



Medium High Power Amplifier

ZHL-42+
ZHL-42X+

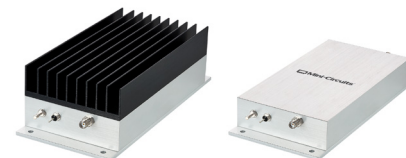
50Ω 600 to 4200 MHz

THE BIG DEAL

- Wideband, 600 to 4200 MHz
- High Gain, 38 dB
- Excellent Gain Flatness, ± 0.8 dB
- High IP3, +44 dBm

APPLICATIONS

- Communication Systems
- Cellular
- Instrumentation
- Laboratory



Generic photo used for illustration purposes only

Model No.	ZHL-42+	ZHL-42X+
Case Style	U36	
Connectors	SMA	

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

PRODUCT OVERVIEW

Mini-Circuits' ZHL-42+ is a medium-power connectorized amplifier supporting a wide range of applications from 600 to 4200 MHz, such as test instrumentation, SatCom, and mobile communications systems, including those operating in the new telecom Band 71 allocation (617 to 698 MHz). This model provides +31 dBm output power at saturation and extremely flat gain (39 ± 0.8 dB) across its full bandwidth, making it ideal for systems where consistent performance across frequency is required. The amplifier operates on a +15V DC supply and comes housed in compact aluminum alloy case (7.00 x 3.25 x 2.13") with SMA connectors, built-in bracket for mounting, and an optional heat sink for efficient cooling.

KEY FEATURES

Feature	Advantages
Wideband, 600 to 4200 MHz	One amplifier supports a broad range of system and test lab applications. Extended bandwidth down to 600 MHz supports new telecom Band 71 allocation (617 to 698 MHz)
High Gain, 38 dB	Reduces the number of gain stages, lowering component count and overall system cost.
Excellent Gain Flatness, ± 0.8 dB	Provides consistent performance across frequency, minimizing the need for external equalizing networks in wideband applications.
Medium Output Power, +31 dBm P3dB	Supports a wide range of power requirements.
High OIP3, +44 dBm	Provides highly linear performance with excellent sensitivity and two-tone spur-free dynamic range.



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ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	ZHL-42+ ZHL-42X+ [▲]			Units
	Min.	Typ.	Max.	
Frequency Range	600	—	4200	MHz
Gain ¹	35	38	42	dB
Gain Flatness	—	±0.8	±1.3	dB
Output Power at 1dB compression	+28	+30	—	dBm
Output Power at 3dB compression	+29	+31	—	dBm
Noise Figure	—	8.5	—	dB
Output third order intercept point	—	+44	—	dBm
Input VSWR	—	1.5	2.5	:1
Output VSWR	—	2.0	2.5	:1
DC Supply Voltage	—	+15	—	V
Supply Current	—	—	1.0	A

Open load is not recommended, potentially can cause damage.
With no load derate max. input power by 20 dB.

[▲] Heat sink not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 65°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 1.3°C/W max.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20°C to +65°C
Storage Temperature	-55°C to +100°C
DC Voltage	+20V
Input RF Power (no damage)	+5 dBm

