

Amplifier

ZX60-6013E-S+

50Ω 20 MHz to 6 GHz

Features

- Wide Bandwidth, 20 MHz to 6 GHz
- Low Noise Figure, 3.3 dB Typ.
- Protected by US Patent 6,790,049

Applications

- Buffer Amplifier
- Cellular
- PCS
- Lab
- Instrumentation
- Test Equipment



CASE STYLE: GC957

Connectors	Model
SMA	ZX60-6013E-S+

+RoHS Compliant

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

Electrical Specifications at $T_{AMB} = 25^{\circ}\text{C}$

MODEL NO.	FREQ. (GHz) $f_L - f_U$	DC VOLTAGE @ Pin V+ (V)	GAIN over frequency in GHz Typ (dB)								MAXIMUM POWER (dBm) Output (1 dB Comp.) Typ. f_L f_U	DYNAMIC RANGE		VSWR (:1) Typ.				ACTIVE DIRECTIVITY (dB) Isolation-Gain Typ.	DC OPERATING CURRENT @ Pin V+ (mA)		
			0.1	1.0	2.0	3.0	4.0	5.0	6.0	Min.at 2 GHz		NF (dB) Typ.	IP3 (dBm) Typ.	In		Out			Typ.	Typ.	Max.
														$f_L - 3$ GHz	$3 - f_U$ GHz	$f_L - 3$ GHz	$3 - f_U$ GHz				
ZX60-6013E-S+	0.02-6	12.0	16.2	15.9	15.2	14.3	13.4	12.7	12.1	13.0	13.4	5.8	3.3	28.7	1.4	1.6	1.2	1.2	3-9	39	50

Maximum Ratings

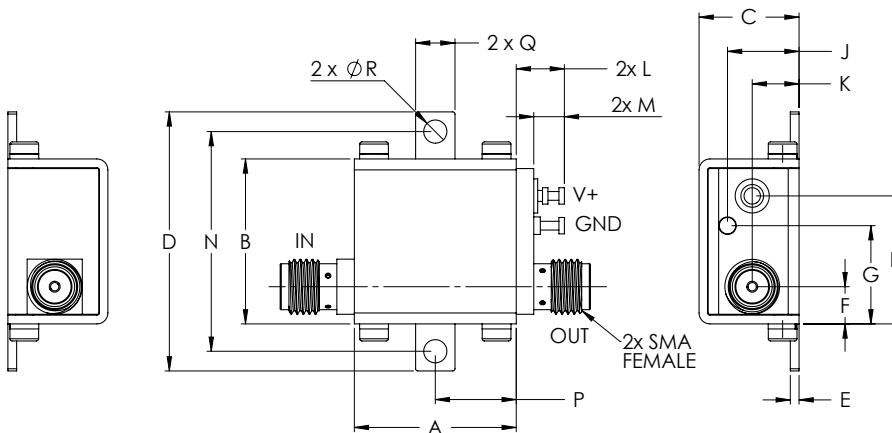
Operating Temperature	-45°C to 80°C case
Storage Temperature	-55°C to 100°C
DC Voltage	12.5V
Input Power(no Damage)	15dBm
Power	650mW

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



NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminals. See Application Note [AN-40-10](#).

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	.14	1.00	.37	.18	.106	GRAM
18.80	19.05	11.68	29.97	1.02	4.32	11.43	14.99	8.38	5.33	5.59	3.56	25.40	9.40	4.57	2.69	23.0

