



## COAXIAL

# Ultra-Wideband Amplifier **ZVA-5803X+**

50Ω 0.5 to 80 GHz Medium Power Amplifier 1.0 mm Female

### THE BIG DEAL

- Ultra Wideband Coverage in One Amplifier, 0.5 to 80 GHz
- High Gain, 17 dB Typ. Over 0.5 to 80 GHz
- Flat Gain Response,  $\pm 3.0$  dB Typ. Through 80 GHz
- Medium Output Power, +14 dBm Typ.
- Operating DC Voltage, +10 to +15 V
- DC Protected Against Over-Voltage & Reverse-Voltage



Generic photo used for illustration purposes only

### APPLICATIONS

- 4G LTE & 5G FR1, FR2 & FR2+ Infrastructure
- R&D, Production, and OTA Test Systems
- Test & Measurement Equipment
- WiFi 6E, IoT, SATCOM
- Communications, Radar, EW, and ECM Defense

Model No.	ZVA-5803X+
Case Style	VP3085-2
Connector	1.0 mm female

#### +RoHS Compliant

The +Suffix identifies RoHS Compliance.  
See our website for methodologies and qualifications

### PRODUCT OVERVIEW

Mini-Circuits' ZVA-5803X+ is a coaxial ultra-wideband amplifier, operating from 0.5 to 80 GHz and utilizing 1.0 mm female connectors. This model operates over a single positive supply voltage of +10 to +15 V, allowing users to choose their desired operating voltage. Internal DC-DC conversion circuitry maintains constant efficiency over the full input voltage range. The amplifier incorporates several DC-protection features, such as over-voltage, reverse voltage and in-rush current, that protect the amplifier from damage if mishandled during operation. The wideband operation and medium output power make this amplifier an ideal choice for testing and instrumentation applications for communications and radar.

### KEY FEATURES

Features	Advantages
Ultra-Wideband Amplifier, 0.5 to 80 GHz	A single amplifier serves the need for applications including 5G bands, Broadband Telecom, SATCOM, Test & Instrumentation, etc.
High Gain, 17 dB Typ. Low Return Loss, 14 dB Typ. Medium RF Power, +14 dBm Typ.	The combination of high gain, low return loss and medium RF power make this amplifier an ideal choice for testing and instrumentation applications.
Wide Operating DC Supply Voltage +10 to +15 V	Offers more flexibility to the user when choosing their power supply, while maintaining consistent DC power consumption.
DC Protection	<ul style="list-style-type: none"> <li>• Over-voltage</li> <li>• Reverse voltage</li> <li>• In-rush Current</li> </ul> The internal DC circuitry protects the amplifier from external mishandling, that could lead to catastrophic failures in the field.



COAXIAL

# Ultra-Wideband Amplifier **ZVA-5803X+**

50Ω 0.5 to 80 GHz Medium Power Amplifier 1.0 mm Female

## ELECTRICAL SPECIFICATIONS AT +25 °C BASEPLATE

Parameter	Condition (GHz)	ZVA-5803X+			Units
		Min.	Typ.	Max.	
Frequency Range		0.5		80	GHz
Gain	0.5-2		14.0		dB
	2-80	14.0	17.0		
Output Power at 1 dB Compression	0.5-55		+11.5		dBm
	55-80		+8.5		
Saturated Output Power ( $P_{SAT}$ ) <sup>1</sup>	0.5-55		+15.5		dBm
	55-80		+12.0		
Output IP3 (Output Power = 0 dBm/Tone)	0.5-67		+23.0		dBm
Input Return Loss	0.5-80		14		dB
Output Return Loss	0.5-80		14		dB
Noise Figure	0.5-54		5.0		dB
Operating DC Voltage		+10		+15	V
Device Operating Current at +10 V			130	170	mA
Total Power Dissipation at +10 V			1.4 <sup>2</sup>		W

1. At  $P_{SAT}$ ,  $P_{OUT}$  changes less than 0.1 dB for a 1 dB change in  $P_{IN}$ .
2. Device operating power based on current when amplifier is in saturation.

