



# 10W Wide Band Power Amplifier 1-9GHz



### Features

- Wideband Solid State Power Amplifier
- Psat: +40dBm Typical
- Gain: 48dB Typical
- Supply Voltage: +36V DC

### Typical Applications

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

Electrical Specifications,  $T_A = 25\text{ }^\circ\text{C}$ ,  $V_{CC} = +36\text{V}$

Parameter	Typical	Units
Frequency Range	1 - 9	GHz
Gain	48	dB
Gain Flatness	$\pm 6$	dB
Gain Variation Over Temperature (-45 ~ +85)	$\pm 4$	dB
Input Return Loss	12	dB
Output Return Loss	10	dB
Saturated Output Power (Psat)	40	dBm
Supply Current (+36V DC)	0.7	A
Isolation S12	60	dB
Input Max Power (No Damage)	Psat – Gain	dBm
Weight	$\approx 450$	g
Impedance	50	Ohms
Input / Output Connectors	SMA-Female	
Finishing	Nickel Plated	
Material	Aluminum / Copper	

\* P1dB, P3dB and Psat power test signal: 200 $\mu$ s pulse width with 10% duty cycle.

\* For average CW power testing, a 5dB back off from Psat is required unless water/oil cooling system is applied.

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Absolute Maximum Ratings	
Supply Voltage	+40 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 Vd
Power OFF Procedure	
Step 1	Turn Off Vd
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

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Ordering Information	
Part No.	Description
RFLUPA01G09GA	Wide Band Power Amplifier 1 - 9GHz

### 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?

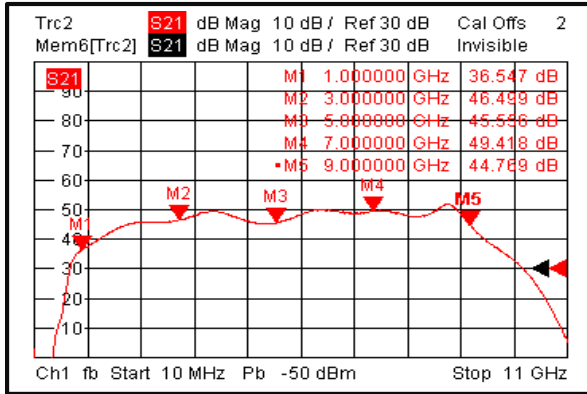
Each RF - Lambda amplifier will go through power and temperature stress testing.

