Ultra Low Noise

Amplifier

ZX60-1614LN-S

50Ω 1217 MHz to 1620 MHz

Features

- Ultra low noise figure 0.5 typ.
- 11V-13V operation
- Good IP3, +30 dBm typ.
- Reverse voltage connection protected
- Small size
- Low cost
- Protected by US patent 6,790,049

Applications

- Low noise amplifier RF front end
- Low noise pre-amp
- Buffer amplifier
- LNA for dual GPS application, 1227MHz and 1559MHz
- General purpose small signal
- Lab
- Instrumentation
- Test equipment

CASE STYLE: GA955

Connectors	Model
SMA	ZX60-1614LN-S

+RoHS Compliant

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

Electrical Specifications at T_{AMB} = 25°C

MODEL NO.	FREQ. (MHz)	GAIN (dB)				MAXIMUM POWER (dBm)	DYNAMIC RANGE			VSWR (:1) Typ.		ACTIVE DIRECTIVITY (dB) Isolation-Gain	DC VOLTAGE @ Pin V+ (V)	DC OPERATING CURRENT @ Pin V+ (mA)	
				Flatness		Output (1 dB Comp.)	NF (dB)		IP3 (dBm)						
	f_L- f_U	Typ.	Min.	Typ.	Max.	Typ.	Typ.	Max	Typ.	In	Out	Typ.		Typ.	Max.
ZX60-1614LN-S	1217-1620	14	11	±1.1	±2.0	13.5	0.5	0.9	30	1.3	1.3	11.5	12	42	50

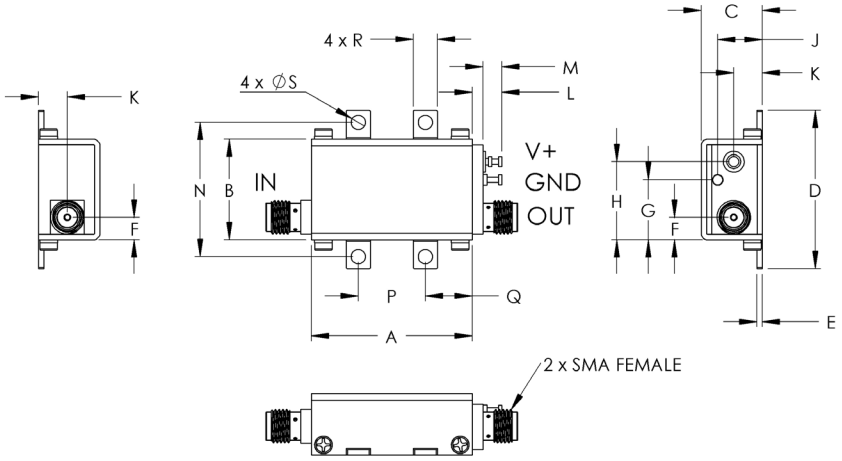
Maximum Ratings

Operating Temperature	-40°C to 80°C case
Storage Temperature	-55°C to 100°C
DC Voltage	15V
Input Power(no Damage)	13dBm

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)

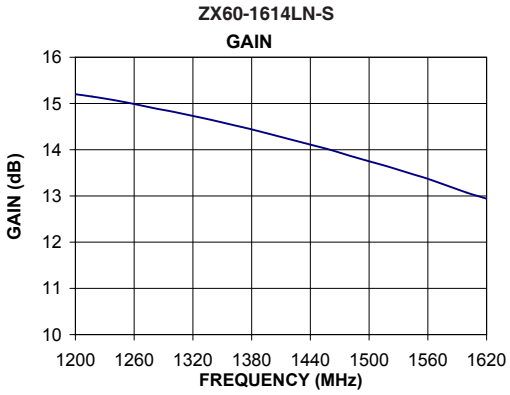
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	wt.
1.20	.75	.46	1.18	.04	.17	.45	.59	.33	.21	.22	.14	1.00	.50	.35	.18	.106	grams
30.48	19.05	11.68	29.97	1.02	4.32	11.43	14.99	8.38	5.33	5.59	3.56	25.40	12.70	8.89	4.57	2.69	35.0

