4W Ultra Wide Band Power Amplifier
0.1GHz~22GHz

RoHS Compliant

Features

- Wideband Solid State Power Amplifier
- Gain: 40 dB Typical
- Psat: +37 dBm Typical
- Noise Figure: 3dB Typical
- Supply Voltage: 110/220 VAC

Typical Applications

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

Electrical Specifications, TA = +25°C

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	0.1GHz – 10GHz			10GHz – 22GHz			GHz
Gain		42			38		dB
Gain Flatness		±2			±5		dB
Gain Variation Over Temperature (-45 ~ +85)		±3			±3		dB
Noise Figure		3			3.5		dB
Input Return Loss		15			15		dB
Output Return Loss		25			25		dB
Output 3dB Compression Point (P3dB)*		37			33		dBm
Saturated Output Power (Psat)*		37.5			36		dBm
Isolation S12		85			86		dB
Input Max Power (No damage)	Psat – Gain			Psat – Gain			dBm
Weight	≈ 6000						g
Impedance	50						Ohms
Input / Output Connectors	SMA-Female						
Finish	Black Painted Finish						
Material	Aluminum / Copper						

* P1dB, P3dB and Psat power testing 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.

4W Ultra Wide Band Power Amplifier 0.1-22GHz

Absolute Maximum Ratings	
Supply Voltage –NP / -WP	230 VAC
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 AC Plug
Step 3	Flip Switch to "ON" Position
Power OFF Procedure	
Step 1	Flip Switch to "OFF" Position
Step 2	Remove AC Plug
Step 3	Remove RF Connection

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
RAMP01M22GA	0.1GHz~22GHz Power Amplifier

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.

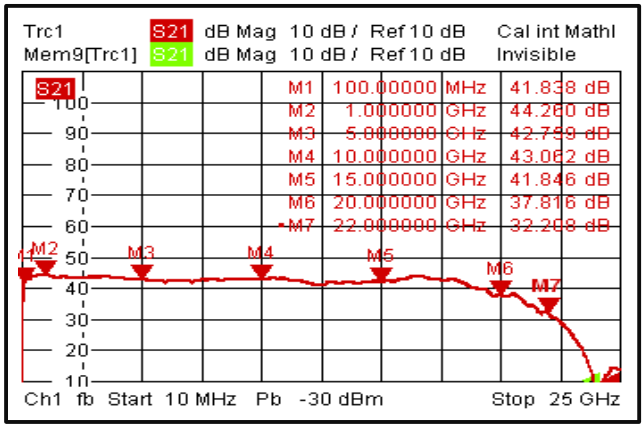
Amplifiers do not contain Thermal protection, Reverse DC polarity or Over voltage protection with the exception of a few models. Please inquire.

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

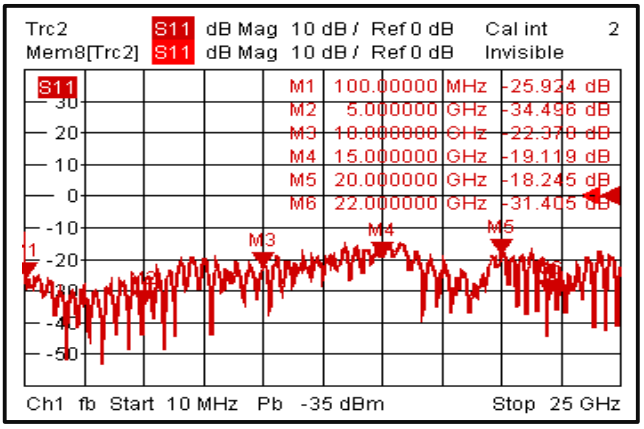
What is not covered with warranty?

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.

