..... -65°C to +150°C  
 Shock..... 1500 G, 0.5 msec; 50 G, 11 msec  
 Vibration..... 20 G, 100 to 2,000 Hz  
 Acceleration..... 10,000 G

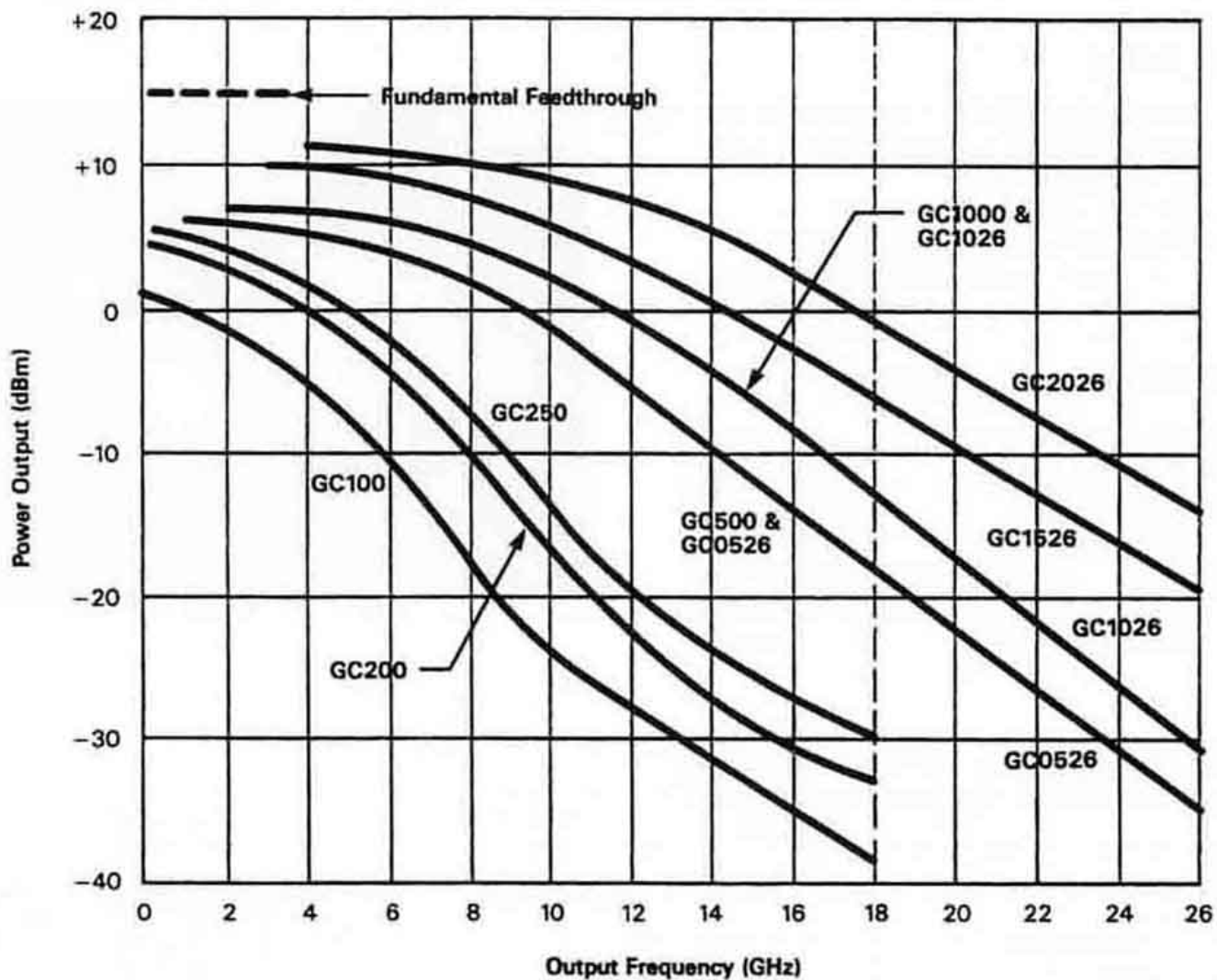
## Specifications: (@ +25°C, 0.5 Watt Input)

MODEL <sup>1</sup>	INPUT FREQ. (MHz) <sup>2</sup>	MAX INPUT VSWR	MINIMUM OUTPUT POWER PER PICKET (dBm)					OUTLINE OPTIONS
			UP to 4 GHz <sup>3</sup>	4-8 GHz	8-12.4 GHz	12.4-18 GHz	18-26 GHz	
GC100**	100	2:1	-10	-20	-30	-40	----	C,L,Y
GC200**	200	2:1	-5	-15	-25	-35	----	C,L,Y
GC250**	250	2:1	0	-10	-20	-30	----	C,L,Y
GC500**	500	2:1	+5	-5	-15	-20	----	C,L,Y
GC1000**	1000	2:1	+5	0	-10	-15	----	C,L,Y
GC0526**	500	2:1	+5	-5	-15	-20	-40	C,L,Y
GC1026**	1000	2:1	+5	0	-10	-15	-35	C,L,Y
GC1526**	1500	2:1	+5	0	-5	-10	-25	C,L,Y
GC2026**	2000	2:1	+5	+5	0	-10	-20	C,L,Y

Note 1: Suffix (\*\*) specify options for internal DC return and package style. First Position: N indicates no DC return and R indicates internal DC return included. Note that DC Return is required for proper operation. Second Position: C, L, or Y indicates Package style (see outline drawings page)  
 Note 2: Other input frequencies from 10 MHz to 10 GHz are available. Contact factory for information.  
 Note 3: For second harmonics up to 4 GHz the fundamental feedthrough is typically +15dBm.  
 Note 4: All units can respond to a 3% bandwidth of input frequency without noticeable degradation.  
 Note 5: All models can be modified for use as an impulse generator. Consult factory for information on output amplitude, polarity, and pulse width.  
 Note 6: Add "X" to final suffix for an enhanced assembly version for more severe vibration environment.