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





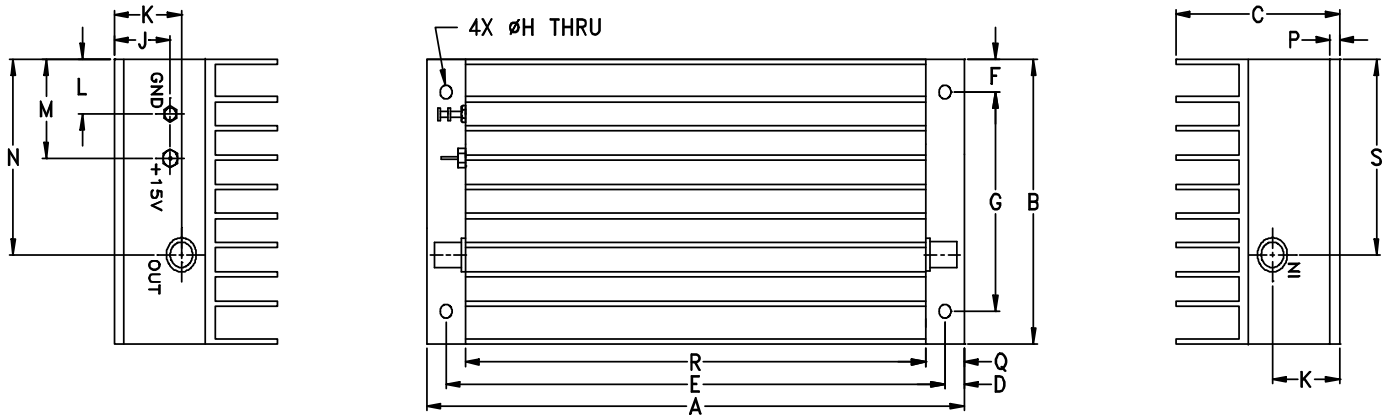
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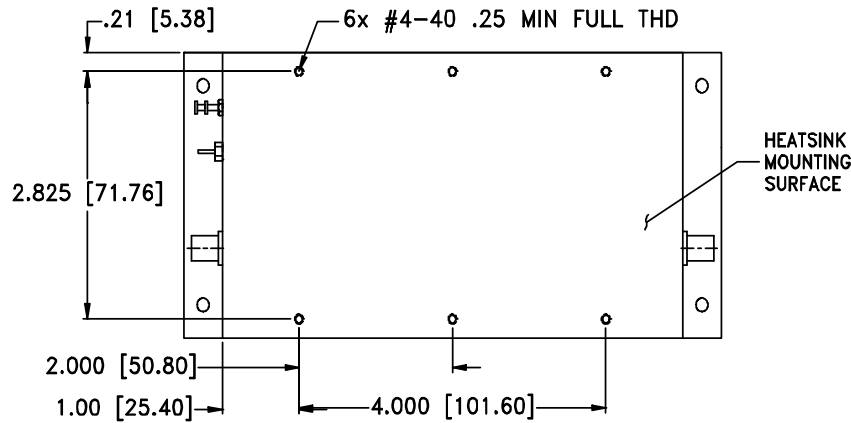
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OUTLINE DRAWING FOR MODELS WITH HEATSINK



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	wt
7.00	3.25	2.13	.25	6.500	.38	2.500	.156	.73	.88	.63	1.13	2.23	.125	.50	6.00	2.23	grams
177.80	82.55	54.10	6.35	165.10	9.65	63.50	3.96	18.54	22.35	16.00	28.70	56.64	3.18	12.70	152.40	56.64	900

*600 grams without heatsink



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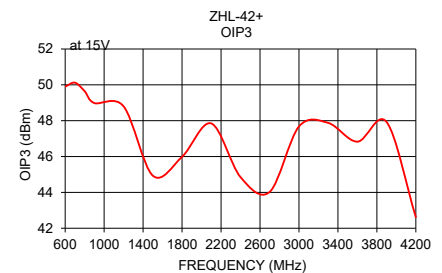
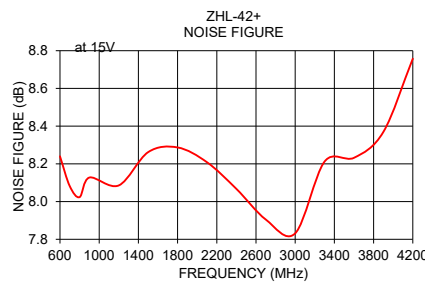
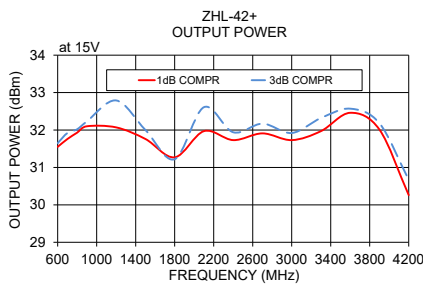
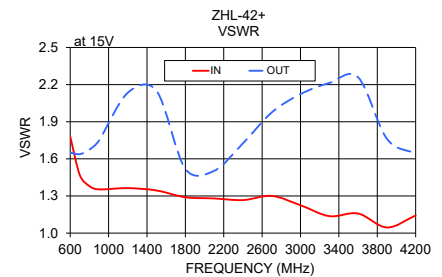
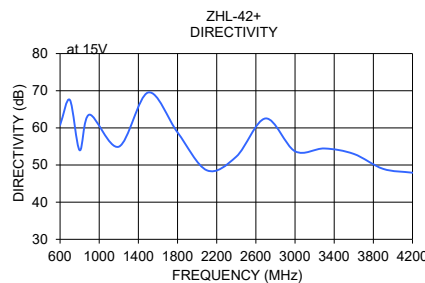
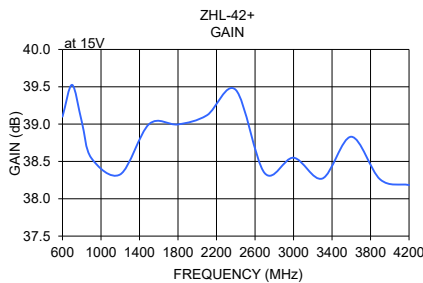
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TYPICAL PERFORMANCE DATA / GRAPHS

