COAXIAL

High Power Amplifier

ZHL-03-5WF+
ZHL-03-5WFX+

50Ω 5 W 60 to 300 MHz SMA Female

FEATURES

- High Power, +39 dBm Typ.
- Low Noise Figure, 3 dB Typ.
- High OIP3, +49 dBm Typ.
- Class A Amplifier



Generic photo used for illustration purposes only

APPLICATIONS

- VHF Transmitters
- Instrumentation
- Test Equipment

Model No.	ZHL-03-5WF+	ZHL-03-5WFX+▲
Case Style	CP641	
Connectors	SMA female	

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

ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Units
Frequency Range	60		300	MHz
Gain	30			dB
Gain Flatness			±1.0	dB
Output Power at 1 dB Compression	+36			dBm
Noise Figure		3.0		dB
Output Third Order Intercept Point		+49		dBm
Input VSWR		1.4		:1
Output VSWR		1.5		:1
DC Supply Voltage		+24		V
Supply Current			2.8	A

Open load is not recommended, potentially can cause damage.
With no load, derate max. input power by 20 dB.

▲ Heatsink and fan not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum baseplate temperature to +85 °C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heatsink to be 0.3 °C/W max.

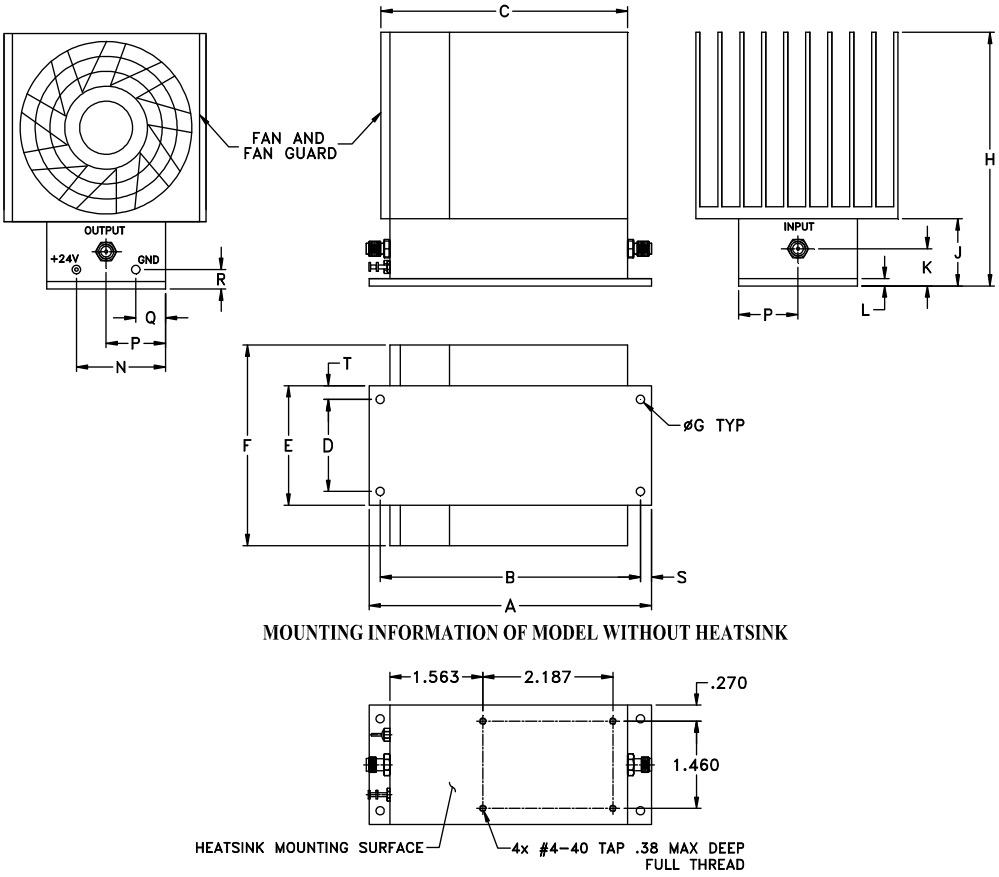
ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20 °C to +65 °C
Storage Temperature	-55 °C to +100 °C
Baseplate Temperature	+85 °C
DC Voltage	+28 V
Input RF Power (No Damage)	+10 dBm

