VERY HIGH FREQUENCY GAIN BLOCK

Wide Band Amplifier ZVA-50953X+

50Ω 45 to 95 GHz 1mm Female

THE BIG DEAL

- Exceptionally high frequency
- Flat gain response over a wideband
- Operates with a single DC supply of +10V to +15V
- Over voltage and reverse voltage protected

Generic photo used for illustration purposes only

Model No.	ZVA-50953X+
Case Style	VP3085-2
Connectors	1mm Female

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

APPLICATIONS

- Automotive Radar/Sensing
- 5G FR2 millimeter wave bands
- Aerospace & Defense
- Test and Measurement

PRODUCT OVERVIEW

Mini-Circuits ZVA-50953X+ is a coaxial wideband and flat gain amplifier operating from 45 GHz to 95 GHz. The model operates over a positive supply range of +10 to +15 V, allowing users to choose their desired operating voltage. Internal DC-DC conversion circuitry maintains constant efficiency over the full input voltage range. The amplifier incorporates several DC-protection features such as over-voltage, reverse voltage and in-rush current to protect from damage in case of unexpected spikes in voltage during operation.

KEY FEATURES

Feature	Advantages
Wide-band amplifier, 45 to 95 GHz	A single amplifier serves the need for applications including Automotive, E-band communications, Test & Instrumentation.
Adjustable DC supply voltage	The device is capable of operating from +10 to +15 V, maintaining constant DC power consumption with no effect on RF performance.
DC Protection • Over-voltage • Reverse voltage • In-rush current	The internal DC circuitry allows the amplifier to be protected from external mishandling or unexpected spikes in voltage that could lead to catastrophic failures in the field.

REV. OR
ECO-013112
ZVA-50953X+
MCL NY
220610

Wide Band Amplifier ZVA-50953X+

50Ω 45 to 95 GHz 1mm Female

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		45		95	GHz
Gain	45 - 55 55 - 90 90 - 95	13.5 14.5 12.5	16 17 16	— — —	dB
Output Power at 1dB compression	45 - 95	12	14	—	dBm
Saturated Power	45 - 95	15	17	—	dBm
Input VSWR	45 - 95	—	1.7	2.0	:1
Output VSWR[1]	45 - 95	—	1.7	2.0	:1
Operating DC Voltage		10	—	15	V
Device Operating Current (at 10V DC)[2]		—	140	205	mA

1. Open and short-circuit loads are not recommended at the amplifier output. Ensure proper 50 Ohm load before turning the amplifier "ON".
2. Max. operating current is based on current when amplifier is in saturation.

MAXIMUM RATINGS[4]

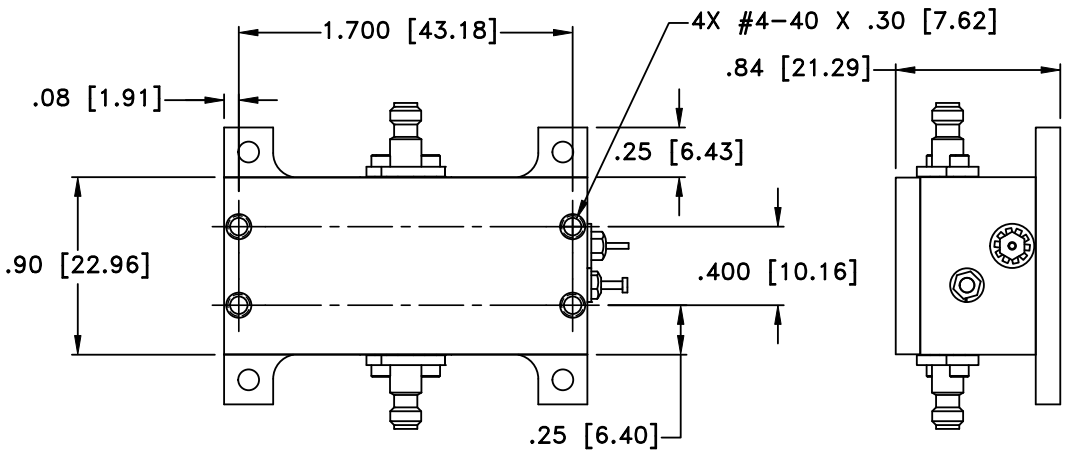
Parameter	Ratings
Operating Temperature (Ambient)	-40°C to 60°C
Storage Temperature	-40°C to 85°C
Total Power Dissipation	1.35W
RF Input Power (CW)[3]	+15 dBm
DC Voltage	15V

3. Specified under matched load to 50 ohms.
4. Continuous operation is not recommended at these extremes. Permanent damage may occur if any of these limits are exceeded.

