



8W Wide Band Power Amplifier 1GHz~22GHz



Features

- Wideband Solid State Power Amplifier
- Gain: 50 dB Typical
- Psat: +39 dBm
- Supply Voltage: +36V

Typical Applications

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

Electrical Specifications, $T_A = +25^\circ\text{C}$

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	1 – 10			11 – 22			GHz
Gain		49			47		dB
Gain Flatness		±5			±5		dB
Gain Variation Over Temperature(-45 ~ +85)		±3			±3		dB
Noise Figure		5			5		dB
Input Return Loss		15			15		dB
Output Return Loss		10			12		dB
Saturated Output Power (Psat) *		39			38		dBm
Output Third Order Intercept (IP3)		42			42		dBm
Supply Current Type 1 (VDC=+24V)		2500	2800		2500	2800	mA
Supply Current Type 2 (VDC=+36V)		1600	2000		1600	2000	mA
Isolation S12		75			75		dB
Input Max Power (no damage)	Psat – Gain			Psat – Gain			dBm
Older model Weight (no heatsink)	≈ 280						g
Newer model Weight (no heatsink)	≈ 1285						g
Impedance	50						Ohms
Input / Output Connectors	SMA-Female						
Finish	Gold 40 micron thickness						
	Nickel 200 micron thickness						
Material	Aluminum / Copper						
Package Sealing	Epoxy Sealed (Standard)						
	Hermetically Sealed (Optional)						

* 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.



Absolute Maximum Ratings	
Supply Voltage (Type 1)	+28 VDC
Supply Voltage (Type 2)	+60 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°C~+55°C (Case Temperature less than 85C)
Storage Temperature		-50°C~+125°C
Thermal Shock		1 Hour@ -45°C → 1 Hour @ +85°C (5 Cycles)
Random Vibration		Acceleration Spectral Density 6 (m/s) Total 92.6 RMS
Electrical & Temperature Burn In		Temperature +85°C 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
RFLUPA01G22GA	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.

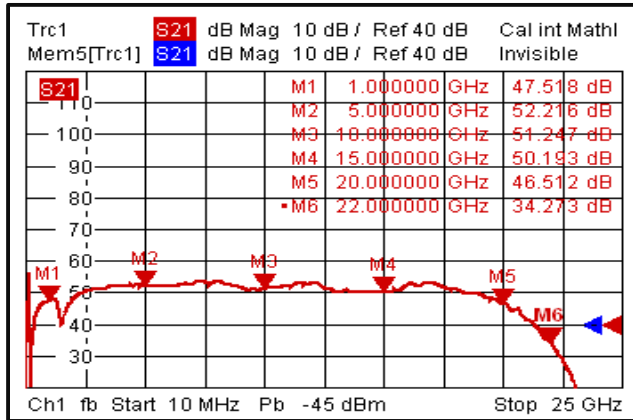
What is not covered with warranty?

Each RF - Lambda amplifier will go through power and temperature stress testing.

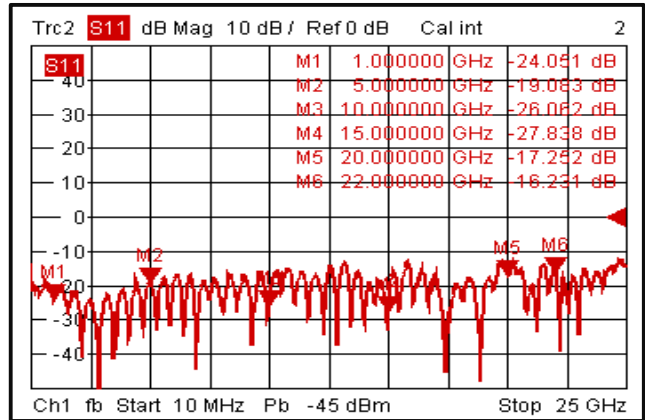
Since the die, ICs or MMICs are fragile, these are not covered by warranty. Any damage to these will NOT be free to repair.



