

High Power Amplifier

ZHL-16W-43+

50Ω 1800 to 4000 MHz

The Big Deal:

- Broadband - High Power, 16 Watt
- Rugged
- Internal Protection from Load and Temperature



ZHL-16W-43+
Price: \$1595 (QTY 1-9)



ZHL-16W-43X+
Price: \$1545 (QTY 1-9)

Product Overview:

Mini-Circuits ZHL-16W-43+ offers high power (16W) with rugged reliability over a broad frequency range from 1800 to 4000 MHz. This model includes temperature sensing circuits for automatic shutdown and output load protection to operate into a short or an open load making it ideal for use in laboratory or field applications.

Summary Performance at 2 GHz

P_{OUT} @ 3dB (P_{SAT})	16	W, typ.
Gain	45	dB, typ.
IP3	+47	dBm, typ.
P_{OUT} (at 1dB)	+41	dBm, typ.
DC Current (at 28V)	4.3	A, max.
Operating Frequency: 1800 to 4000 MHz		

Key Features

Feature	Advantages
Combination of Power and Bandwidth	Offering a unique combination of output power over a broad frequency range, the ZHL-16W-43+ is ideal for laboratory and other test applications which require a high degree of flexibility to delivery power over a wide array of applications including <ul style="list-style-type: none">• PCS, UMTS, LTE and wireless• WiMAX• Radar• Microwave radio and ISM
Excellent Input and Output VSWR	With 1.3:1 output VSWR, the ZHL-16W-43+ is designed for use in driving circuits with a variety of impedances and still provide consistent, reliable output power.
Over Temp Shutdown	The ZHL-16W-43+ includes internal temperature monitoring circuits to automatically shut down the amplifier in the event of over temperature operation. Set for approximately +85°C shutdown (with auto recovery at 70°C), this feature ensures that users whom have difficulty in controlling their thermal environment or need to operate in a remote mode and cannot monitor the amplifier real time, can function with the security that a thermal run-away condition will be avoided through this self management feature. Furthermore, the ZHL-16W-43+ provides a TTL output to indicate thermal shutdown for remote automated systems.
Output Load Protection	A high root cause for damage to power amplifiers is the operation into highly reflective loads. The ZHL-16W-43+ power amplifier includes circuits to enable the amplifier to operate without damage in the presence of an open or short over all phases.

Mini-Circuits®
ISO 9001 ISO 14001 AS 9100 CERTIFIED

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Coaxial High Power Amplifier

ZHL-16W-43+

50Ω 16W 1800 to 4000 MHz

General Description

Mini-Circuits ZHL-16W-43+, is a wide band High Power Amplifier providing 16W saturated output power over more than an octave up to 4000 MHz. It supports a variety of applications from communication or radar to critical test and measurement systems and includes over-temperature self-protect and alarming circuits as well as internal protection circuits to prevent damage due to operation into an open or short under full RF power.

Features

- High power, 16 Watt
- Low Current consumption, 3A typ.
- High IP3, +47 dBm typ.
- Usable over 800 to 4200 MHz
- Good gain flatness, ±1.5 dB typ.
- No damage with an open or short output load under full CW output power
- Overheat-protection automatic shuts off when base plate temperature exceeds +80°C

Applications

- PCN
- GSM
- ISM
- WiMax
- Lab test



Model No.	ZHL-16W-43-S+	ZHL-16W-43X-S+▲
Case Style	BT1344	
Connectors	SMA / D-Sub Male	
Price (Qty.)	\$1595.00 ea. (1-9)	\$1545.00 ea. (1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

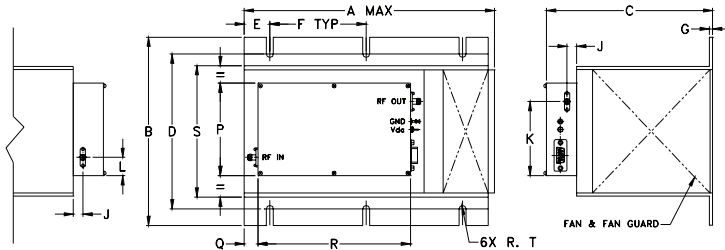
The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

Electrical Specifications

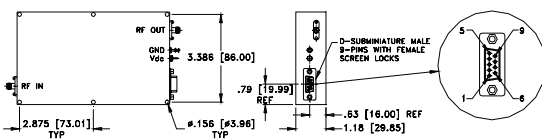
Parameter	ZHL-16W-43-S+			ZHL-16W-43X-S+▲			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range	1800		4000	1800		4000	MHz
Gain	40	45	50	40	45	50	dB
Gain Flatness			±2.0			±2.0	dB
Output Power at 1dB compression	+39	+41		+39	+41		dBm
Saturated Output Power at 3dB compression	+40	+42		+40	+42		dBm
Noise Figure		6.0			6.0		dB
Output third order intercept point		+47			+47		dBm
Input VSWR		1.5			1.5		:1
Output VSWR		1.3			1.3		:1
DC Supply Voltage		28	30		28	30	V
Supply Current			4.3			4.0	A

▲ Heat sink and fan not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 60°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 0.109°C/W max. at 47°C ambient.

