



MEDIUM POWER, HIGH GAIN

# Wideband Amplifier ZVA-443HGX+

50Ω 10 MHz to 43.5 GHz<sup>1</sup>

## THE BIG DEAL

- High Gain of 33 dB typ.
- Output Power of +11 dBm typ. at saturation
- Operates with a single DC supply of +9 to +15 V
- Over-Voltage and Reverse Voltage protected

## APPLICATIONS

- Wideband Test and Instrumentation
- 5G
- SATCOM
- Optical communications



Generic photo used for illustration purposes only

Model No.	ZVA-443HGX+
Case Style	T2704-1
Connectors	2.92mm Female

### +RoHS Compliant

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

## PRODUCT OVERVIEW

Mini-Circuits' ZVA-443HGX+ is a Coaxial, High Gain and General-Purpose Wideband amplifier operating from 10 MHz to 43.5 GHz<sup>1</sup>. The model operates over a single positive supply range of +9 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 protects the amplifier from damage if mishandled during operation. The Amplifier is capable of delivering over +11 dBm of saturated RF power over the entire band and has a good Noise figure performance of 3.5 dB, typ. up to 26.5 GHz. The Wideband operation combined with a High Gain makes this model an ideal choice for testing and instrumentation applications.

## KEY FEATURES

Feature	Advantages
Wide-band amplifier, 10 MHz to 43.5 GHz <sup>1</sup>	A single amplifier covers applications including Test & instrumentation, Fiber Optics, 5G, SATCOM, etc.
<ul style="list-style-type: none"> <li>• High Gain</li> <li>• Wideband</li> <li>• Low Noise Figure</li> <li>• Medium RF power</li> </ul>	The Amplifier is capable of providing High Gain of about 33 dB typ. combined with low Noise Figure of 3.5 dB typ. The model is capable of delivering Saturated Output Power of over +11 dBm typ. in the entire operating band.
Adjustable DC Supply voltage	The device is capable of operating from +9 to +15 V with constant DC power consumption, with no effect on RF performance.
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 allows the amplifier to be protected from any external mishandling that could lead to catastrophic failures in the field.

1. Amplifier is usable down to 100 kHz

REV. B  
 ECO-008181  
 ZVA-443HGX+  
 AD/JM/CP/AM  
 210610





MEDIUM POWER, HIGH GAIN

# Wideband Amplifier ZVA-443HGX+

Mini-Circuits

## ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range <sup>1</sup>		10		43500	MHz
Gain	10 - 18000	30	37		dB
	18000 - 32000	25	33		
	32000 - 40000	24	30		
	40000 - 43500	22	28		
Input VSWR	10 - 18000		1.5		:1
	18000 - 32000		1.3		
	32000 - 40000		1.4		
	40000 - 43500		1.6		
Output VSWR <sup>3</sup>	10 - 18000		1.5		:1
	18000 - 32000		1.7		
	32000 - 40000		1.9		
	40000 - 43500		1.7		
Output Power at 1dB compression	10 - 18000		12		dBm
	18000 - 32000		10		
	32000 - 40000		9		
	40000 - 43500		8		
Output IP3	10 - 18000		20		dBm
	18000 - 32000		18		
	32000 - 40000		18		
	40000 - 43500		18		
Noise Figure	1000-26500		3.5		dB
	26500-43500		6.0		
Operating DC Voltage		+9		+15	V
Device Operating Current at +9V <sup>2</sup>				350	mA
Device Operating Power at Operating DC Voltage			2.6		W

1. Amplifier is usable down to 100 kHz

2. DC Supply must be able to source at least 400mA DC at startup.

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

Parameter	Ratings
Operating Temperature (Ambient)	-10°C to +85°C
Storage Temperature	-55°C to +100°C
Total Power dissipation	3W
Input Power (CW)	+5 dBm
DC Voltage	+16V

