COAXIAL

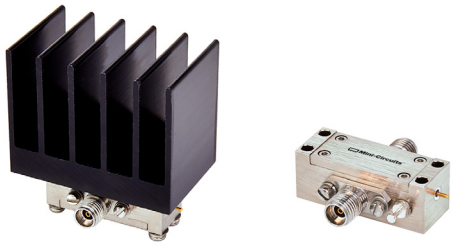
Wideband Amplifier

ZVE-373LN-K+
ZVE-373LNX-K+

50Ω 28 to 37 GHz 2.92 mm Female

THE BIG DEAL

- Extremely Wideband, 28 to 37 GHz
- Flat Gain, 20 ±1.5 dB Typ.
- High OIP3, +20 dBm Typ.
- P_{OUT} at 1 dB Compression, +9 dBm Typ.



Generic photo used for illustration purposes only

Model No.	ZVE-373LN-K+	ZVE-373LNX-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

APPLICATIONS

- Radar and Military
- 5G mmW
- KA Band Satellite Repeaters

PRODUCT OVERVIEW

Mini-Circuits' ZVE-373LN(X)-K+ is a Class A, three-stage, unconditionally stable amplifier providing flat gain over an extremely wide frequency range from 28 to 37 GHz. This model is capable of delivering up to 9 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 wideband 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 (1.2x0.46x0.45") with K-type (2.92 mm) connectors and an optional heatsink for efficient cooling.

KEY FEATURES

Feature	Advantages
Wideband, 28 to 37 GHz Able to Work from 25 to 40 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, 2.5 dB Typ. • OIP3, +20 dBm Typ.	The combination of low noise and high OIP3 makes the ZVE-373LN-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.

Wideband Amplifier

ZVE-373LN-K+
ZVE-373LNX-K+

50Ω 28 to 37 GHz 2.92 mm Female

ELECTRICAL SPECIFICATIONS AT +25 °C

Parameter	Condition (GHz)	ZVE-373LN-K+ ZVE-373LNX-K+▲ Min.	Typ.	Max.	Units
Frequency Range		28		37	GHz
Noise Figure	28-37		2.5	3.5	dB
Gain	28-37	17	20	25	dB
Gain Flatness	28-37		±1.5	±2.5	dB
Output Power at 1 dB Compression	28-37		+9		dBm
Output Third Order Intercept Point	28-37		+20		dBm
Input VSWR	28-37		1.5	2.5	:1
Output VSWR	28-37		1.4	2.5	:1
DC Supply Voltage			+12[1]		V
Supply Current			75	106	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-373LN-K+ -40 °C to +60 °C ambient ZVE-373LNX-K+ -40 °C to +85 °C baseplate temp.
Storage Temperature	-65 °C to +150 °C
DC Voltage	+15 V
CW Input RF Power (No Damage)	+5 dBm (25-32 GHz) -1 dBm (32-40 GHz)

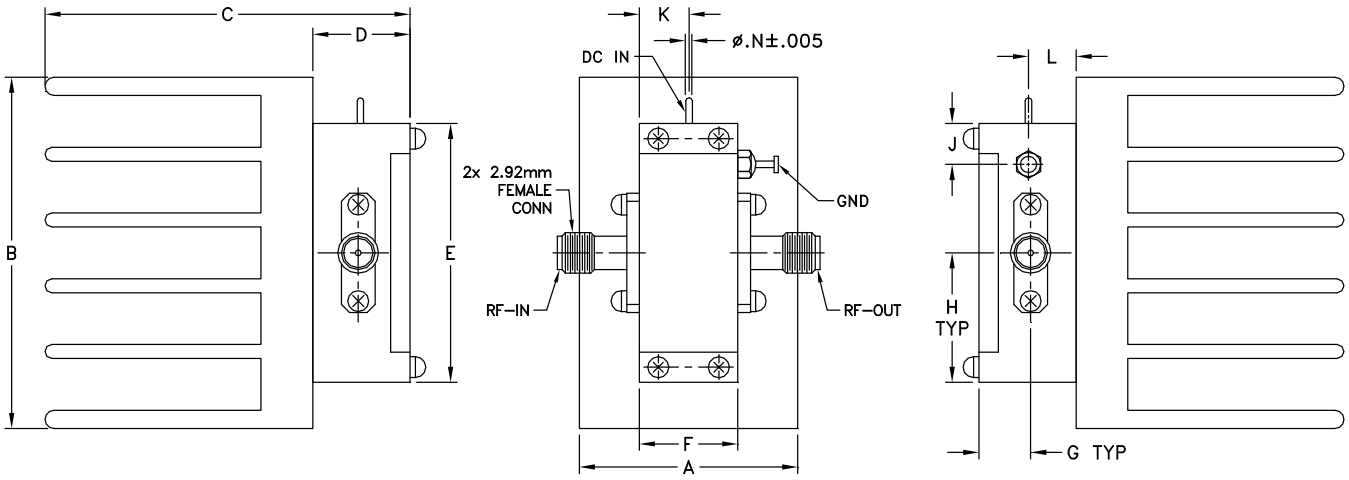
Permanent damage may occur if any of these limits are exceeded.

