COAXIAL

Low Noise Amplifier ZX60-04183LN+

50Ω 4 to 18 GHz SMA Female

KEY FEATURES

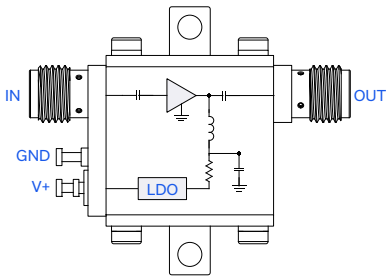
- Ultra-Wideband, 4 to 18 GHz
- Excellent Noise Figure, 2.5 dB Typ. at 15 GHz
- Low Current, 48 mA Typ.
- Voltage Regulated Internally and Reverse Voltage Protected
- Usable up to 20 GHz

Generic photo used for illustration purposes only

APPLICATIONS

- WiFi
- WLAN
- LTE/WCDMA/EDGE
- C, X & Ku Band Radar & SATCOM

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' ZX60-04183LN+ is a wideband low noise connectorized amplifier providing a unique combination of low noise figure, high IP3, and low current making it ideal for sensitive, high-dynamic-range receiver applications. This design operates on a single +5 V supply and comes in a rugged, compact unibody case (0.74x0.75x0.46") with SMA connectors, making it an excellent candidate for tough operating conditions and crowded system layouts.

ELECTRICAL SPECIFICATIONS AT +25 °C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Frequency Range		4		18	GHz
Noise Figure	4-8 8-12 12-18		2.6 2.5 2.5		dB
Gain	4-8 8-12 12-18	11 9 9	13 12 11		dB
Input Return Loss	4-8 8-12 12-18		8 11 12		dB
Output Return Loss	4-8 8-12 12-18		13 15 13		dB
Output Power at 1 dB Compression[1]	4-8 8-12 12-18		+15 +15 +15		dBm
Output IP3[2]	4-8 8-12 12-18		+26 +26 +26		dBm
Device Operating Voltage (V_{DD})		+4.75	+5.0	+9.0	V
Device Operating Current (I_{DD})			46	66	mA

1. Current increases at P1dB.
2. OIP3 measured with 0 dBm tones and 1 MHz spacing.

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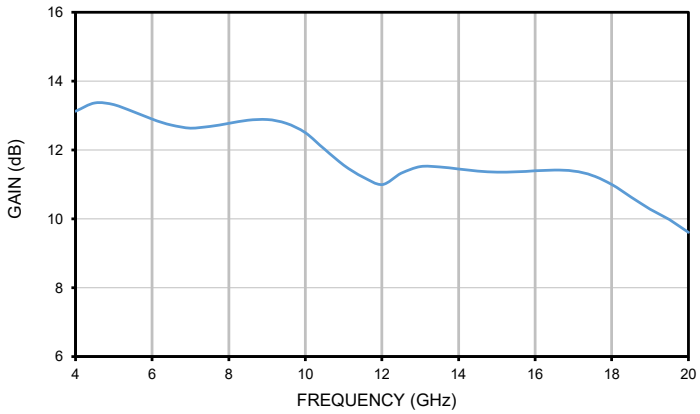
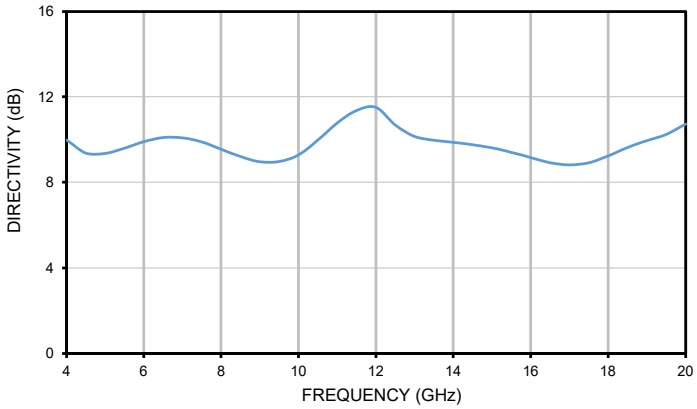
TYPICAL PERFORMANCE GRAPHS

