

50  $\Omega$     5 to 20 GHz

CASE STYLE: GC957

### The Big Deal

- Extra Wideband, 5-20 GHz
- High Gain, Flat Response, 24 dB  $\pm$ 1.3 dB typ.
- Excellent Isolation, 62 dB typ.
- Unconditionally Stable performance

### Product Overview

The ZX60-24+ 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 50  $\Omega$  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	$\pm$ 1.3 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
High Gain and Excellent Isolation	24-dB gain with reverse isolation of 62 dB (38 dB directivity) prevents leakage, making the ZX60-24+ 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
Unconditionally Stable	No risk of damage to other components from impedance mismatch or internal oscillation

# Wideband Microwave Amplifier

ZX60-24+

50Ω 5 to 20 GHz

**Features**

- wideband, 5 to 20 GHz
- gain, 24 dB typ and flatness, ±1.3 dB typ.
- output power at 1 dB compression, 18.0 dBm typ.
- excellent isolation, 62 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



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Connectors	Model	Price	Qty.
SMA	ZX60-24-S+	\$199.95 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 at 25°C**

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units		
Frequency Range		5.0		20.0	GHz		
Gain	5.0		24.2		dB		
	8.0	20.0	24.3				
	10.0	20.0	23.5				
	12.0		23.5				
	14.0		23.4				
	16.0		22.7				
	18.0	20.0	24.0				
Gain Flatness	20.0	18.0	22.8		dB		
	5.0-20.0		±1.3				
Input Return Loss	5.0		16.3		dB		
	8.0	10.0	16.5				
	10.0		12.2				
	12.0	10.0	15.7				
	14.0	12.0	18.0				
	16.0		11.8				
	18.0	10.0	15.8				
Output Return Loss	20.0		15.6		dB		
	5.0		22.2				
	8.0	10.0	17.2				
	10.0		13.8				
	12.0	10.0	15.9				
	14.0	12.0	22.8				
	16.0		15.0				
Output IP3	18.0	12.0	26.6		dBm		
	20.0		21.0				
	5.0		27.4				
	8.0		27.7				
	10.0		27.9				
	12.0		27.2				
	14.0		26.9				
Output Power @ 1 dB compression	16.0		27.1		dBm		
	18.0		26.4				
	20.0		24.9				
	5.0		18.0				
	8.0		18.3				
	10.0	16.0	18.5				
	12.0		18.1				
Noise Figure	14.0		17.6		dB		
	16.0		18.0				
	18.0		18.0				
	20.0		17.9				
	5.0		8.2				
	8.0		6.9				
	10.0		6.3				
Directivity (Isolation-Gain)	12.0		6.9		dB		
	14.0		6.8				
	16.0		6.8				
	18.0		6.5				
	20.0		7.0				
	DC Voltage			38			V
	DC Current			260		290	mA



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Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

For detailed performance specs & shopping online see web site

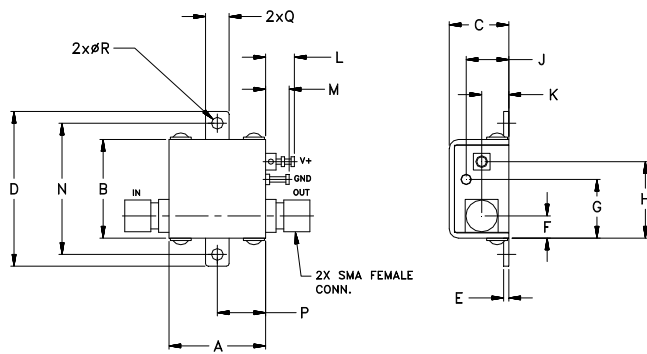
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ZX60-24+  
ED-13973/2  
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## Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°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



## 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	VSWR IN (:1)	VSWR OUT (:1)	POWER OUT @1 dB COMPR. (dBm)	IP3 (dBm)	NF (dB)
5000.00	23.94	49.97	1.41	1.23	17.91	27.35	8.38
6000.00	24.24	43.74	1.13	1.23	17.80	27.78	7.40
7000.00	24.13	41.84	1.06	1.31	18.44	27.98	7.03
8000.00	24.19	38.28	1.26	1.47	18.49	27.72	6.90
9000.00	23.91	36.50	1.57	1.62	18.73	27.47	7.08
10000.00	23.19	39.89	1.67	1.64	18.63	27.76	6.37
11000.00	23.09	45.13	1.64	1.56	18.43	27.26	7.21
12000.00	23.23	40.13	1.41	1.36	18.13	27.49	7.01
13000.00	23.36	40.96	1.21	1.15	17.90	27.48	6.89
14000.00	23.22	38.51	1.32	1.20	17.34	27.34	6.82
15000.00	22.74	38.10	1.57	1.48	17.28	27.40	6.90
16000.00	22.47	39.63	1.59	1.63	17.84	27.64	6.77
17000.00	23.02	44.13	1.39	1.51	17.47	27.12	7.56
18000.00	23.73	39.26	1.43	1.20	18.24	26.71	6.59
20000.00	22.25	33.67	1.39	1.27	18.41	25.82	7.13

