25W High Power Fast Switch T/R Module
5.0GHz~6.0 GHz

Features

- High Tx Power Psat : +44dBm
- Low Rx insertion loss: -1.2dB
- Fast T/R switching speed: 4us
- Supply Voltage: +28V
- T/R select voltage: +3.3V

Typical Applications

- Military & Defense Applications
- Wireless Infrastructure
- Test and Measurement

Electrical Specifications, T_A = +25°C, Vcc = +28V

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
	Tx			Rx			
Frequency Range	5.03 – 5.09			5.03 – 5.09			GHz
Gain		26			-1.2		dB
Gain Flatness		±0.5			±0.1		dB
Gain Variation Over Temperature (-45 ~ +85)		±3			±3		dB
Input Return Loss		23			20		dB
Output Return Loss		30			21		dB
Saturated Output Power (Psat)		44			NA		dBm
Supply Current		4.7	5		2.5	3	A
Isolation S12	70	69					dB
T/R Isolation				25	30		dB
Harmonics, (2^{nd}, 3^{rd}, 4^{th})		-60					dBc
Input Max Power (No damage)	Psat – Gain			Psat – Gain			dBm
Weight	1275						Ounces
Impedance	50						Ohms
Input / Output Connectors	2.92mm-Female						
Finish	Nickel Plated						
Material	Aluminum / Copper						

* P1dB, P3dB and Psat power test signal: 200µs pulse width with 10% duty cycle.
* For average CW power testing or increased duty cycle, a 5dB back off from Psat is required unless water/oil cooling system is applied.

25W High Power T/R Module 5 - 6GHz

Absolute Maximum Ratings	
Supply Voltage	+30 VDC
RF Input Power	Psat – Gain

Note: Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.

Biasing Up Procedure	
Step 1	Connect input and output with 50 Ohm source/load. (in band VSWR<1.9:1 or >10dB return loss)
Step 2	Connect Ground Pin
Step 3	Connect VDC
Power OFF Procedure	
Step 1	Turn Off VDC
Step 2	Remove RF Connection
Step 3	Remove Ground

Environmental Specifications and Test Standards

Parameter	Standard	Description
Operational Temperature	MIL-STD-39016	-45℃~+55℃ (Case Temperature less than 85C)
Storage Temperature		-50℃~+125℃
Thermal Shock		1 Hour@ -45℃ → 1 Hour @ +85℃ (5 Cycles)
Random Vibration		Acceleration Spectral Density 6 (m/s) Total 92.6 RMS
Electrical & Temperature Burn In		Temperature +85℃ for 72 Hours
Shock		1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s 2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s 3. Total 18 times (6 directions, 3 repetitions per direction).
Altitude		Standard: 30,000 Ft (Epoxy Sealed Controlled Environment) Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min)
Hermetically Sealed (Optional)	MIL-STD-883	MIL-STD-883 (For Hermetically Sealed Units)

Note: The operating temperature for the unit is specified at the package base. It is the user's responsibility to ensure the part is in an environment capable of maintaining the temperature within the specified limits

Ordering Information	
Part No.	Description
RFTRM5060JPSD	5GHz~6GHz T/R Module

Amplifier Use

Ensure that the amplifier input and output ports are safely terminated into a proper 50 ohm load before turning on the power. Never operate the amplifier without a load. A proper 50 ohm load is defined as a load with impedance less than 1.9:1 or return loss larger than 10dB relative to 50 Ohm within the specified operating band width.

Power Supply Requirements

Power supply must be able to provide adequate current for the amplifier. Power supply should be able to provide 1.5 times the typical current or 1.2 times the maximum current (whichever is greater).

In most cases, RF - Lambda amplifiers will withstand severe mismatches without damage. However, operation with poor loads is discouraged. If prolonged operation with poor or unknown loads is expected, an external device such as an isolator or circulator should be used to protect the amplifier.

Ensure that the power is off when connecting or disconnecting the input or output of the amp.

Prevent overdriving the amplifier. Do not exceed the recommended input power level.

Adequate heat-sinking required for RF amplifier modules. Please inquire.

Amplifiers do not contain Thermal protection, Reverse DC polarity or Over voltage protection with the exception of a few models. Please inquire.

