COAXIAL

High Power Amplifier

ZHL-0G62G5030+
ZHL-0G62G5030X+

50Ω 600 to 2500 MHz Broadband 30 W SMA Female

KEY FEATURES

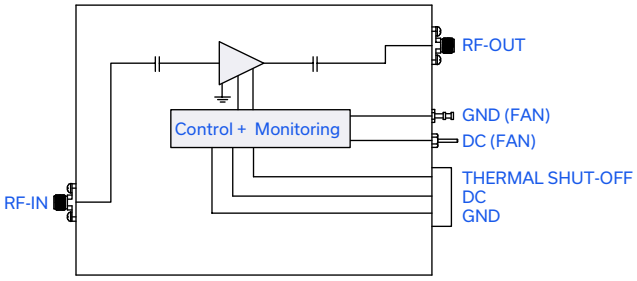
- Broadband, 600 to 2500 MHz
- High Gain, 51 dB Typ.
- High P1dB, +45 dBm, Typ.
- High OIP3, +52 dBm Typ.

Generic photo used for illustration purposes only

APPLICATIONS

- Communication Systems
- R&D, Production, and OTA Test Systems
- Test & Measurement Equipment
- General Laboratory Applications

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' ZHL-0G62G5030(X)+ is a high power broadband amplifier providing more than 30 W of output power with a typical small signal gain of 51 dB over the 600 to 2500 MHz frequency band. The amplifier uses state-of-the-art semiconductor technology and can be used in a wide range of applications. A single supply voltage ensures ease of operation. The amplifier is made with a rugged aluminum housing and can be supplied with or without a heatsink.

ELECTRICAL SPECIFICATIONS AT $T_{MOUNTING\ BASE}$ = +25 °C, V_{DC} = +28 V

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Frequency Range	f		600		2500	MHz
Small Signal Gain	G_{SS}	P_{IN} = -50 dBm	45	51	55	dB
Small Signal Gain Flatness	$G_{SS-FLAT}$	P_{IN} = -50 dBm		±1.6	±2.0	dB
Output Power at 1 dB Compression	P_{1dB}	$P_{OUT-REF}$ = +25 dBm	+43	+45		dBm
Output Power at 3 dB Compression	P_{3dB}	$P_{OUT-REF}$ = +25 dBm	+44	+47		dBm
Noise Figure	NF			7	10	dB
Output Third Order Intercept Point	OIP3	P_{OUT} = +38 dBm/Tone		+52		dBm
Input Return Loss	I-RL		9.5	16		dB
Output Return Loss	O-RL		9.5	21		dB
DC Supply Voltage	V_{DC}		+27	+28	+29	V
Supply Current	I_{DC}	Without Fan at P_{3dB} With Fan at P_{3db}		4.9 5.3	6.0 6.4	A

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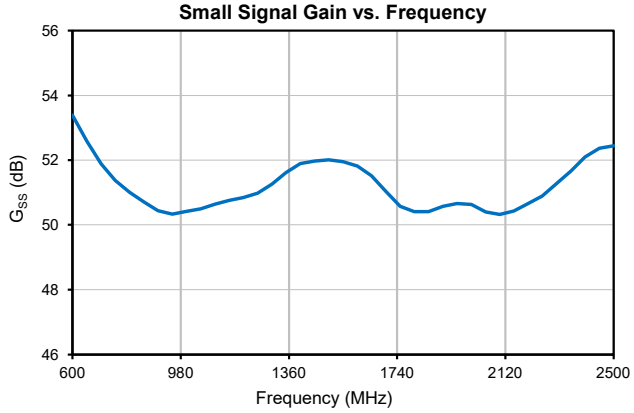
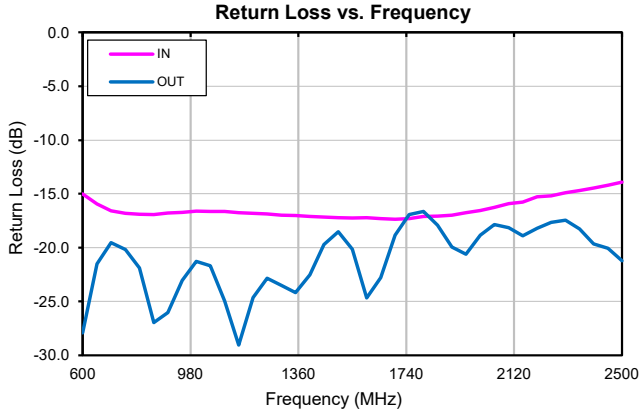
TYPICAL PERFORMANCE DATA AT $T_{MOUNTINGBASE}$ = +25 °C, V_{DC} = +28 V, 50Ω

