



WIDEBAND

Medium Power Amplifier

ZX60-83MPR-S+

50Ω 0.4 to 8 GHz SMA Female

KEY FEATURES

- Wideband, 0.4 to 8 GHz
- P1dB, +27 dBm Typ.
- Excellent OIP3, +38 dBm Typ.
- 3.1 dB Typ. Noise Figure
- Voltage Regulated Internally and Reverse Voltage Protected
- Ideal evaluation module for PMA3-83MP+

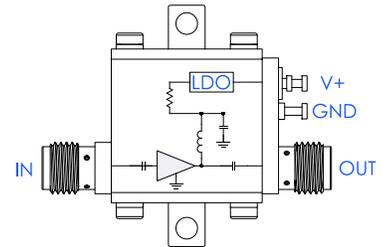


Generic photo used for illustration purposes only

APPLICATIONS

- Sub-6 GHz 5G Infrastructure
- WiFi6E, IoT & ISM Applications
- Test & Measurement Equipment
- R&D Lab, Production, and OTA Test Systems

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' ZX60-83MPR-S+ is a medium power amplifier utilizing MCL's own GaAs PHEMT amplifier, PMA3-83MP+, offering industry-leading performance over its full frequency range from 400 MHz to 8 GHz. This design operates on a single +9V supply @ 144 mA and comes in a rugged, compact unibody case (0.74" x 0.75" x 0.46") with integrated SMA female connectors, making it an excellent candidate for demanding operating conditions and crowded system layouts. A compatible heat sink is provided (not installed) for convenient setup and stand alone operation.

ELECTRICAL SPECIFICATIONS AT +25°C BASEPLATE, UNLESS OTHERWISE NOTED

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.4		8	GHz
Gain	0.4		21.5		dB
	1.0		21.4		
	2.0		20.7		
	4.0		19.5		
	6.0		19.2		
Gain Flatness	0.4-4.0		±1.4		dB
	0.4-8.0		±2.6		
Input Return Loss	0.4		13.5		dB
	1.0		14.5		
	2.0		13.5		
	4.0		10.5		
	6.0		9.7		
Output Return Loss	0.4		10.0		dB
	1.0		12.5		
	2.0		15.5		
	4.0		14.0		
	6.0		15.0		
	8.0		13.5		

REV. A
 ECO-027410
 ZX60-83MPR-S+
 MCL NY
 250905





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ELECTRICAL SPECIFICATIONS AT +25°C BASEPLATE, UNLESS OTHERWISE NOTED

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Output Power @ 1 dB Compression	0.4		+28.5		dBm
	1.0		+28.0		
	2.0		+28.0		
	4.0		+27.0		
	6.0		+26.5		
	8.0		+26.0		
Output IP3 ¹	0.4		+40.0		dBm
	2.0		+37.7		
	4.0		+38.0		
	8.0		+36.0		
Noise Figure	0.4		3.3		dB
	2.0		3.2		
	4.0		2.8		
	8.0		3.2		
Device Operating Voltage (V_{DD})		+8.5	+9.0	+9.5	V
Device Operating Current (I_{DD}) ²		—	144	180	mA

1. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, +13 dBm/tone at output.
 2. Current at $P_{IN} = -25$ dBm. Increases to 280 mA at P_{sat} .



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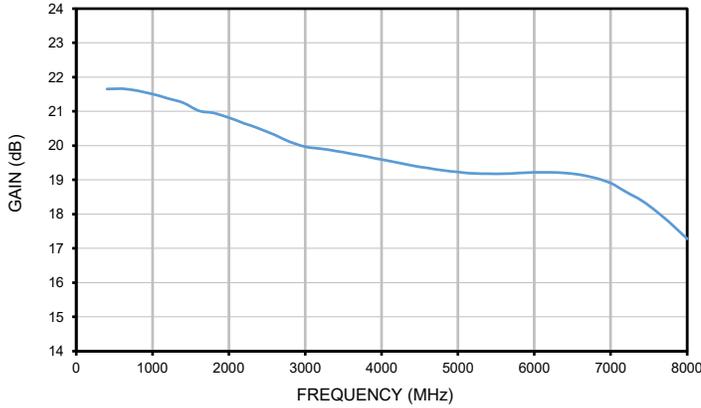
ZX60-83MPR-S+

