COAXIAL

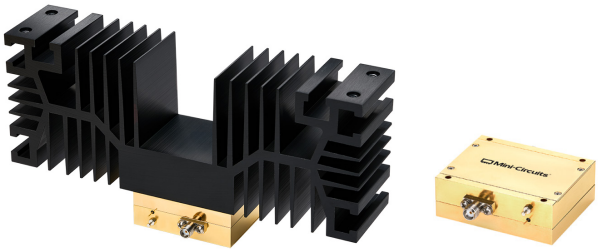
High Power Amplifier

ZVE-18GB+
ZVE-18GBX+

50Ω 0.1 to 18 GHz P_{SAT} +33 dBm SMA Female

KEY FEATURES

- Wideband Coverage, 0.1 to 18 GHz
- High Output IP3, +40 dBm Typ.
- Single +15 V Supply
- Reverse Voltage Protected
- Rugged, Compact Case for Ease of System Integration

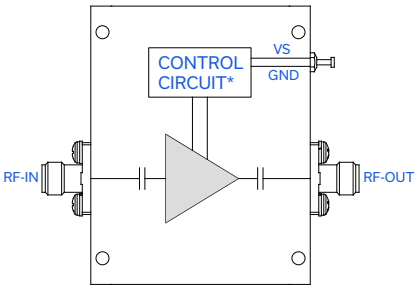


Generic photo used for illustration purposes only

APPLICATIONS

- Wideband Test and Instrumentation
- Military EW and Radar
- Satellite Systems
- 4G LTE & 5G FR1 Infrastructure
- WiFi 6E & WiFi 7
- Aerospace and Defense
- Microwave Point to Point Radio

FUNCTIONAL DIAGRAM



* Voltage regulation, over-voltage, reverse voltage, and in-rush current protection circuits.

PRODUCT OVERVIEW

Mini-Circuits' ZVE-18GB(X)+ is a coaxial, wideband amplifier offering flat gain across a wide frequency range from 0.1 to 18 GHz. This model operates on a single +15 V supply with 720 mA typical current consumption and can deliver 2 W output power in saturation. The amplifier incorporates several DC-protection features such as over-voltage, under-voltage, reverse-voltage, and in-rush current limiting that protect the amplifier from damage if mishandled during operation. The ZVE-18GB(X)+ comes in a rugged, compact case (2.13" x 1.68" x 0.74") with SMA (f) RF connectors.

ELECTRICAL SPECIFICATIONS AT +25°C BASEPLATE AND V_S = +15 V

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.1		18	GHz
Gain	0.1-1 1-18	27 23	30.5 29.0		dB
Noise Figure	0.1-18		4.0		dB
Input Return Loss	0.1-18		12.0		dB
Output Return Loss	0.1-18		11.0		dB
Output Power at 1 dB Compression (P1dB)	0.1-1 1-18	+25.0 +28.0	+29.0 +31.0		dBm
Saturated Output Power (P_{SAT})[1]	0.1-18		+33.0		dBm
Output Third Order Intercept Point (Output Power = +20 dBm/Tone)	0.1-18		+40.0		dBm
DC Supply Voltage (V_S)			+15.0	+16.0	V
DC Current[2]			720	1200	mA

1. At P_{SAT}, P_{OUT} changes less than 0.1 dB for a 1 dB change in P_{IN}.
2. Typical current measured under small signal conditions. Max DC current measured at P_{SAT}. DC current increases as amplifier is driven into compression.