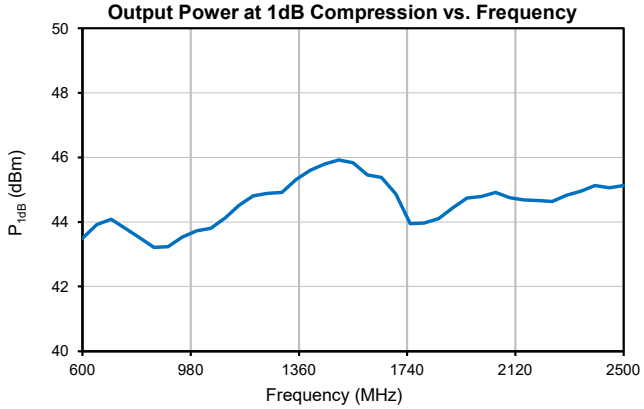
Small Signal Gain vs. Frequency



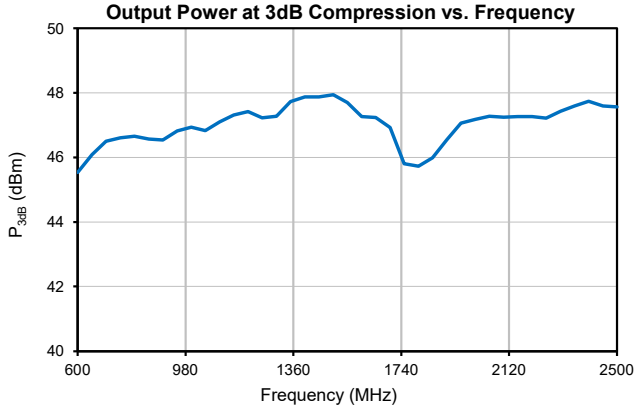
Return Loss vs. Frequency



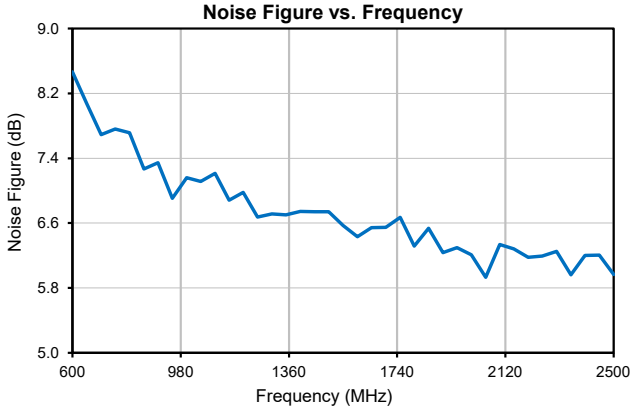
Output Power at 1dB Compression vs. Frequency



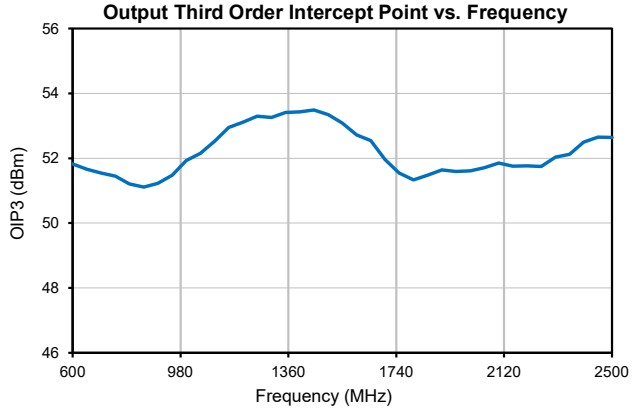
Output Power at 3dB Compression vs. Frequency



