SUPER ULTRA

Wideband Amplifier

50Ω 800 MHz to 21 GHz

ZVA-213-S+
ZVA-213X-S+

FEATURES

- Super ultra-wideband, 800 MHz to 21 GHz
- High output IP3, +33 dBm typ.
- Rugged, compact case (including heat sink)
- Unconditionally stable
- Good matching at input and output
- Withstands open/short load at 1dB compression point output power
- Very good isolation, 75 dB typ.

Generic photo used for illustration purposes only

Model No.	ZVA-213-S+	ZVA-213X-S+▲
Case Style	AV1280	
Connectors	SMA	

+RoHS Compliant

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

APPLICATIONS

- Radar
- Very wideband test instrumentation
- Lab use
- Wideband isolaton, directivity 50 dB typ.

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	ZVA-213-S+ ZVA-213X-S+ ▲			Units
		Min.	Typ.	Max.	
Frequency Range		800	—	21000	MHz
Gain	800 - 21000	20	26	—	dB
Gain Flatness	800 - 21000	—	±2.0	—	dB
Output Power at 1dB compression	800 - 21000	—	24	—	dBm
Noise Figure	800 - 21000	—	3.0	5.5	dB
Output third order intercept point	800 - 21000	—	+33	—	dBm
Input VSWR	800 - 21000	—	1.35	—	:1
Output VSWR	800 - 21000	—	1.25	—	:1
DC Supply Voltage		—	12*	—	V
Supply Current		—	—	400	mA

*Recommended Operating Voltage.

▲ Heat sink not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 85°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 4°C/W max.

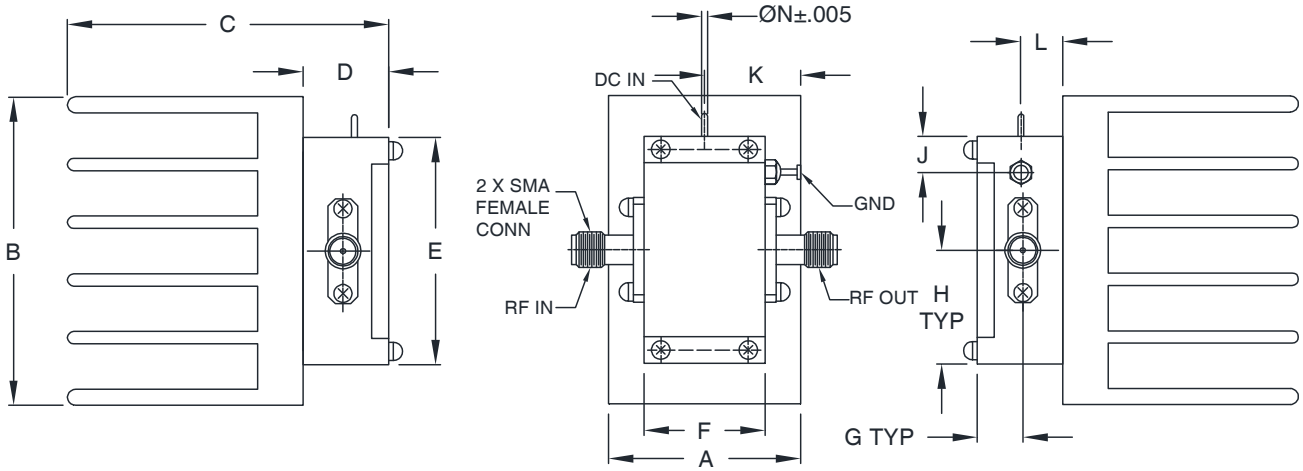
MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 85°C base plate temp.
Storage Temperature	-65°C to 150°C
DC Voltage	15V
CW Input RF Power (no damage)	+4 dBm