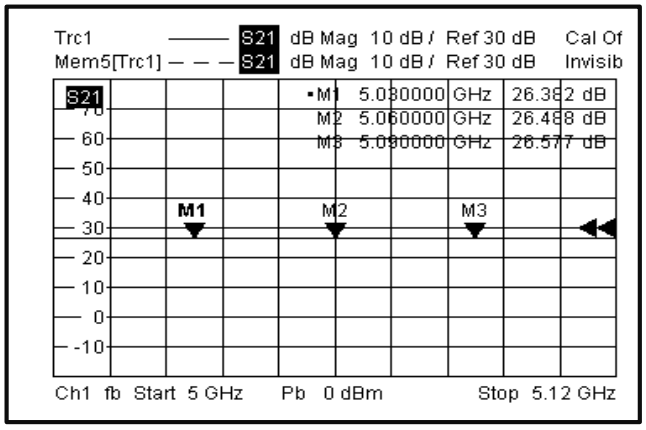
Proper electrostatic discharge (ESD) precautions are recommended to avoid performance degradation or loss of functionality.

What is not covered with warranty?

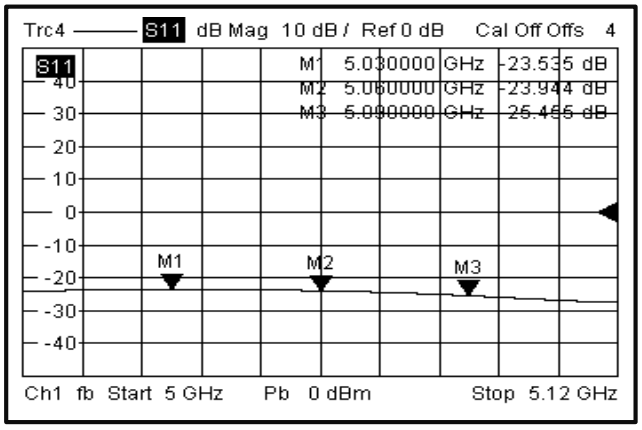
Each RF - Lambda amplifier will go through power and temperature stress testing.
Since the die, ICs or MMICs are fragile, these are not covered by warranty. Any damage to these will NOT be free to repair.

