



COAXIAL

High Power Amplifier

ZHL-40W-372-S+

50Ω 40W 3400 to 3700 MHz

THE BIG DEAL

- High Power, 40 Watt, typ
- Low Current consumption, 5A typ. at saturation
- High IP3, +52 dBm typ.
- Good Gain Flatness, ±1.0 dB typ.
- No damage with an open or short output load under 43 dB CW output power
- Shuts off when base plate temperature exceeds +85°C

APPLICATIONS

- Telecommunication
- Broadband wireless
- Aviation and space operation
- Amateur radio
- Lab Test



Generic photo used for illustration purposes only

Model No.	ZHL-40W-372-S+
Case Style	BT1344
Connectors	SMA/D-Sub Male

PRODUCT OVERVIEW

Mini-Circuits' ZHL-40W-372-S+ is a high-power connectorized amplifier supporting a wide range of applications from 3400 to 3700 MHz. This model provides +46 dBm output power at saturation and extremely flat gain (50 ±1.0 dB) across its full bandwidth, making it ideal for systems where consistent performance across frequency is required. The amplifier operates on a +28V DC supply and comes housed in compact aluminum alloy case (5.94 x 3.58 x 1.18") with SMA connectors, and an optional heat sink and fan for efficient cooling.

KEY FEATURES

Feature	Advantages
Frequency band, 3400 to 3700 MHz	One amplifier supports a broad range of system and test lab applications such as telecommunication and broadband wireless, amateur radio, aviation and space operation.
High Gain, 50 dB typ.	Reduces the number of gain stages, lowering component count and overall system cost.
Excellent Gain Flatness, ±1.0 dB typ.	Provides consistent performance across frequency, minimizing the need for external equalizing networks in wideband applications.
High saturated output power, +46 dBm typ.	Supports a wide range of power requirements.
High OIP3, +52 dBm typ.	Provides highly linear performance with excellent sensitivity and two-tone spur-free dynamic range.
Built-in protections	The unit features immunity to open and short loads under full CW output power and automatically shuts off when the base plate temperature exceeds +80°C.

REV. A
 ECO-017508
 ZHL-40W-372-S+
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ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Units
Frequency Range	3400	—	3700	MHz
Gain ¹	46	50	56	dB
Gain Flatness	—	±1.0	±2.0	dB
Output Power at 3dB	—	+45	—	dBm
Saturated Output Power	—	+46	—	dBm
Noise Figure	—	15	—	dB
Output third order intercept point	—	+52	—	dBm
Input VSWR	—	1.5	—	:1
Output VSWR	—	1.5	—	:1
DC Supply Voltage	—	28	29	V
Supply Current ²	—	5.0	6.2	A

- 1. Small signal input power -50 dBm typ.
- 2. At saturation

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 0.13°C/W max.

MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20 °C to 60 °C
Storage Temperature	-55 °C to 100 °C
Base Plate Temperature	85 °C
Input RF Power (no damage)	+5 dBm
Input RF Power (open/short)	-13 dBm

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

D-SUB MALE CONNECTOR PIN CONNECTIONS³

Pin Function	Label on unit	Pin #	Color	Gauge
None	N/C1, N/C2 N/C4, N/C5	1,2,4,5	None	None
<u>Thermal Shut-Off Indication:</u> Shut-Off: +2 to +5V Not Shut-Off: 0 to +0.8V	TTL Out	3	Orange	26 AWG
DC Input (+)	Vdc	6,7	Red	18 AWG
Ground	GND	8,9	Black	18 AWG

