



6W Ka Band Power Amplifier 28GHz~42GHz



Features

- Wideband Power Amplifier
- Gain: 47dB Typical
- Psat: +36.5dBm Typical
- Supply Voltage: +36V

Typical Applications

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

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

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	30- 35			35 - 40			GHz
Gain		50			43		dB
Gain Flatness		±3			±3		dB
Gain Variation Over Temperature (-45 ~ +85)		±3			±3		dB
Input Return Loss		9			8		dB
Output Return Loss		10			10		dB
Saturated Output Power (Psat)		36.5			36.5		dBm
Supply Current		1.2	5		1.2	5	A
Isolation S12	79	85		76	86		dB
Input Max Power (No damage)	Psat - Gain			Psat - Gain			dBm
Weight	500						g
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.

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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 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
RFLUPA28G42GB	28GHz~42GHz 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.

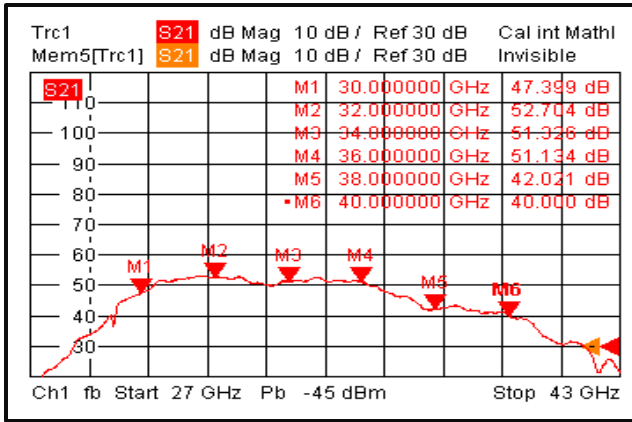
What is not covered with warranty?

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.

