Coaxial

Wideband Microwave Amplifier ZX60-24A+

50Ω 5 to 20 GHz

The Big Deal

- Extra wideband, 5-20 GHz
- High gain, flat response, 24 dB ±2.2 dB typ.
- Excellent isolation, 67 dB typ.
- Unconditionally stable performance

CASE STYLE: GC957

Product Overview

The ZX60-24A+ two-stage amplifier provides high gain in a very small package, only 0.75” x 0.74” x 0.46” high. Internal compensating circuitry provides a consistent, flat response over the extra wide bandwidth. Designed for 50Ω SMA coax systems, the gold-plated package uses convenient 5V DC power, and has a nickel-plated brass cover and unibody construction for extra durability.

Key Features

Feature	Advantages
Extra Wideband, 5-20 GHz	Wider frequency range supports a wider array of applications, from microwave radio and radar to military communications, satellite communications, and countermeasures
Excellent Gain Flatness, ±2.2 dB	±2.2 dB gain flatness across entire bandwidth minimizes the need for external equalizer networks, making it a great fit for instrumentation, test lab, EW, or any other amplitude sensitive system
Excellent Isolation, 67 dB typ.	24-dB gain with reverse isolation of 67 dB typ. (43 dB typ. directivity) minimizes leakage, making the ZX60-24A+ an excellent choice for minimizing interactions between different microwave components. It is an ideal LO driver amplifier and provides designers system flexibility and robustness when integrating cascaded RF components. Can replace expensive isollators in many applications.
Unconditionally Stable	No risk of oscillation due to impedance mismatch.

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Features

- Wideband, 5 to 20 GHz
- Gain, 24 dB typ and flatness, ±2.2 dB typ.
- Output power at 1 dB compression, 18.3 dBm typ.
- Excellent isolation, 67 dB typ.
- Unconditionally stable
- Protected by US patent 6,790,049

Applications

- Military and radar
- DBS
- Wideband isolation amplifier
- Microwave point to point radio
- Satellite systems

CASE STYLE: GC957

Connectors	Model
SMA	ZX60-24A-S+

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications at 25°C

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		5.0		20.0	GHz
Gain	5.0	—	23.0	—	dB
	8.0	22.4	25.8	28.3	
	10.0	21.3	24.4	26.9	
	12.0	—	23.9	—	
	14.0	—	24.0	—	
	16.0	—	25.3	—	
	18.0	22.2	25.5	28.1	
	20.0	19.3	22.2	24.4	
Gain Flatness	5.0 - 20.0	—	±2.2	—	dB
Input Return Loss	5.0	—	10.1	—	dB
	8.0	10	17.5	—	
	10.0	—	17.4	—	
	12.0	10	21.2	—	
	14.0	—	17.0	—	
	16.0	—	15.7	—	
	18.0	—	11.5	—	
	20.0	—	7.6	—	
Output Return Loss	5.0	—	7.5	—	dB
	8.0	10	13.3	—	
	10.0	—	11.0	—	
	12.0	10	14.2	—	
	14.0	—	14.7	—	
	16.0	—	12.4	—	
	18.0	—	10.7	—	
	20.0	—	14.3	—	
Output IP3 @ Output Power +8 dBm / tone. (Tone spacing, 1 MHz)	5.0		30.5		dBm
	8.0		28.2		
	10.0		26.8		
	12.0		25.4		
	14.0		24.8		
	16.0		25.1		
	18.0		23.1		
	20.0		23.4		
Output Power @ 1 dB compression	5.0		17.4		dBm
	8.0		18.6		
	10.0		19.0		
	12.0		18.3		
	14.0		18.4		
	16.0		18.1		
	18.0		19.4		
	20.0		18.2		
Noise Figure	5.0		9.4		dB
	8.0		5.3		
	10.0		6.0		
	12.0		6.4		
	14.0		7.4		
	16.0		7.6		
	18.0		6.9		
	20.0		7.2		
Directivity (Isolation-Gain)		—	43	—	dB
DC Voltage		—	5.0	—	V
DC Current		—	270	295	mA

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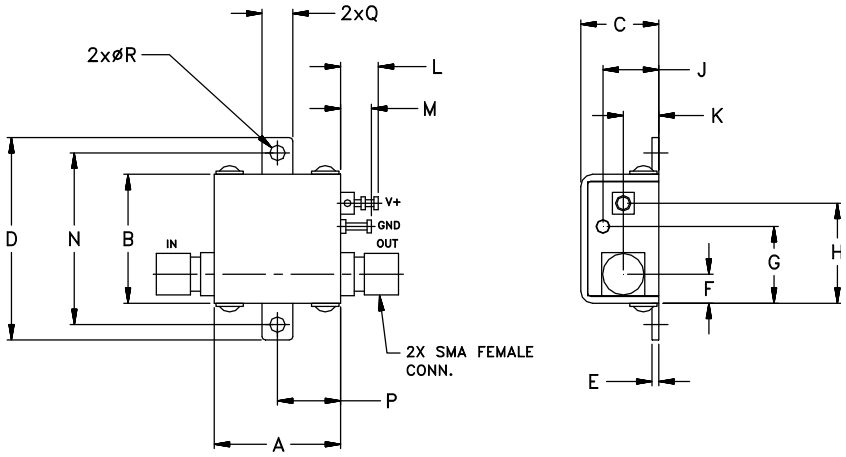
Maximum Ratings

Parameter	Ratings
Operating Temperature	-20°C to 85°C Base Plate Temp.
Storage Temperature	-55°C to 100°C
DC Voltage	5.5 V
Input RF Power (no damage)	+20 dBm
Power Dissipation	1.6 W

