COAXIAL

High Power Amplifier ZHL-50W-63+

50Ω 50 W 700 to 6000 MHz Input- & Output-SMA Female

THE BIG DEAL

- Saturated Output Power, 50 W Typ.
- Wide Bandwidth, 700 to 6000 MHz
- High Gain, 59 dB Typ.
- Unconditionally Stable
- Self-Protected From Overheating, Reverse Polarity and Shorting/Unshorting
- Can Withstand Short and Open Circuit at Output While Delivering 40 W

Generic photo used for illustration purposes only

Model No.	ZHL-50W-63+
Case Style	BT2533
Connectors	Input-SMA female, Output-SMA female

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

APPLICATIONS

- High Power Test Sets
- Burn-In Setups
- Communications
- Radar

PRODUCT OVERVIEW

Mini-Circuits' ZHL-50W-63+ is a Class AB, high-power amplifier providing 50 W saturated power over the 700 to 6000 MHz band, ideal for a variety of high-power test setups as well as applications including communications, radar and more. The ruggedly-designed amplifier provides unconditional stability and built-in self-protection against reverse polarity and overheating. The amplifier's output stage is further protected in the event of a fault condition, allowing high power operation for up to 5 minutes into an OPEN or SHORT load (refer to the maximum input power specifications). Housed in a rugged aluminum alloy case measuring 5.9x9.1x1.2", the unit features SMA connectors and heatsink with an integrated fan attachment for cooling.

KEY FEATURES

Feature	Advantages
Wideband, Usable from 700 to 6000 MHz	Suitable for a broad range of high-power, wideband applications, including test setups, communications and defense applications.
High Gain, 59 dB Typ.	Enables signal amplification to 50 W output without the need for multiple gain stages.
Built-In Self-Protection	In instances of potentially-damaging overheating within the housing an automatic sensing feature signals the unit to power down.
Unconditional Stability	Provides reliable performance independent of input and output load conditions.

REV. D
ECO-017949
ZHL-50W-63+
MCL NY
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ELECTRICAL SPECIFICATIONS AT +25 °C

Parameter	ZHL-50W-63+			Units
	Min.	Typ.	Max.	
Frequency Range	700		6000	MHz
Gain[1]	49	59	64	dB
Gain Flatness[1]		±4.0	±5.0	dB
Output Power at 1 dB Compression		+42[2]		dBm
Output Power at Saturation	+44.5	+47[2]		dBm
Noise Figure		11	16	dB
Output Third Order Intercept Point[3]	+45	+53		dBm
Input VSWR[1]		1.5		:1
Output VSWR[1]		1.5		:1
DC Supply Voltage		+40[4]	+42	V
Supply Current		6.0	12.5	A

1. Small signal input power -50 dBm typ.
2. Power measured of fundamental tone only. Does not include power contribution of harmonic signals.
3. Two tones, +35 dBm/tone, 1 MHz spacing.
4. Recommended Operating Voltage.

ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Ambient Temperature (With Mini-Circuits' heatsink and fan)	0 °C to +60 °C
Storage Temperature	-55 °C to +100 °C
DC Voltage	+42 V
Input RF Power (No Damage)	+5 dBm[6] -15 dBm[7]

5. Specifications apply to CW signals only. Permanent damage may occur if any of these limits are exceeded.
6. Into 50Ω load.
7. Into open or short load, for up to 5 minutes.