Wideband Amplifier

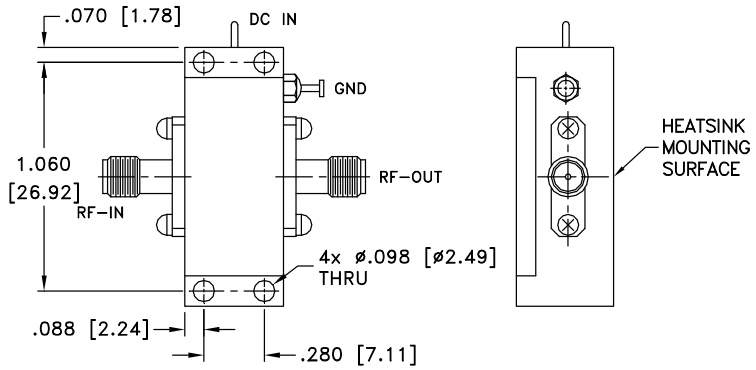
ZVE-373LN-K+
ZVE-373LNX-K+

50Ω 28 to 37 GHz 2.92 mm Female

OUTLINE DRAWING FOR MODELS WITH HEATSINK (ZVE-373LN-K+)



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK (ZVE-373LNX-K+)



OUTLINE DIMENSIONS (inch / mm)