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

Parameter	Ratings
Operating Temperature	-40 °C to +50 °C Ambient -40 °C to +60 °C Case
Storage Temperature	-40 °C to +85 °C
RF Input Power <sup>4</sup> (CW)	+5 dBm
DC Operating Voltage	+16 V

3. Continuous operation is not recommended at these extremes. Permanent damage may occur if any of these limits are exceeded.
4. Specified under 50Ω, input and output load and source impedance.

## HANDLING PRECAUTIONS<sup>5</sup>

Baseplate Temperature	Do not operate above +60 °C
Open Load Impedance	Open and short-circuit loads are not recommended at the amplifier output. Ensure proper 50Ω load before turning the amplifier "on".

5. Damage to the device may occur when operating improperly.

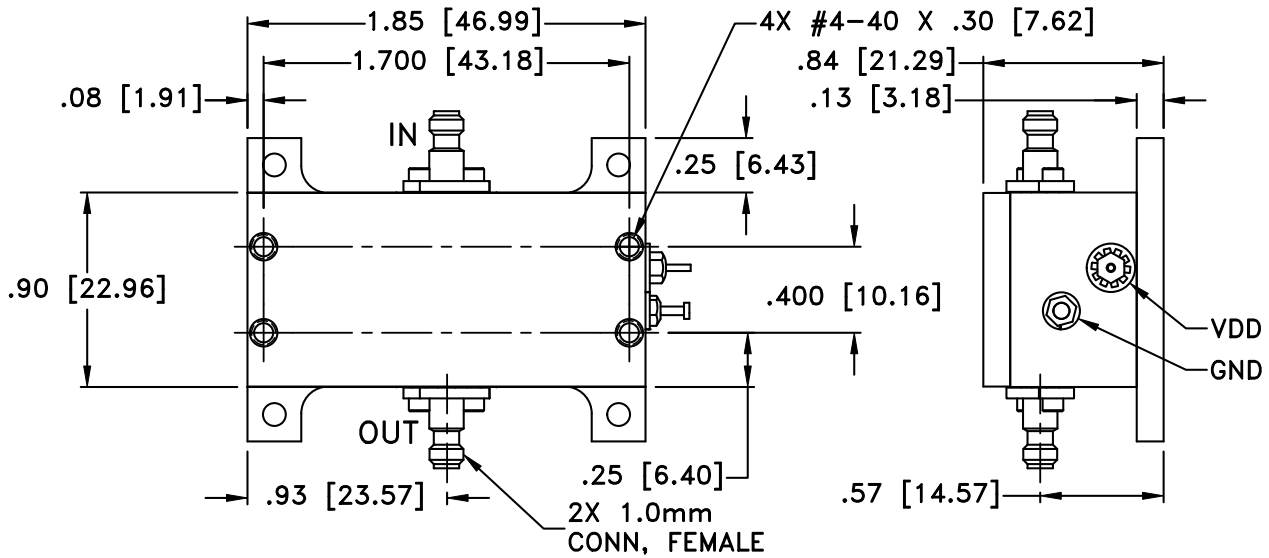


