COAXIAL

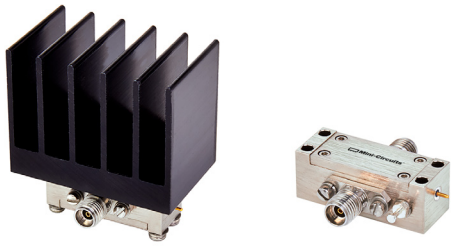
Wideband Amplifier

ZVE-323LN-K+
ZVE-323LNX-K+

50Ω 18 to 32 GHz 2.92 mm Female

THE BIG DEAL

- Extremely Wideband, 18 to 32 GHz
- Flat Gain, 20 ±1.5 dB Typ.
- High OIP3, +23 dBm Typ.
- Output P1dB, +10 dBm Typ.



Generic photo used for illustration purposes only

APPLICATIONS

- Radar and Military
- Test Instrumentation
- Satellite Repeaters
- Communication

Model No.	ZVE-323LN-K+	ZVE-323LNX-K+ ▲
Option	With Heatsink	Without Heatsink
Case Style	AV1280-1	
Connectors	2.92 mm (K-Type) Female	

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

PRODUCT OVERVIEW

Mini-Circuits' ZVE-323LN(X)-K+ is a Class A, three-stage, unconditionally stable amplifier providing flat gain over an extremely wide frequency range from 18 to 32 GHz. This model is capable of delivering up to 10 mW output power at P1dB with high output IP3 supporting a wide range of sensitive, high dynamic-range receiver applications and many systems where high performance over a wide bandwidth is needed. It operates on a +12 V supply and features built-in safety features including protection against reverse bias and immunity to accidental open or short loads for 2 minutes. The amplifier comes in a rugged, compact case (1.2 × 0.46 × 0.45") with K-type (2.92 mm) connectors and an optional heatsink for efficient cooling.

KEY FEATURES

Feature	Advantages
Ultra-Wideband, 18 to 32 GHz Operates from 17 to 33 GHz	Enables a single amplifier to be used in a wide range of applications.
Excellent Gain Flatness, ±1.5 dB Across Full Frequency Range	Provides consistent performance across its operating frequency, minimizing the need for external equalizing networks in wideband applications.
High Gain, 20 dB Typ.	Reduces the number of gain stages, lowering component count and overall system cost.
Class A Amplifier	Provides good linearity with low signal distortion.
Low Noise and High OIP3: • NF, 3 dB Typ. • OIP3, +23 dBm Typ.	The combination of low noise and high OIP3 makes the ZVE-323LN-K+ ideal for use in low-noise receiver front end (RFE) as it gives the user the advantages of sensitivity and two-tone IM performance at both ends of the dynamic range.
Rugged Design	Built-in protection against reverse bias and accidental open and short loads provides added reliability for demanding operating conditions.

REV. B
ECO-012828
ZVE-323LN(X)-K+
MCL NY
260916

Wideband Amplifier

ZVE-323LN-K+
ZVE-323LNX-K+

50Ω 18 to 32 GHz 2.92 mm Female

ELECTRICAL SPECIFICATIONS AT +25 °C

Parameter	Condition (GHz)	ZVE-323LN-K+ ZVE-323LNX-K+▲			Units
		Min.	Typ.	Max.	
Frequency Range		18		32	GHz
Gain	18–32	17	20	24	dB
Gain Flatness	18–32	–	±1.5	±2.5	dB
Output Power at 1 dB Compression	18–32	–	+10	–	dBm
Noise Figure	18–32	–	3	4	dB
Output Third Order Intercept Point	18–32	–	+23	–	dBm
Input VSWR	18–32	–	1.9	3.0	:1
Output VSWR	18–32	–	1.8	3.0	:1
DC Supply Voltage	–	–	+12[1]	–	V
Supply Current	–	–	50	75	mA

1. Recommended operating voltage.

▲ Heatsink not included. Alternative heatsinking and heat removal must be provided by the user to limit maximum baseplate temperature to +85 °C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heatsink to be 20 °C/W max.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	ZVE-323LN-K+ -40 °C to +60 °C Ambient ZVE-323LNX-K+ -40 °C to +85 °C Baseplate Temp.
Storage Temperature	-65 °C to +150 °C
DC Voltage	+14 V
CW Input RF Power (No Damage)	+15 dBm