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

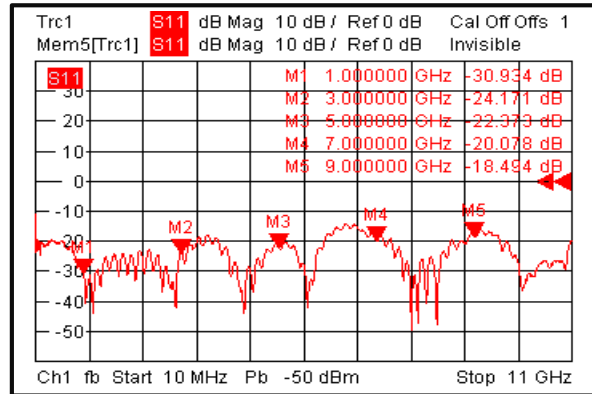


### Typical Performance Plots

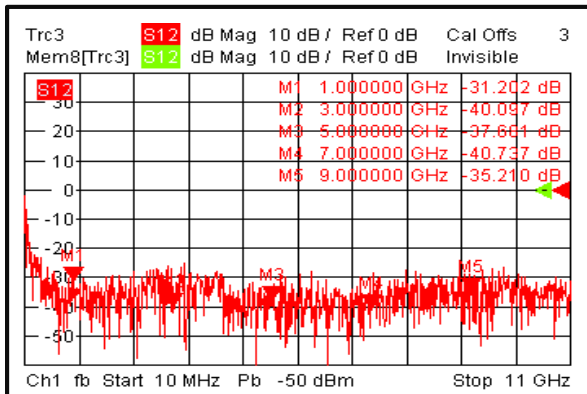
#### Gain vs. Frequency



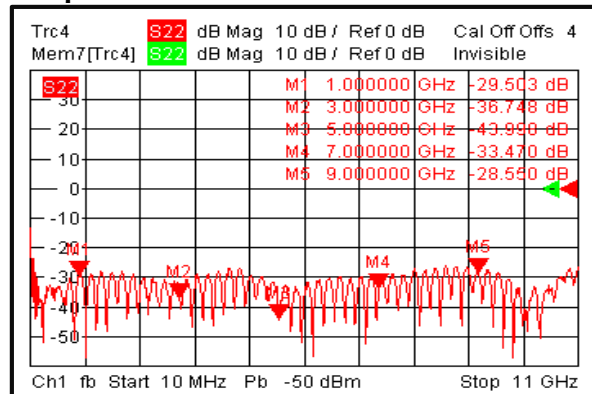
#### Input Return Loss



#### Isolation



#### Output Return Loss

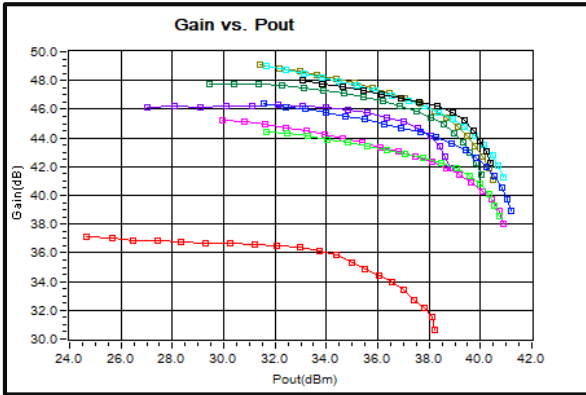


Note: Input/output return loss measurements include attenuators to protect equipment

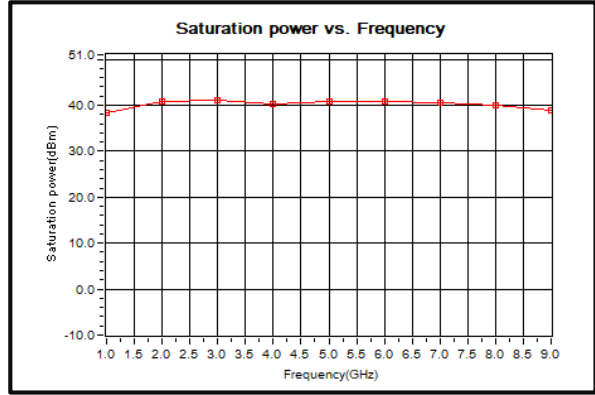
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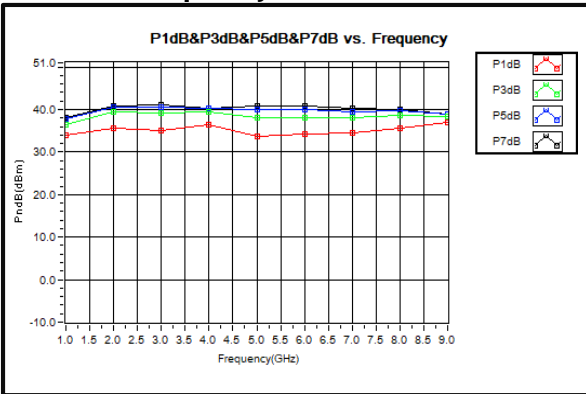
### Gain vs. Output Power



