



Mini-Circuits

COAXIAL

Wideband Amplifier ZVA-213UWX+

50Ω 0.1 to 20 GHz 2.9 mm Female

THE BIG DEAL

- Flat Gain, 14.75 ±1.25 dB Across Entire Bandwidth
- Low Noise Figure, 2.9 dB Typ.
- High IP3, +28.7 dBm

APPLICATIONS

- WiFi
- WLAN
- UMTS
- LTE
- WiMAX
- S-Band Radar
- C-Band SATCOM



Generic photo used for illustration purposes only

Model No.	ZVA-213UWX+
Case Style	RN2486-1
Connectors	2.9 mm female

+RoHS Compliant

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

PRODUCT OVERVIEW

Mini-Circuits' ZVA-213UWX+ is a coaxial, ultra-wideband amplifier offering very flat gain and high dynamic range from 0.1 to 20 GHz. This model is capable of delivering up to +16 dBm output power at 1 dB compression with 2.9 dB noise and +28.7 dBm IP3 supporting a wide range of sensitive, high-dynamic range receiver applications and many systems where high performance over a wide frequency range is needed. It operates on a +12/-5 V supply and features built-in safety features including protection against reverse bias and immunity to accidental open or short loads. The amplifier comes in a rugged, compact case (1.3x0.98x0.56") with 2.92 mm connectors.

KEY FEATURES

Feature	Advantages
Ultra-Wideband, 0.1 to 20 GHz	Enables a single amplifier to be used in a wide range of applications.
Excellent Gain Flatness, ±1.25 dB Across Full Frequency Range	Provides consistent performance across its operating frequency, minimizing the need for external equalizing networks in wideband applications.
Low Noise and High IP3: • NF, 2.9 dB Typ. • IP3, +28.7 dBm Typ.	The combination of low noise and high IP3 makes the ZVA-213UWX+ ideal for use in low noise receiver front end (RFE) as it gives the user the advantages of sensitivity and two-tone IM performance at both ends of the dynamic range.
Rugged Design	Built-in protection against reverse bias and accidental open and short loads provides added reliability for demanding operating conditions.

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ELECTRICAL SPECIFICATIONS AT +25 °C

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.1		20	GHz
Noise Figure	0.1-6		3.5		dB
	6-12		2.5		
	12-18		2.7		
	18-20		3.4		
Gain	0.1-6	11.0	14		dB
	6-12	11.0	14		
	12-18	11.0	14		
	18-20	10.0	13		
Input VSWR	0.1-6		1.4		:1
	6-12		1.25		
	12-18		1.3		
	18-20		1.6		
Output VSWR	0.1-6		1.4		:1
	6-12		1.3		
	12-18		1.4		
	18-20		1.6		
Output Power at 1 dB Compression ¹	0.1-6		+16		dBm
	6-12		+15		
	12-18		+14		
	18-20		+13		
Output IP3	0.1-6		+29.5		dBm
	6-12		+29		
	12-18		+28.5		
	18-20		+26		
Device Operating Voltage (V_{DD})			+12		V
Device Operating Voltage (V_{GG})			-5		V
Device Operating Current (I_{DD})			80	94	mA

1. Current increases at P1dB.

ABSOLUTE MAXIMUM RATINGS²

Parameter	Ratings
Operating Temperature (Ground Lead)	-40 °C to +85 °C
Storage Temperature	-55°C to +100 °C
Total Power Dissipation	1.5 W
Input Power (CW), $V_{DD} = +12$	+12 dBm
V_{DD}	+13 V

2. Permanent damage may occur if any of these limits are exceeded. Electrical maximum ratings are not intended for continuous normal operation.