Notes

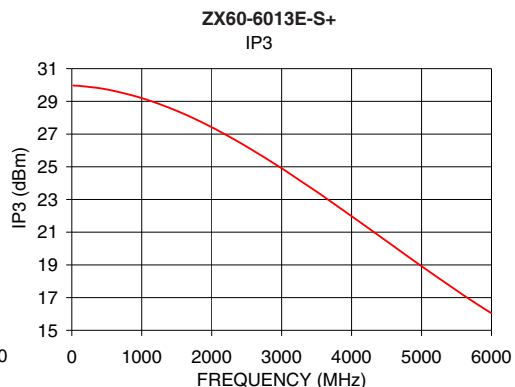
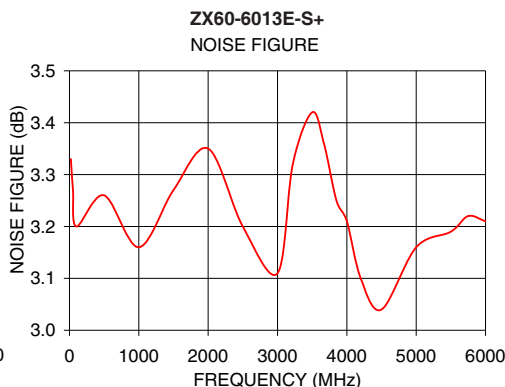
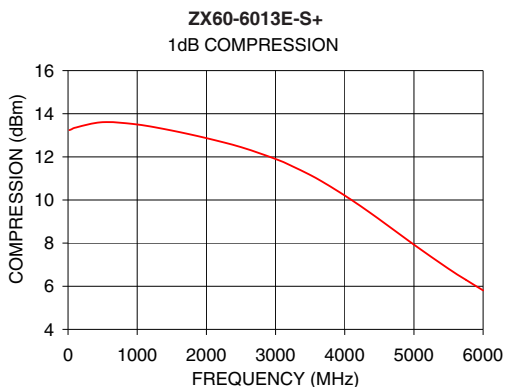
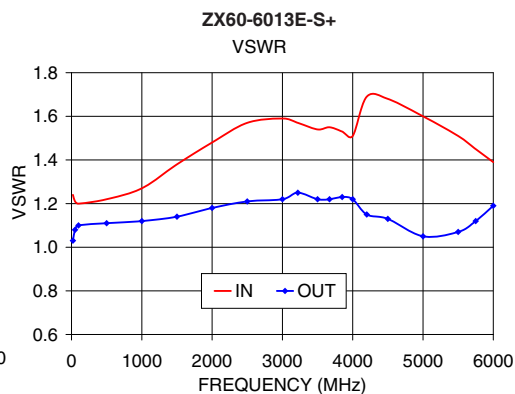
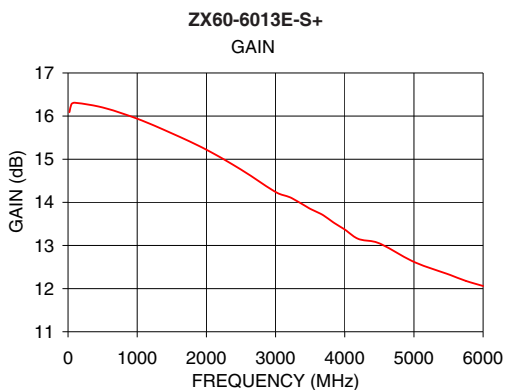
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- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Typical Performance Data & Curves at 25°C ZX60-6013E-S+

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR IN (:1)	VSWR OUT (:1)	POWER OUT @1dB COMPRESSION (dBm)	IP3 (dBm)	NF (dB)
20	16.09	3.60	1.24	1.03	13.24	29.97	3.33
50	16.28	3.33	1.21	1.08	13.28	29.96	3.27
100	16.31	3.24	1.20	1.10	13.35	29.95	3.20
500	16.20	3.40	1.22	1.11	13.61	29.73	3.26
1000	15.94	3.73	1.27	1.12	13.50	29.20	3.16
1500	15.60	4.12	1.38	1.14	13.22	28.42	3.27
2000	15.22	4.54	1.48	1.18	12.87	27.42	3.35
2500	14.76	5.59	1.57	1.21	12.45	26.23	3.20
3000	14.24	6.08	1.59	1.22	11.90	24.91	3.11
3220	14.11	6.22	1.57	1.25	11.60	24.28	3.32
3500	13.85	6.78	1.54	1.22	11.16	23.48	3.42
3670	13.72	6.91	1.55	1.22	10.86	22.97	3.36
3850	13.52	7.28	1.53	1.23	10.51	22.43	3.25
4000	13.37	7.13	1.51	1.22	10.21	21.98	3.21
4200	13.15	7.35	1.69	1.15	9.78	21.37	3.10
4500	13.05	7.95	1.68	1.13	9.10	20.45	3.04
5000	12.62	8.79	1.60	1.05	7.93	18.92	3.16
5500	12.33	8.81	1.51	1.07	6.81	17.44	3.19
5750	12.18	9.27	1.45	1.12	6.30	16.72	3.22
6000	12.06	9.18	1.39	1.19	5.81	16.04	3.21