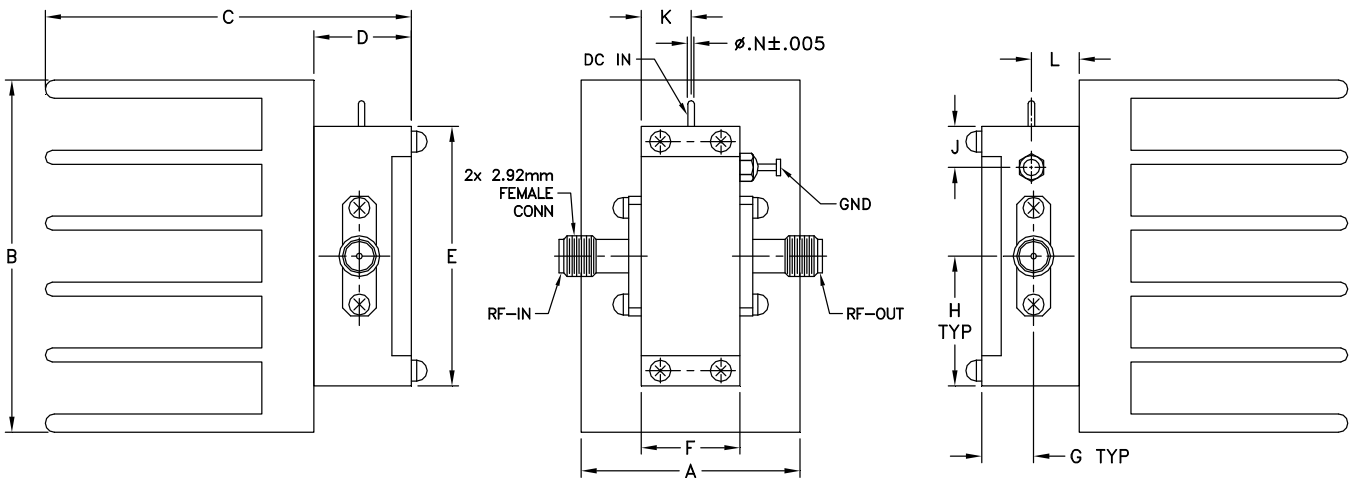
Permanent damage may occur if any of these limits are exceeded.

Wideband Amplifier

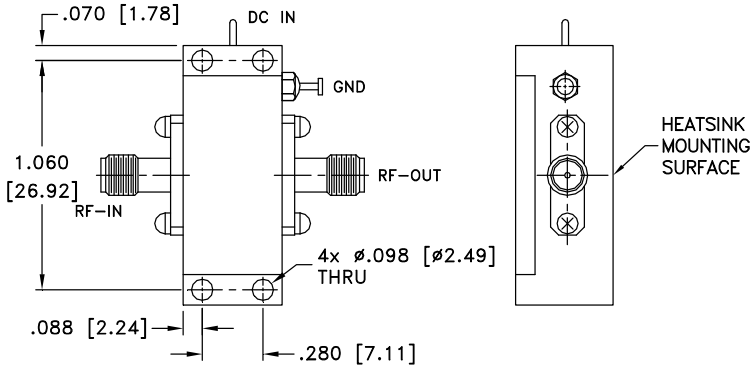
ZVE-323LN-K+
ZVE-323LNX-K+

50Ω 18 to 32 GHz 2.92 mm Female

OUTLINE DRAWING FOR MODEL WITH HEATSINK (ZVE-323LN-K+)



MOUNTING INFORMATION FOR MODEL WITHOUT HEATSINK (ZVE-323LNX-K+)



OUTLINE DIMENSIONS (MM/INCH)

A	B	C	D	E	F	G	H	J	K	L	M	N	wt
1.01	1.63	1.74	.45	1.20	.46	.24	.60	.19	.23	.27	-	.03	grams*
25.65	41.40	44.20	11.43	30.48	11.68	6.10	15.24	4.83	5.84	6.86	-	0.76	58