3. Permanent damage may occur if any of these limits are exceeded.



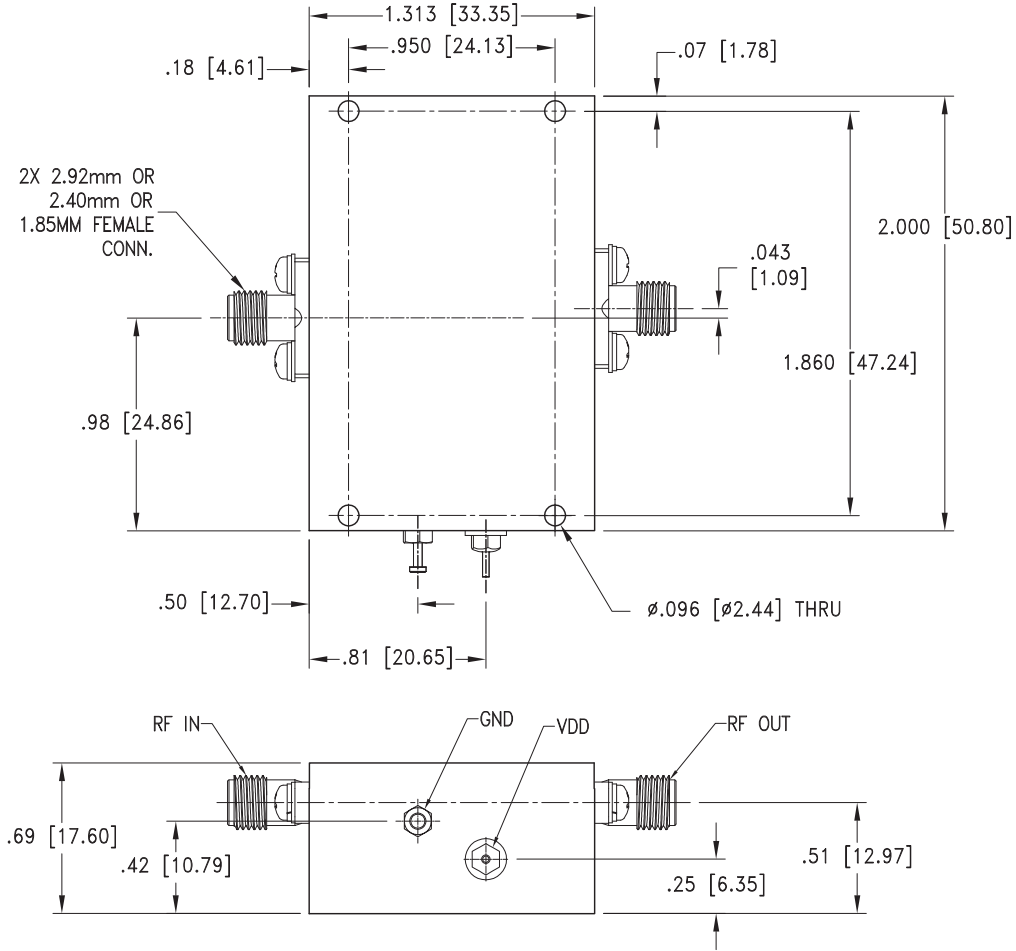


MEDIUM POWER, HIGH GAIN

# Wideband Amplifier **ZVA-443HGX+**

Mini-Circuits

## OUTLINE DRAWING



Weight: 220 grams

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



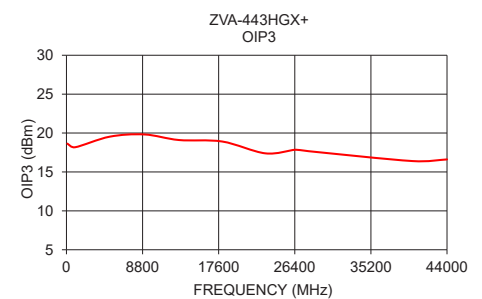
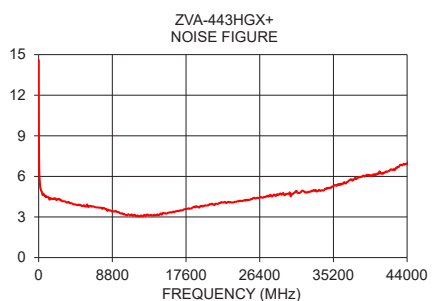
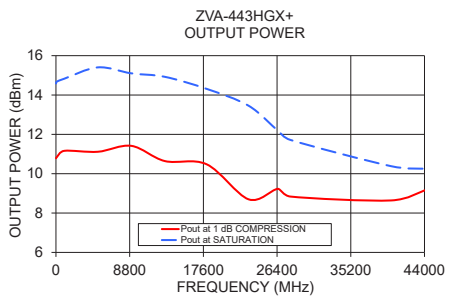
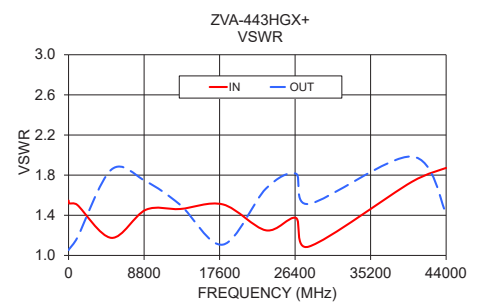
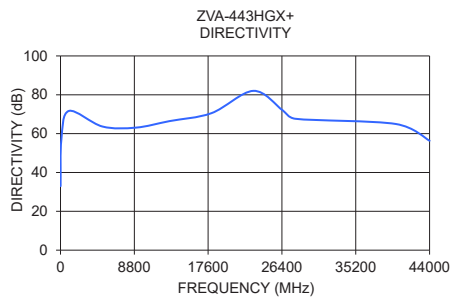
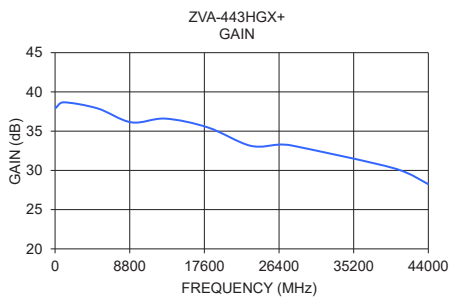


MEDIUM POWER, HIGH GAIN

# Wideband Amplifier ZVA-443HGX+

## TYPICAL PERFORMANCE DATA/CURVES

Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		NOISE FIGURE (dB)	POUT at 1 dB COMPR. (dBm)	POUT at SATURATION (dBm)	OIP3 (dBm)
			IN	OUT				
10	38.17	32.97	1.55	1.05	14.59	10.79	14.59	--
100	37.96	56.78	1.52	1.07	5.39	10.84	14.68	18.64
1000	38.68	71.68	1.50	1.17	4.48	11.16	14.83	18.18
5000	37.90	63.65	1.17	1.86	3.90	11.12	15.40	19.53
9000	36.12	63.10	1.45	1.74	3.42	11.42	15.10	19.82
13000	36.60	66.44	1.46	1.50	3.18	10.64	14.92	19.10
18000	35.48	70.54	1.51	1.11	3.60	10.48	14.31	18.91
23000	33.15	82.02	1.25	1.67	4.08	8.70	13.46	17.39
26500	33.30	71.95	1.37	1.81	4.49	9.23	12.18	17.86
28000	33.15	67.64	1.09	1.51	4.59	8.84	11.72	17.67
40000	30.26	64.94	1.73	1.99	6.15	8.64	10.38	16.40
44000	28.23	56.33	1.87	1.42	6.90	9.15	10.25	16.61