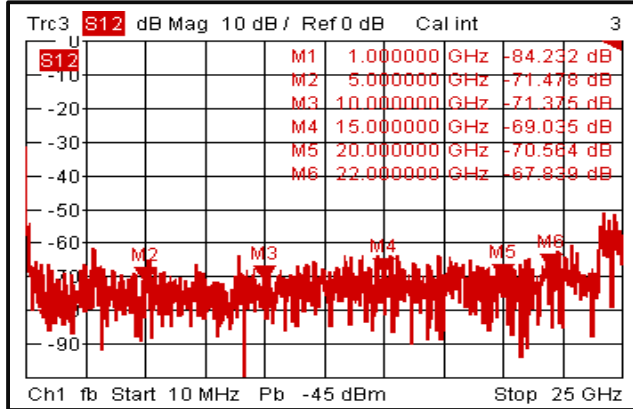
Gain vs. Frequency



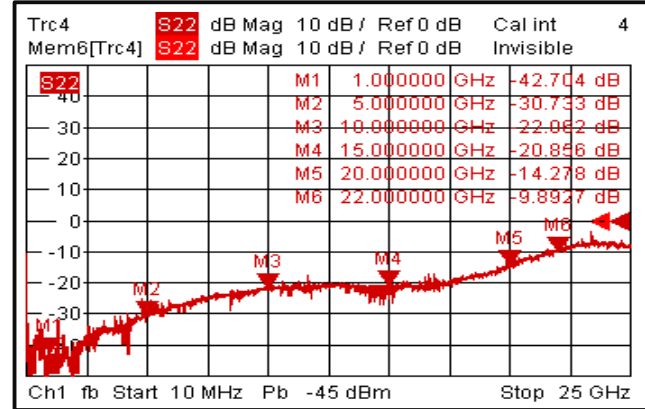
Input Return Loss



Isolation



Output Return Loss



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

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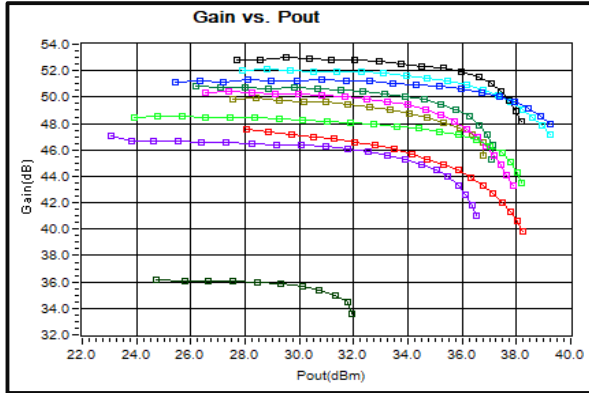