3. Each amplifier will come packaged with an additional D-Sub connector for mating with the amplifier.





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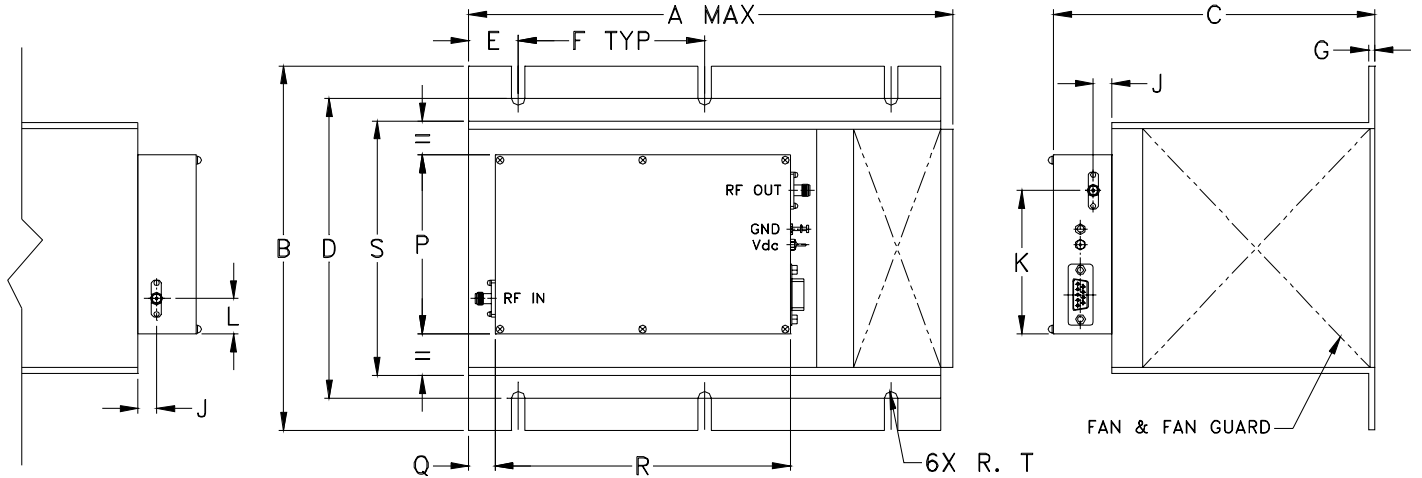
High Power Amplifier

ZHL-40W-372-S+

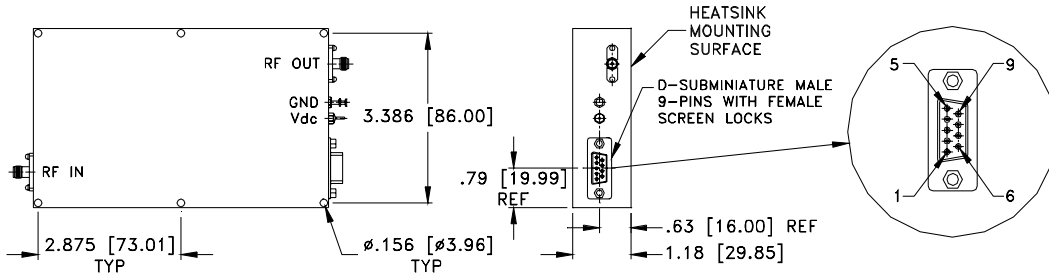
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50Ω 40W 3400 to 3700 MHz

CASE STYLE DRAWING



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK.



OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	G	J	K	L	P	Q	R	S	T	wt
9.85	7.3	6.5	6.00	1.00	3.75	.13	.37	2.87	.71	3.58	.5	5.95	5.1	.135	grams*
250.19	185.42	165.10	152.40	25.40	95.25	3.30	9.40	72.90	18.03	90.93	12.70	151.13	129.54	3.43	4265

*580 grams without heatsink

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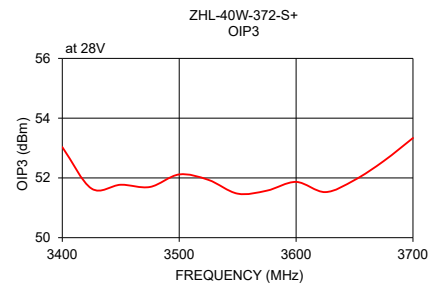
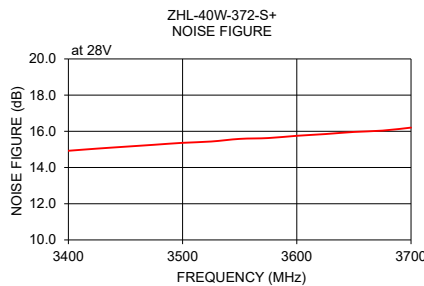
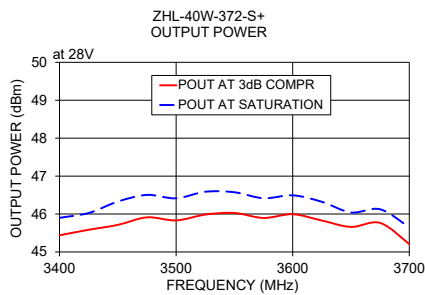
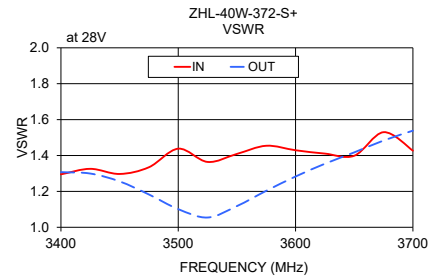
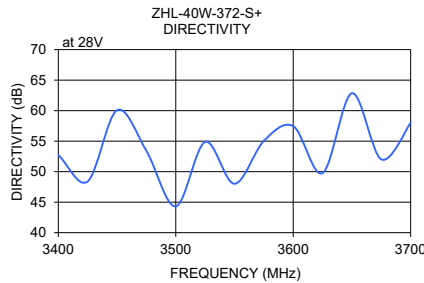
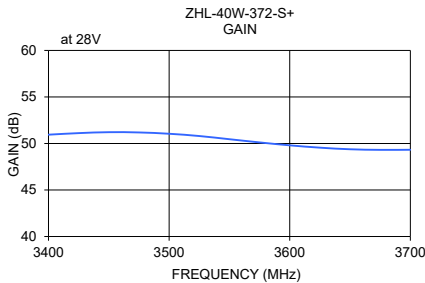
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ZHL-40W-372-S+ ZHL-40W-372X-S+