### NOTES

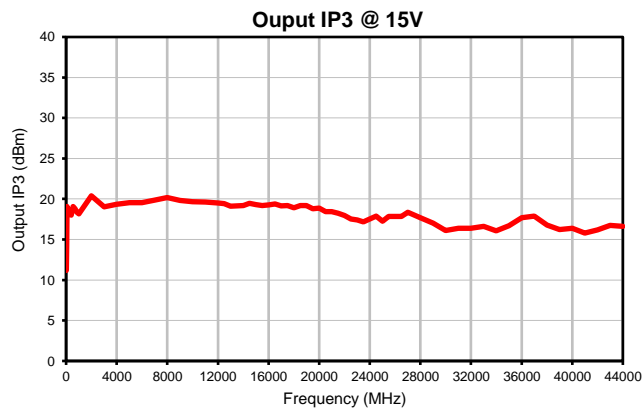
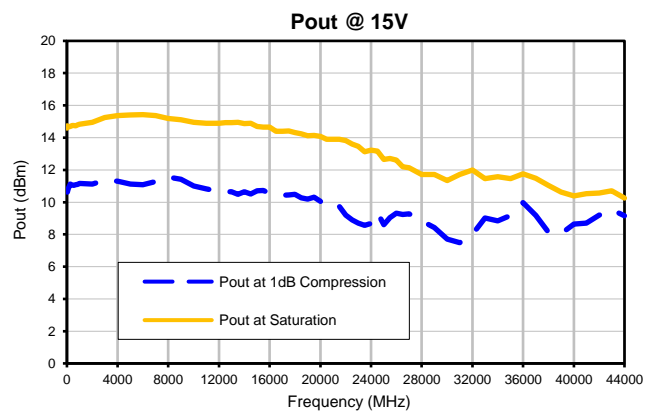
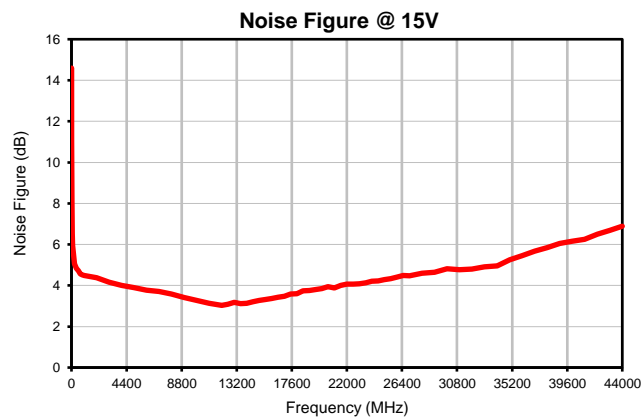
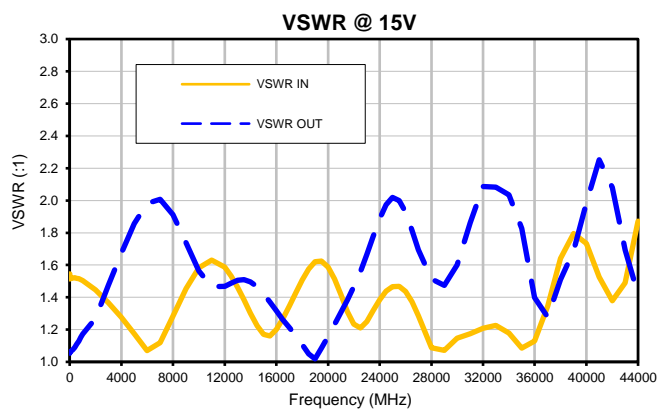
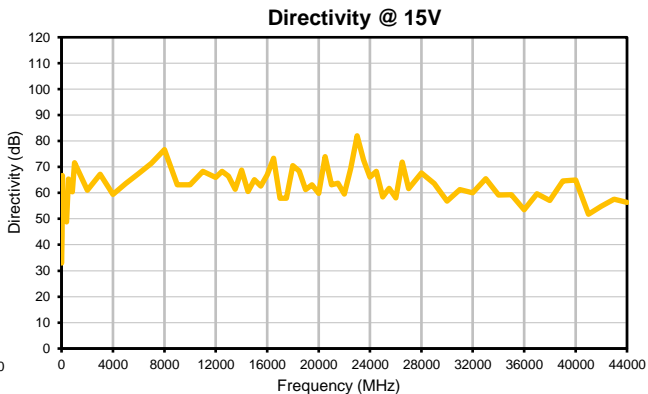
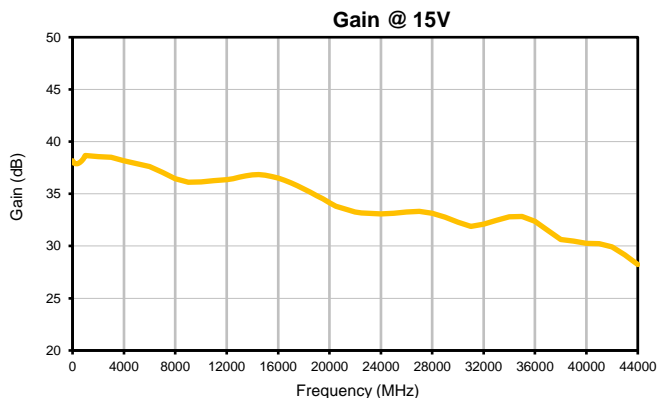
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



## Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 15V	DIRECTIVITY (dB) 15V	VSWR (:1)		NOISE FIGURE (dB) 15V	POUT @ 1 dB COMPRESSION (dBm) 15V	POUT @ SATURATION (dBm) 15V	OUTPUT IP3 (dBm) 15V
			IN 15V	OUT 15V				
10	38.17	32.97	1.55	1.05	14.59	10.79	14.59	--
20	38.12	36.38	1.51	1.06	11.11	10.75	14.67	11.18
40	38.08	43.64	1.52	1.06	8.19	10.63	14.73	14.40
70	38.02	66.72	1.52	1.06	6.53	10.71	14.72	19.05
100	37.96	56.78	1.52	1.07	5.96	10.84	14.68	18.64
250	37.88	51.02	1.52	1.08	5.06	11.13	14.70	18.68
400	37.89	48.82	1.52	1.09	4.84	11.06	14.76	17.98
550	37.98	65.40	1.52	1.11	4.72	11.04	14.74	19.09
700	38.12	63.74	1.51	1.13	4.56	11.08	14.73	18.78
850	38.36	60.41	1.51	1.15	4.53	11.11	14.80	18.36
1000	38.68	71.68	1.50	1.17	4.48	11.16	14.83	18.18
2000	38.58	60.98	1.45	1.27	4.38	11.12	14.94	20.39
3000	38.50	67.16	1.37	1.47	4.16	11.36	15.26	19.03
4000	38.16	59.48	1.28	1.67	4.00	11.30	15.37	19.35
5000	37.90	63.65	1.17	1.86	3.90	11.12	15.40	19.53
6000	37.62	67.43	1.07	1.98	3.77	11.08	15.43	19.52
7000	37.05	71.38	1.12	2.01	3.71	11.27	15.36	19.87
8000	36.43	76.73	1.28	1.91	3.58	11.56	15.19	20.17
9000	36.12	63.10	1.45	1.74	3.42	11.42	15.10	19.82
10000	36.15	63.14	1.58	1.56	3.27	11.00	14.95	19.66
11000	36.26	68.29	1.63	1.47	3.13	10.81	14.90	19.64
12000	36.36	65.95	1.59	1.47	3.03	10.67	14.89	19.50
12500	36.46	68.32	1.53	1.49	3.08	10.64	14.94	19.43
13000	36.60	66.44	1.46	1.50	3.18	10.64	14.92	19.10
13500	36.74	61.36	1.38	1.51	3.11	10.49	14.94	19.17
14000	36.83	68.84	1.30	1.50	3.13	10.64	14.88	19.18
14500	36.86	60.50	1.22	1.47	3.22	10.51	14.88	19.47
15000	36.80	65.07	1.17	1.42	3.27	10.70	14.69	19.30
15500	36.67	62.64	1.16	1.37	3.32	10.72	14.66	19.19
16000	36.50	66.93	1.20	1.32	3.37	10.58	14.65	19.28
16500	36.28	73.34	1.27	1.26	3.42	10.52	14.39	19.39
17000	36.04	57.96	1.35	1.21	3.48	10.43	14.40	19.13