Wide Band Amplifier ZVA-50953X+

50Ω 45 to 95 GHz 1mm Female

OUTLINE DRAWING



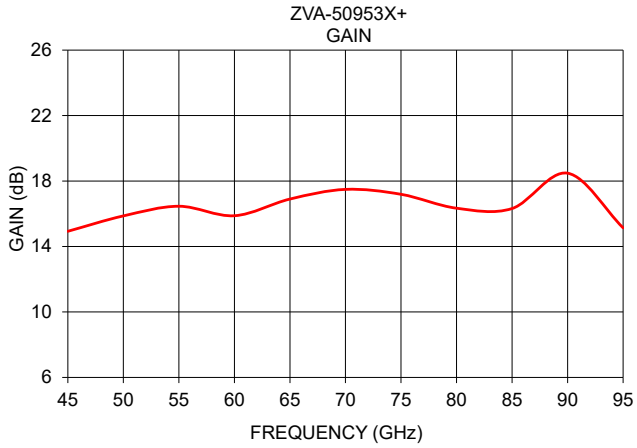
Weight: 47.0 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 Pl.±.015

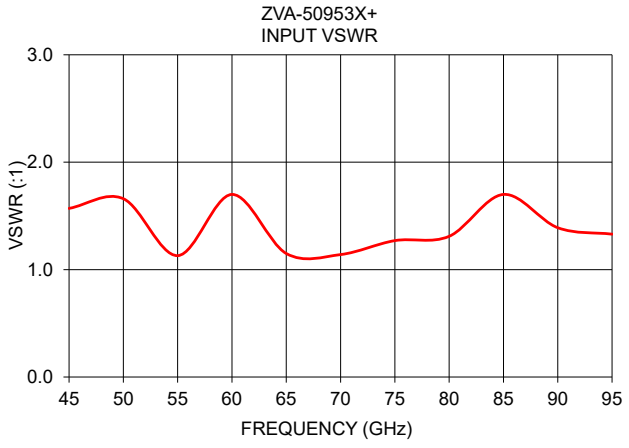
Wide Band Amplifier ZVA-50953X+

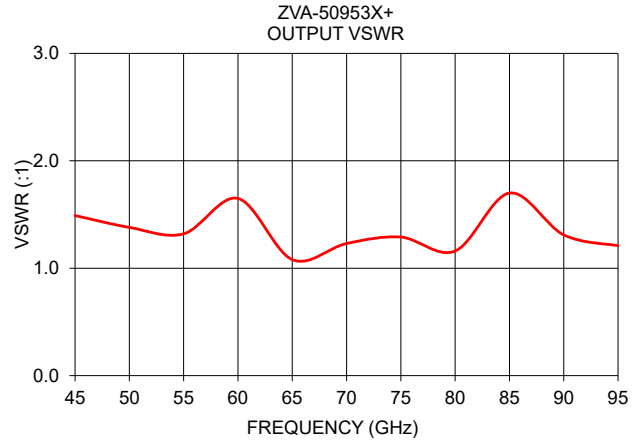
50Ω 45 to 95 GHz 1mm Female

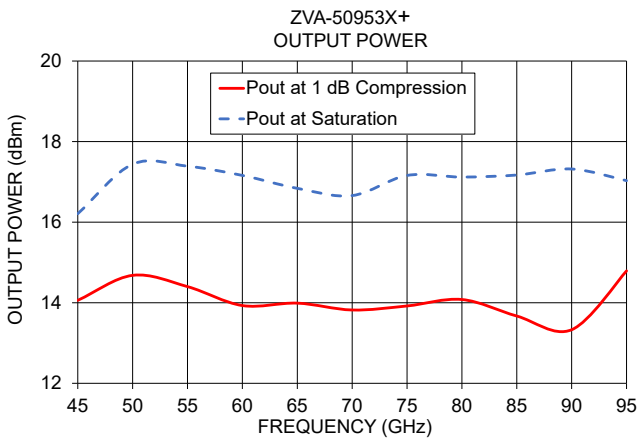
TYPICAL PERFORMANCE DATA / CURVES

Frequency (GHz)	Gain (dB)	VSWR (:1) IN	VSWR (:1) OUT	Pout at 1 dB Compression (dBm)	Pout at Saturation (dBm)
45	14.93	1.57	1.49	14.06	16.21
50	15.87	1.66	1.38	14.68	17.44
55	16.46	1.13	1.32	14.40	17.39
60	15.88	1.70	1.65	13.93	17.16
65	16.90	1.15	1.08	13.99	16.84
70	17.49	1.14	1.23	13.82	16.66
75	17.19	1.27	1.29	13.92	17.16
80	16.34	1.31	1.16	14.08	17.12
85	16.32	1.70	1.70	13.67	17.17
90	18.48	1.39	1.31	13.33	17.32
95	15.14	1.33	1.21	14.79	17.03









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.

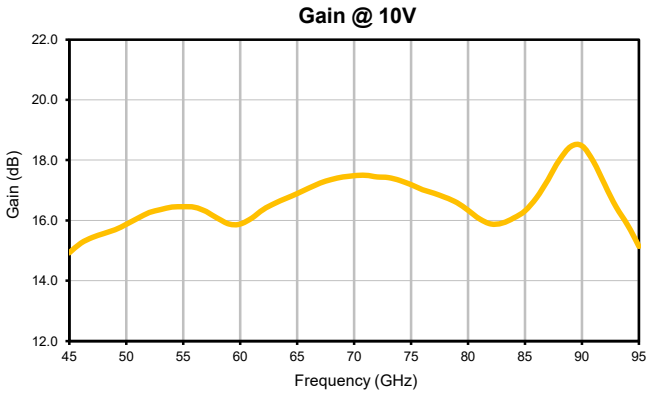
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

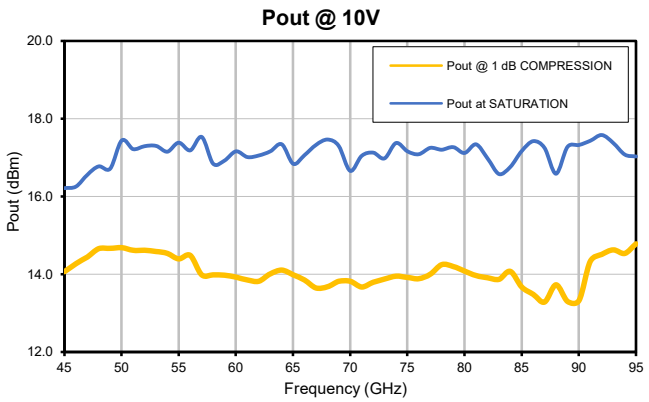
Coaxial Amplifier ZVA-50953X+

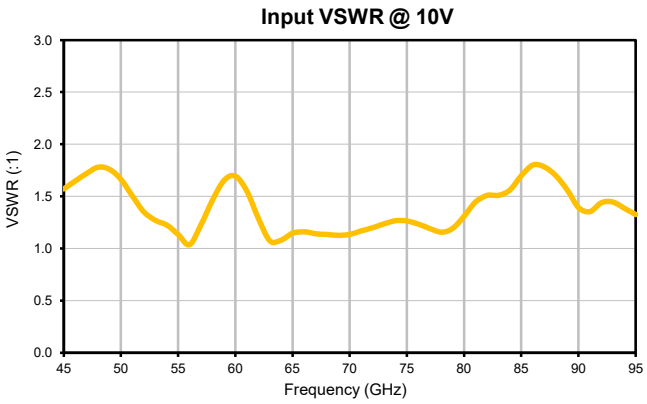
Typical Performance Data

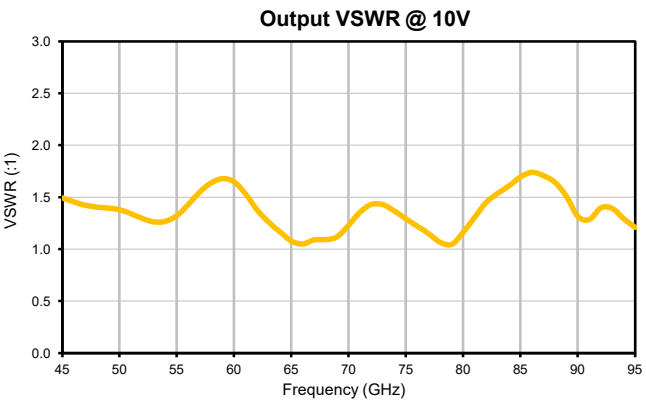
FREQUENCY (GHz)	GAIN (dB) 10V	VSWR (:1) IN 10V	VSWR (:1) OUT 10V	Pout @ 1 dB COMPRESSION (dBm) 10V	Pout at SATURATION (dBm) 10V
45.0	14.93	1.57	1.49	14.1	16.21
46.0	15.25	1.65	1.46	14.3	16.26
47.0	15.44	1.72	1.42	14.4	16.56
48.0	15.57	1.78	1.41	14.7	16.78
49.0	15.70	1.76	1.40	14.7	16.72
50.0	15.87	1.66	1.38	14.7	17.44
51.0	16.08	1.50	1.34	14.6	17.22
52.0	16.26	1.35	1.30	14.6	17.29
53.0	16.36	1.27	1.26	14.6	17.30
54.0	16.44	1.23	1.27	14.5	17.15
55.0	16.46	1.13	1.32	14.4	17.39
56.0	16.44	1.04	1.43	14.5	17.19
57.0	16.29	1.23	1.55	14.0	17.53
58.0	16.07	1.47	1.64	14.0	16.85
59.0	15.89	1.65	1.68	14.0	16.93
60.0	15.88	1.70	1.65	13.9	17.16
61.0	16.08	1.55	1.53	13.9	17.01
62.0	16.37	1.29	1.38	13.8	17.06
63.0	16.56	1.07	1.26	14.0	17.16
