COAXIAL WIDEBAND

Medium Power Amplifier

ZVA-183WA-S+
ZVA-183WAX-S+

50Ω 100 MHz to 18 GHz SMA Female

THE BIG DEAL

- Wideband 100 MHz to 18 GHz
- +30 dBm P_{SAT} Typical
- Excellent Gain Flatness, ±1.5 dB Typical
- Low Noise Figure, 4 dB Typical
- Over-Voltage and Reverse-Voltage Protection
- Single Supply Voltage of +12 VDC

Generic photo used for illustration purposes only

Model No.	ZVA-183WA-S+	ZVA-183WAX-S+
Option	With Heatsink	Without Heatsink
Case Style	AV2554-3	
Connector	SMA Female	

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

APPLICATIONS

- Lab Use
- Wideband Test and Measurement
- 5G Sub-6 GHz
- Driver Amplifier
- Aerospace and Defense
- Radios, Radars and Satellite Systems
- Industrial, Scientific and Medical

PRODUCT OVERVIEW

Mini-Circuits' ZVA-183WA(X)-S+ is a coaxial, wideband RF amplifier capable of operating from 100 MHz to 18 GHz. The design can deliver output power of +30 dBm typical at saturation and +27 dBm typical at 1 dB compression, making it an ideal choice for applications requiring a wideband driver amplifier. With a low noise figure of 4 dB typical across a majority of the band, it can be used in test setups that require higher dynamic range. The amplifier incorporates several DC-protection features, including over-voltage, reverse-voltage, and inrush-current protection, to protect the amplifier from damage if mishandled during operation.

KEY FEATURES

Features	Advantages
Ultra-Wideband, 100 MHz to 18 GHz	Enables a single amplifier to be used in a wide range of applications.
Low Noise and High IP3: • NF, 4 dB Typical • IP3, +36 dBm Typical	The combination of low noise and high IP3 makes the ZVA-183WA(X)-S+ ideal for use in receiver front ends (RFE) as it gives the user the advantages of sensitivity and two-tone IM performance at both ends of the dynamic range.

REV. B
ECO-028560
ZVA-183WA(X)-S+
MCL NY
260828

ELECTRICAL SPECIFICATIONS AT +25 °C (AMBIENT), V_{DD} = +12 V TYPICAL

Parameter	Condition (MHz)	ZVA-183WA-S+ ZVA-183WAX-S+ Min.	Typical	Max.	Units
Frequency Range		100		18000	MHz
Gain	100–6000	22	25	–	dB
	6000–18000	20	24	–	
Output Power at 1 dB Compression	100–1000	+23.5	+27	–	dBm
	1000–6000	+27	+29	–	
	6000–18000	+25	+27.5	–	
Noise Figure	500–18000	–	4	–	dB
Output IP3 (Output Power = +10 dBm/Tone)	100–6000	–	+38	–	dBm
	6000–18000	–	+36	–	
Input VSWR	100–18000	–	1.3	–	:1
Output VSWR[1]	100–18000	–	1.5	–	:1
DC Supply Voltage	–	+11	+12	+13	V
Supply Current[2] (at +12 V DC)	–	–	550	950	mA

1. Open and short-circuit loads are not recommended at the amplifier output. Ensure proper 50Ω load before turning the amplifier "ON".
2. Maximum supply current is specified at saturated output power.

ABSOLUTE MAXIMUM RATINGS[3]

Parameter	Ratings
Operating Temperature (Ambient)	-40 °C to +60 °C
Operating Temperature (Baseplate)	-40 °C to +85 °C
Storage Temperature	-55 °C to +125 °C
Total Power Dissipation[4]	11 W
RF Input Power[5] (CW), V_{DD} = +12 V	+15 dBm
DC Voltage	+14 V

3. Continuous operation is not recommended at these extremes. Permanent damage may occur if any of these limits are exceeded.
4. Total Power Dissipation is specified at Saturated Output Power.
5. Specified with a matched 50Ω load.

DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEATSINK

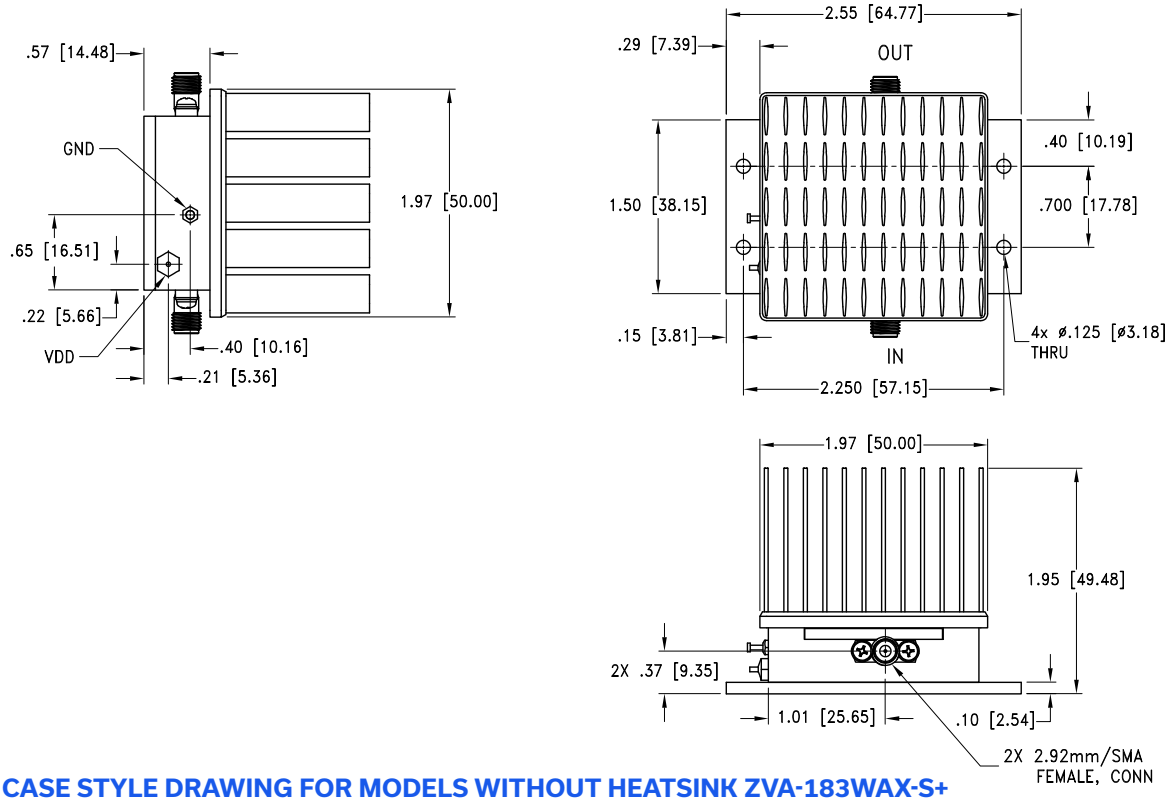
$$\textit{MAXIMUM THERMAL RESISTANCE} = \frac{\textit{MAXIMUM OPERATING CASE TEMP} - \textit{MAXIMUM USER AMBIENT TEMP}}{\textit{POWER DISSIPATION}}$$