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Amplifier

ZX60-6013E-S+

Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR IN (:1) 12V	VSWR OUT (:1) 12V	Output IP3 (dBm) 12V	NOISE FIGURE (dB) 12V	Pout at 1dB Comp. (dBm) 12V
20	16.09	3.60	1.24	1.03	29.97	3.33	13.24
50	16.28	3.33	1.21	1.08	29.96	3.27	13.28
100	16.31	3.24	1.20	1.10	29.95	3.20	13.35
500	16.20	3.40	1.22	1.11	29.73	3.26	13.61
1000	15.94	3.73	1.27	1.12	29.20	3.16	13.50
1500	15.60	4.12	1.38	1.14	28.42	3.27	13.22
2000	15.22	4.54	1.48	1.18	27.42	3.35	12.87
2500	14.76	5.59	1.57	1.21	26.23	3.20	12.45
3000	14.24	6.08	1.59	1.22	24.91	3.11	11.90
3220	14.11	6.22	1.57	1.25	24.28	3.32	11.60
3500	13.85	6.78	1.54	1.22	23.48	3.42	11.16
3670	13.72	6.91	1.55	1.22	22.97	3.36	10.86
3850	13.52	7.28	1.53	1.23	22.43	3.25	10.51
4000	13.37	7.13	1.51	1.22	21.98	3.21	10.21
4200	13.15	7.35	1.69	1.15	21.37	3.10	9.78
4500	13.05	7.95	1.68	1.13	20.45	3.04	9.10
5000	12.62	8.79	1.60	1.05	18.92	3.16	7.93
5500	12.33	8.81	1.51	1.07	17.44	3.19	6.81
5750	12.18	9.27	1.45	1.12	16.72	3.22	6.30
6000	12.06	9.18	1.39	1.19	16.04	3.21	5.81