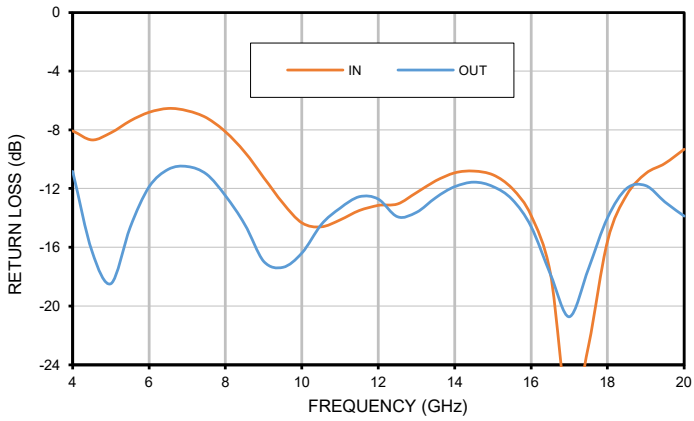
GAIN



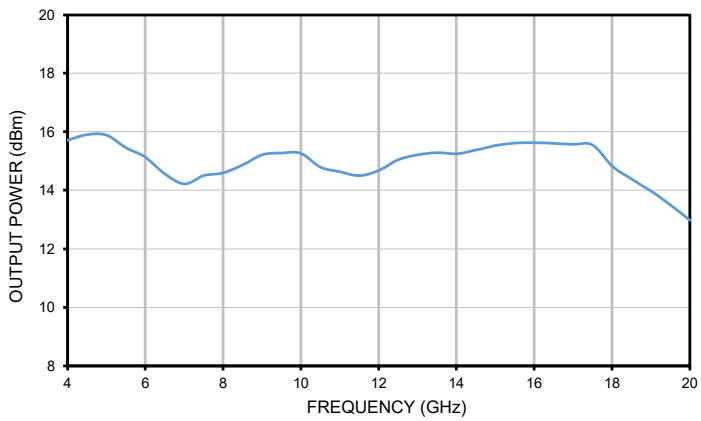
DIRECTIVITY



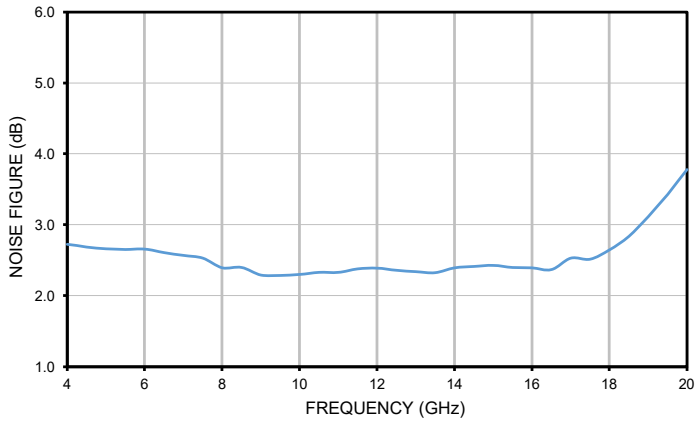
RETURN LOSS



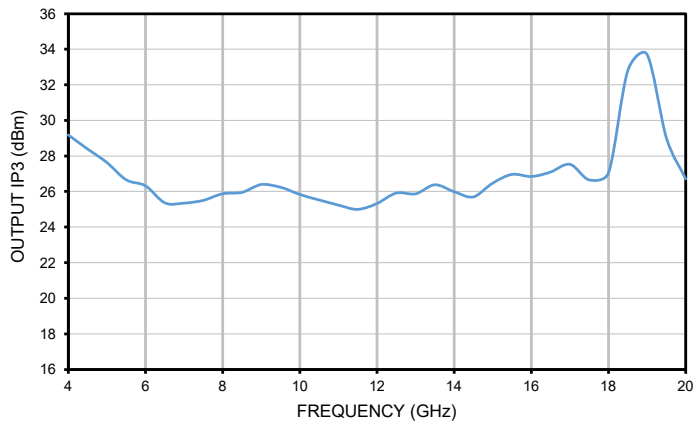
OUTPUT POWER AT 1dB COMPRESSION



NOISE FIGURE



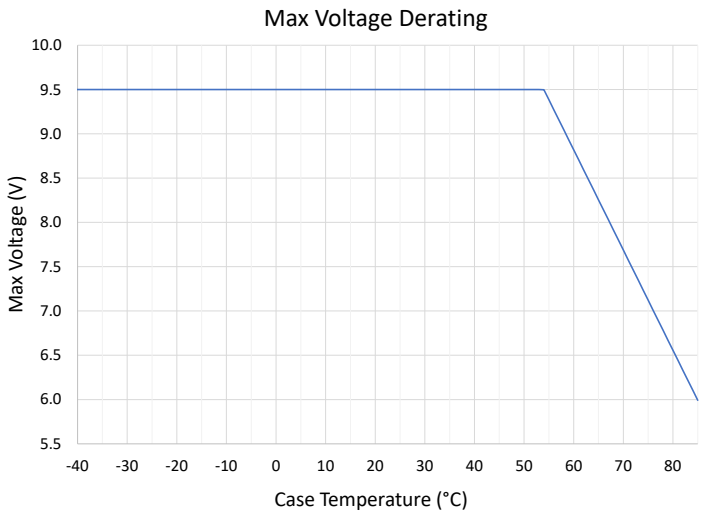
OUTPUT IP3



ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-55 °C to +100 °C
Total Power Dissipation	0.7 W
Input Power (CW), V_D = +5 V	+12 dBm
DC Voltage[3]	+9.5 V

3. See max voltage derating chart below.
Permanent damage may occur if any of these limits are exceeded.



DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEAT SINK

$$\text{MAXIMUM THERMAL RESISTANCE} = \frac{\text{MAXIMUM OPERATING CASE TEMP} - \text{MAXIMUM USER AMBIENT TEMP}}{\text{POWER DISSIPATION}}$$

Example:	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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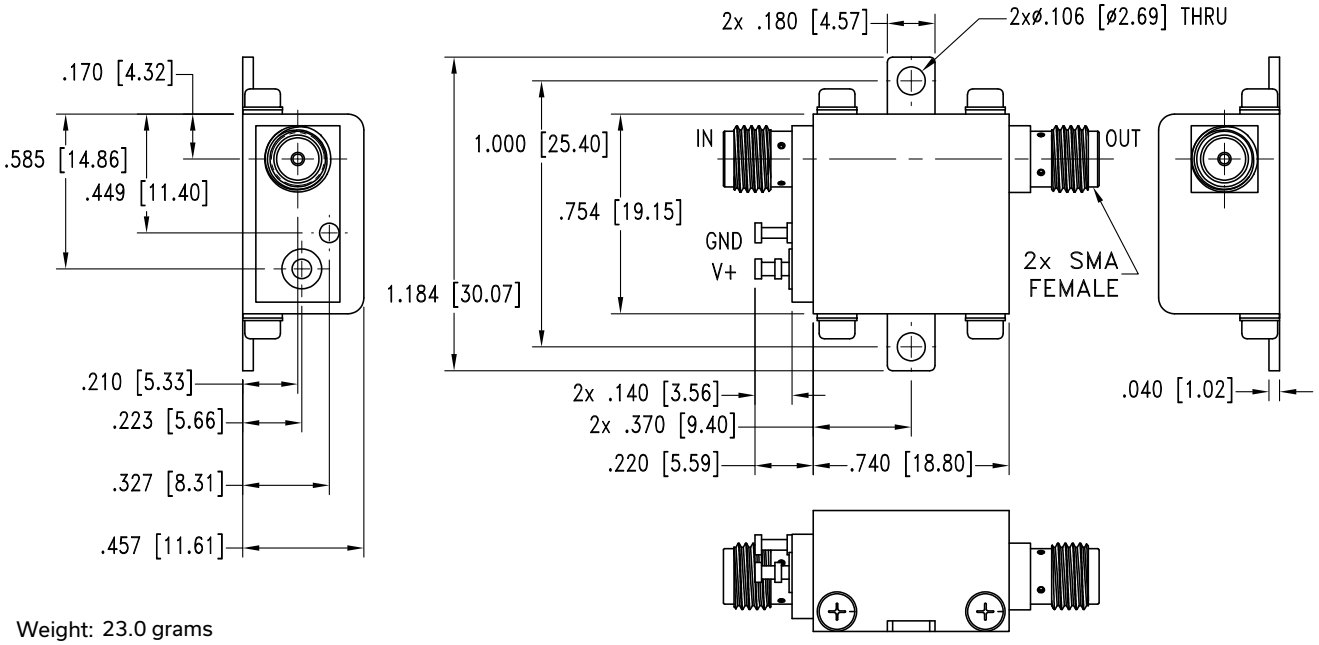
CASE STYLE DRAWING



Weight: 23.0 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 Pl. ±.015 Inches

⚠ NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminal. See Application Note AN-40-010.

