

Coaxial

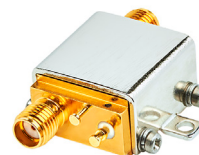
# Wideband Amplifier

## ZX60-V82-S+

50Ω 20 to 6000 MHz

### The Big Deal

- Ultra wideband
- High dynamic range:
  - +19dBm P1dB compression
  - +35dBm Output IP3



CASE STYLE: GC957

### Product Overview

The ZX60-V82-S+ (RoHS compliant) is a very compact wideband amplifier covering 20 to 6000MHz with 13.5dB gain (at 2GHz). Housed in a rugged, cost effective unibody chassis, this amplifier supports a wide variety of applications requiring moderate power output, low distortion and 50 ohm matched input/output ports.

### Key Features

Feature	Advantages
Ultra Wide band high dynamic range	The ZX60-V82-S+ covers a wide spectrum of application frequencies from VHF through 'C' band. When combined with the output power and IP3, this amplifier supports a broad array of systems and test applications.
Well Matched input / output ports	With typical input VSWR of 1.3:1 and output VSWR of 1.5:1 at 2GHz, the ZX60-V82-S+ can be used in cascade with many components and maintain minimal interaction or reflections.
Very small size, 0.75" x 0.75"	The unique unibody construction enables the ZX60-V82-S+ to be used in compact designs.
Unconditionally stable	No adverse effects due to loading of the input and output ports.

#### Notes

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# Wideband Amplifier

## ZX60-V82-S+

50Ω      20 to 6000 MHz

### Features

- Wideband, 20 to 6000 MHz
- Output power at 1dB compression, +19 dBm typ.
- Good output IP3, 35 dBm typ.
- Good VSWR
- Unconditionally stable
- Protected by US patents 6,790,049 & 6,943,629

### Applications

- Base station infrastructure
- CATV & DBS
- MMDS & wireless LAN
- LTE
- Buffer amplifier
- PCS
- Test equipment



Case Style: GC957  
 Connectors    Model  
 SMA            ZX60-V82-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 (MHz)	Min.	Typ.	Max.	Units
Frequency Range		20		6000	MHz
Gain	100	13.5	15.2	16.8	dB
	1000		14.7		
	2000	12.0	13.5	15.2	
	3000		12.3		
	4000	9.5	11.4	13.0	
	6000		9.1		
Output Power at 1dB compression	100	17.0	19.0		dBm
	1000	17.5	19.5		
	2000	18.0	20.0		
	3000		19.7		
	4000		19.4		
	6000		17.5		
Noise Figure	100		6.5	8.0	dB
	1000		6.7		
	2000		6.8	8.4	
	3000		6.9		
	4000		7.0		
	6000		7.7		
Output third order intercept point	100		38.5		dBm
	1000		36.5		
	2000	33.0	35.0		
	3000		34.0		
	4000		33.5		
	6000		31.0		
Input VSWR	100		1.10		:1
	1000		1.15		
	2000		1.30	1.5	
	3000		1.30		
	4000		1.30		
	6000		1.70		
Output VSWR	100		1.30		:1
	1000		1.40		
	2000		1.50	1.9	
	3000		1.70		
	4000		1.70		
	6000		2.30		
Active Directivity	20-6000		11		dB
DC Supply Voltage		4.8	5.0	5.2	V
DC Supply Current			100	120	mA

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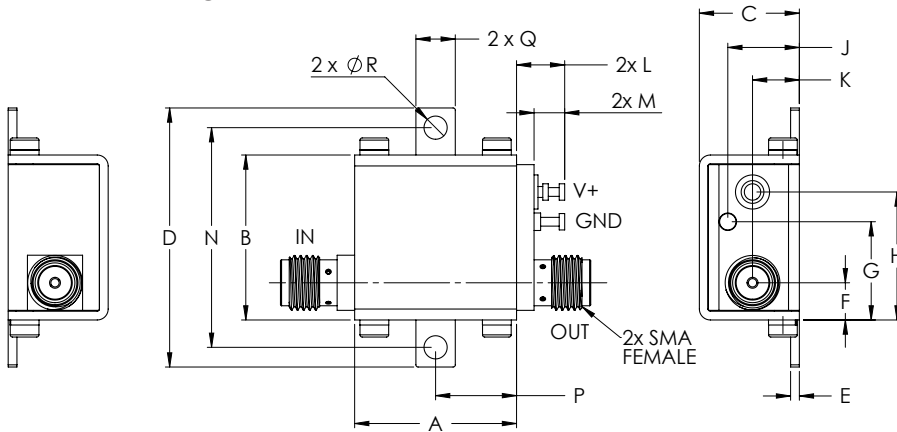


## Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C Case
Storage Temperature	-55°C to 100°C
DC Voltage	5.5 V
Input RF Power (no damage)	20 dBm
Power Consumption	840 mW

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 terminals. See Application Note [AN-40-10](#).