*17 grams without heatsink

COAXIAL

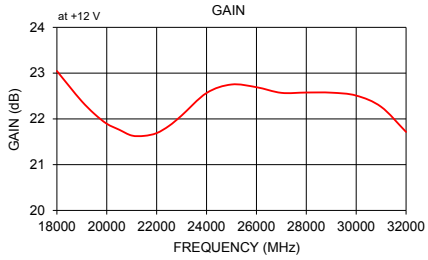
Wideband Amplifier

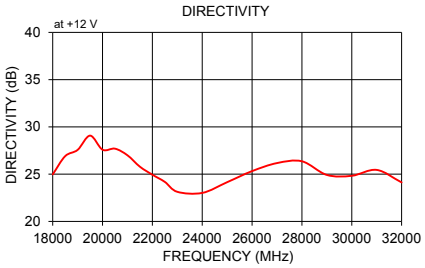
ZVE-323LN-K+
ZVE-323LNX-K+

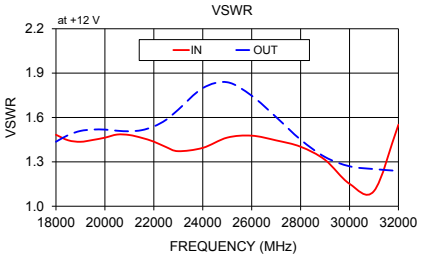
50Ω 18 to 32 GHz 2.92 mm Female

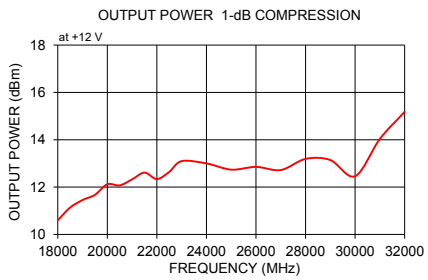
TYPICAL PERFORMANCE DATA/CURVES

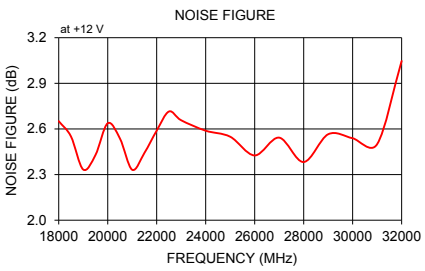
Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		P_{OUT} at 1 dB Compr. (dBm)	Noise Figure (dB)	OIP3 (dBm)
	+12 V	+12 V	IN	OUT	+12 V	+12 V	+12 V
18000	23.05	24.97	1.48	1.44	10.60	2.65	20.09
18500	22.71	26.90	1.45	1.48	11.14	2.55	20.97
19000	22.38	27.57	1.44	1.51	11.45	2.33	21.41
19500	22.11	29.08	1.45	1.52	11.67	2.43	21.65
20000	21.89	27.59	1.46	1.52	12.12	2.64	22.29
20500	21.76	27.70	1.48	1.51	12.07	2.54	23.03
21000	21.64	27.00	1.48	1.51	12.33	2.33	23.60
21500	21.63	25.79	1.46	1.51	12.61	2.44	24.18
22000	21.69	24.94	1.44	1.54	12.34	2.59	24.16
22500	21.85	24.18	1.40	1.58	12.64	2.71	24.71
23000	22.07	23.13	1.37	1.65	13.10	2.66	24.38
24000	22.57	23.02	1.39	1.80	13.00	2.59	24.97
25000	22.75	24.15	1.46	1.84	12.74	2.55	25.83
26000	22.69	25.32	1.48	1.75	12.85	2.43	26.12
27000	22.57	26.17	1.45	1.60	12.72	2.54	25.61
28000	22.58	26.36	1.40	1.45	13.19	2.38	25.42
29000	22.57	24.92	1.31	1.33	13.14	2.57	25.55
30000	22.51	24.83	1.15	1.27	12.46	2.54	25.80
31000	22.26	25.45	1.10	1.25	14.04	2.50	25.88
32000	21.72	24.13	1.55	1.24	15.18	3.05	26.12