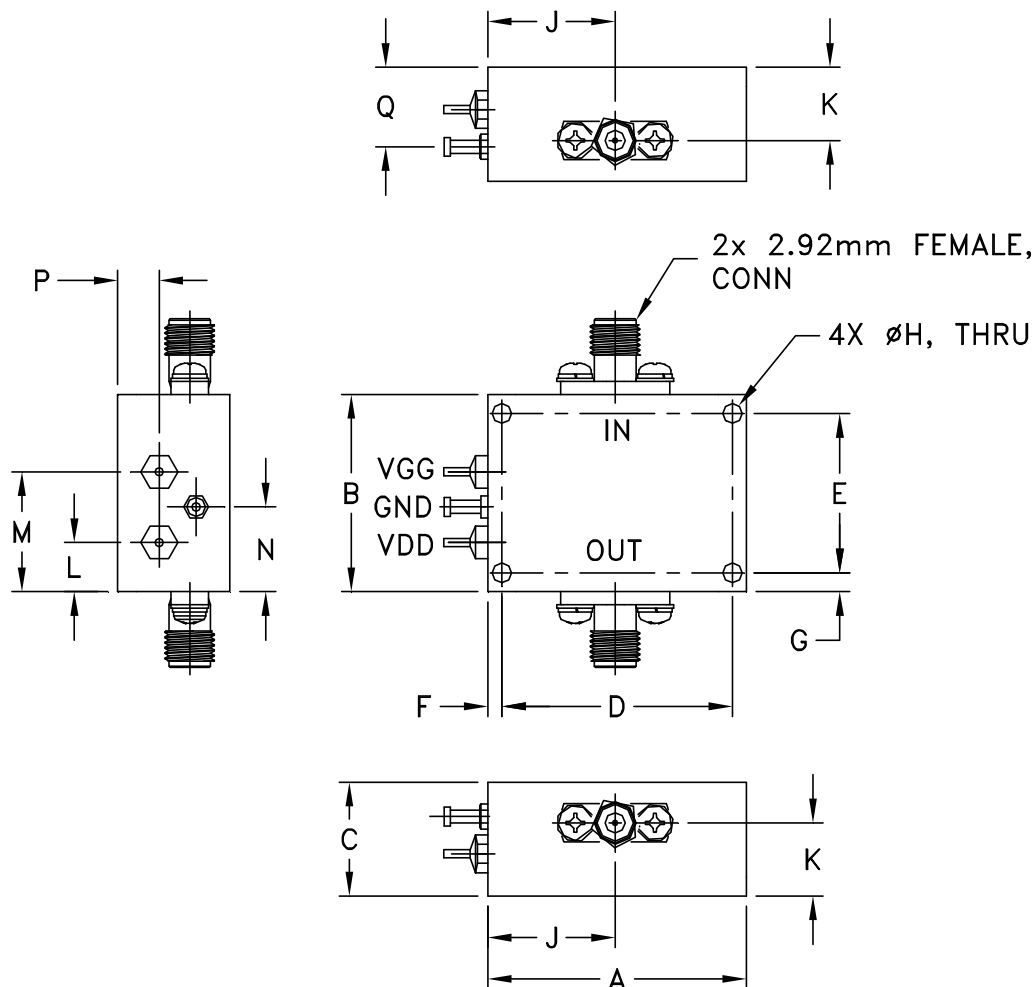
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OUTLINE DRAWING



OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	wt
1.3	0.98	0.56	1.16	0.79	0.07	.09	0.098	0.64	0.36	0.24	0.59	0.42	0.21	0.39	grams
33.02	24.89	14.22	29.46	20.07	1.78	2.29	2.49	16.26	9.14	6.10	14.99	10.67	5.33	9.91	74

