



## COAXIAL

# Positive Gain Slope Amplifier **ZX60-R5183P+**

50Ω 0.5 to 18 GHz SMA Female

### KEY FEATURES

- Ultra Wideband, 0.5 to 18 GHz
- Low Noise Figure, 4.5 dB typ, 5 to 18 GHz
- Positive Gain Slope, 3 dB, typ., 0.5 to 18 GHz
- Protected by US patent 6,790,049

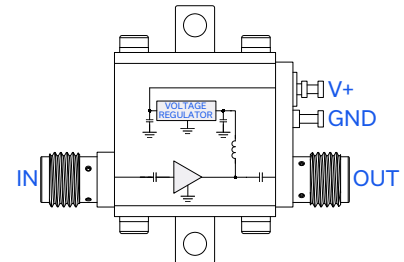


Generic photo used for illustration purposes only

### APPLICATIONS

- Microwave point to point radios
- Satellite Communication
- Military EW and Radar
- C-band Satcom

### FUNCTIONAL DIAGRAM



### PRODUCT OVERVIEW

Mini-Circuits' ZX60-R5183P+ is a wideband, positive gain slope, connectorized amplifier, providing a unique combination of low noise figure and positive gain slope, over a very wide frequency range. It supports a wide range of sensitive, high-dynamic range receiver applications and many systems where high performance over wideband is needed. This design operates on a single +5 V supply and comes in a rugged, compact unibody case (0.74 x 0.75 x 0.46") with SMA connectors, making it an excellent candidate for tough operating conditions and crowded system layouts.

### ELECTRICAL SPECIFICATIONS AT +25°C AND +5V, UNLESS NOTED OTHERWISE

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.5		18.0	GHz
Gain	0.5 - 5	-	6.5		dB
	5 - 10	5.0	7.1		
	10 - 13	5.2	8.2		
	13 - 15	6.0	8.8		
	15 - 18	-	9.5		
Input Return Loss	0.5 - 5		12.0		dB
	5 - 10		10.8		
	10 - 13		9.8		
	13 - 15		12.5		
	15 - 18		12.2		
Output Return Loss	0.5 - 5		10.2		dB
	5 - 10		6.2		
	10 - 13		9.5		
	13 - 15		10.6		
	15 - 18		11.2		
Output Power at 1 dB Compression (P1dB)	0.5 - 5		+10.2		dBm
	5 - 10		+10.6		
	10 - 13		+11.0		
	13 - 15		+10.8		
	15 - 18		+11.5		
Output Third Order Intercept Point (OIP3)	0.5 - 5		+23.5		dBm
	5 - 10		+20.5		
	10 - 13		+19.2		
	13 - 15		+18.6		
	15 - 18		+17.5		
Noise Figure	0.5 - 5		6.1		dB
	5 - 10		4.2		
	10 - 13		4.5		
	13 - 15		4.2		
	15 - 18		4.5		
Device Operating Voltage (V <sub>DD</sub> )		+4.8	+5.0	+5.2	V
Device Operating Current (I <sub>DD</sub> )			48	68	mA