RF-LAMBDA

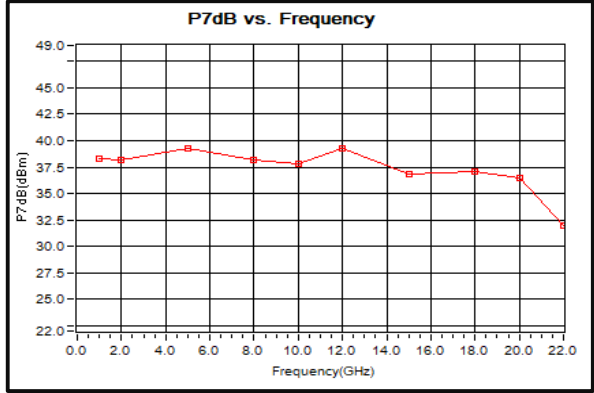
The power beyond expectations

RFLUPA01G22GA

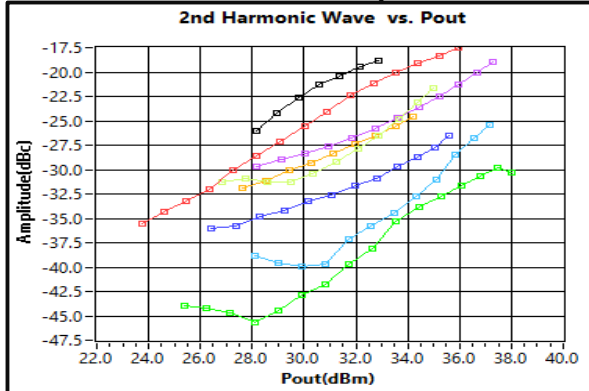
Gain vs Output Power



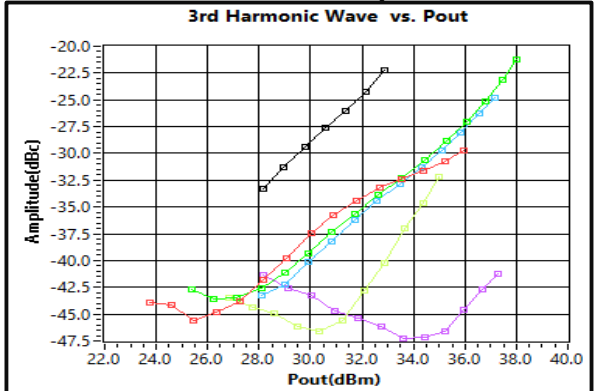
Saturated Power vs Frequency



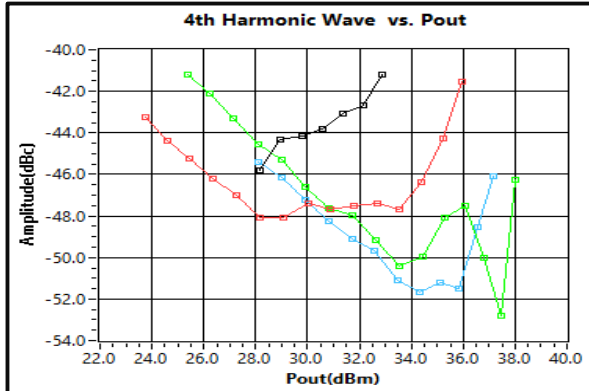
2nd Harmonic Wave vs Output Power



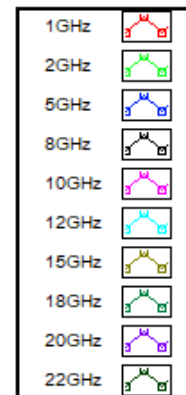
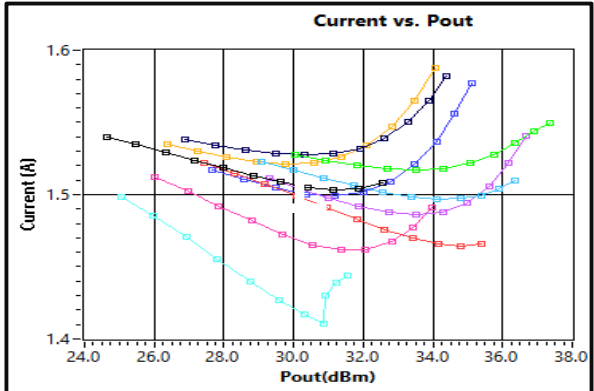
3rd Harmonic Wave vs Output Power



4th Harmonic Wave vs Output Power



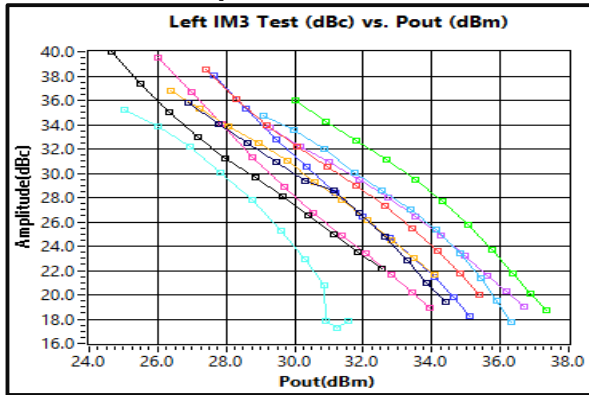
Current vs Output Power



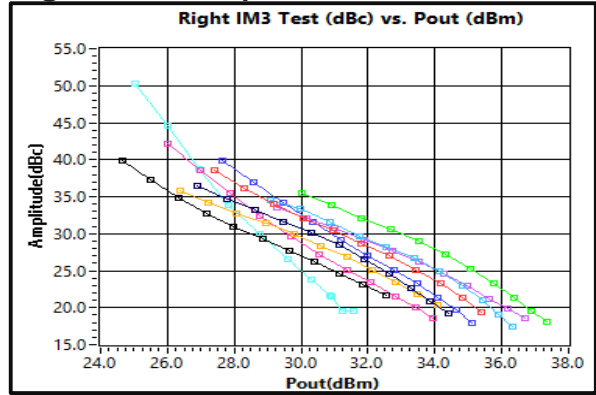
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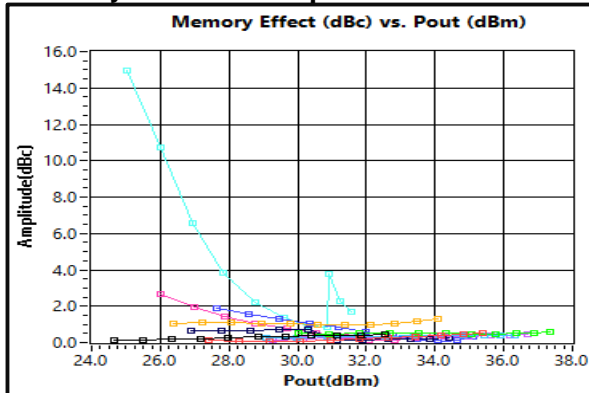
Left IM3 vs Output Power