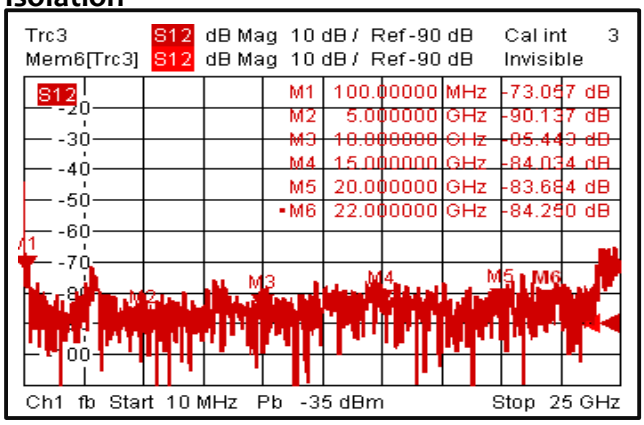
Gain vs. Frequency



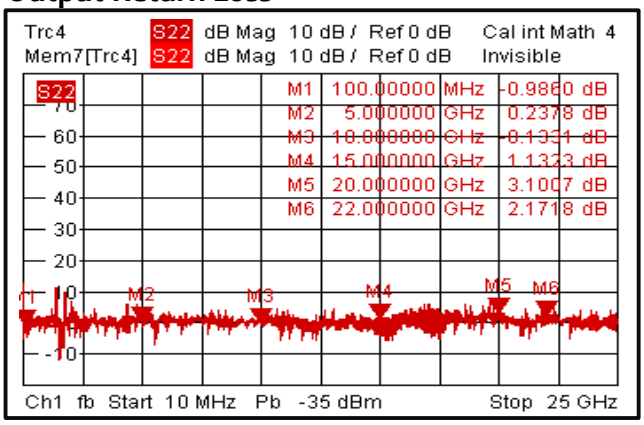
Input Return Loss



Isolation



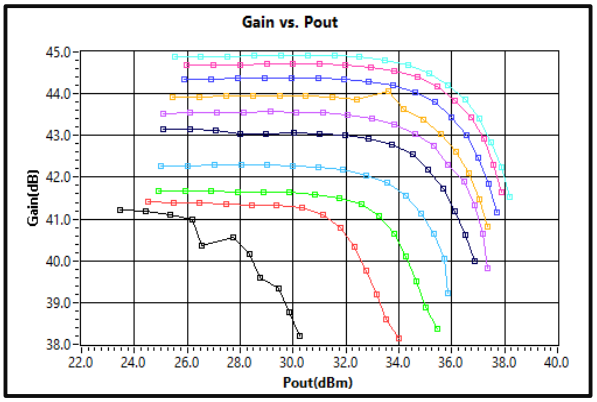
Output Return Loss



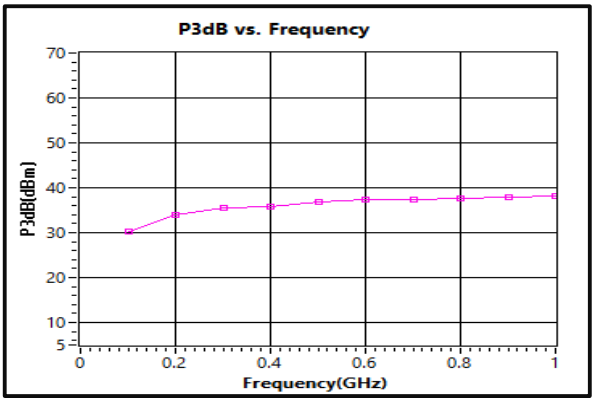
Note: Input/output return loss measurements include attenuators to protect equipment

4W Ultra Wide Band Power Amplifier 0.1-22GHz

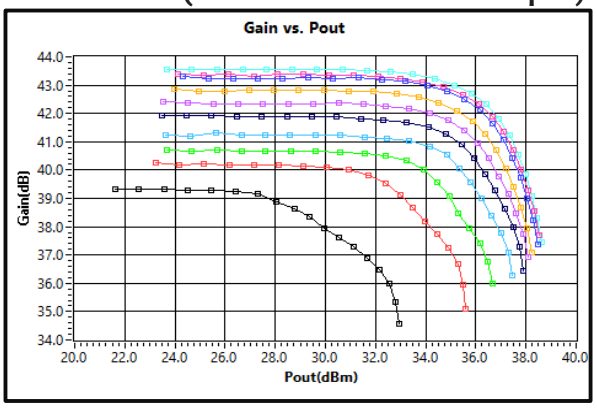
Gain vs. Pout (100MHz – 1GHz CW Input)



