MEDIUM POWER, WIDEBAND

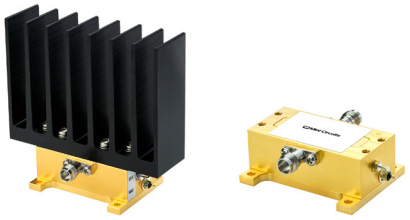
High-Frequency Amplifier

ZVA-35703+
ZVA-35703X+

50Ω 35 to 71 GHz

THE BIG DEAL

- High gain 17.5 dB typ. over the entire operating band
- Excellent gain flatness, ±1.5 dB typ.
- High Psat = 21 dBm typ.
- Adjustable DC voltage, +10 to +15 V



Generic photo used for illustration purposes only

Model No.	ZVA-35703+	ZVA-35703X+
Case Style	VP3085-1	
Connectors	1.85mm Female	

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

APPLICATIONS

- Automotive tests
- Radar/Sensing
- 5G FR2+ bands (Ka-band, Q-band, V-band, E-band)
- SATCOM
- Wireless Infrastructure
- IEEE 802.11.ad WiGig

PRODUCT OVERVIEW

Mini-Circuits' ZVA-35703+ is a coaxial, medium power high frequency wideband amplifier, operating from 35 to 71 GHz. This model operates over a single 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, that protect the amplifier from damage if mishandled during operation. The high frequency operation combined with medium output power makes this amplifier an ideal choice for 5G communications applications..

KEY FEATURES

Feature	Advantages
High Freq amplifier, 35 to 71 GHz	Broadband amplifier focusing on 5G mmWave frequencies up to 71 GHz
Heatsink option	Model ZVA-35703+ comes with a heatsink, keeping the amplifier cool to the touch during normal operation at room temperature
Excellent gain flatness Low VSWR Medium output power	The amplifier provides 17.5 dB (typ.) of gain over the entire operating band and has high output power at saturation of 21 dBm (typ.) which makes it a good choice for applications that require a medium or high power amplifier at high frequency
Adjustable DC supply voltage	The device is capable of operating from +10 to +15 V with consistent DC power consumption
DC Protection – Over-voltage Reverse voltage In-rush current	The internal DC circuitry allows the amplifier to be protected from external mishandling that could lead to catastrophic failures in the field

REV. OR
ECO-012191
ZVA-35703+
MCL NY
220317

ELECTRICAL SPECIFICATIONS AT 25 °C BASEPLATE

Parameter	Condition (MHz)	ZVA-35703+[3] ZVA-35703X+[4] Min.	Typ.	Max.	Units
Frequency Range		35000		71000	MHz
Gain	35000 - 70000	15.0	17.5	-	dB
Output Power at 1dB Compression	35000 - 44000	17.0	19.0	-	dBm
	44000 - 70000	18.0	20.0	-	
Output Power at Saturation	35000 - 65000	20.0	21.5	-	dBm
	65000 - 70000	18.5	20.5	-	
OIP3	35000 - 70000	-	28	-	dBm
Input VSWR	35000 - 70000	-	1.5	2.0	:1
Output VSWR[1]	35000 - 70000	-	1.5	2.0	:1
Operating DC Voltage		+10	-	+15	V
Device Operating Current at +10 V[2]		-	210	400[2]	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.
3. For units with heatsink, limit ambient temperature to 50 °C.
4. For units without heatsink, limit the maximum baseplate temperature to 60 °C.

