



COAXIAL

# RF Instrument Amplifier TVA-4W-422A+

50Ω 500 to 4200 MHz N-Type Female

## THE BIG DEAL

- High IP3, +44 dBm typ.
- High Gain, 25 dB Typ.
- Excellent Gain Flatness ±1 dB
- High Reverse Isolation, 70 dB
- Built in 110/220V AC power supply
- Unconditional stable
- Thermally self protected, LED indicator
- Withstands open short load at 1 dB comp. point output power
- $\text{C}$   $\text{C}$  marked

## APPLICATIONS

- Lab use
- Wideband test instrumentation

## PRODUCT OVERVIEW

Mini-Circuits' TVA-4W-422A+ instrument amplifier provides flat gain and high IP3 across the 500 to 4200 MHz frequency range, supporting a wide variety of applications. The amplifier runs on a built-in 110/220V power supply, making it easy to use in most lab environments. This model features thermal self-protection and withstands open and short loads while delivering signals up to P1dB, preventing damage to the amplifier and providing added reliability. It comes housed in a light-weight aluminum alloy case (15.35 x 8.27 x 3.25") with N-Type connectors, ideal for bench-top use. 2 N-male to SMA-female adapters come included for the user's convenience.

## KEY FEATURES

Feature	Advantages
High OIP3, +44 dBm	TVA-4W-422A+ provides highly linear performance with excellent sensitivity and two-tone spur free dynamic range.
High Gain, 25 dB	25 dB gain allows the TVA-4W-422A+ to be driven to full output power with most commercially available signal generators.
Excellent Gain Flatness, ±1.0 dB	Flat gain across the entire 500 to 4200 MHz frequency range provides consistent performance for broadband applications.
High Output Power, +34 dBm at 1 dB compression	Supports high power test applications such as EMI, maximum power handling, and reliability testing.
High Reverse Isolation, 70 dB	Protects signal sources from load, preventing potential damage and performance variation due to load pulling.
Built-in 110V/220V power supply	Operating from a standard AC line power supply, the TVA-4W-422A+ can be powered from 110 to 220V, making the amplifier versatile for use in most lab environments.
Thermally-self-protected	A built-in sensing feature signals the unit to power off when the amplifier reaches its maximum rated operating temperature, preventing damage to the equipment and providing added reliability.
$\text{C}$ $\text{C}$ marked	Meets conformity standards for sale within the European Economic Area (EEA).



Generic photo used for illustration purposes only

Model No.	TVA-4W-422A+
Case Style	PJ2059-2
Connectors	N-Type Female N-Male - SMA Female Adapters (2 included)

### +RoHS Compliant

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





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## ELECTRICAL SPECIFICATIONS AT 25°C, UNLESS OTHERWISE NOTED

Parameter	Condition (GHz)	Min	Typ.	Max.	Units
Frequency Range		500	—	4200	MHz
Gain	500 - 4200	20	25	—	dB
Gain Flatness	500 - 4200	—	±1.0	—	dB
Output Power at 1dB compression	500 - 4200	—	34	—	dBm
Noise Figure	500 - 4200	—	10	—	dB
Output third order intercept point	500 - 4200	—	+44	—	dBm
Input VSWR	500 - 4200	—	1.6	—	:1
Output VSWR	500 - 4200	—	2.6	—	:1
AC Supply Voltage	47 - 63 Hz	85	110/220	265	V

Note: Keep area adjacent to the air vents clear to allow free air flow.

## ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	0°C to +55°C
Storage Temperature	-40°C to +70°C
Input RF Power (no damage)	+20 dBm