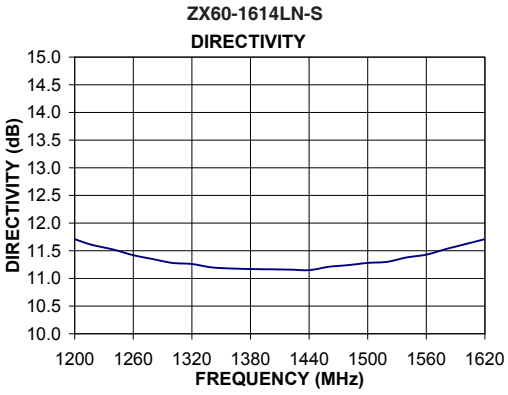
Notes

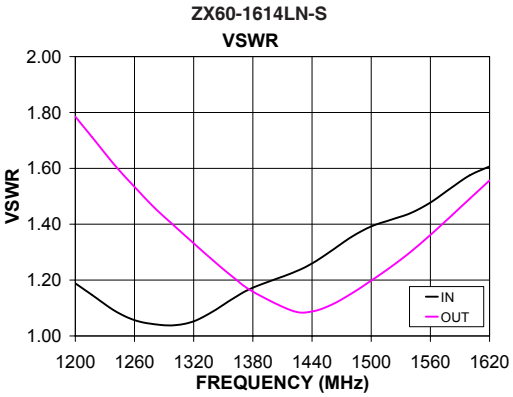
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document 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

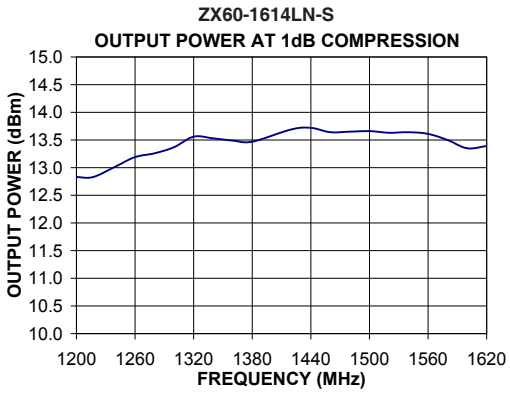
Typical Performance Data & Curves at 25°C ZX60-1614LN-S

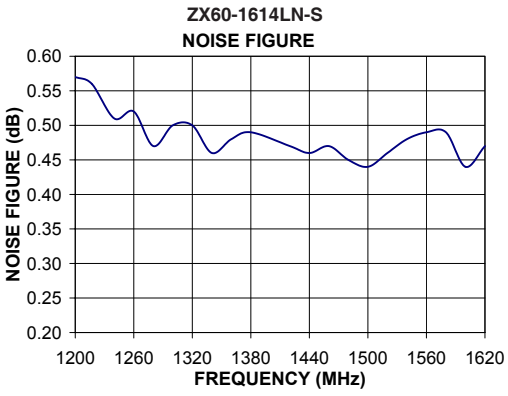
FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR IN (:1)	VSWR OUT (:1)	POWER OUT @1dB COMPRESSION (dBm)	IP3 (dBm)	NF (dB)
1217	15.15	11.61	1.15	1.71	12.83	28.05	0.56
1240	15.07	11.52	1.09	1.61	13.02	28.46	0.51
1260	14.99	11.42	1.06	1.53	13.19	28.60	0.52
1280	14.90	11.35	1.04	1.46	13.26	28.81	0.47
1300	14.82	11.28	1.04	1.40	13.37	29.45	0.50
1320	14.73	11.26	1.05	1.33	13.56	29.89	0.50
1340	14.64	11.20	1.09	1.27	13.53	30.29	0.46
1360	14.54	11.18	1.13	1.21	13.49	30.39	0.48
1380	14.44	11.17	1.17	1.16	13.47	30.48	0.49
1420	14.22	11.16	1.23	1.09	13.69	31.44	0.47
1440	14.11	11.15	1.26	1.09	13.72	31.57	0.46
1460	14.00	11.21	1.31	1.11	13.64	31.66	0.47
1480	13.87	11.24	1.35	1.15	13.65	31.31	0.45
1500	13.75	11.28	1.39	1.20	13.66	31.52	0.44
1520	13.63	11.30	1.42	1.25	13.63	31.61	0.46
1540	13.50	11.38	1.44	1.30	13.64	31.47	0.48
1560	13.37	11.43	1.48	1.36	13.61	31.15	0.49
1580	13.22	11.53	1.53	1.43	13.50	30.74	0.49
1600	13.07	11.62	1.58	1.49	13.35	30.79	0.44
1620	12.94	11.71	1.61	1.56	13.39	30.90	0.47

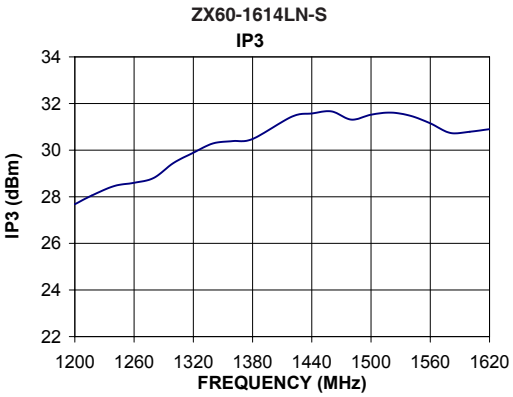












Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document 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

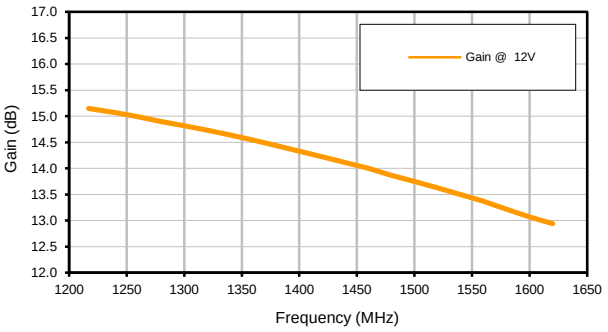
Amplifier ZX60-1614LN-S

Typical Performance Data

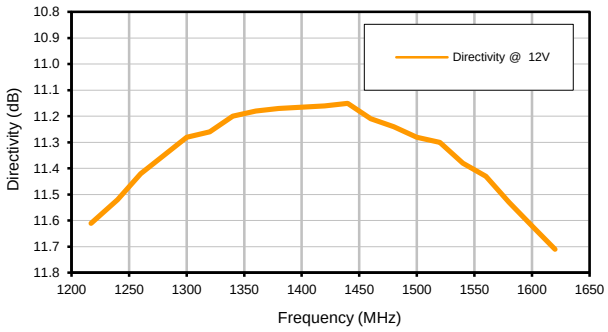
FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR IN (:1) 12V	VSWR OUT (:1) 12V	Output IP3 (dBm) 12V	NOISE FIGURE (dB) 12V	Pout at 1dB Comp. (dBm) 12V
1217	15.15	11.61	1.15	1.71	28.05	0.56	12.83
1240	15.07	11.52	1.09	1.61	28.46	0.51	13.02
1260	14.99	11.42	1.06	1.53	28.60	0.52	13.19
1280	14.90	11.35	1.04	1.46	28.81	0.47	13.26
1300	14.82	11.28	1.04	1.40	29.45	0.50	13.37
1320	14.73	11.26	1.05	1.33	29.89	0.50	13.56
1340	14.64	11.20	1.09	1.27	30.29	0.46	13.53
1360	14.54	11.18	1.13	1.21	30.39	0.48	13.49
1380	14.44	11.17	1.17	1.16	30.48	0.49	13.47
1420	14.22	11.16	1.23	1.09	31.44	0.47	13.69
1440	14.11	11.15	1.26	1.09	31.57	0.46	13.72
1460	14.00	11.21	1.31	1.11	31.66	0.47	13.64
1480	13.87	11.24	1.35	1.15	31.31	0.45	13.65
1500	13.75	11.28	1.39	1.20	31.52	0.44	13.66
1520	13.63	11.30	1.42	1.25	31.61	0.46	13.63
1540	13.50	11.38	1.44	1.30	31.47	0.48	13.64
1560	13.37	11.43	1.48	1.36	31.15	0.49	13.61
1580	13.22	11.53	1.53	1.43	30.74	0.49	13.50
1600	13.07	11.62	1.58	1.49	30.79	0.44	13.35
1620	12.94	11.71	1.61	1.56	30.90	0.47	13.39