Right IM3 vs Output Power



Memory Effect vs Output Power

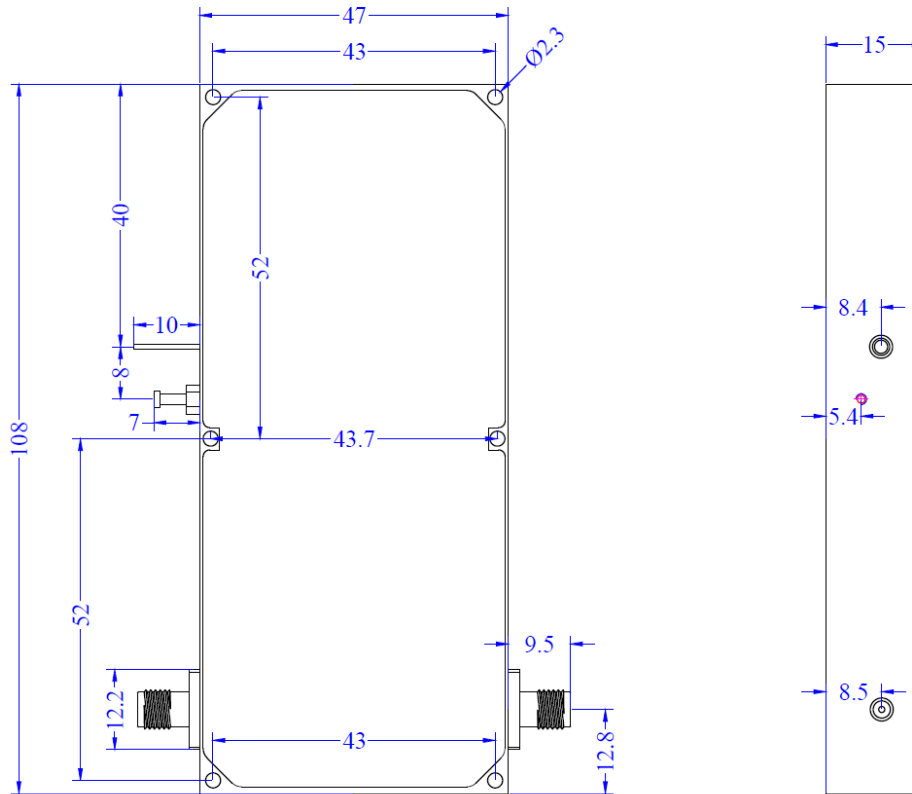


1.0(GHz)	
2.0(GHz)	
5.0(GHz)	
8.0(GHz)	
10.0(GHz)	
12.0(GHz)	
15.0(GHz)	
18.0(GHz)	
20.0(GHz)	
22.0(GHz)	



Housing Outline (Type 1):

All Dimensions in mm [inch]