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



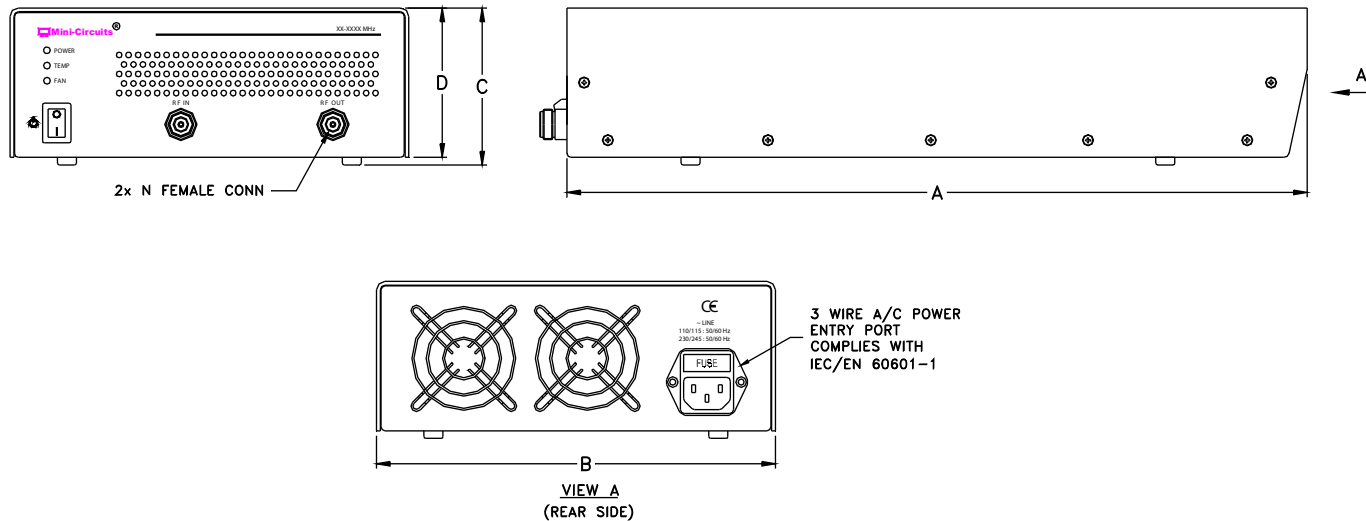
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# RF Instrument Amplifier **TVA-4W-422A+**

Mini-Circuits

50Ω 500 to 4200 MHz N-Type Female

## OUTLINE DRAWING



## OUTLINE DIMENSIONS (Inch mm)

A	B	C	D	WT.
15.35	8.27	3.25	3.09	GRAM
389.89	210.06	82.55	78.49	3870



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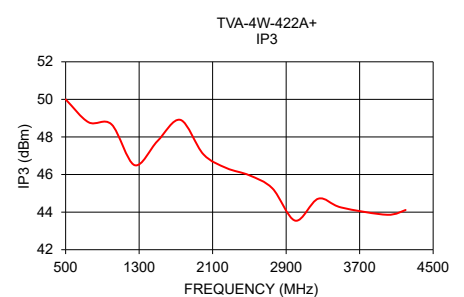
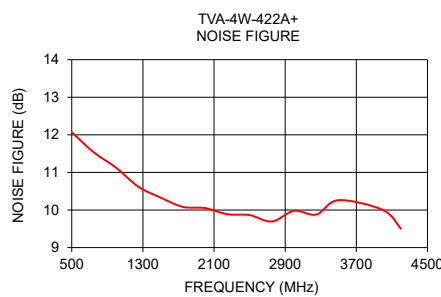
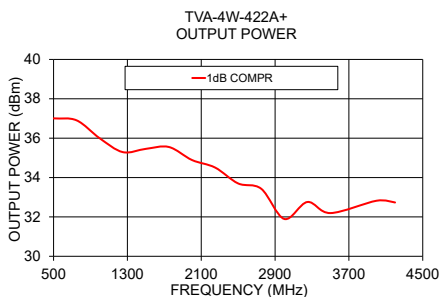
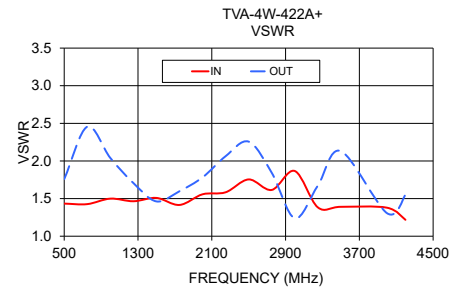
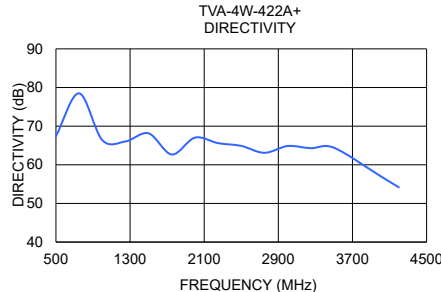
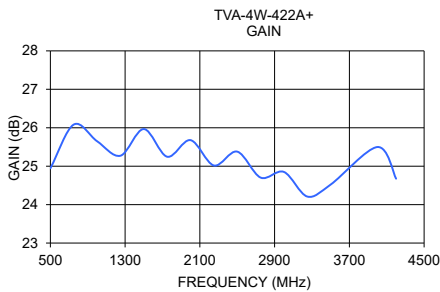
# RF Instrument Amplifier TVA-4W-422A+