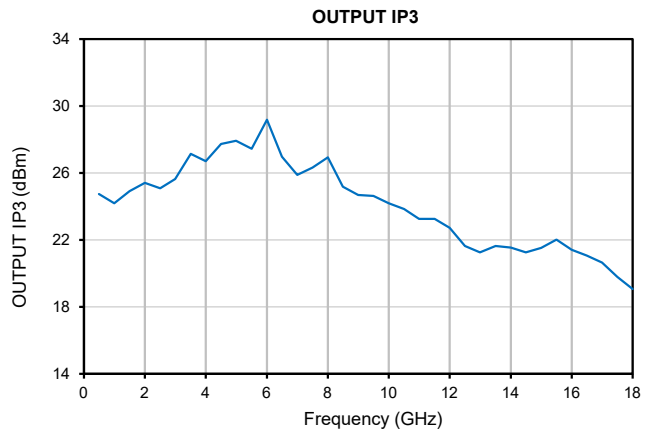
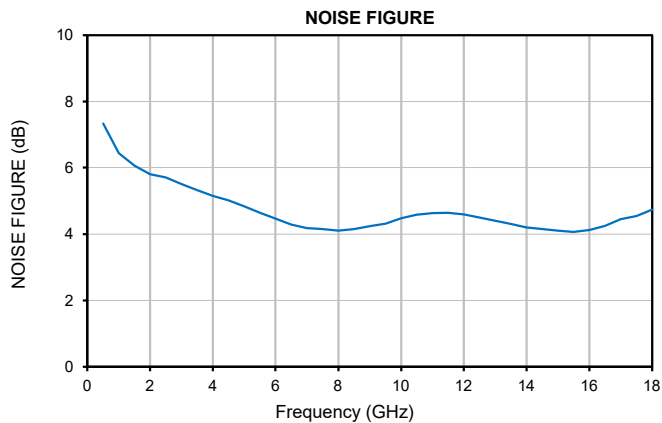
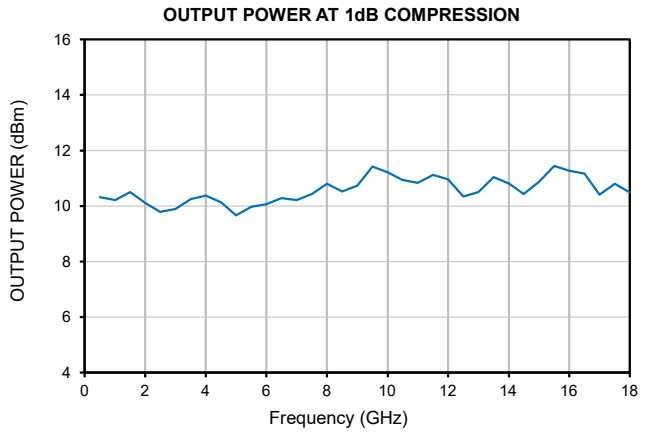
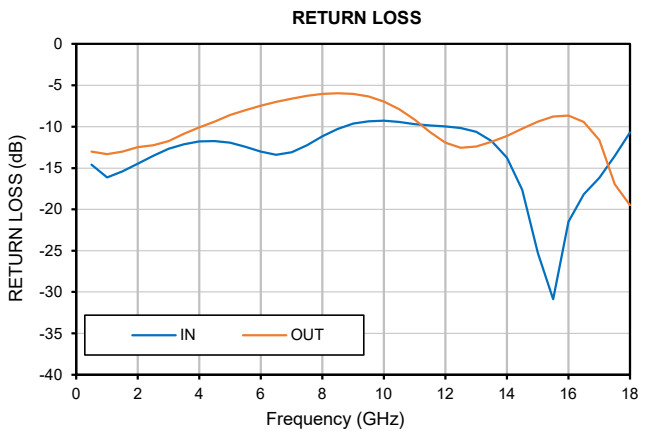
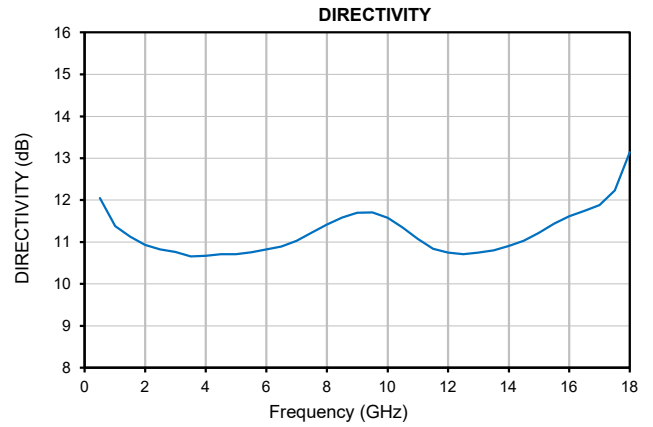
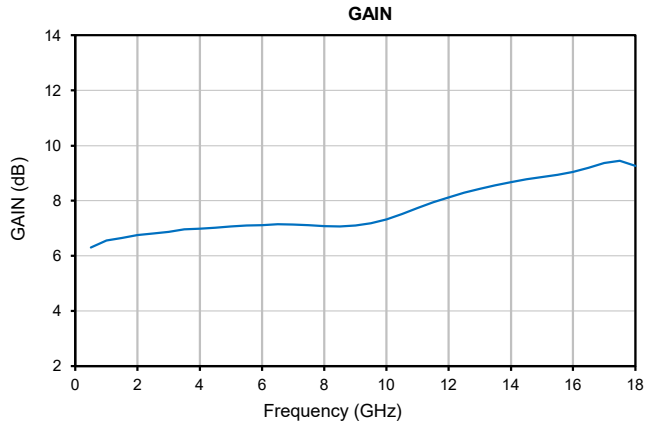