Tx Mode

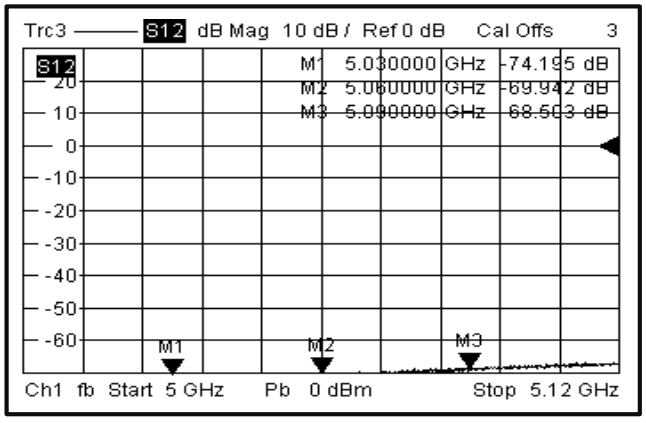
Gain



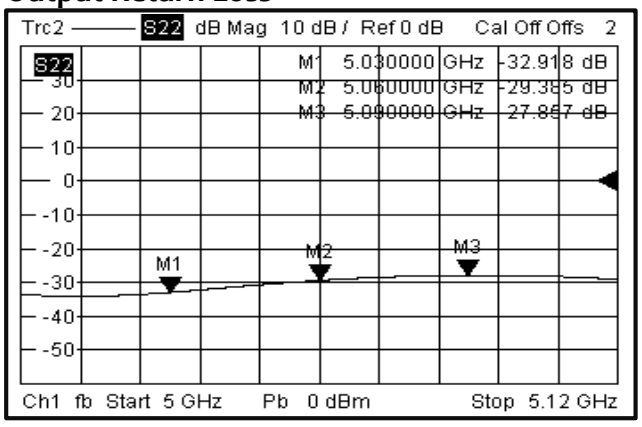
Input Return Loss



Isolation



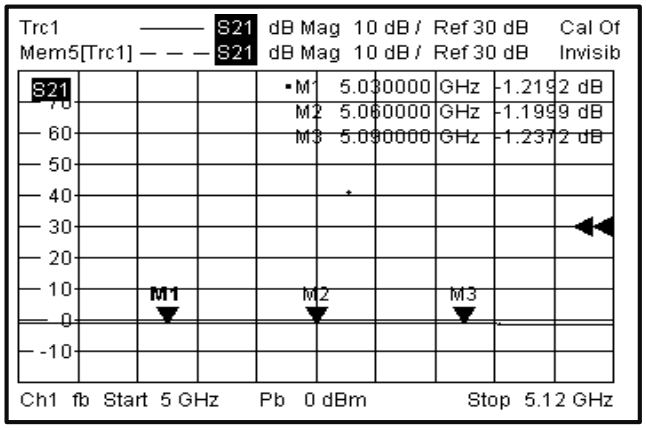
Output Return Loss



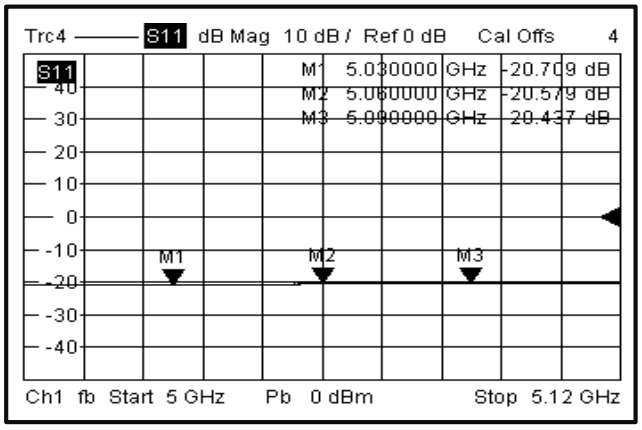
Note: Input/output return loss measurements include attenuators to protect equipment