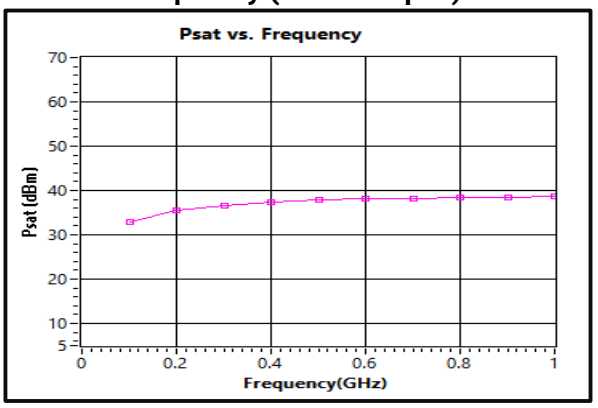
P3dB vs. Frequency (CW Input)

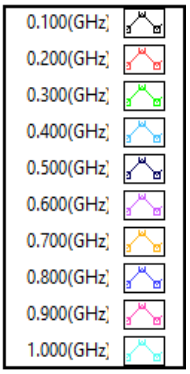


Gain vs Pout (100MHz – 1GHz Pulsed Input)



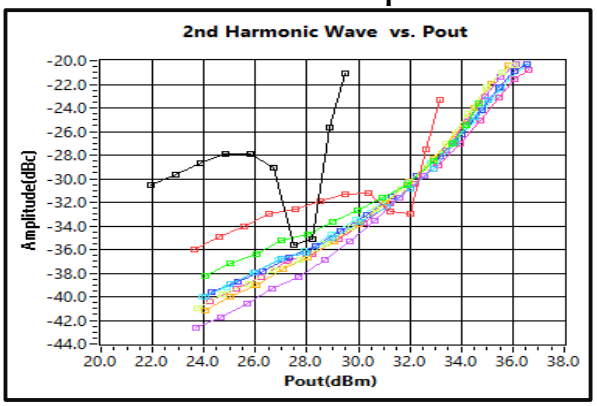
Psat vs. Frequency (Pulsed Input)