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## TYPICAL PERFORMANCE GRAPHS





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### ABSOLUTE MAXIMUM RATINGS<sup>3</sup>

Parameter	Ratings
Operating Temperature	-40°C to +85 °C
Storage Temperature	-55 °C to +100 °C
Total Power Dissipation	0.8 W
RF Input Power (CW)	+22 dBm (5 minutes, max.) +13 dBm (continuous)
DC Operating Voltage	+8.5 V

3. Continuous operation is not recommended at these extremes. Permanent damage may occur if any of these limits are exceeded.

### DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEAT SINK

$\text{MAXIMUM THERMAL RESISTANCE} = \frac{\text{MAXIMUM OPERATING CASE TEMP} - \text{MAXIMUM USER AMBIENT TEMP}}{\text{POWER DISSIPATION}}$	
<b>Example:</b>	MAXIMUM OPERATING CASE TEMP = +50 °C (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) MAXIMUM USER AMBIENT TEMP = +30 °C (USER DEFINED) POWER DISSIPATION = 10 WATTS (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) THEN MAXIMUM ALLOWABLE THERMAL RESISTANCE = 2 °C/W

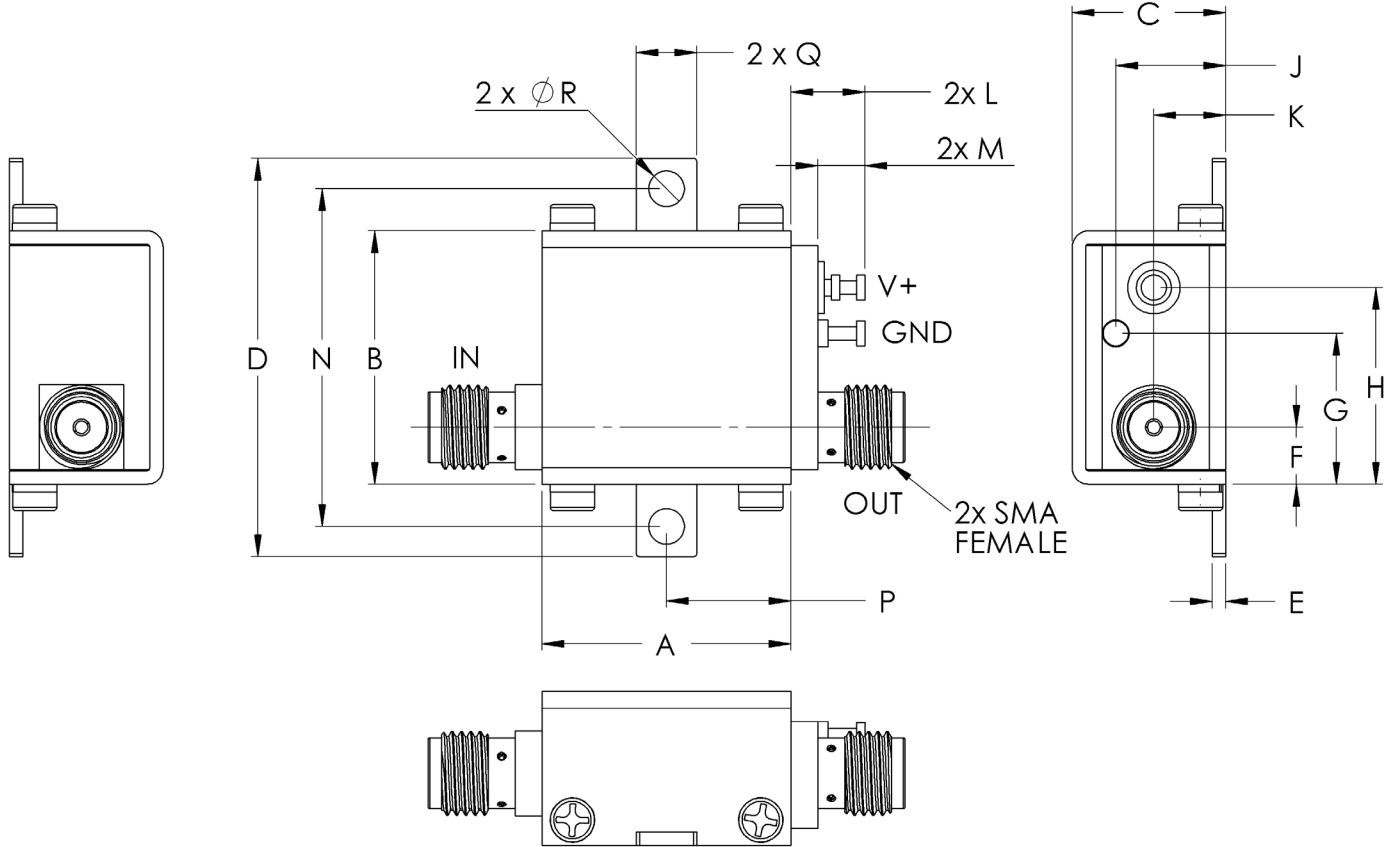


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## CASE STYLE DRAWING



## OUTLINE DIMENSIONS (inch mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	wt
.74	.75	.46	1.18	.04	.17	.45	.59	.33	.21	.22	.14	1.00	.37	.18	.106	grams
18.80	19.1	11.68	30.0	1.02	4.32	11.4	14.99	8.38	5.33	5.59	3.56	25.40	9.40	4.57	2.69	23.0





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## ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD.

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file)
RoHs Status	Compliant
Environmental Ratings	ENV23T10

## ORDERING INFORMATION

Model No. Links	<a href="#">ZX60-R5183P+</a>
Case Style	GC957
Connector	IN SMA/Female / OUT SMA/Female