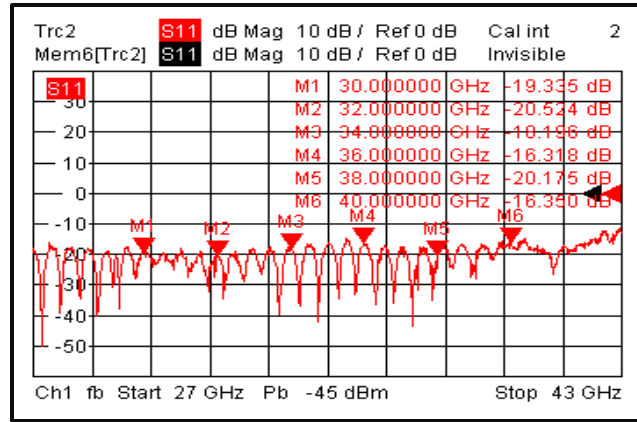


Typical Performance Plots

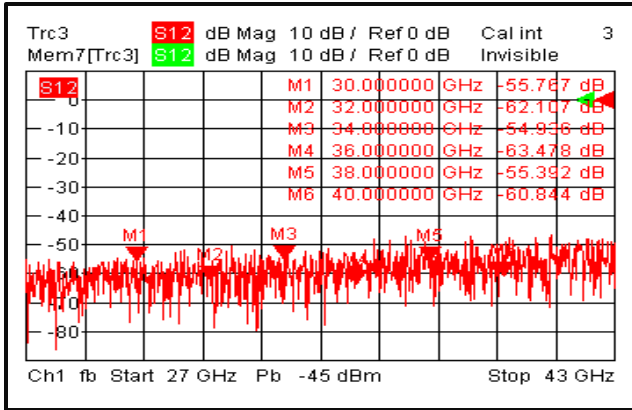
Gain



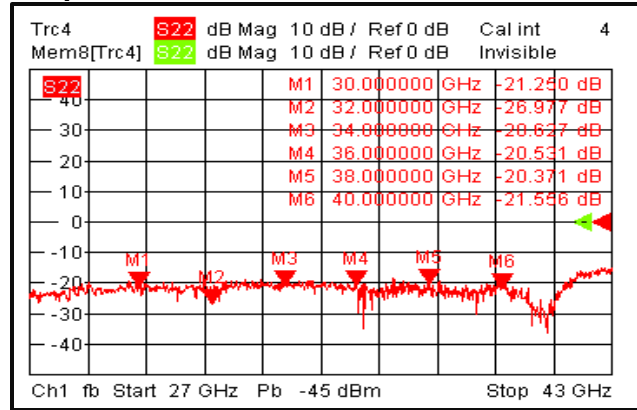
Input Return Loss



Isolation



Output Return Loss

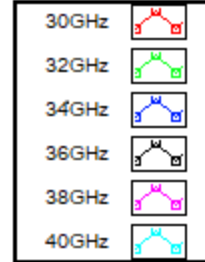
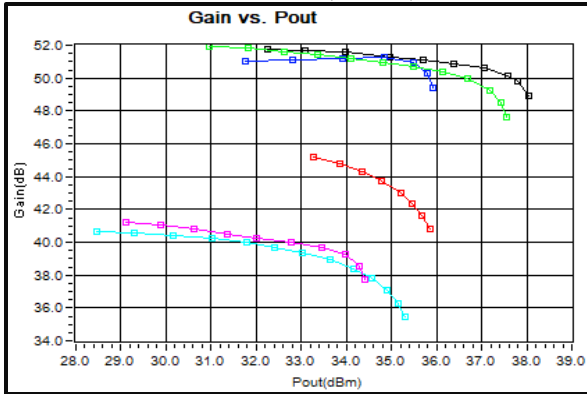


Note: Input/output return loss measurements include attenuators to protect equipment

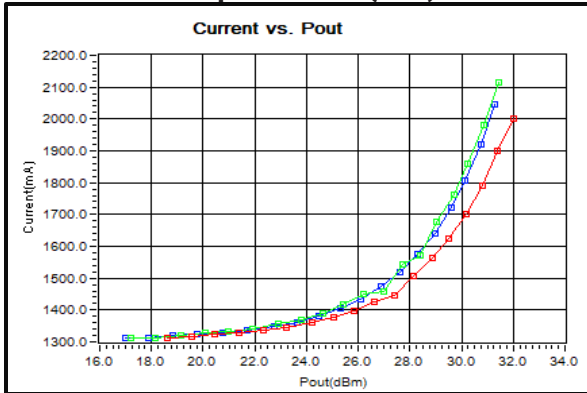
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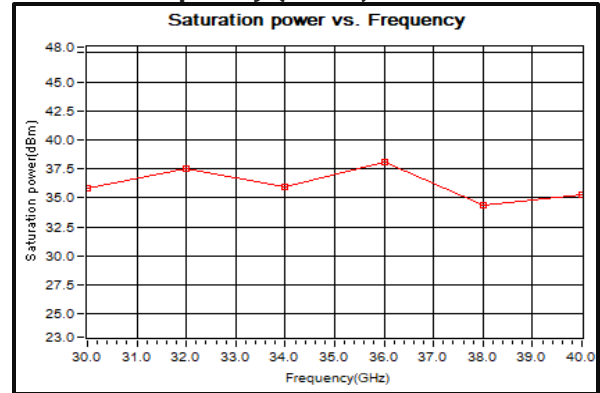
Gain vs. Output Power (Pulse)



Current vs. Output Power (CW)

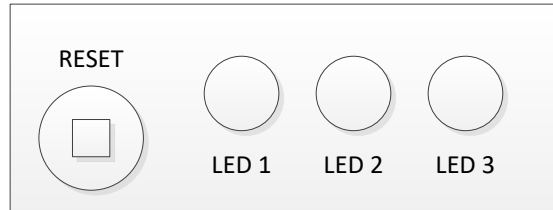


PSat vs. Frequency (Pulse)





Alarm Status Panel:

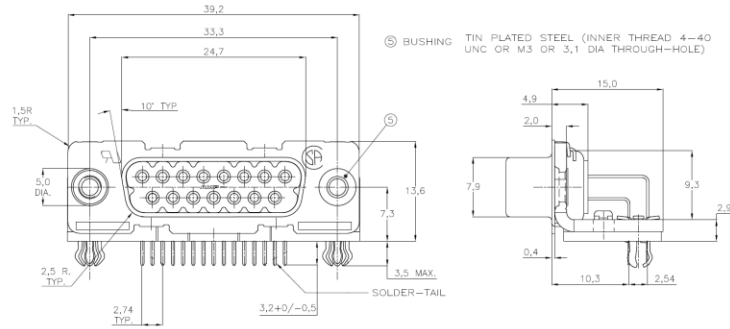
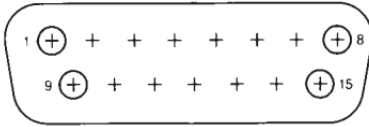


	Name	Function	Initial State	Description	Applied
	RESET	Control		Manual reset button to reset PA	Yes
LED 1	TEMP	Indicator	GREEN Color	PA will shut down and latch this LED to a RED color when driven over temperature *	Yes
LED 2	ID	Indicator	GREEN Color	PA will shut down and latch this LED to a RED color when an imbalance in the drain current of the combining branches occurs or if a drain current limit is reached *	Yes
LED 3	POWER	Indicator	RED Color	LED will light to RED color when supply power is applied	Yes