For Package Outlines see Outline Drawings Page

## TYPICAL OUTPUT POWER SPECTRUM ENVELOPE



For Package Outlines see Outline Drawings Page



# STEP RECOVERY DIODE COMB (HARMONIC) GENERATORS

0.5 – 50 GHz

## FEATURES

- Broadband Output Frequency Spectrum (from second harmonic to 50 GHz)
- No Bias Required
- Input Matched to 50 Ohms
- Very Low Phase Noise
- Hermetically Sealed Module
- Excellent for Multiplier Applications
- Custom Input Frequency Available from 500MHz to 10GHz



## APPLICATIONS

- Impulse Generator
- Frequency Multipliers
- Frequency Synthesizers
- Built-In-Self-Test Sources

## ENVIRONMENTAL RATINGS

Max Input Power..... 1 Watt  
 Operating Temperature..... -55°C to +95°C  
 Storage Temperature..... -65°C to +150°C  
 Temperature Cycling..... -65°C to +150°C  
 Shock..... 1500 G, 0.5 msec; 50 G, 11 msec  
 Vibration..... 20 G, 100 to 2,000 Hz  
 Acceleration..... 10,000 G

## Specifications: (@ +25°C, 0.5 Watt Input)

MODEL	INPUT FREQ. (MHz)	MAX INPUT VSWR	MINIMUM OUTPUT POWER PER PICKET (dBm)				OUTLINE
			UP to 20 GHz	20 - 30 GHz	30 - 40 GHz	40 - 50 GHz	
GC0540A	500	2:1	-25	-40	-55	--	C2
GC1040A	1000	2:1	-15	-30	-45	--	C2
GC1540A	1500	2:1	-10	-25	-40	--	C2
GC2040A	2000	2:1	-5	-15	-30	--	C2
GC1050A	1000	2:1	-15	-30	-45	-50	C2
GC1550A	1500	2:1	-10	-25	-40	-50	C2
GC2050A	2000	2:1	-5	-15	-30	-40	C2

Note 1: Internal DC return included

Note 2: Other input frequencies from 500 MHz to 10 GHz are available. Contact factory for information.

Note 3: All units can respond to a 3% bandwidth of input frequency without noticeable degradation.

Note 4: All models can be modified for use as an impulse generator. Consult factory for information on output amplitude, polarity, and pulse width.

For Package Outlines see Outline Drawings Page





# COMB (HARMONIC) GENERATORS WITH INTEGRAL PREAMPLIFIER

0.1 – 26 GHz

## FEATURES

- Options for Input Drive of 0 dBm or +10 dBm
- Low Bias Voltage (+ 5V +/- 0.2V)
- Broadband Output Spectrum
- Hermetically Sealed Module
- Field Removable Connectors for Drop-In Assembly
- Custom Input Frequency Available from 10MHz to 10GHz



## APPLICATIONS

- Impulse Generator
- Frequency Multipliers
- Frequency Synthesizers
- Built-In-Self-Test Sources

## ENVIRONMENTAL RATINGS

Max Input Power..... 100m Watt  
 Operating Temperature..... -55°C to +95°C  
 Storage Temperature..... -65°C to +125°C  
 Temperature Cycling..... -65°C to +125°C  
 Shock..... 50 G, 11 msec  
 Vibration..... 20 G, 100 to 2,000 Hz

## Specifications: (@ +25°C)

MODEL <sup>4,5</sup>	INPUT POWER (dBm)	INPUT FREQ. (MHz)	MAX INPUT VSWR	MINIMUM OUTPUT POWER PER PICKET (dBm)					OUTLINE
				UP to 4 GHz	4 - 8 GHz	8 - 12.4 GHz	12.4 - 18 GHz	18 - 26 GHz	
GCA100A	0	100	2:1	-12	-20	-30	-40	--	3A
GCA100B	+10								
GCA200A	0	200	2:1	-7	-15	-25	-35	--	3A
GCA200B	+10								
GCA250A	0	250	2:1	-2	-10	-20	-30	--	3A
GCA250B	+10								
GCA500A	0	500	2:1	+3	-5	-15	-20	--	3A
GCA500B	+10								1A
GCA1000A	0	1000	2:1	+3	0	-10	-15	--	3A
GCA1000B	+10								1A
GCA0526A	0	500	2:1	+3	-5	-15	-20	-40	3A
GCA0526B	+10								1A
GCA1026A	0	1000	2:1	+3	0	-10	-15	-35	3A
GCA1026B	+10								1A
GCA1526A	0	1500	2:1	+3	0	-5	-10	-25	3A
GCA1526B	+10								1A
GCA2026A	0	2000	2:1	+3	0	0	-10	-20	3A
GCA2026B	+10								1A

Note 1: All units do not have internal regulator and will be permanently damaged if more than +5.2V of bias is used.  
 Note 2: Bias voltage: +5 ± 0.2V. Current: 150mA nominal for "B" Model, 200mA for "A" Model  
 Note 3: Other input frequencies from 10 MHz to 10 GHz are available. Contact factory for information.  
 Note 4: Add "X" to "A" or "B" models if an enhanced assembly version is desired for more severe vibration environments.  
 Note 5: Add "-12" or "-15" to the end of model number if DC bias of +12V or +15V is desired. In this case a larger outline might be necessary.

For Package Outlines see Outline Drawings Page



# IMPULSE GENERATORS

100-2000 MHz

## FEATURES

- Extremely narrow pulse width (typically 30 psec to 100 psec)
- Very high voltage output amplitude (6V to 20V into 50 ohms)
- Various input and output frequencies available
- Input matched to 50 ohms system
- No bias required
- Hermetically sealed module
- Available in drop-in type package



## APPLICATIONS

- Clock reference
- Sampling circuit
- Sharp biasing or triggering source
- Optical modulator driving

## ENVIRONMENTAL RATINGS

Max Input Power..... 1 Watt  
 Operating Temperature Range.....-55°C to + 95°C  
 Storage Temperature Range.....-65°C to +150°C  
 Temperature Cycling.....-65°C to +150°C  
 Shock.....1500 G, 0.5 msec; 50 G, 11 msec  
 Vibration.....20G, 100 to 2000 Hz  
 Acceleration.....10,000 G

## Specifications: (@ +25°C, 0.5 Watt <sup>3</sup> input)

MODEL <sup>1</sup>	INPUT <sup>2</sup> (DRIVING) FREQ. (MHz)	MAX INPUT VSWR	TYPICAL <sup>4</sup> IMPULSE OUTPUT VOLTAGE (V)	TYPICAL <sup>5</sup> IMPULSE PULSE WIDTH (P SEC)	IMPULSE OUTPUT FREQ. (MHz)	OUTLINE
GIM100A*	100	2:1	-12	100	100	C, L
GIM200A*	200	2:1	-18	90	200	C, L
GIM250A*	250	2:1	-18	80	250	C, L
GIM500A*	500	2:1	-15	60	500	C, L
GIM1000A*	1000	2:1	-10	50	1000	C2, L
GIM1500A*	1500	2:1	-8	45	1500	C2, L
GIM2000A*	2000	2:1	-7	35	2000	C2, L

Notes: 1. Suffix (\*) for designations of the desired outline package, either C, C2 or L.  
 2. Other driving (input) frequencies from 10 MHz to 10 GHz are available. Consult factory for the desired frequency.  
 3. If input power other than 0.5 Watt (typically +10 dBm or 0 dBm) is desired, consult factory for information.  
 4. Impulse output voltage into 50-ohm system, standard output polarity is negative; positive polarity is available. Consult factory for information.  
 5. Pulse width is measured at 50% of the impulse peak voltage.  
 6. Add "X" to final suffix for an enhanced assembly version for more severe vibration environment.