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

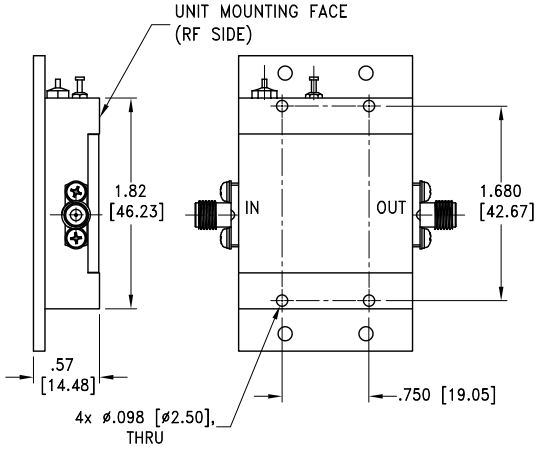
COAXIAL CONNECTIONS

Input	SMA Female
Output	SMA Female

CASE STYLE DRAWING FOR MODELS WITH HEATSINK ZVA-183WA-S+



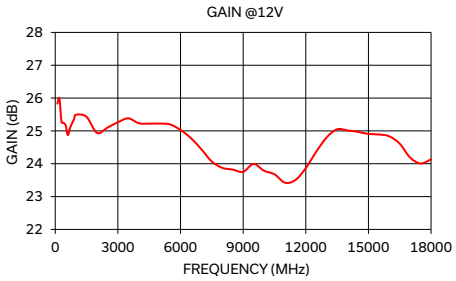
CASE STYLE DRAWING FOR MODELS WITHOUT HEATSINK ZVA-183WAX-S+

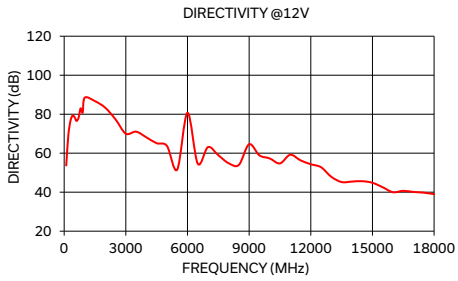


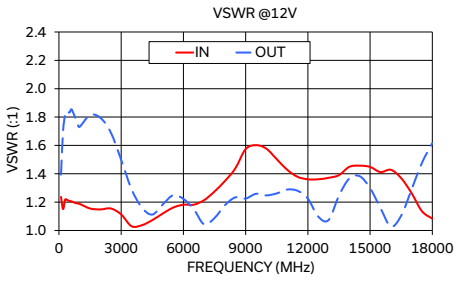
Weight: 455 grams;
Weight without heatsink: 345 grams;
Dimensions are in inches [mm]. Tolerances: 2 Pl. ±0.03; 3 Pl. ±0.015

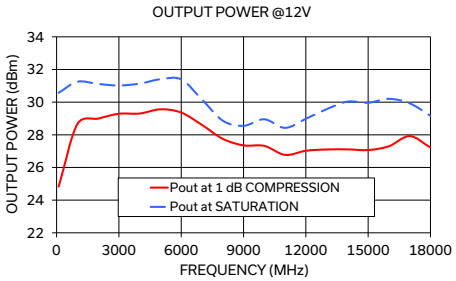
TYPICAL PERFORMANCE DATA/GRAPHS

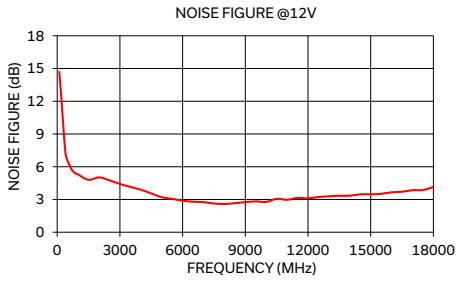
Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1) +12 V		P_{OUT} at 1 dB Compression (dBm)	P_{OUT} at Saturation (dBm)	Output IP3 (dBm)	Noise Figure (dB)
	+12 V	+12 V	IN	OUT	+12 V	+12 V	+12 V	+12 V
100	25.8	53.7	1.2	1.4	24.8	30.6	35.1	14.7
1000	25.5	88.5	1.2	1.7	28.7	31.3	38.7	5.3
2000	24.9	83.3	1.1	1.8	29.0	31.1	39.1	5.0
3000	25.3	70.0	1.1	1.5	29.3	31.0	39.1	4.4
4000	25.2	68.1	1.0	1.2	29.3	31.1	42.8	3.9
5000	25.2	63.7	1.1	1.2	29.6	31.4	39.4	3.2
6000	25.0	80.7	1.2	1.2	29.4	31.4	38.4	2.9
7000	24.4	63.1	1.2	1.0	28.6	30.2	37.1	2.8
8000	23.9	54.9	1.3	1.2	27.8	28.9	37.0	2.6
9000	23.8	64.6	1.6	1.2	27.4	28.6	36.0	2.8
10000	23.8	57.3	1.6	1.2	27.3	29.0	35.6	2.8
11000	23.4	59.2	1.4	1.3	26.8	28.4	35.3	3.0
12000	23.9	54.3	1.4	1.2	27.0	29.0	35.7	3.1
13000	24.8	47.9	1.4	1.1	27.1	29.6	35.5	3.3
14000	25.0	45.4	1.4	1.4	27.1	30.0	36.7	3.3
15000	24.9	44.8	1.4	1.3	27.1	30.0	36.4	3.5
16000	24.8	40.0	1.4	1.0	27.3	30.2	35.2	3.7
17000	24.2	40.1	1.3	1.3	27.9	29.9	35.5	3.8
18000	24.1	39.0	1.1	1.6	27.2	29.2	33.6	4.2