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

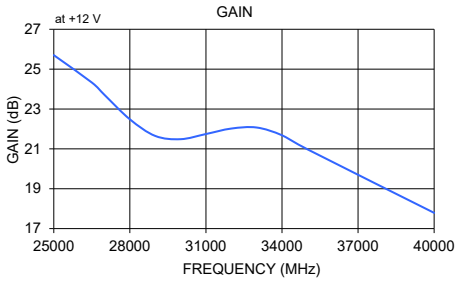
Wideband Amplifier

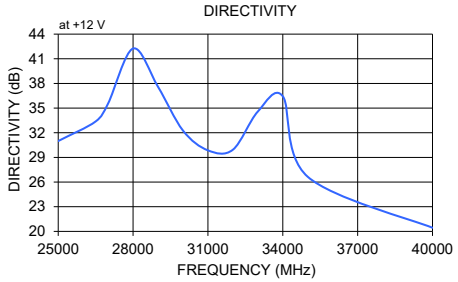
ZVE-373LN-K+
ZVE-373LNX-K+

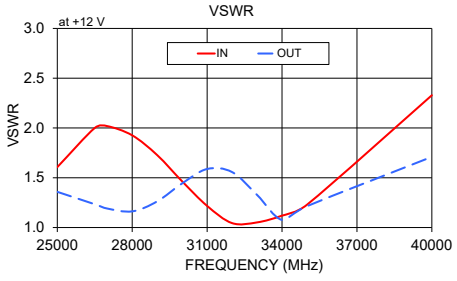
50Ω 28 to 37 GHz 2.92 mm Female

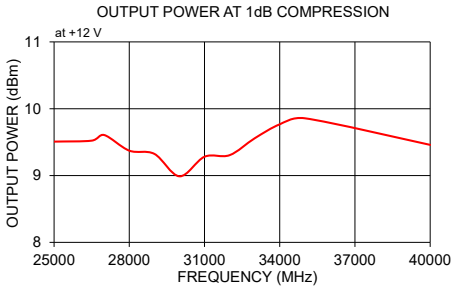
TYPICAL PERFORMANCE DATA/CURVES

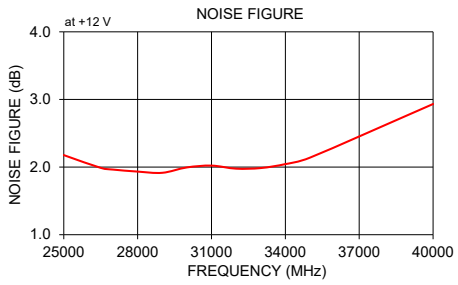
Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		P_{OUT} at 1 dB Compr. (dBm)	Noise Figure (dB)	OIP3 (dBm)
	+12 V	+12 V	IN	OUT	+12 V	+12 V	+12 V
25000	25.70	30.99	1.61	1.36	9.51	2.18	21.51
26500	24.33	33.38	2.00	1.23	9.52	1.99	21.60
27000	23.71	35.57	2.02	1.19	9.61	1.96	21.87
28000	22.48	42.25	1.93	1.16	9.37	1.93	21.90
29000	21.65	37.59	1.73	1.26	9.32	1.92	21.39
30000	21.49	32.27	1.46	1.44	8.99	1.99	20.66
31000	21.74	29.86	1.22	1.59	9.28	2.02	22.19
32000	22.02	29.94	1.04	1.56	9.30	1.98	21.87
33000	22.07	34.58	1.05	1.33	9.56	1.99	22.18
34000	21.68	36.44	1.12	1.08	9.77	2.04	22.01
35000	20.98	26.64	1.23	1.21	9.86	2.14	22.69
37000	19.83	20.34	1.49	1.44	9.76	2.36	20.86
40000	17.79	20.44	2.33	1.71	9.46	2.93	11.65

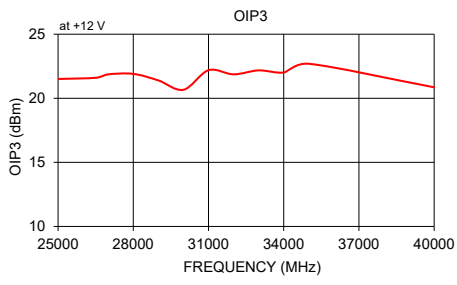












NOTES

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.

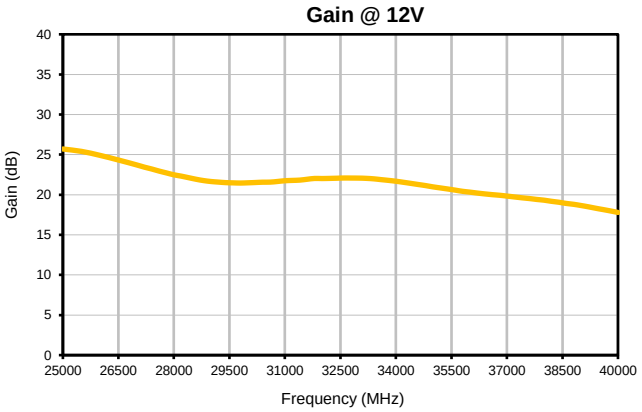
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