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		POUT at 1 dB COMPR. (dBm)	POUT at 3 dB COMPR. (dBm)	NOISE FIGURE (dB)	OUTPUT IP3 (dBm)
	15V	15V	IN	OUT	15V	15V	15V	15V
700	39.53	67.53	1.47	1.64	31.76	31.92	8.08	50.12
800	39.03	53.97	1.38	1.67	31.93	32.02	8.02	49.64
900	38.54	63.56	1.35	1.75	32.10	32.23	8.13	48.98
1200	38.33	54.93	1.36	2.13	32.07	32.79	8.09	48.80
1500	39.00	69.53	1.34	2.15	31.76	32.00	8.26	44.93
1800	39.00	58.78	1.29	1.52	31.27	31.22	8.29	45.99
2100	39.12	48.57	1.28	1.50	31.97	32.61	8.21	47.85
2400	39.46	52.25	1.27	1.73	31.73	31.94	8.07	44.85
2700	38.34	62.54	1.30	1.97	31.91	32.17	7.90	44.03
3000	38.55	53.70	1.23	2.12	31.73	31.92	7.83	47.68
3300	38.27	54.45	1.14	2.21	31.97	32.32	8.21	47.88
3600	38.83	52.99	1.16	2.26	32.46	32.57	8.23	46.83
3900	38.26	48.96	1.05	1.76	32.01	32.18	8.37	47.92
4200	38.18	47.93	1.14	1.64	30.26	30.67	8.76	42.62



