



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



#### Features

- Wideband Solid State Power Amplifier
- Gain: 37dB Typical
- Psat: +37dBm Typical
- Noise Figure: 3dB Typical
- Supply Voltage: +24V (-NP) / +36V (-WP)

#### 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	0.1		10	11		22	GHz
Gain	31	37	40	31	35	40	dB
Gain Flatness		±5			±5		dB
Gain Variation Over Temperature (-45 ~ +85)		±3			±3		dB
Noise Figure		3.5			3		dB
Input Return Loss		15			15		dB
Output Return Loss		25			25		dB
Output 1dB Compression Point (P1dB)*	34	34.5	35.5	27	30	33	dBm
Output 3dB Compression Point (P3dB)*	35	36	37	31	33	36	dBm
Saturated Output Power (Psat)*		37			36.5		dBm
Output Third Order Intercept (IP3)		42			40		dBm
Supply Current –NP Model (VDC=+24V)		1400	1800		1400	1800	mA
Supply Current –WP Model (VDC=+36V)		900			900		mA
Isolation S12	79	85	94	76	86	94	dB
Input Max Power (No damage)			-3			-3	dBm
-NP model Weight (No heatsink)	280						g
-WP model Weight (No heatsink)	1285						g
Impedance	50						Ohms
Input / Output Connectors	SMA-Female						
Finish	-NP model: Gold Plated.						
	-WP model: Nickel Plated.						
Material	Aluminum / Copper						
Package Sealing	Epoxy Sealed (Standard)						
	Hermetically Sealed (Optional)						

\* P1dB, P3dB and Psat power testing signal: 200µs 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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# RF-LAMBDA

The power beyond expectations

## RFLUPA01M22GA

Absolute Maximum Ratings	
Supply Voltage -NP / -WP	+28V / +60VDC
RF Input Power	+2dBm
Storage Temperature(°C)	-50 to +125

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	
Operational Temperature (°C)	-45 ~ +55 (Case Temperature must be less than 85°C all time)
Altitude	30,000 ft. (Epoxy Sealed Controlled environment)
	60,000 ft 1.0psi min (Hermetically Sealed Un-controlled environment) (Optional)
Vibration	25g RMA (15 degrees 2KHz) endurance, 1 hour per axis
Humidity	100% RH at 35°C, 95%RH at 40°C
Shock	20G for 11msec half sine wave, 3 axis both directions

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
RFLUPA01M22GA-NP	0.1GHz~22GHz Power Amplifier No Protection
RFLUPA01M22GA-WP	0.1GHz~22GHz Power Amplifier With Protection

### 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?

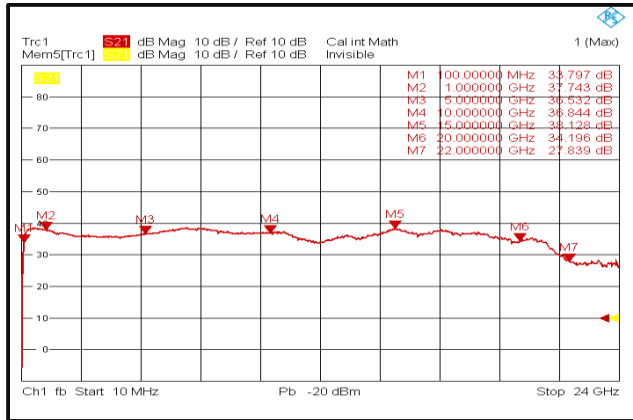
Each RF - Lambda amplifier will go through power and temperature stress testing.