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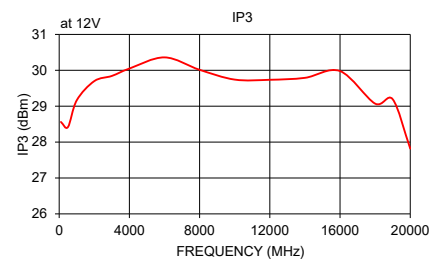
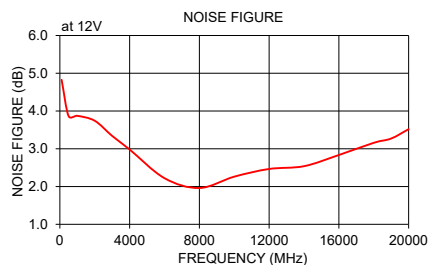
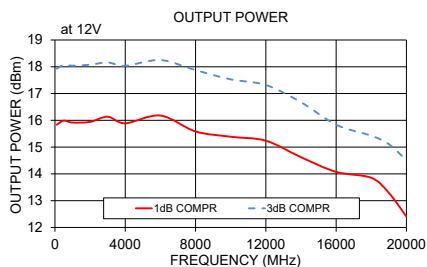
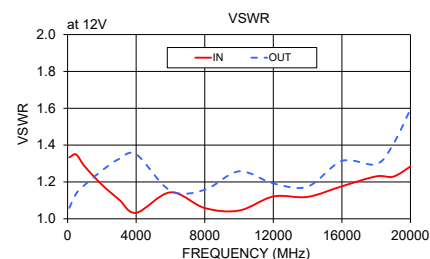
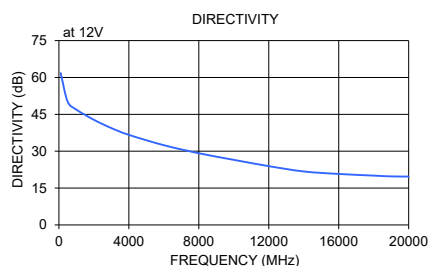
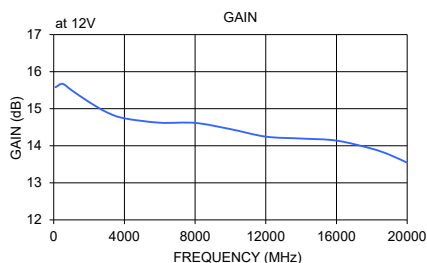
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Wideband Amplifier ZVA-213UWX+

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TYPICAL PERFORMANCE DATA/CURVES

Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		Noise Figure (dB)	P _{OUT} at COMPR. (dBm)		OUTPUT IP3 (dBm)
			IN	OUT		1 dB	3 dB	
100	15.58	61.77	1.33	1.06	4.83	15.84	17.93	28.56
500	15.67	50.16	1.35	1.14	3.87	15.99	18.07	28.42
1000	15.50	46.91	1.28	1.18	3.87	15.92	18.04	29.16
2000	15.18	42.78	1.19	1.26	3.74	15.94	18.08	29.70
3000	14.90	39.40	1.10	1.32	3.34	16.13	18.16	29.84
4000	14.74	36.64	1.03	1.35	2.98	15.89	18.04	30.05
6000	14.62	32.44	1.14	1.15	2.22	16.18	18.25	30.36
8000	14.62	29.17	1.06	1.16	1.96	15.58	17.88	30.01
10000	14.45	26.48	1.04	1.26	2.26	15.39	17.53	29.74
12000	14.25	23.92	1.12	1.19	2.47	15.24	17.32	29.74
14000	14.20	21.76	1.12	1.17	2.54	14.62	16.67	29.79
16000	14.14	20.74	1.18	1.31	2.84	14.07	15.84	29.98
18000	13.92	20.07	1.23	1.30	3.16	13.85	15.42	29.07
19000	13.76	19.74	1.23	1.41	3.27	13.29	15.11	29.19
20000	13.54	19.69	1.28	1.60	3.52	12.41	14.51	27.82



NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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/terms/viewterm.html