Mini-Circuits

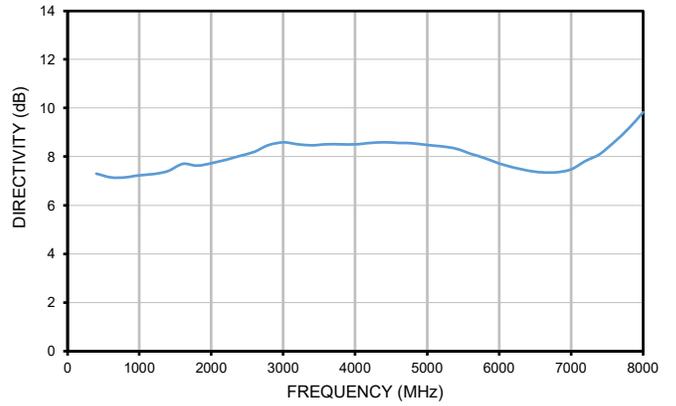
50Ω 0.4 to 8 GHz SMA Female

TYPICAL PERFORMANCE GRAPHS

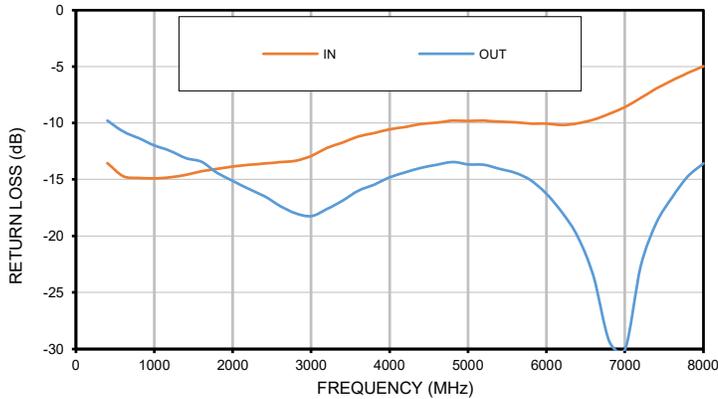
GAIN



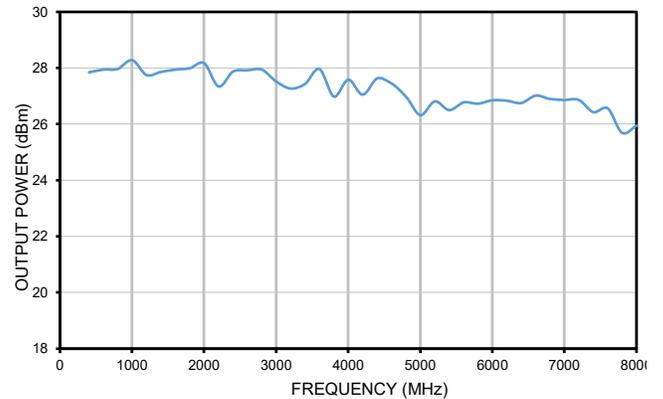
DIRECTIVITY



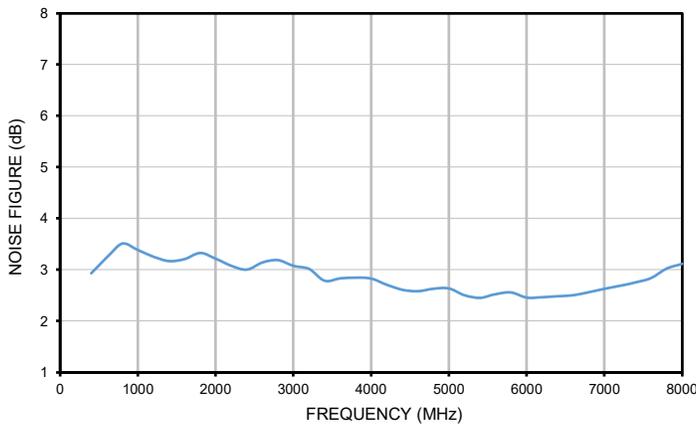
RETURN LOSS



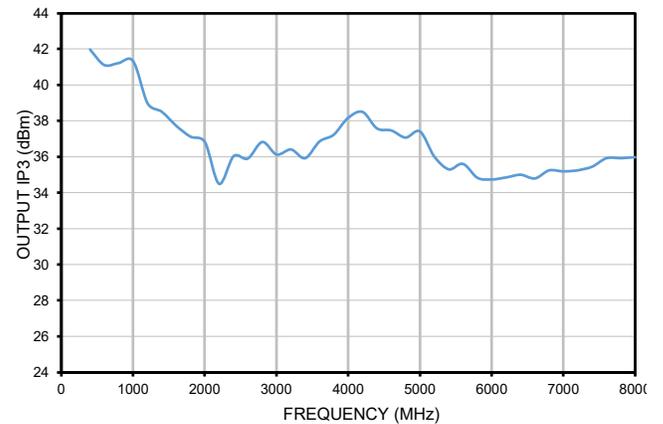
OUTPUT POWER AT 1dB COMPRESSION



NOISE FIGURE



OUTPUT IP3





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ABSOLUTE MAXIMUM RATINGS^{3,4}

Parameter	Ratings
Operating Temperature	-40°C to +85°C Baseplate -40°C to +65°C Ambient ⁵
Storage Temperature	-55°C to +100°C
Total Power Dissipation ^{5,6}	2.2 W
RF Input Power (CW)	+14 dBm
DC Operating Voltage	+10 V