### NOTES

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# Coaxial Amplifier

# ZX60-R5183P+

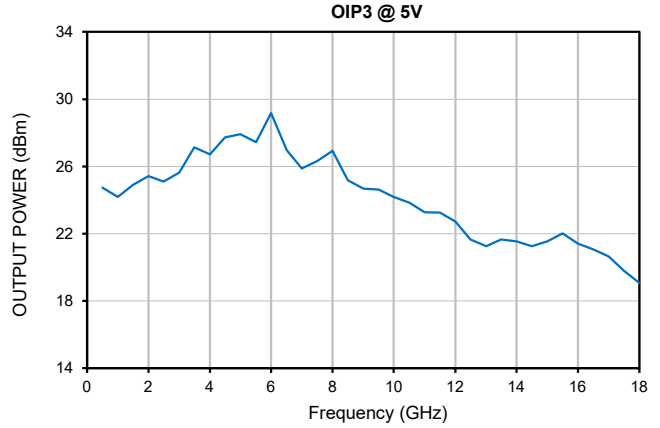
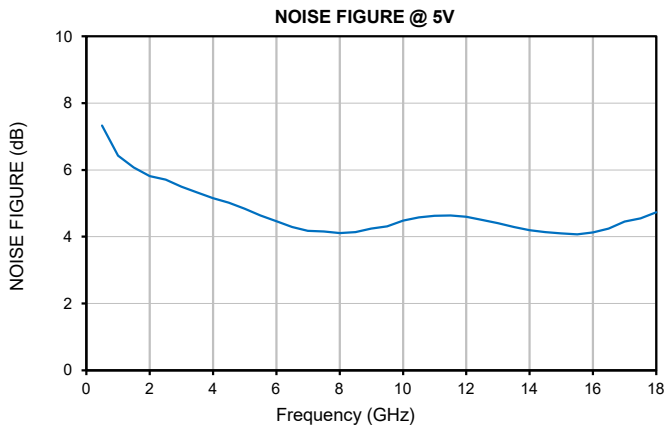
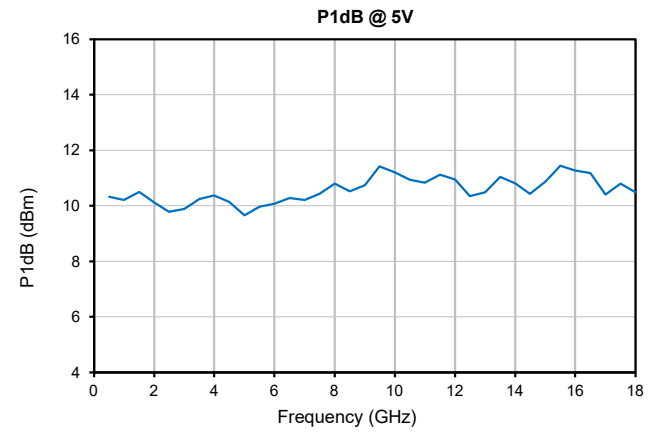
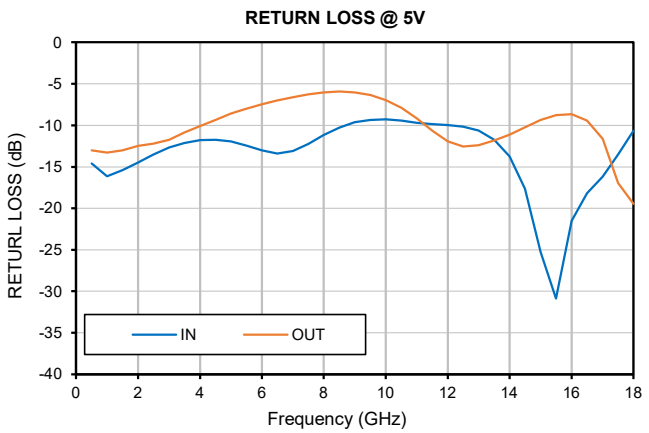