*LED needs to be manually reset to initial state by pressing RESET button



Connector Table:



Pin #	Name	Function	Initial State	Description	Applied
1	Reset	Control		Resets PA when logic LOW is applied and released	Yes
2	Drain Disable	Control	LOW	Applying logic HIGH disables drains of amplifiers	Yes
3	Gate Disable	Control	LOW	Applying logic HIGH disables gates of amplifiers	Yes
4	RF IN Over	Indicator	LOW	Pin will be latched to logic HIGH when input signal is over limit	No
5	Temp Over	Indicator	LOW	Pin will be latched to logic HIGH when amplifier is driven over temperature	Yes
6	Current Over	Indicator	LOW	Pin will be latched to logic HIGH when drain current limit is reached	Yes
7	ID Imbalance	Indicator	LOW	Pin will be latched to logic HIGH when an imbalance in the drain current of the combining branches occurs	Yes
8	Output VSWR	Indicator	LOW	Pin will be latched to logic HIGH when output reflection is over limit	No
9	Temp Signal	Indicator		PA carrier case temperature is represented by voltage	Yes
10	+5V	Power Supply	+5V	+5V DC is supplied for reference	Yes
11	GND	Ground	GND	Ground	Yes
12	GND	Ground	GND	Ground	Yes
13	GND	Ground	GND	Ground	Yes
14	Vdd	Vdd	Vdd	Amplifier Supply Voltage	Yes
15	Vdd	Vdd	Vdd	Amplifier Supply Voltage	Yes

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

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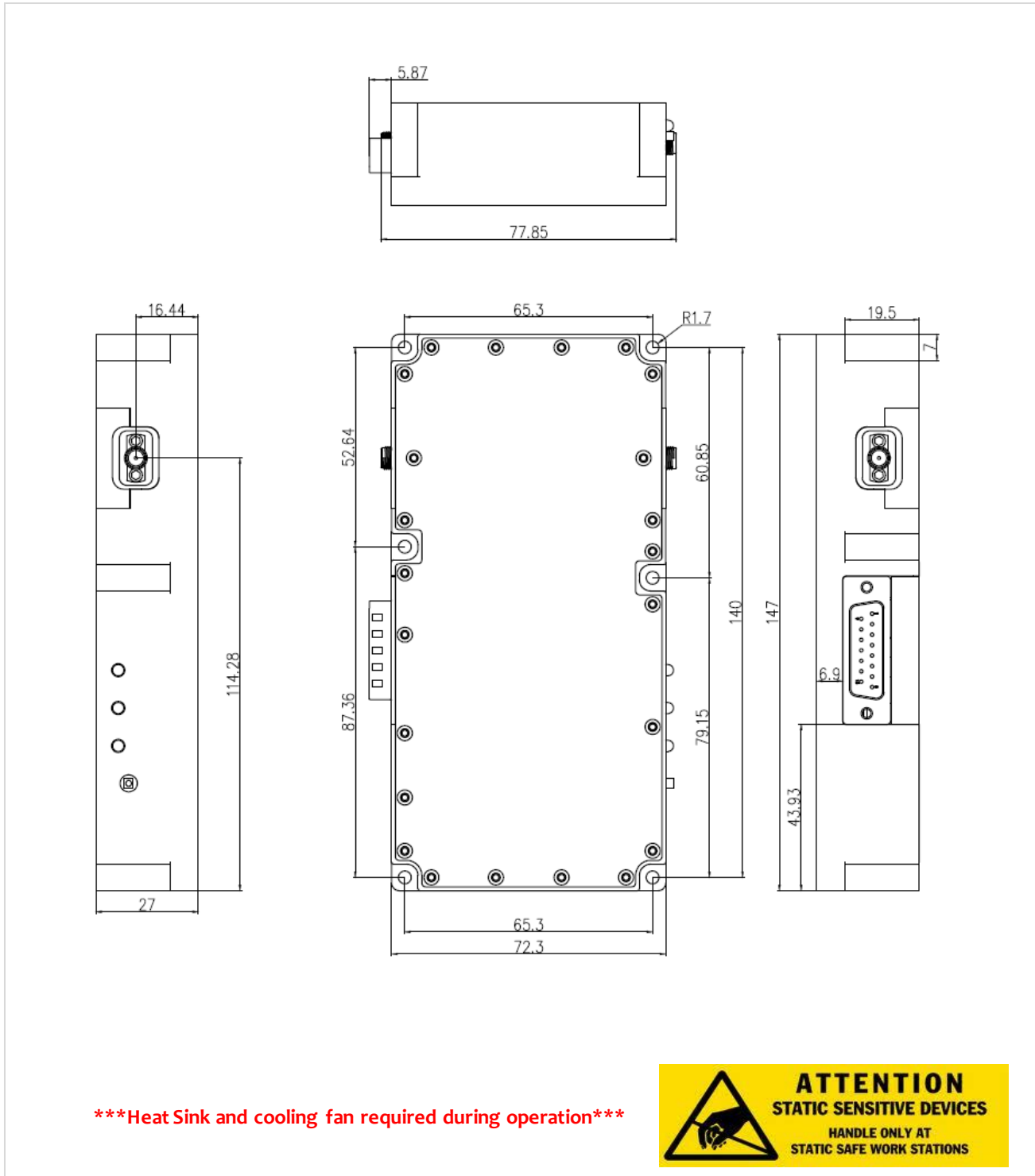
RF-LAMBDA

The power beyond expectations

RFLUPA28G42GB

Outline Drawing (Type 1):

All Dimensions in mm



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

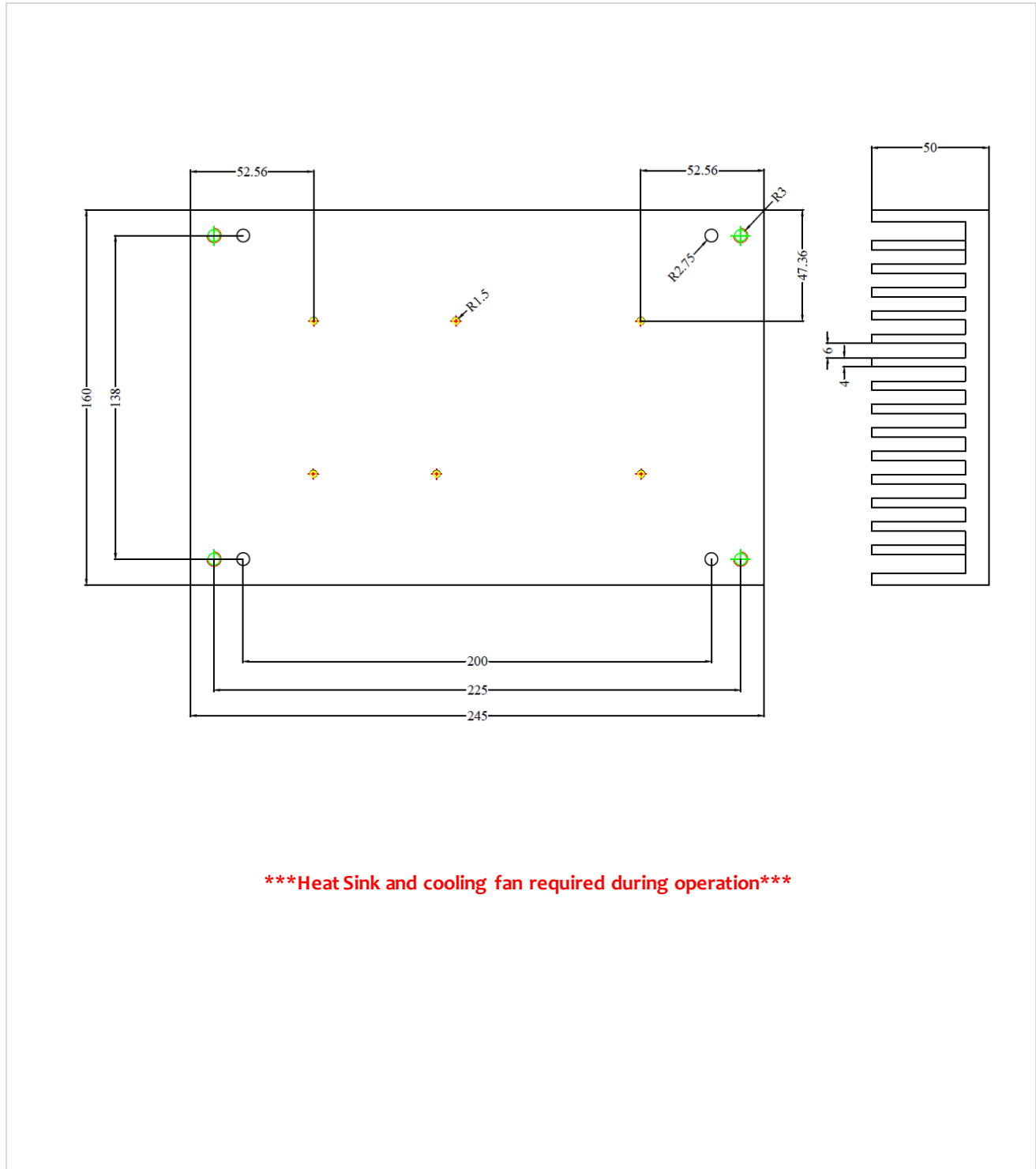


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Heatsink Outline Drawing (Type 1):