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

4. Specified under matched load to 50 ohms.

5. Operation is recommended using the supplied heatsink or an alternative heatsink with a thermal resistance ≤ 13.4 °C/W.

6. Total power dissipation determined at $V_s = +10V$ with amplifier in saturation.

DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEAT SINK

<i>MAXIMUM THERMAL RESISTANCE</i>	$= \frac{\text{MAXIMUM OPERATING CASE TEMP} - \text{MAXIMUM USER AMBIENT TEMP}}{\text{POWER DISSIPATION}}$
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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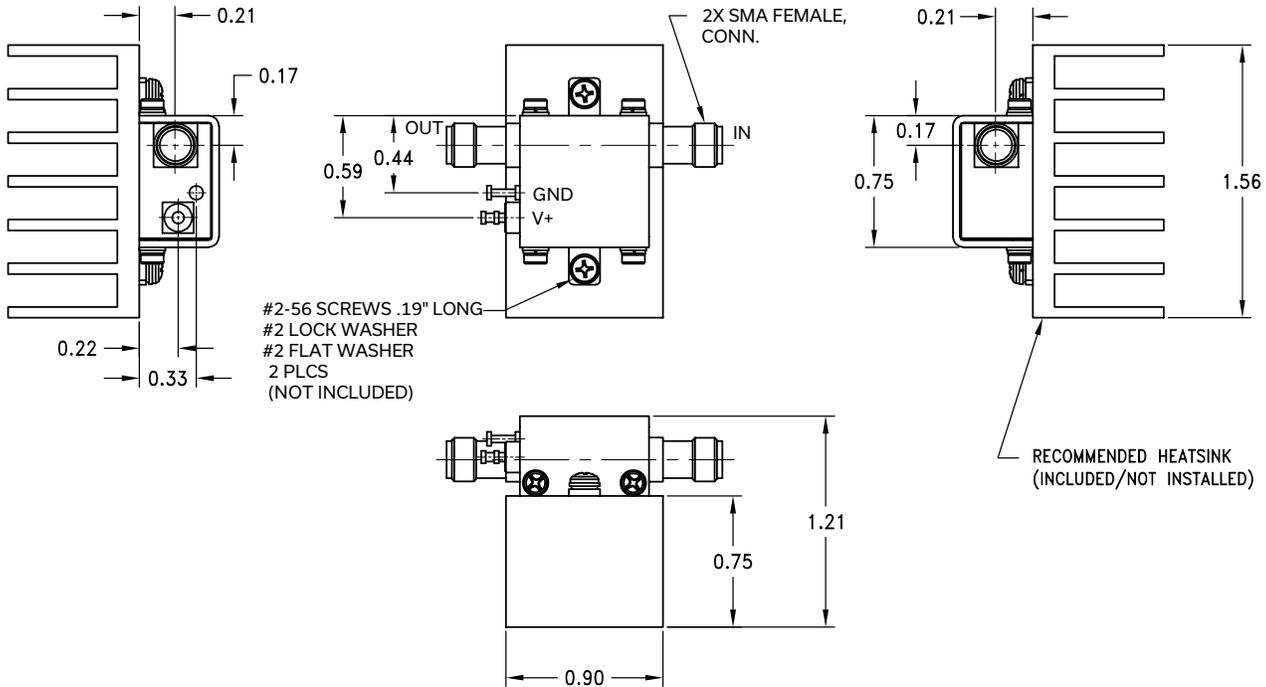
Medium Power Amplifier