COAXIAL

# Ultra-Wideband Amplifier **ZVA-5803X+**

50Ω 0.5 to 80 GHz Medium Power Amplifier 1.0 mm Female

## OUTLINE DRAWING



Weight 47.0 grams

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



COAXIAL

# Ultra-Wideband Amplifier **ZVA-5803X+**

50Ω 0.5 to 80 GHz Medium Power Amplifier 1.0 mm Female

### TYPICAL PERFORMANCE DATA

Frequency (GHz)	Gain (dB) +10 V	Active Directivity (dB) +10 V	Return Loss (dB) +10 V		P <sub>OUT</sub> at 1 dB Compression (dBm) +10 V	P <sub>OUT</sub> at Saturation (dBm) +10 V	OIP3 (dBm) +10 V	Noise Figure (dB) +10 V
			IN	OUT				
0.5	11.1	72.9	5.7	11.2	10.8	13.7	20.9	8.6
5.0	17.8	58.4	15.1	25.0	12.0	15.8	24.3	5.6
10.0	16.1	53.9	14.7	19.8	11.6	15.2	24.3	5.8
15.0	15.9	50.9	14.5	15.2	11.8	15.5	24.2	5.2
20.0	16.6	45.5	16.9	16.9	12.4	15.8	24.7	4.9
25.0	17.2	35.8	16.8	18.8	12.8	15.8	24.7	4.6
30.0	17.8	37.0	18.5	14.0	12.5	15.9	24.7	4.3
35.0	18.5	36.8	18.0	19.2	12.0	15.2	24.4	4.3
40.0	17.7	34.3	21.1	10.9	11.4	14.6	24.1	4.5
45.0	18.1	40.0	16.3	14.3	12.0	14.9	25.8	5.0
50.0	18.4	43.3	14.9	16.2	12.0	14.9	24.2	4.5
55.0	19.1	36.6	12.1	17.4	11.2	14.2	23.7	
60.0	18.9	36.0	11.6	12.0	10.0	13.3	22.1	
65.0	20.1	28.9	23.6	16.3	10.1	13.7	21.3	
70.0	18.3	27.6	16.8	20.3	9.1	12.4		
75.0	18.0	31.1	18.9	9.4	8.6	11.8		
80.0	19.7	35.9	10.5	11.1	6.5	10.1		



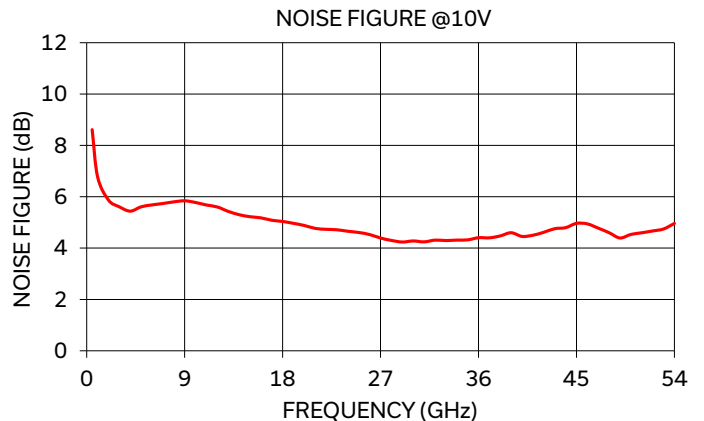
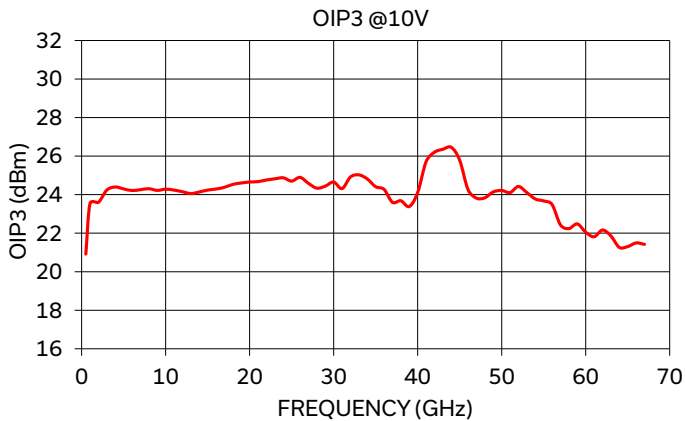
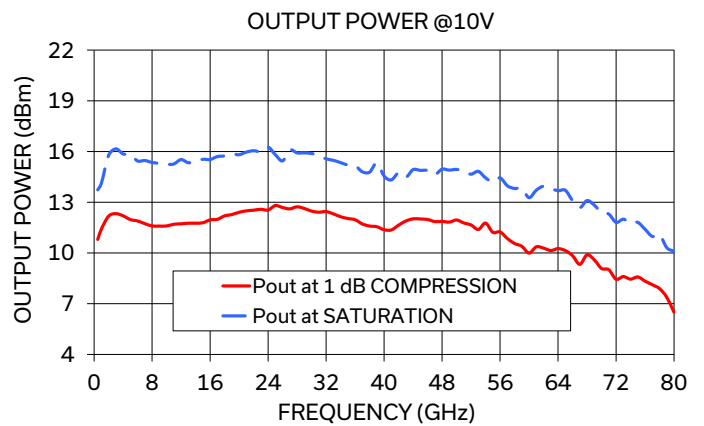
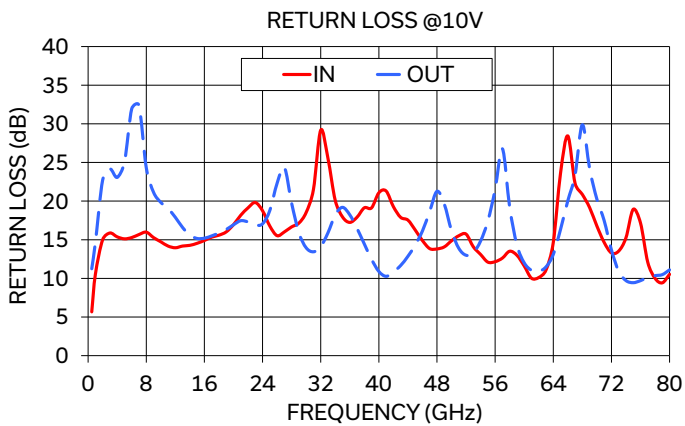
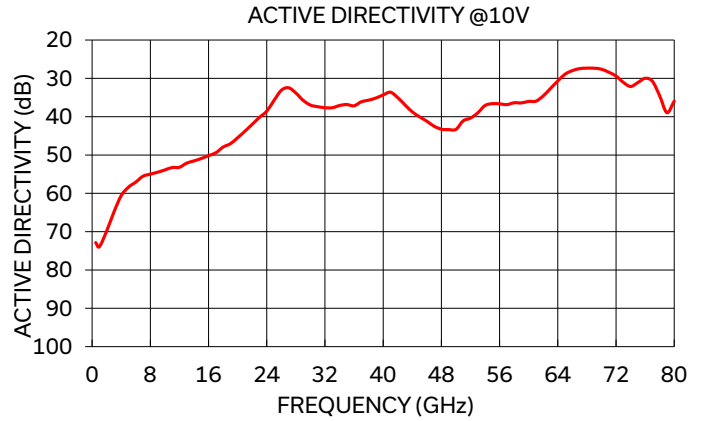
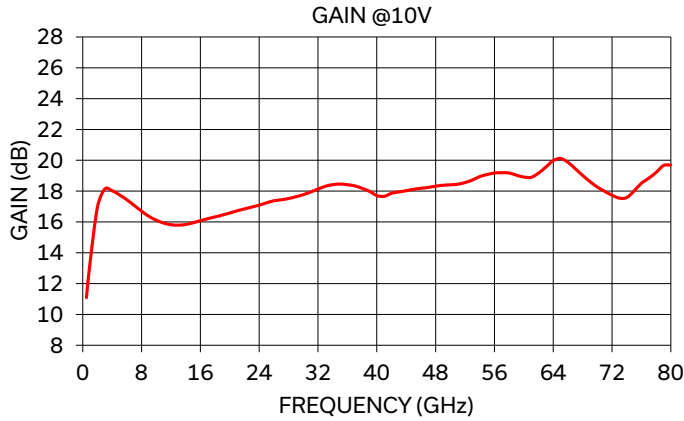