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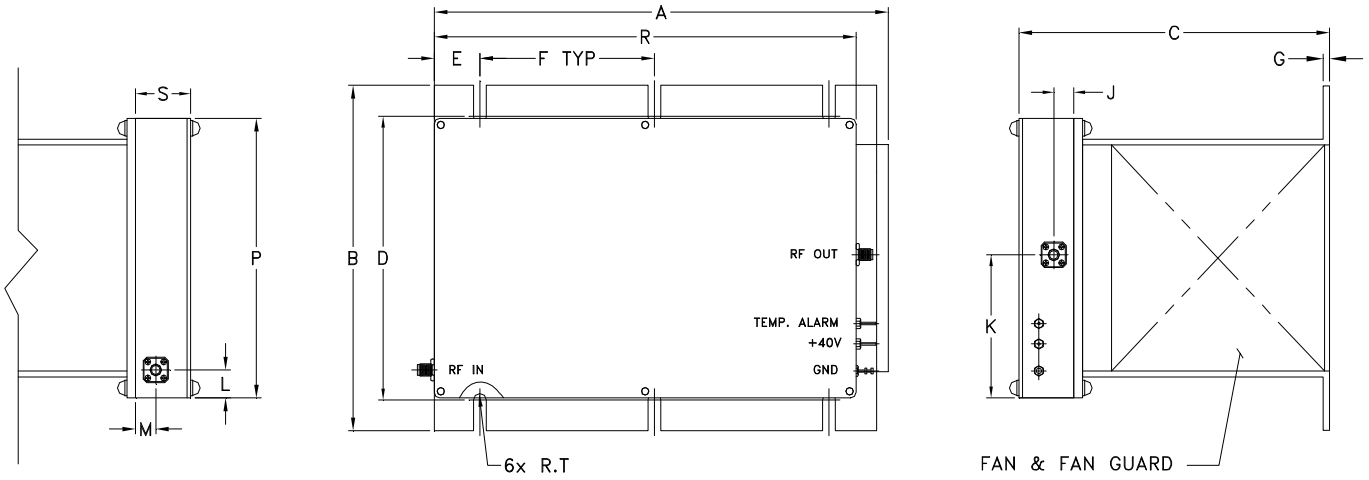
OUTLINE DRAWING FOR MODELS WITH HEATSINK



OUTLINE DIMENSIONS (Inch / mm)

A	B	C	D	E	F	G	J	K	L	M	P	Q	R	S	T	wt
9.85	7.30	6.60	6.00	0.98	3.75	0.13	0.43	3.02	0.59	0.43	5.91	--	9.06	1.18	0.14	grams
250.19	185.42	167.64	152.4	24.89	95.25	3.30	11.00	76.70	15.00	11.00	150.00	--	230.00	30.00	3.43	5350

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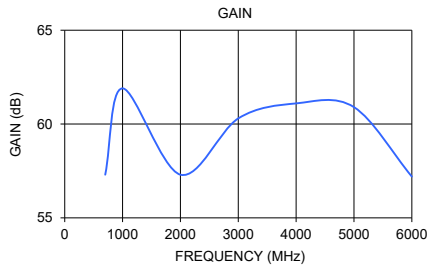
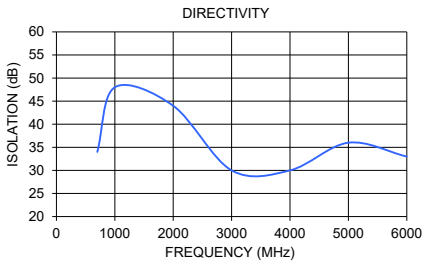
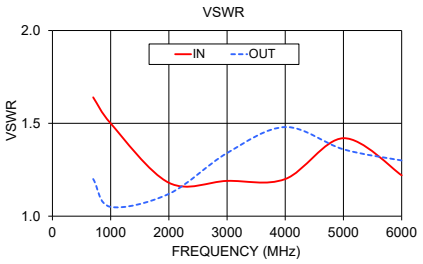
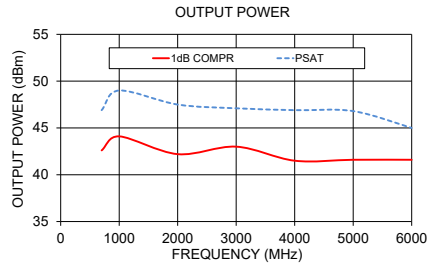
TYPICAL PERFORMANCE DATA/CURVES

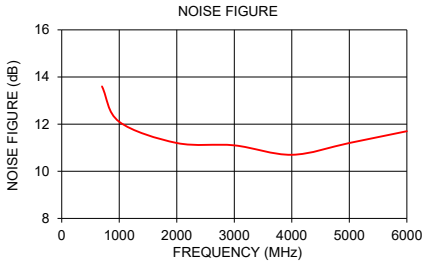
FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		P_{OUT} at 1 dB COMPR. (dBm)	P_{OUT} at Saturation (dBm)	NOISE FIGURE (dB)	OIP3 (dBm)
	+40 V	+40 V	IN	OUT	+40 V	+40 V	+40 V	+40 V
700	57.3	34	1.64	1.20	42.6	46.9	13.6	52.2
1000	61.9	48	1.50	1.05	44.1	49.0	12.1	54.6
2000	57.3	44	1.18	1.12	42.2	47.5	11.2	53.8
3000	60.3	30	1.19	1.34	43.0	47.1	11.1	56.3
4000	61.1	30	1.20	1.48	41.5	46.9	10.7	53.7
5000	60.9	36	1.42	1.36	41.6	46.8	11.2	51.4
6000	57.2	33	1.22	1.30	41.6	45.0	11.7	51.6