64.0	16.73	1.08	1.17	14.1	17.35
65.0	16.90	1.15	1.08	14.0	16.84
66.0	17.07	1.16	1.05	13.9	17.06
67.0	17.24	1.14	1.09	13.6	17.33
68.0	17.36	1.14	1.09	13.7	17.46
69.0	17.44	1.13	1.12	13.8	17.30
70.0	17.49	1.14	1.23	13.8	16.66
71.0	17.50	1.17	1.36	13.7	17.05
72.0	17.45	1.20	1.43	13.8	17.12
73.0	17.42	1.24	1.43	13.9	16.98
74.0	17.33	1.27	1.37	14.0	17.37
75.0	17.19	1.27	1.29	13.9	17.16
76.0	17.02	1.23	1.22	13.9	17.09
77.0	16.90	1.19	1.15	14.0	17.25
78.0	16.77	1.16	1.07	14.3	17.20
79.0	16.59	1.19	1.05	14.2	17.27
80.0	16.34	1.31	1.16	14.1	17.12
81.0	16.05	1.45	1.31	14.0	17.34
82.0	15.88	1.51	1.45	13.9	16.98
83.0	15.91	1.51	1.54	13.9	16.58
84.0	16.08	1.56	1.61	14.1	16.76
85.0	16.32	1.70	1.70	13.7	17.17
86.0	16.75	1.80	1.74	13.5	17.42
87.0	17.35	1.78	1.71	13.3	17.25
88.0	18.00	1.70	1.64	13.7	16.59
89.0	18.45	1.56	1.51	13.3	17.28
90.0	18.48	1.39	1.31	13.3	17.32
91.0	17.95	1.36	1.29	14.33	17.43
92.0	17.18	1.44	1.40	14.52	17.58
93.0	16.44	1.45	1.39	14.63	17.38
94.0	15.84	1.39	1.29	14.53	17.08
95.0	15.14	1.33	1.21	14.79	17.03