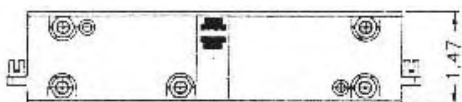
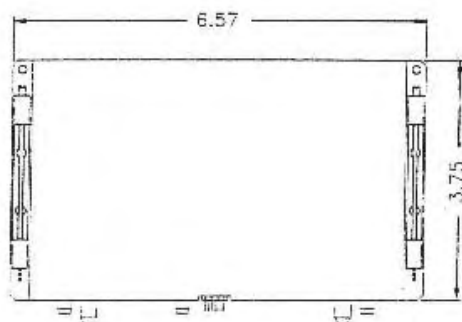
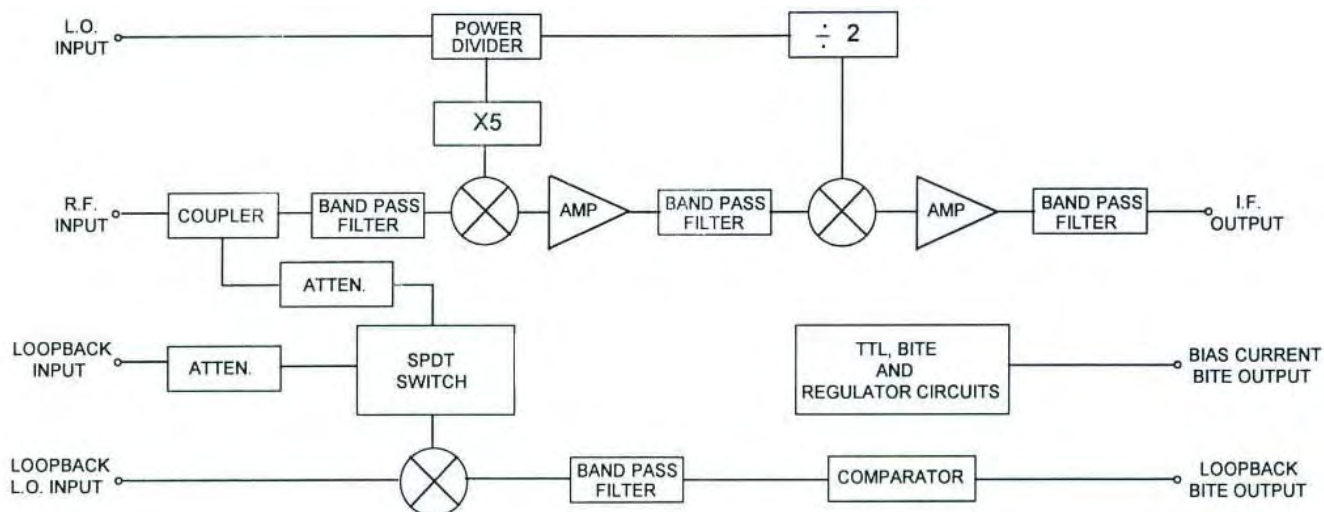
For Package Outlines see Outline Drawings Page

## SPECIFICATIONS

- Input Frequency.....7.4 Ghz
- L.O. Frequency.....1.3 Ghz
- L.O. Power Level.....0 ± 3 dBm
- Output Frequency.....70 MHz
- Gain R.F. to I.F. ....34 ± 2 dB
- Input Noise Figure.....13 dB
- VSWR (all ports).....2:1 max
- Pout at 1 dB Compression.....± 20 dBm min
- Spurious Output.....-78 dBm max
- D.C. Supply.....± 15V

## FEATURES

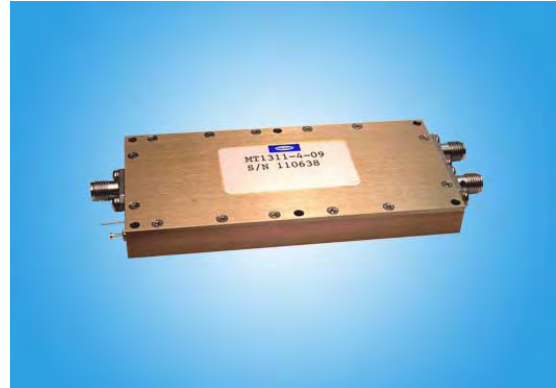
- Loopback circuit includes mixing and switching functions which allow the introduction of a calibrated reference signal.
- Built-in TTL bite circuit for indication of excess D.C. power consumption.



- Integrated hermetically sealed MIC
- MIL-Q-9858 screening for solid-state components
- MIL-Q-9858 quality program
- MIL-STD-2000 soldering for electronic assemblies

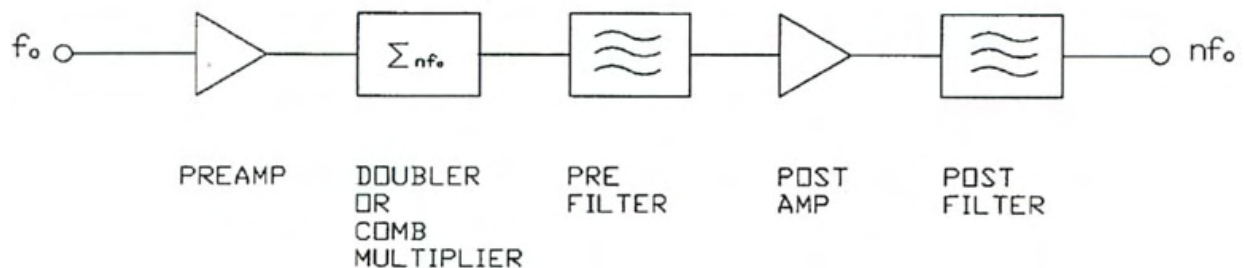
## VERSATILE DESIGN CAPABILITES FOR DIFFERENT REQUIREMENTS

- Input Frequency Range From: 50 MHz to 13 GHz
- Output Frequency Range From: 100 MHz to 26 Ghz
- Input Power Level From: -40 dBm to +30 dBm
- Output Power Level: Up to +30dBm
- Harmonics or Subharmonics Suppressions: -20 dBc to -70 dBc
- Low Added Phase Noise