Outline Drawing



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



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

Maximum Ratings

Parameter	Ratings
Operating Temperature	-20°C to 47°C
Storage Temperature	-55°C to 100°C
Base Plate Temperature	60°C
Input RF Power (no damage)†	+9 dBm

1. Peak envelop power. (Refer to Application Note AN-60-037 for PEP calculation). Permanent damage may occur if any of these limits are exceeded.

D-Sub Male Connector Pin Connections**

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

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



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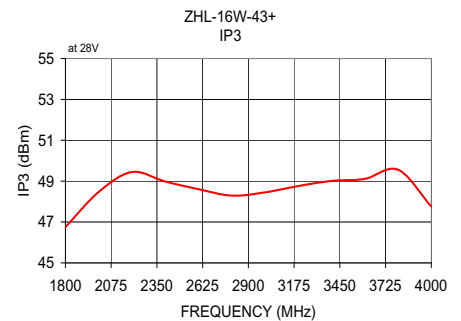
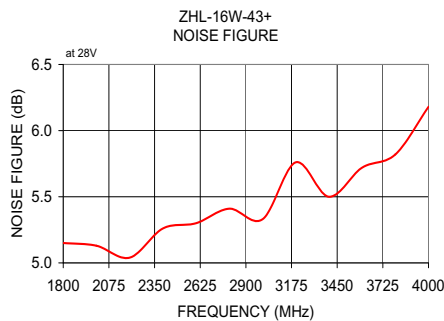
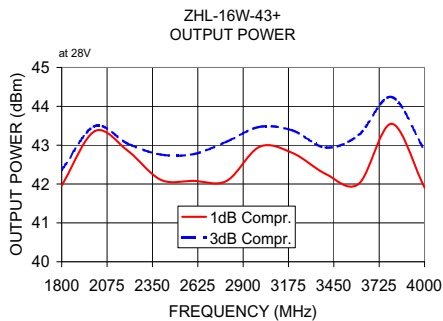
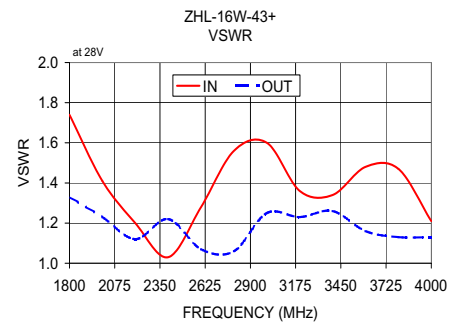
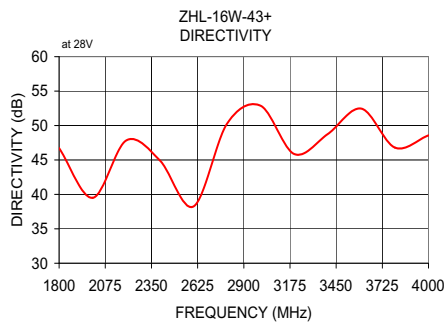
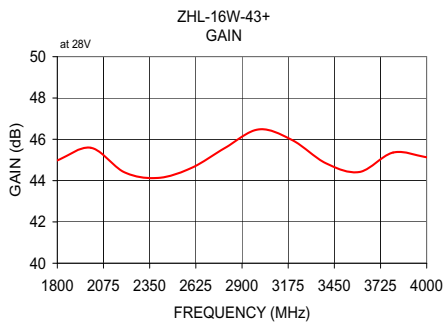
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FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		NOISE FIGURE (dB)	P _{OUT} (dBm) at 28V		OUTPUT IP ₃ (dBm)
	28V	28V	IN	OUT		1 dB Compr.	3 dB Compr.	28V
1800.00	44.98	46.72	1.74	1.33	5.15	41.96	42.36	46.75
2000.00	45.59	39.51	1.41	1.23	5.13	43.36	43.49	48.47
2200.00	44.40	47.84	1.20	1.12	5.04	42.86	43.04	49.45
2400.00	44.13	44.94	1.03	1.22	5.26	42.11	42.76	48.98
2600.00	44.62	38.25	1.28	1.07	5.30	42.08	42.77	48.61
2800.00	45.59	50.27	1.56	1.06	5.41	42.08	43.09	48.29
3000.00	46.48	52.87	1.60	1.25	5.33	42.96	43.47	48.45
3200.00	45.96	45.87	1.36	1.23	5.76	42.80	43.38	48.76
3400.00	44.84	48.76	1.34	1.26	5.50	42.26	42.94	49.01
3600.00	44.42	52.45	1.48	1.16	5.72	42.00	43.26	49.11
3800.00	45.36	46.80	1.47	1.13	5.82	43.55	44.24	49.56
4000.00	45.13	48.58	1.21	1.13	6.18	41.91	42.87	47.76



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