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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. Link	ZX60-04183LN+
Case Style	GC957-2
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

Coaxial Amplifier ZX60-04183LN+

Typical Performance Data

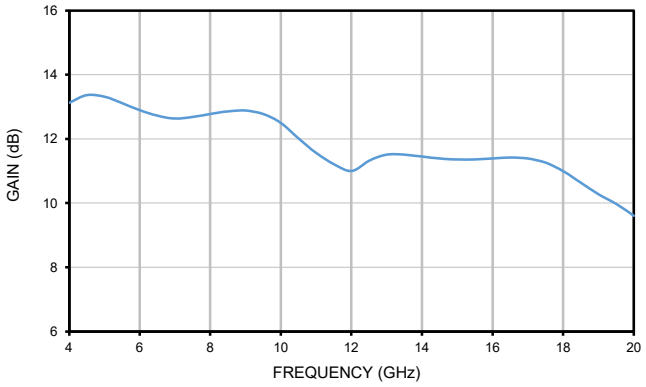
Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5V, Id = 46mA @ Temperature = +25°C

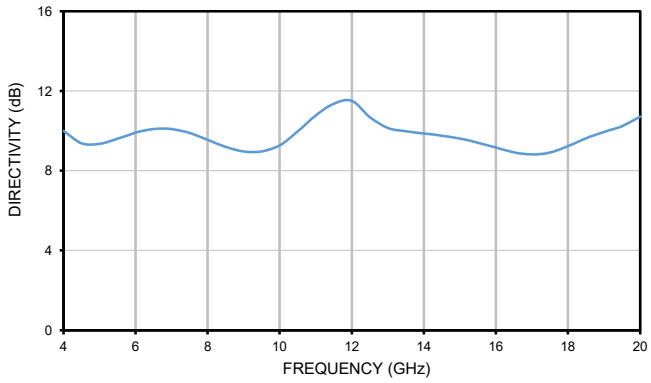
FREQUENCY	GAIN	DIRECTIVITY	RETURN LOSS (dB)		STABILITY		Pout @ 1 dB COMPRESSION	NOISE FIGURE	OIP3
(GHz)	(dB)	(dB)	IN	OUT	K	Measure	(dBm)	(dB)	(dBm)
4.0	13.1	10.0	8.1	10.8	1.4	1.0	15.7	2.7	29.2
4.5	13.4	9.4	8.7	16.3	1.4	1.0	15.9	2.7	28.4
5.0	13.3	9.4	8.2	18.5	1.4	1.0	15.9	2.7	27.6
5.5	13.1	9.6	7.4	14.6	1.4	1.0	15.5	2.7	26.7
6.0	12.9	9.9	6.8	11.9	1.4	1.0	15.1	2.7	26.3
6.5	12.7	10.1	6.5	10.7	1.4	0.9	14.6	2.6	25.4
7.0	12.6	10.1	6.7	10.5	1.4	0.9	14.2	2.6	25.4
7.5	12.7	9.9	7.2	11.0	1.4	0.9	14.5	2.5	25.5
8.0	12.8	9.6	8.1	12.5	1.5	0.9	14.6	2.4	25.9
8.5	12.9	9.2	9.5	14.4	1.5	0.9	14.9	2.4	26.0
9.0	12.9	9.0	11.2	16.9	1.5	0.9	15.2	2.3	26.4
9.5	12.8	9.0	13.0	17.3	1.5	0.9	15.3	2.3	26.2
10.0	12.5	9.3	14.3	16.4	1.6	0.9	15.3	2.3	25.8
10.5	12.0	10.0	14.6	14.5	1.6	0.9	14.8	2.3	25.5
11.0	11.6	10.8	14.1	13.3	1.7	0.9	14.6	2.3	25.2
11.5	11.2	11.4	13.5	12.6	1.8	0.9	14.5	2.4	25.0
12.0	11.0	11.5	13.1	12.7	1.8	0.9	14.7	2.4	25.3
12.5	11.3	10.7	13.0	13.9	1.7	0.9	15.0	2.4	25.9
13.0	11.5	10.2	12.3	13.6	1.6	0.9	15.2	2.3	25.9
13.5	11.5	10.0	11.5	12.6	1.6	0.9	15.3	2.3	26.4
14.0	11.5	9.9	10.9	11.9	1.6	0.9	15.3	2.4	26.0
14.5	11.4	9.8	10.8	11.6	1.5	0.9	15.4	2.4	25.7
15.0	11.4	9.6	11.1	11.8	1.5	0.9	15.5	2.4	26.5
15.5	11.4	9.4	12.0	12.7	1.5	0.9	15.6	2.4	27.0
16.0	11.4	9.2	13.8	14.6	1.5	0.9	15.6	2.4	26.8
16.5	11.4	8.9	17.7	17.8	1.5	0.9	15.6	2.4	27.1
17.0	11.4	8.8	27.7	20.7	1.5	0.9	15.6	2.5	27.5
17.5	11.3	8.9	22.6	17.4	1.6	0.9	15.6	2.5	26.7
18.0	11.0	9.2	15.5	14.0	1.6	0.8	14.8	2.6	27.1
18.5	10.6	9.6	12.4	12.0	1.6	0.8	14.4	2.8	32.8
19.0	10.3	10.0	11.0	11.8	1.5	0.9	14.0	3.1	33.7
19.5	10.0	10.3	10.3	12.9	1.5	1.0	13.5	3.4	29.0
20.0	9.6	10.7	9.3	13.9	1.5	1.0	13.0	3.8	26.7