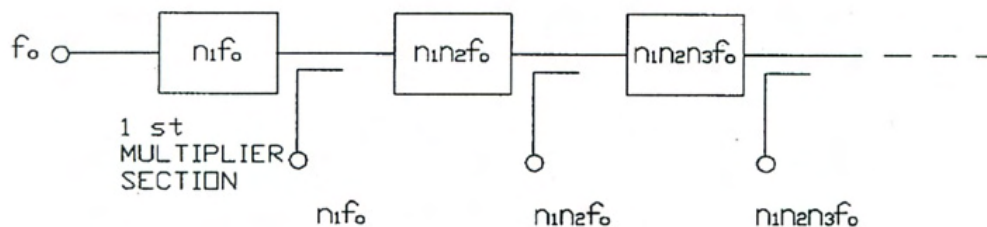
X4 Multiplier, 5 GHz/+10dBm Dual Output

## TYPICAL BLOCK DIAGRAM

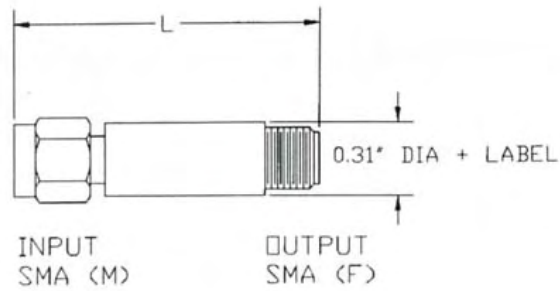


## MULTIPLIER SECTION

- Optimized Design with Combination of Bipolar, FET and MMIC Amplifiers; Schottky Diode Doublers and SRD Combs; Microstrip and Mechanical Filters
- Series of Multiplier Chain for Various Higher Output Frequencies

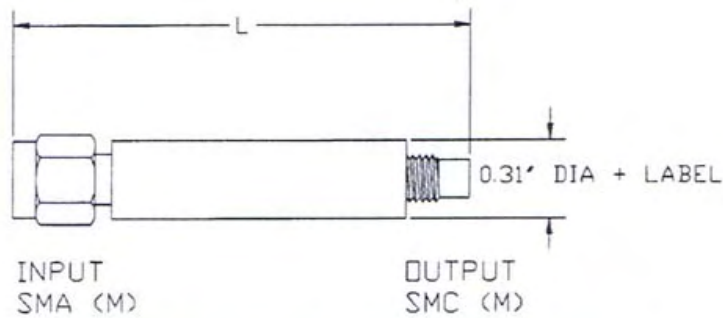


TYPICAL MULTIPLIER CHAIN

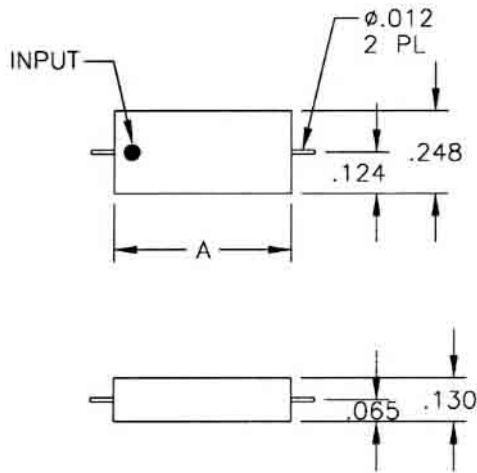


STYLE	INPUT CONNECTOR	L
A	SMA (M)	1.05" ± 0.05"
B	SMA (M)	1.16" ± 0.05"
C	SMA (M)	1.26" ± 0.05"
CI	K-TYPE (M)*	1.30" ± 0.05"

\*K CONNECTOR TRADEMARK OF WILTRON CO.

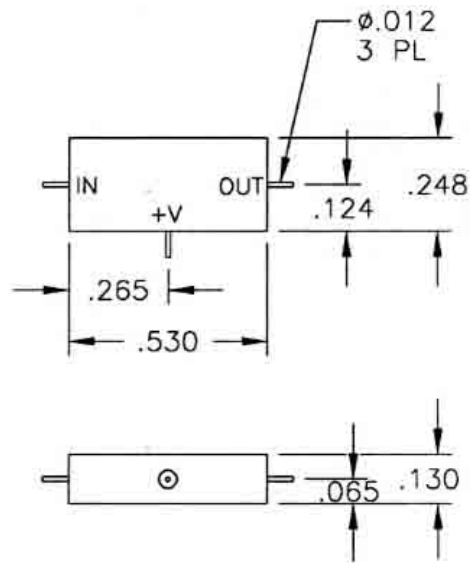


STYLE	L
AC1	1.20" ± 0.05"
AC2	1.47" ± 0.05"
AC3	1.55" ± 0.05"