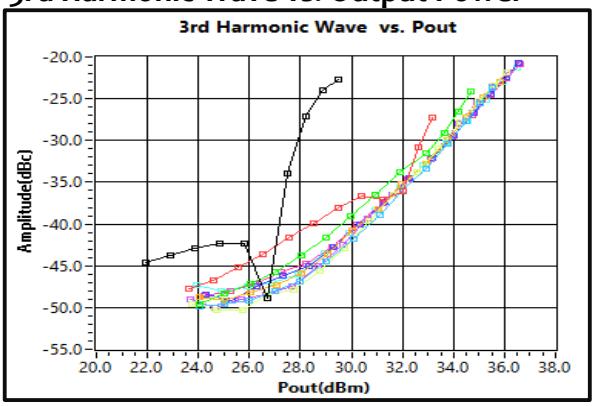


4W Ultra Wide Band Power Amplifier 0.1-22GHz

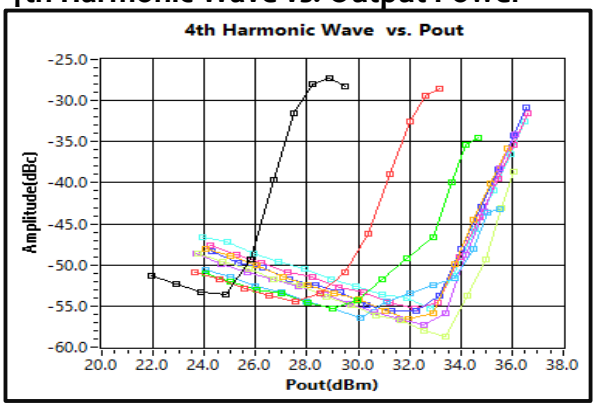
2nd Harmonic Wave vs. Output Power



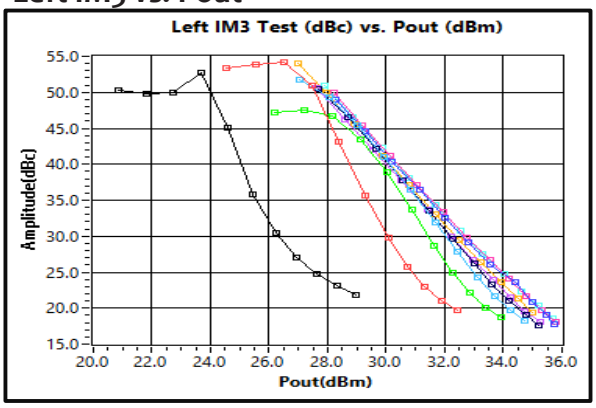
3rd Harmonic Wave vs. Output Power



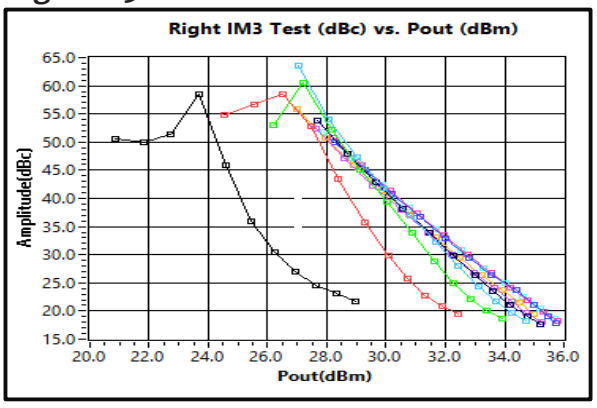
4th Harmonic Wave vs. Output Power



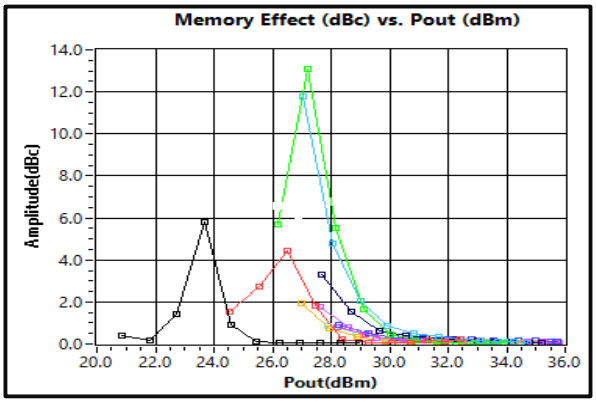
Left IM3 vs. Pout

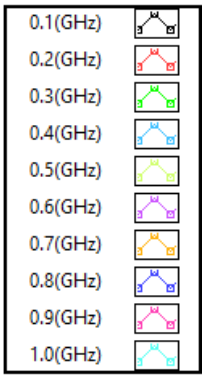


Right IM3 vs. Pout