## Outline Dimensions (inch/mm)

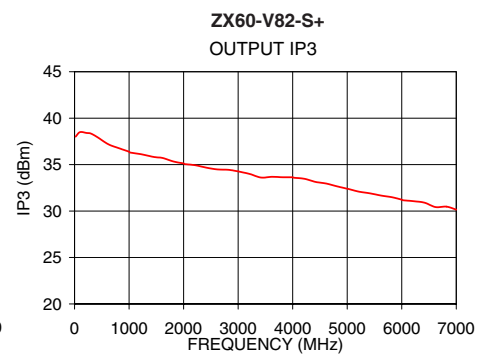
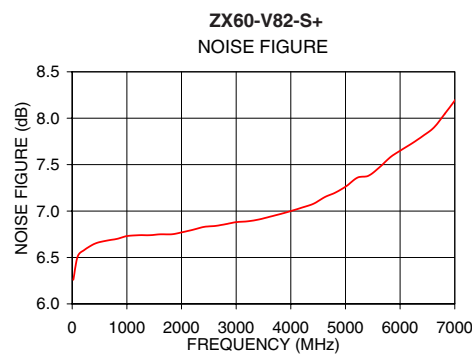
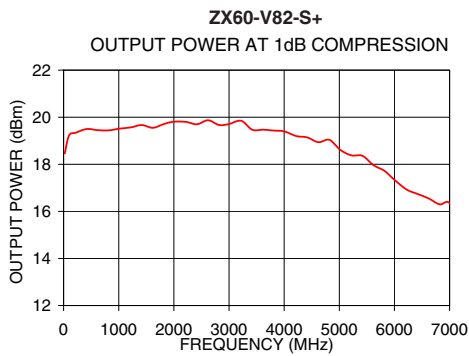
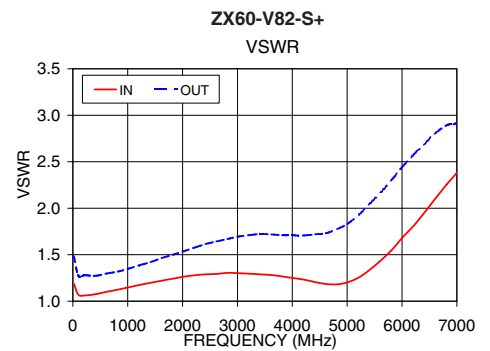
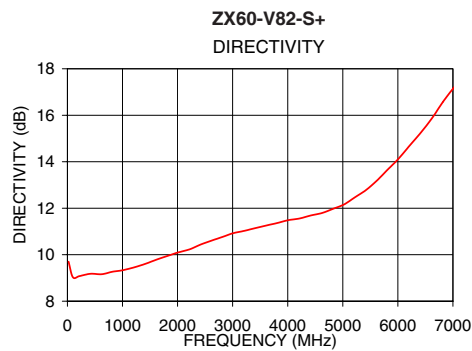
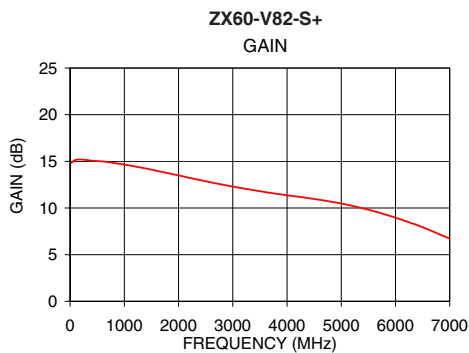
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	WT.
.74	.75	.46	1.18	.04	.17	.45	.59	.33	.21	.22	.14	1.00	.37	.18	.106	GRAM
18.80	19.05	11.68	29.97	1.02	4.32	11.43	14.99	8.38	5.33	5.59	3.56	25.40	9.40	4.57	2.69	23.0