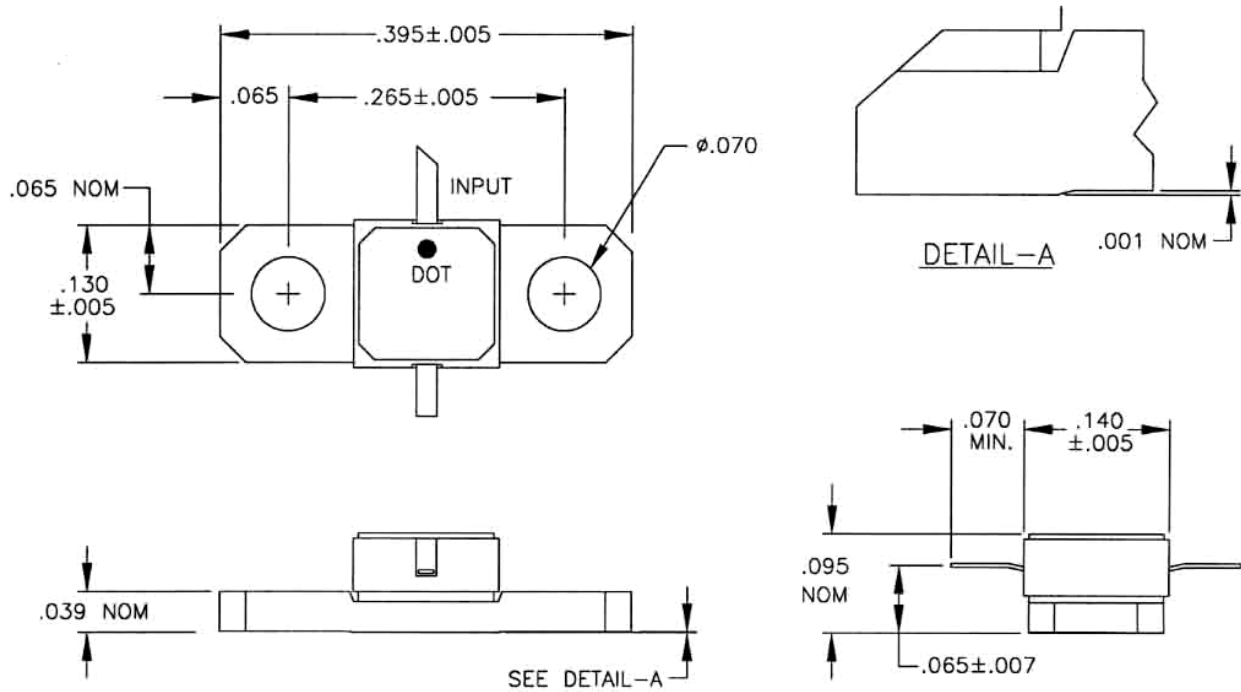


STYLE	A
K	.330
L	.530

**OUTLINE K & L**

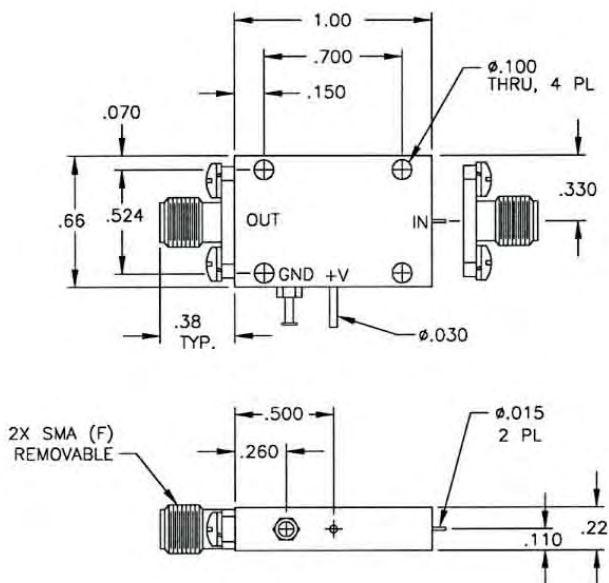


**OUTLINE L3**

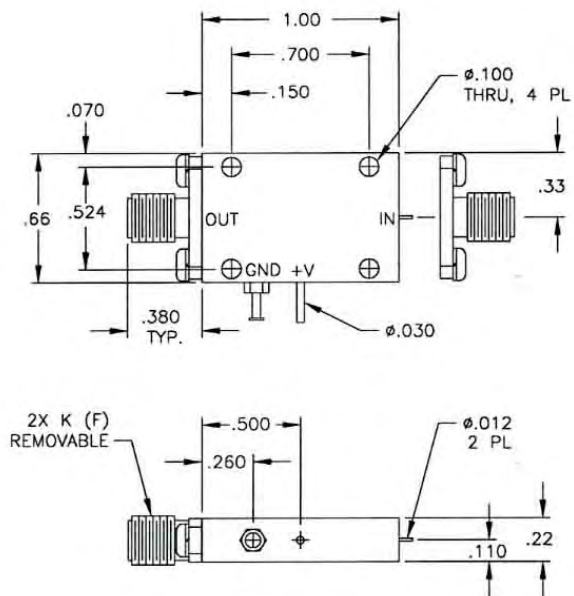


**OUTLINE Z1**

NOTE: BLACK DOTS SHOWN INDICATE RF INPUT

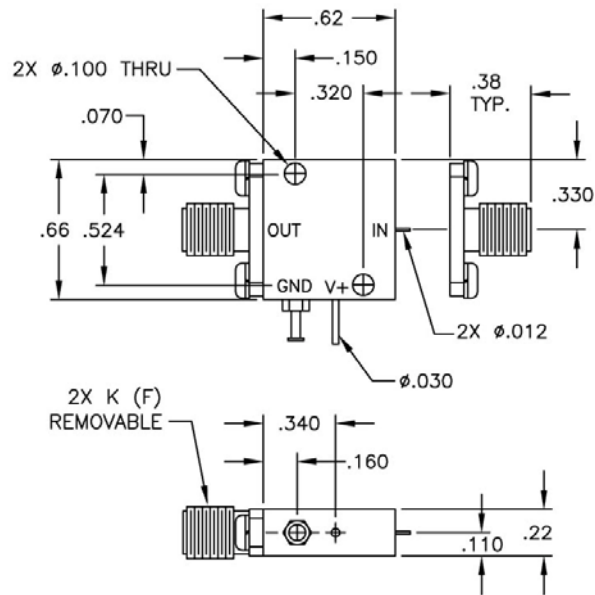


**OUTLINE 2A**

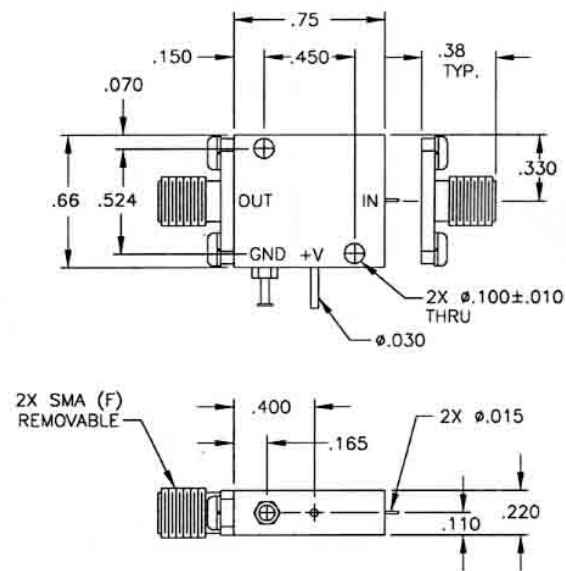


**OUTLINE 2C**

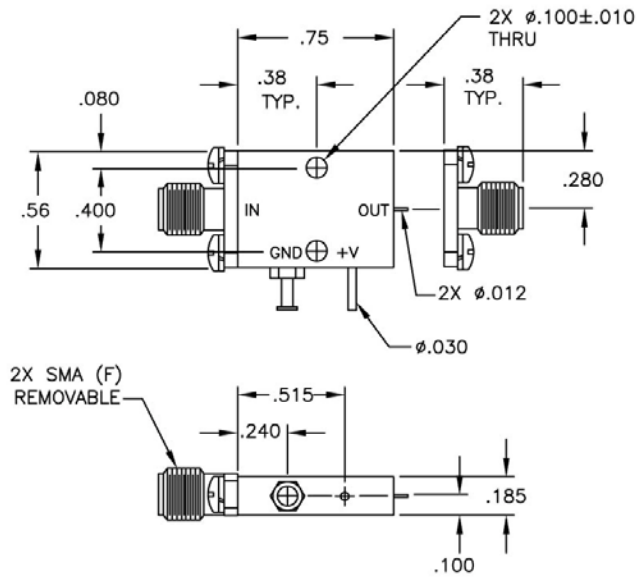