REV. OR
ECO-026789
ZVE-18GB+
MCL NY
250917

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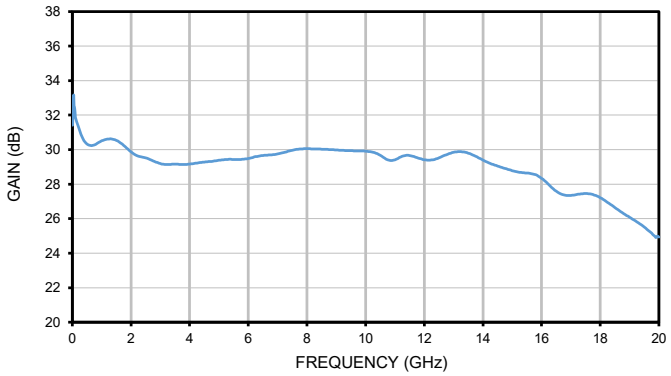
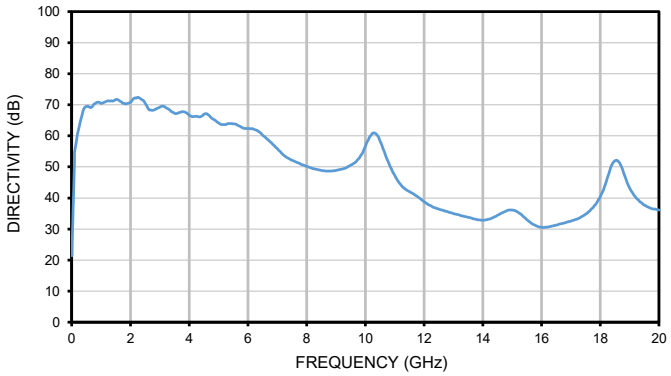
TYPICAL PERFORMANCE GRAPHS

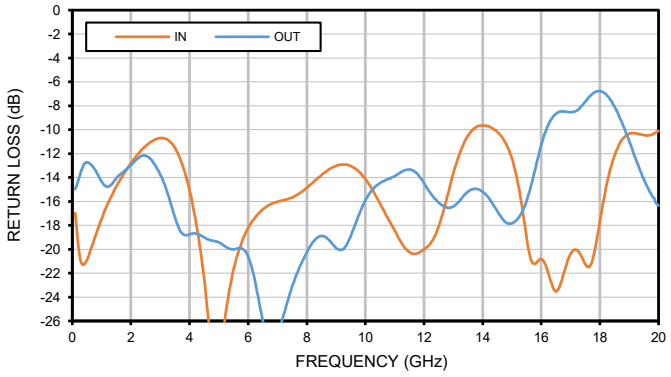
GAIN



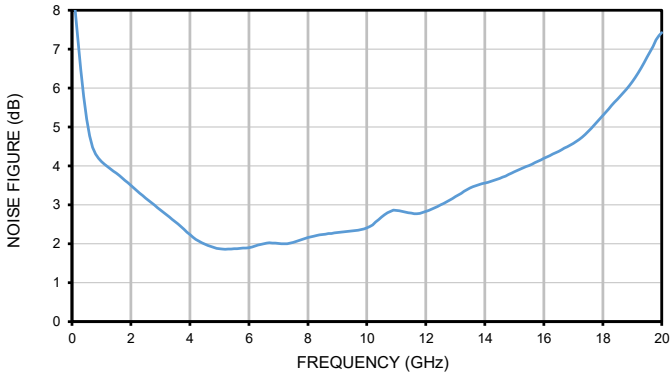
DIRECTIVITY



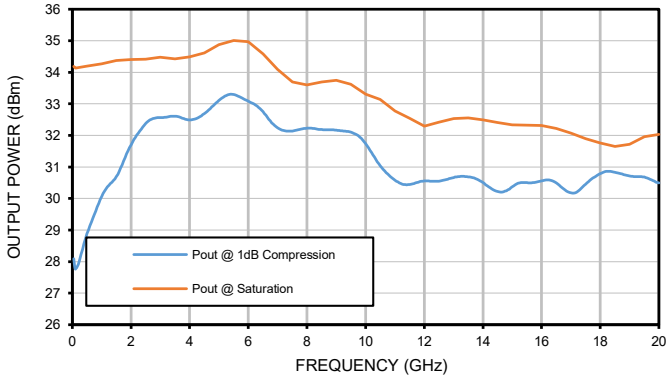
RETURN LOSS



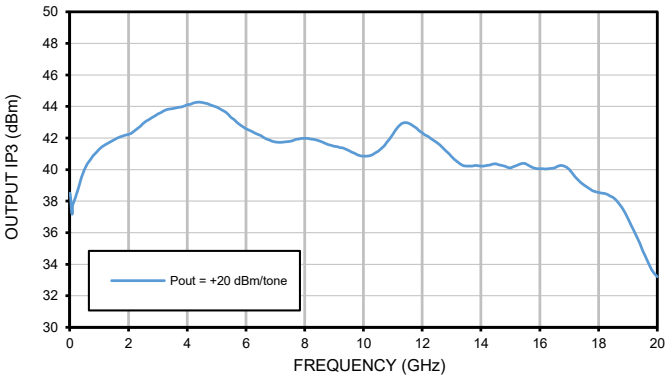
NOISE FIGURE



OUTPUT POWER



OIP3



ABSOLUTE MAXIMUM RATINGS[3,4]