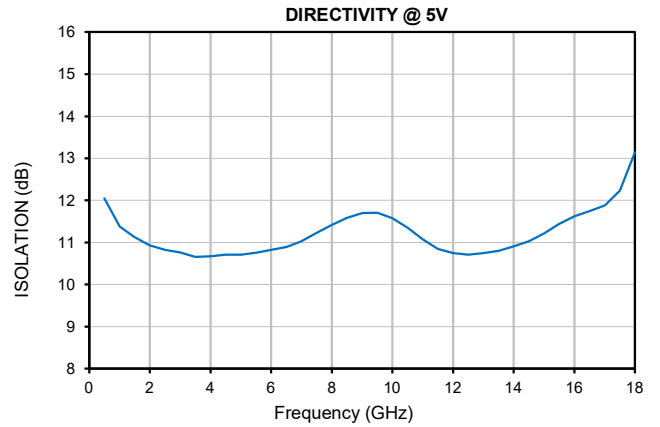
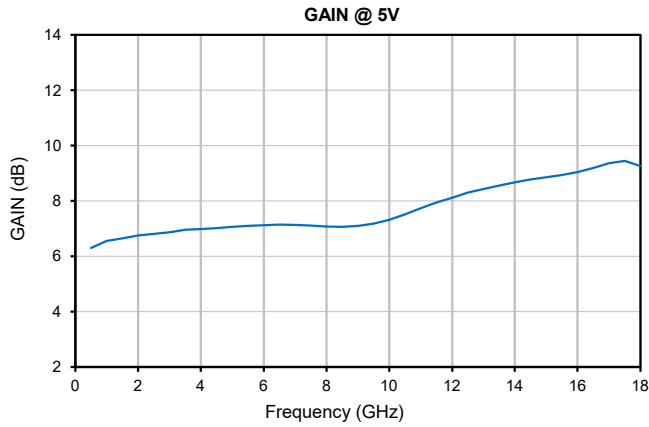
## Typical Performance Data

**Definitions:**

Input Return Loss = -S11 (dB)  
 Gain(Power Gain) = S21 (dB)  
 Reverse Isolation = -S12 (dB)  
 Output Return Loss = -S22 (dB)