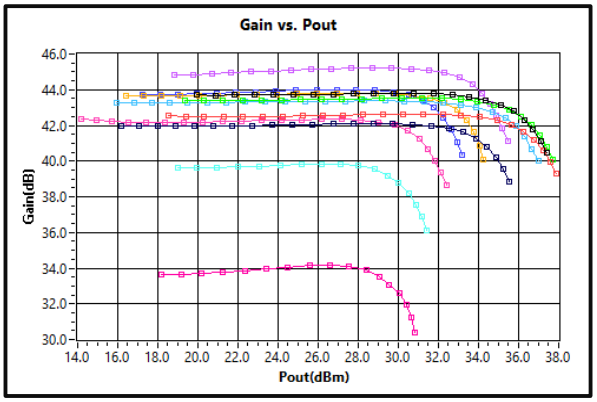
Memory Effect vs. Pout



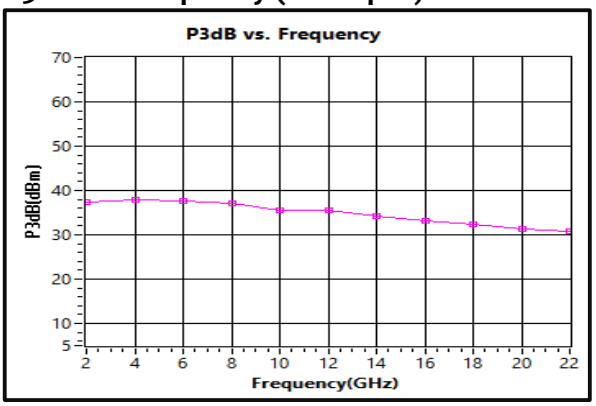


4W Ultra Wide Band Power Amplifier 0.1-22GHz

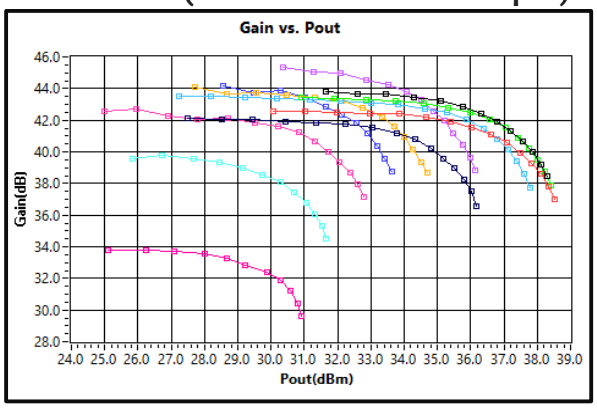
Gain vs. Pout (2GHz - 22GHz CW Input)



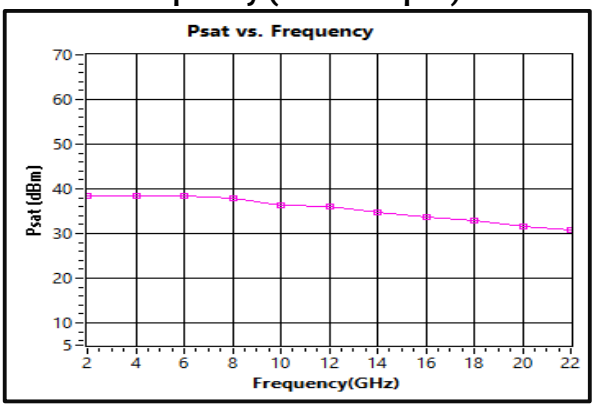
P3dB vs. Frequency (CW Input)

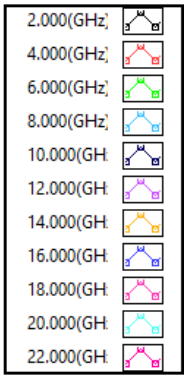


Gain vs Pout (2GHz – 22GHz Pulsed Input)



Psat vs. Frequency (Pulsed Input)





