



COAXIAL

Medium High Power Amplifier

ZHL-2W-63-S+ ZHL-2W-63X-S+

Mini-Circuits

50Ω 2 W 600 to 6000 MHz SMA Female

THE BIG DEAL

- Wideband, 600 to 6000 MHz
- High OIP3, +38 dBm Typ.
- High Gain, 42 dB Typ.

APPLICATIONS

- Communication Systems
- Cellular
- Instrumentation
- Laboratory



Generic photo used for illustration purposes only

Model No.	ZHL-2W-63-S+	ZHL-2W-63X-S+ [▲]
Case Style	CP2548-1	
Connectors	SMA female	

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

PRODUCT OVERVIEW

Mini-Circuits' ZHL-2W-63-S+ is a class AB medium-power connectorized amplifier with GaN output transistor supporting a wide range of applications from 600 to 6000 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 +33 dBm output power at saturation. The amplifier operates on a +28 V DC supply and comes housed in compact aluminum alloy case (7.00x3.25x1.12") with SMA connectors, built-in bracket for mounting, and an optional heat sink for efficient cooling.

KEY FEATURES

Feature	Advantages
Wideband, Usable from 500 to 6100 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, 42 dB	Reduces the number of gain stages, lowering component count and overall system cost.
Medium Output Power, +33 dBm	Supports a wide range of power requirements.
High OIP3, +38 dBm	Provides highly linear performance with excellent sensitivity and two-tone spur-free dynamic range.

REV. A
 ECO-017770
 ZHL-2W-63-S+
 MCL NY
 260210





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ELECTRICAL SPECIFICATIONS AT +25 °C

Parameter	Condition (MHz)	ZHL-2W-63-S+ ZHL-2W-63X-S+ ^A			Units
		Min.	Typ.	Max.	
Frequency Range		600		6000	MHz
Gain	600-6000	34	42	51	dB
Gain Flatness	600-6000		±3.5		dB
Output Power at 3 dB Compression	600-6000		+31		dBm
Output Power at Saturation	600-6000	+31	+33		dBm
Noise Figure	600-6000		12		dB
Output Third Order Intercept Point	600-6000		+38		dBm
Input VSWR	600-6000		2.5		:1
Output VSWR	600-6000		3.5		:1
DC Supply Voltage			+28		V
Supply Current			1.5	2.0	A

^A Heat sink not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to +85 °C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 0.4°C/W max.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	0 °C to +60 °C
Storage Temperature	-55 °C to +100 °C
DC Voltage	+32 V
Input RF Power (No Damage) at Load	+7 dBm
Input RF Power at OPEN / SHORT	-21 dBm

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



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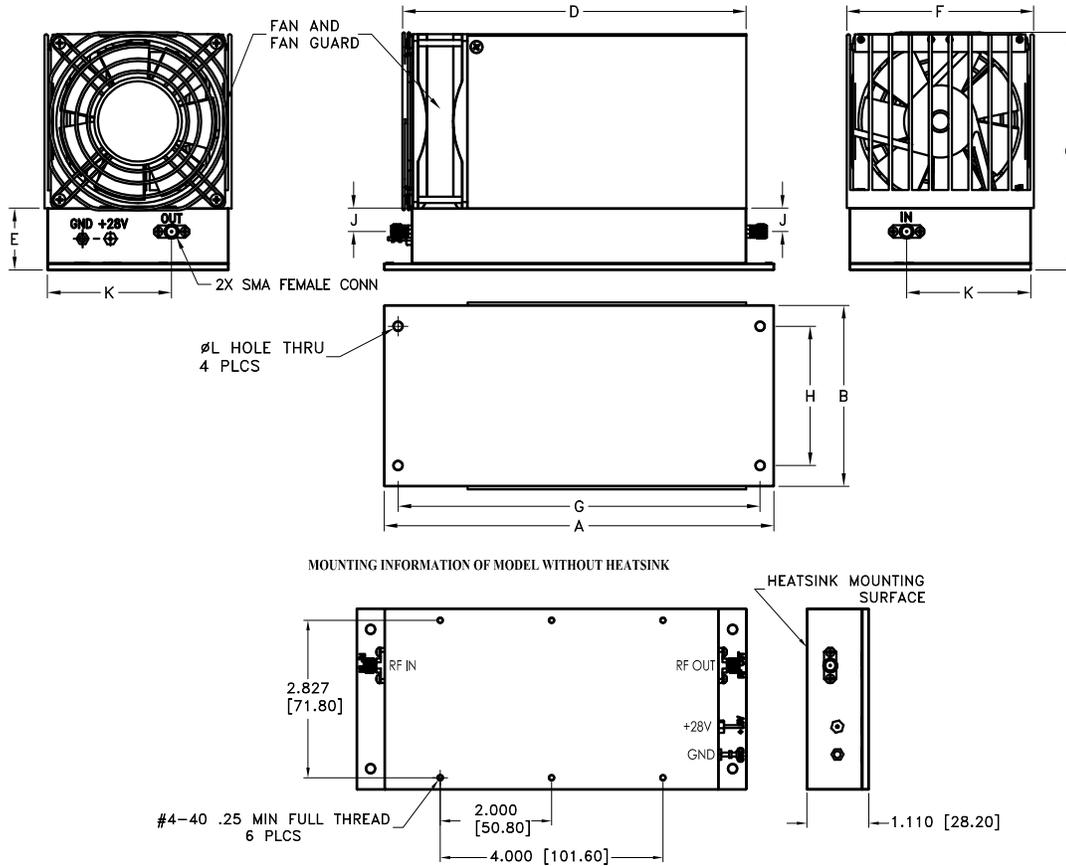
Medium High Power Amplifier