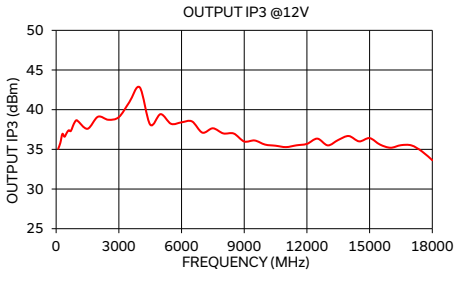












NOTES

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-Circuits' 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

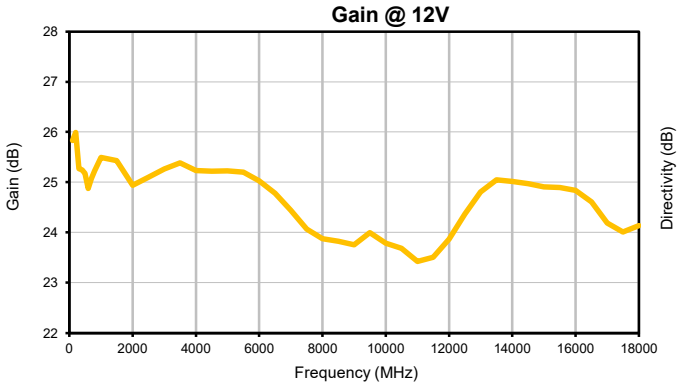
Coaxial Amplifier ZVA-183WAX-S+

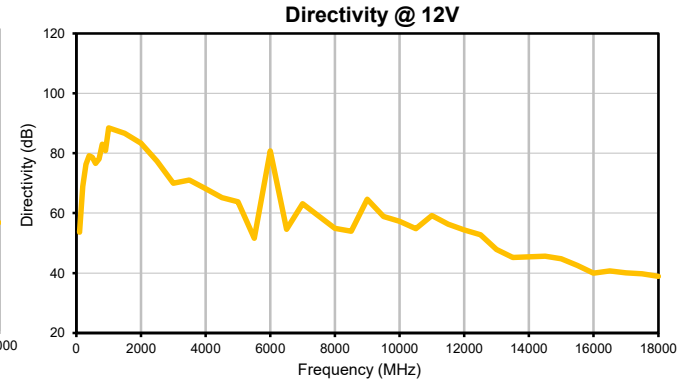
Typical Performance Data

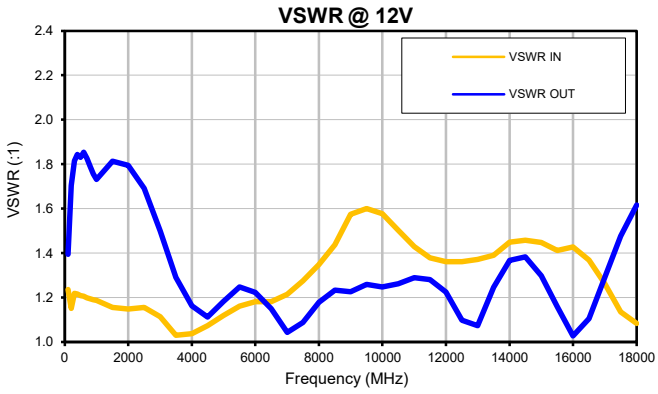
FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR (:1) IN 12V	VSWR (:1) OUT 12V	NOISE FIGURE (dB) 12V	Pout @ 1 dB COMPRESSION (dBm) 12V	OUTPUT IP3 (dBm) 12V
100	25.83	53.68	1.24	1.39	14.69	24.83	35.07
200	25.99	68.94	1.15	1.70	12.29	26.84	35.80
300	25.27	76.29	1.22	1.82	9.55	27.73	36.94
400	25.25	79.20	1.22	1.84	7.20	28.16	36.59
500	25.17	78.59	1.21	1.83	6.53	28.18	37.04
600	24.87	76.55	1.21	1.85	6.13	28.11	37.40
700	25.07	78.11	1.20	1.83	5.71	28.40	37.30
800	25.23	82.97	1.19	1.79	5.51	28.44	37.92
900	25.36	80.83	1.19	1.76	5.36	28.52	38.47
1000	25.49	88.48	1.19	1.73	5.29	28.66	38.65
1500	25.43	86.69	1.15	1.81	4.80	28.95	37.59
2000	24.94	83.30	1.15	1.79	5.02	28.99	39.11
2500	25.10	77.34	1.16	1.69	4.76	29.25	38.73
3000	25.26	70.00	1.11	1.50	4.42	29.29	39.06
3500	25.38	71.04	1.03	1.29	4.15	29.40	40.94
4000	25.23	68.13	1.04	1.16	3.89	29.30	42.82
4500	25.22	65.12	1.07	1.11	3.55	29.43	38.12
5000	25.22	63.75	1.12	1.18	3.21	29.56	39.44
5500	25.20	51.59	1.16	1.25	3.06	29.42	38.22
6000	25.03	80.72	1.18	1.22	2.89	29.36	38.41