ZX60-83MPR-S+

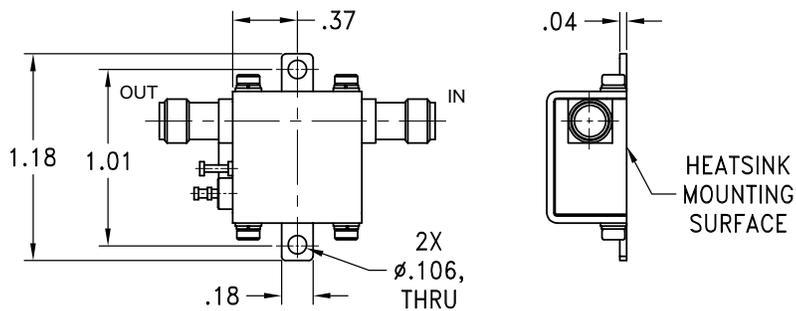
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50Ω 0.4 to 8 GHz SMA Female

CASE STYLE DRAWING



MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



Weight: 43 grams; without heatsink 23 grams.

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



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Mini-Circuits

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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
Export Information	ECCN# EAR99

ORDERING INFORMATION

Model No. Link	ZX60-83MPR-S+
Case Style	GC957-3
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

ZX60-83MPR-S+

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 = 9V, Id = 144mA @ Temperature = +25°C