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

REV. M
ECO-022711
ZHL-03-5WF(X)+
MCL NY
260302

OUTLINE DRAWING

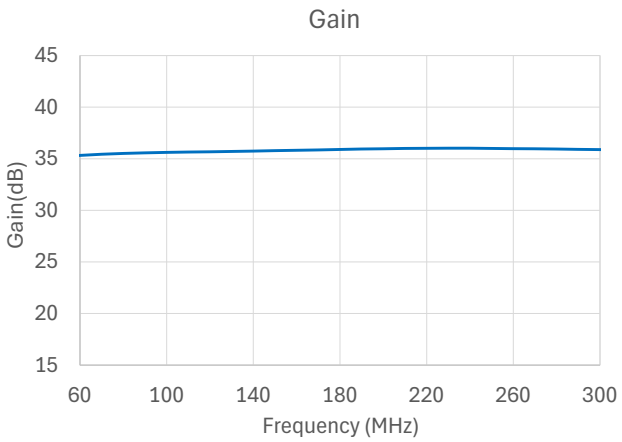


OUTLINE DIMENSIONS (inch / mm)

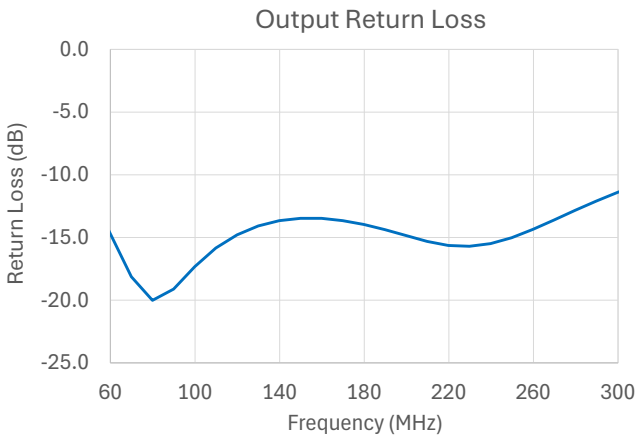
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	wt
4.75	4.375	4.18	1.540	2.00	3.36	.144	4.24	1.12	.58	.125	--	1.50	1.00	.50	.34	.19	.23	grams*
120.65	111.13	106.17	39.12	50.80	85.34	3.66	107.70	28.45	14.73	3.18	--	38.10	25.40	12.70	8.64	4.83	5.84	750