COAXIAL

# Ultra-Wideband Amplifier ZVA-5803X+

50Ω 0.5 to 80 GHz Medium Power Amplifier 1.0 mm Female

## TYPICAL PERFORMANCE GRAPHS



- 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

# ZVA-5803X+

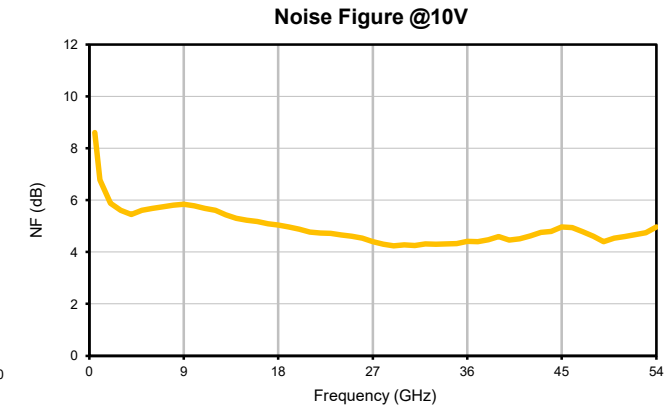
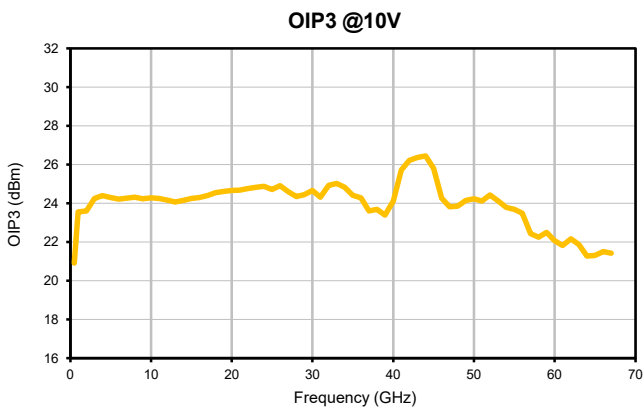
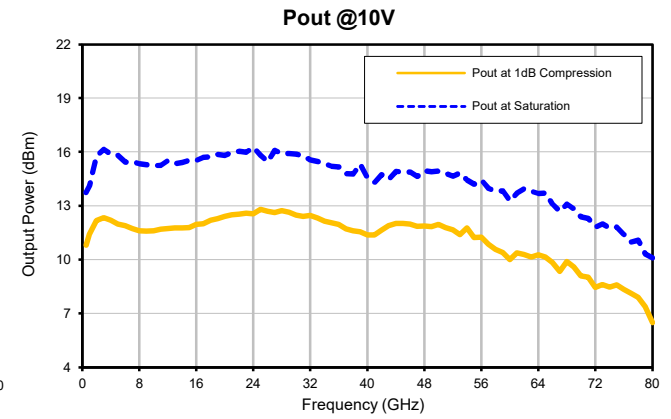
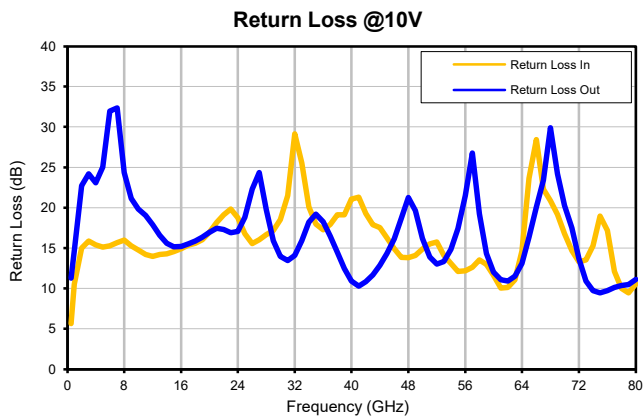
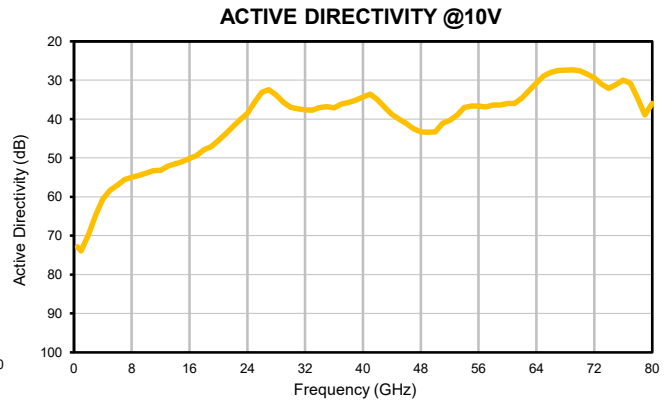
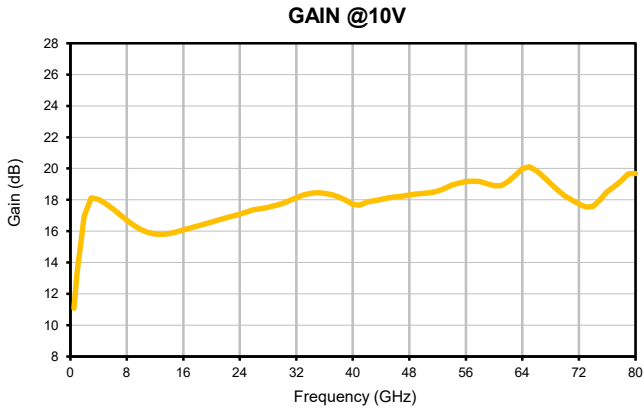
## Typical Performance Data