Typical Performance Curves



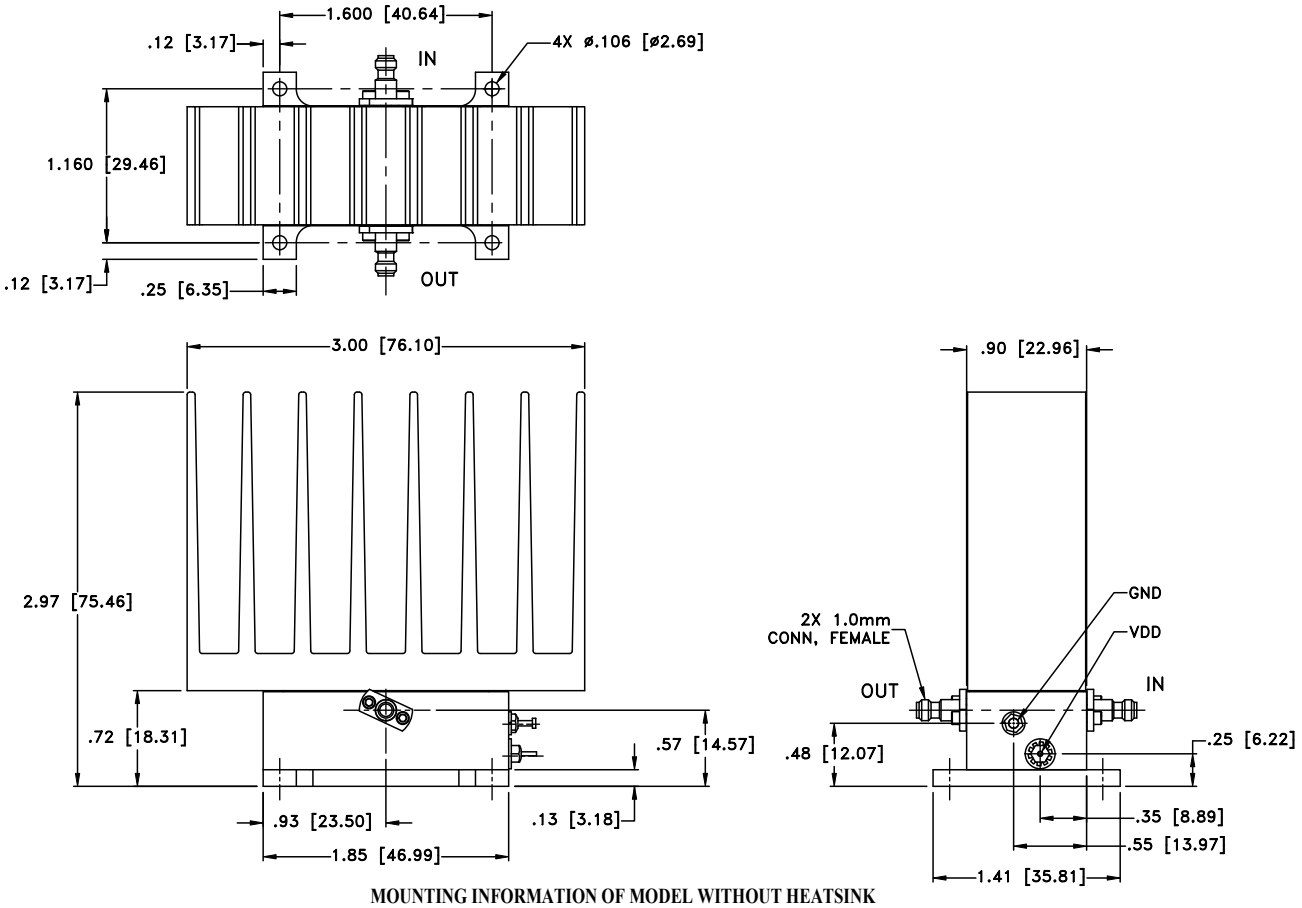




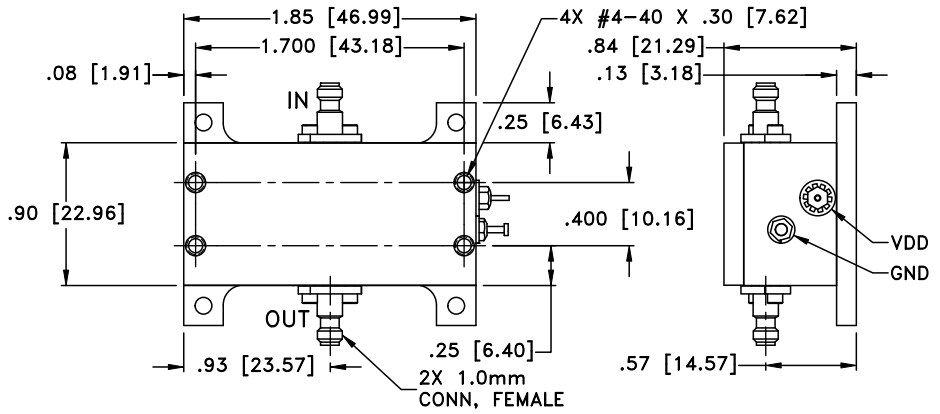


Case Style VP

Outline Dimensions VP3085-2



MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



Weight: 135.0 grams; Without heatsink 47.0 grams

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

Notes:
1. Case material: Aluminum
2. Case finish: Gold plating
3. Heat sink finish: Black anodize
4. Refer to the individual model data sheet for the type of connectors available
5. Shape of connector flange may vary

This document and its contents are the property of Mini-Circuits

Mini-Circuits

Environmental Specifications ENV130

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 Baseplate Temp	Individual Model Data Sheet
Storage Temperature	-40° to +85° C Ambient Environment	Individual Model Data Sheet
Burn-in	(DC on) 72 hours at 25°C	----
Thermal Shock	-40° C to +85°C, 100 cycles	Transition time = 5 mins, Dwell time = 30 mins
Vibration	Random Vibration (non-operating)	MIL-STD-883K, Method 2025, Cond. 1A

This document and its contents are the property of Mini-Circuits.