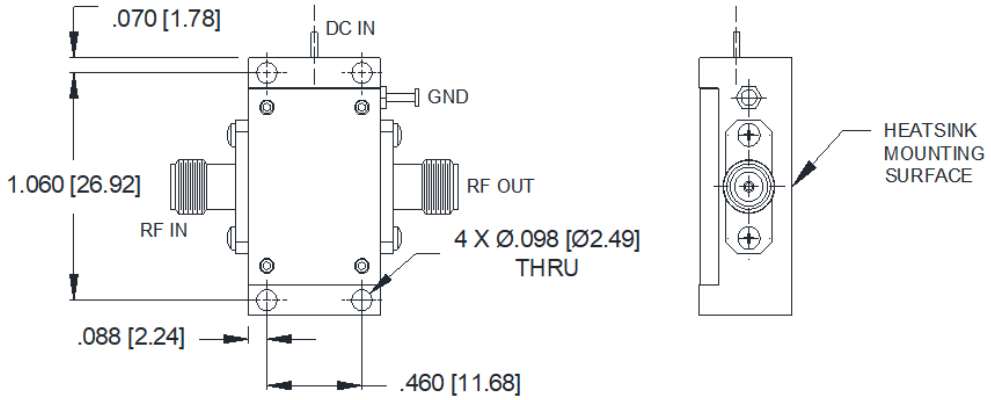
Permanent damage may occur if any of these limits are exceeded.

REV. H
ECO-011916
ZVA-213-S+
ED-13014
BC/CP/AM
220215

OUTLINE DRAWING FOR MODELS WITH HEATSINK



OUTLINE DRAWING FOR MODELS WITHOUT HEATSINK



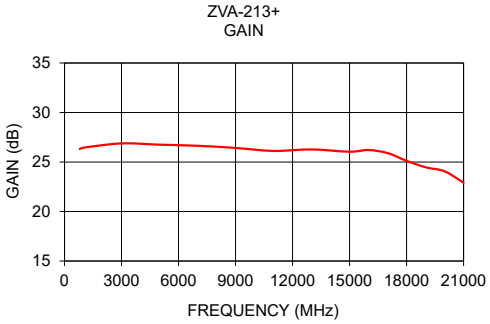
OUTLINE DIMENSIONS (MM/INCH)

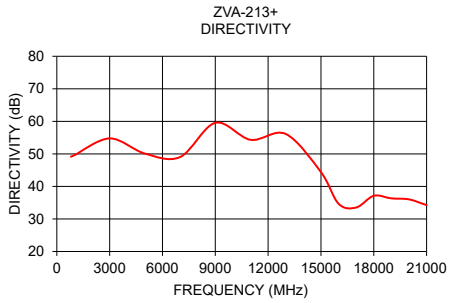
A	B	C	D	E	F	G	H	J	K	L	M	N	wt
1.01	1.63	1.74	.45	1.20	.64	.24	.60	.19	.32	.22	-	.03	grams*
25.65	41.40	44.20	11.43	30.48	16.26	6.10	15.24	4.83	8.13	5.59	-	0.76	58

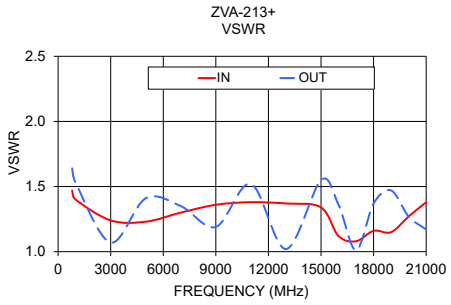
*17 grams without heatsink

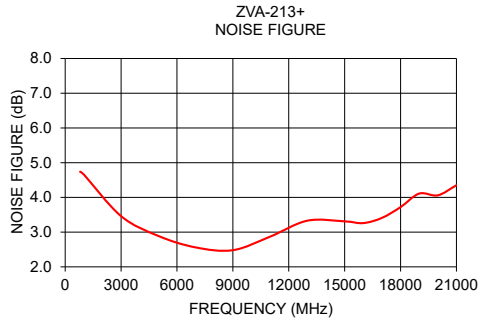
TYPICAL PERFORMANCE DATA/CURVES

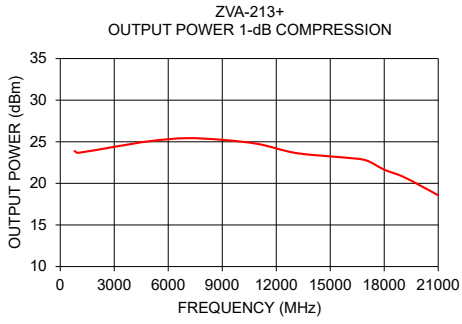
Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		Noise Figure (dB)	Pout at 1 dB Compr. (dBm)	IP3 (dBm)
			IN	OUT			
800	26.32	49.16	1.47	1.64	4.74	23.89	36.82
1000	26.45	49.60	1.40	1.53	4.66	23.67	37.33
3000	26.88	54.76	1.24	1.07	3.46	24.39	36.24
5000	26.75	50.10	1.23	1.41	2.89	25.08	35.10
7000	26.64	49.03	1.30	1.35	2.56	25.43	33.78
9000	26.42	59.55	1.36	1.19	2.48	25.23	32.62
11000	26.12	54.33	1.38	1.52	2.87	24.73	31.27
13000	26.27	56.13	1.37	1.02	3.33	23.68	30.47
15000	26.04	44.40	1.34	1.55	3.31	23.24	29.63
16000	26.21	34.69	1.12	1.36	3.26	23.06	29.01
17000	25.90	33.52	1.08	1.01	3.41	22.76	28.88
18000	25.12	37.12	1.16	1.37	3.72	21.65	28.98
19000	24.47	36.33	1.15	1.47	4.11	20.85	29.87
20000	24.06	36.02	1.27	1.27	4.06	19.74	
21000	22.91	34.26	1.38	1.17	4.35	18.57	

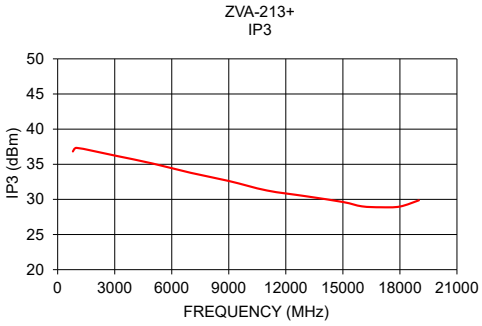












NOTES

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 there in. 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

Wideband Amplifier ZVA-213+

Typical Performance Data

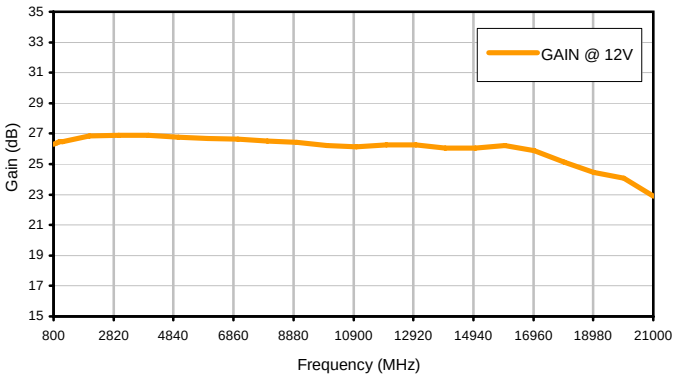
FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR IN (:1) 12V	VSWR OUT (:1) 12V	NOISE FIGURE (dB) 12V	Pout at 1dB Comp. (dBm) 12V
800.0	26.32	49.16	1.47	1.64	4.74	23.89
900.0	26.40	50.96	1.43	1.58	4.68	23.80
1000.0	26.45	49.60	1.40	1.53	4.66	23.67
1100.0	26.49	54.43	1.38	1.50	4.70	23.73
2000.0	26.83	49.44	1.27	1.28	3.91	23.95
3000.0	26.88	54.76	1.24	1.07	3.46	24.39
4000.0	26.87	50.02	1.23	1.21	3.19	24.80
5000.0	26.75	50.10	1.23	1.41	2.89	25.08
6000.0	26.68	47.03	1.26	1.46	2.74	25.04
7000.0	26.64	49.03	1.30	1.35	2.56	25.43
8000.0	26.53	52.49	1.34	1.17	2.49	25.34
9000.0	26.42	59.55	1.36	1.19	2.48	25.23
10000.0	26.23	53.89	1.36	1.39	2.63	25.09
11000.0	26.12	54.33	1.38	1.52	2.87	24.73
12000.0	26.28	38.47	1.37	1.37	3.25	24.14
13000.0	26.27	56.13	1.37	1.02	3.33	23.68
14000.0	26.03	43.11	1.40	1.38	3.14	23.31
15000.0	26.04	44.40	1.34	1.55	3.31	23.24
16000.0	26.21	34.69	1.12	1.36	3.26	23.06
17000.0	25.90	33.52	1.08	1.01	3.41	22.76
18000.0	25.12	37.12	1.16	1.37	3.72	21.65
19000.0	24.47	36.33	1.15	1.47	4.11	20.85
20000.0	24.06	36.02	1.27	1.27	4.06	19.74
21000.0	22.91	34.26	1.38	1.17	4.35	18.57

FREQUENCY (MHz)	Output IP3 (dBm) 12V
800.0	36.82
900.0	37.38
1000.0	37.33
2000.0	36.86
3000.0	36.24
4000.0	35.58
5000.0	35.10
6000.0	34.38
7000.0	33.78
8000.0	33.26
9000.0	32.62
10000.0	32.09
11000.0	31.27
12000.0	30.49
13000.0	30.47
14000.0	30.19
15000.0	29.63
16000.0	29.01
17000.0	28.88
18000.0	28.98
19000.0	29.87
19500.0	27.95

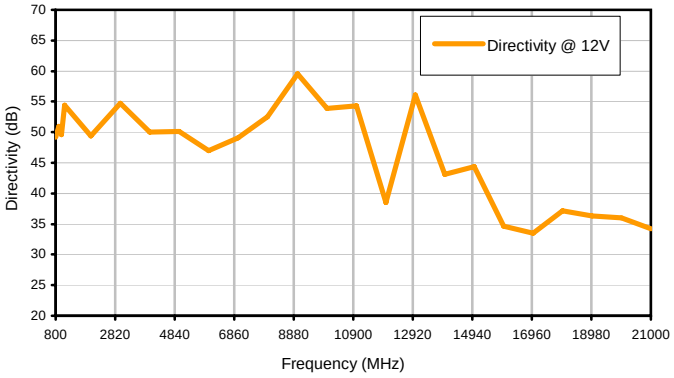
Wideband Amplifier ZVA-213+

Typical Performance Curves

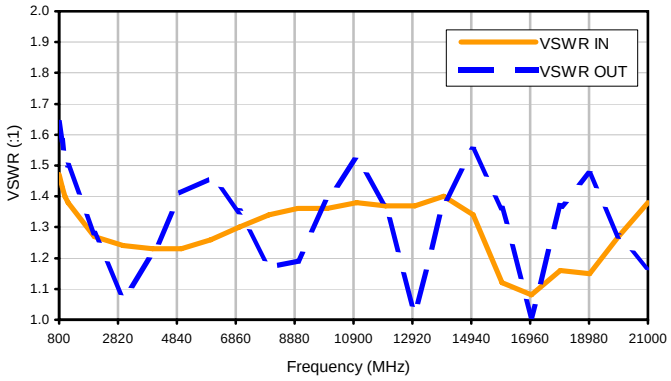
Gain



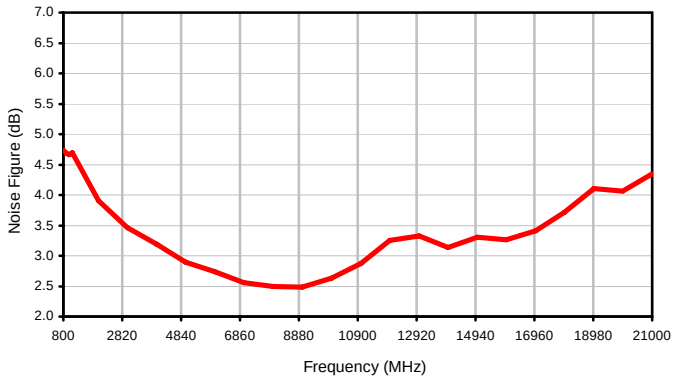
Directivity



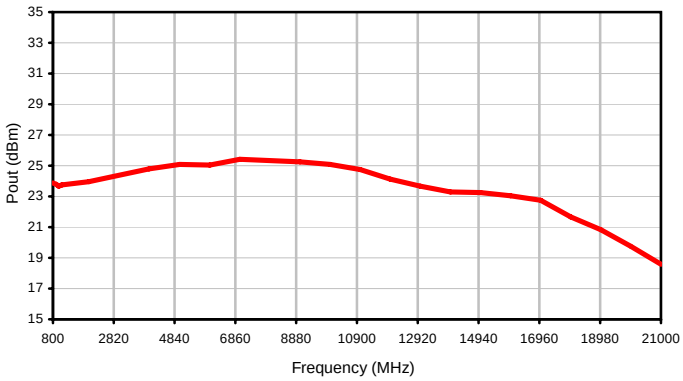
VSWR @ 12V



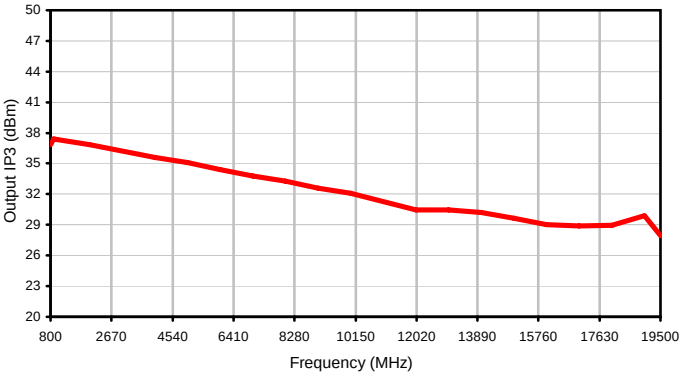
Noise Figure @ 12V