NOTES

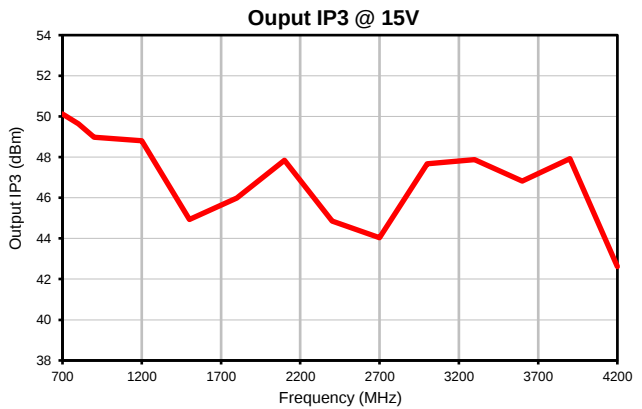
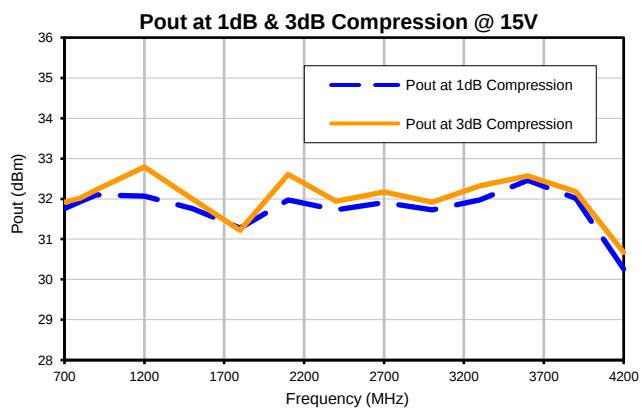
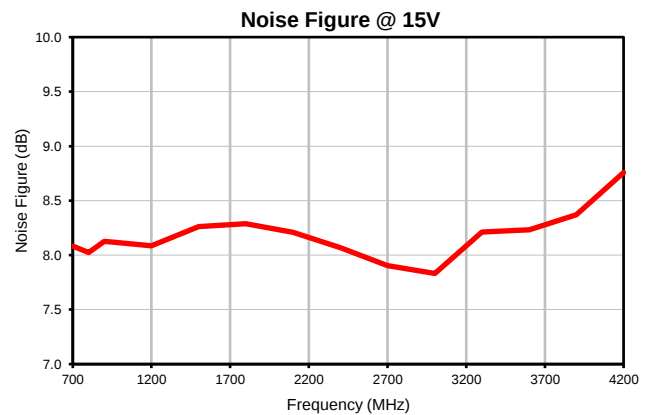
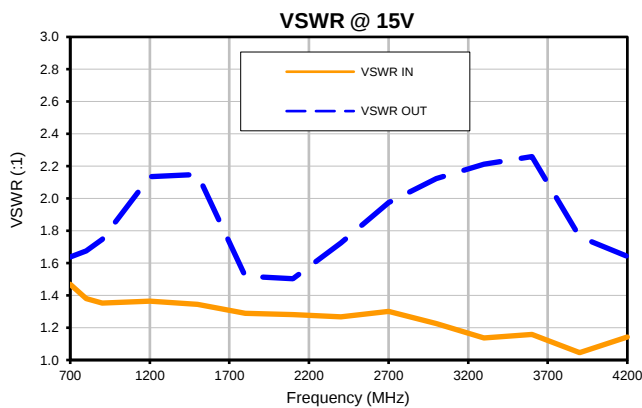
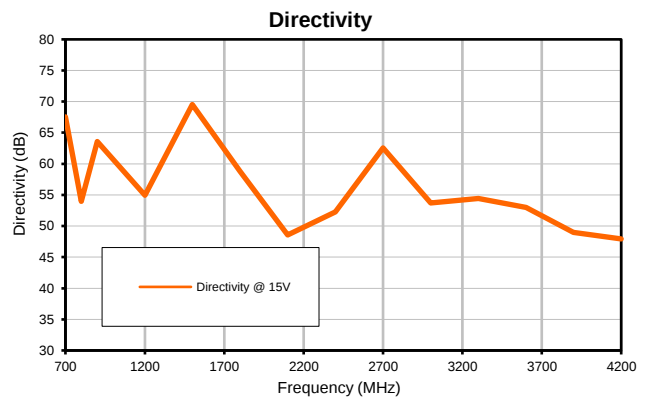
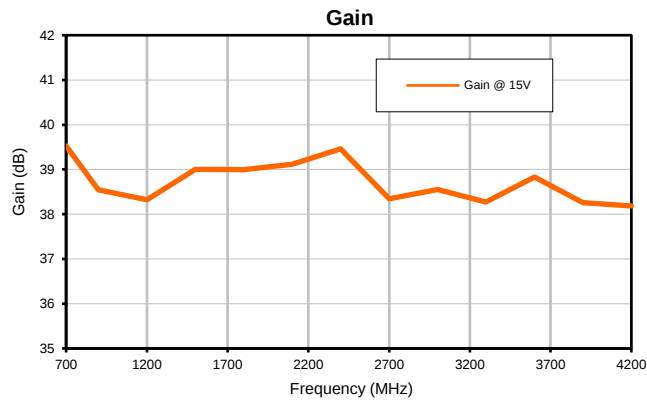
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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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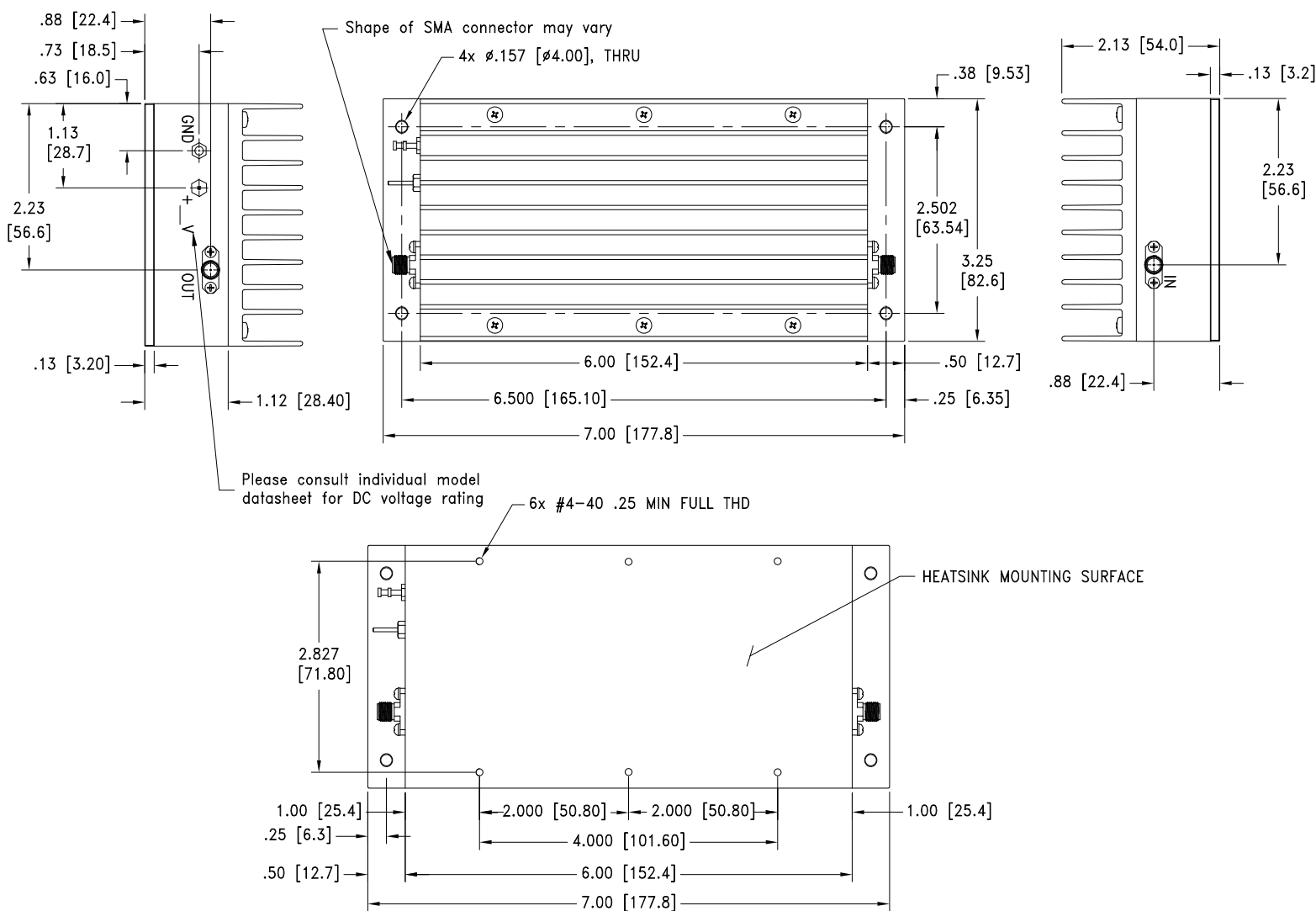