Rx Mode

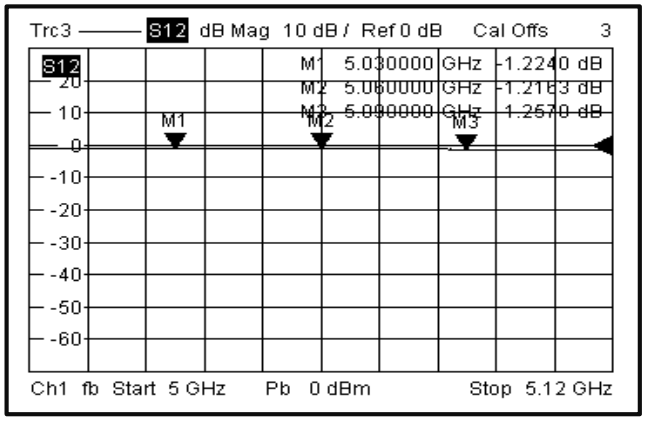
Gain



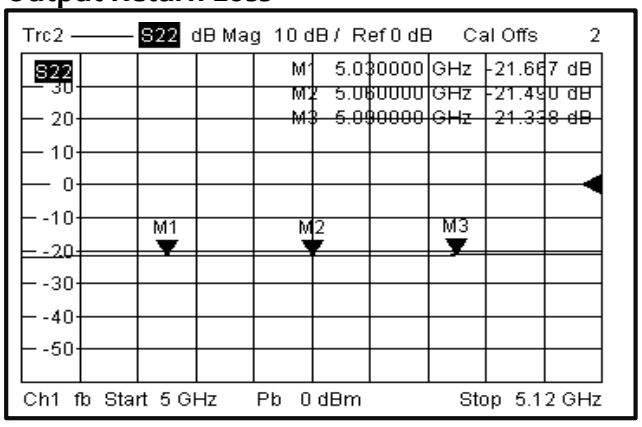
Input Return Loss



Isolation



Output Return Loss



25W High Power T/R Module 5 - 6GHz

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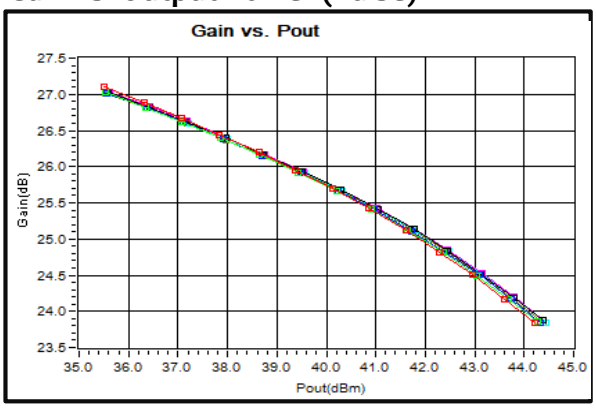
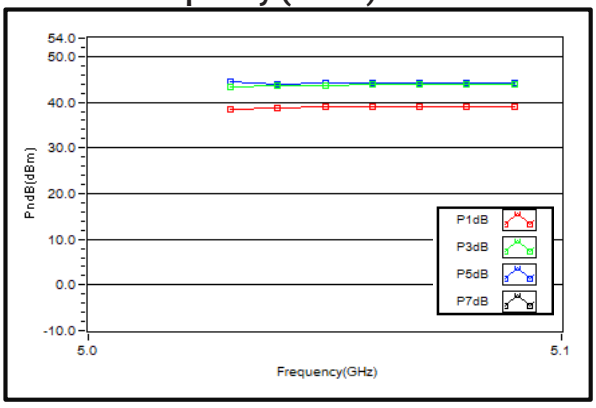
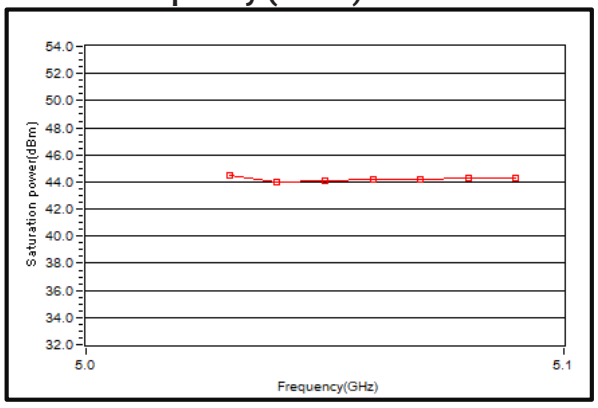
Gain vs. Output Power (Pulse)



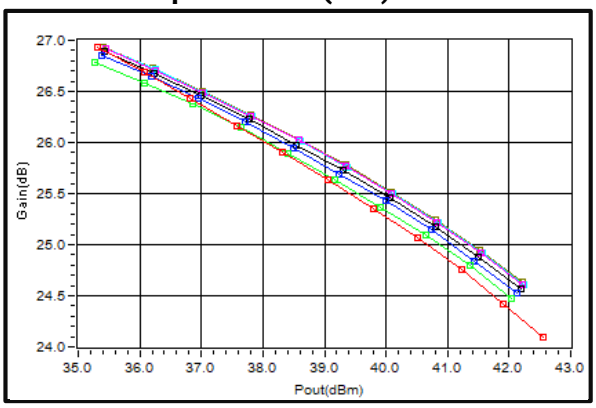
PndB vs. Frequency (Pulse)



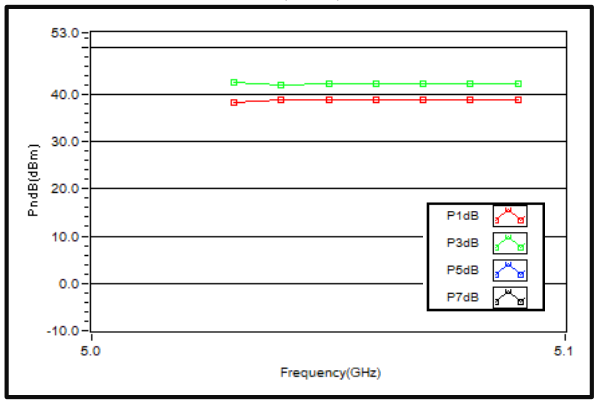
PSat vs. Frequency (Pulse)



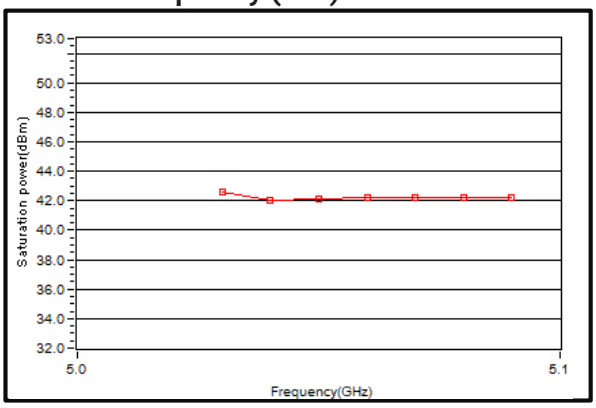
Gain vs. Output Power (CW)