ZHL-2W-63-S+ ZHL-2W-63X-S+

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50Ω 2W 600 to 6000 MHz SMA Female

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inch mm)

A	B	C	D	E	F	G	H	J	K	L	wt
7.00	3.25	4.27	6.17	1.12	3.36	6.500	2.500	0.42	2.23	0.157	grams*
177.8	82.6	108.4	156.7	28.4	85.2	165.10	63.50	10.65	56.6	4.0	1761

*600 grams without heatsink



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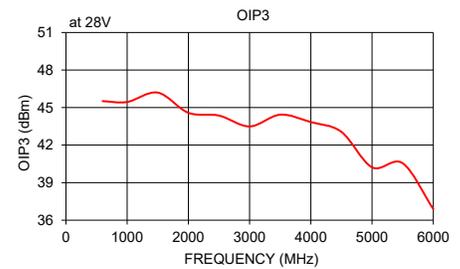
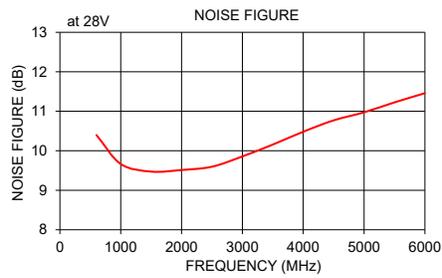
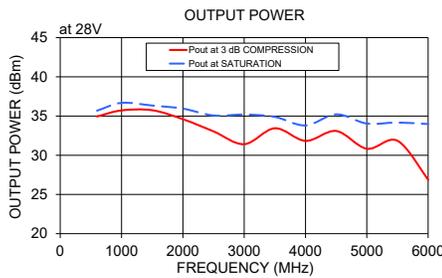
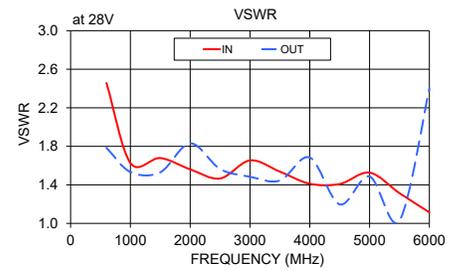
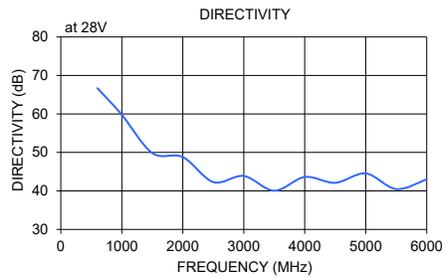
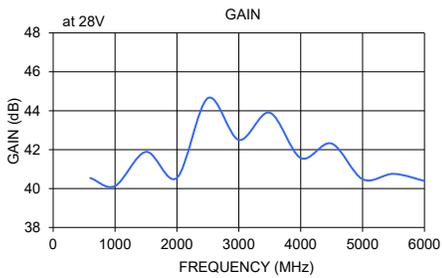
Medium High Power Amplifier