Noise Figure vs. Frequency



Output Third Order Intercept Point vs. Frequency



ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	ZHL-0G62G5030+ $T_{AMBIENT}$: -20 °C to +60 °C ZHL-0G62G5030X+ $T_{MOUNTINGBASE}$: -20 °C to +80 °C
Storage Temperature	-55 °C to +100 °C
No damage with an open or short at P_{3dB} for 2 hours	
RF Input Power (No Damage)	0 dBm
DC Operating Voltage	+29 V
Total Power Dissipation (Without Fan)	29 V x 6 A = 174 W
Total Power Dissipation (With Fan)	29 V x 6.4 A = 185.6 W

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

D-SUB MALE CONNECTOR PIN CONNECTIONS[1]

Pin Function	Label on Unit	Pin #	Color	Gauge
None	N/C1, N/C2, N/C3 N/C4, N/C5	1,2,4,5	None	None
Thermal Shut-Off Indication Shut-Off: +2 to +5 V Not Shut-Off: 0 to +0.8 V	TTL Out	3	Orange	26 AWG
DC Input (+)	V_{DC}	6,7	Red	18 AWG
Ground	GND	8,9	Black	18 AWG

1. Each amplifier will come packaged with an additional D-Sub connector for mating with the amplifier.

DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEATSINK

$$\textit{MAXIMUM THERMAL RESISTANCE} = \frac{\textit{MAXIMUM OPERATING CASE TEMP} - \textit{MAXIMUM USER AMBIENT TEMP}}{\textit{POWER DISSIPATION}}$$

Example:	MAXIMUM MOUNTING BASE TEMP = +80 °C (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) MAXIMUM USER AMBIENT TEMP = +60 °C (USER DEFINED) POWER DISSIPATION = 144 WATTS (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) THEN MAXIMUM ALLOWABLE THERMAL RESISTANCE = 0.14 °C/W

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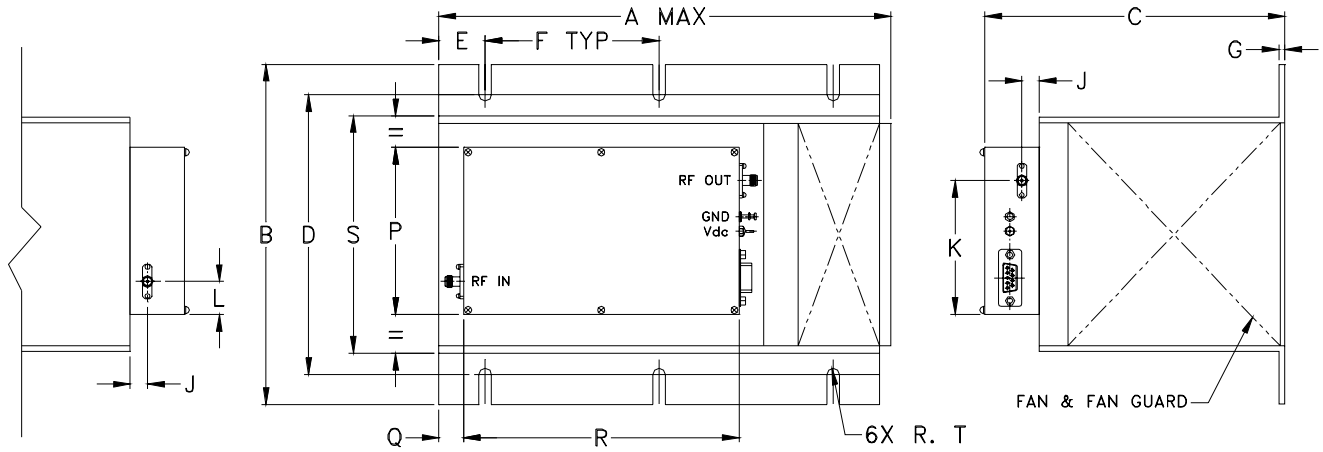
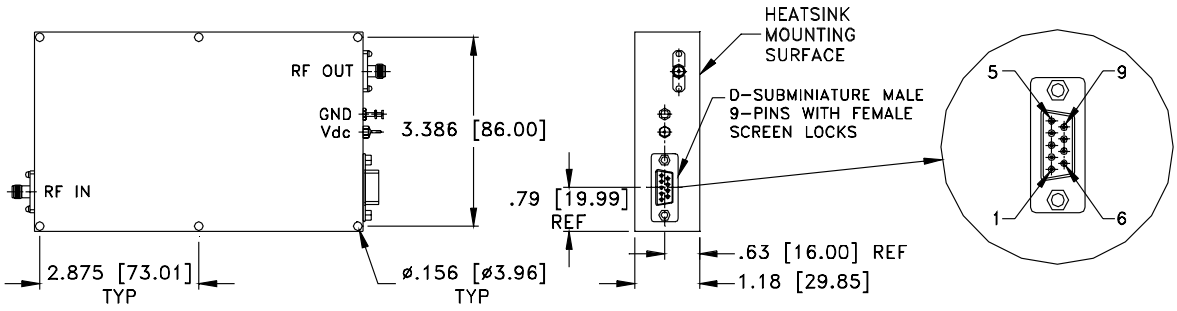
COAXIAL CONNECTIONS