17500	35.77	57.99	1.43	1.16	3.59	10.44	14.42	19.20
18000	35.48	70.54	1.51	1.11	3.60	10.48	14.31	18.91
18500	35.16	68.41	1.58	1.05	3.74	10.27	14.23	19.19
19000	34.83	61.23	1.62	1.02	3.75	10.19	14.12	19.18
19500	34.52	63.19	1.62	1.09	3.80	10.32	14.13	18.78
20000	34.15	59.84	1.59	1.16	3.84	10.04	14.08	18.89
20500	33.83	73.97	1.51	1.23	3.95	9.79	13.90	18.43
21000	33.62	63.08	1.42	1.31	3.88	9.91	13.89	18.42
21500	33.43	63.70	1.31	1.38	4.00	9.73	13.90	18.25
22000	33.26	59.57	1.23	1.47	4.07	9.19	13.82	17.97
22500	33.17	69.47	1.21	1.56	4.07	8.90	13.61	17.52
23000	33.15	82.02	1.25	1.67	4.08	8.70	13.46	17.39
23500	33.11	72.70	1.32	1.78	4.12	8.55	13.12	17.18
24000	33.08	66.08	1.39	1.89	4.21	8.67	13.23	17.51
24500	33.11	68.36	1.44	1.97	4.23	9.36	13.18	17.90
25000	33.14	58.44	1.47	2.02	4.28	8.61	12.65	17.26
25500	33.20	61.81	1.47	2.00	4.33	9.03	12.70	17.85
26000	33.26	58.04	1.44	1.93	4.40	9.32	12.62	17.85
26500	33.30	71.95	1.37	1.81	4.49	9.23	12.18	17.86
27000	33.32	61.60	1.29	1.69	4.46	9.27	12.14	18.37
28000	33.15	67.64	1.09	1.51	4.59	8.84	11.72	17.67
29000	32.77	63.64	1.07	1.47	4.65	8.43	11.71	17.02
30000	32.28	56.81	1.15	1.60	4.81	7.72	11.35	16.09
31000	31.89	61.22	1.17	1.86	4.77	7.49	11.71	16.38
32000	32.10	60.06	1.21	2.09	4.80	8.00	12.00	16.37
33000	32.48	65.53	1.23	2.08	4.91	9.01	11.47	16.62
34000	32.79	59.18	1.18	2.04	4.96	8.84	11.59	16.06
35000	32.82	59.25	1.08	1.83	5.25	9.17	11.46	16.68
36000	32.38	53.47	1.13	1.40	5.46	9.97	11.76	17.67
37000	31.47	59.66	1.35	1.28	5.67	9.17	11.47	17.89
38000	30.64	57.09	1.64	1.51	5.85	8.14	11.05	16.77
39000	30.48	64.60	1.80	1.69	6.04	8.04	10.62	16.21
40000	30.26	64.94	1.73	1.99	6.15	8.64	10.38	16.40
41000	30.23	51.76	1.53	2.25	6.25	8.70	10.52	15.77
42000	29.93	54.90	1.38	2.08	6.50	9.20	10.56	16.17
43000	29.15	57.58	1.49	1.69	6.69	9.54	10.70	16.72
44000	28.23	56.33	1.87	1.42	6.90	9.15	10.25	16.61