ZHL-2W-63-S+ ZHL-2W-63X-S+

Mini-Circuits

50Ω 2 W 600 to 6000 MHz SMA Female

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		NOISE FIGURE (dB)	P _{OUT} at 3 dB COMPR. (dBm)	P _{OUT} at SATURATION (dBm)	OIP3 (dBm)
	+28 V	+28 V	IN	OUT	+28 V	+28 V	+28 V	+28 V
600	40.54	66.68	2.46	1.78	10.40	34.95	35.69	45.51
1000	40.13	59.78	1.63	1.53	9.67	35.72	36.68	45.45
1500	41.89	49.83	1.68	1.53	9.47	35.74	36.34	46.20
2000	40.55	48.79	1.56	1.83	9.51	34.60	35.95	44.58
2500	44.65	42.29	1.47	1.56	9.60	33.04	35.07	44.36
3000	42.50	43.88	1.65	1.48	9.86	31.41	35.19	43.49
3500	43.90	40.05	1.54	1.44	10.16	33.44	34.89	44.43
4000	41.57	43.62	1.41	1.68	10.48	31.83	33.80	43.84
4500	42.31	42.11	1.41	1.20	10.77	33.09	35.22	43.06
5000	40.48	44.54	1.53	1.49	10.97	30.83	34.04	40.22
5500	40.76	40.47	1.31	1.03	11.23	31.85	34.17	40.55
6000	40.39	43.03	1.11	2.40	11.46	26.87	33.98	36.89



NOTES

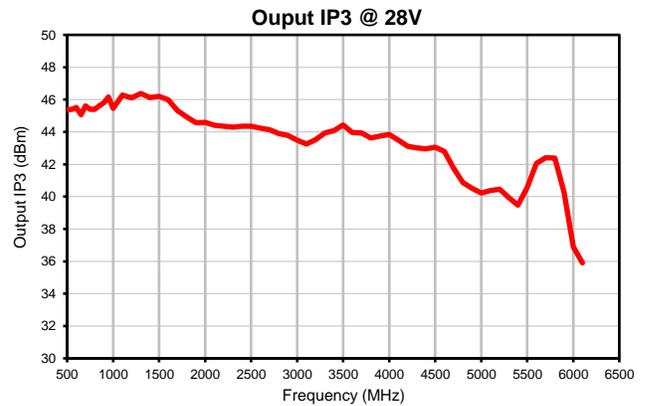
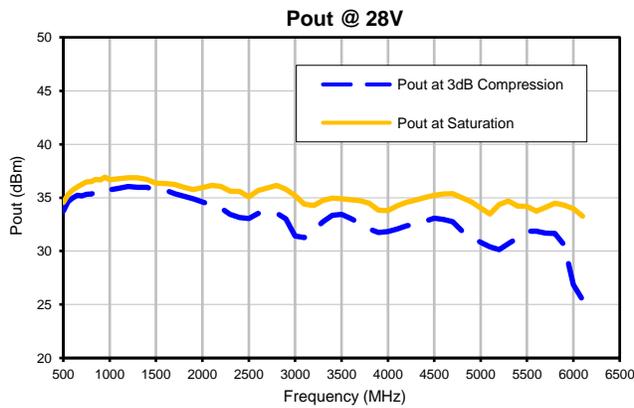
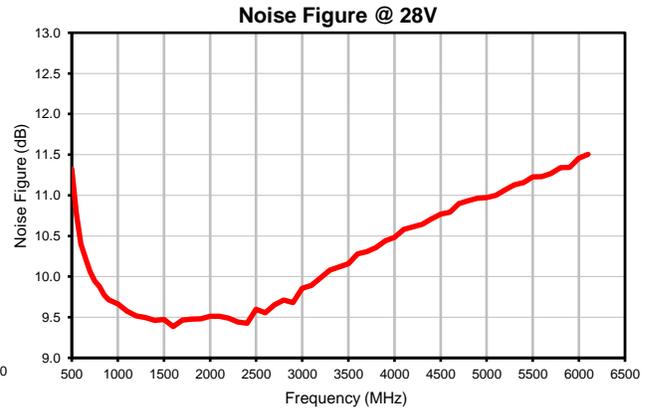
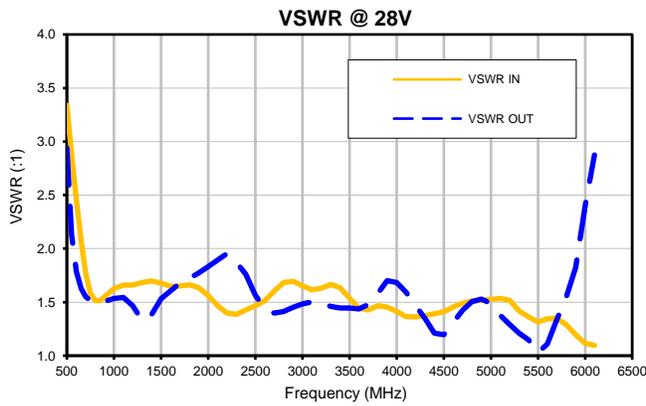
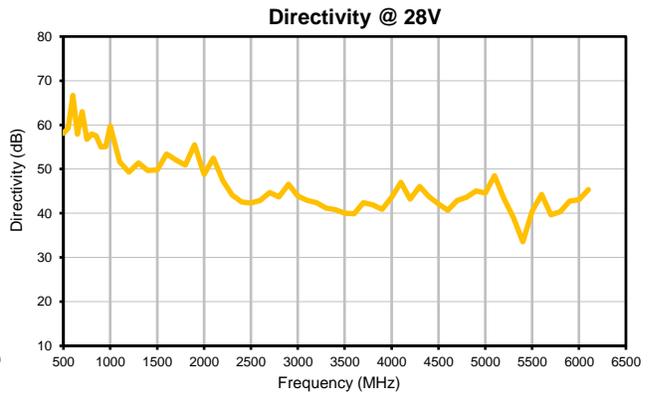
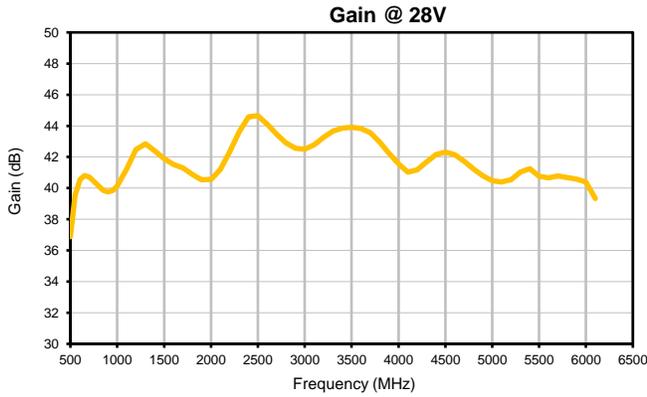
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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