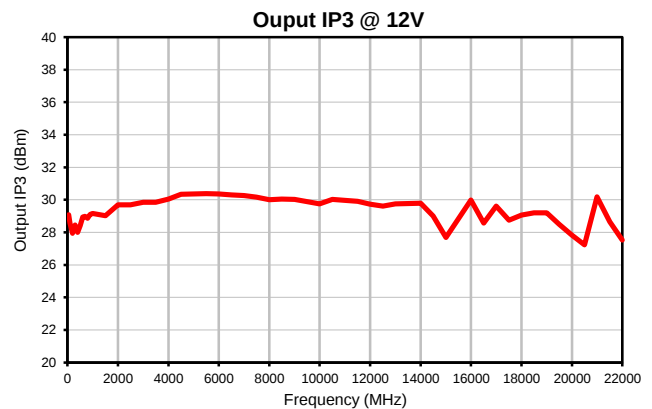
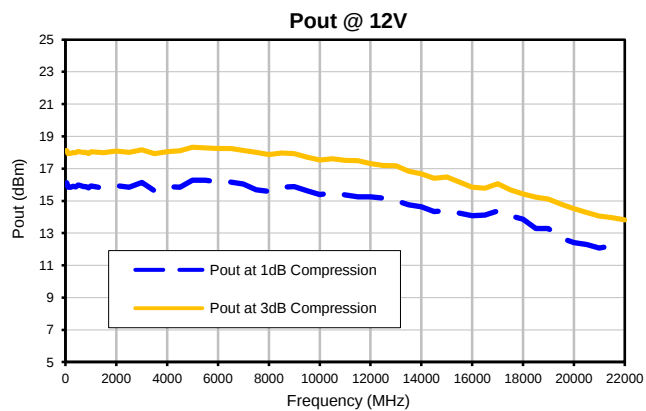
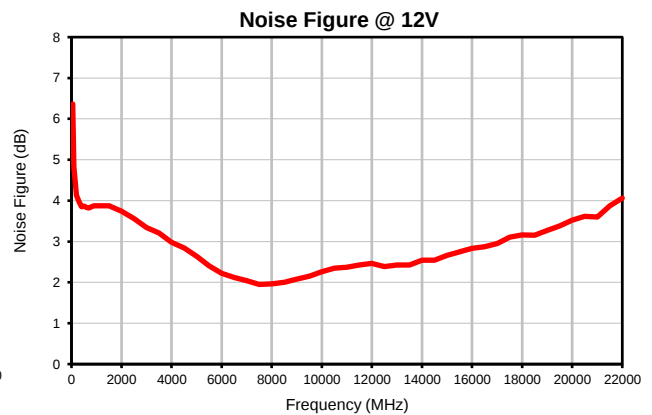
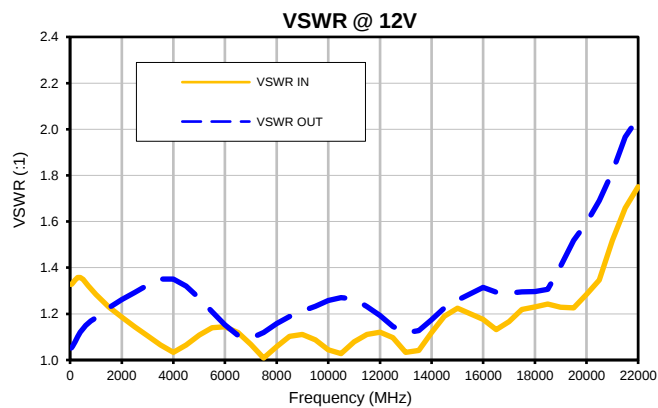
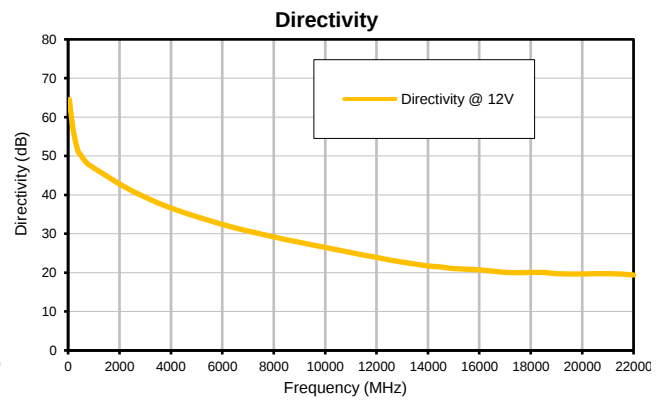
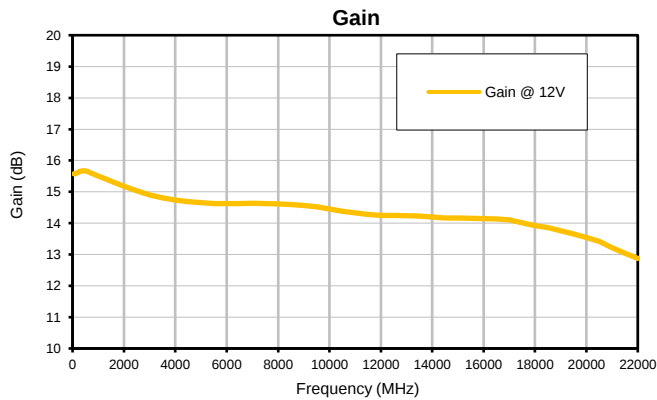
Typical Performance Data