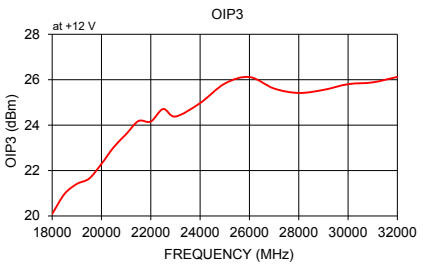












NOTES

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

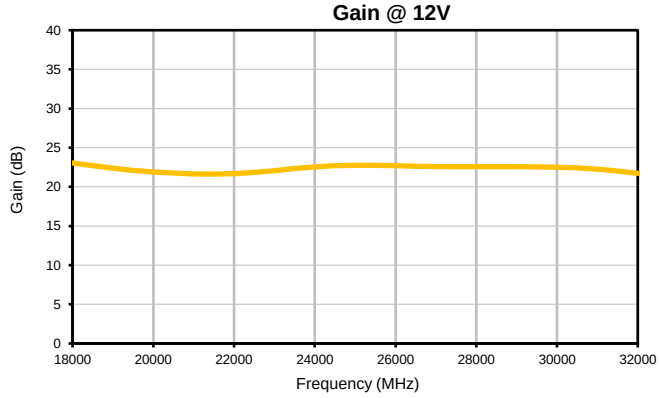
Low Noise Wideband Amplifier ZVE-323LN-K+

Typical Performance Data

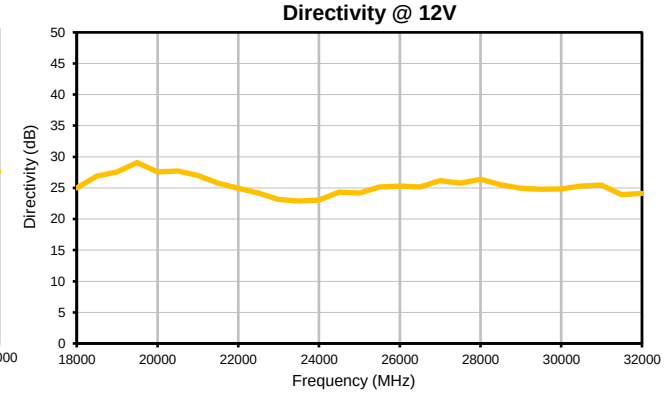
FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR (:1) IN 12V	VSWR (:1) OUT 12V	NOISE FIGURE (dB) 12V	Pout at 1 dB COMPRESSION (dBm) 12V	OUTPUT IP3 (dBm) 12V
18000	23.05	24.97	1.48	1.44	2.65	10.60	20.09
18500	22.71	26.90	1.45	1.48	2.55	11.14	20.97
19000	22.38	27.57	1.44	1.51	2.33	11.45	21.41
19500	22.11	29.08	1.45	1.52	2.43	11.67	21.65
20000	21.89	27.59	1.46	1.52	2.64	12.12	22.29
20500	21.76	27.70	1.48	1.51	2.54	12.07	23.03
21000	21.64	27.00	1.48	1.51	2.33	12.33	23.60
21500	21.63	25.79	1.46	1.51	2.44	12.61	24.18
22000	21.69	24.94	1.44	1.54	2.59	12.34	24.16
22500	21.85	24.18	1.40	1.58	2.71	12.64	24.71
23000	22.07	23.13	1.37	1.65	2.66	13.10	24.38
23500	22.33	22.90	1.37	1.73	2.54	12.82	24.97
24000	22.57	23.02	1.39	1.80	2.59	13.00	24.97
24500	22.71	24.34	1.43	1.83	2.65	13.00	25.14
25000	22.75	24.15	1.46	1.84	2.55	12.74	25.83
25500	22.74	25.17	1.48	1.81	2.37	13.07	25.51
26000	22.69	25.32	1.48	1.75	2.43	12.85	26.12
26500	22.64	25.15	1.47	1.68	2.47	12.78	25.96
27000	22.57	26.17	1.45	1.60	2.54	12.72	25.61
27500	22.58	25.75	1.43	1.53	2.38	12.91	25.50
28000	22.58	26.36	1.40	1.45	2.38	13.19	25.42
28500	22.58	25.50	1.37	1.38	2.50	13.21	25.50
29000	22.57	24.92	1.31	1.33	2.57	13.14	25.55
29500	22.56	24.81	1.24	1.29	2.52	13.08	25.71
30000	22.51	24.83	1.15	1.27	2.54	12.46	25.80
30500	22.42	25.30	1.04	1.26	2.52	16.00	25.97
31000	22.26	25.45	1.10	1.25	2.50	14.04	25.88
31500	22.03	23.92	1.29	1.25	2.79	14.49	25.92
32000	21.72	24.13	1.55	1.24	3.05	15.18	26.12