Typical Performance Data

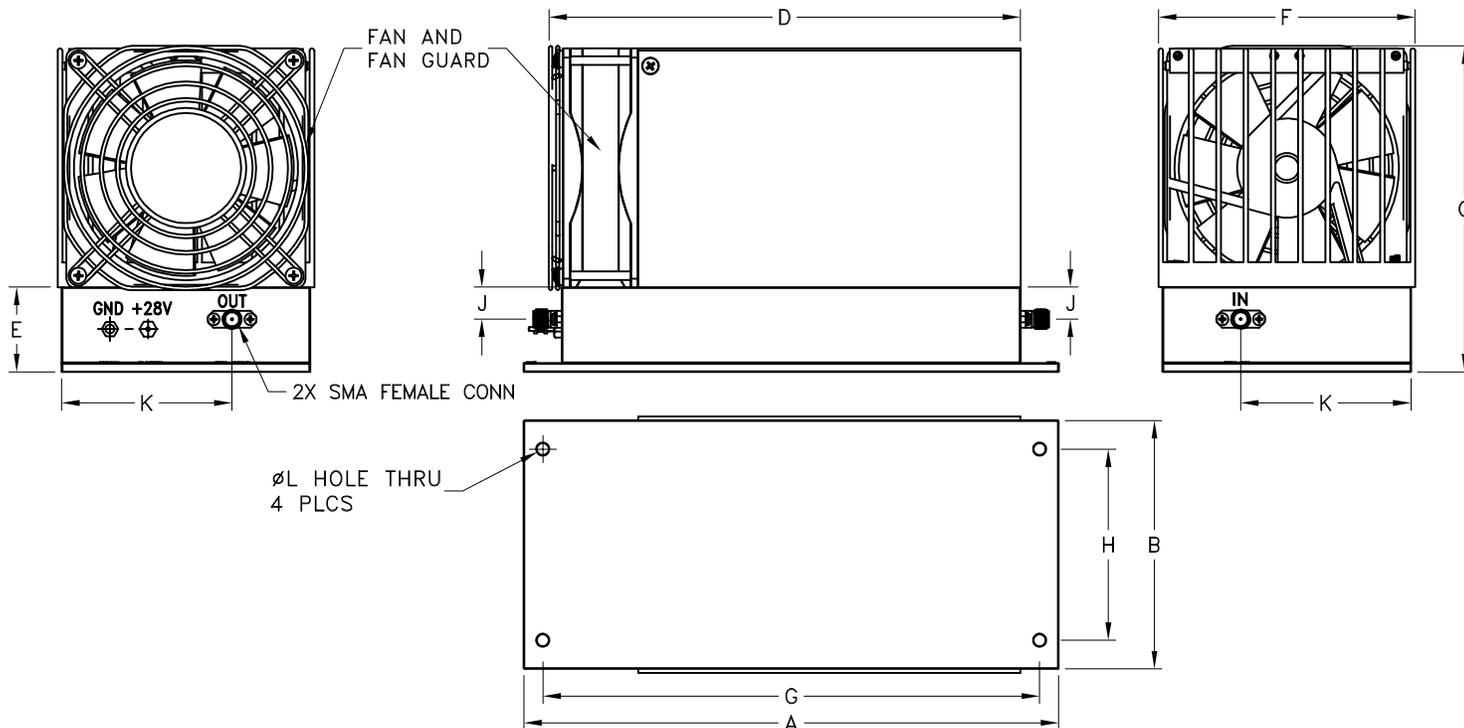
FREQUENCY (MHz)	GAIN (dB) 28V	DIRECTIVITY (dB) 28V	VSWR (:1)		NOISE FIGURE (dB) 28V	Pout at 3dB COMPRESSION (dBm) 28V	Pout at SATURATION (dBm) 28V	OUTPUT IP3 (dBm) 28V
			IN 28V	OUT 28V				
500	36.88	58.07	3.34	2.94	11.32	33.74	34.54	45.38
550	39.53	59.28	2.88	2.13	10.77	34.62	35.30	45.40
600	40.54	66.68	2.46	1.78	10.40	34.95	35.69	45.51
650	40.80	57.88	2.08	1.63	10.22	35.21	36.01	45.07
700	40.71	63.03	1.77	1.55	10.06	35.17	36.25	45.60
750	40.43	56.74	1.59	1.52	9.94	35.32	36.48	45.40
800	40.12	57.98	1.51	1.50	9.88	35.36	36.50	45.40
850	39.86	57.52	1.51	1.50	9.77	35.50	36.73	45.61
900	39.76	54.99	1.55	1.51	9.72	35.34	36.66	45.82
950	39.84	55.09	1.59	1.52	9.69	35.65	36.93	46.16
1000	40.13	59.78	1.63	1.53	9.67	35.72	36.68	45.45
1100	41.24	51.62	1.66	1.54	9.57	35.88	36.77	46.29
1200	42.48	49.29	1.66	1.47	9.51	36.05	36.85	46.11
1300	42.85	51.43	1.68	1.33	9.49	35.98	36.87	46.38
1400	42.39	49.69	1.70	1.38	9.46	35.96	36.70	46.13
1500	41.89	49.83	1.68	1.53	9.47	35.74	36.34	46.20
1600	41.52	53.39	1.65	1.61	9.39	35.70	36.31	45.99
1700	41.28	52.04	1.65	1.68	9.46	35.37	36.24	45.31
1800	40.89	50.90	1.66	1.72	9.48	35.13	35.97	44.91
1900	40.53	55.48	1.64	1.77	9.48	34.91	35.77	44.58
2000	40.55	48.79	1.56	1.83	9.51	34.60	35.95	44.58
2100	41.19	52.48	1.47	1.89	9.51	34.33	36.15	44.41
2200	42.35	47.35	1.40	1.95	9.49	34.04	36.05	44.34
2300	43.61	44.10	1.39	1.87	9.44	33.42	35.61	44.29
2400	44.59	42.54	1.43	1.76	9.43	33.14	35.59	44.36
2500	44.65	42.29	1.47	1.56	9.60	33.04	35.07	44.36
2600	44.11	42.93	1.52	1.44	9.56	33.53	35.67	44.24
2700	43.46	44.69	1.60	1.40	9.65	33.55	35.91	44.13
2800	42.90	43.73	1.68	1.41	9.71	33.54	36.16	43.91
2900	42.57	46.59	1.70	1.45	9.68	33.01	35.78	43.78
3000	42.50	43.88	1.65	1.48	9.86	31.41	35.19	43.49
3100	42.79	42.94	1.62	1.50	9.89	31.25	34.40	43.26
3200	43.26	42.38	1.63	1.49	9.99	31.98	34.26	43.52
3300	43.66	41.20	1.66	1.46	10.08	32.75	34.75	43.94
3400	43.85	40.82	1.64	1.45	10.12	33.34	34.95	44.08
3500	43.90	40.05	1.54	1.44	10.16	33.44	34.89	44.43
3600	43.83	39.91	1.44	1.44	10.28	33.05	34.80	43.96
3700	43.56	42.39	1.43	1.48	10.31	32.60	34.71	43.94
3800	42.95	41.90	1.47	1.58	10.36	32.08	34.47	43.62