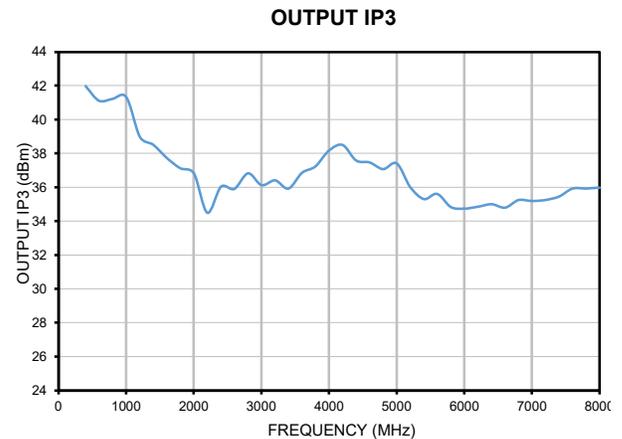
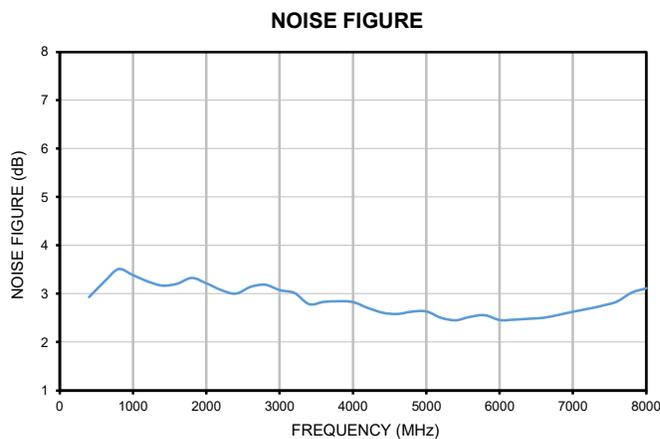
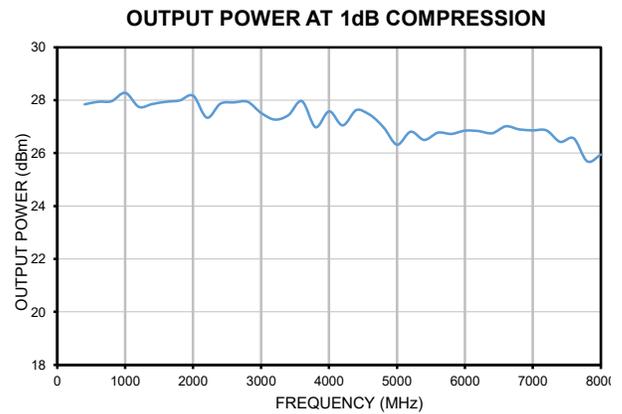
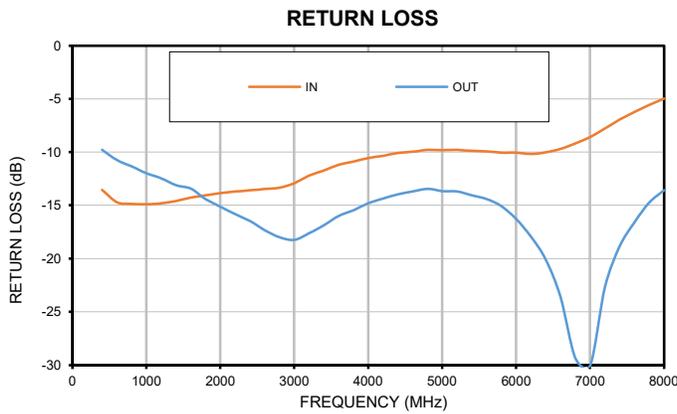
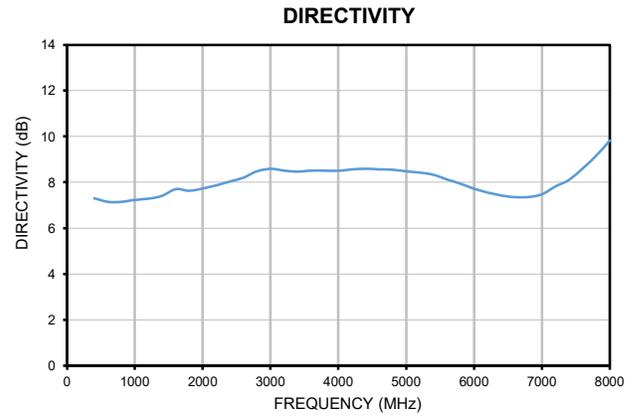
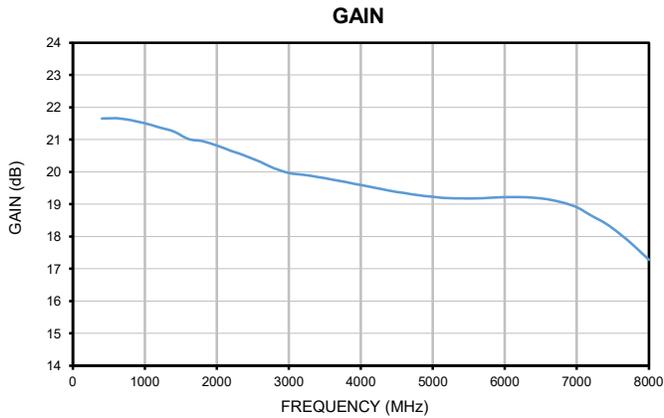
FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	RETURN LOSS (dB)		STABILITY		Pout @ 1 dB COMPRESSION (dBm)	NOISE FIGURE (dB)	OIP3 (dBm)
			IN	OUT	K	Measure			
400	21.7	7.3	13.5	9.8	1.26	0.70	27.8	2.9	42.0
600	21.7	7.2	14.7	10.8	1.27	0.72	27.9	3.2	41.1
800	21.6	7.2	14.9	11.3	1.27	0.74	28.0	3.5	41.2
1000	21.5	7.2	14.9	12.0	1.28	0.76	28.3	3.4	41.3
1200	21.4	7.3	14.8	12.5	1.28	0.78	27.8	3.3	39.0
1400	21.3	7.4	14.6	13.1	1.29	0.80	27.9	3.2	38.5
1600	21.0	7.7	14.3	13.4	1.31	0.83	27.9	3.2	37.7
1800	21.0	7.6	14.1	14.4	1.31	0.84	28.0	3.3	37.1
2000	20.8	7.7	13.8	15.1	1.32	0.86	28.2	3.2	36.8
2200	20.7	7.9	13.7	15.8	1.33	0.87	27.3	3.1	34.5
2400	20.5	8.0	13.6	16.5	1.35	0.88	27.9	3.0	36.0
2600	20.3	8.2	13.5	17.3	1.37	0.90	27.9	3.1	35.9
2800	20.1	8.5	13.3	18.0	1.41	0.91	27.9	3.2	36.8
3000	20.0	8.6	12.9	18.2	1.42	0.92	27.5	3.1	36.1
3200	19.9	8.5	12.2	17.6	1.39	0.92	27.3	3.0	36.4