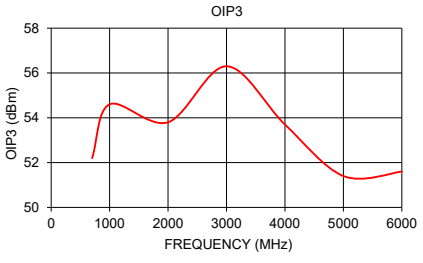












NOTES

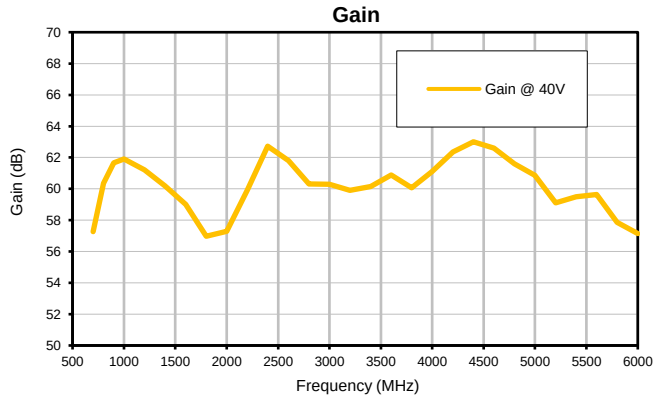
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's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