## Typical Performance Curves

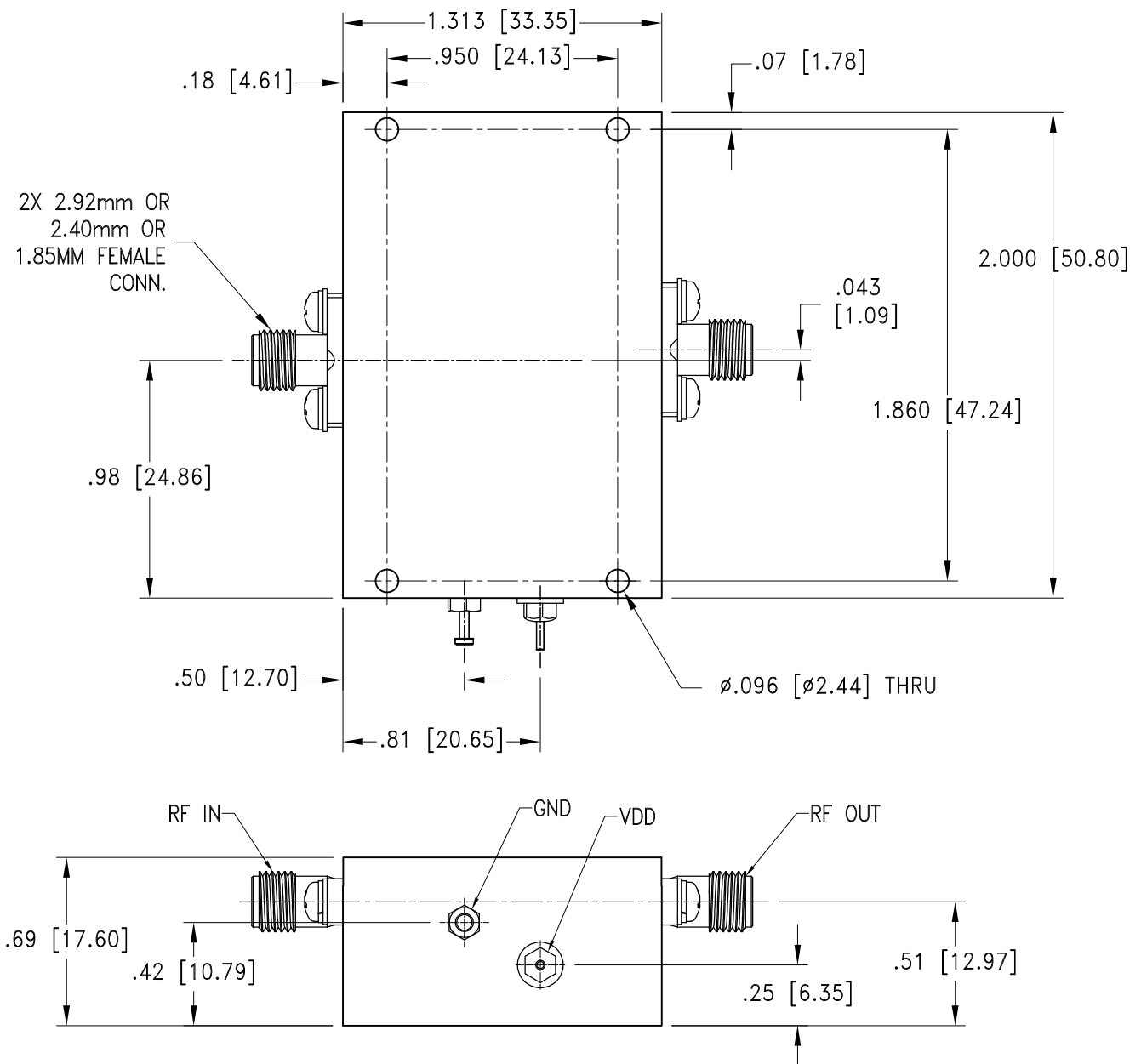


# Case Style

# T

## Outline Dimensions

### T2704-1



Weight: 220 grams;

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

### Notes:

1. Case Material: Brass Alloy
2. Case Finish: Gold Plating

**Mini-Circuits**<sup>®</sup>  
ISO 9001 ISO 14001 CERTIFIED

ALL NEW  
minicircuits.com

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.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-10° to +85° C Case Temperature or Ambient Temperature	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet