High IP3

Low Noise Amplifier

ZRL-1150LN+

50Ω 650 to 1400 MHz

Features

- High IP3, +40 dBm typ.
- Low Noise figure, 0.8 dB typ.
- Broadband flat gain response
- Internal voltage regulated
- Over-voltage and transient protected

Applications

- Very low noise, preamplifier
- Analog/digital cellular
- PCS, GSM, TDMA, CDMA
- GPS and MAS
- Aeronautical and defense communications

Generic photo used for illustration purposes only

Case Style: FJ893

Connectors	Model
SMA	ZRL-1150LN+

+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		650		1400	MHz
Noise Figure	650 - 1400 685 - 1000	— —	1.1 0.8	1.7 1.4	dB
Gain	650 - 1400 685 - 1000	25 27	32 34	— —	dB
Gain Flatness	650 - 1400 685 - 1000	— —	±2.0 ±0.5	— ±1.0	dB
Output Power at 1dB compression	650 - 1400 685 - 1000	22 22	25 25	— —	dBm
Output Power at 3dB compression	650 - 1400 685 - 1000	— —	26.3 26.0	— —	dBm
Output third order intercept point[1]	650 - 1400 685 - 1000	— —	+41 +41	— —	dBm
Input VSWR	650 - 1400 685 - 1000	— —	1.25 1.20	— —	:1
Output VSWR	650 - 1400 685 - 1000	— —	1.20 1.25	— —	:1
Active Directivity	650 - 1400 685 - 1000	— —	14 15	— —	dB
DC Supply Voltage[2]		—	12	—	V
Supply Current		—	400	500	mA

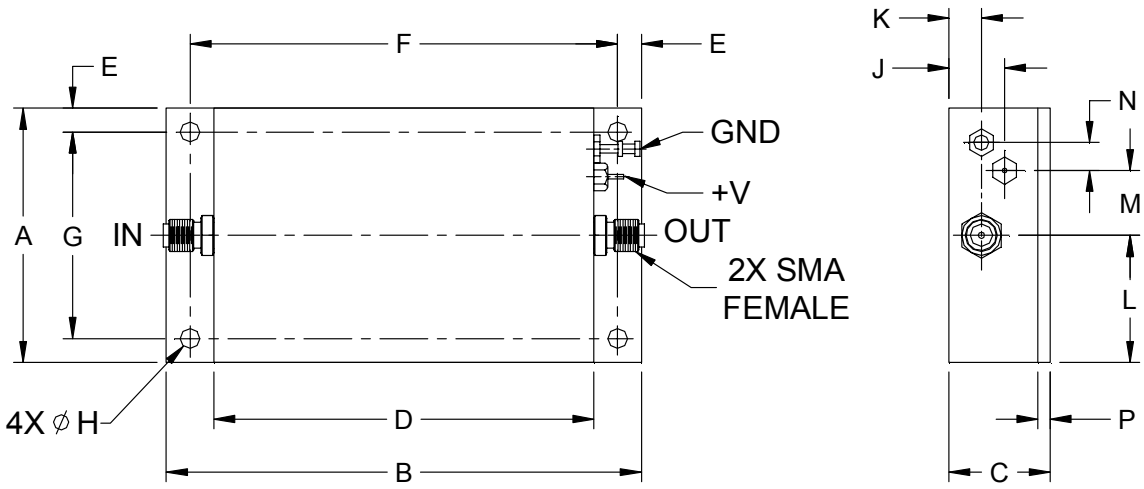
1. 1 MHz tonse spacing.
2. Unit is internally voltage regulated for 6.5 to 17VDC input voltage range.

Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 80°C case -40°C to 60° ambient
Storage Temperature	-55°C to 100°C
DC Voltage	+17V
Input RF Power (no damage)	+10 dBm

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	wt
2.00	3.75	0.80	3.00	0.19	3.374	1.624	0.156	0.44	0.26	1.00	0.51	0.22	0.10	grams
50.80	95.25	20.32	76.20	4.83	85.70	41.25	3.96	11.18	6.60	25.40	12.95	5.59	2.54	135

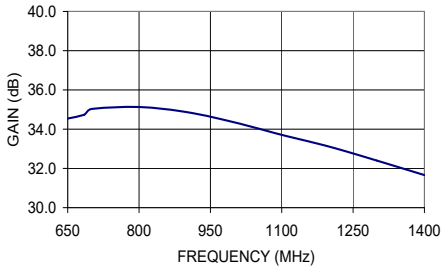
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

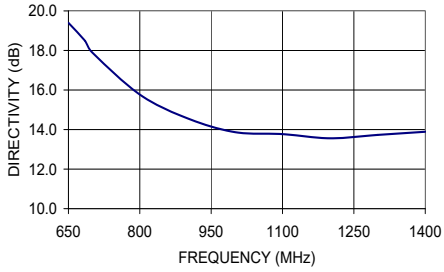
ZRL-1150LN+

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		NOISE FIGURE (dB)	POUT at 1dB COMPR. (dBm)	OUTPUT IP3 (dBm)
	12V	12V	IN	OUT	12V	12V	12V
650.00	34.54	19.40	1.55	1.14	1.03	25.15	41.25
685.00	34.74	18.48	1.51	1.10	0.93	25.19	41.26
700.00	35.03	17.90	1.48	1.10	0.86	25.23	41.51
800.00	35.13	15.77	1.35	1.22	0.73	25.32	42.02
900.00	34.87	14.57	1.23	1.20	0.68	25.15	41.91
1000.00	34.35	13.87	1.23	1.12	0.71	25.15	41.98
1100.00	33.71	13.77	1.26	1.11	0.77	25.61	41.59
1200.00	33.11	13.56	1.18	1.06	0.81	25.55	41.39
1300.00	32.40	13.73	1.22	1.11	0.87	25.35	41.95
1400.00	31.66	13.89	1.45	1.26	1.01	25.10	42.59

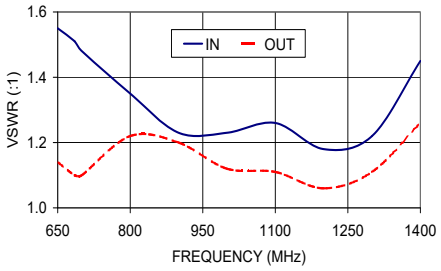
ZRL-1150LN+
GAIN



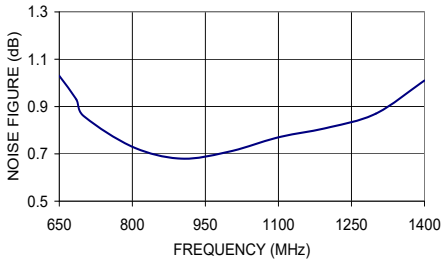
ZRL-1150LN+
DIRECTIVITY



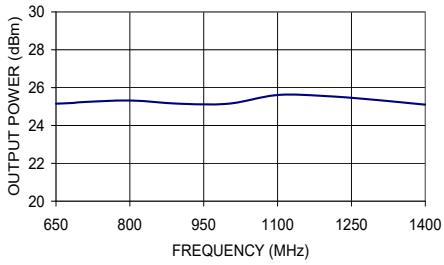
ZRL-1150LN+
VSWR



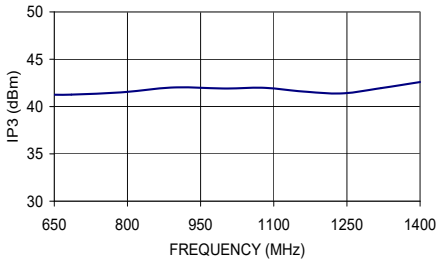
ZRL-1150LN+
NOISE FIGURE



ZRL-1150LN+
OUTPUT POWER AT 1-dB COMPRESSION



ZRL-1150LN+
IP3



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Low Noise Amplifier ZRL-1150LN+