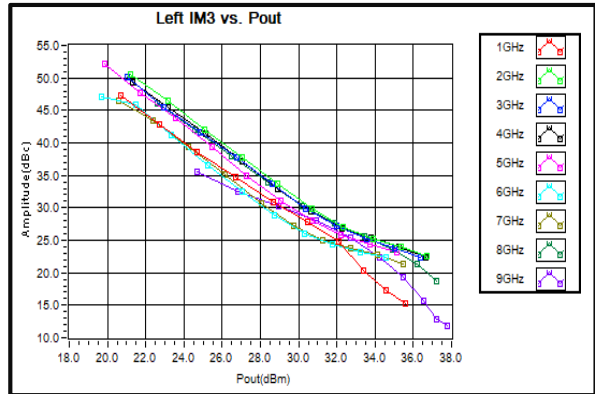
### Psat vs. Frequency



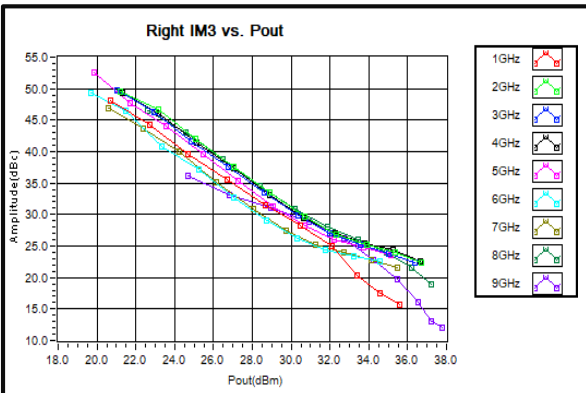
### PxdB vs. Frequency



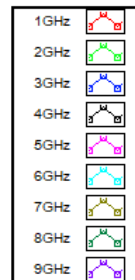
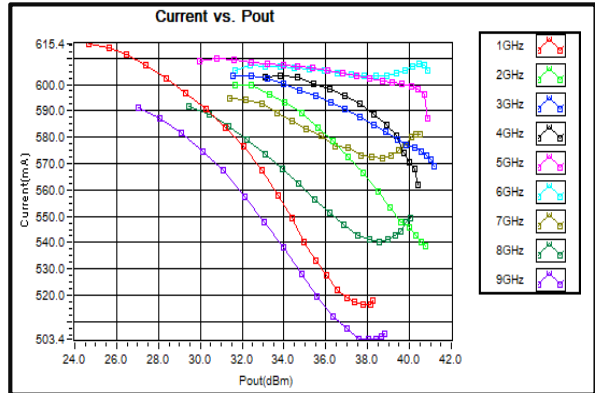
### Left IM3 vs Pout



### Right IM3 vs Pout



### Current vs. Pout



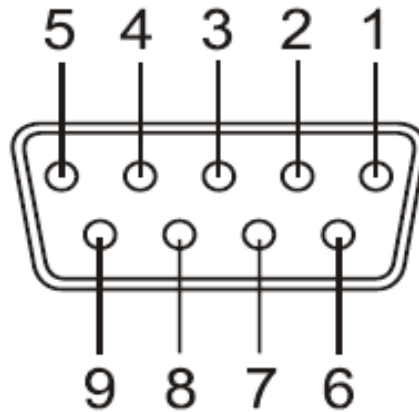
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\* P1dB, P3dB and Psat power testing signal: 200μs pulse width with 10% duty cycle.

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D-Sub 9 Pin



	Name	Function	Initial State	Description	Applied
Pin 1	NC	---	---	---	---
Pin 2	ID Over	Indicator	LOW	High TTL signal will indicate if the last stage of the amplifier is drawing too much current	Yes
Pin 3	ID Signal	Indicator	---	Analog voltage that represents the current being drawn from the last stage of the amplifier	Yes
Pin 4	VDC	---	---	VDC (must be able to support 5A) Both VDC pins must be tied together	Yes
Pin 5	VDC	---	---	VDC (must be able to support 5A) Both VDC pins must be tied together	Yes
Pin 6	RF Off	Control	LOW	Applying a TTL High signal to this pin will disable the RF signal	Yes
Pin 7	TEMP Signal	Indicator	---	Analog voltage that represents the case temperature of the amplifier	Yes
Pin 8	GND	---	---	GND (must be able to support 5A) Both GND pins must be tied together	Yes
Pin 9	GND	---	---	GND (must be able to support 5A) Both GND pins must be tied together	Yes