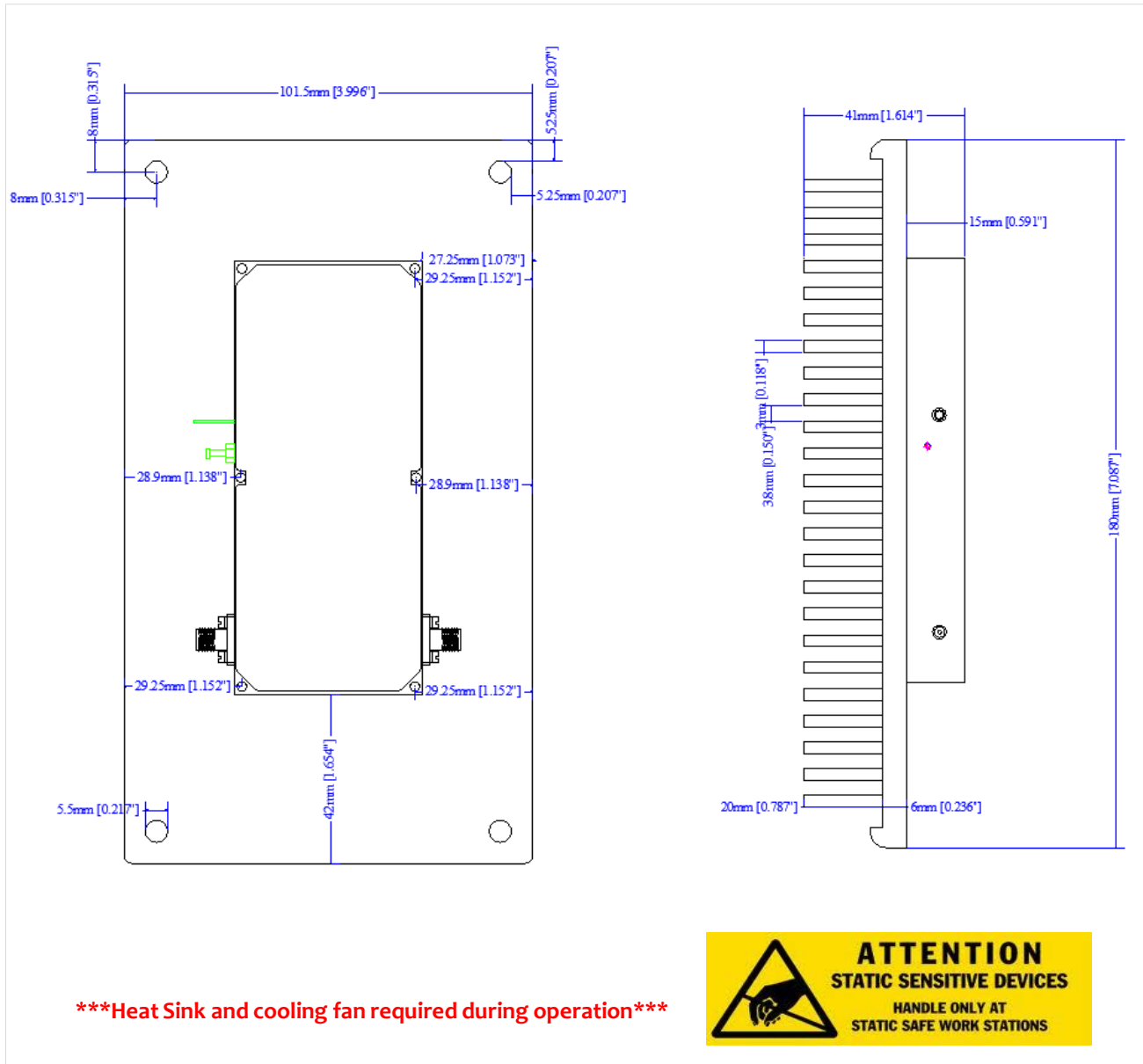
Heat Sink and cooling fan required during operation





Heatsink Outline (Type 1):

All Dimensions in mm [inch]