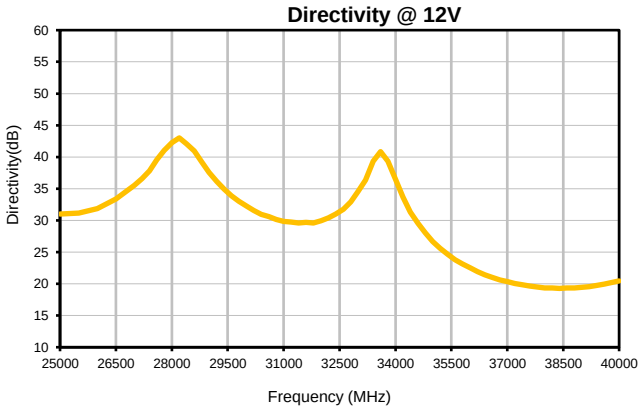
Coaxial Amplifier ZVE-373LN-K+

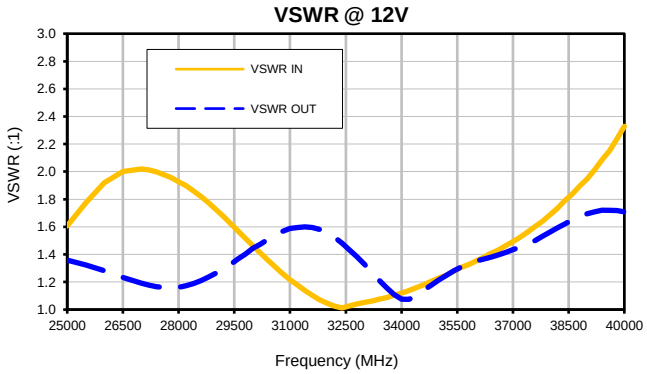
Typical Performance Data

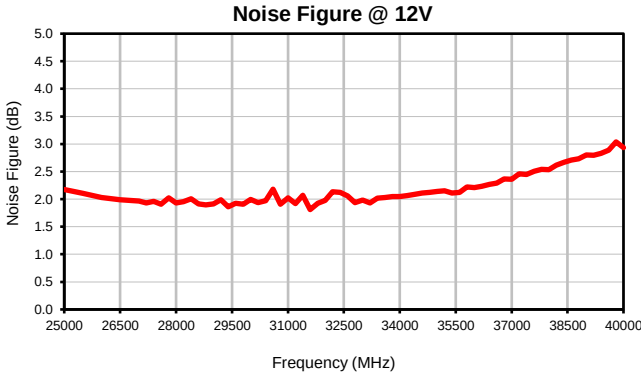
FREQ. (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR (:1) IN 12V	VSWR (:1) OUT 12V	NOISE FIGURE (dB) 12V	POUT @ 1 dB COMPRESSION (dBm) 12V	POUT @ 3 dB COMPRESSION (dBm) 12V	OUTUPUT IP3 (dBm) 12V
25000	25.70	30.99	1.61	1.36	2.18	9.51	10.97	21.51
25500	25.40	31.13	1.77	1.32	2.11	9.38	11.05	21.37
26000	24.91	31.87	1.92	1.28	2.03	9.37	11.14	21.62
26500	24.33	33.38	2.00	1.23	1.99	9.52	11.29	21.60
27000	23.71	35.57	2.02	1.19	1.96	9.61	11.44	21.87
27200	23.44	36.59	2.01	1.18	1.93	9.41	11.39	21.64
27400	23.21	37.84	2.00	1.17	1.96	9.67	11.59	22.17
27600	22.95	39.58	1.98	1.16	1.91	9.67	11.64	21.67
27800	22.71	41.05	1.96	1.16	2.03	9.73	11.71	22.47
28000	22.48	42.25	1.93	1.16	1.93	9.37	11.52	21.90
28200	22.32	43.02	1.90	1.17	1.95	9.61	11.55	22.11
28400	22.12	42.06	1.86	1.19	2.01	9.43	11.50	21.74
28600	21.93	40.92	1.82	1.21	1.91	9.56	11.70	22.17
28800	21.76	39.23	1.78	1.24	1.90	9.18	11.66	21.21
29000	21.65	37.59	1.73	1.26	1.92	9.32	11.74	21.39
29200	21.58	36.17	1.68	1.30	1.99	9.10	11.60	20.67
29400	21.51	34.93	1.62	1.33	1.86	9.36	11.77	21.57
29600	21.48	33.88	1.57	1.37	1.92	9.23	11.73	21.33
29800	21.46	33.02	1.52	1.40	1.91	9.27	11.78	21.55
30000	21.49	32.27	1.46	1.44	1.99	8.99	11.66	20.66
30200	21.52	31.58	1.41	1.48	1.94	9.18	11.71	21.61
30400	21.56	30.96	1.36	1.51	1.97	9.05	11.69	20.98
30600	21.57	30.60	1.31	1.54	2.18	9.07	11.78	21.04
30800	21.65	30.16	1.26	1.57	1.91	8.98	11.77	20.50
31000	21.74	29.86	1.22	1.59	2.02	9.28	11.67	22.19
31200	21.78	29.72	1.18	1.60	1.92	9.19	11.81	21.52
31400	21.82	29.58	1.14	1.60	2.07	9.14	11.84	20.90
31600	21.93	29.67	1.10	1.59	1.81	9.14	11.88	20.81
31800	22.03	29.61	1.07	1.58	1.92	9.36	11.70	22.70
32000	22.02	29.94	1.04	1.56	1.98	9.30	11.77	21.87
32200	22.03	30.39	1.02	1.52	2.13	9.26	11.79	21.25