All Dimensions in mm

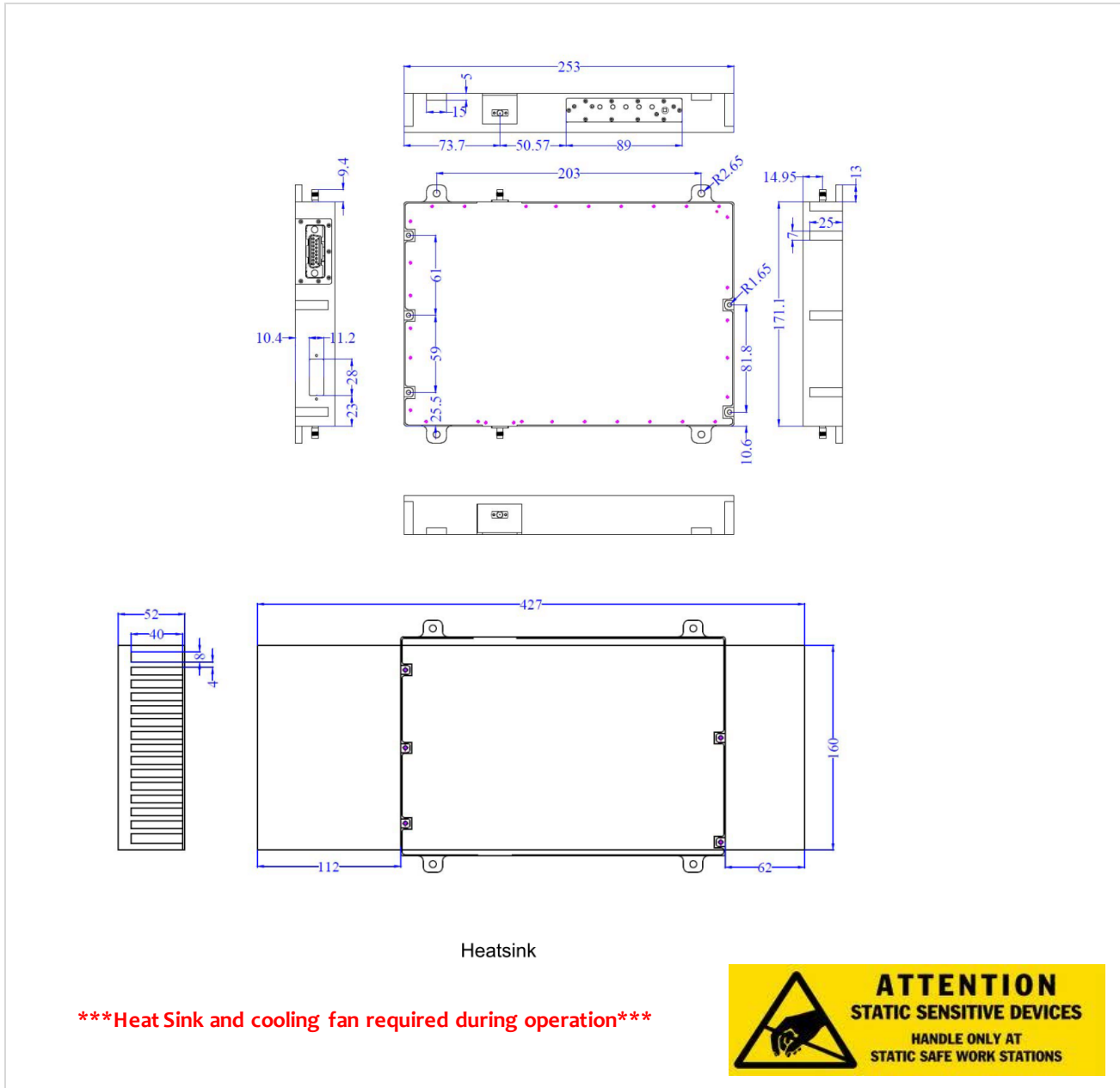


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Outline Drawing (Type 2) Including Heatsink:

All Dimensions in mm



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Important Notice

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