*****Heat Sink and cooling fan required during operation*****

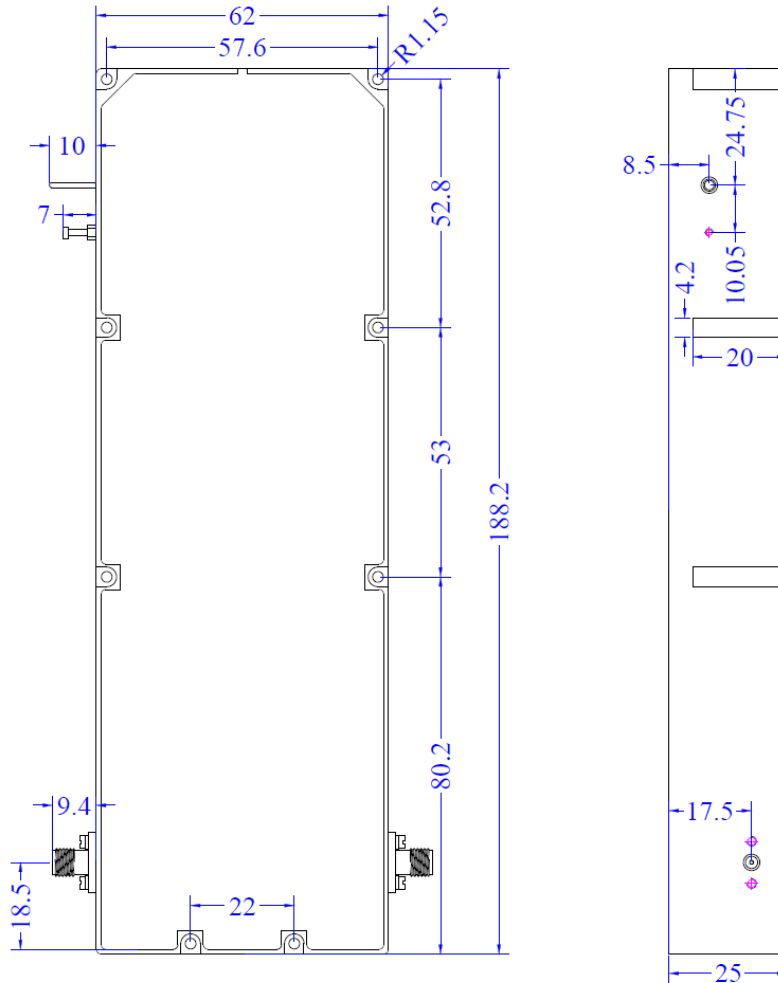


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Housing Outline (Type 2):

All Dimensions in mm [inch]



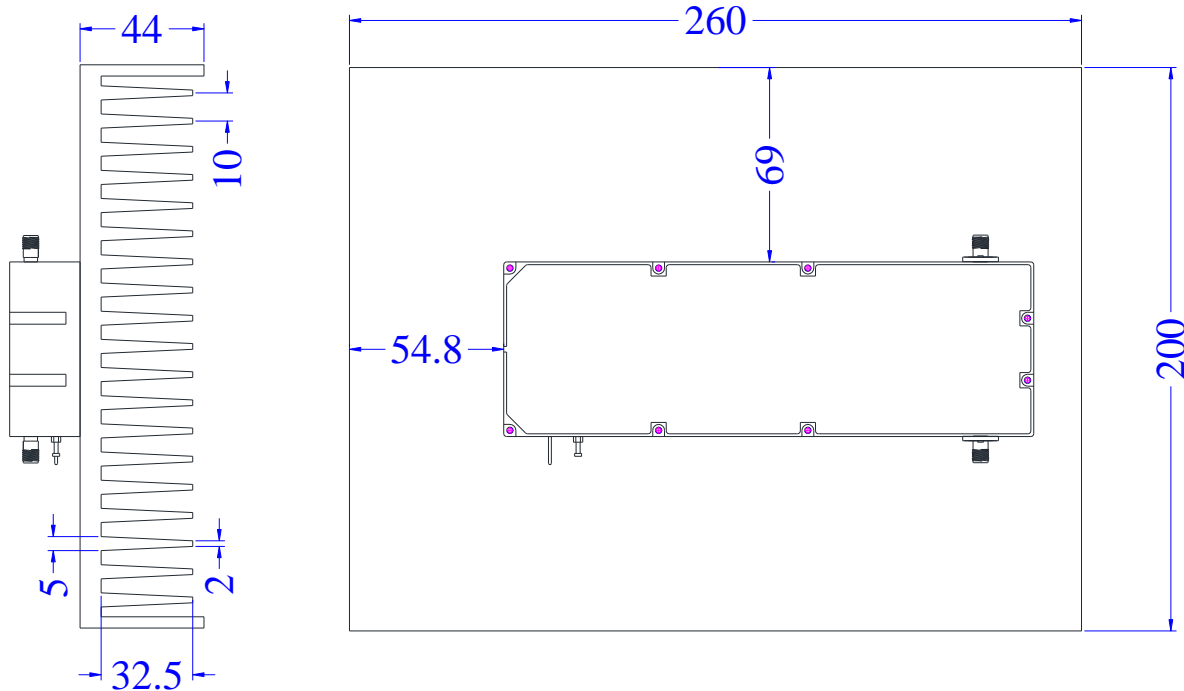
Heat Sink and cooling fan required during operation