32400	22.06	31.02	1.01	1.48	2.12	9.28	11.81	21.12
32600	22.09	31.78	1.03	1.43	2.06	9.39	11.80	21.48
32800	22.08	32.94	1.04	1.38	1.94	9.45	11.85	21.53
33000	22.07	34.58	1.05	1.33	1.99	9.56	11.84	22.18
33200	22.04	36.33	1.06	1.27	1.93	9.64	11.79	22.03
33400	21.98	39.35	1.08	1.21	2.02	9.66	11.86	22.25
33600	21.88	40.85	1.09	1.16	2.03	9.59	11.94	22.09
33800	21.79	39.34	1.10	1.11	2.05	9.68	11.96	22.14
34000	21.68	36.44	1.12	1.08	2.04	9.77	11.94	22.01
34200	21.55	33.69	1.14	1.07	2.07	9.76	11.93	22.29
34400	21.42	31.32	1.16	1.10	2.09	9.79	11.85	22.09
34600	21.28	29.56	1.18	1.14	2.11	9.83	11.84	22.19
34800	21.14	28.03	1.21	1.18	2.12	9.84	11.84	22.48
35000	20.98	26.64	1.23	1.21	2.14	9.86	11.92	22.69
35200	20.85	25.58	1.25	1.25	2.15	9.90	11.85	22.39
35400	20.71	24.64	1.28	1.28	2.11	9.94	11.84	22.50
35600	20.57	23.82	1.30	1.31	2.12	9.92	11.80	22.38
35800	20.42	23.15	1.33	1.33	2.22	9.89	11.84	22.56
36000	20.32	22.53	1.35	1.35	2.21	9.91	11.75	22.37
36200	20.20	21.94	1.38	1.37	2.23	9.88	11.82	22.45
36400	20.10	21.42	1.41	1.38	2.27	9.80	11.77	22.11
36600	20.01	21.01	1.43	1.40	2.29	9.81	11.72	22.10
36800	19.93	20.63	1.46	1.41	2.37	9.74	11.62	21.73
37000	19.83	20.34	1.49	1.44	2.36	9.76	11.78	22.18
37200	19.72	20.06	1.53	1.45	2.46	9.71	11.82	22.08
37400	19.62	19.86	1.56	1.48	2.45	9.75	11.82	21.94
37600	19.53	19.63	1.60	1.50	2.51	9.64	11.71	21.73
37800	19.42	19.48	1.64	1.53	2.54	9.64	11.69	22.33
38000	19.32	19.34	1.69	1.56	2.53	9.63	11.66	22.02
38200	19.18	19.32	1.73	1.59	2.62	9.63	11.71	22.34
38400	19.06	19.27	1.79	1.62	2.67	9.57	11.68	21.79
38600	18.92	19.34	1.84	1.65	2.71	9.55	11.69	21.64
38800	18.81	19.34	1.90	1.67	2.73	9.48	11.61	21.54
39000	18.66	19.46	1.95	1.69	2.80	9.54	11.61	21.87
39200	18.49	19.56	2.01	1.71	2.80	9.49	11.54	22.07
39400	18.31	19.77	2.09	1.72	2.83	9.44	11.62	21.87
39600	18.15	19.97	2.15	1.72	2.89	9.40	11.52	21.48
39800	17.98	20.20	2.24	1.72	3.04	9.44	11.60	21.56
40000	17.79	20.44	2.33	1.71	2.93	9.46	11.65	20.86