Mini-Circuits

50Ω 500 to 4200 MHz N-Type Female

## TYPICAL PERFORMANCE DATA AND CHARTS

Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		POUT at 1 dB COMPR. (dBm)	Noise Figure (dB)	IP3 (dBm)
			IN	OUT			
500	24.94	67.42	1.43	1.76	37.01	12.07	50.00
750	26.08	78.49	1.43	2.45	36.90	11.53	48.78
1000	25.65	66.38	1.50	2.04	35.99	11.12	48.67
1250	25.27	66.03	1.46	1.71	35.29	10.62	46.50
1500	25.97	68.14	1.51	1.46	35.46	10.33	47.78
1750	25.25	62.66	1.42	1.60	35.55	10.08	48.91
2000	25.68	67.03	1.56	1.78	34.89	10.05	47.07
2250	25.02	65.60	1.58	2.06	34.51	9.89	46.35
2500	25.38	64.89	1.75	2.26	33.70	9.86	45.96
2750	24.70	63.10	1.61	1.84	33.43	9.69	45.27
3000	24.85	64.85	1.87	1.24	31.90	9.98	43.55
3250	24.21	64.29	1.38	1.67	32.76	9.88	44.71
3500	24.52	64.41	1.39	2.13	32.19	10.26	44.25
4000	25.50	57.10	1.38	1.31	32.82	10.00	43.86
4200	24.67	54.16	1.22	1.55	32.73	9.50	44.11