MAXIMUM RATINGS[6]

Parameter	Rating
Operating temperature	ZVA-35703+ -40 °C to +50 °C Ambient ZVA-35703X+ -40 °C to + 60 °C Baseplate
Storage temperature	-40 °C to +85 °C
Total Power Dissipation	3.6 W
RF Input Power[5] (CW)	+18 dBm
DC Operating Voltage	+16 V

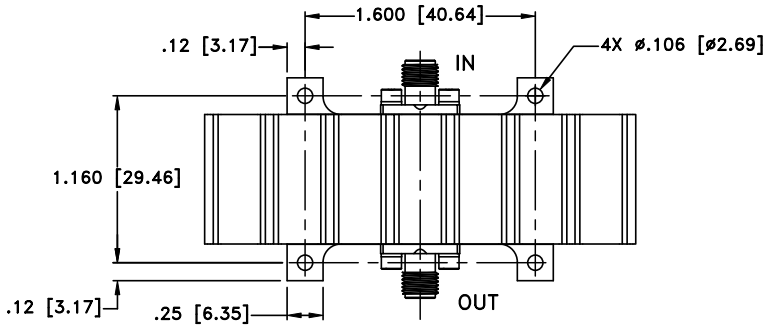
5. Specified under matched load to 50 ohms.
6. Continuous operation is not recommended at these extremes. Permanent damage may occur if any of these limits are exceeded.

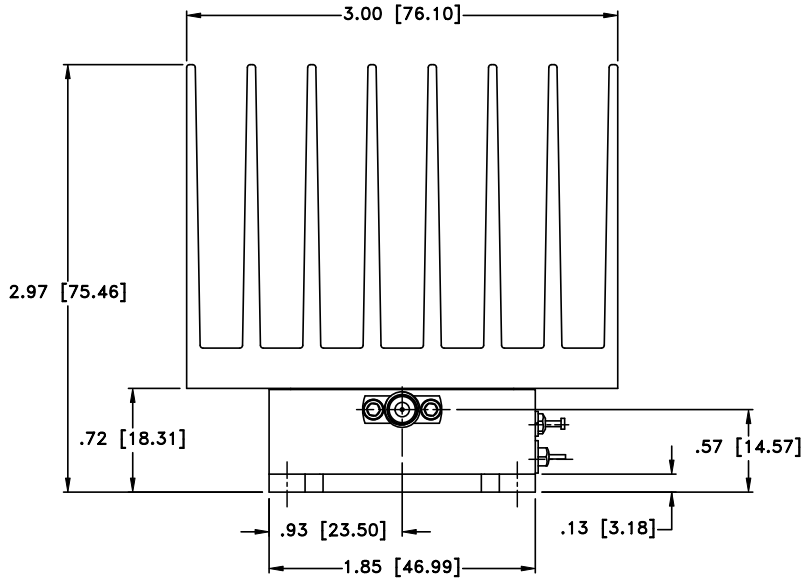
DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEAT SINK

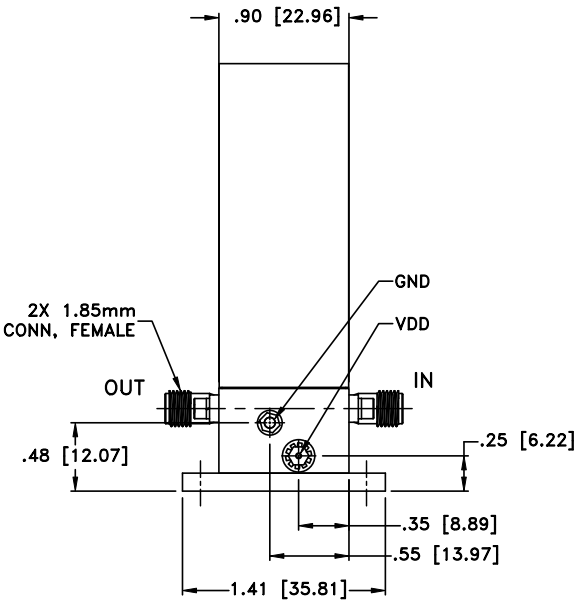
$$\textit{MAXIMUM THERMAL RESISTANCE} = \frac{\textit{MAXIMUM OPERATING CASE TEMP} - \textit{MAXIMUM USER AMBIENT TEMP}}{\textit{POWER DISSIPATION}}$$

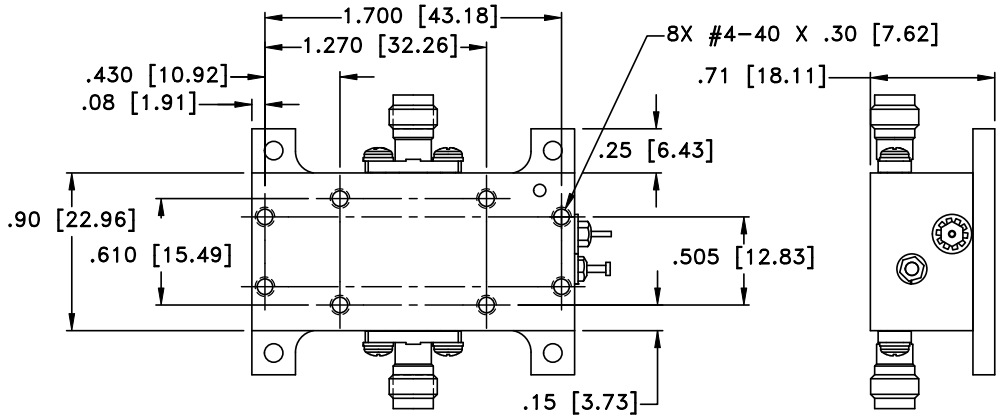
Example:	MAXIMUM OPERATING CASE TEMP = 50 °C (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) MAXIMUM USER AMBIENT TEMP = 30 °C (USER DEFINED) POWER DISSIPATION = 10 WATTS (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) THEN MAXIMUM ALLOWABLE THERMAL RESISTANCE = 2 °C/W

OUTLINE DRAWING





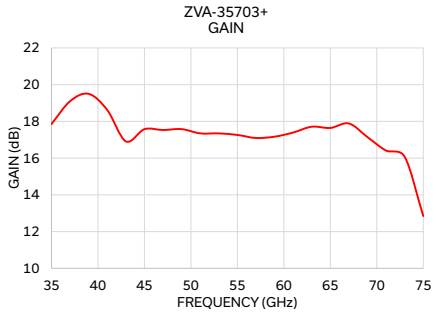


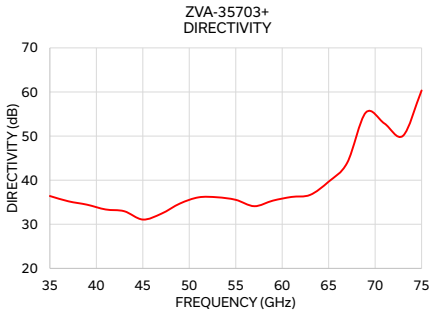


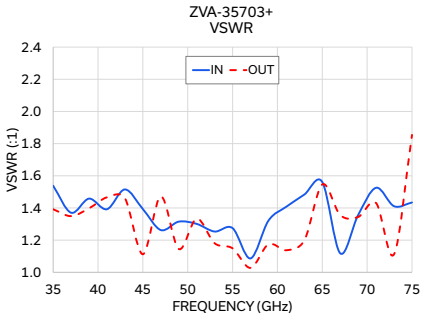
Weight: 135.0 grams; Without heatsink 47.0 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 Pl.±.015