ISO 9001 ISO 14001 AS 9100 CERTIFIED

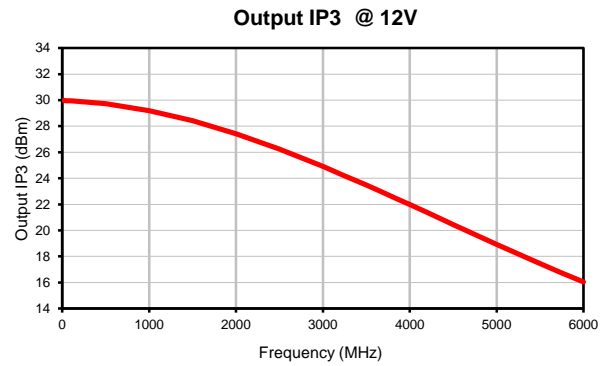
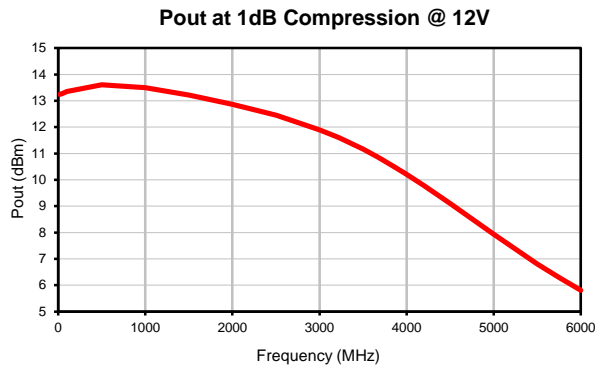
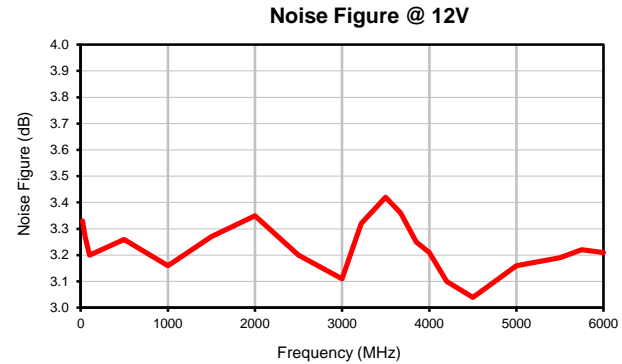
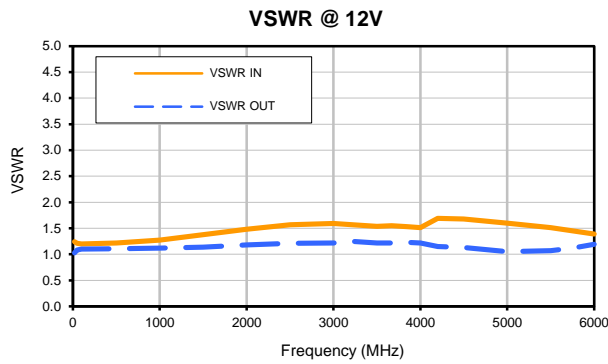
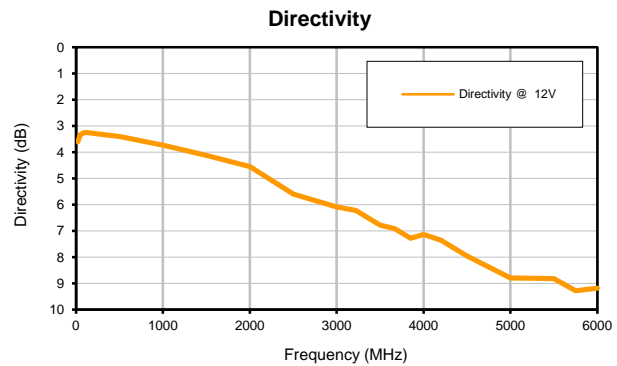
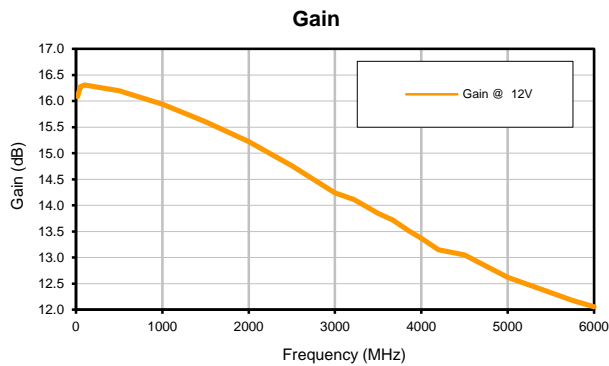
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IF/RF MICROWAVE COMPONENTS

For detailed performance specs
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Typical Performance Curves