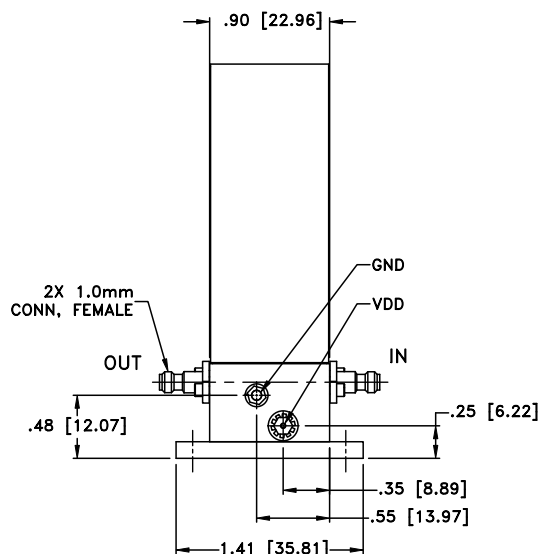
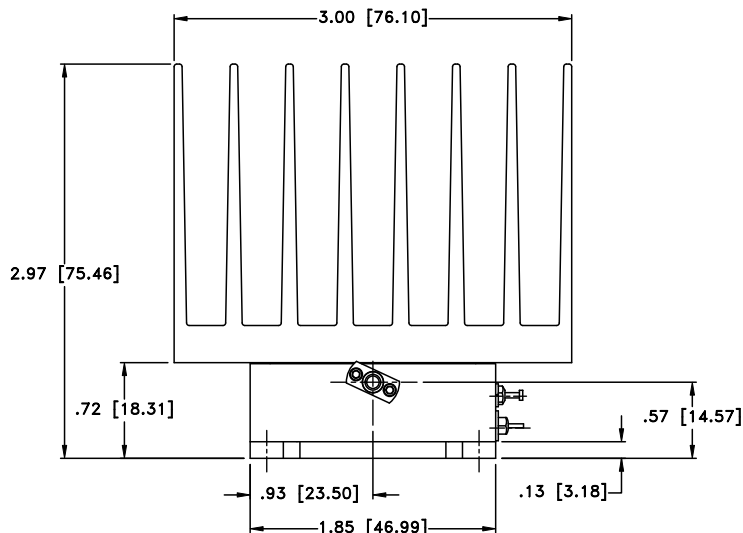
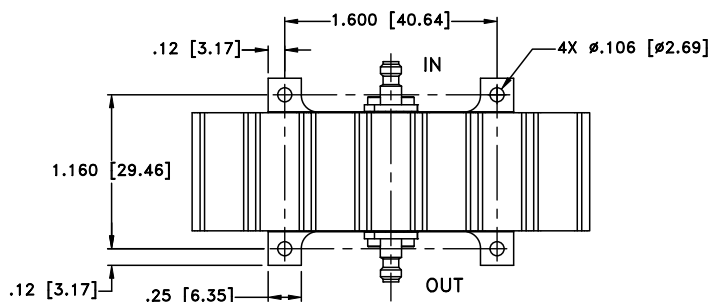
FREQUENCY (GHz)	GAIN (dB) 10V	ACTIVE DIRECTIVITY (dB) 10V	RETURN LOSS (dB)		Pout @ 1 dB COMPRESSION (dBm) 10V	Pout at SATURATION (dBm) 10V	Output IP3 (dBm) 10V	Noise Figure (dB) 10V
			IN 10V	OUT 10V				
0.5	11.09	72.85	5.7	11.2	10.80	13.73	20.92	8.61
1.0	13.39	73.92	10.5	14.6	11.41	14.12	23.54	6.78
2.0	16.96	69.84	15.0	22.7	12.18	15.77	23.60	5.87
3.0	18.13	64.87	15.9	24.2	12.33	16.16	24.24	5.61
4.0	18.03	60.61	15.4	23.1	12.20	15.86	24.40	5.44
5.0	17.76	58.39	15.1	25.0	11.98	15.82	24.30	5.61
6.0	17.44	57.07	15.3	31.9	11.89	15.44	24.21	5.68
7.0	17.07	55.53	15.7	32.4	11.73	15.47	24.26	5.74
8.0	16.70	55.00	16.0	24.3	11.60	15.35	24.31	5.80
9.0	16.36	54.49	15.3	21.1	11.59	15.30	24.22	5.84
10.0	16.11	53.89	14.7	19.8	11.60	15.24	24.28	5.78
11.0	15.93	53.27	14.2	19.0	11.70	15.27	24.24	5.68
12.0	15.82	53.20	14.0	17.9	11.72	15.52	24.15	5.60
13.0	15.79	52.12	14.2	16.6	11.76	15.34	24.06	5.43
14.0	15.84	51.54	14.3	15.6	11.76	15.43	24.14	5.30
15.0	15.94	50.92	14.5	15.2	11.79	15.54	24.24	5.22
16.0	16.08	50.17	14.9	15.2	11.96	15.53	24.29	5.18
17.0	16.21	49.43	15.3	15.5	11.99	15.70	24.38	5.08
18.0	16.33	47.93	15.6	15.9	12.20	15.74	24.53	5.04
19.0	16.45	47.07	16.0	16.3	12.27	15.86	24.60	4.96
20.0	16.58	45.49	16.9	16.9	12.41	15.81	24.66	4.88
21.0	16.72	43.80	18.2	17.5	12.49	15.97	24.68	4.77
22.0	16.84	42.00	19.1	17.3	12.53	16.05	24.76	4.73
23.0	16.97	40.18	19.8	16.9	12.58	16.00	24.82	4.71
24.0	17.09	38.56	18.8	17.1	12.54	16.26	24.87	4.66
25.0	17.24	35.75	16.8	18.8	12.81	15.81	24.70	4.61
26.0	17.37	33.12	15.5	22.3	12.69	15.45	24.90	4.53
27.0	17.44	32.46	16.0	24.4	12.61	16.09	24.59	4.39
28.0	17.52	33.82	16.7	19.7	12.73	15.92	24.34	4.30
29.0	17.64	35.73	17.2	15.9	12.63	15.92	24.44	4.24
30.0	17.77	36.97	18.5	14.0	12.48	15.88	24.65	4.28
31.0	17.94	37.39	21.5	13.4	12.41	15.77	24.31	4.24
32.0	18.13	37.66	29.2	14.1	12.45	15.57	24.92	4.31
33.0	18.32	37.67	25.5	15.9	12.31	15.48	25.03	4.29
34.0	18.42	37.09	20.1	18.2	12.14	15.35	24.82	4.31