Typical Performance Data

FREQUENCY	GAIN	DIRECTIVITY	VSWR (:1)		NOISE FIGURE	POUT @ 1 dB COMPRESSION	POUT @ 3 dB COMPRESSION	OUTPUT IP3
(MHz)	(dB) 15V	(dB) 15V	IN 15V	OUT 15V	(dB) 15V	(dBm) 15V	(dBm) 15V	(dBm) 15V
700	39.53	67.53	1.47	1.64	8.08	31.76	31.92	50.12
800	39.03	53.97	1.38	1.67	8.02	31.93	32.02	49.64
900	38.54	63.56	1.35	1.75	8.13	32.10	32.23	48.98
1200	38.33	54.93	1.36	2.13	8.09	32.07	32.79	48.80
1500	39.00	69.53	1.34	2.15	8.26	31.76	32.00	44.93
1800	39.00	58.78	1.29	1.52	8.29	31.27	31.22	45.99
2100	39.12	48.57	1.28	1.50	8.21	31.97	32.61	47.85
2400	39.46	52.25	1.27	1.73	8.07	31.73	31.94	44.85
2700	38.34	62.54	1.30	1.97	7.90	31.91	32.17	44.03
3000	38.55	53.70	1.23	2.12	7.83	31.73	31.92	47.68
3300	38.27	54.45	1.14	2.21	8.21	31.97	32.32	47.88
3600	38.83	52.99	1.16	2.26	8.23	32.46	32.57	46.83
3900	38.26	48.96	1.05	1.76	8.37	32.01	32.18	47.92
4200	38.18	47.93	1.14	1.64	8.76	30.26	30.67	42.62

Typical Performance Curves





MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK

Weight: 900.0 grams

Weight without heatsink: 600.0 grams

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

Notes:

- Case material: Aluminum alloy.
- Case finish and mounting bracket finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.

For Non-RoHS Case Styles: Yellow hexavalent chrome based conversion coating.

Due to transition from non-RoHS to RoHS, models will be supplied with either case style finish until the non-RoHS case inventory is depleted.

- Heat sink finish: Black anodize.

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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	-20° to 65° 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