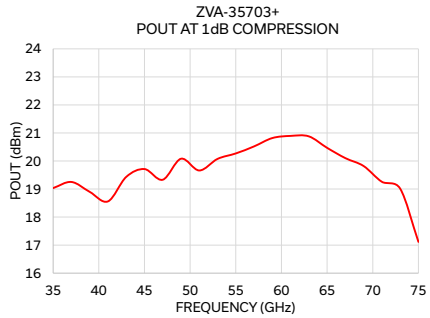
TYPICAL PERFORMANCE DATA

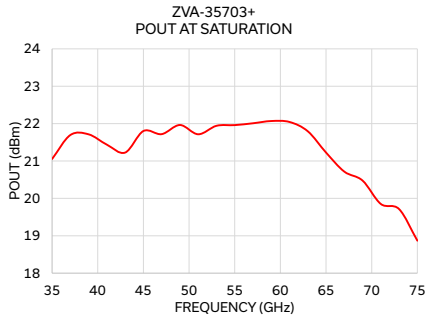
Frequency (GHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		Pout at 1 dB Compr. (dBm)	Pout at Saturation (dBm)	OIP3 (dBm)
	10V	10V	IN	OUT	10V	10V	10V
35.00	17.86	36.40	1.54	1.39	19.03	21.05	27.27
37.00	19.10	35.20	1.37	1.35	19.25	21.69	27.26
39.00	19.50	34.44	1.46	1.40	18.90	21.71	26.75
41.00	18.62	33.36	1.39	1.47	18.56	21.44	26.12
43.00	16.91	32.96	1.52	1.46	19.43	21.23	26.01
45.00	17.58	31.07	1.39	1.11	19.71	21.80	26.30
47.00	17.53	32.40	1.26	1.47	19.33	21.72	26.50
49.00	17.58	34.71	1.31	1.14	20.08	21.96	26.92
51.00	17.35	36.10	1.30	1.33	19.66	21.72	26.86
53.00	17.35	36.12	1.25	1.18	20.07	21.94	27.23
55.00	17.26	35.54	1.27	1.15	20.27	21.96	27.51
57.00	17.10	34.10	1.09	1.03	20.52	22.01	27.96
59.00	17.17	35.36	1.32	1.17	20.82	22.07	28.60
61.00	17.39	36.20	1.41	1.14	20.90	22.04	29.19
63.00	17.71	36.65	1.48	1.20	20.88	21.80	29.59
65.00	17.64	39.67	1.56	1.55	20.47	21.23	30.25
67.00	17.89	43.96	1.12	1.36	20.10	20.72	31.34
69.00	17.14	55.34	1.36	1.34	19.82	20.48	32.45
71.00	16.41	52.86	1.53	1.43	19.26	19.85	-
73.00	16.07	50.07	1.41	1.11	19.01	19.71	-
75.00	12.85	60.34	1.43	1.85	17.12	18.87	-