FREQUENCY (GHz)	GAIN (dB) 5V	DIRECTIVITY (dB) 5V	RETURN LOSS (dB)		Pout @ 1 dB COMPRESSION (dBm) 5V	OIP3 (dBm) 5V	NOISE FIGURE (dB) 5V
			IN 5V	OUT 5V			
0.5	6.30	12.04	14.6	13.0	10.3	24.74	7.33
1.0	6.55	11.38	16.1	13.3	10.2	24.18	6.43
1.5	6.65	11.13	15.4	13.0	10.5	24.91	6.07
2.0	6.75	10.93	14.5	12.5	10.1	25.42	5.81
2.5	6.82	10.82	13.5	12.2	9.8	25.09	5.71
3.0	6.87	10.76	12.7	11.8	9.9	25.64	5.50
3.5	6.96	10.66	12.1	10.9	10.2	27.13	5.33
4.0	6.99	10.67	11.8	10.1	10.4	26.70	5.15
4.5	7.02	10.71	11.7	9.4	10.1	27.73	5.02
5.0	7.07	10.70	11.9	8.6	9.7	27.93	4.83
5.5	7.09	10.75	12.5	8.0	10.0	27.43	4.64
6.0	7.12	10.82	13.0	7.5	10.1	29.17	4.46
6.5	7.14	10.89	13.4	7.0	10.3	26.97	4.29
7.0	7.14	11.03	13.1	6.6	10.2	25.88	4.18
7.5	7.11	11.22	12.3	6.3	10.4	26.31	4.16
8.0	7.08	11.42	11.2	6.0	10.8	26.93	4.11
8.5	7.07	11.58	10.3	5.9	10.5	25.17	4.14
9.0	7.10	11.69	9.6	6.0	10.7	24.68	4.24
9.5	7.18	11.70	9.3	6.4	11.4	24.61	4.31
10.0	7.32	11.57	9.3	7.0	11.2	24.18	4.49
10.5	7.52	11.34	9.44	7.91	10.94	23.85	4.58
11.0	7.74	11.08	9.71	9.18	10.84	23.26	4.63
11.5	7.95	10.84	9.87	10.66	11.12	23.25	4.64
12.0	8.12	10.74	9.97	11.94	10.95	22.73	4.59
12.5	8.30	10.71	10.18	12.55	10.34	21.64	4.50
13.0	8.44	10.74	10.61	12.40	10.49	21.25	4.40
13.5	8.55	10.81	11.74	11.82	11.04	21.65	4.30
14.0	8.67	10.91	13.77	11.10	10.81	21.54	4.20
14.5	8.78	11.03	17.63	10.22	10.43	21.25	4.14
15.0	8.86	11.21	25.28	9.38	10.87	21.52	4.10
15.5	8.93	11.44	30.88	8.78	11.44	22.01	4.07
16.0	9.04	11.62	21.49	8.67	11.27	21.40	4.12
16.5	9.19	11.74	18.19	9.44	11.17	21.05	4.24
17.0	9.37	11.88	16.21	11.66	10.41	20.64	4.45
17.5	9.44	12.23	13.54	16.94	10.80	19.77	4.55
18.0	9.26	13.15	10.67	19.48	10.49	19.05	4.73