IN (RF-IN)	SMA female
OUT (RF-OUT)	SMA female

CASE STYLE DRAWING WITH HEATSINK (ZHL-0G62G5030+)



CASE STYLE DRAWING WITHOUT HEATSINK (ZHL-0G62G5030X+)



OUTLINE DIMENSIONS (Inch / mm)

A	B	C	D	E	F	G	J	K	L	P	Q	R	S	T	wt
9.85	7.3	6.5	6.00	1.00	3.75	.13	.37	2.87	.71	3.58	.5	5.95	5.1	.135	grams*
250.19	185.42	165.10	152.40	25.40	95.25	3.30	9.40	72.90	18.03	90.93	12.70	151.13	129.54	3.43	4265

*580 grams without heatsink

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ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD.

Performance Data	Table Graphs S-Parameter (S2P Files) Data Set (.zip file)
RoHs Status	Compliant
Environmental Ratings	ENV23T15

ORDERING INFORMATION

Model No. Links	ZHL-0G62G5030+	ZHL-0G62G5030X+
Option	With Heatsink	Without Heatsink
Product Marking	ZHL-0G62G5030+	ZHL-0G62G5030X+
Case Style	BT1344	
Connector	IN (SMA female) / OUT (SMA female)	

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

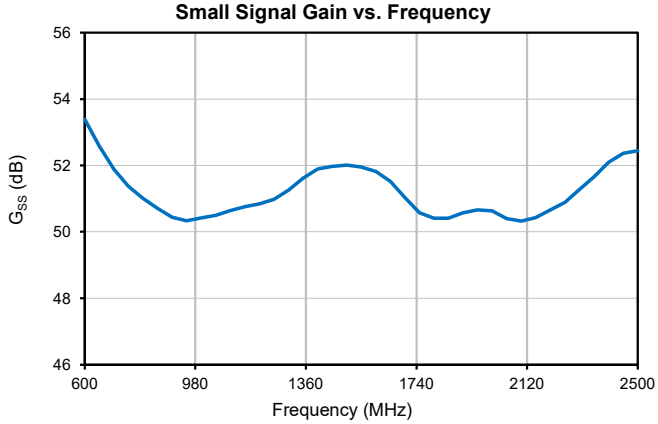
Coaxial Amplifier ZHL-0G62G5030(X)+

Typical Performance Data

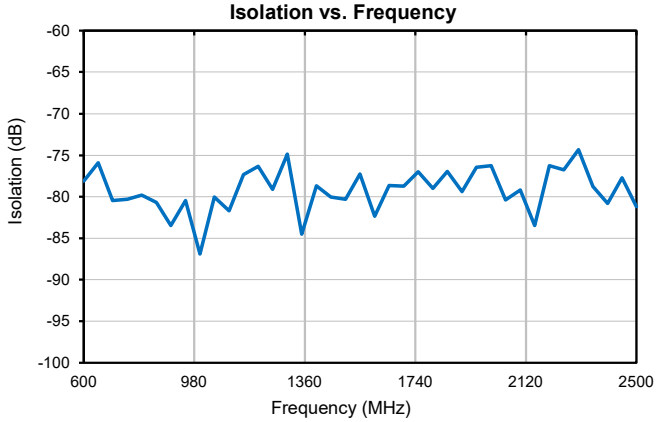
Frequency (MHz)	Gain (dB)	Isolation (dB)	Return Loss (dB)		P_{OUT} @ 1dB Compression (dBm)	P_{OUT} @ 3dB Compression (dBm)	P_{OUT} @ Saturation (dBm)	OIP3 (dBm)	Noise Figure (dB)
			IN	OUT					
	28V	28V	28V	28V	28V	28V	28V	28V	28V
600	53.39	78.11	15.02	27.90	43.50	45.53	46.12	51.82	8.46
650	52.59	75.89	15.96	21.52	43.93	46.09	46.71	51.66	8.07
700	51.89	80.44	16.60	19.56	44.08	46.50	47.09	51.55	7.69
750	51.38	80.33	16.81	20.17	43.80	46.62	47.12	51.45	7.76
800	51.01	79.80	16.88	21.89	43.51	46.66	47.13	51.21	7.71
850	50.72	80.71	16.95	26.96	43.22	46.57	47.07	51.12	7.27
900	50.45	83.46	16.79	26.03	43.24	46.54	46.97	51.23	7.34
950	50.33	80.44	16.73	23.05	43.54	46.82	47.11	51.48	6.91