4W Ultra Wide Band Power Amplifier 0.1-22GHz

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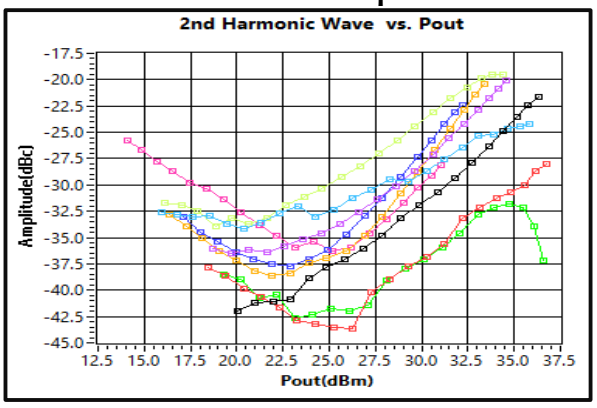
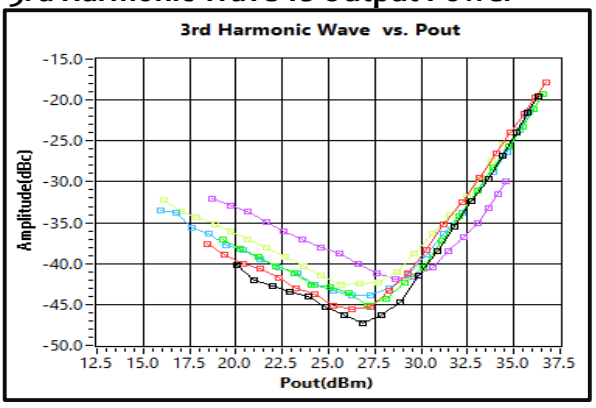
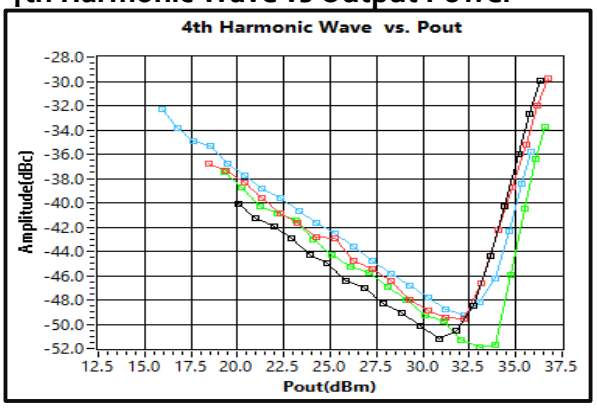
2nd Harmonic Wave vs Output Power



