

High IP3

# Low Noise Amplifier

## ZRL-400+

50Ω

150 to 400 MHz

### Features

- High IP3, +42 dBm typ.
- Low Noise figure, 2.5 dB typ.
- Broadband flat gain response
- Internal voltage regulated
- Over-voltage and transient protected

### Applications

- High dynamic range VHF/UHF
- Mobile radio
- VHF/UHF television or radio
- defense communications



Generic photo used for illustration purposes only

Case Style: FJ893

Connectors Model

SMA ZRL-400+

**+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		150		400	MHz
Noise Figure	150 - 400	—	2.5	3.5	dB
	175 - 300	—	2.5	3.5	
Gain	150 - 400	27	31	—	dB
	175 - 300	28	31	—	
Gain Flatness	150 - 400	—	±0.5	±1.0	dB
	175 - 300	—	±0.3	±0.5	
Output Power at 1dB compression	150 - 400	23.5	25	—	dBm
	175 - 300	23.5	25	—	
Output third order intercept point <sup>1</sup>	150 - 400	—	+42	—	dBm
	175 - 300	—	+42	—	
Input VSWR	150 - 400	—	1.5	—	:1
	175 - 300	—	1.5	—	
Output VSWR	150 - 400	—	1.25	—	:1
	175 - 300	—	1.15	—	
DC Supply Voltage <sup>2</sup>		—	12	—	V
Supply Current		—	450	575	mA

1. 1 MHz tone 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

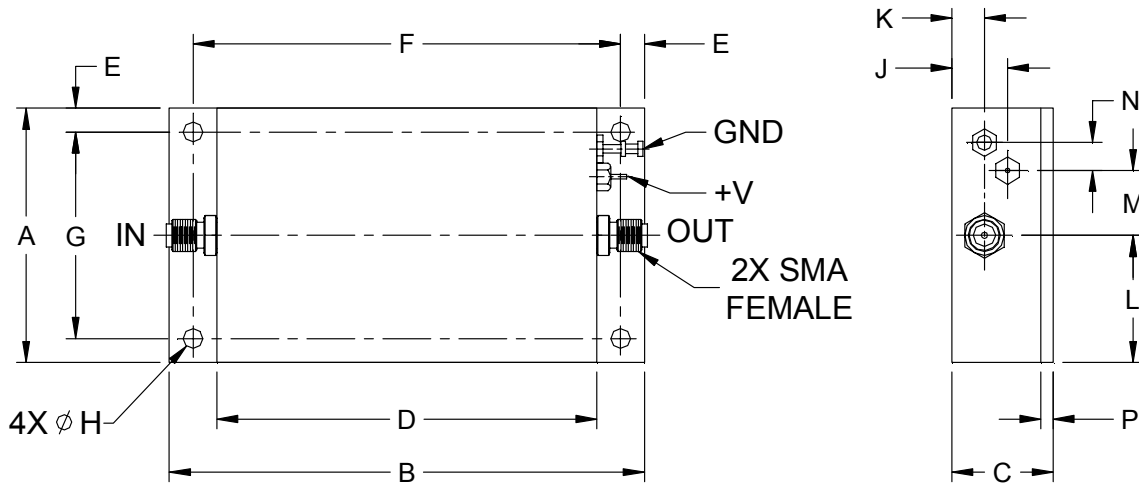
Permanent damage may occur if any of these limits are exceeded.

### 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](http://www.minicircuits.com/MCLStore/terms.jsp)



## Outline Drawing



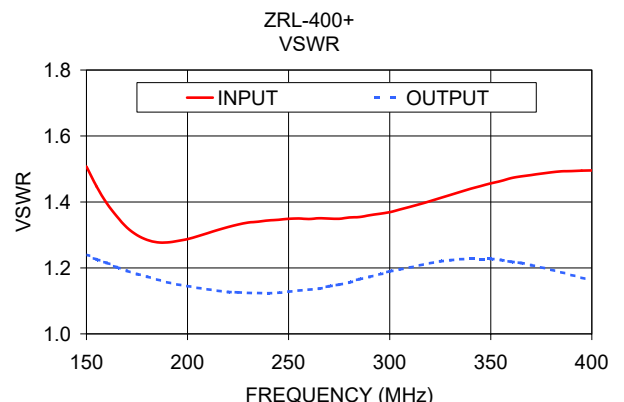
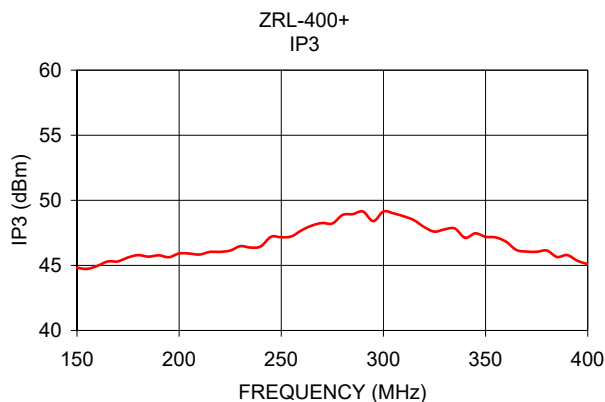
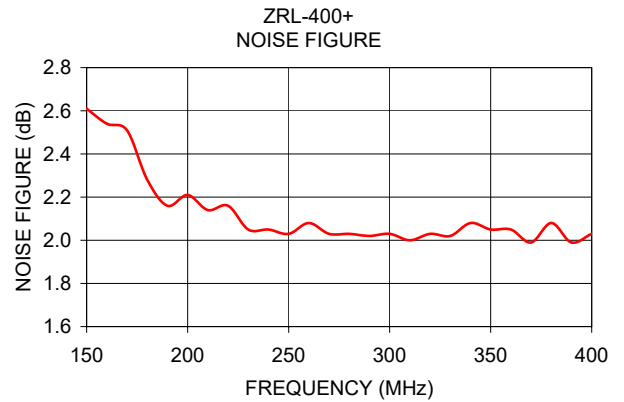
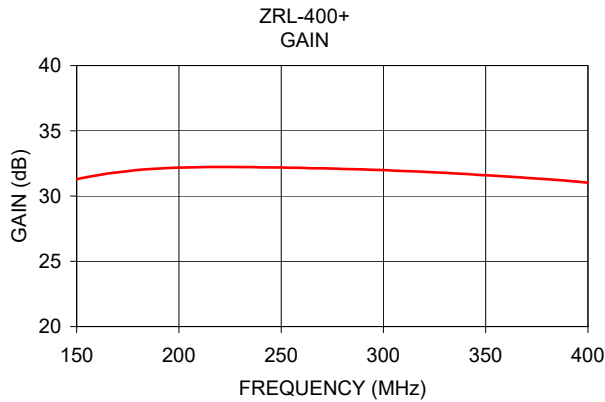
## Outline Dimensions (inch/mm)

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

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# Low Noise Amplifier

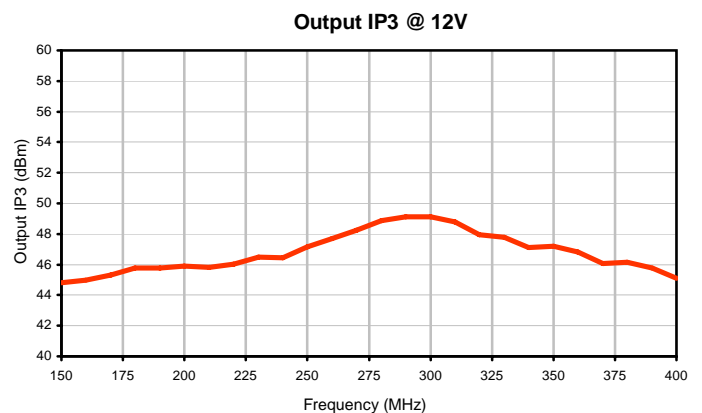
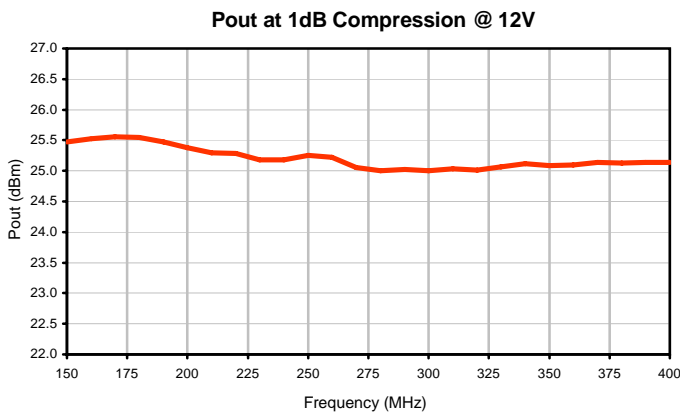
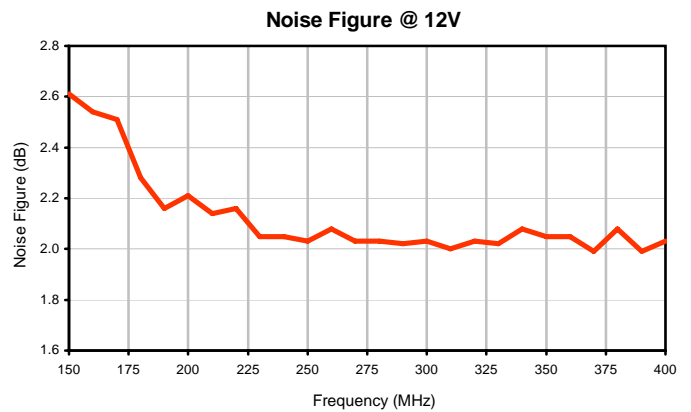
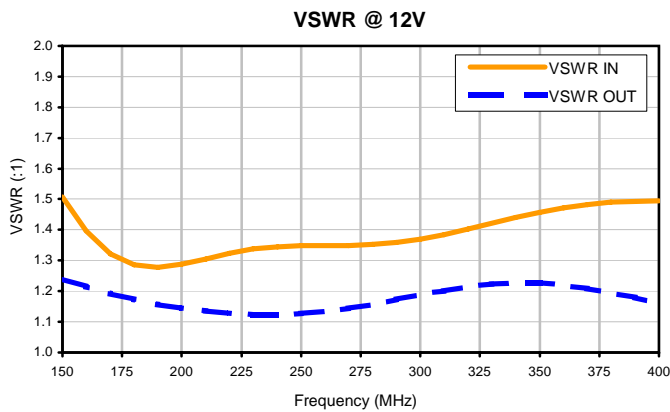
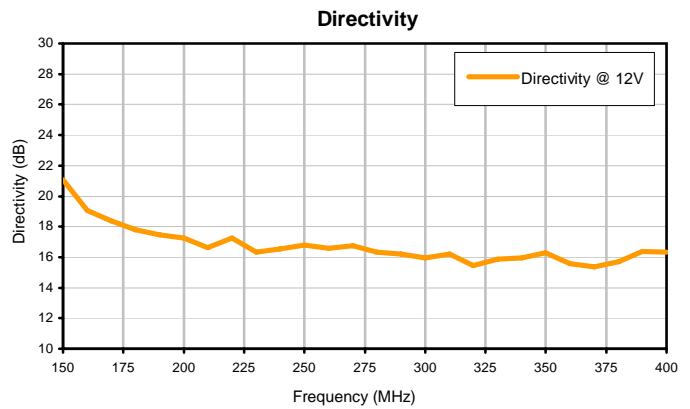
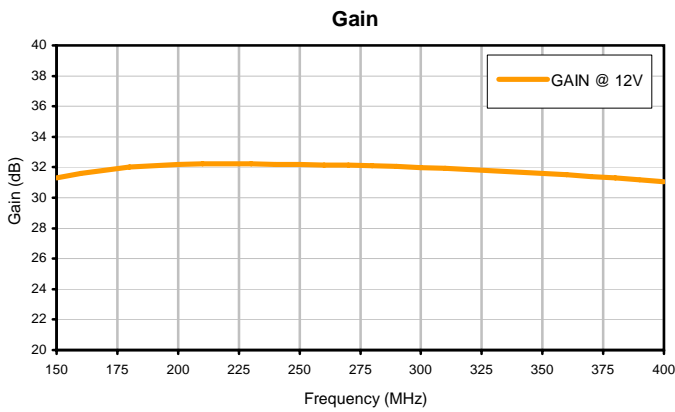
# ZRL-400+

## Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR (:1)		NOISE FIGURE (dB) 12V	POUT @ 1 dB COMPRESSION (dBm) 12V	OUTPUT IP3 (dBm) 12V
			IN 12V	OUT 12V			
150.0	31.29	21.07	1.51	1.24	2.61	25.47	44.82
160.0	31.59	19.06	1.40	1.22	2.54	25.52	44.97
170.0	31.82	18.38	1.32	1.19	2.51	25.56	45.31
180.0	32.00	17.78	1.29	1.17	2.28	25.55	45.79
190.0	32.10	17.48	1.28	1.16	2.16	25.47	45.77
200.0	32.18	17.27	1.29	1.15	2.21	25.38	45.92
210.0	32.21	16.64	1.31	1.14	2.14	25.30	45.83
220.0	32.23	17.26	1.32	1.13	2.16	25.28	46.04
230.0	32.22	16.35	1.34	1.12	2.05	25.18	46.48
240.0	32.20	16.56	1.34	1.12	2.05	25.18	46.46
250.0	32.19	16.78	1.35	1.13	2.03	25.25	47.16
260.0	32.16	16.57	1.35	1.13	2.08	25.22	47.7
270.0	32.13	16.75	1.35	1.14	2.03	25.05	48.26
280.0	32.08	16.32	1.35	1.16	2.03	25.00	48.88
290.0	32.04	16.21	1.36	1.17	2.02	25.02	49.14
300.0	31.99	15.97	1.37	1.19	2.03	25.00	49.14
310.0	31.92	16.22	1.39	1.20	2.00	25.03	48.77
320.0	31.86	15.43	1.40	1.21	2.03	25.01	47.94
330.0	31.78	15.87	1.42	1.22	2.02	25.06	47.77
340.0	31.70	15.94	1.44	1.23	2.08	25.12	47.12
350.0	31.60	16.29	1.46	1.23	2.05	25.09	47.19
360.0	31.50	15.57	1.47	1.22	2.05	25.10	46.82
370.0	31.39	15.37	1.48	1.21	1.99	25.14	46.06
380.0	31.29	15.71	1.49	1.19	2.08	25.13	46.14
390.0	31.17	16.36	1.49	1.18	1.99	25.14	45.79
400.0	31.03	16.34	1.50	1.16	2.03	25.14	45.09



## Typical Performance Curves

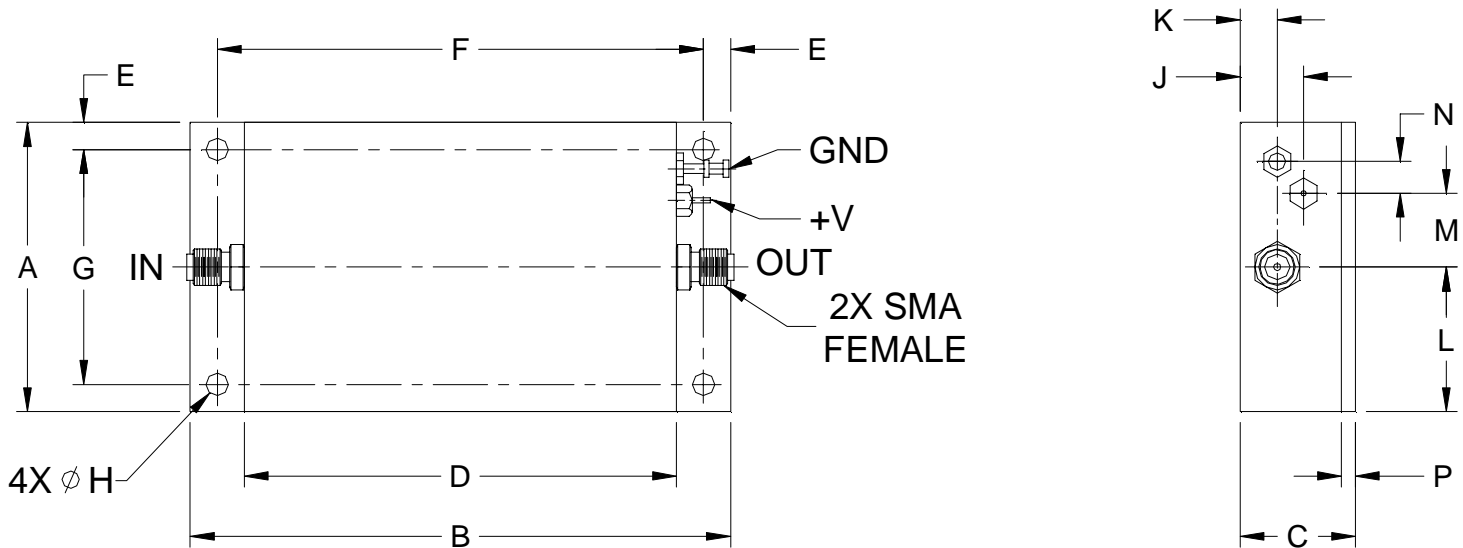


# Case Style

# 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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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