## Typical Performance Curves

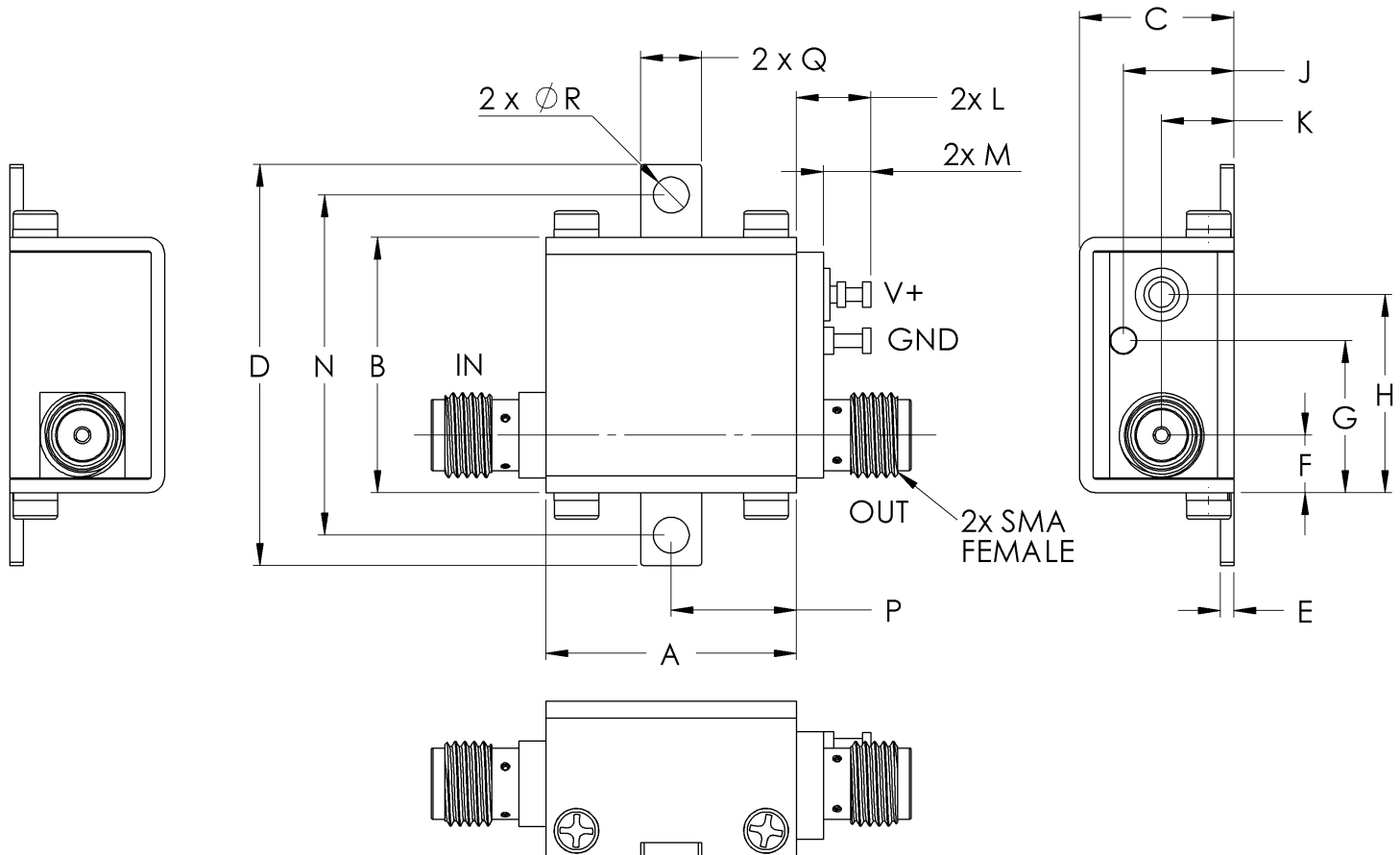


# Case Style

# GC

## Outline Dimensions

## GC957



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N
GC957	.74 (18.80)	.75 (19.15)	.46 (11.61)	1.18 (30.07)	.04 (1.02)	.17 (4.32)	.45 (11.40)	.59 (14.86)	.33 (8.31)	.21 (5.44)	.22 (5.59)	.14 (3.56)	1.00 (25.4)

CASE #.	P	Q	R	WT GRAMS
GC957	.37 (9.40)	.18 (4.57)	.106 (2.69)	23.0

Dimensions are in inches (mm). Tolerances: 2Pl.  $\pm .03$ ; 3Pl.  $\pm .015$   
Tolerance on hole size and interaxes dimensions to be  $\pm .005$ .

### Note:

1. Case material: Brass
2. Case finish: Nickel plate

**Mini-Circuits**<sup>®</sup>

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85° C Case Temperature	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Stabilization Bake	(non-operating) 125°C, 24 hours	- - -
Burn-in at Elevated Temp.	(DC on) 160 hours at 85° C	MIL-STD-202, Method 108
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, except 100°C