50Ω 40W 3400 to 3700 MHz

TYPICAL PERFORMANCE DATA / GRAPHS

Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		Noise Figure (dB)	POUT at 3 dB COMPR. (dBm)	POUT at SAT (dBm)	Output IP3 (dBm)
	28V	28V	IN	OUT	28V	28V	28V	28V
3400	50.94	52.72	1.30	1.31	14.93	45.44	45.90	53.03
3425	51.11	48.40	1.33	1.30	15.04	45.59	46.03	51.64
3450	51.21	60.07	1.30	1.26	15.15	45.71	46.33	51.77
3475	51.18	53.41	1.33	1.18	15.26	45.91	46.50	51.70
3500	51.04	44.30	1.44	1.10	15.36	45.83	46.41	52.12
3525	50.80	54.87	1.36	1.05	15.44	45.99	46.59	51.93
3550	50.46	48.02	1.41	1.12	15.58	46.03	46.57	51.47
3575	50.11	55.04	1.45	1.20	15.63	45.90	46.42	51.57
3600	49.80	57.46	1.43	1.28	15.75	45.99	46.49	51.87
3625	49.55	49.75	1.41	1.35	15.85	45.83	46.32	51.53
3650	49.38	62.85	1.40	1.42	15.97	45.66	46.04	51.93
3675	49.31	52.01	1.53	1.48	16.04	45.77	46.12	52.56
3700	49.32	58.00	1.43	1.54	16.21	45.21	45.65	53.34



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



High Power Amplifier

ZHL-40W-372-S+

Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 28V	DIRECTIVITY (dB) 28V	VSWR (:1)		NOISE FIGURE (dB) 28V	Pout at 3 dB COMPRESSION (dBm) 28V	Pout at SATURATION (dBm) 28V	OUTPUT IP3 (dBm) 28V
			IN 28V	OUT 28V				
3400	50.94	52.72	1.30	1.31	14.93	45.44	45.90	53.03
3425	51.11	48.40	1.33	1.30	15.04	45.59	46.03	51.64
3450	51.21	60.07	1.30	1.26	15.15	45.71	46.33	51.77
3475	51.18	53.41	1.33	1.18	15.26	45.91	46.50	51.70
3500	51.04	44.30	1.44	1.10	15.36	45.83	46.41	52.12
3525	50.80	54.87	1.36	1.05	15.44	45.99	46.59	51.93
3550	50.46	48.02	1.41	1.12	15.58	46.03	46.57	51.47
3575	50.11	55.04	1.45	1.20	15.63	45.90	46.42	51.57
3600	49.80	57.46	1.43	1.28	15.75	45.99	46.49	51.87
3625	49.55	49.75	1.41	1.35	15.85	45.83	46.32	51.53
3650	49.38	62.85	1.40	1.42	15.97	45.66	46.04	51.93
3675	49.31	52.01	1.53	1.48	16.04	45.77	46.12	52.56
3700	49.32	58.00	1.43	1.54	16.21	45.21	45.65	53.34