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FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR IN (:1)	VSWR OUT (:1)	POWER OUT @ 1dB COMPRESSION (dBm)	OUTPUT IP3 (dBm)	NF (dB)
20	14.83	9.70	1.19	1.48	18.46	38.01	6.26
100	15.15	9.03	1.07	1.27	19.23	38.50	6.51
420	15.06	9.18	1.08	1.27	19.50	37.95	6.65
1000	14.66	9.33	1.15	1.35	19.51	36.39	6.73
1220	14.43	9.46	1.18	1.39	19.57	36.12	6.74
1420	14.21	9.61	1.20	1.42	19.67	35.86	6.74
1620	13.96	9.79	1.22	1.46	19.55	35.71	6.75
2000	13.49	10.09	1.26	1.53	19.81	35.12	6.77
2220	13.21	10.23	1.28	1.58	19.80	34.93	6.80
2420	12.97	10.44	1.29	1.61	19.70	34.67	6.83
2620	12.72	10.61	1.29	1.64	19.87	34.48	6.84
3000	12.30	10.92	1.30	1.69	19.71	34.27	6.88
3420	11.88	11.15	1.29	1.72	19.47	33.61	6.91
4000	11.36	11.48	1.25	1.71	19.40	33.64	7.00
4420	11.03	11.69	1.20	1.72	19.14	33.14	7.08
5000	10.48	12.18	1.20	1.83	18.72	32.41	7.27
5420	9.94	12.78	1.34	2.05	18.36	31.90	7.38
6000	8.96	14.10	1.68	2.44	17.34	31.22	7.65
6620	7.66	15.87	2.11	2.81	16.55	30.43	7.90
7000	6.73	17.14	2.38	2.92	16.35	30.15	8.19



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# Amplifier

# ZX60-V82-S+

## Typical Performance Data

**NOTE: Use PDF Bookmarks to view DATA at required conditions or to view GRAPHS.**

**Definitions:**

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 97mA, Vd = 5V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
					K	Delta			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
20	14.83	24.53	21.40	14.26	1.64	0.34	38.01	18.46	6.26
100	15.15	24.18	29.45	18.36	1.57	0.36	38.50	19.23	6.51
220	15.19	24.27	30.46	18.22	1.58	0.35	38.41	19.34	6.58
300	15.17	24.19	30.16	18.46	1.57	0.36	38.34	19.46	6.63
420	15.06	24.24	28.73	18.39	1.59	0.35	37.95	19.50	6.65
620	14.98	24.14	26.33	17.74	1.58	0.35	37.19	19.45	6.68
820	14.81	24.08	24.68	17.25	1.59	0.34	36.75	19.44	6.70
1000	14.66	23.99	23.27	16.60	1.59	0.33	36.39	19.51	6.73
1220	14.43	23.89	21.87	15.79	1.59	0.32	36.12	19.57	6.74
1420	14.21	23.82	20.89	15.20	1.60	0.32	35.86	19.67	6.74
1500	14.11	23.80	20.51	14.90	1.61	0.31	35.79	19.57	6.74
1620	13.96	23.75	20.06	14.51	1.62	0.31	35.71	19.55	6.75
1820	13.72	23.67	19.32	14.00	1.63	0.30	35.33	19.71	6.75
2000	13.49	23.58	18.74	13.54	1.64	0.29	35.12	19.81	6.77
2220	13.21	23.44	18.24	13.01	1.65	0.28	34.93	19.80	6.80
2420	12.97	23.41	17.98	12.58	1.67	0.27	34.67	19.70	6.83
2620	12.72	23.33	17.86	12.28	1.69	0.26	34.48	19.87	6.84
2820	12.49	23.26	17.58	12.02	1.70	0.26	34.44	19.67	6.86
3000	12.30	23.22	17.63	11.78	1.72	0.25	34.27	19.71	6.88
3220	12.07	23.10	17.80	11.63	1.74	0.25	33.98	19.85	6.89
3420	11.88	23.03	17.99	11.52	1.76	0.24	33.61	19.47	6.91
3620	11.69	22.95	18.18	11.56	1.78	0.24	33.69	19.47	6.94
3820	11.52	22.89	18.61	11.64	1.81	0.24	33.64	19.43	6.97
4000	11.36	22.84	19.08	11.65	1.83	0.24	33.64	19.40	7.00
4220	11.20	22.76	19.71	11.66	1.85	0.24	33.47	19.20	7.04
4420	11.03	22.72	20.66	11.55	1.88	0.24	33.14	19.14	7.08
4620	10.86	22.65	21.47	11.44	1.90	0.24	32.96	18.94	7.15
4820	10.67	22.64	21.60	11.07	1.93	0.24	32.65	19.04	7.20
5000	10.48	22.66	20.77	10.65	1.96	0.24	32.41	18.72	7.27
5220	10.21	22.68	18.85	9.94	1.99	0.25	32.08	18.38	7.36
5420	9.94	22.72	16.71	9.24	2.01	0.25	31.90	18.36	7.38
5620	9.64	22.83	14.86	8.64	2.05	0.26	31.67	17.96	7.47
5820	9.29	22.96	13.27	8.05	2.09	0.26	31.49	17.72	7.58
6000	8.96	23.06	11.92	7.56	2.12	0.27	31.22	17.34	7.65
6220	8.53	23.24	10.76	7.10	2.17	0.28	31.06	16.93	7.73
6420	8.12	23.38	9.77	6.76	2.22	0.28	30.90	16.74	7.81
6620	7.66	23.53	8.94	6.46	2.27	0.29	30.43	16.55	7.90
7000	6.73	23.87	7.78	6.20	2.44	0.29	30.15	16.35	8.19