Typical Performance Curves

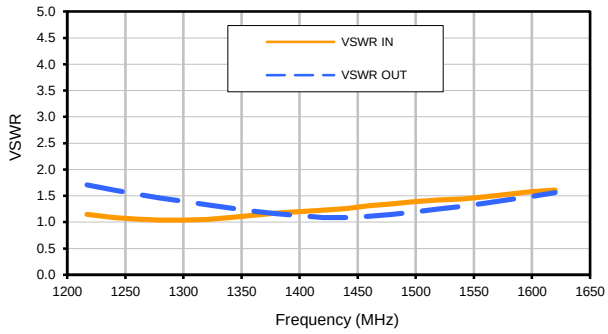
Gain



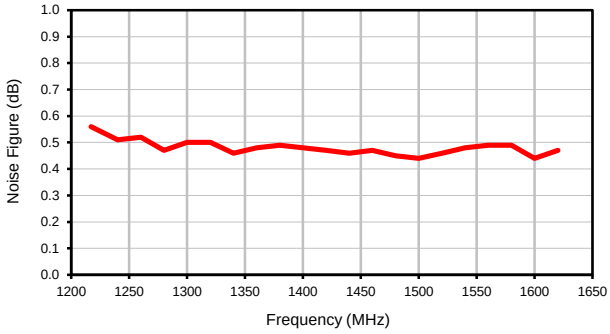
Directivity



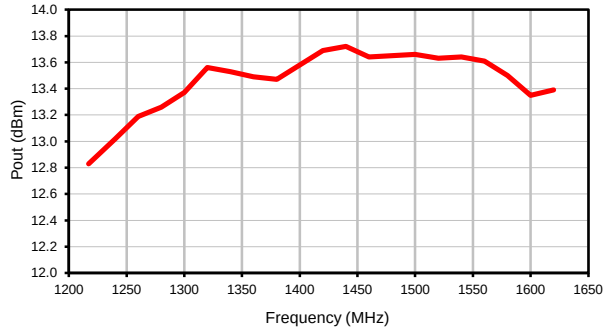
VSWR @ 12V



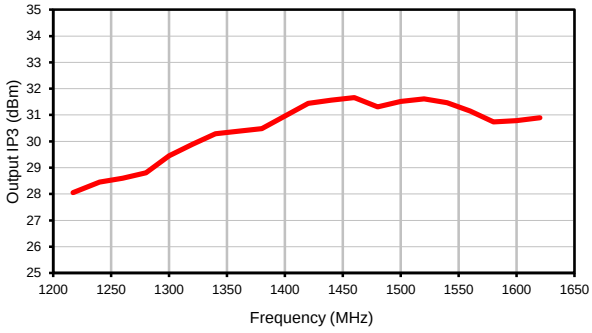
Noise Figure @ 12V



Pout at 1dB Compression @ 12V



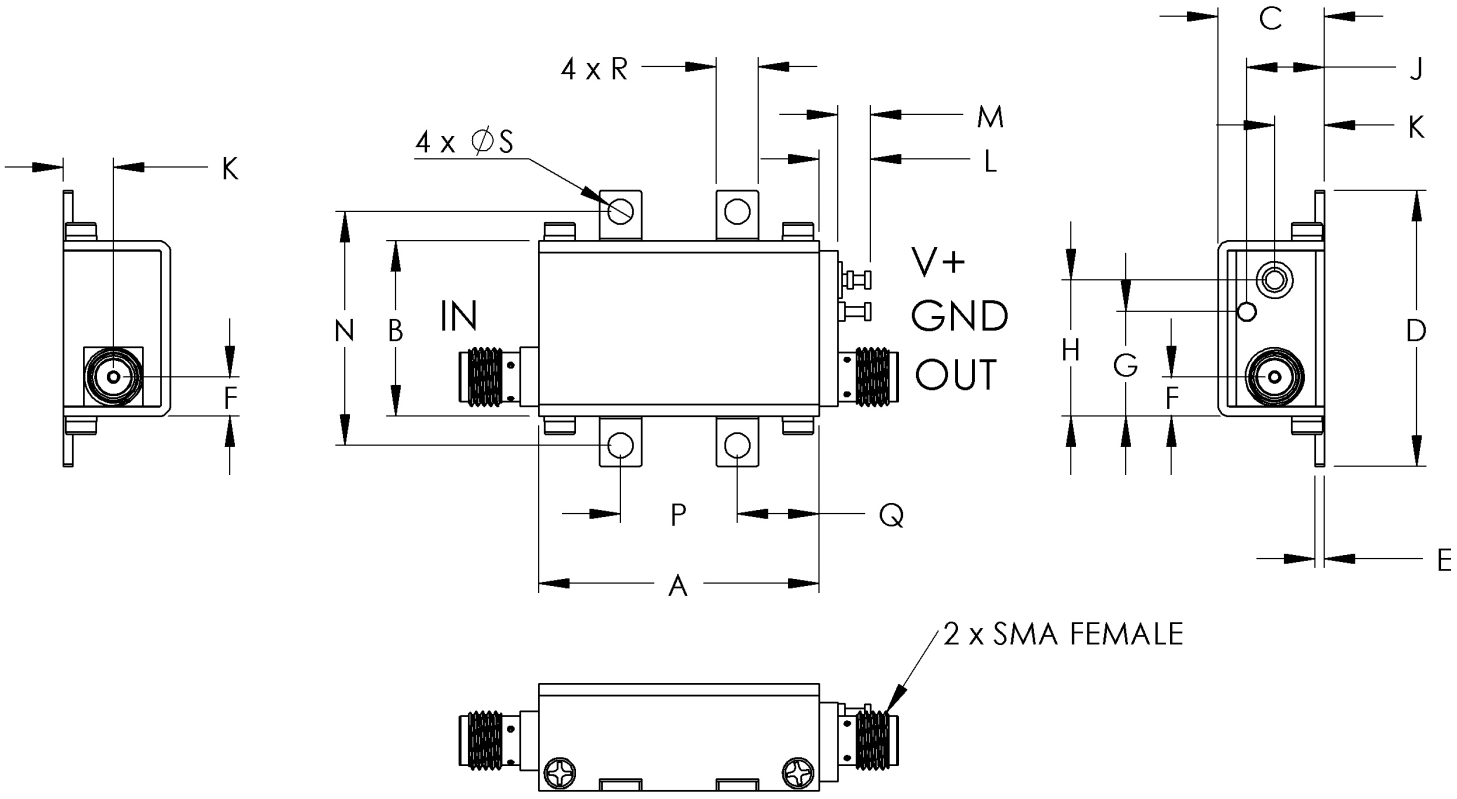
Output IP3 @ 12V



Case Style GA

Outline Dimensions

GA955



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N
GA955	1.20 (30.48)	.75 (19.05)	.46 (11.61)	1.18 (29.97)	.04 (1.02)	.17 (4.27)	.45 (11.35)	.58 (14.81)	.33 (8.46)	.21 (5.44)	.22 (5.59)	.14 (3.56)	1.000 (25.4)

CASE #.	P	Q	R	S	WT GRAMS
GA955	.500 (12.70)	.35 (8.89)	.18 (4.57)	.106 (2.69)	35.0

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

Note:

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

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
*Mini-Circuits **ISO 9001 & ISO 14001** Certified*

Mini-Circuits

Environmental Specifications **ENV23T17**

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	-40° 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