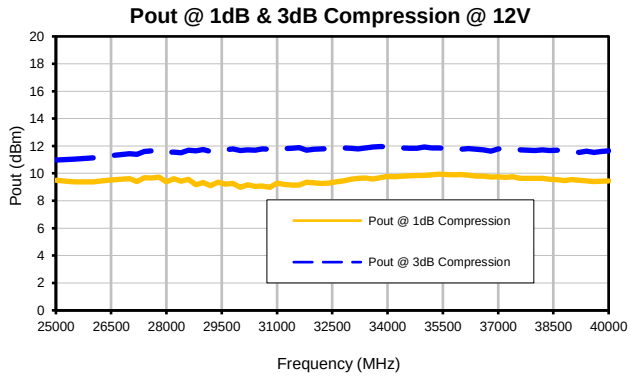
Typical Performance Curves

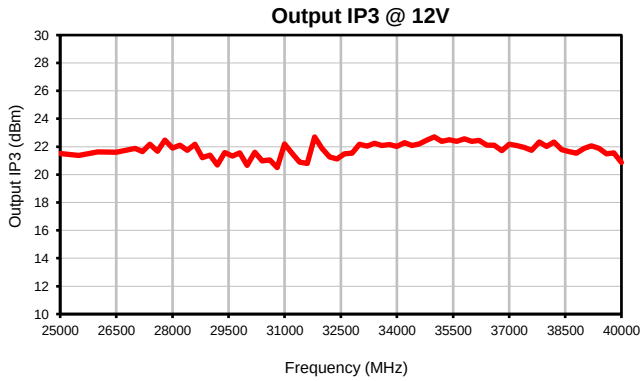








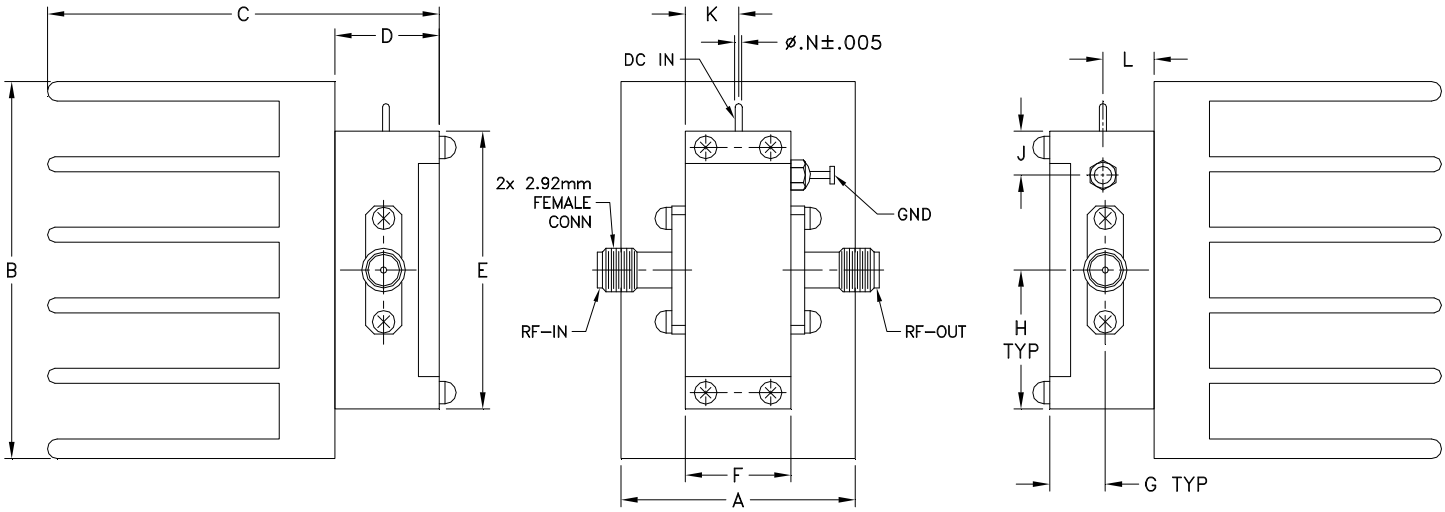




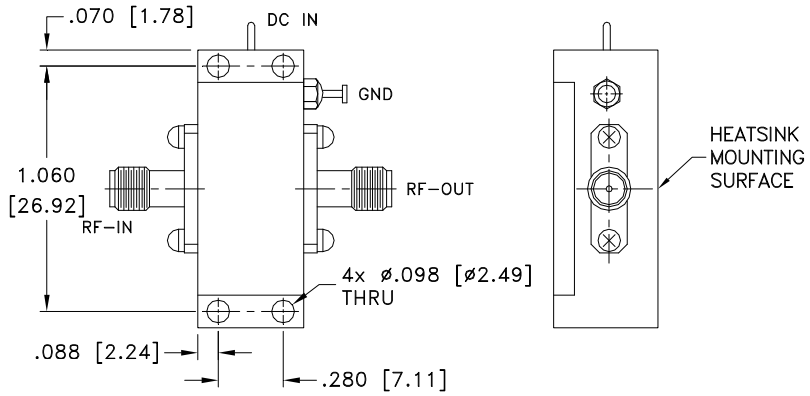
Case Style AV

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.

Mini-Circuits®
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
RF/IF MICROWAVE COMPONENTS

This document and its contents are the property of Mini-Circuits.

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

This document and its contents are the property of Mini-Circuits.