Pout at 1dB Compression @ 12V



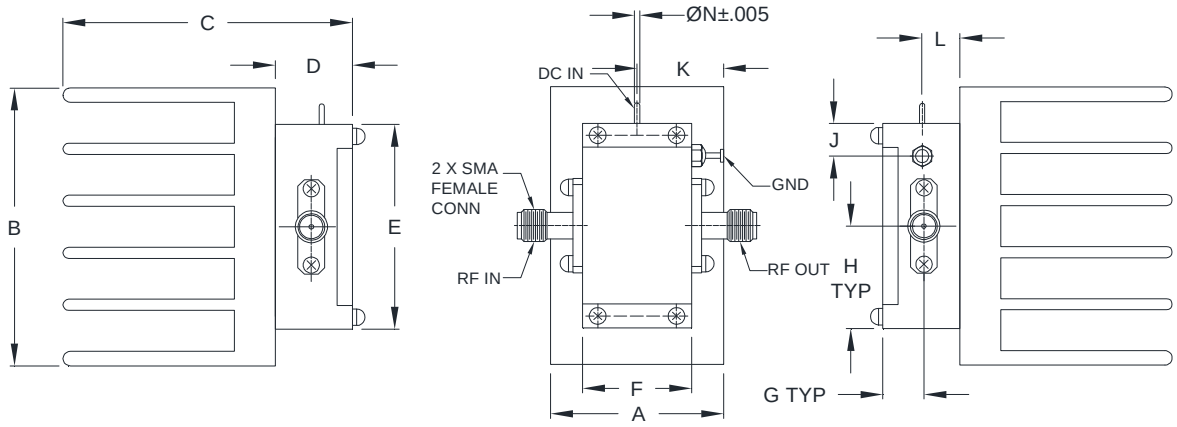
Output IP3 @ 12V



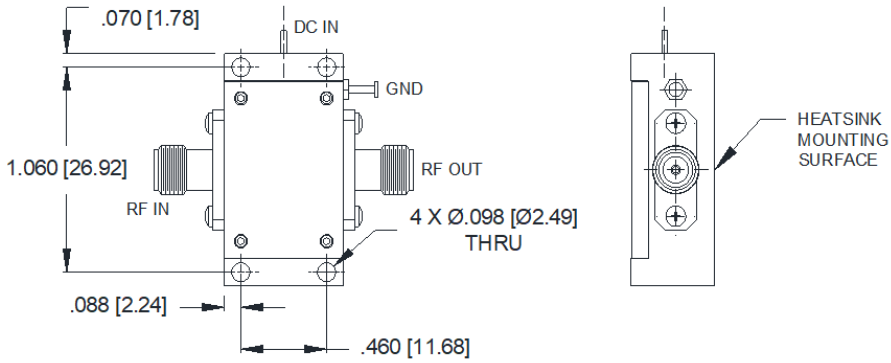
Case Style AV

AV1280

Outline Dimensions



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	WT. GRAM
AV1280	1.01 (25.65)	1.63 (41.40)	1.74 (44.20)	.45 (11.43)	1.20 (30.48)	.64 (16.26)	.24 (6.10)	.60 (15.24)	.19 (4.83)	.32 (8.08)	.27 (6.86)	--	.03 (.76)	58

CASE#	WT. WITHOUT HEATSINK GRAM
AV1280	17

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish: Nickel plate.
3. Heat sink finish: Black anodize.

Mini-Circuits

Environmental Specifications ENV39

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