### 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)



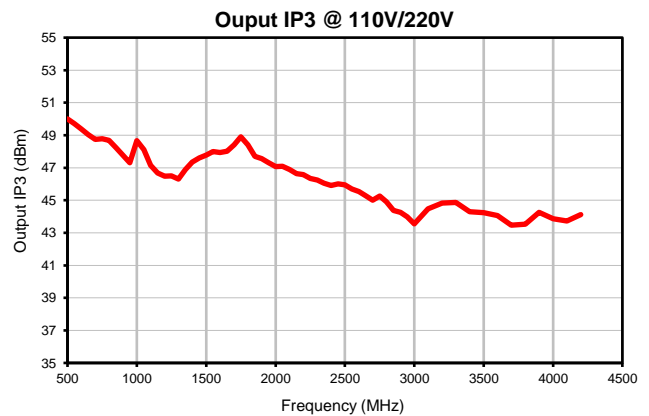
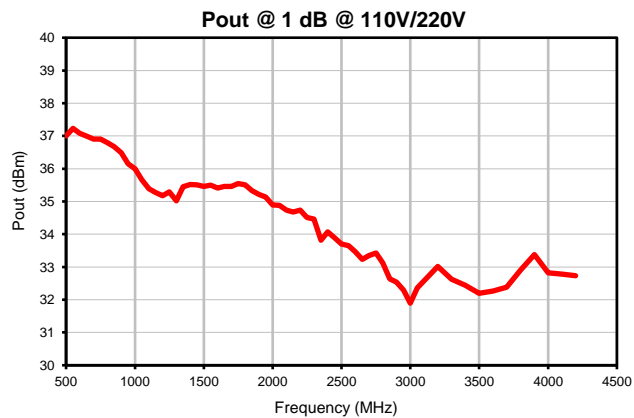
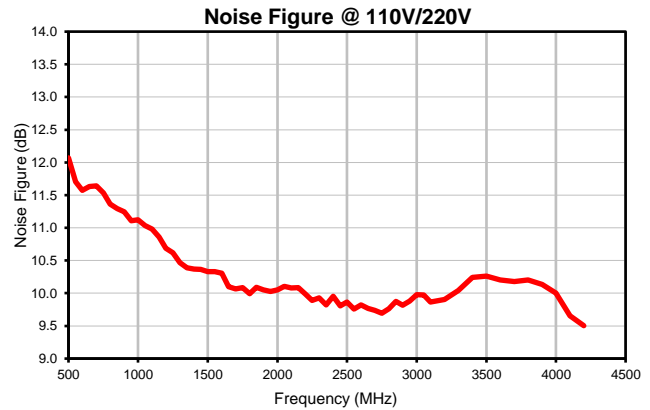
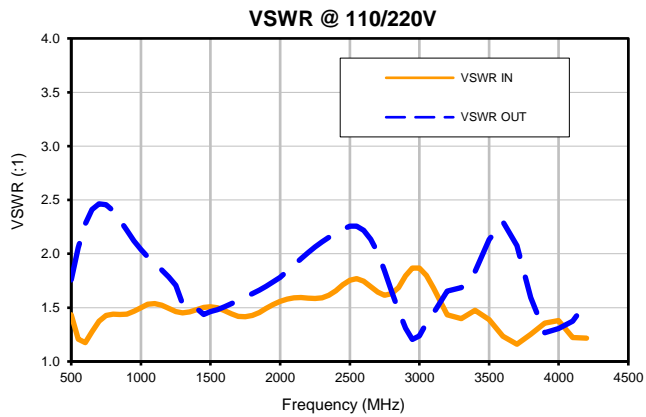
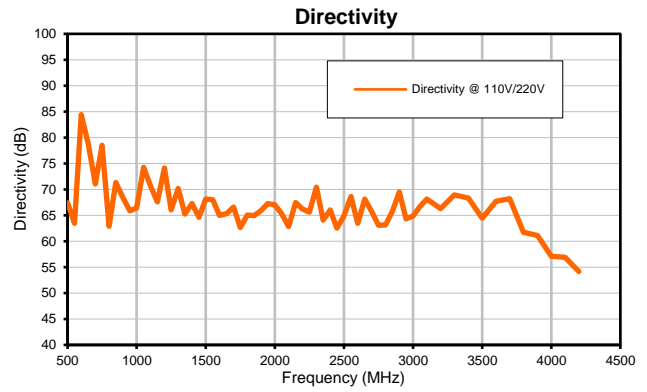
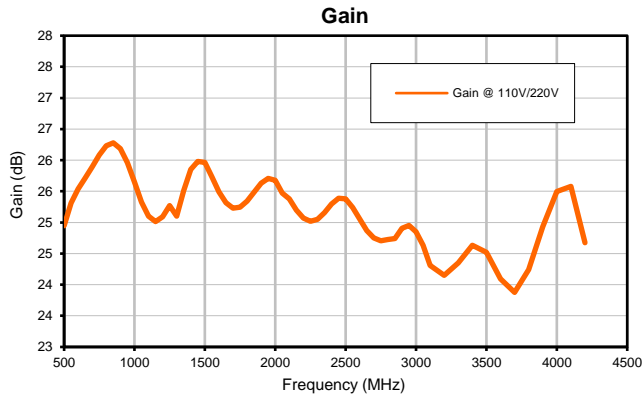
## Typical Performance Data