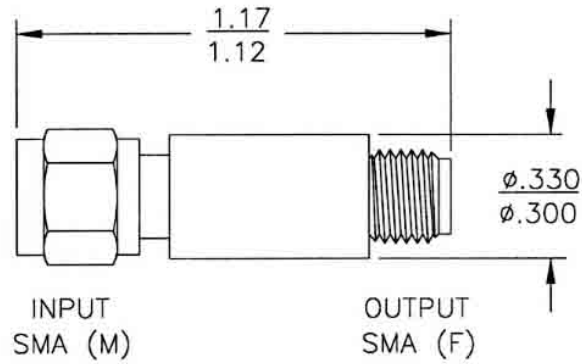
**OUTLINE 1C**



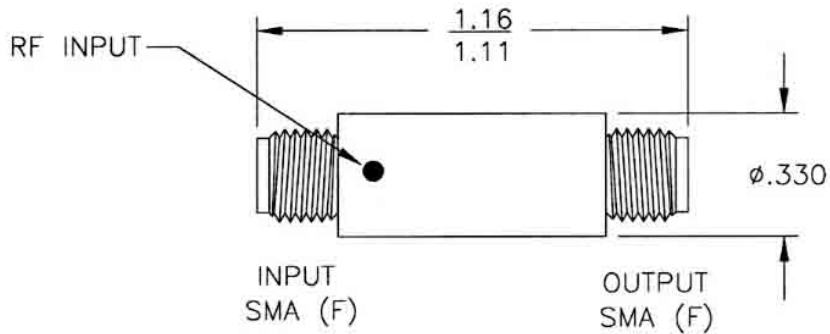
**OUTLINE 1D**



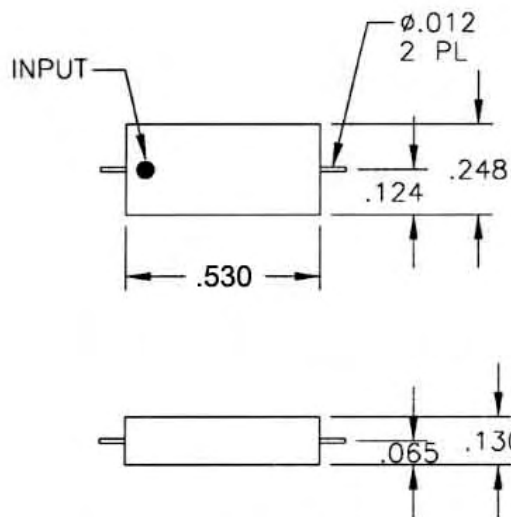
**OUTLINE 1A**



**OUTLINE B**

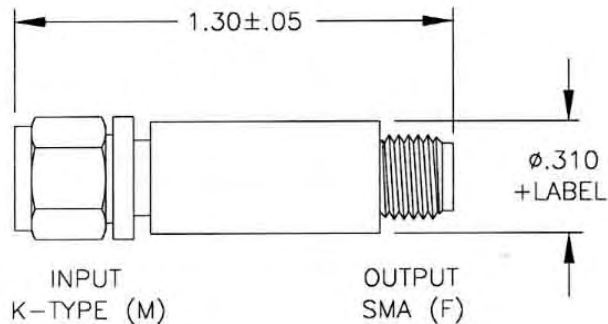


**OUTLINE BF**

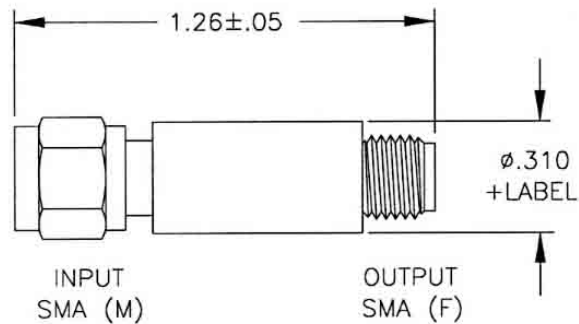


**OUTLINE L**

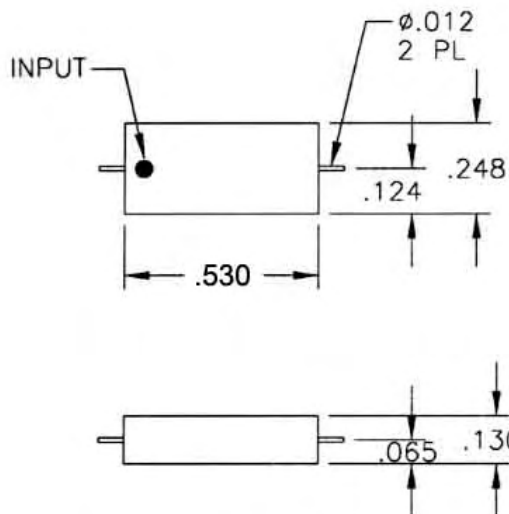
NOTE: BLACK DOTS SHOWN INDICATE RF INPUT