Parameter	Ratings
Operating Temperature	ZVE-18GB+ -40°C to +50°C Ambient ZVE-18GBX+ -40°C to +60°C Baseplate
Storage Temperature	-55°C to +100°C
Total Power Dissipation	15 W
RF Input Power (CW)	+12 dBm
DC Operating Voltage	+16.5 V

3. Specified under matched load to 50 ohms.
4. 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

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

Example:	MAXIMUM OPERATING BASEPLATE 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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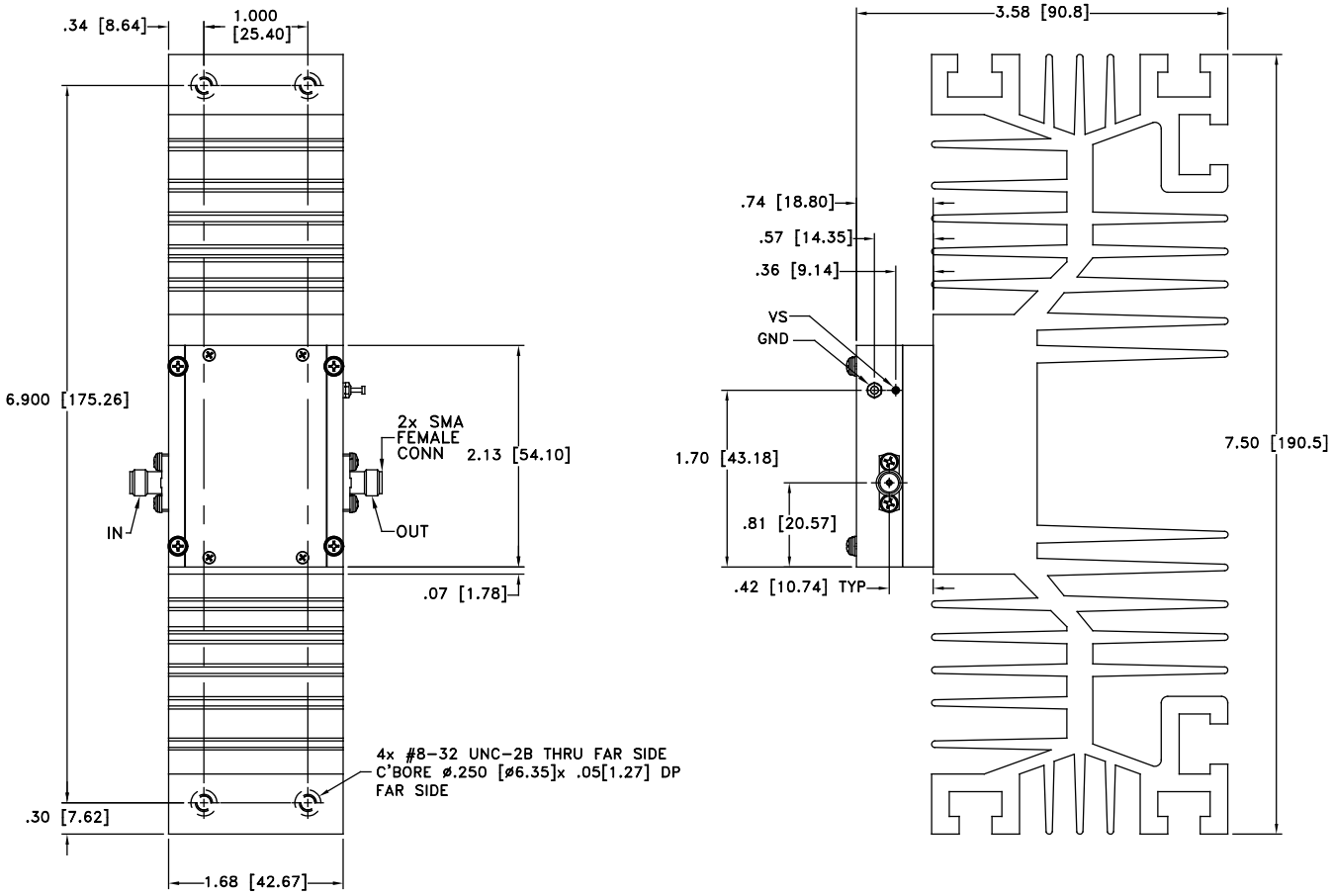
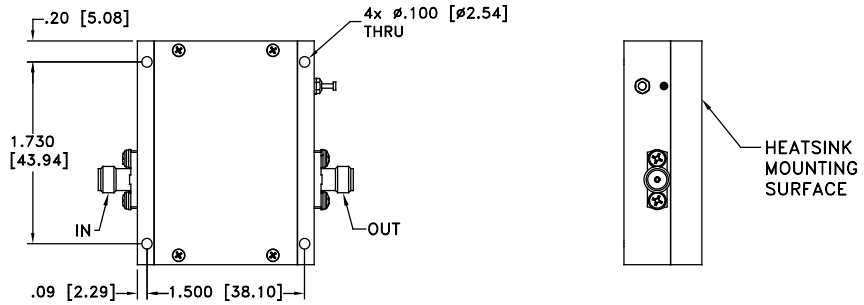
CASE STYLE DRAWING FOR MODELS WITH HEATSINK (ZVE-18GB+)