35.0	18.46	36.83	18.0	19.2	12.04	15.20	24.41	4.32
36.0	18.42	37.16	17.2	18.2	11.97	15.17	24.27	4.40
37.0	18.34	36.11	17.9	16.5	11.72	14.80	23.60	4.40
38.0	18.18	35.69	19.1	14.5	11.59	14.78	23.68	4.47
39.0	17.99	35.13	19.1	12.5	11.55	15.32	23.38	4.60
40.0	17.71	34.33	21.1	10.9	11.38	14.55	24.11	4.46
41.0	17.66	33.62	21.3	10.3	11.36	14.32	25.71	4.50
42.0	17.86	35.02	19.3	10.8	11.65	14.74	26.20	4.62
43.0	17.95	36.93	17.9	11.7	11.89	14.48	26.35	4.76
44.0	18.03	38.75	17.5	12.9	12.02	14.93	26.46	4.80
45.0	18.12	40.04	16.3	14.3	12.01	14.89	25.79	4.96
46.0	18.18	41.18	14.9	16.1	11.98	14.88	24.26	4.94
47.0	18.24	42.49	13.9	18.7	11.86	14.64	23.82	4.78
48.0	18.32	43.26	13.8	21.3	11.87	14.96	23.84	4.60
49.0	18.38	43.37	14.1	19.6	11.83	14.90	24.14	4.39
50.0	18.41	43.32	14.9	16.2	11.95	14.94	24.22	4.53
51.0	18.45	41.09	15.5	13.9	11.78	14.82	24.11	4.60
52.0	18.55	40.37	15.7	13.0	11.66	14.66	24.42	4.67
53.0	18.72	39.00	14.1	13.3	11.39	14.83	24.11	4.74
54.0	18.94	37.09	13.1	14.8	11.77	14.44	23.78	4.96
55.0	19.07	36.60	12.1	17.4	11.22	14.20	23.67	
56.0	19.17	36.66	12.2	21.5	11.25	14.44	23.49	
57.0	19.19	36.85	12.6	26.8	10.86	13.98	22.43	
58.0	19.18	36.37	13.5	19.2	10.56	13.81	22.24	
59.0	19.03	36.40	13.0	14.3	10.40	13.83	22.48	
60.0	18.91	36.01	11.6	12.0	9.99	13.27	22.05	
61.0	18.90	35.95	10.0	11.0	10.37	13.71	21.81	
62.0	19.17	34.58	10.1	10.9	10.29	13.95	22.16	
63.0	19.56	32.63	11.1	11.5	10.15	13.81	21.86	
64.0	19.98	30.70	14.6	13.1	10.26	13.68	21.26	
65.0	20.12	28.91	23.6	16.3	10.14	13.71	21.30	
66.0	19.87	27.98	28.4	20.0	9.84	13.09	21.49	
67.0	19.45	27.46	22.3	23.4	9.33	12.68	21.42	
68.0	19.02	27.34	20.9	29.9	9.89	13.10		
69.0	18.62	27.36	19.2	24.2	9.59	12.83		
70.0	18.26	27.62	16.8	20.3	9.08	12.39		
71.0	17.99	28.40	14.7	17.5	9.01	12.30		
72.0	17.73	29.40	13.3	13.7	8.45	11.81		
73.0	17.54	31.03	13.5	10.9	8.61	12.00		
74.0	17.58	32.12	15.3	9.7	8.45	11.77		
75.0	18.01	31.09	18.9	9.4	8.58	11.81		
76.0	18.51	29.99	17.2	9.7	8.34	11.40		
77.0	18.84	30.76	12.1	10.1	8.12	10.98		
78.0	19.22	34.55	10.0	10.3	7.89	11.08		
79.0	19.66	38.95	9.4	10.5	7.38	10.31		
80.0	19.69	35.94	10.5	11.1	6.49	10.10		