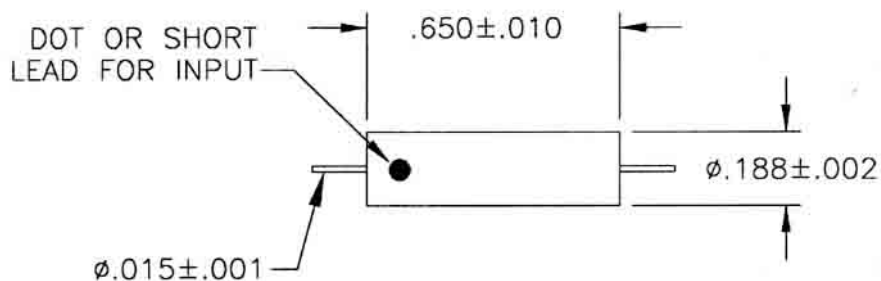
**OUTLINE C1**



**OUTLINE C**

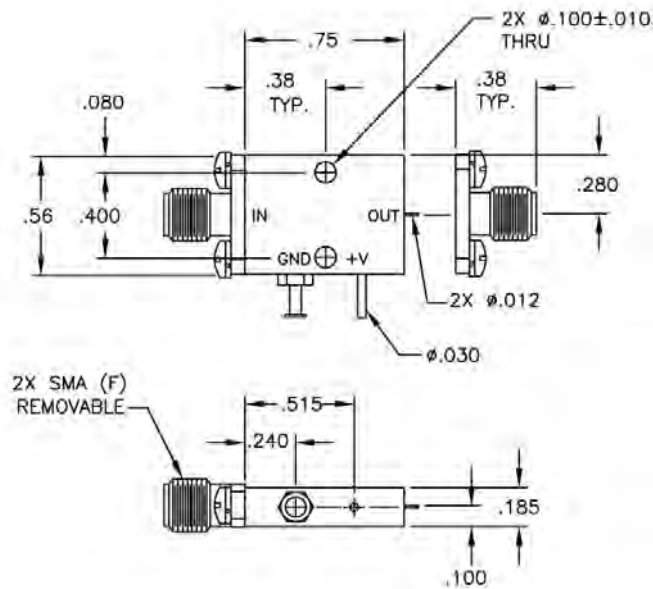


**OUTLINE L**

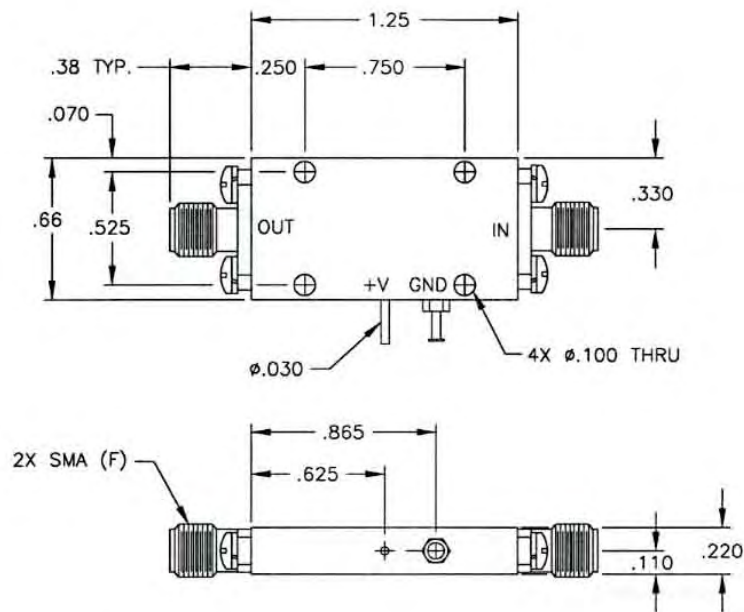


**OUTLINE Y**

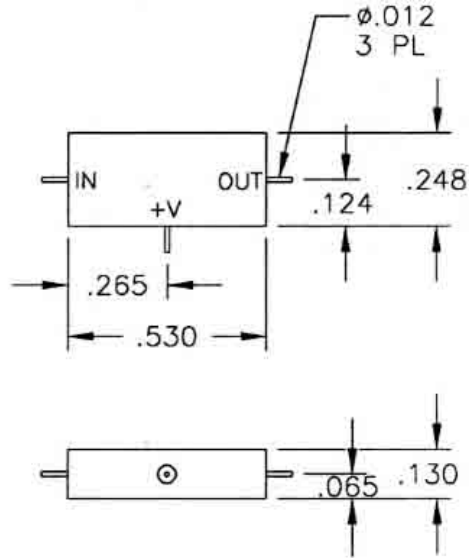
NOTE: BLACK DOTS SHOWN INDICATE RF INPUT



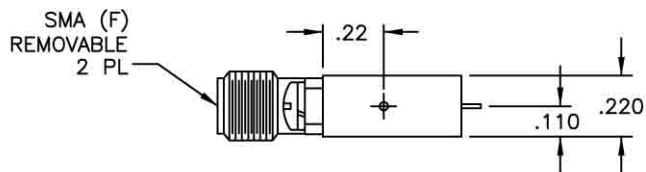
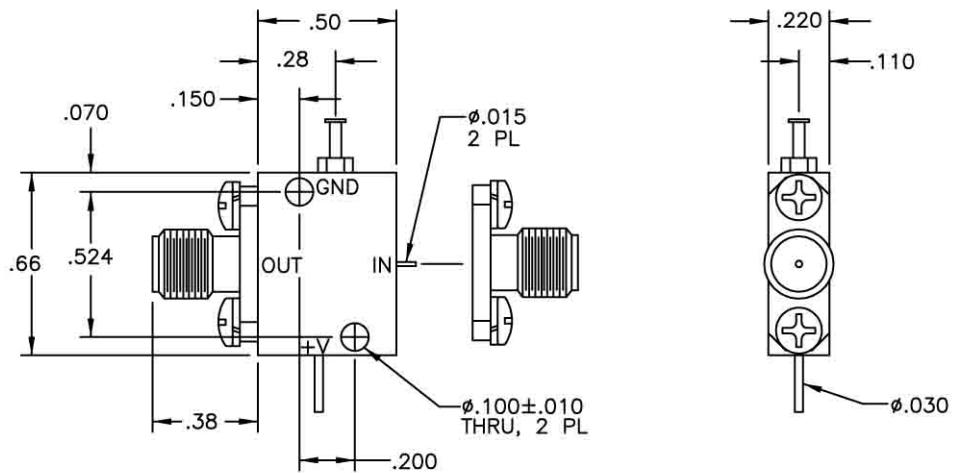
**OUTLINE 1A**