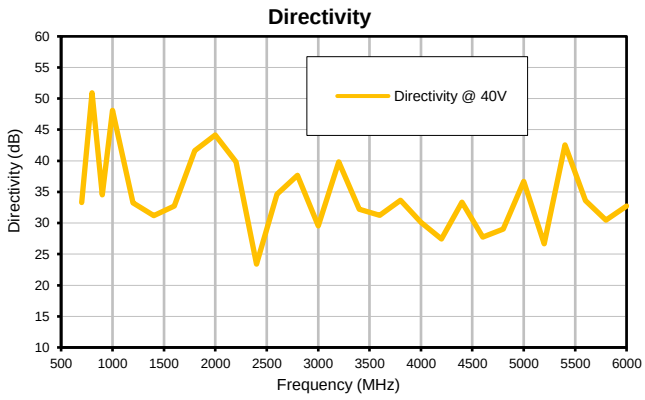
High Power Amplifier ZHL-50W-63+

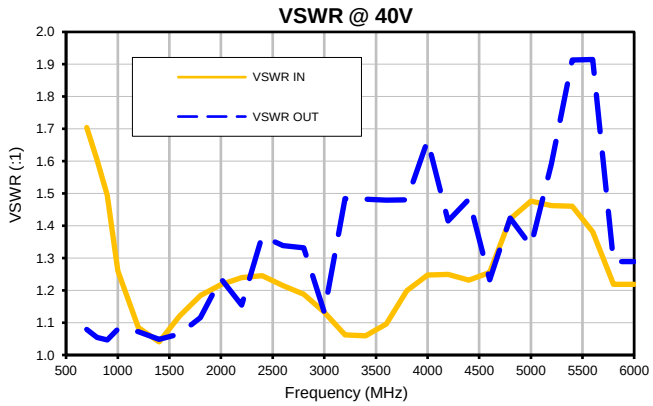
Typical Performance Data

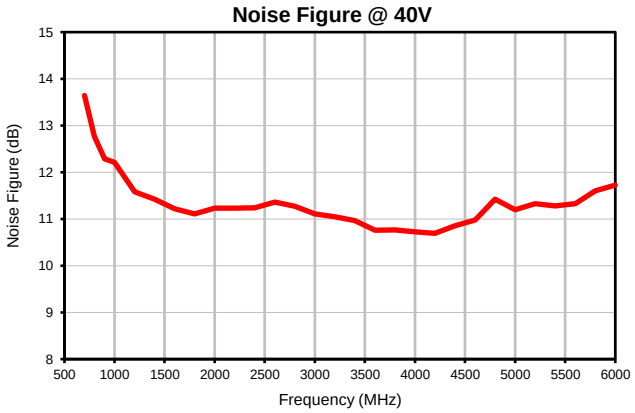
FREQUENCY (MHz)	GAIN (dB) 40V	DIRECTIVITY (dB) 40V	VSWR (:1) IN 40V	VSWR (:1) OUT 40V	NOISE FIGURE (dB) 40V	POUT @ 1 dB COMPRESSION (dBm) 40V	POUT AT SATURATION (dBm) 40V	OUTPUT IP3 (dBm) 40V
700	57.3	33.3	1.70	1.08	13.64	42.57	46.89	52.23
800	60.4	50.9	1.60	1.05	12.77	43.52	48.13	52.73
900	61.7	34.5	1.49	1.05	12.28	43.91	48.79	53.02
1000	61.9	48.1	1.26	1.08	12.21	44.14	49.05	54.56
1200	61.2	33.3	1.09	1.07	11.58	43.61	48.88	56.06
1400	60.2	31.2	1.04	1.05	11.43	42.40	47.99	57.71
1600	59.0	32.7	1.12	1.06	11.22	41.78	47.57	55.26
1800	57.0	41.6	1.18	1.12	11.11	41.56	46.91	54.20
2000	57.3	44.1	1.22	1.24	11.23	42.21	47.52	53.79
2200	59.9	39.8	1.24	1.15	11.23	43.14	48.00	54.32
2400	62.7	23.4	1.25	1.37	11.24	43.46	48.10	55.37
2600	61.8	34.7	1.22	1.34	11.36	43.13	48.01	55.42
2800	60.3	37.7	1.19	1.33	11.28	43.00	47.63	55.06
3000	60.3	29.6	1.13	1.13	11.11	42.99	47.12	56.33
3200	59.9	39.8	1.06	1.48	11.05	42.54	46.30	51.88
3400	60.2	32.2	1.06	1.48	10.97	41.38	45.65	52.93
3600	60.9	31.2	1.10	1.48	10.76	41.48	46.29	53.24
3800	60.1	33.6	1.20	1.48	10.76	41.38	45.98	52.89
4000	61.1	30.1	1.25	1.66	10.72	41.48	46.88	53.71
4200	62.4	27.4	1.25	1.42	10.69	41.51	46.91	52.77
4400	63.0	33.3	1.23	1.48	10.86	40.29	46.16	51.29
4600	62.6	27.7	1.26	1.23	10.98	39.81	45.47	51.08
4800	61.6	29.0	1.42	1.42	11.42	41.24	46.59	51.50
5000	60.9	36.7	1.48	1.34	11.20	41.61	46.83	51.42
5200	59.1	26.7	1.46	1.59	11.33	41.08	46.80	50.72
5400	59.5	42.6	1.46	1.91	11.28	41.60	47.17	50.04
5600	59.6	33.6	1.38	1.91	11.33	42.68	46.57	50.96
5800	57.9	30.5	1.22	1.29	11.60	42.64	45.83	53.14
6000	57.1	32.7	1.22	1.29	11.72	41.62	45.01	51.56