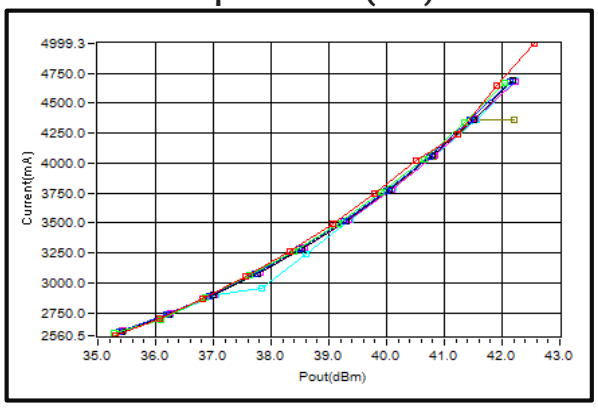
PndB vs. Frequency (CW)



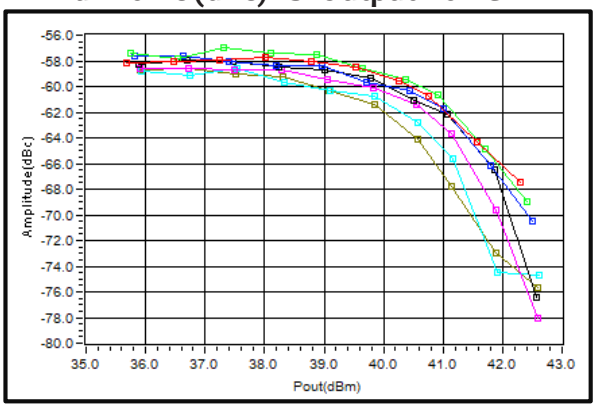
PSat vs. Frequency (CW)

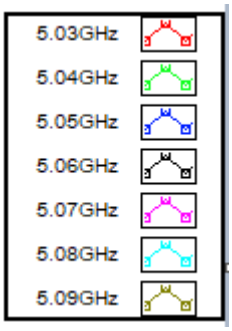


Current vs. Output Power (CW)

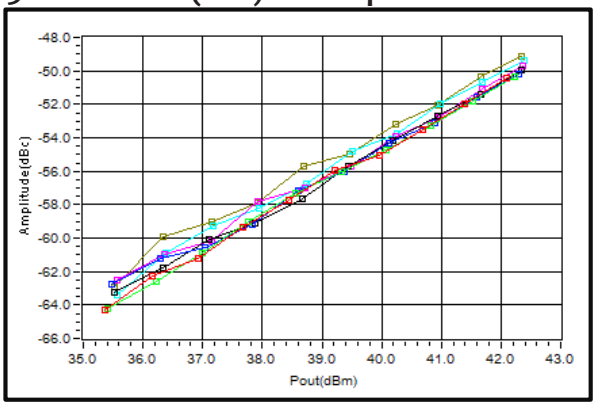


2nd Harmonic (dBc) vs. Output Power

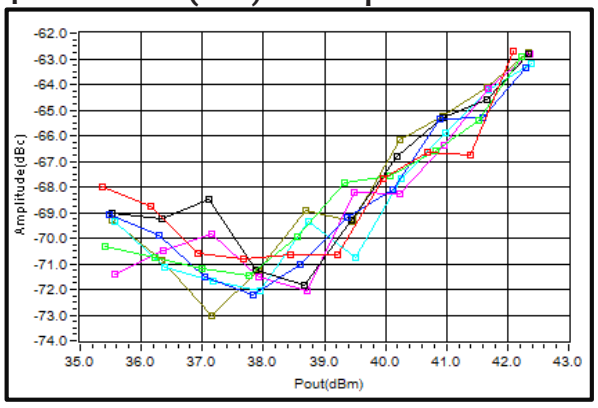




3rd Harmonic (dBc) vs. Output Power

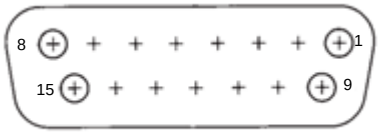


4th Harmonic (dBc) vs. Output Power



25W High Power T/R Module 5 - 6GHz

Customer Interface Pin Layout:

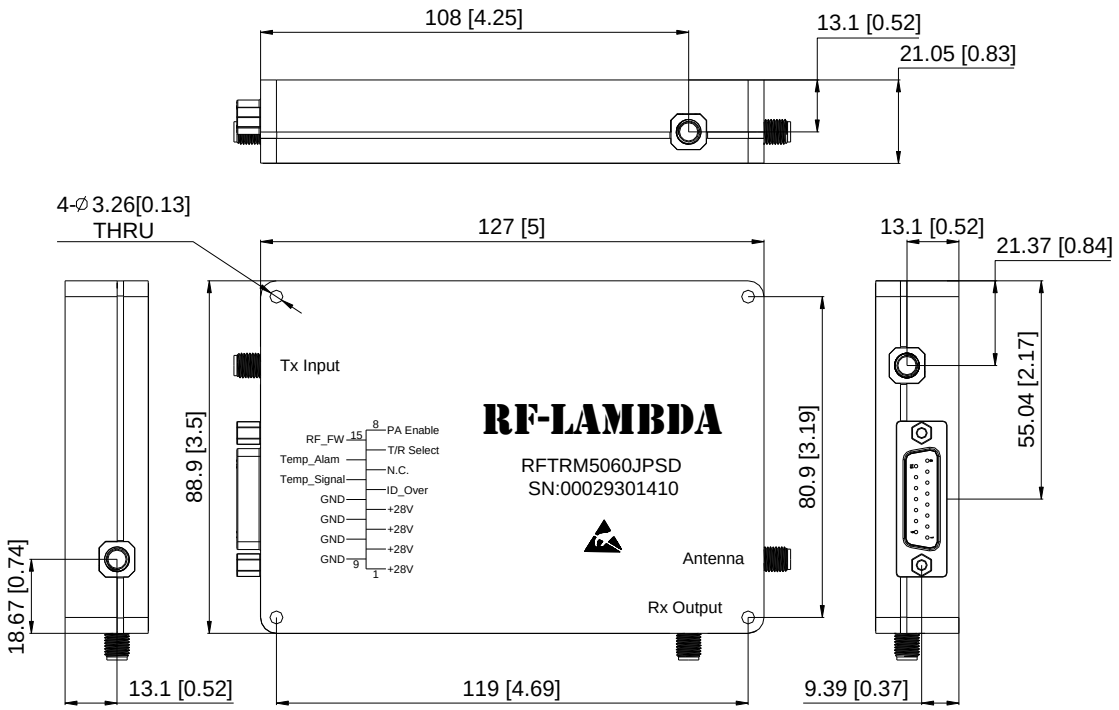


Pin #	Name	Function	Initial State	Description	Applied
1	+28V	Power Supply		Power supply to turn on the unit	Yes
2	+28V	Power Supply		Power supply to turn on the unit	Yes
3	+28V	Power Supply		Power supply to turn on the unit	Yes
4	+28V	Power Supply		Power supply to turn on the unit	Yes
5	Current Over	Indicator	LOW	Pin will be latched to logic HIGH when drain current limit is reached	Yes
6	PA output reflection power	Indicator		PA output reflection power is represented by voltage	Yes
7	T/R Select	Control	LOW	Applying HIGH switches to Tx mode	Yes
8	PA Enable	Control	HIGH	Appling logic HIGH disables amplifiers	Yes
9	GND	Ground	GND	Ground	Yes
10	GND	Ground	GND	Ground	Yes
11	GND	Ground	GND	Ground	Yes
12	GND	Ground	GND	Ground	Yes
13	Temp Signal	Indicator		PA carrier case temperature is represented by voltage	Yes
14	Temp Over	Indicator	LOW	Pin will be latched to logic HIGH when amplifier is driven over temperature	Yes
15	PA output power	Indicator		PA output power is represented by voltage	Yes

HIGH/LOW voltages are standard TTL signals:
0.0V-0.8V = LOW
2V-5V = HIGH

Heatsink Outline:

All Dimensions in mm [inch]



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