CASE STYLE DRAWING FOR MODELS WITHOUT HEATSINK (ZVE-18GBX+)



Weight: 700 gram; Weight without heatsink: 100 gram
Dimensions are in inches [mm]. Tolerances: 1 Pl.±0.1; 2 Pl.±0.03; 3 Pl.±0.015 Inches

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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	ENV141
Export Information	ECCN# EAR99

ORDERING INFORMATION

Model No. Links	ZVE-18GB+	ZVE-18GBX+
Option	With heatsink	Without heatsink
Product Marking	ZVE-18GB+	ZVE-18GBX+
Case Style	BN333-1	
Connector	SMA-Female	

NOTES

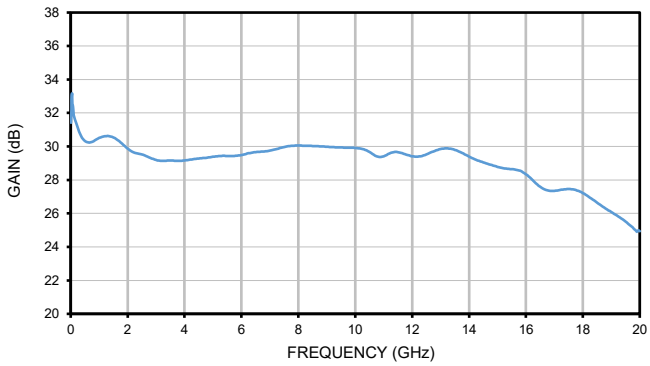
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Typical Performance Data @ +25°C