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



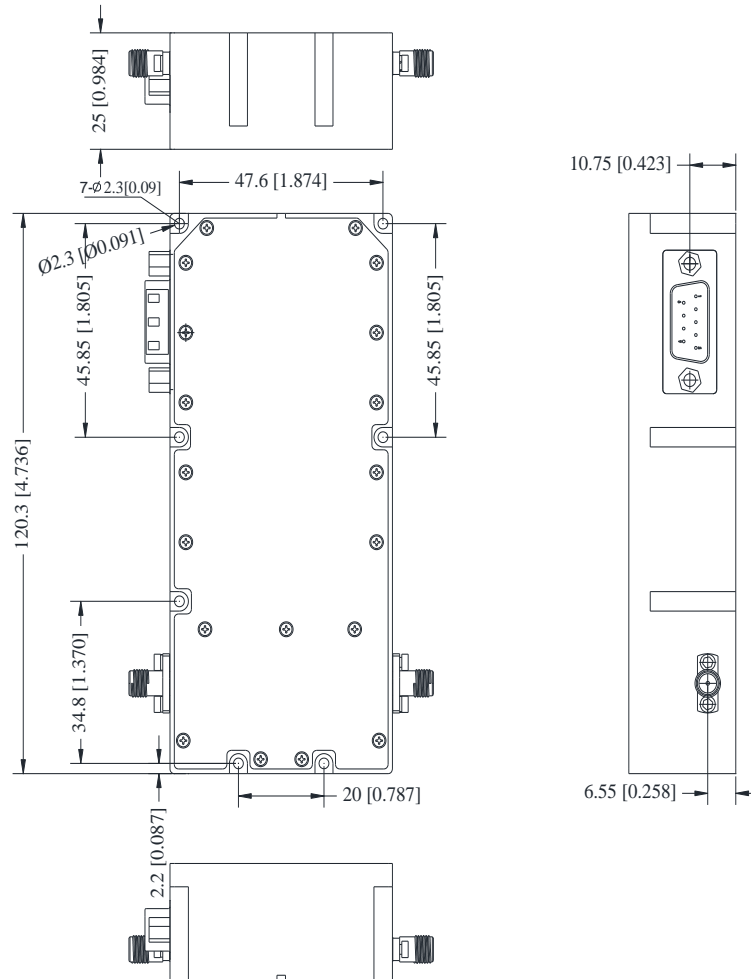
# RF-LAMBDA

The power beyond expectations

## RFLUPA01G09GA

### Outline Drawing:

All Dimensions in mm



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

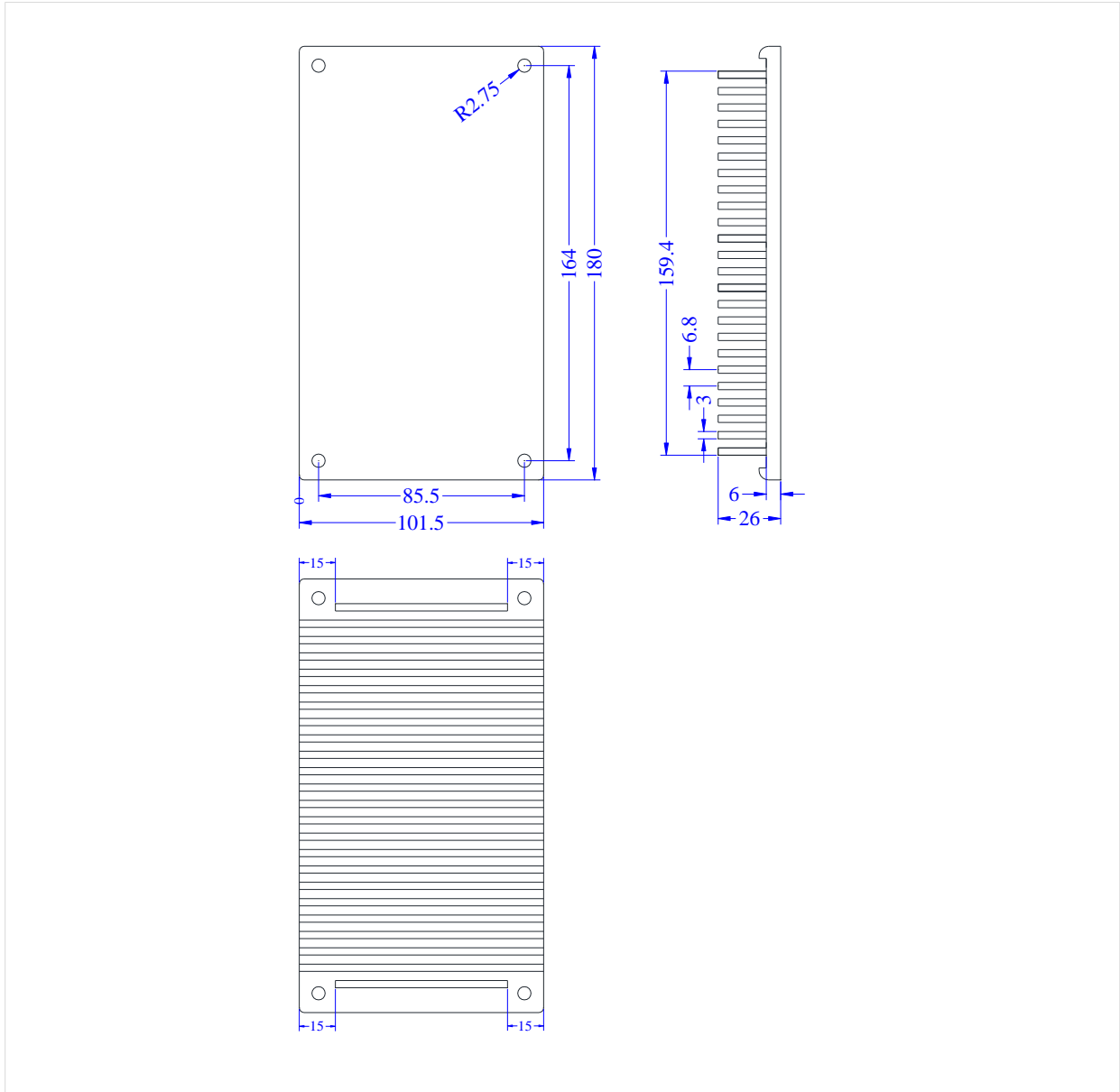


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### Heatsink Outline Drawing:

All Dimensions in mm

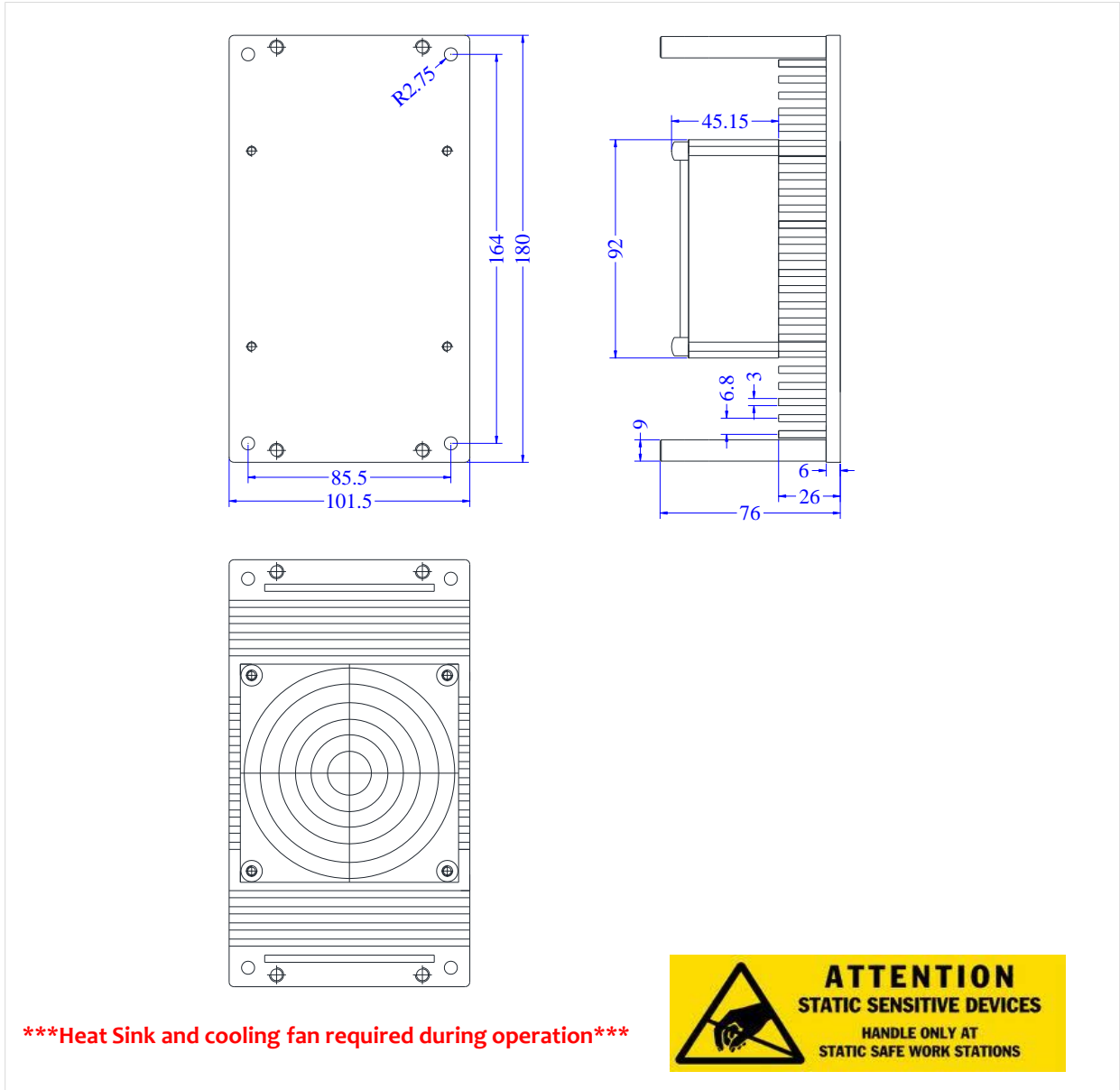






### Air Cooling Outline Drawing:

All Dimensions in mm



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