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# Amplifier

# ZX60-V82-S+

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 94mA, Vd = 5V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
					K	Delta			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
20	15.01	24.51	22.04	15.63	1.62	0.35	38.15	18.37	6.34
100	15.19	24.30	27.51	17.77	1.58	0.36	38.80	19.24	6.09
220	15.21	24.17	28.65	17.25	1.56	0.36	38.44	19.14	6.06
300	15.19	24.17	30.35	18.01	1.56	0.36	38.29	19.20	6.07
420	15.11	24.14	29.97	18.71	1.57	0.35	37.92	19.24	6.10
620	15.04	24.05	26.86	17.76	1.56	0.35	37.17	19.21	6.12
820	14.86	24.05	24.87	16.90	1.57	0.34	36.74	19.23	6.13
1000	14.73	23.91	23.22	16.36	1.56	0.34	36.40	19.31	6.15
1220	14.51	23.82	21.82	15.64	1.57	0.33	36.16	19.34	6.16
1420	14.30	23.69	20.60	15.46	1.57	0.33	35.96	19.50	6.15
1500	14.21	23.66	20.15	15.23	1.58	0.32	35.92	19.42	6.14
1620	14.07	23.60	19.80	14.88	1.58	0.32	35.87	19.39	6.13
1820	13.84	23.49	19.39	14.34	1.59	0.31	35.46	19.53	6.14
2000	13.63	23.42	19.24	13.70	1.60	0.30	35.28	19.60	6.16
2220	13.33	23.38	19.12	12.87	1.62	0.29	35.13	19.61	6.16
2420	13.08	23.25	18.66	12.32	1.62	0.28	34.89	19.59	6.19
2620	12.83	23.21	18.18	11.91	1.64	0.27	34.74	19.72	6.22
2820	12.60	23.14	17.69	11.77	1.66	0.26	34.73	19.55	6.24
3000	12.42	23.09	17.52	11.67	1.68	0.26	34.60	19.60	6.19
3220	12.20	22.98	17.54	11.63	1.69	0.25	34.36	19.89	6.15
3420	12.03	22.88	17.76	11.64	1.71	0.25	34.09	19.53	6.16
3620	11.87	22.79	17.92	11.75	1.72	0.25	34.16	19.50	6.17
3820	11.71	22.68	18.02	11.99	1.74	0.25	34.16	19.57	6.20
4000	11.57	22.64	18.88	11.76	1.76	0.25	34.12	19.67	6.24
4220	11.40	22.57	20.54	11.58	1.78	0.25	34.01	19.51	6.30
4420	11.25	22.50	22.36	11.20	1.80	0.26	33.72	19.32	6.34
4620	11.08	22.46	23.34	10.99	1.82	0.26	33.57	19.20	6.40
4820	10.89	22.47	22.47	10.61	1.85	0.26	33.22	19.28	6.44
5000	10.69	22.50	21.03	10.00	1.87	0.26	33.03	18.97	6.48
5220	10.44	22.53	18.02	9.39	1.89	0.27	32.65	18.69	6.55
5420	10.19	22.58	15.90	8.92	1.91	0.27	32.50	18.75	6.60
5620	9.94	22.61	14.21	8.62	1.93	0.27	32.31	18.34	6.65
5820	9.68	22.64	13.54	8.13	1.95	0.27	32.12	18.22	6.69
6000	9.40	22.75	12.69	7.57	1.98	0.28	31.83	17.70	6.76
6220	9.05	22.88	11.46	7.14	2.01	0.29	31.66	17.32	6.83
6420	8.70	22.91	10.53	6.80	2.03	0.30	31.51	17.32	6.85
6620	8.30	23.09	9.59	6.30	2.05	0.31	31.04	17.18	6.98
6820	7.80	23.31	8.60	5.84	2.10	0.32	31.09	16.72	7.19
7000	7.35	23.48	7.79	5.58	2.14	0.33	30.73	16.66	7.31