Typical Performance Curves

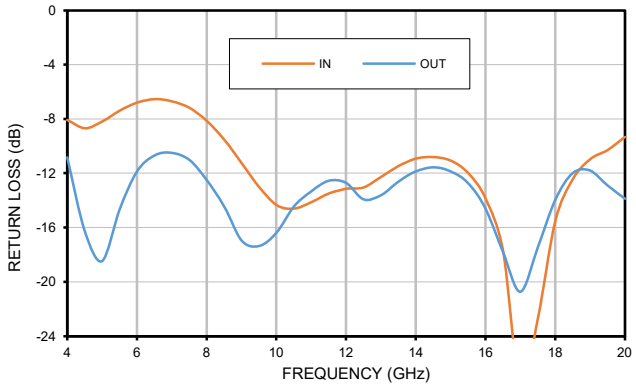
GAIN



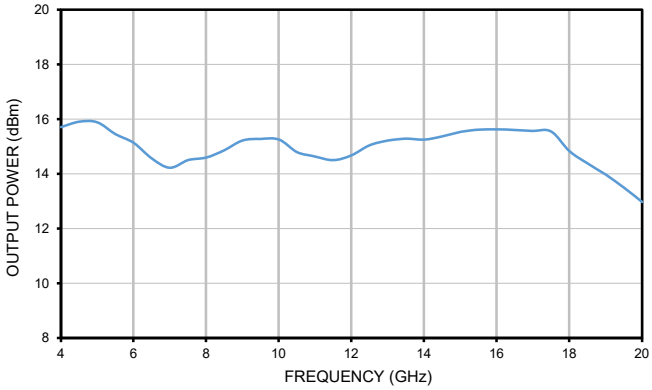
DIRECTIVITY



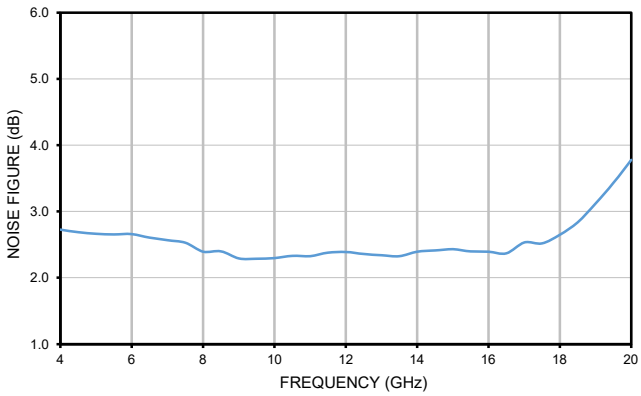
RETURN LOSS



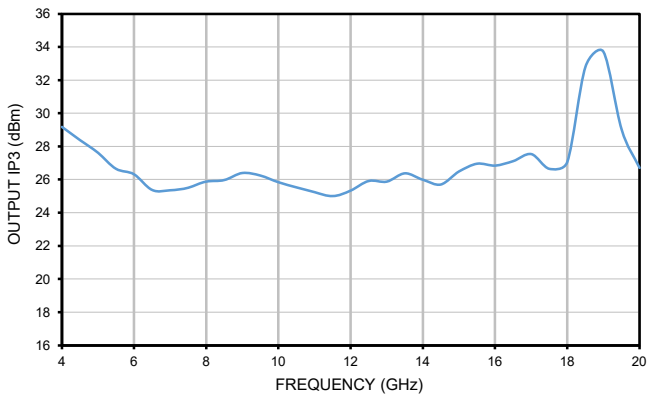
OUTPUT POWER AT 1dB COMPRESSION



NOISE FIGURE



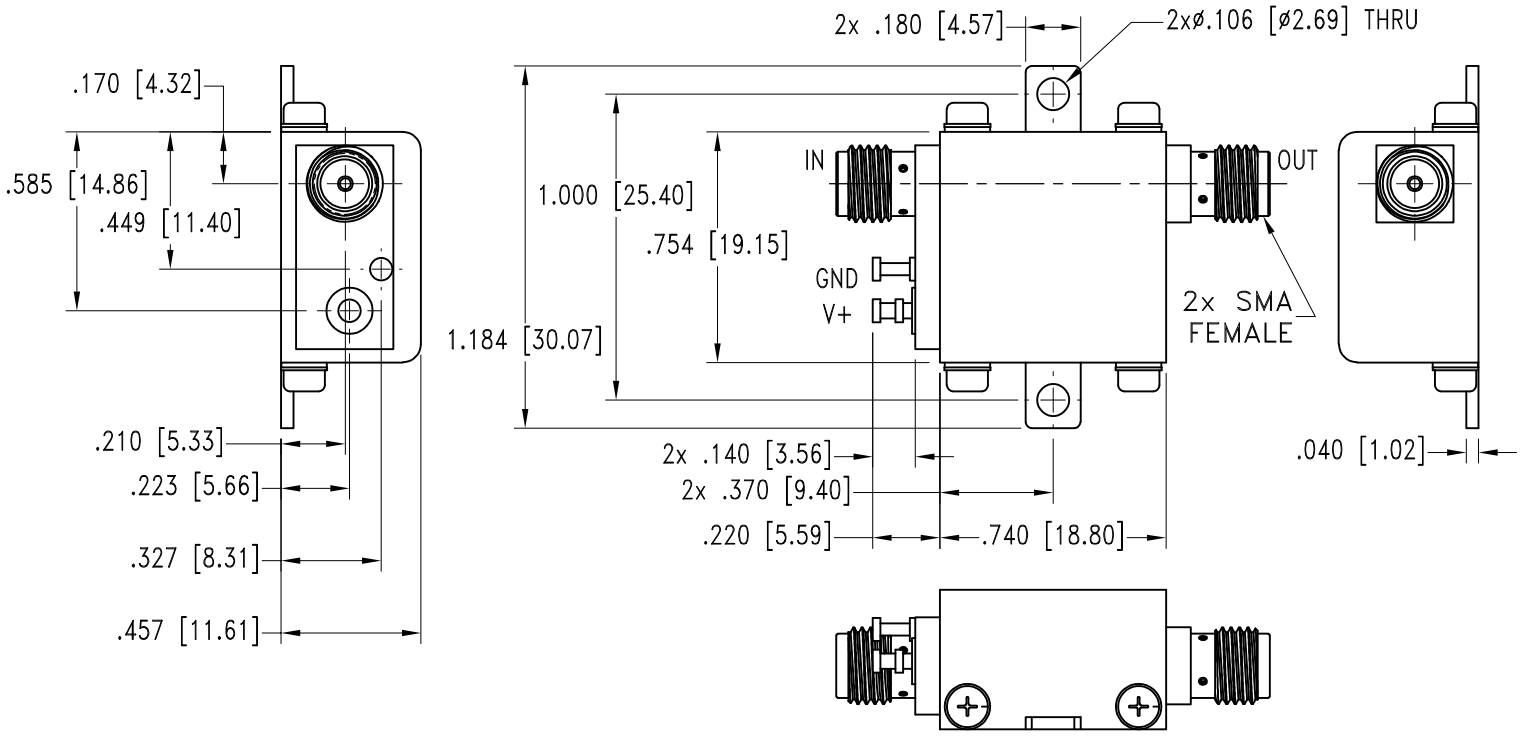
OUTPUT IP3



Case Style GC

Outline Dimensions

GC957-2



Weight: 23.0 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 Pl. ±.015 Inches

Notes:

Case material:	Brass.
Case Finish:	Nickel plate.

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Environmental Specifications ENV23T10

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

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