3400	19.8	8.5	11.7	16.9	1.38	0.92	27.4	2.8	35.9
3600	19.8	8.5	11.2	16.0	1.37	0.92	28.0	2.8	36.9
3800	19.7	8.5	10.9	15.5	1.36	0.92	27.0	2.8	37.2
4000	19.6	8.5	10.6	14.8	1.35	0.92	27.6	2.8	38.2
4200	19.5	8.6	10.3	14.4	1.36	0.91	27.0	2.7	38.5
4400	19.4	8.6	10.1	14.0	1.35	0.91	27.6	2.6	37.6
4600	19.3	8.6	10.0	13.7	1.35	0.91	27.4	2.6	37.5
4800	19.3	8.6	9.8	13.5	1.35	0.90	27.0	2.6	37.1
5000	19.2	8.5	9.8	13.7	1.35	0.90	26.3	2.6	37.4
5200	19.2	8.4	9.8	13.7	1.34	0.90	26.8	2.5	36.0
5400	19.2	8.3	9.9	14.0	1.34	0.90	26.5	2.5	35.3
5600	19.2	8.1	9.9	14.4	1.32	0.89	26.8	2.5	35.6
5800	19.2	7.9	10.0	15.1	1.31	0.89	26.7	2.6	34.8
6000	19.2	7.7	10.1	16.3	1.29	0.89	26.9	2.5	34.7
6200	19.2	7.6	10.2	17.9	1.28	0.90	26.8	2.5	34.9
6400	19.2	7.4	10.0	20.1	1.27	0.90	26.8	2.5	35.0
6600	19.2	7.4	9.7	23.6	1.26	0.91	27.0	2.5	34.8
6800	19.1	7.4	9.2	29.3	1.25	0.93	26.9	2.6	35.2
7000	18.9	7.5	8.6	30.0	1.24	0.95	26.9	2.6	35.2
7200	18.7	7.8	7.8	22.7	1.24	0.98	26.9	2.7	35.3
7400	18.4	8.1	7.0	18.9	1.23	1.00	26.4	2.8	35.5
7600	18.1	8.6	6.2	16.6	1.24	1.04	26.6	2.8	35.9
7800	17.7	9.2	5.6	14.7	1.24	1.07	25.7	3.0	35.9
8000	17.3	9.8	5.0	13.6	1.24	1.11	26.0	3.1	36.0