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# Amplifier

# ZX60-V82-S+

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 99mA, Vd = 5V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
					K	Delta			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
20	14.71	24.60	21.12	14.75	1.67	0.34	37.57	18.51	7.53
100	15.11	24.14	30.91	19.04	1.57	0.36	38.38	19.54	7.32
220	15.14	24.19	31.65	19.49	1.58	0.35	38.29	19.48	7.31
300	15.10	24.13	30.00	19.24	1.57	0.35	38.22	19.60	7.33
420	15.00	24.17	28.10	18.51	1.59	0.35	37.83	19.64	7.35
620	14.92	24.08	25.35	17.63	1.58	0.35	37.03	19.61	7.38
820	14.72	24.06	23.91	16.87	1.59	0.34	36.56	19.58	7.41
1000	14.58	23.96	22.46	16.37	1.59	0.33	36.15	19.63	7.43
1220	14.35	23.87	21.20	15.58	1.60	0.32	35.83	19.70	7.45
1420	14.12	23.80	20.45	14.99	1.61	0.31	35.50	19.76	7.45
1500	14.02	23.75	20.15	14.64	1.61	0.31	35.41	19.63	7.46
1620	13.88	23.71	19.74	14.31	1.62	0.30	35.29	19.64	7.46
1820	13.63	23.63	19.14	13.85	1.63	0.29	34.89	19.78	7.47
2000	13.41	23.58	18.44	13.39	1.65	0.28	34.61	19.89	7.49
2220	13.11	23.43	17.93	12.90	1.66	0.28	34.41	19.88	7.52
2420	12.86	23.37	17.56	12.45	1.67	0.27	34.08	19.74	7.55
2620	12.60	23.29	17.31	12.17	1.69	0.26	33.86	19.86	7.58
2820	12.37	23.23	17.01	11.96	1.71	0.25	33.76	19.65	7.60
3000	12.16	23.14	16.86	11.75	1.72	0.25	33.57	19.70	7.59
3220	11.91	23.08	17.03	11.53	1.75	0.24	33.25	19.69	7.58
3420	11.70	23.04	17.17	11.37	1.78	0.23	32.96	19.30	7.62
3620	11.51	22.96	17.42	11.43	1.80	0.23	32.97	19.31	7.66
3820	11.33	22.87	17.90	11.57	1.83	0.23	32.86	19.26	7.72
4000	11.16	22.82	18.54	11.47	1.85	0.23	32.78	19.15	7.74
4220	10.97	22.74	19.12	11.53	1.88	0.23	32.64	18.86	7.78
4420	10.79	22.68	19.85	11.44	1.91	0.23	32.29	18.85	7.83
4620	10.61	22.64	20.36	11.44	1.94	0.23	32.07	18.63	7.89
4820	10.38	22.65	20.29	11.08	1.98	0.23	31.81	18.68	7.96
5000	10.17	22.67	19.14	10.71	2.02	0.23	31.61	18.41	8.00
5220	9.89	22.73	17.60	10.09	2.06	0.24	31.30	18.03	8.09
5420	9.60	22.76	16.12	9.43	2.09	0.24	31.11	18.07	8.16
5620	9.29	22.86	14.49	8.90	2.14	0.25	30.92	17.59	8.25
5820	8.92	22.95	12.83	8.17	2.16	0.25	30.77	17.36	8.35
6000	8.56	23.11	11.53	7.64	2.20	0.26	30.48	16.95	8.45
6220	8.11	23.26	10.45	7.10	2.25	0.27	30.33	16.63	8.60
6420	7.67	23.40	9.50	6.78	2.30	0.27	30.21	16.31	8.68
6620	7.19	23.61	8.58	6.32	2.34	0.28	29.83	16.09	8.84
6820	6.69	23.75	7.86	6.11	2.41	0.29	29.82	15.92	9.04
7000	6.25	23.86	7.55	6.06	2.50	0.28	29.48	15.77	9.09