Typical Performance Curves

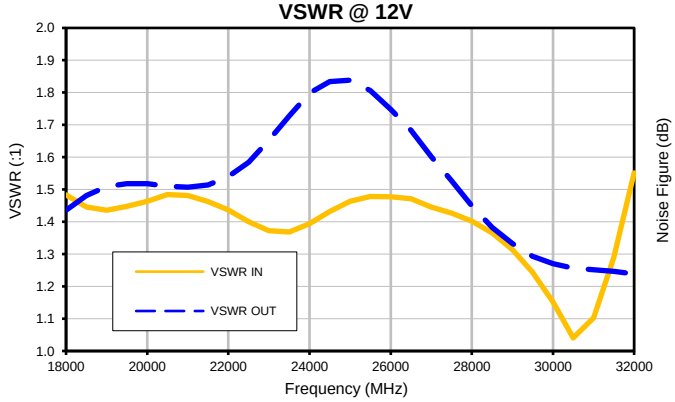
Gain @ 12V



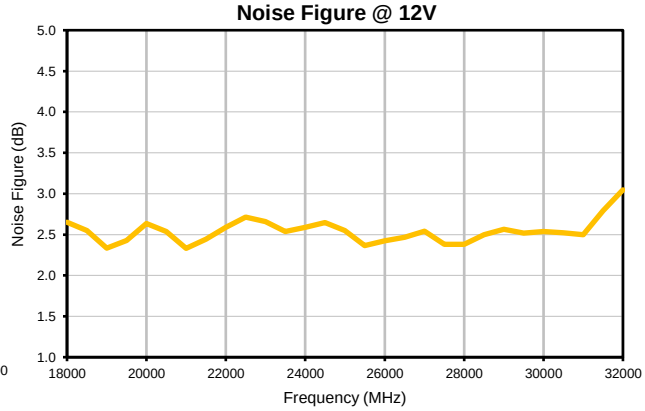
Directivity @ 12V



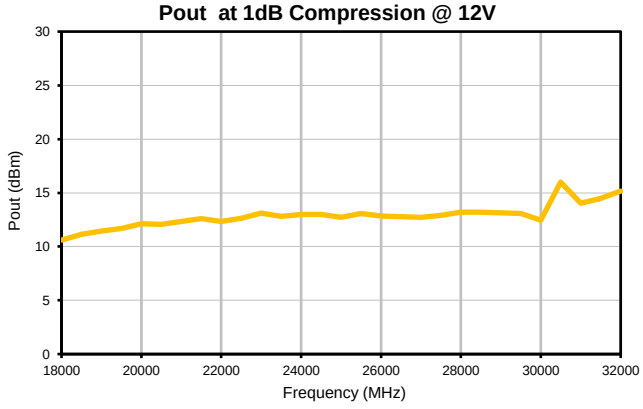
VSWR @ 12V



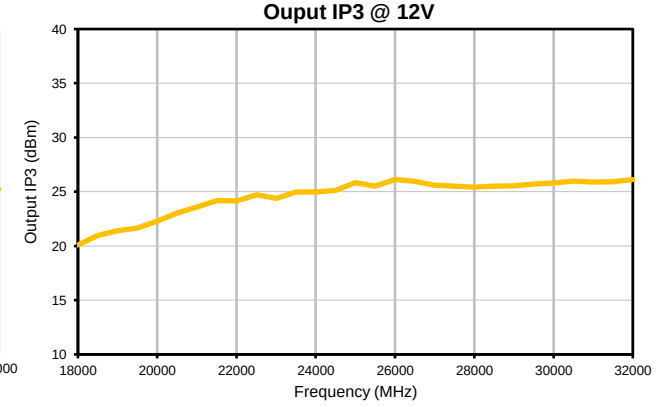
Noise Figure @ 12V



Pout at 1dB Compression @ 12V



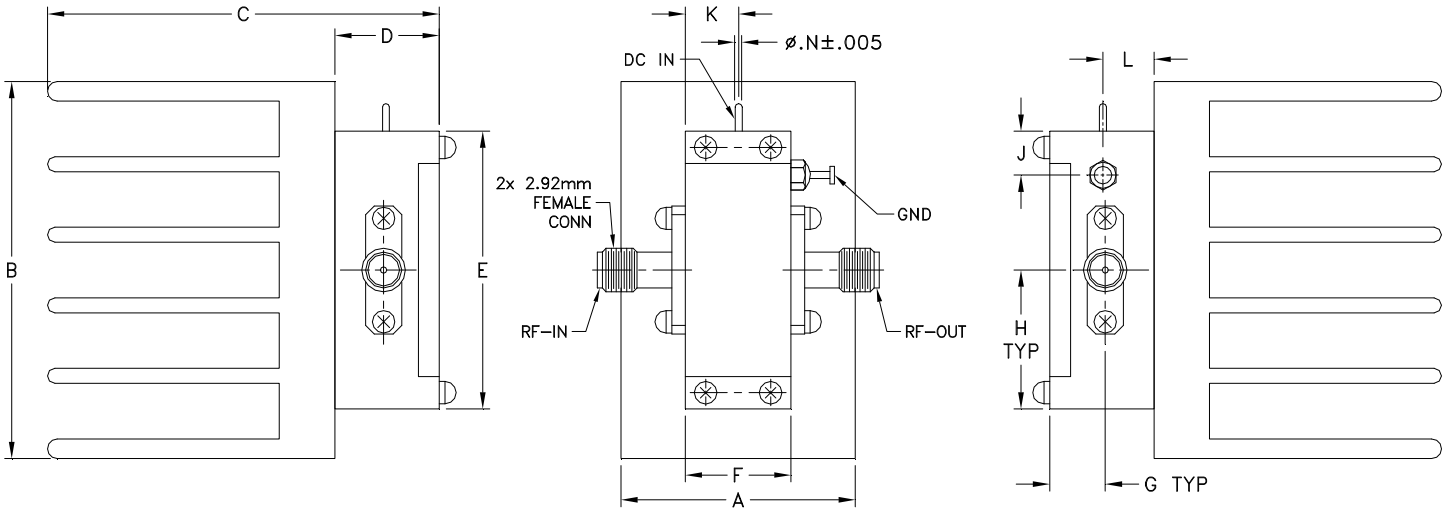
Ouput IP3 @ 12V



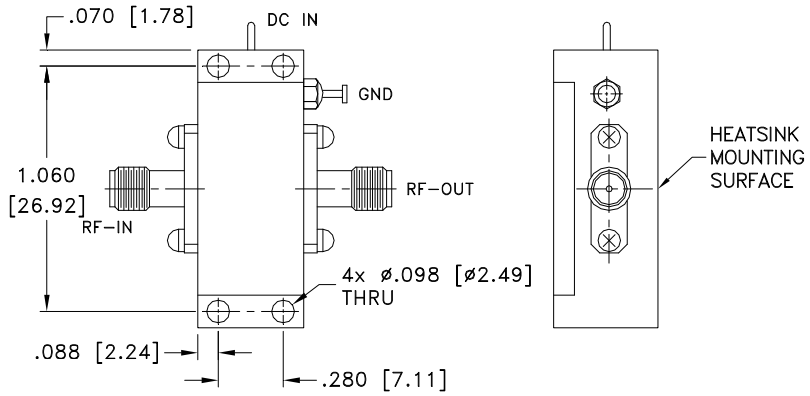
Case Style AV

Outline Dimensions

AV1280-1



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	WT. GRAM
AV1280-1	1.01 (25.65)	1.63 (41.40)	1.74 (44.20)	.45 (11.43)	1.20 (30.48)	.46 (11.58)	.24 (6.10)	.60 (15.24)	.19 (4.83)	.23 (5.84)	.22 (5.59)	-- --	.03 (.76)	58

CASE#	WT. WITHOUT HEATSINK GRAM
AV1280-1	17

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish: Nickel plate.
3. Heat sink finish: Black anodize.

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RF/IF MICROWAVE COMPONENTS

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Mini-Circuits

Environmental Specifications ENV23T9

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 54° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Stabilization Bake	(non-operating) 125°C, 24 hours	- - -
Burn-in at Elevated Temp.	(DC on) 160 hours at 85° C	MIL-STD-202, Method 108
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, except 100°C

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