1000	50.42	86.89	16.63	21.28	43.73	46.93	47.17	51.93	7.16
1050	50.50	80.07	16.64	21.69	43.80	46.84	47.17	52.14	7.11
1100	50.64	81.69	16.64	24.99	44.13	47.11	47.37	52.53	7.21
1150	50.75	77.34	16.73	29.05	44.53	47.32	47.53	52.95	6.88
1200	50.85	76.36	16.81	24.63	44.81	47.42	47.66	53.11	6.98
1250	50.98	79.11	16.87	22.85	44.89	47.23	47.58	53.30	6.68
1300	51.26	74.87	17.00	23.52	44.92	47.28	47.74	53.26	6.71
1350	51.62	84.51	17.02	24.19	45.32	47.73	48.20	53.41	6.70
1400	51.89	78.68	17.12	22.54	45.61	47.88	48.38	53.44	6.74
1450	51.98	80.04	17.15	19.72	45.80	47.88	48.33	53.49	6.74
1500	52.01	80.31	17.21	18.52	45.93	47.94	48.39	53.35	6.74
1550	51.96	77.28	17.22	20.15	45.84	47.70	48.15	53.09	6.57
1600	51.82	82.34	17.21	24.67	45.45	47.27	47.80	52.72	6.43
1650	51.52	78.66	17.31	22.80	45.38	47.24	47.74	52.55	6.55
1700	51.03	78.76	17.37	18.83	44.87	46.93	47.41	51.96	6.55
1750	50.58	77.00	17.30	16.94	43.95	45.81	46.43	51.55	6.67
1800	50.41	79.02	17.12	16.64	43.97	45.72	46.30	51.34	6.32
1850	50.41	76.94	17.09	17.89	44.11	45.99	46.51	51.48	6.54
1900	50.57	79.40	16.99	19.94	44.45	46.55	46.91	51.64	6.24
1950	50.66	76.46	16.74	20.61	44.74	47.06	47.33	51.59	6.30
2000	50.64	76.26	16.55	18.84	44.78	47.18	47.38	51.61	6.21
2050	50.41	80.38	16.24	17.86	44.92	47.28	47.39	51.71	5.93
2100	50.32	79.20	15.91	18.16	44.76	47.25	47.32	51.85	6.34
2150	50.43	83.48	15.78	18.90	44.69	47.27	47.42	51.75	6.28
2200	50.66	76.25	15.30	18.21	44.66	47.27	47.47	51.76	6.18
2250	50.89	76.76	15.20	17.65	44.64	47.22	47.52	51.75	6.19
2300	51.28	74.34	14.90	17.45	44.83	47.44	47.77	52.04	6.25
2350	51.66	78.78	14.71	18.26	44.96	47.59	47.99	52.12	5.96
2400	52.10	80.80	14.47	19.65	45.13	47.74	48.17	52.50	6.20
2450	52.37	77.75	14.19	20.06	45.06	47.59	48.14	52.66	6.20
2500	52.44	81.21	13.93	21.24	45.14	47.57	48.15	52.64	5.97