FREQ. (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		NOISE FIGURE (dB)	POUT @ 1 dB COMPRESSION (dBm)	OUTPUT IP3 (dBm)
			IN	OUT			
			110V/220V	110V/220V			
500	24.94	67.42	1.43	1.76	12.07	37.01	50.00
550	25.31	63.45	1.21	2.06	11.70	37.23	49.71
600	25.54	84.42	1.17	2.28	11.57	37.08	49.38
650	25.71	78.73	1.28	2.41	11.63	36.99	49.04
700	25.89	71.06	1.37	2.46	11.64	36.90	48.75
750	26.08	78.49	1.43	2.45	11.53	36.90	48.78
800	26.23	62.90	1.44	2.40	11.36	36.79	48.69
850	26.28	71.38	1.44	2.31	11.29	36.67	48.23
900	26.19	68.47	1.44	2.22	11.24	36.49	47.77
950	25.96	65.86	1.47	2.12	11.11	36.15	47.31
1000	25.65	66.38	1.50	2.04	11.12	35.99	48.67
1050	25.33	74.28	1.53	1.97	11.04	35.67	48.12
1100	25.10	70.71	1.54	1.91	10.98	35.39	47.15
1150	25.01	67.59	1.52	1.85	10.86	35.27	46.69
1200	25.09	74.12	1.49	1.78	10.69	35.18	46.49
1250	25.27	66.03	1.46	1.71	10.62	35.29	46.50
1300	25.10	70.19	1.45	1.53	10.47	35.02	46.31
1350	25.51	65.23	1.46	1.53	10.39	35.45	46.89
1400	25.85	67.28	1.48	1.49	10.37	35.52	47.35
1450	25.98	64.62	1.50	1.44	10.36	35.51	47.60
1500	25.97	68.14	1.51	1.46	10.33	35.46	47.78
1550	25.73	68.04	1.50	1.48	10.33	35.50	48.00
1600	25.49	64.97	1.47	1.51	10.31	35.41	47.94
1650	25.32	65.28	1.44	1.54	10.10	35.46	48.01
1700	25.23	66.57	1.42	1.57	10.07	35.46	48.40
1750	25.25	62.66	1.42	1.60	10.08	35.55	48.91
1800	25.34	65.08	1.43	1.63	9.99	35.51	48.41
1850	25.49	64.91	1.45	1.66	10.09	35.33	47.69
1900	25.63	65.94	1.49	1.70	10.05	35.22	47.56
1950	25.71	67.25	1.53	1.74	10.03	35.14	47.31
2000	25.68	67.03	1.56	1.78	10.05	34.89	47.07
2050	25.47	65.22	1.58	1.84	10.10	34.88	47.09
2100	25.38	62.85	1.59	1.89	10.08	34.74	46.90
2150	25.20	67.47	1.59	1.95	10.09	34.68	46.64
2200	25.07	66.24	1.59	2.01	9.99	34.73	46.58
2250	25.02	65.60	1.58	2.06	9.89	34.51	46.35
2300	25.05	70.41	1.59	2.11	9.93	34.46	46.25
2350	25.16	64.06	1.61	2.15	9.82	33.82	46.05
2400	25.30	66.06	1.66	2.20	9.96	34.07	45.92
2450	25.39	62.55	1.71	2.23	9.81	33.89	46.01
2500	25.38	64.89	1.75	2.26	9.86	33.70	45.96
2550	25.24	68.61	1.77	2.26	9.76	33.66	45.70
2600	25.06	63.42	1.75	2.22	9.82	33.46	45.55
2650	24.87	68.12	1.70	2.14	9.77	33.23	45.28
2700	24.75	65.77	1.64	2.01	9.74	33.35	45.01
2750	24.70	63.10	1.61	1.84	9.69	33.43	45.27
2800	24.72	63.14	1.63	1.65	9.76	33.13	44.91
2850	24.74	65.71	1.69	1.47	9.87	32.64	44.37
2900	24.90	69.49	1.80	1.31	9.82	32.54	44.26
2950	24.95	64.31	1.87	1.20	9.88	32.30	43.98
3000	24.85	64.85	1.87	1.24	9.98	31.90	43.55
3050	24.63	66.65	1.80	1.36	9.97	32.36	44.02
3100	24.31	68.13	1.68	1.45	9.87	32.58	44.48
3200	24.15	66.31	1.43	1.65	9.90	33.02	44.83
3300	24.35	68.95	1.40	1.69	10.04	32.62	44.88
3400	24.63	68.36	1.48	1.84	10.24	32.44	44.29
3500	24.52	64.41	1.39	2.13	10.26	32.19	44.25
3600	24.09	67.70	1.23	2.30	10.20	32.26	44.06
3700	23.88	68.19	1.16	2.08	10.18	32.39	43.47
3800	24.24	61.71	1.25	1.59	10.20	32.91	43.53
3900	24.93	61.10	1.36	1.27	10.14	33.38	44.26
4000	25.50	57.10	1.38	1.31	10.00	32.82	43.86
4100	25.58	56.91	1.22	1.37	9.65	32.78	43.74
4200	24.67	54.16	1.22	1.55	9.50	32.73	44.11