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

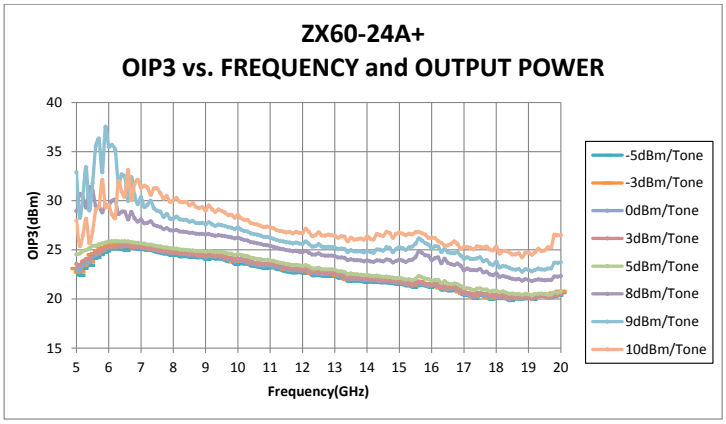
Outline Drawing



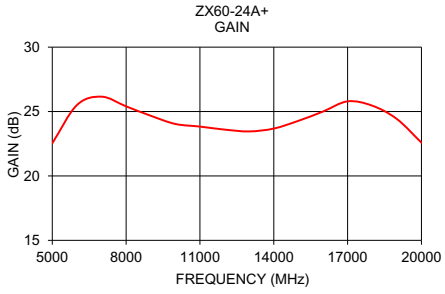
NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminal. See Application Note. AN-40-010.

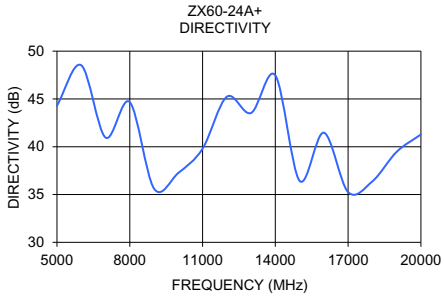
Outline Dimensions (inch / mm)

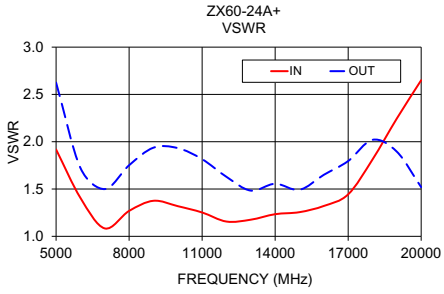
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	wt
.74	.75	.46	1.18	.04	.17	.45	.59	.33	.21	.22	.18	1.00	.37	.18	.106	grams
18.80	19.05	11.68	29.97	1.02	4.32	11.43	14.99	8.38	5.33	5.59	4.57	25.40	9.40	4.57	2.69	23.0

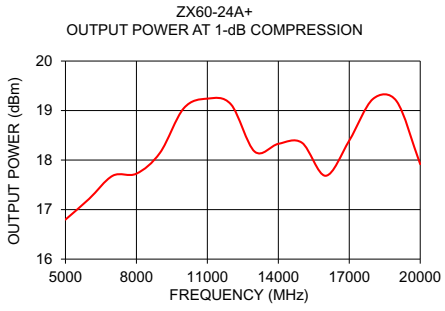


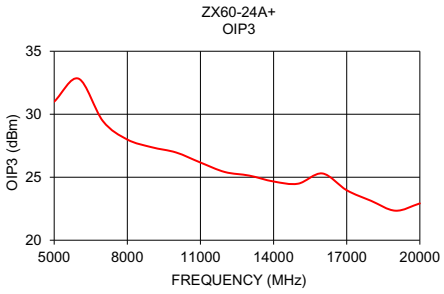
FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR IN (:1)	VSWR OUT (:1)	POWER OUT @1 dB COMPR. (dBm)	NF (dB)	OIP3 (dBm)
5000	22.54	44.30	1.92	2.63	16.80	9.84	31.00
6000	25.50	48.52	1.41	1.72	17.22	6.47	32.82
7000	26.15	40.96	1.08	1.50	17.68	5.61	29.45
8000	25.40	44.67	1.27	1.75	17.73	5.55	27.99
9000	24.67	35.62	1.38	1.94	18.15	5.90	27.38
10000	24.04	37.26	1.32	1.93	19.05	6.12	26.96
11000	23.83	39.79	1.25	1.82	19.24	6.13	26.17
12000	23.60	45.23	1.16	1.63	19.12	6.26	25.41
13000	23.46	43.53	1.18	1.48	18.17	6.38	25.13
14000	23.68	47.46	1.23	1.56	18.33	6.56	24.66
15000	24.28	36.43	1.26	1.49	18.35	6.72	24.49
16000	25.00	41.47	1.32	1.65	17.68	6.83	25.30
17000	25.79	35.25	1.44	1.80	18.39	6.93	23.97
18000	25.46	36.38	1.81	2.02	19.23	7.14	23.13
19000	24.42	39.47	2.25	1.89	19.19	7.42	22.34
20000	22.58	41.29	2.65	1.52	17.92	7.63	22.92

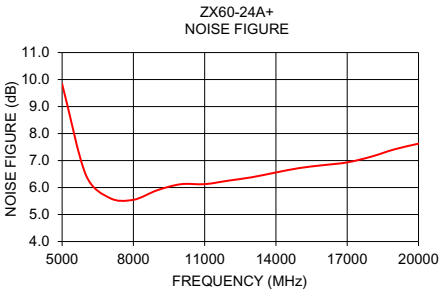












Additional Notes

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.

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