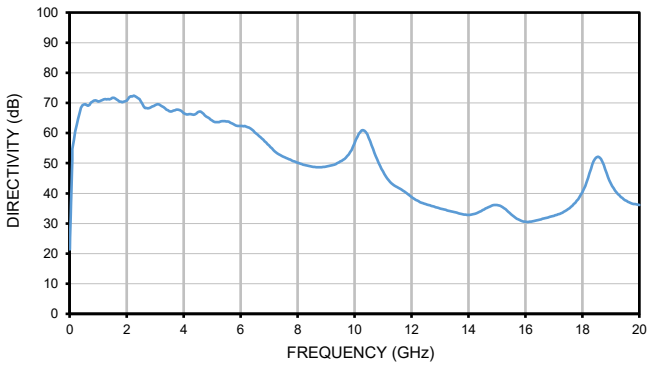
FREQUENCY (GHz)	GAIN (dB)	DIRECTIVITY (dB)	RETURN LOSS (dB)		Pout @ 1 dB COMPRESSION (dBm)	Pout at SATURATION (dBm)	Noise Figure (dB)	OUTPUT IP3 (dBm)
			IN	OUT				@ +20 dBm/tone
0.1	31.88	54.69	16.98	14.98	27.76	34.13	8.10	37.71
0.50	30.32	69.51	20.88	12.72	28.88	34.19	5.21	40.00
1.00	30.51	70.48	17.44	14.35	30.07	34.27	4.11	41.28
1.50	30.53	71.65	14.78	14.08	30.69	34.37	3.81	41.88
2.00	29.87	70.72	12.80	12.97	31.70	34.41	3.50	42.22
2.50	29.52	70.53	11.38	12.18	32.38	34.42	3.17	42.91
3.00	29.19	69.28	10.70	13.74	32.57	34.48	2.87	43.52
3.50	29.16	67.21	11.52	17.33	32.61	34.43	2.57	43.86
4.00	29.16	66.64	15.07	18.75	32.49	34.49	2.23	44.10
4.50	29.28	66.97	22.53	19.02	32.69	34.61	1.99	44.25
5.00	29.38	64.20	29.80	19.43	33.11	34.87	1.87	43.96
5.50	29.43	63.84	21.72	20.02	33.30	35.01	1.87	43.30
6.00	29.49	62.41	18.22	20.61	33.08	34.97	1.90	42.59
6.50	29.66	60.25	16.67	25.97	32.75	34.58	2.00	42.16
7.00	29.75	55.90	16.03	27.00	32.24	34.09	2.01	41.75
7.50	29.97	52.14	15.67	23.11	32.14	33.69	2.04	41.80
8.00	30.05	50.18	14.87	20.27	32.23	33.60	2.16	41.98
8.50	30.03	48.88	13.80	18.88	32.19	33.70	2.23	41.82
9.00	29.98	48.87	13.03	19.89	32.16	33.74	2.29	41.47
9.50	29.94	50.55	13.04	18.89	32.10	33.63	2.33	41.21
10.00	29.91	56.58	14.13	15.91	31.74	33.31	2.41	40.86
10.50	29.67	58.45	16.18	14.46	31.04	33.15	2.69	41.17
11.00	29.41	47.26	18.44	13.88	30.58	32.77	2.86	42.24
11.50	29.66	42.07	20.24	13.33	30.45	32.55	2.79	42.96
12.00	29.42	38.81	20.02	14.47	30.55	32.29	2.83	42.34
12.50	29.52	36.39	18.10	16.10	30.55	32.41	3.00	41.71
13.00	29.84	35.00	13.65	16.43	30.67	32.53	3.21	40.83
13.50	29.80	33.77	10.50	15.18	30.69	32.55	3.43	40.22
14.00	29.40	32.84	9.65	15.20	30.50	32.49	3.56	40.22
14.50	29.05	34.39	10.19	16.82	30.22	32.41	3.68	40.37
15.00	28.78	36.11	12.43	17.83	30.37	32.33	3.85	40.09
15.50	28.64	33.07	19.05	15.95	30.50	32.33	4.01	40.39
16.00	28.34	30.57	20.82	11.28	30.56	32.31	4.19	40.05
16.50	27.59	31.24	23.54	8.66	30.49	32.22	4.38	40.11
17.00	27.35	32.54	20.39	8.54	30.18	32.07	4.58	40.01
17.50	27.46	34.74	21.25	7.66	30.46	31.90	4.88	39.03
18.00	27.22	40.39	17.67	6.77	30.79	31.76	5.30	38.54
18.50	26.64	52.00	12.15	8.08	30.83	31.65	5.72	38.23
19.00	26.08	43.26	10.34	10.96	30.72	31.71	6.16	36.89
19.50	25.52	37.76	10.45	14.18	30.68	31.96	6.79	34.90
20.00	24.93	36.14	10.12	16.35	30.50	32.03	7.42	33.21