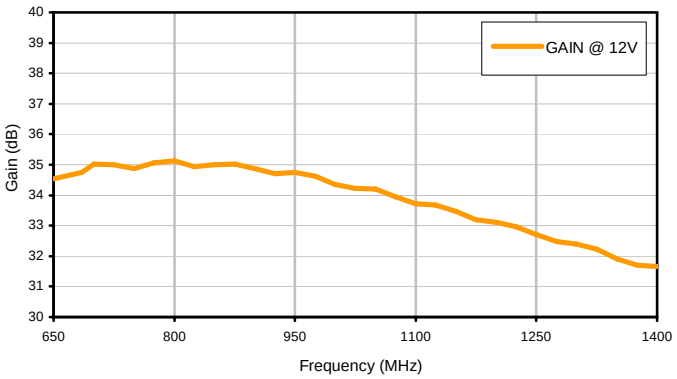
Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR (:1) IN 12V	VSWR (:1) OUT 12V	NOISE FIGURE (dB) 12V	POUT @ 1 dB COMPRESSION (dBm) 12V
650.0	34.54	19.40	1.55	1.14	1.03	25.15
685.0	34.74	18.48	1.51	1.10	0.93	25.19
700.0	35.03	17.90	1.48	1.10	0.86	25.23
725.0	35.01	17.37	1.39	1.12	0.80	25.23
750.0	34.87	17.22	1.35	1.15	0.76	25.29
775.0	35.07	16.35	1.37	1.18	0.74	25.43
800.0	35.13	15.77	1.35	1.22	0.73	25.32
825.0	34.93	15.55	1.26	1.25	0.68	25.32
850.0	35.01	15.01	1.23	1.22	0.69	25.24
875.0	35.03	14.87	1.24	1.19	0.70	25.22
900.0	34.87	14.57	1.23	1.20	0.68	25.15
925.0	34.71	14.34	1.22	1.21	0.72	25.14
950.0	34.74	14.24	1.20	1.18	0.67	25.16
975.0	34.63	13.75	1.19	1.12	0.69	25.11
1000.0	34.35	13.87	1.23	1.12	0.71	25.15
1025.0	34.23	14.08	1.27	1.17	0.73	25.28
1050.0	34.21	13.76	1.28	1.18	0.76	25.47
1075.0	33.94	13.63	1.25	1.14	0.78	25.54
1100.0	33.71	13.77	1.26	1.11	0.77	25.61
1125.0	33.67	13.70	1.29	1.16	0.76	25.61
1150.0	33.47	13.68	1.30	1.18	0.80	25.66
1175.0	33.19	13.70	1.24	1.13	0.78	25.64
1200.0	33.11	13.56	1.18	1.06	0.81	25.55
1225.0	32.97	13.54	1.21	1.06	0.81	25.52
1250.0	32.72	13.55	1.23	1.09	0.80	25.44
1275.0	32.48	13.73	1.22	1.09	0.83	25.50
1300.0	32.40	13.73	1.22	1.11	0.87	25.35
1325.0	32.22	13.77	1.23	1.08	0.87	25.38
1350.0	31.91	13.85	1.28	1.08	0.91	25.30
1375.0	31.71	13.98	1.38	1.19	0.99	25.27
1400.0	31.66	13.89	1.45	1.26	1.01	25.10