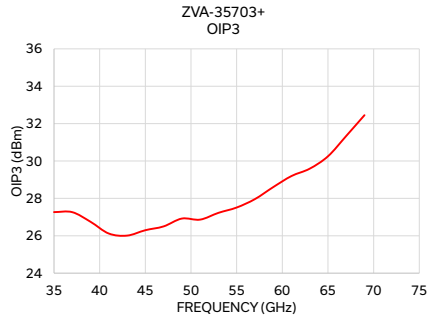












NOTES

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

Coaxial Amplifier ZVA-35703+

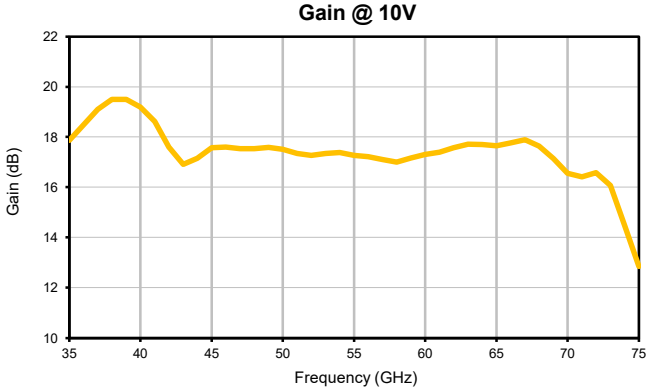
Typical Performance Data

FREQUENCY (GHz)	GAIN (dB) 10V	DIRECTIVITY (dB) 10V	VSWR (:1) IN 10V	VSWR (:1) OUT 10V
35.0	17.86	36.40	1.54	1.39
36.0	18.48	36.21	1.49	1.46
37.0	19.10	35.20	1.37	1.35
38.0	19.51	34.37	1.36	1.27
39.0	19.50	34.44	1.46	1.40
40.0	19.19	33.85	1.49	1.50
41.0	18.62	33.36	1.39	1.47
42.0	17.60	33.23	1.37	1.43
43.0	16.91	32.96	1.52	1.46
44.0	17.15	31.99	1.53	1.29
45.0	17.58	31.07	1.39	1.11
46.0	17.60	31.40	1.32	1.39
47.0	17.53	32.40	1.26	1.47
48.0	17.53	33.37	1.33	1.35
49.0	17.58	34.71	1.31	1.14
50.0	17.51	35.73	1.26	1.20
51.0	17.35	36.10	1.30	1.33
52.0	17.27	36.41	1.35	1.32
53.0	17.35	36.12	1.25	1.18
54.0	17.38	35.55	1.15	1.10
55.0	17.26	35.54	1.27	1.15
56.0	17.22	35.08	1.25	1.10
57.0	17.10	34.10	1.09	1.03
58.0	17.00	34.90	1.24	1.14
59.0	17.17	35.36	1.32	1.17
60.0	17.30	35.82	1.34	1.14
61.0	17.39	36.20	1.41	1.14
62.0	17.57	35.89	1.46	1.16
63.0	17.71	36.65	1.48	1.20
64.0	17.70	38.00	1.53	1.32
65.0	17.64	39.67	1.56	1.55
66.0	17.76	41.01	1.39	1.61
67.0	17.89	43.96	1.12	1.36
68.0	17.63	48.82	1.11	1.09
69.0	17.14	55.34	1.36	1.34
70.0	16.55	53.51	1.66	1.50
71.0	16.41	52.86	1.53	1.43
72.0	16.58	50.19	1.11	1.22
73.0	16.07	50.07	1.41	1.11
74.0	14.49	56.31	1.63	1.61
75.0	12.85	60.34	1.43	1.85

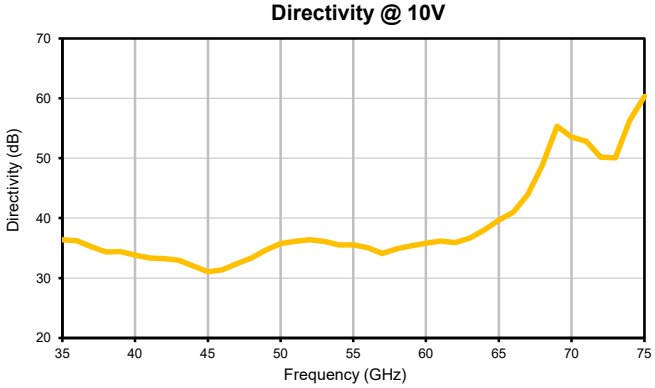
FREQUENCY (GHz)	Pout @ 1 dB COMPRESSION (dBm) 10V	Pout at SATURATION (dBm) 10V	OIP3 (dBm) 10V
35.0	19.0	21.1	27.27
37.0	19.3	21.7	27.26
39.0	18.9	21.7	26.75
41.0	18.6	21.4	26.12
43.0	19.4	21.2	26.01
45.0	19.7	21.8	26.30
47.0	19.3	21.7	26.50
49.0	20.1	22.0	26.92
51.0	19.7	21.7	26.86
53.0	20.1	21.9	27.23
55.0	20.3	22.0	27.51
57.0	20.5	22.0	27.96
59.0	20.8	22.1	28.60
61.0	20.9	22.0	29.19
63.0	20.9	21.8	29.59
65.0	20.5	21.2	30.25
67.0	20.1	20.7	31.34
69.0	19.8	20.5	32.45
71.0	19.3	19.9	-
73.0	19.0	19.7	-
75.0	17.1	18.9	-