Coaxial Amplifier

ZX60-83MPR-S+

Typical Performance Curves



ISO 9001 ISO 14001 AS 9100 CERTIFIED



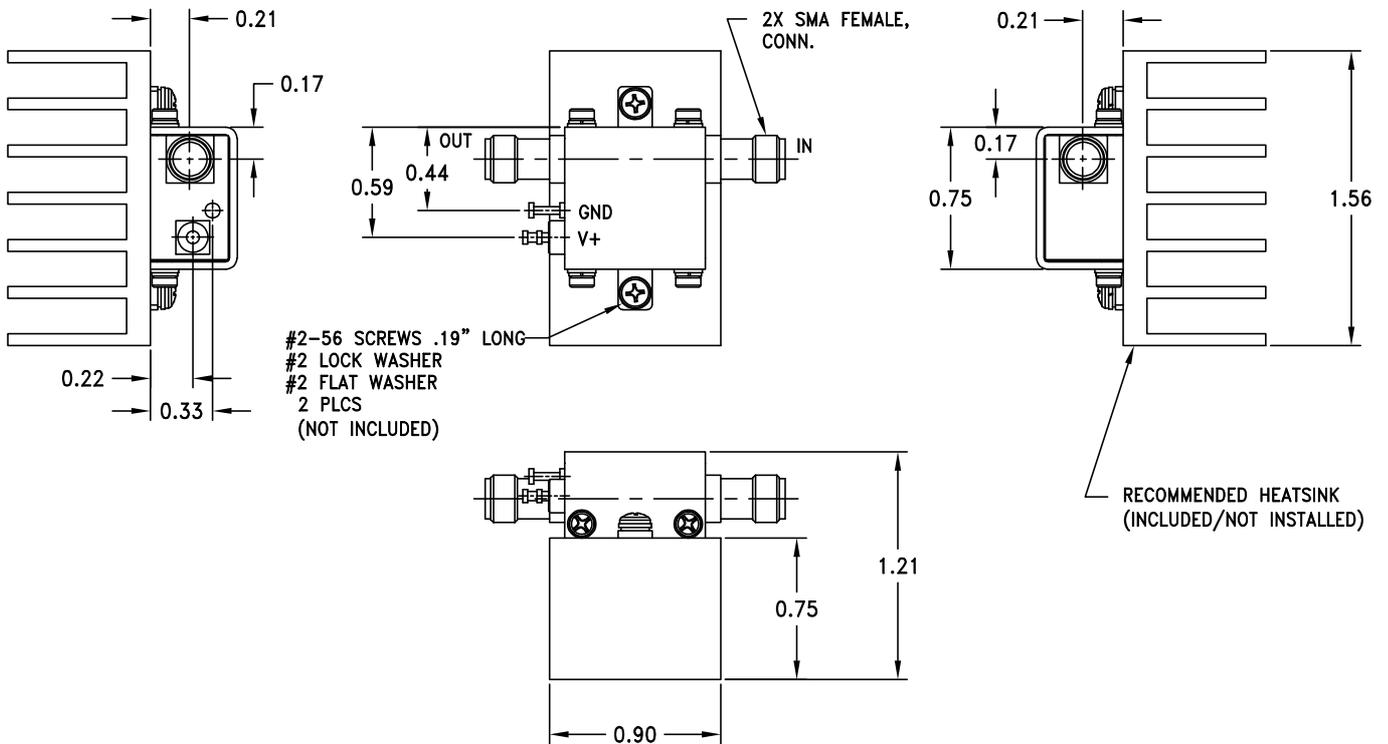
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



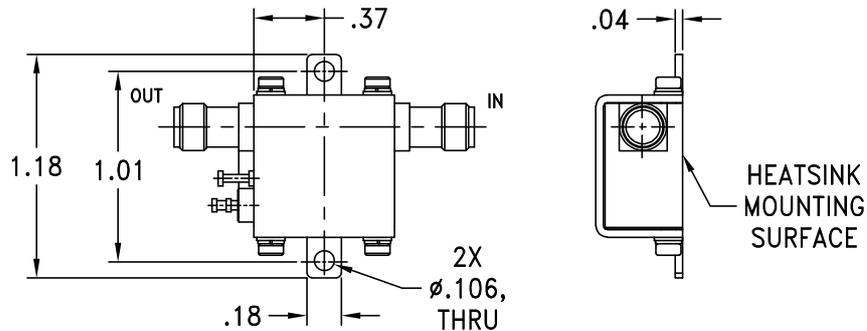
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IF/RF MICROWAVE COMPONENTS

REV. OR
ZX60-83MPR-S+
8/27/2025
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MOUNTING INFORMATION OF MODEL WITHOUT RECOMMENDED HEATSINK



Weight: 43 grams; without heatsink 23 grams.

Dimensions are in inches [mm]. Tolerances: 2 Pl. ± 0.03 ; 3 Pl. ± 0.015 inches

Notes:

1. Case Material: Brass.
2. Case Finish: Nickel plate.
3. Heatsink Finish: Black anodize.

Mini-Circuits®
 ISO 9001 ISO 14001 CERTIFIED

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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



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