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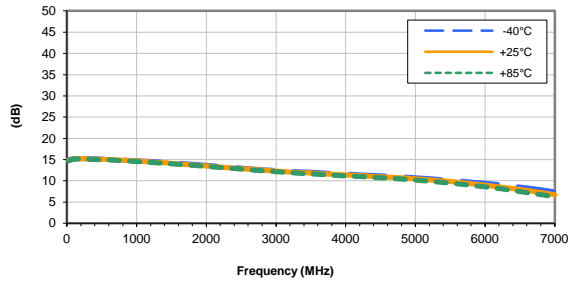
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## Typical Performance Curves

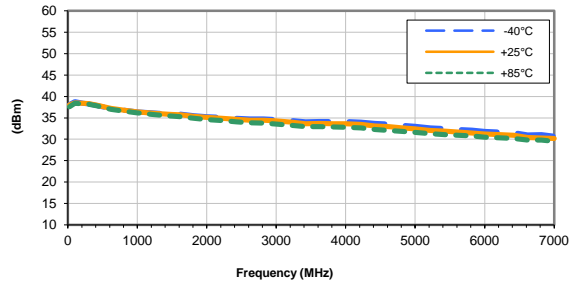
**GAIN vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -25, VOLTAGE = 5V



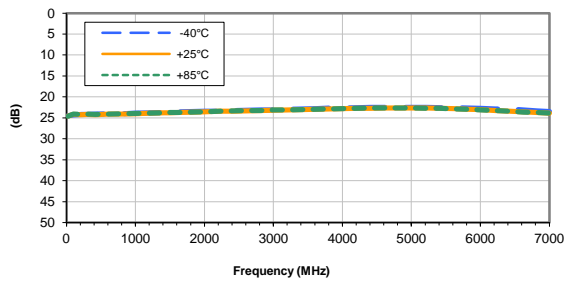
**OUTPUT IP3 vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -10, VOLTAGE = 5V



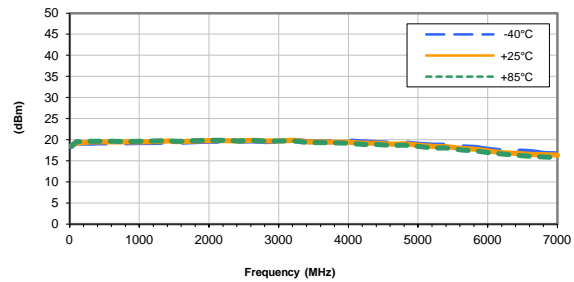
**ISOLATION vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -25, VOLTAGE = 5V



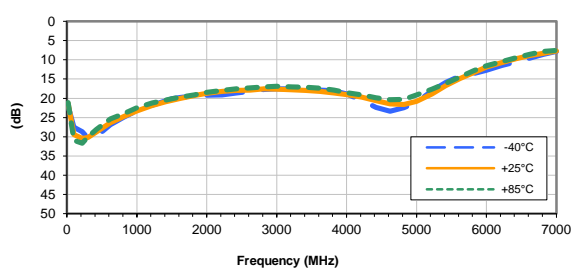
**OUTPUT POWER at 1dB COMPRESSION vs. FREQUENCY & TEMPERATURE**

VOLTAGE = 5V



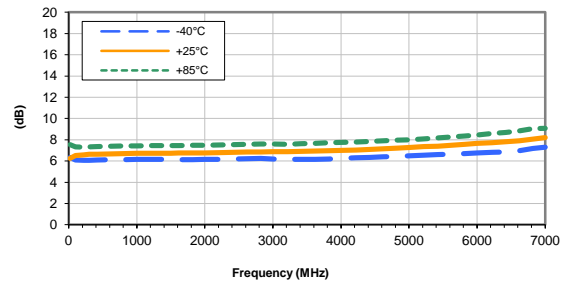
**INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -25, VOLTAGE = 5V