Typical Performance Curves

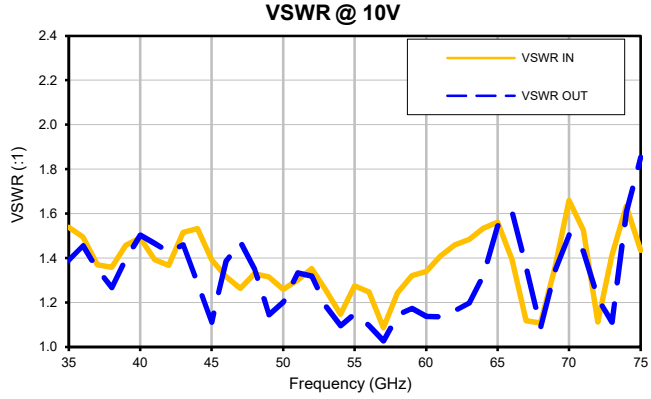
Gain @ 10V



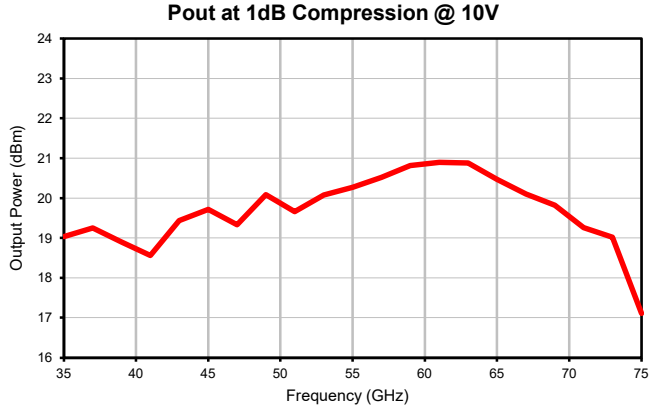
Directivity @ 10V



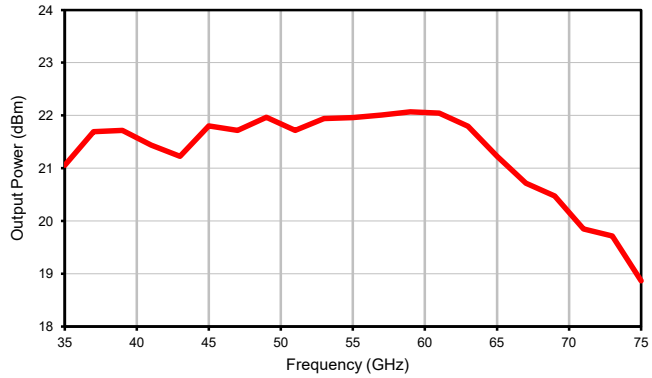
VSWR @ 10V



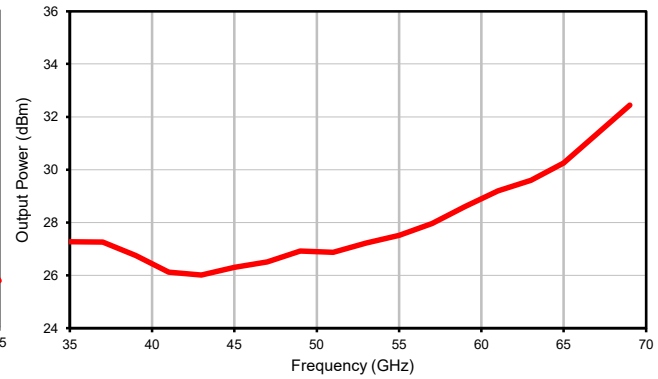
Pout at 1dB Compression @ 10V



Pout at Saturation @ 10V

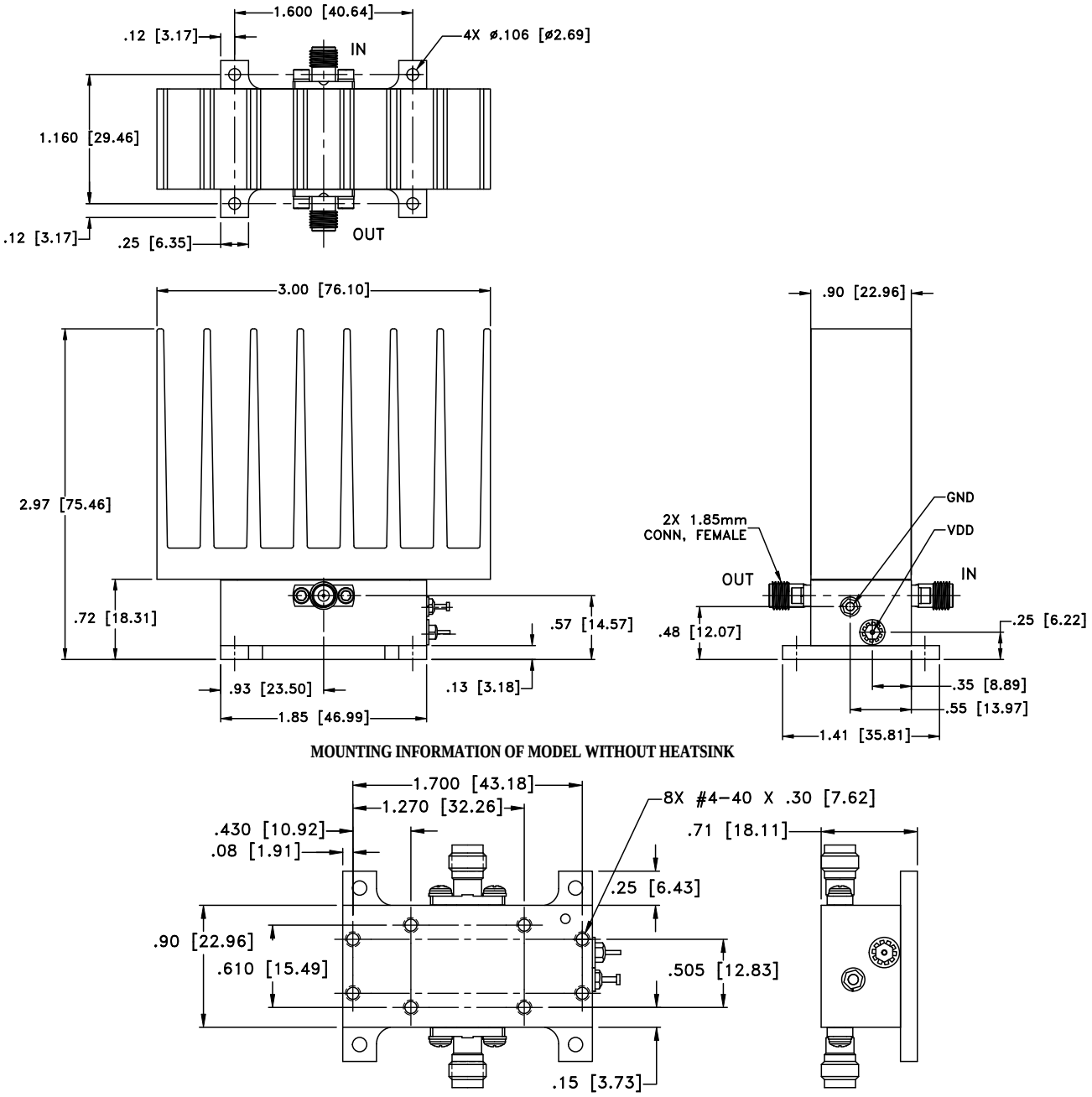


OIP3 @ 10V



Outline Dimensions

VP3085-1



MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK

Weight: 135.0 grams; Without heatsink 47.0 grams

Dimensions are in inches (mm). Tolerances: 2 Pl.Ñ03; 3 Pl.Ñ015

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

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