Typical Performance Curves

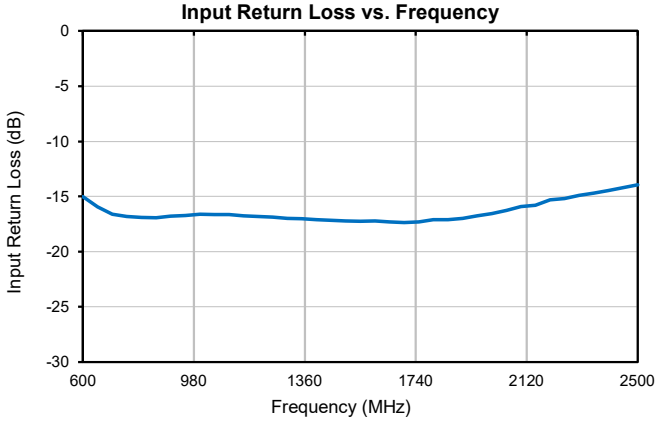
Small Signal Gain vs. Frequency



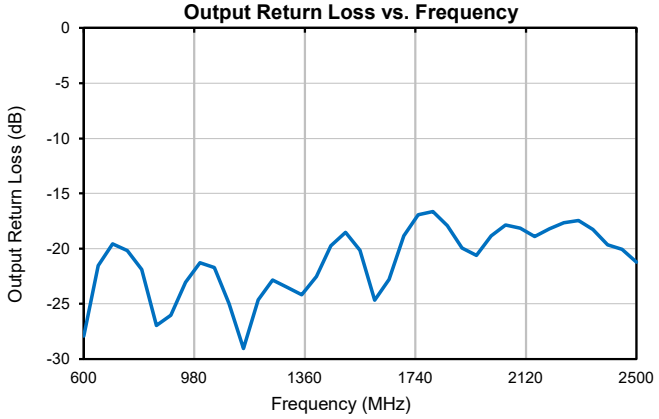
Isolation vs. Frequency



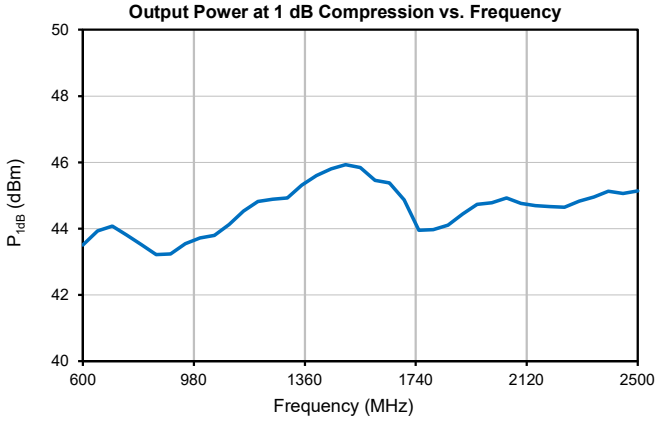
Input Return Loss vs. Frequency



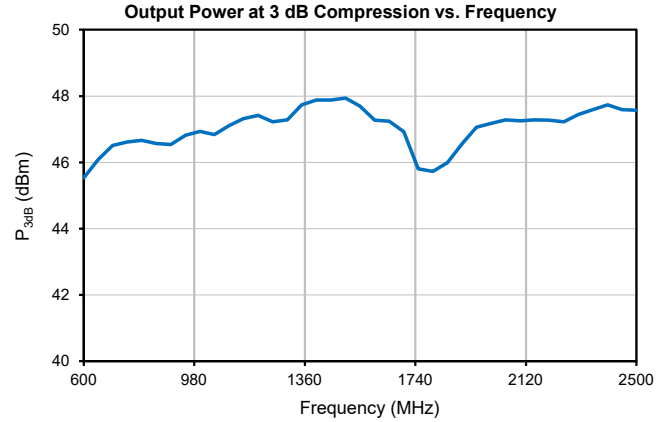
Output Return Loss vs. Frequency