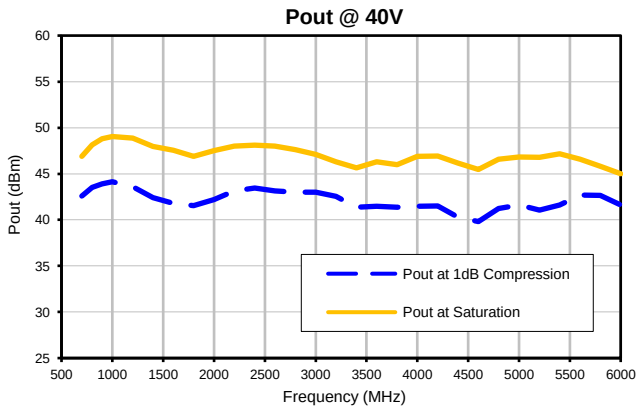
Typical Performance Curves

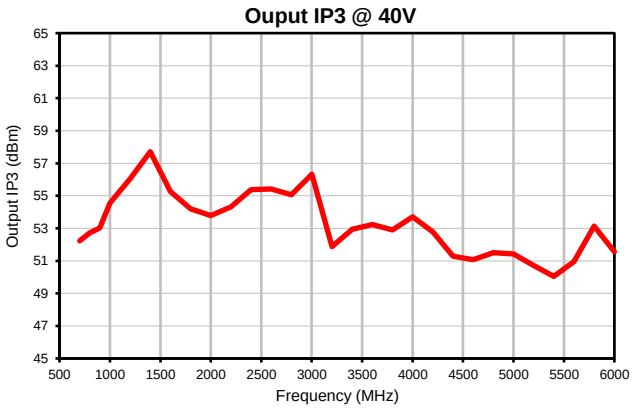








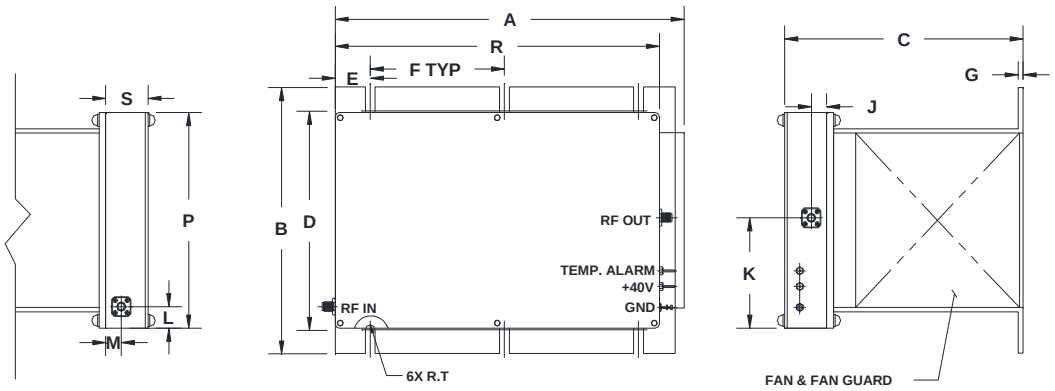




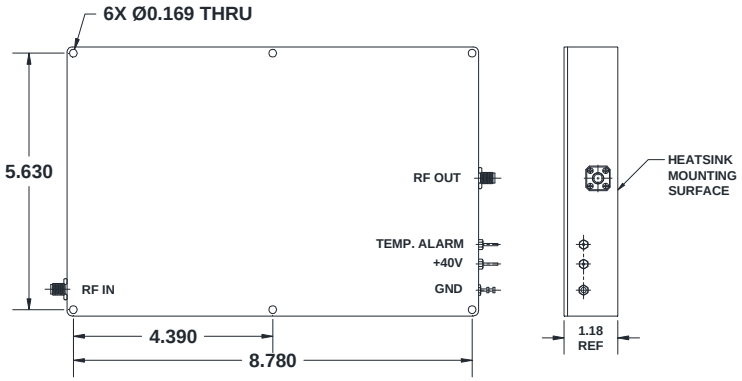
Case Style BT

Outline Dimensions

BT2533



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
BT2533	9.85 (250.19)	7.3 (185.42)	6.6 (167.64)	6.00 (152.40)	.98 (24.89)	3.75 (95.25)	.13 (3.30)	- -	.43 (11.00)	3.02 (76.7)	.59 (15.0)	.43 (11.0)	- -

CASE#	P	Q	R	S	T	U	WT, GRAM	WT WITHOUT HEATSINK, GRAM
BT2533	5.91 (150.00)	- -	9.06 (230.00)	1.18 (30.00)	.135 (3.43)	- -	5350	1670

Dimensions in inches. Tolerances: 2 Pl. ± .03; 3Pl. ± .015

Notes:

1. Case material: Aluminum alloy.
2. Finish:
   For RoHS Case Styles: Clear Chemical conversion coating, non-chrome or trivalent chrome based.
3. Heatsink finish: Black anodize.
4. Refer to the individual model data sheet for the type of connectors available.
5. Recommended screw for mounting model without heatsink on 3/32” thick sheet: #6-32, 1.50” Length.

Mini-Circuits

Environmental Specifications ENV27

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 60° C Case Temperature or Ambient Temperature	Individual Model Data Sheet
Storage Temperature	55° to 125° C or -55° to 100° 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