Heatsink Outline (Type 2):

All Dimensions in mm [inch]



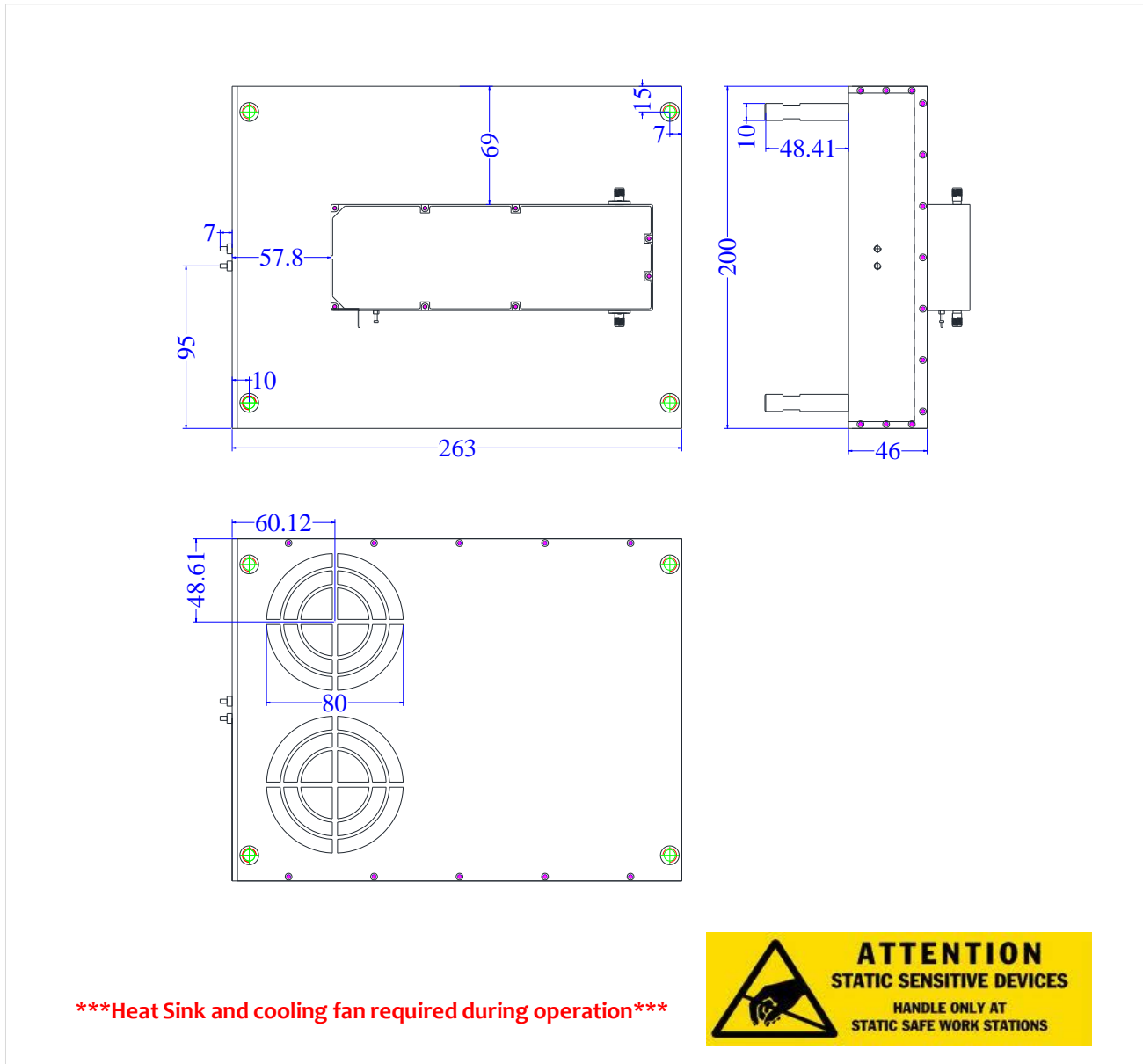
Heat Sink and cooling fan required during operation





Heatsink with Air Cooling System Outline (Type 2):

All Dimensions in mm [inch]



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Important Notice

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