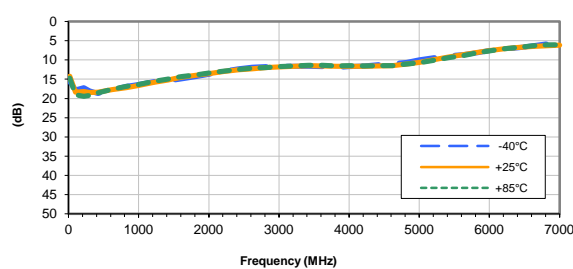
**NOISE FIGURE vs. FREQUENCY & TEMPERATURE**

VOLTAGE = 5V



**OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -25, VOLTAGE = 5V



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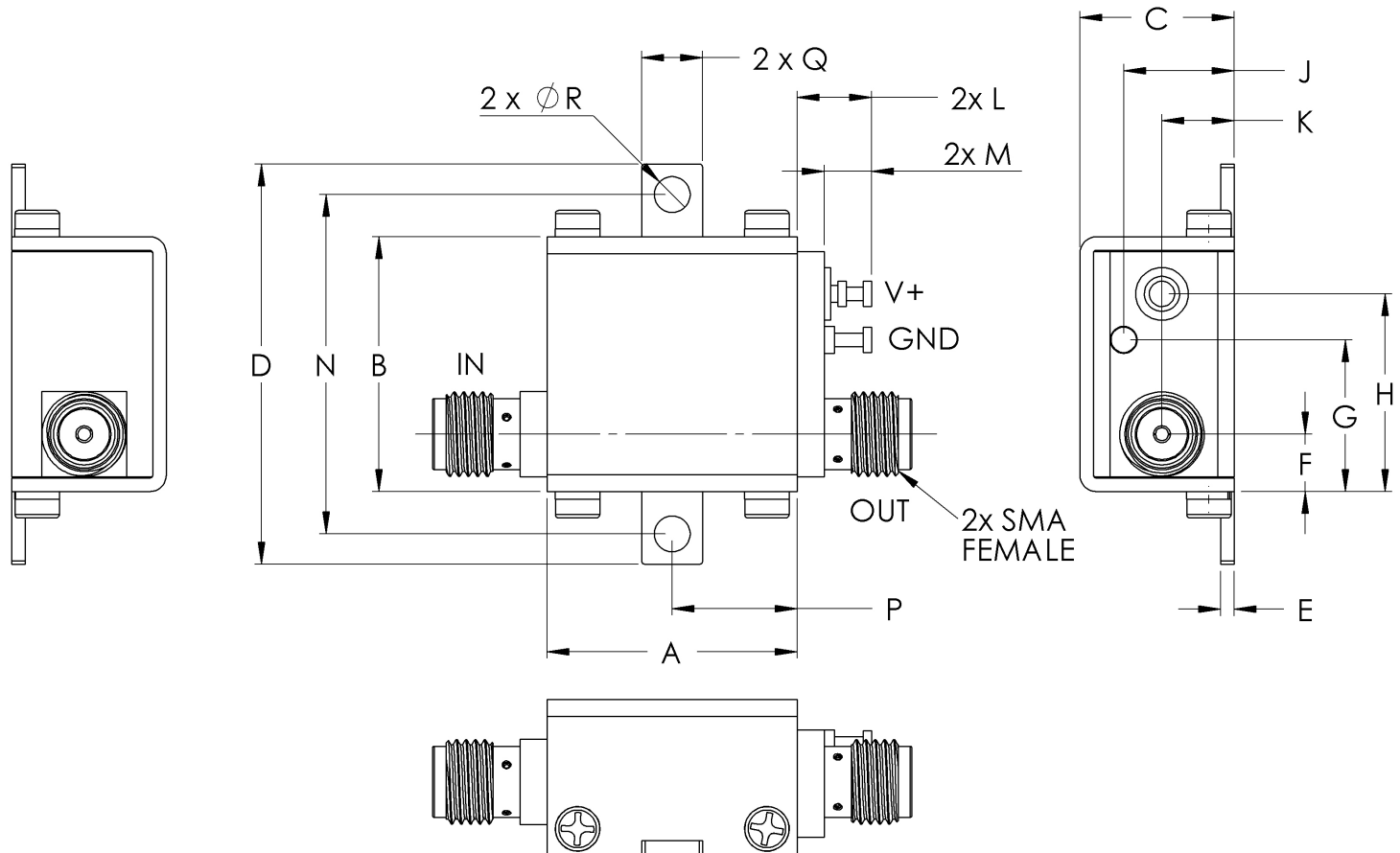


# Case Style

# 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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Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85° 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