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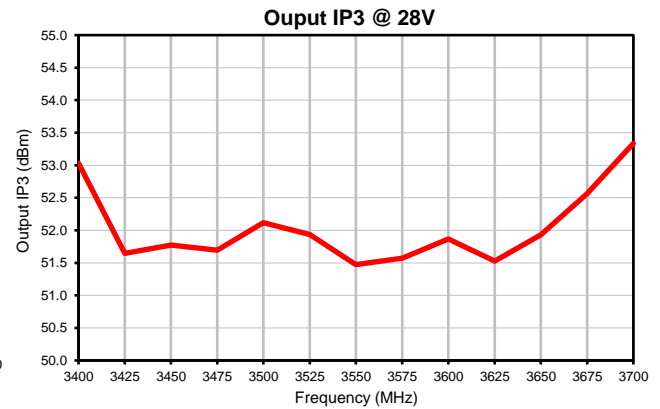
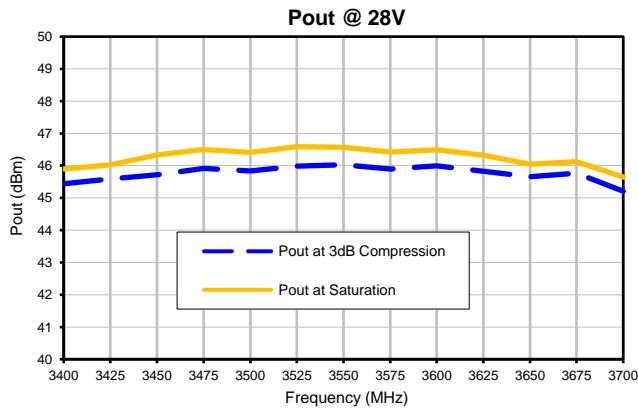
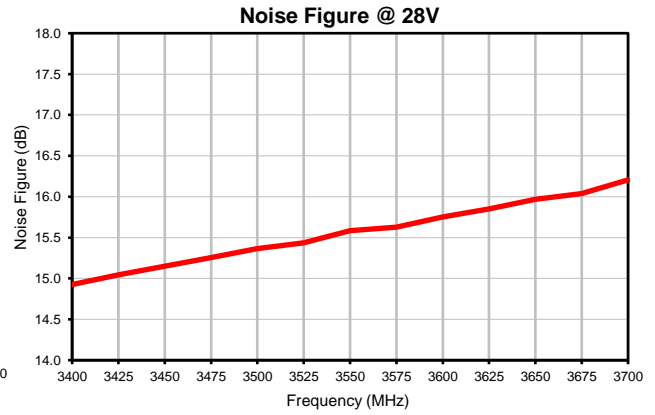
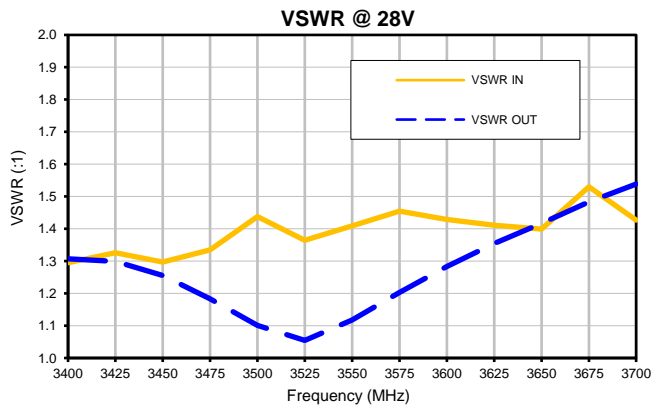
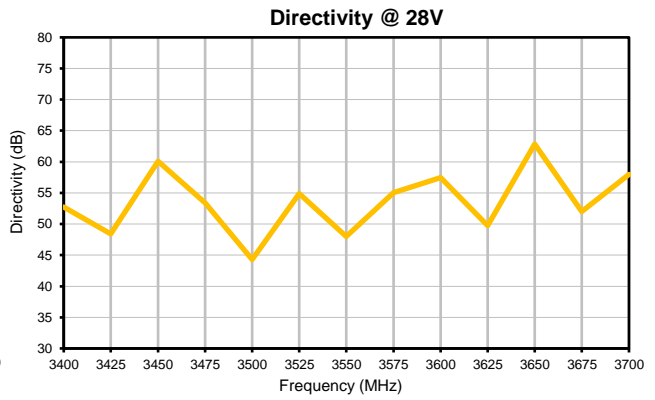
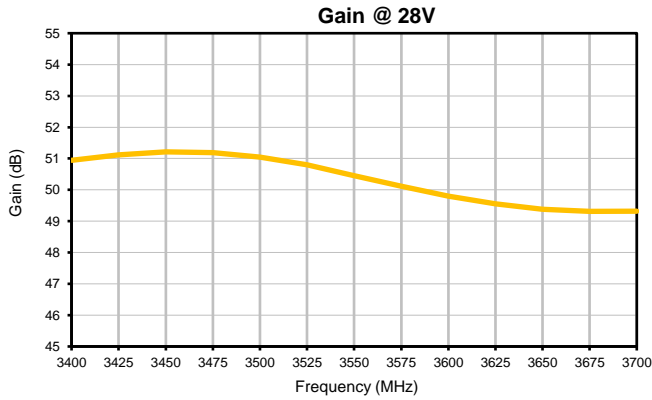
IF/RF MICROWAVE COMPONENTS