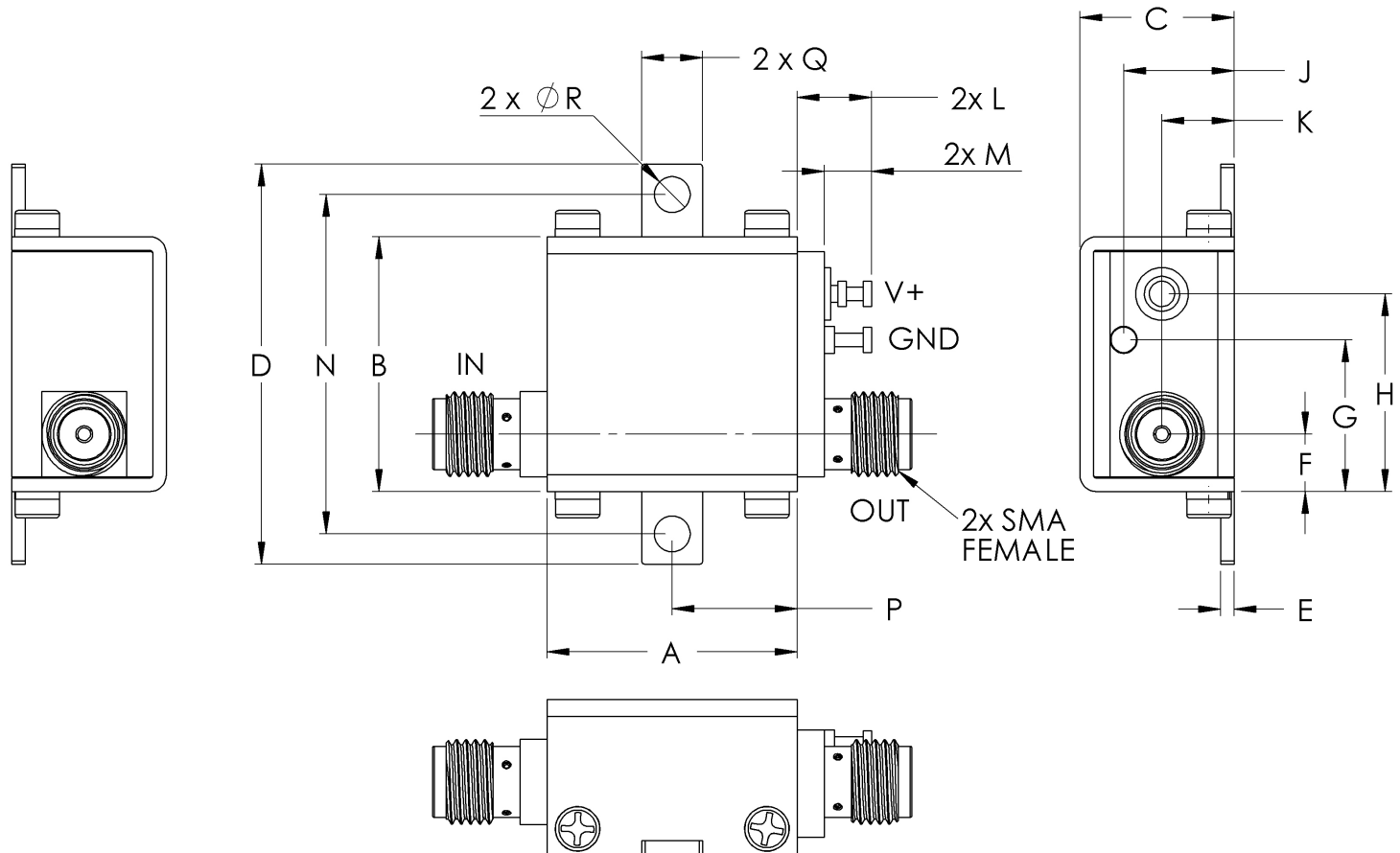


Case Style

GC

Outline Dimensions

GC957



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N
GC957	.74 (18.80)	.75 (19.15)	.46 (11.61)	1.18 (30.07)	.04 (1.02)	.17 (4.32)	.45 (11.40)	.59 (14.86)	.33 (8.31)	.21 (5.44)	.22 (5.59)	.14 (3.56)	1.00 (25.4)

CASE #.	P	Q	R	WT GRAMS
GC957	.37 (9.40)	.18 (4.57)	.106 (2.69)	23.0

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .03$; 3Pl. $\pm .015$
Tolerance on hole size and interaxes dimensions to be $\pm .005$.

Note:

1. Case material: Brass
2. Case finish: Nickel plate

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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	-45° to 80°C Case Temperature	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