6500	24.78	54.62	1.18	1.15	2.80	29.24	38.52
7000	24.44	63.14	1.21	1.04	2.76	28.61	37.10
7500	24.07	58.97	1.27	1.09	2.63	28.22	37.65
8000	23.88	54.88	1.35	1.18	2.59	27.75	37.01
8500	23.82	53.98	1.44	1.23	2.66	27.49	36.99
9000	23.76	64.59	1.57	1.23	2.75	27.35	35.99
9500	23.99	58.90	1.60	1.26	2.82	27.68	36.12
10000	23.79	57.31	1.58	1.25	2.77	27.32	35.60
10500	23.68	54.76	1.50	1.26	3.06	26.95	35.46
11000	23.42	59.20	1.43	1.29	2.97	26.77	35.28
11500	23.50	56.33	1.38	1.28	3.14	26.90	35.51
12000	23.87	54.34	1.36	1.22	3.11	27.02	35.69
12500	24.37	52.79	1.36	1.10	3.23	27.01	36.35
13000	24.80	47.88	1.37	1.07	3.29	27.10	35.50
13500	25.05	45.19	1.39	1.25	3.34	27.23	36.18
14000	25.01	45.44	1.45	1.37	3.34	27.11	36.68
14500	24.97	45.64	1.46	1.38	3.47	27.05	36.01
15000	24.91	44.81	1.45	1.30	3.47	27.07	36.42
15500	24.89	42.52	1.41	1.16	3.52	27.23	35.60
16000	24.83	39.98	1.43	1.03	3.66	27.30	35.20
16500	24.61	40.69	1.37	1.10	3.71	27.73	35.53
17000	24.19	40.11	1.26	1.29	3.85	27.92	35.50
17500	24.01	39.76	1.14	1.48	3.86	27.73	34.75
18000	24.14	39.00	1.08	1.62	4.15	27.22	33.63

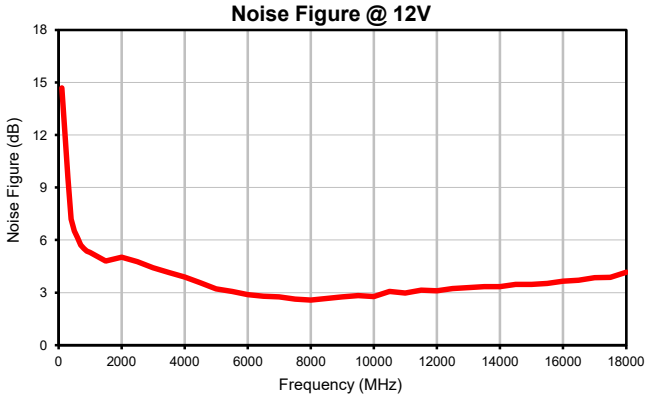
FREQUENCY (MHz)	Pout at SATURATION (dBm) 12V
100.00	30.57
1000.00	31.25
2000.00	31.11
3000.00	31.02
4000.00	31.13
5000.00	31.40
6000.00	31.39
7000.00	30.16
8000.00	28.87
9000.00	28.55
10000.00	28.95
11000.00	28.43
12000.00	28.98
13000.00	29.57
14000.00	30.03
15000.00	29.96
16000.00	30.20
17000.00	29.93
18000.00	29.17