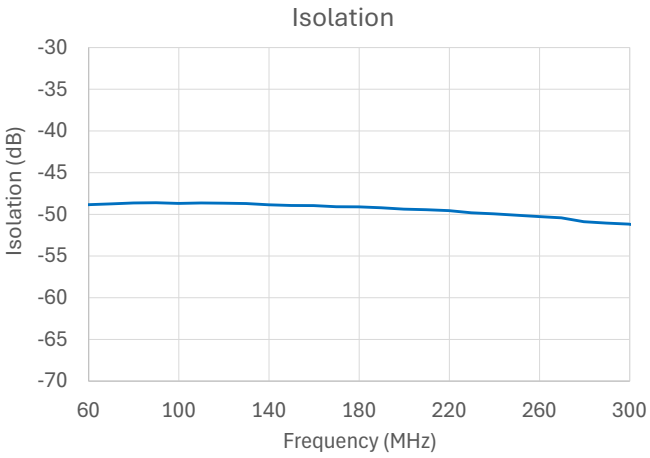
*290 grams without heatsink

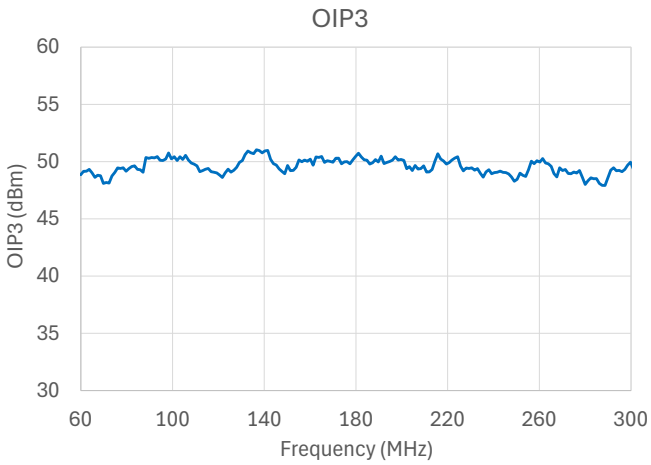
TYPICAL PERFORMANCE CHARTS











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

Amplifier ZHL-03-5WF+

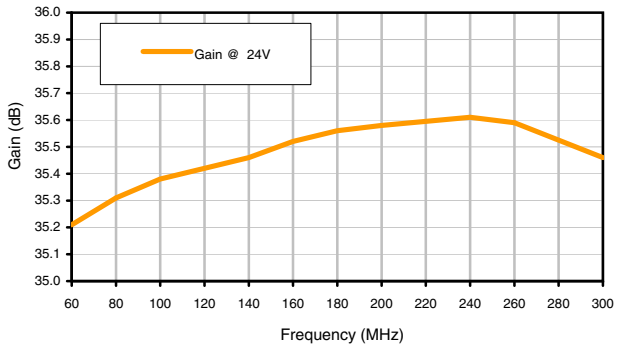
Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 24V	DIRECTIVITY (dB) 24V	VSWR IN (:1) 24V	VSWR OUT (:1) 24V	Output IP3 (dBm) 24V	NOISE FIGURE (dB) 24V	Pout at 1dB Comp. (dBm) 24V
60.0	35.21	9.38	1.18	1.74	48.61	3.85	38.73
80.0	35.31	8.95	1.24	1.57	49.22	3.51	39.38
100.0	35.38	8.91	1.28	1.50	49.62	3.40	39.53
140.0	35.46	9.08	1.32	1.44	49.47	3.14	39.35
160.0	35.52	9.02	1.33	1.41	49.45	3.05	39.26
180.0	35.56	9.03	1.34	1.39	49.57	3.02	39.79
200.0	35.58	9.04	1.37	1.38	49.47	2.99	40.07
240.0	35.61	9.39	1.50	1.45	49.24	3.00	39.99
260.0	35.59	9.71	1.59	1.54	49.16	3.00	39.72
300.0	35.46	10.32	1.81	1.78	48.87	3.05	39.40

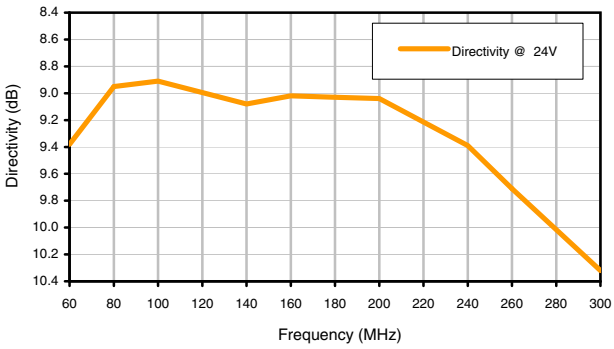
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Typical Performance Curves