3900	42.24	40.89	1.45	1.70	10.44	31.74	33.84	43.74
4000	41.57	43.62	1.41	1.68	10.48	31.83	33.80	43.84
4100	41.02	46.97	1.37	1.59	10.58	32.07	34.24	43.49
4200	41.18	43.22	1.36	1.47	10.61	32.36	34.57	43.12
4300	41.69	46.09	1.37	1.35	10.64	32.55	34.79	43.02
4400	42.15	43.76	1.39	1.21	10.71	32.77	35.02	42.96
4500	42.31	42.11	1.41	1.20	10.77	33.09	35.22	43.06
4600	42.14	40.69	1.45	1.31	10.79	32.98	35.34	42.79
4700	41.73	42.88	1.49	1.42	10.90	32.76	35.36	41.77
4800	41.24	43.63	1.51	1.51	10.93	31.86	34.99	40.87
4900	40.79	45.07	1.52	1.53	10.97	31.32	34.61	40.53
5000	40.48	44.54	1.53	1.49	10.97	30.83	34.04	40.22
5100	40.39	48.53	1.53	1.38	11.00	30.40	33.48	40.38
5200	40.54	43.28	1.52	1.29	11.07	30.14	34.35	40.47
5300	41.02	39.12	1.42	1.21	11.13	30.69	34.68	39.95
5400	41.25	33.55	1.36	1.15	11.16	31.24	34.22	39.47
5500	40.76	40.47	1.31	1.03	11.23	31.85	34.17	40.55
5600	40.66	44.24	1.35	1.11	11.23	31.85	33.75	42.06
5700	40.78	39.69	1.35	1.34	11.27	31.68	34.09	42.41
5800	40.69	40.30	1.29	1.54	11.34	31.64	34.48	42.39
5900	40.57	42.74	1.20	1.82	11.34	30.59	34.29	40.27
6000	40.39	43.03	1.11	2.40	11.46	26.87	33.98	36.89
6100	39.34	45.33	1.10	2.87	11.50	25.43	33.27	35.90

Typical Performance Curves



Outline Dimensions

CP2548-1



CASE#	A	B	C	D	E	F	G	H	J	K	L	WT.GRAMS	WT.WITHOUT HEATSINK GRAMS
CP2548-1	7.00 (177.8)	3.25 (82.6)	4.27 (108.4)	6.17 (156.7)	1.12 (28.4)	3.36 (85.2)	6.500 (165.10)	2.500 (63.50)	0.42 (10.65)	2.23 (56.6)	0.157 (4.00)	1761	600

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

Notes:

- Case material: Aluminum alloy
- Finish:
For RoHS Case Styles: Clear Chemical conversion coating, non-chrome or trivalent chrome based.
- Heat sink finish: Black anodize.
- Refer to the individual model data sheet for the type of connectors available.
- Recommended screws for mounting model without heat sink on 3/32" thick sheet: #6-32, 1.50" Length.
- Shape of connector flange may vary.

Mini-Circuits
ISO 9001 ISO 14001 CERTIFIED

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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 45°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 60° C base plate Temperature	MIL-STD-202, Method 108
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, except 100°C