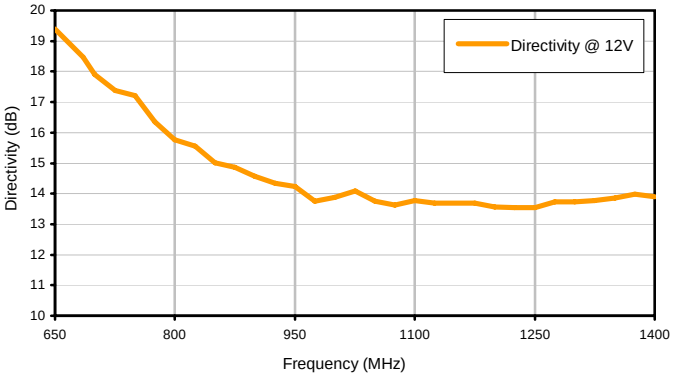
FREQUENCY (MHz)	OUTPUT IP3 (dBm) 12V
650.0	41.25
657.0	41.33
664.0	41.55
671.0	41.32
678.0	41.46
685.0	41.26
790.0	41.51
895.0	42.02
1000.0	41.91
1080.0	41.98
1160.0	41.59
1240.0	41.39
1320.0	41.95
1400.0	42.59

Typical Performance Curves

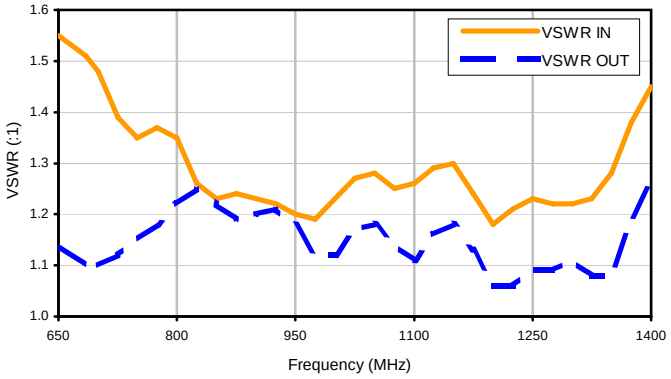
Gain



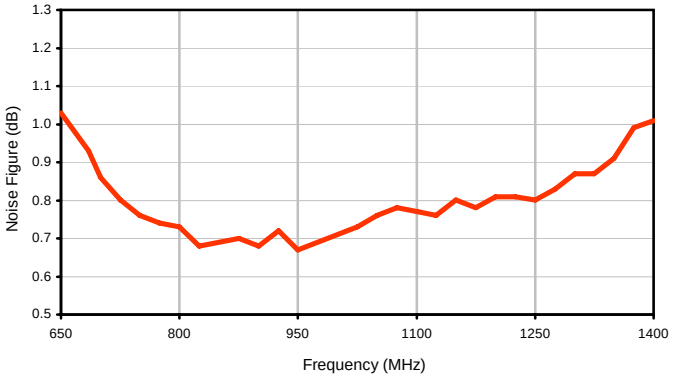
Directivity



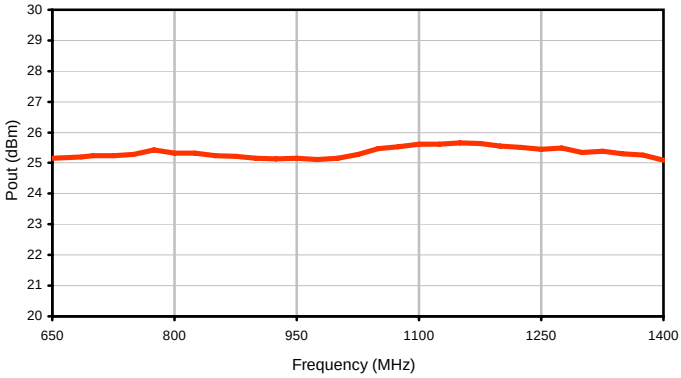
VSWR @ 12V



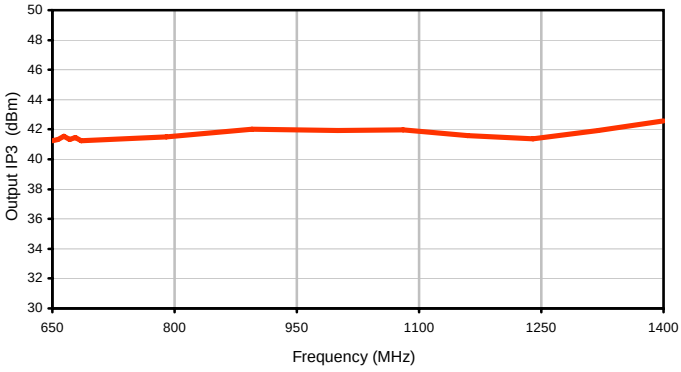
Noise Figure @ 12V



Pout at 1dB Compression @ 12V



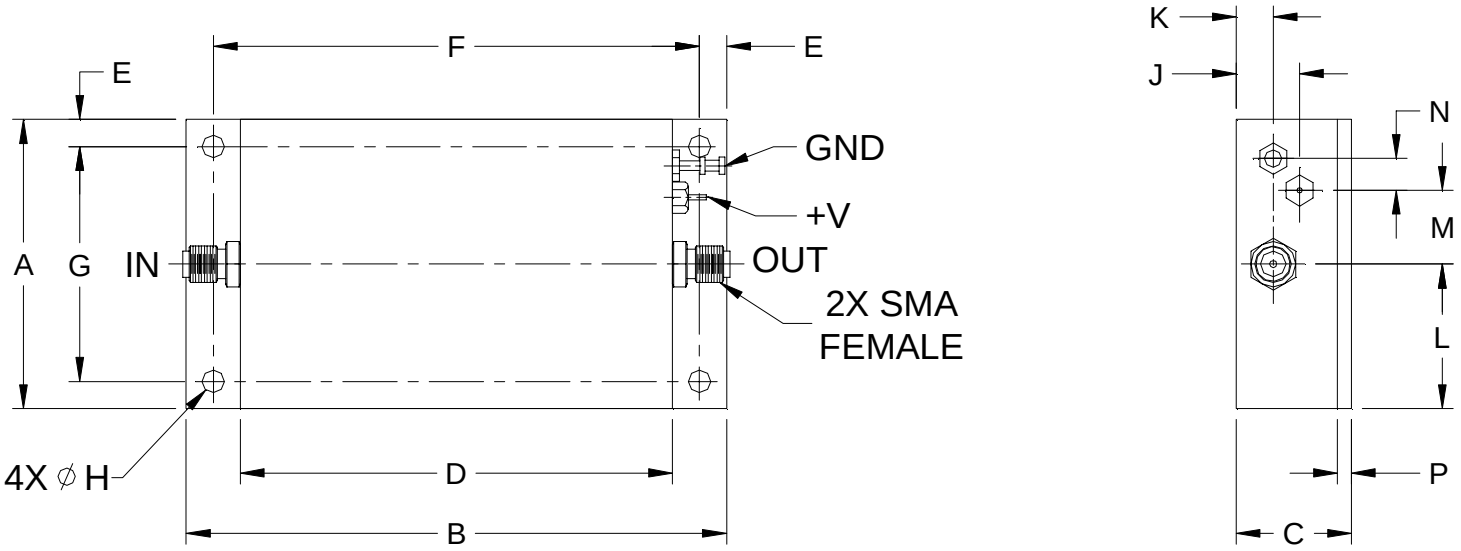
Output IP3 @ 12V



Case Style FJ

Outline Dimensions

FJ893



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT. GRAMS
FJ893	2.00 (50.80)	3.75 (95.25)	.80 (20.32)	3.00 (76.20)	.19 (4.83)	3.374 (85.70)	1.624 (41.25)	.156 (3.96)	.44 (11.18)	.26 (6.60)	1.00 (25.40)	.51 (12.95)	.22 (5.59)	.10 (2.54)	135

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.

Mini-Circuits®
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Environmental Specifications ENV23T7

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 60° C Ambient Environment	Individual Model Data Sheet
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