# Coaxial Amplifier

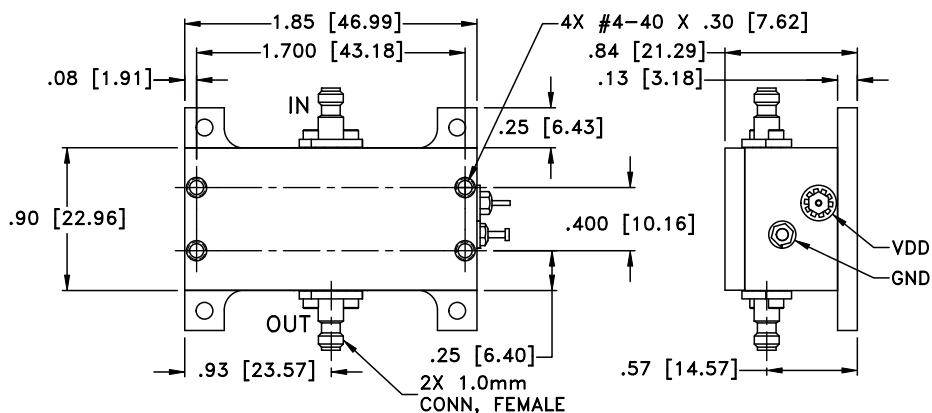
## Typical Performance Curves

ZVA-5803X+





MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



Weight: 135.0 grams; Without heatsink 47.0 grams

Dimensions are in inches (mm). Tolerances: 2 Pl.±.03; 3 Pl.±.015

### Notes:

1. Case material: Aluminum
2. Case finish: Gold plating
3. Heat sink finish: Black anodize
4. Refer to the individual model data sheet for the type of connectors available
5. Shape of connector flange may vary



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

The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-40° to +60° C Baseplate Temp	Individual Model Data Sheet
Storage Temperature	-40° to +85° C Ambient Environment	Individual Model Data Sheet
Burn-in	(DC on) 72 hours at 25°C	----
Thermal Shock	-40° C to +85°C, 100 cycles	Transition time = 5 mins, Dwell time = 30 mins
Vibration	Random Vibration (non-operating)	MIL-STD-883K, Method 2025, Cond. 1A