Typical Performance Curves

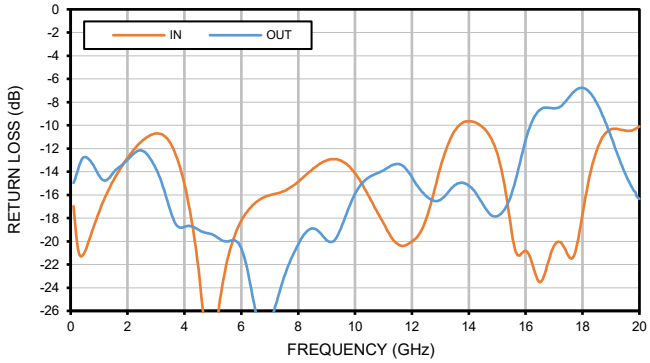
GAIN



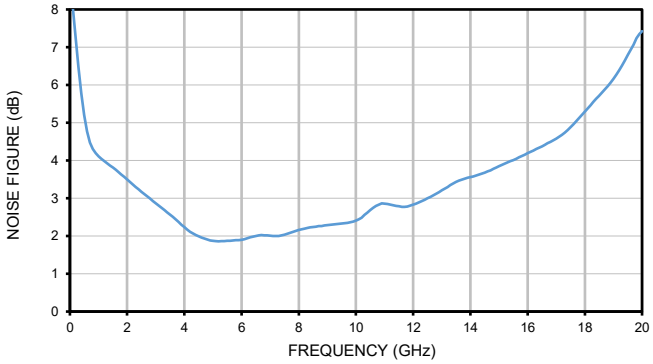
DIRECTIVITY



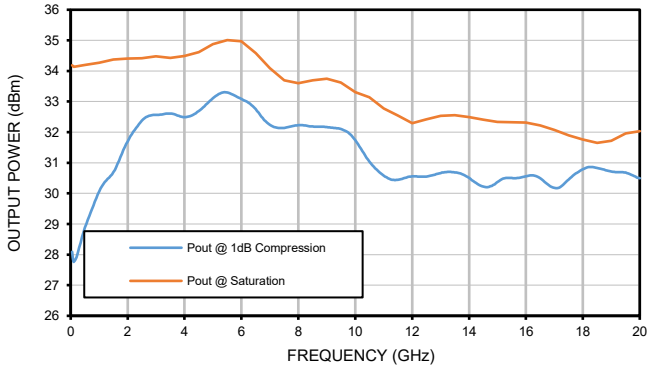
RETURN LOSS



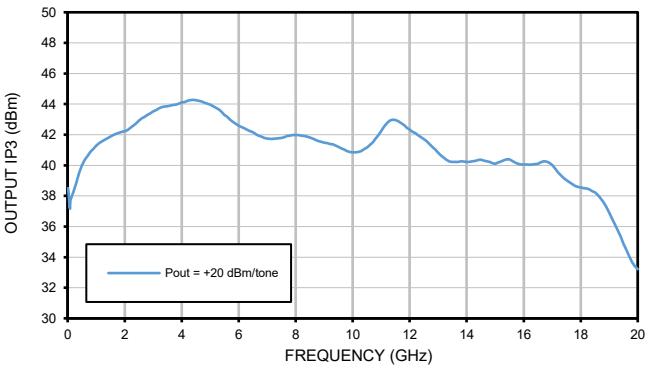
NOISE FIGURE



OUTPUT POWER



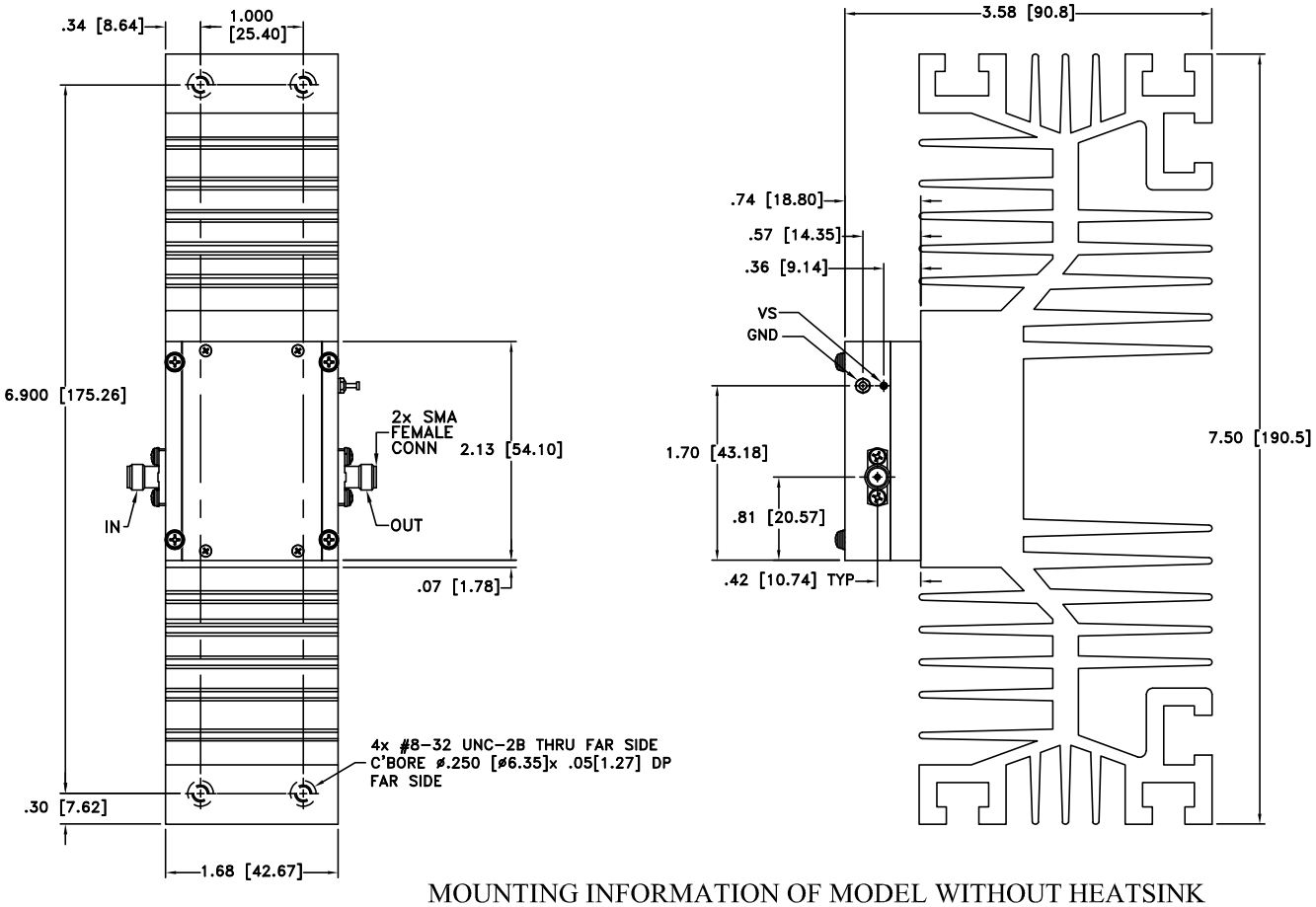
OIP3



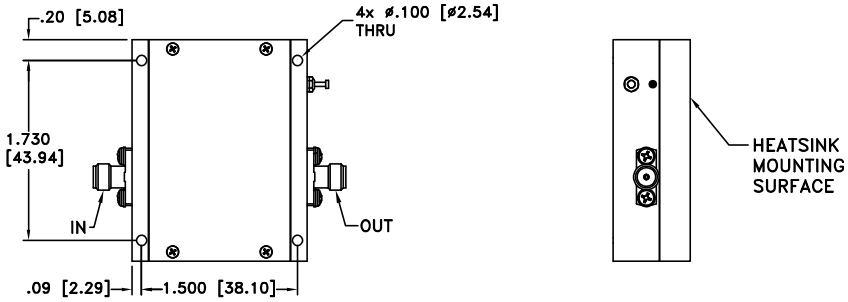
Case Style BN

Outline Dimensions

BN333-1



MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



Weight: 700 gram; Weight without heatsink: 100 gram

Dimensions are in inches [mm]. Tolerances: 1 Pl.±0.1; 2 Pl.±0.03; 3 Pl.±0.015 Inches

Notes:

1. Case material: Aluminum alloy
2. Case finish: Gold plating.
3. Heat sink finish: Black anodized.
4. Shape of mounting flange may vary.

Mini-Circuits

Environmental Specifications ENV141

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	See Data Sheet	Individual Model Data Sheet
Storage Temperature	See Data Sheet	Individual Model Data Sheet
Burn-in	(DC on) 72 hours at 25°C	----
Thermal Shock	-55 °C to +100 °C, 5 cycles	MIL-STD-202, Method 108
Vibration	Random Vibration (non-operating)	MIL-STD-883K, Method 2025, Cond. 1A