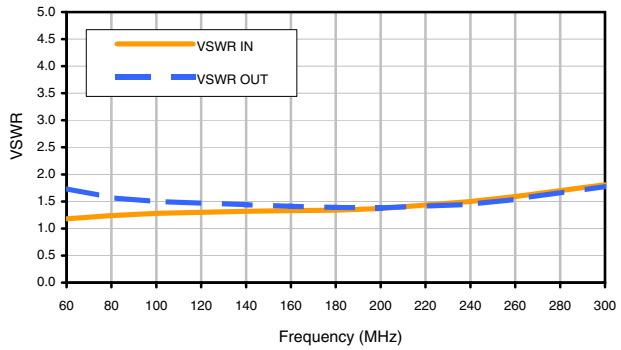
Gain



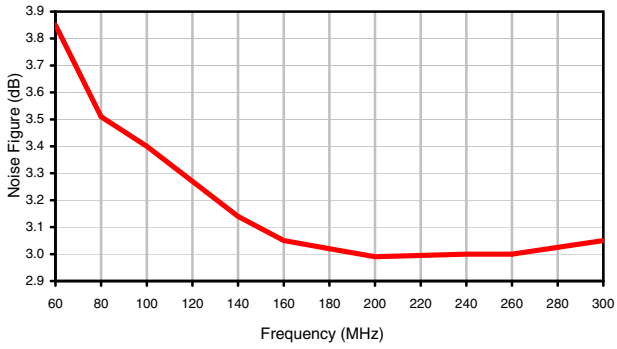
Directivity



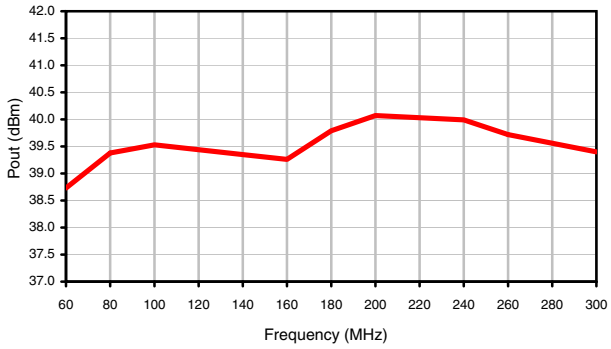
VSWR @ 24V



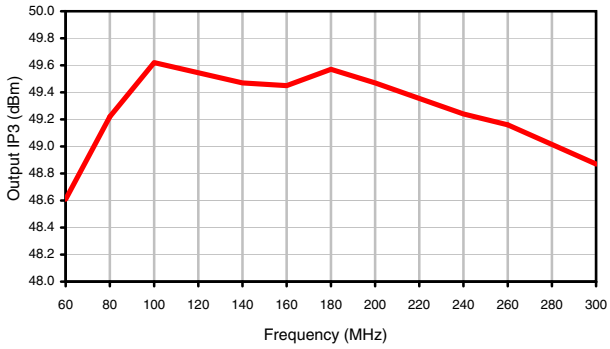
Noise Figure @ 24V



Pout at 1dB Compression @ 24V



Output IP3 @ 24V

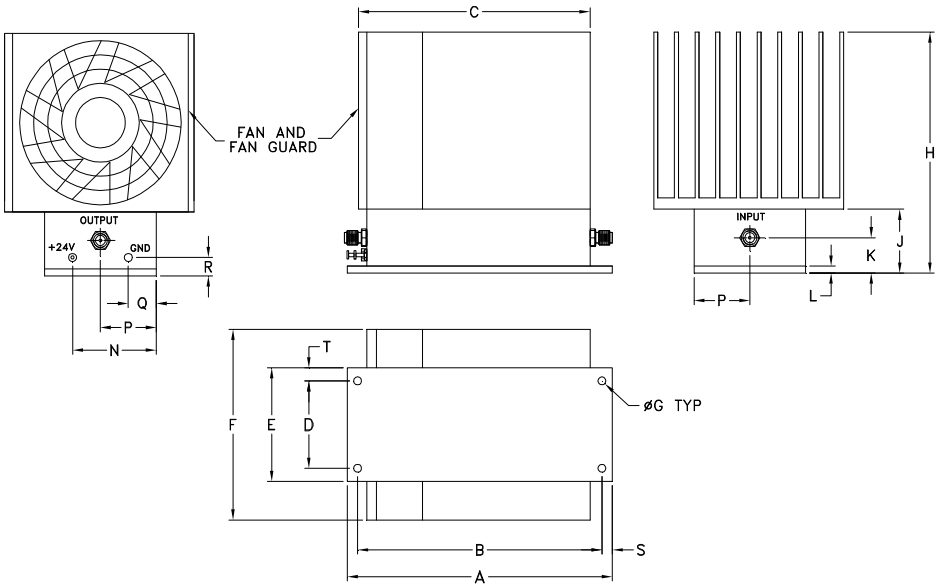


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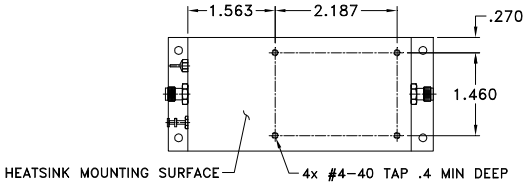
Case Style CP

Outline Dimensions

CP641



MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
CP641	4.75 (120.65)	4.375 (111.13)	4.18 (106.17)	1.540 (39.12)	2.00 (50.80)	3.36 (85.34)	.144 (3.66)	4.24 (107.70)	1.12 (28.45)	.58 (14.73)	.125 (3.18)	-- --	1.50 (38.10)

CASE#	P	Q	R	S	T	WT. GRAMS	WT. WITHOUT HEATSINK GRAMS
CP641	1.00 (25.40)	.50 (12.70)	.34 (8.64)	.19 (4.83)	.23 (5.84)	750	290

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Heat sink finish: Black anodize if supplied with heat sink.

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Mini-Circuits

Environmental Specifications **ENV23T5**

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	-20° to 80° C Ambient Environment	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

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