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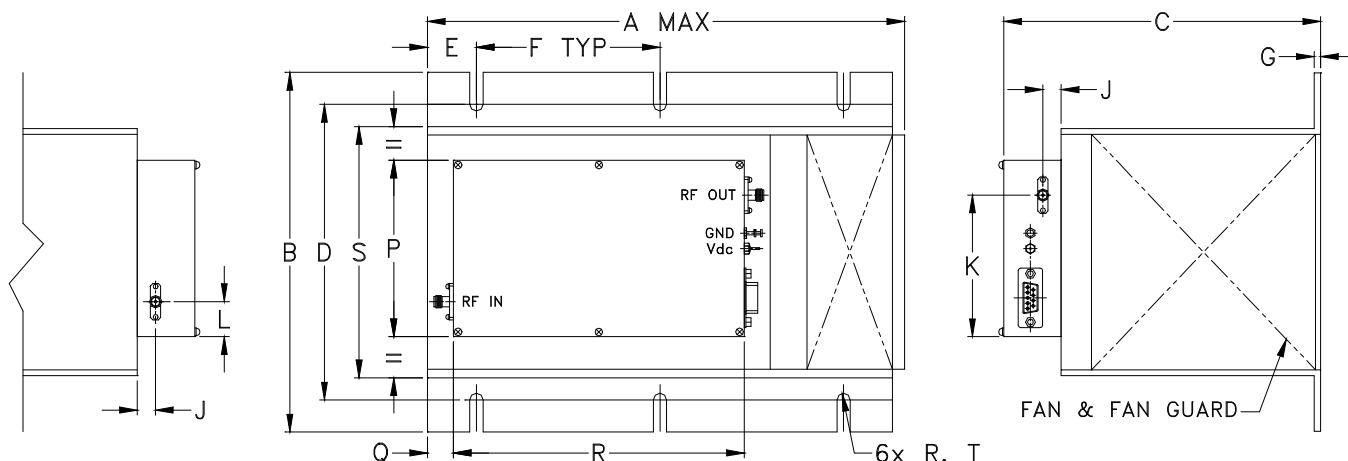
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Typical Performance Curves

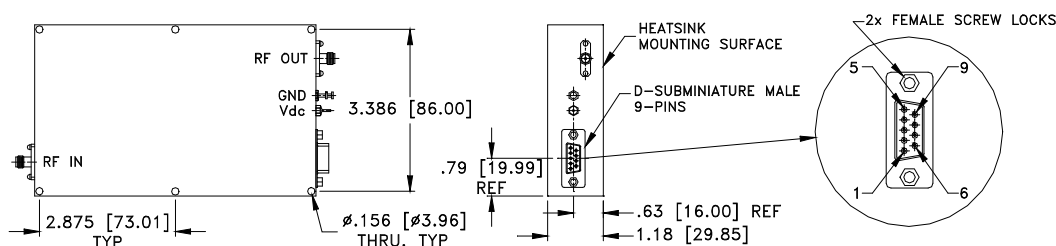
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Outline Dimensions



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK.



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
BT1344	9.85 (250.19)	7.3 (185.42)	6.5 (165.10)	6.00 (152.40)	1.00 (25.40)	3.75 (95.25)	.13 (3.30)	-	.37 (9.40)	2.87 (72.90)	.71 (18.03)	-	-

CASE#	P	Q	R	S	T	WT, GRAM	WT WITHOUT HEATSINK, GRAM
BT1344	3.58 (90.93)	.5 (12.70)	5.95 (151.13)	5.1 (129.54)	.135 (3.43)	4265	580

Dimensions are in inches (mm). Tolerances: 1 Pl. $\pm .1$; 2 Pl. $\pm .03$; 3 Pl. $\pm .015$

Notes:

- Case material: Aluminum alloy.
- Finish:
For RoHS Case Styles: Clear Chemical conversion coating, non-chrome or trivalent chrome based.
- Heatsink finish: Black anodize.
- Refer to the individual model data sheet for the type of connectors available.
- Recommended screws for mounting model without heat sink on 3/32" thick sheet: #6-32, 1.50" Length.



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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	-20° to 45°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 60° C base plate Temperature	MIL-STD-202, Method 108
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, except 100°C