# RF Instrument Amplifier

## Typical Performance Curves

# TVA-4W-422A+

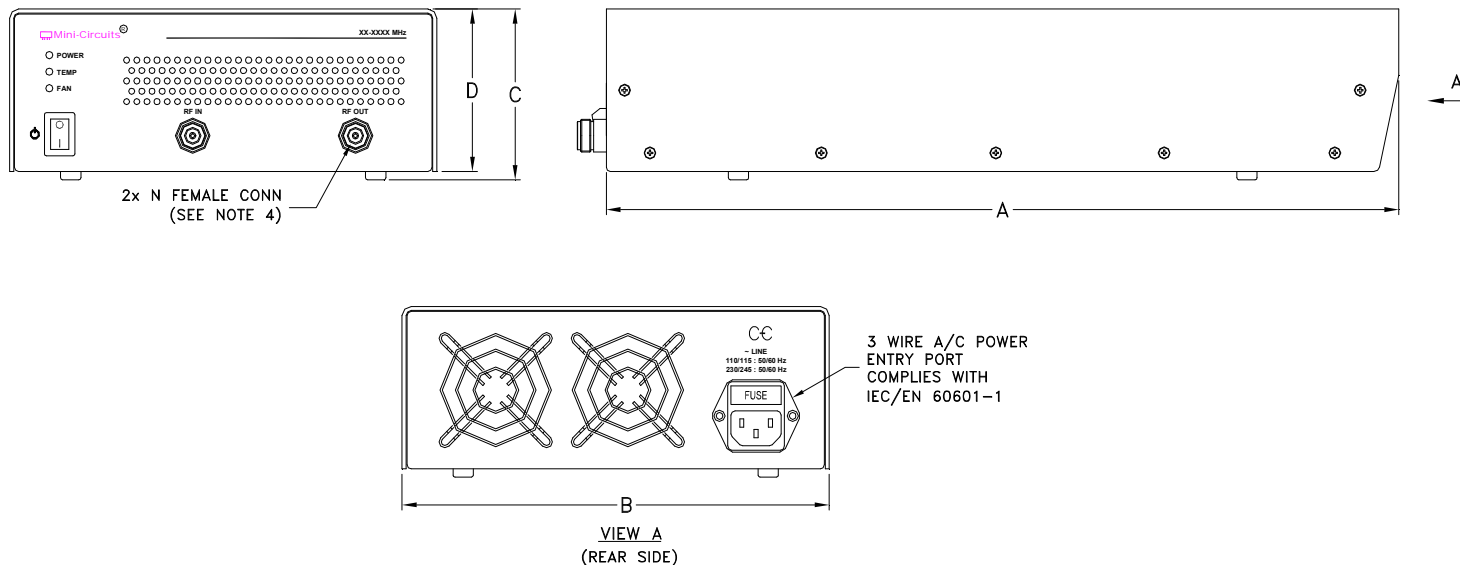


# Case Style

# PJ

## PJ2059-2

### Outline Dimensions



CASE#	A	B	C	D	E	WT, GRAM
PJ2059-2	15.35 (390.0)	8.27 (210.0)	3.25 (82.6)	3.09 (78.5)	-- --	3870

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

#### Notes:

1. Case material: Aluminum alloy.
2. Finish: White paint.
3. Keep area adjacent to airvents clear to allow free air flow. Caution: Do not insert anything, especially conductors or fingers into case opening. Physical injury, shock or death may occur.
4. Connector shape may vary.

**Mini-Circuits**

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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	-0° to 55° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-40° to 70° C Ambient Environment	Individual Model Data Sheet