Output Power at 1 dB Compression vs. Frequency

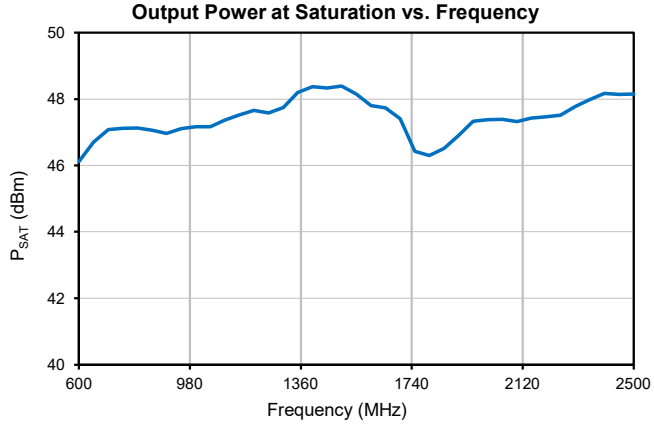


Output Power at 3 dB Compression vs. Frequency

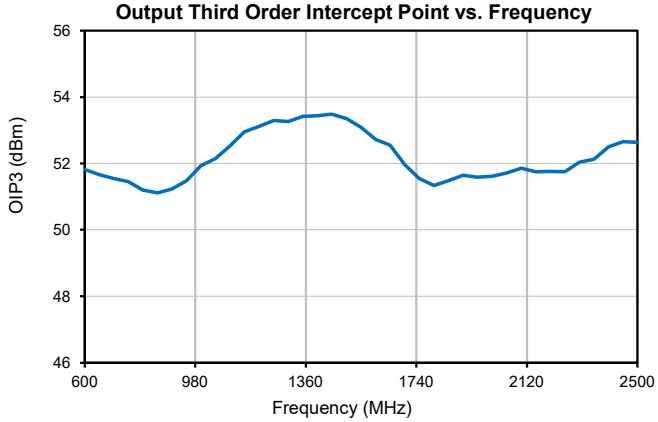


Typical Performance Curves

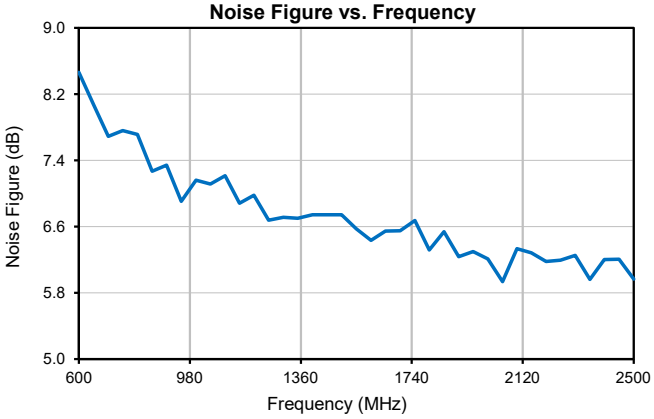
Output Power at Saturation vs. Frequency



Output Third Order Intercept Point vs. Frequency



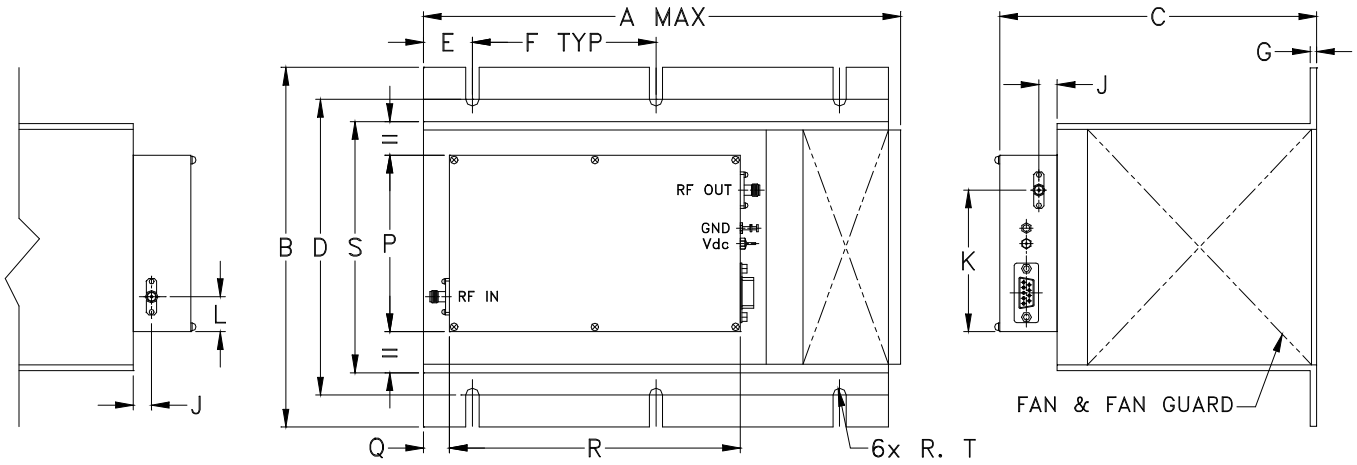
Noise Figure vs. Frequency



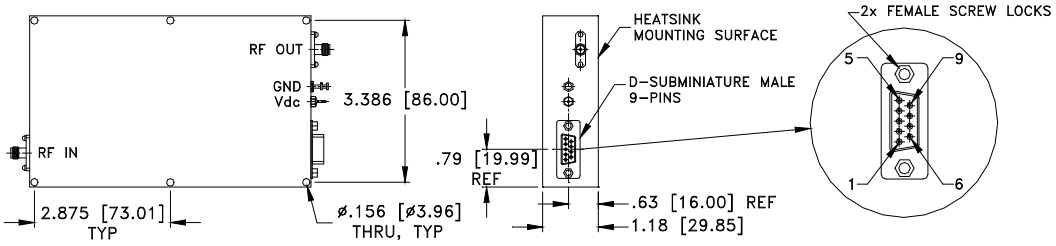
Case Style BT

BT1344

Outline Dimensions



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK.



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
BT1344	9.85 (250.19)	7.3 (185.42)	6.5 (165.10)	6.00 (152.40)	1.00 (25.40)	3.75 (95.25)	.13 (3.30)	- -	.37 (9.40)	2.87 (72.90)	.71 (18.03)	- -	- -

CASE#	P	Q	R	S	T	WT, GRAM	WT WITHOUT HEATSINK, GRAM
BT1344	3.58 (90.93)	.5 (12.70)	5.95 (151.13)	5.1 (129.54)	.135 (3.43)	4265	580

Dimensions are in inches (mm). Tolerances: 1 Pl. ± .1; 2 Pl. ± .03; 3 Pl. ± .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 screws for mounting model without heat sink on 3/32” thick sheet: #6-32, 1.50” Length.

Mini-Circuits

Environmental Specifications **ENV23T15**

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 60°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