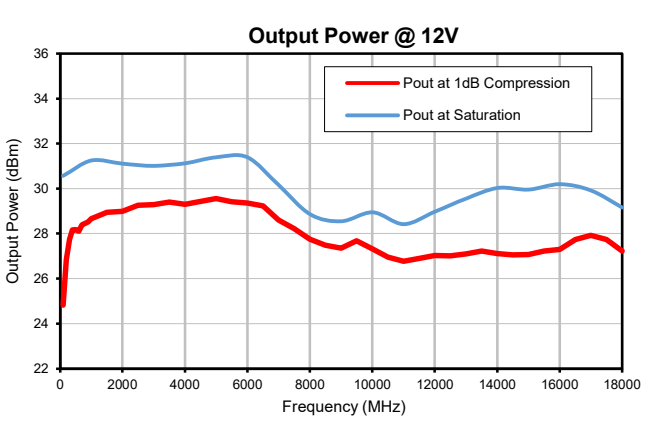
Typical Performance Curves

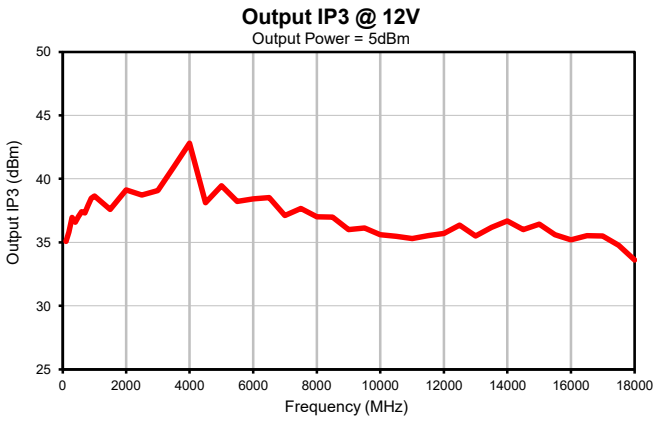








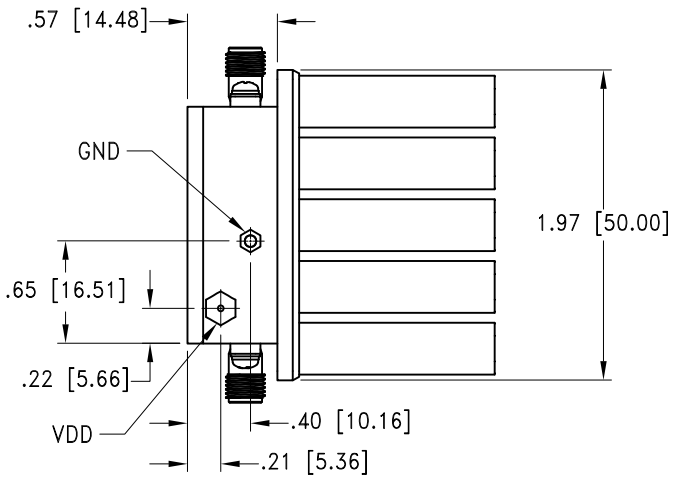


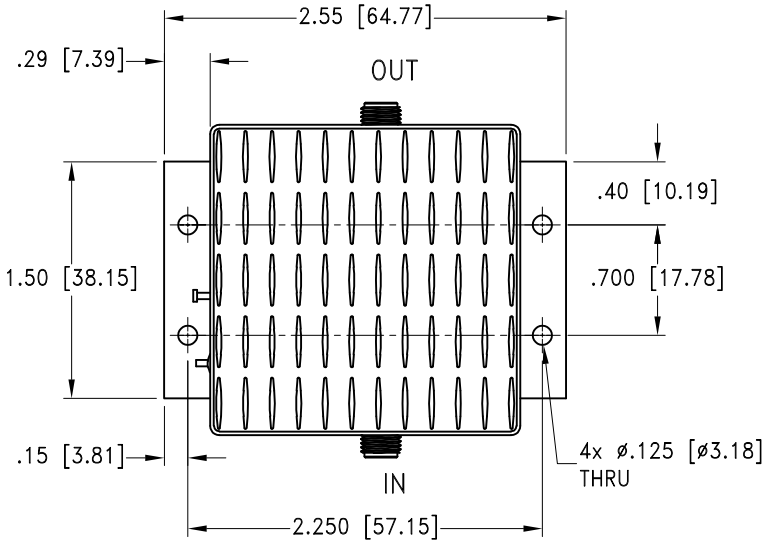


Case Style AV

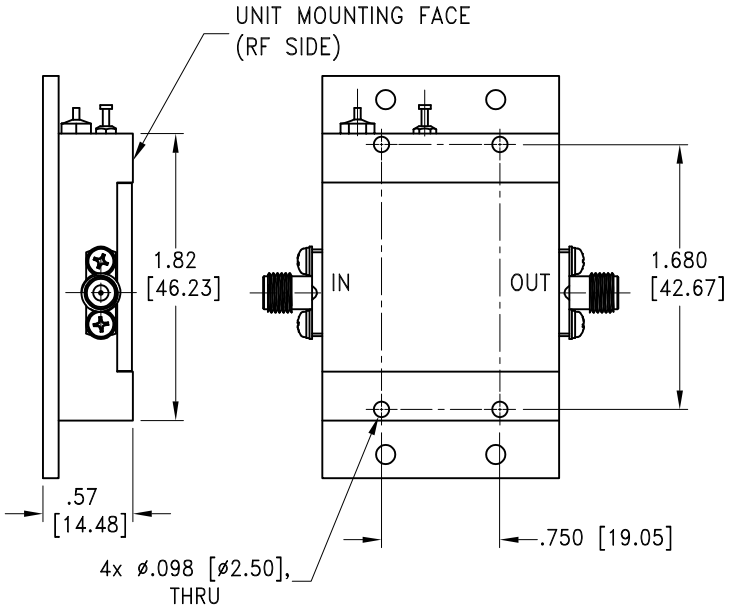
Outline Dimensions

AV2554-3

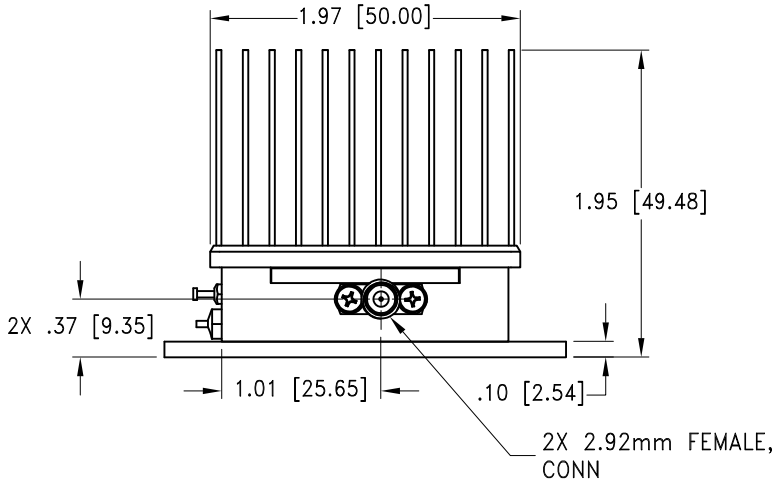




MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



Weight without heatsink: 345 grams;



Weight: 455 grams;

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

Notes:
1. Case material: Brass
2. Case finish: Gold plate.
3. Heat sink finish: Black anodize.

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RF/IF MICROWAVE COMPONENTS

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Mini-Circuits

Environmental Specifications ENV39

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	-55° to 85°C base plate temp	Individual Model Data Sheet
Storage Temperature	-65° to 150°C	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107
Vibration (High Frequency)	Category 24, Exposure level figures 514C-17 General use, random, 20-2000Hz, 1 hr per axis	MIL-STD-810, Method 514.5
Mechanical Shock	40Gs,11ms, 18 shocks: 3 each direction), each axis	MIL-STD-810, Method 516-5-II

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