FREQUENCY	GAIN	DIRECTIVITY	VSWR (:1)		NOISE FIGURE	POUT @ 1 dB COMPRESSION	POUT @ 3 dB COMPRESSION	OUTPUT IP3
(MHz)	(dB) 12V	(dB) 12V	IN 12V	OUT 12V	(dB) 12V	(dBm) 12V	(dBm) 12V	(dBm) 12V
50	15.58	64.52	1.33	1.05	6.36	16.12	18.13	29.08
100	15.58	61.77	1.33	1.06	4.83	15.84	17.93	28.56
200	15.61	56.72	1.35	1.08	4.14	15.84	17.94	27.93
300	15.66	53.48	1.36	1.10	3.97	15.91	17.99	28.45
400	15.67	51.03	1.36	1.12	3.85	15.87	17.98	28.00
500	15.67	50.16	1.35	1.14	3.87	15.99	18.07	28.42
600	15.64	49.16	1.34	1.15	3.84	15.93	18.03	28.95
700	15.61	48.41	1.32	1.16	3.82	15.88	18.00	28.98
800	15.57	47.73	1.31	1.17	3.85	15.88	18.00	28.86
900	15.54	47.42	1.30	1.18	3.87	15.80	17.93	29.10
1000	15.50	46.91	1.28	1.18	3.87	15.92	18.04	29.16
1500	15.34	44.84	1.23	1.23	3.87	15.78	17.99	29.02
2000	15.18	42.78	1.19	1.26	3.74	15.94	18.08	29.70
2500	15.03	40.95	1.14	1.29	3.56	15.84	18.01	29.69
3000	14.90	39.40	1.10	1.32	3.34	16.13	18.16	29.84
3500	14.81	37.96	1.06	1.35	3.21	15.62	17.93	29.85
4000	14.74	36.64	1.03	1.35	2.98	15.89	18.04	30.05
4500	14.69	35.48	1.06	1.32	2.84	15.84	18.10	30.35
5000	14.65	34.40	1.11	1.27	2.64	16.27	18.31	30.36
5500	14.63	33.40	1.14	1.21	2.40	16.28	18.28	30.38
6000	14.62	32.44	1.14	1.15	2.22	16.18	18.25	30.36
6500	14.62	31.53	1.12	1.11	2.12	16.16	18.24	30.30
7000	14.63	30.70	1.07	1.09	2.04	16.04	18.13	30.26
7500	14.63	29.95	1.01	1.12	1.95	15.69	18.00	30.17
8000	14.62	29.17	1.06	1.16	1.96	15.58	17.88	30.01
8500	14.59	28.48	1.10	1.19	2.00	15.84	17.96	30.05
9000	14.56	27.80	1.11	1.21	2.08	15.89	17.93	30.02
9500	14.52	27.14	1.09	1.23	2.15	15.62	17.72	29.88
10000	14.45	26.48	1.04	1.26	2.26	15.39	17.53	29.74
10500	14.38	25.83	1.03	1.27	2.34	15.51	17.61	30.03
11000	14.33	25.16	1.08	1.26	2.37	15.36	17.51	29.98
11500	14.28	24.54	1.11	1.23	2.43	15.25	17.48	29.91
12000	14.25	23.92	1.12	1.19	2.47	15.24	17.32	29.74
12500	14.24	23.29	1.10	1.15	2.39	15.18	17.20	29.61
13000	14.24	22.74	1.03	1.12	2.43	15.01	17.17	29.74
13500	14.23	22.24	1.04	1.13	2.43	14.75	16.84	29.78
14000	14.20	21.76	1.12	1.17	2.54	14.62	16.67	29.79
14500	14.17	21.44	1.19	1.23	2.55	14.33	16.40	29.01
15000	14.16	21.03	1.23	1.26	2.66	14.39	16.47	27.69
16000	14.14	20.74	1.18	1.31	2.84	14.07	15.84	29.98
16500	14.13	20.39	1.13	1.29	2.87	14.11	15.79	28.57
17000	14.10	20.07	1.17	1.29	2.95	14.38	16.06	29.62
17500	14.02	19.99	1.22	1.30	3.11	14.08	15.69	28.75
18000	13.92	20.07	1.23	1.30	3.16	13.85	15.42	29.07
18500	13.86	20.07	1.24	1.31	3.15	13.28	15.23	29.20
19000	13.76	19.74	1.23	1.41	3.27	13.29	15.11	29.19
19500	13.65	19.63	1.23	1.52	3.38	12.68	14.79	28.50
20000	13.54	19.69	1.28	1.60	3.52	12.41	14.51	27.82
20500	13.42	19.73	1.35	1.69	3.62	12.30	14.28	27.23
21000	13.22	19.77	1.52	1.81	3.60	12.08	14.05	30.18
21500	13.04	19.63	1.66	1.97	3.88	12.20	13.97	28.65
22000	12.87	19.41	1.75	2.05	4.06	12.07	13.83	27.53

Wideband Amplifier

Typical Performance Curves

ZVA-213UWX+



Mini-Circuits®
ISO 9001 ISO 14001 AS 9100 CERTIFIED

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P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

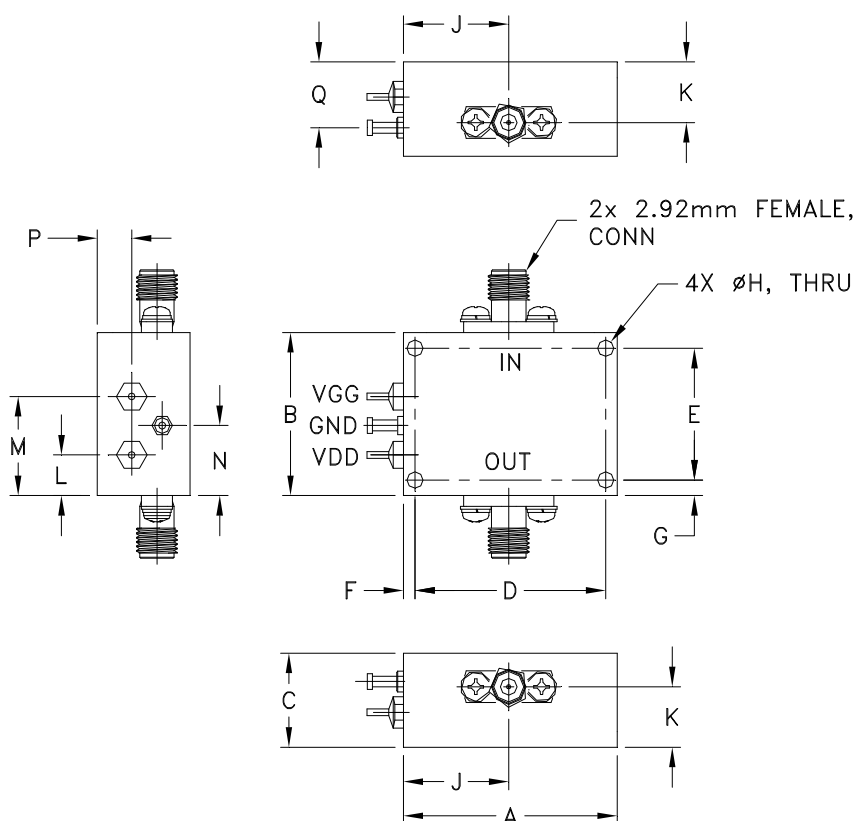


IF/RF MICROWAVE COMPONENTS

REV. OR
ZVA-213UWX+
1/31/2018
Page 1 of 1

Outline Dimensions

RN2486-1



CASE #	A	B	C	D	E	F	G	H	J	K	L	M
RN2486-1	1.30 (33.02)	.98 (24.89)	.56 (14.22)	1.160 (29.46)	.790 (20.07)	.07 (1.78)	.09 (2.29)	.098 (2.49)	.64 (16.26)	.36 (9.14)	.24 (6.10)	.59 (14.99)

CASE #	N	P	Q	R	S	T	WT. GRAM
RN2486-1	.42 (10.67)	.21 (5.33)	.39 (9.91)	--	--	--	74

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .03$; 3 Pl. $\pm .015$

Notes:

1. Case material: Brass alloy.
2. Case finish: Gold Plating.



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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



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	-55° to 85°C base plate temp	Individual Model Data Sheet
Storage Temperature	-65° to 150°C	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107
Vibration (High Frequency)	Category 24, Exposure level figures 514C-17 General use, random, 20-2000Hz, 1 hr per axis	MIL-STD-810, Method 514.5
Mechanical Shock	40Gs,11ms, 18 shocks: 3 each direction), each axis	MIL-STD-810, Method 516-5-II