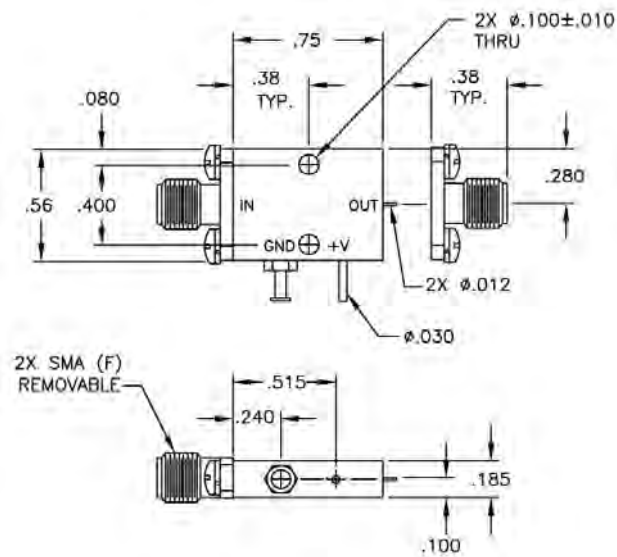
**OUTLINE 3A**



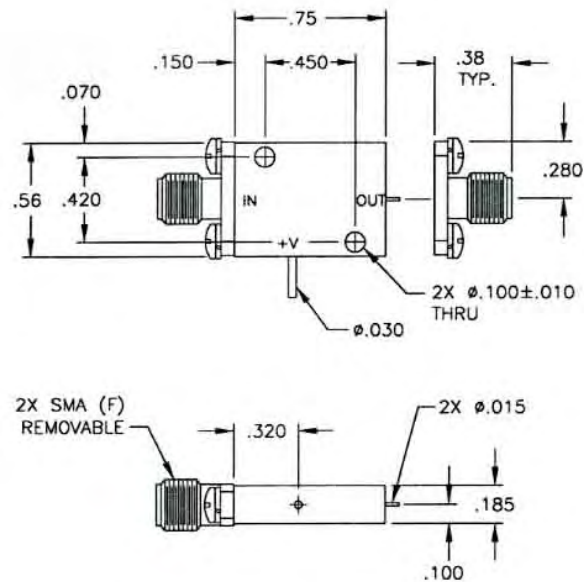
**OUTLINE L3**



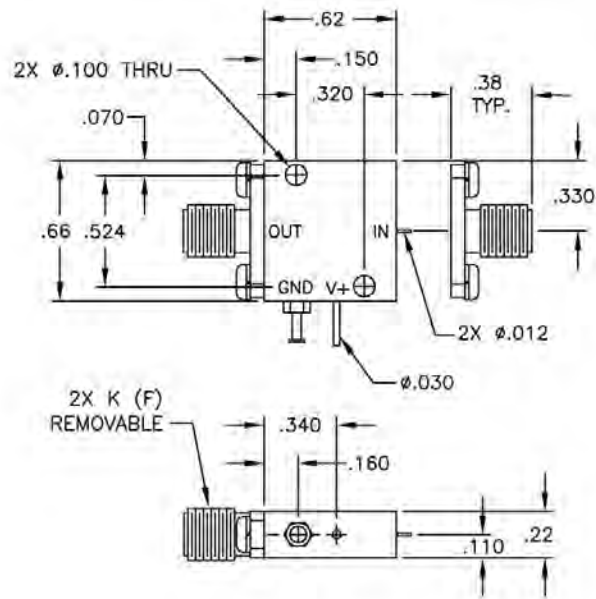
**OUTLINE 0A**



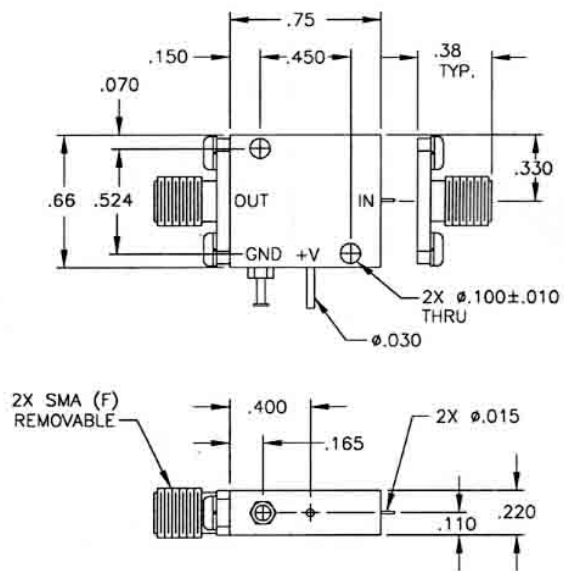
**OUTLINE 1A**



**OUTLINE 1B**

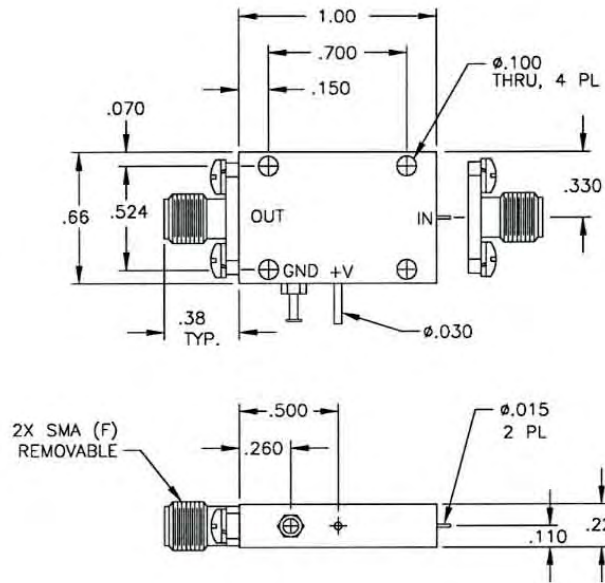


**OUTLINE 1C**

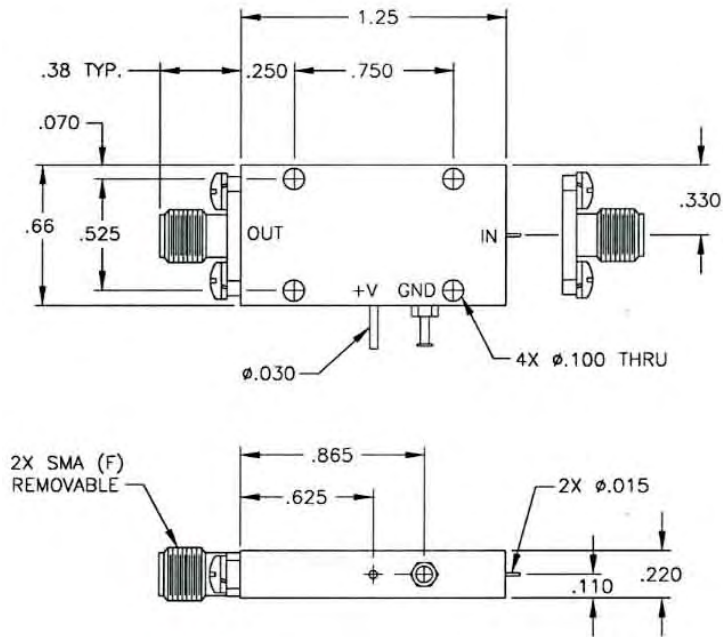


**OUTLINE 1D**

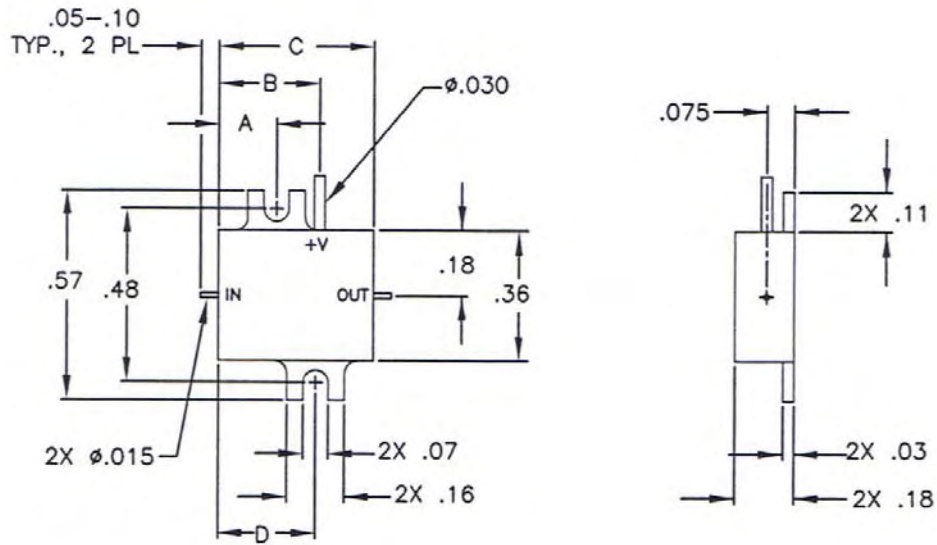




**OUTLINE 2A**



**OUTLINE 3B**



OUTLINE	A	B	C	D
M2	.16	.28	.43	.27
M3	.16	.32	.53	.38
M4	.22	.43	.64	.42
M5	.22	.53	.75	.53

**OUTLINE M (Series)**