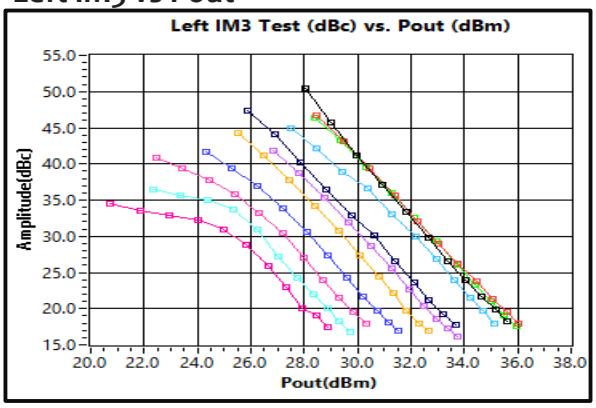
3rd Harmonic Wave vs Output Power



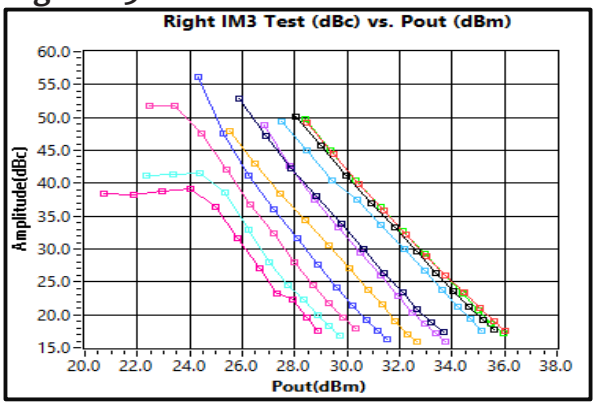
4th Harmonic Wave vs Output Power



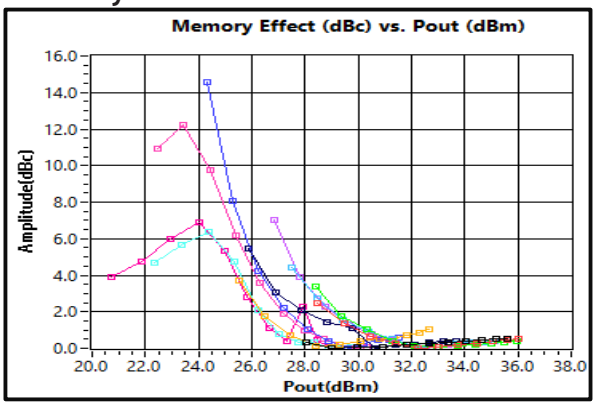
Left IM3 vs Pout

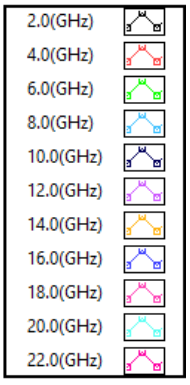


Right IM3 vs Pout



Memory Effect vs Pout

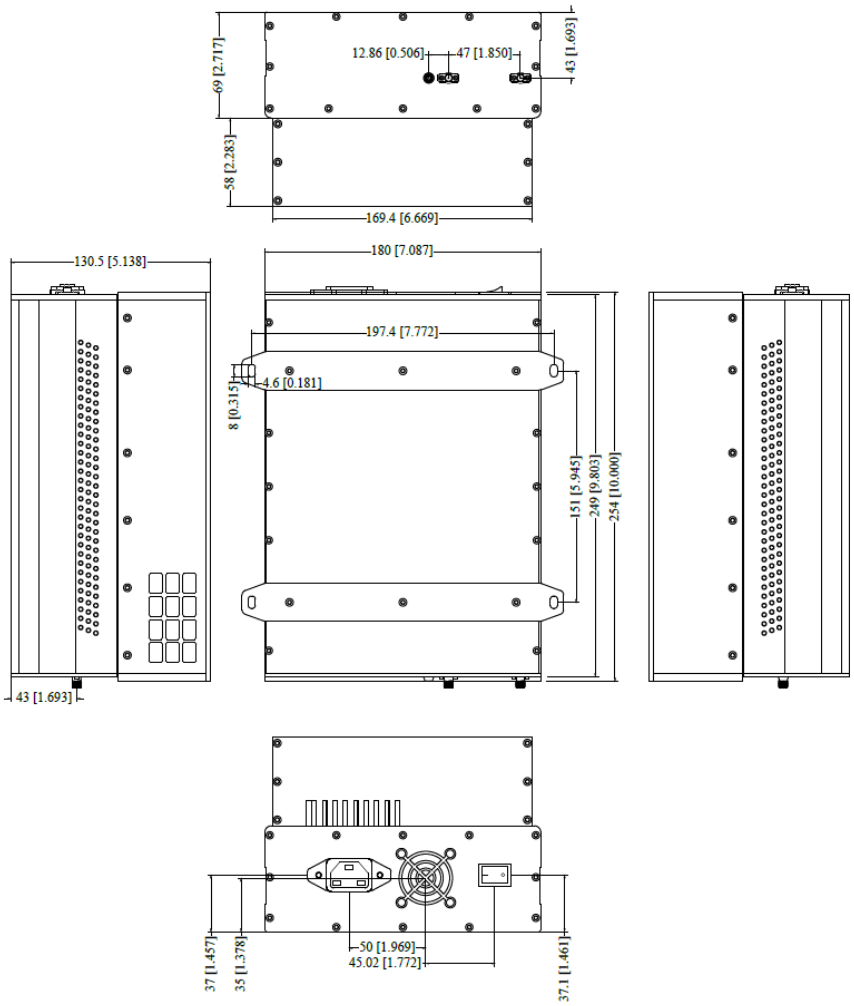




4W Ultra Wide Band Power Amplifier 0.1-22GHz

Outline Drawing:

All Dimensions in mm



Heat Sink and cooling fan required during operation

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