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

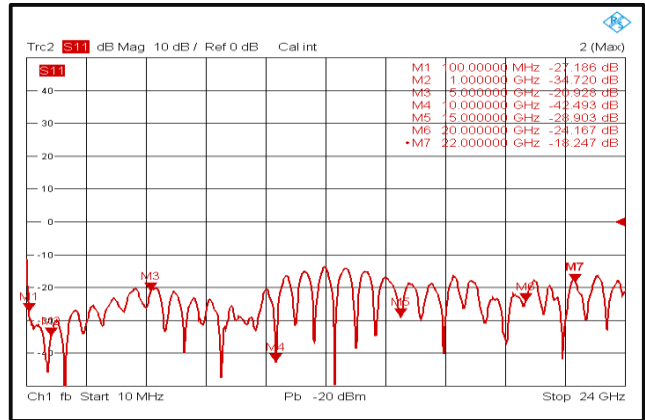
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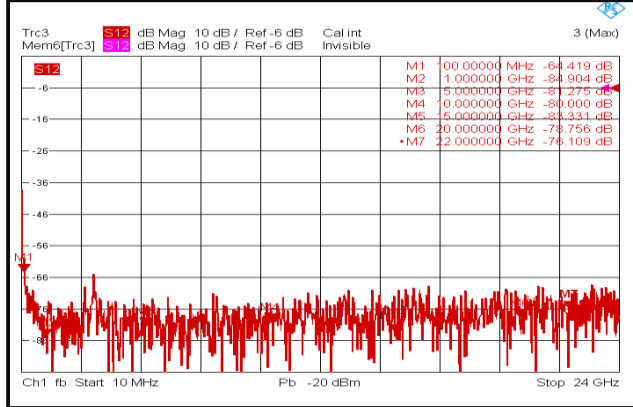
### Gain vs. Frequency



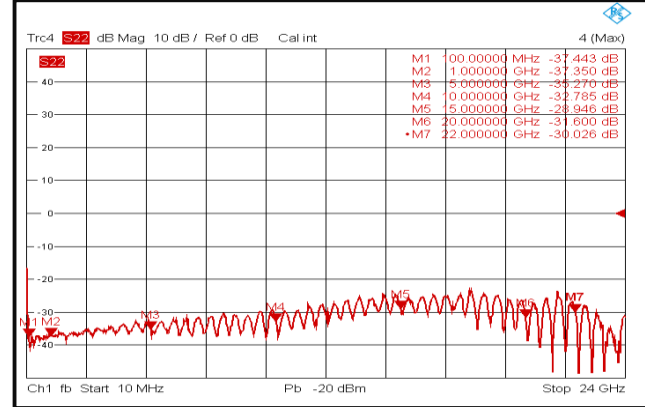
### Input Return Loss



### Isolation



### Output Return Loss

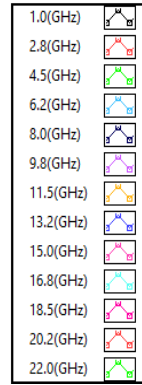
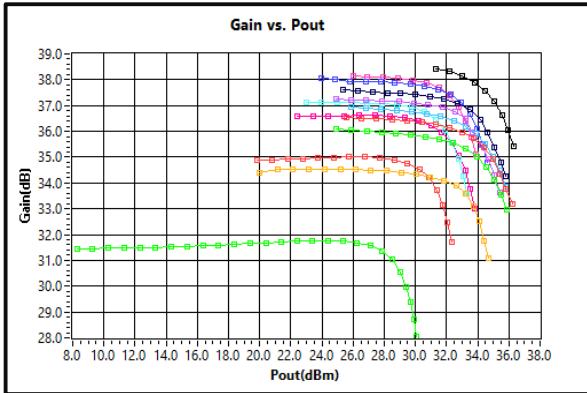


Note: Input/output return loss measurements include attenuators to protect equipment

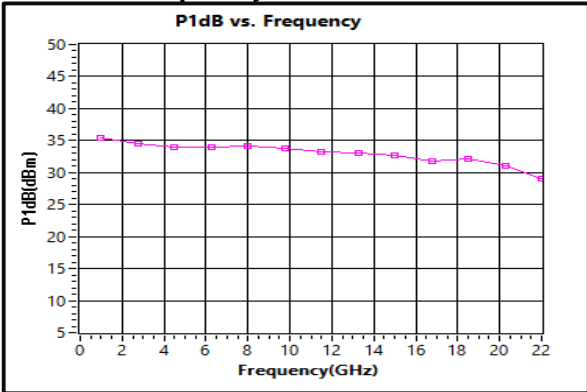
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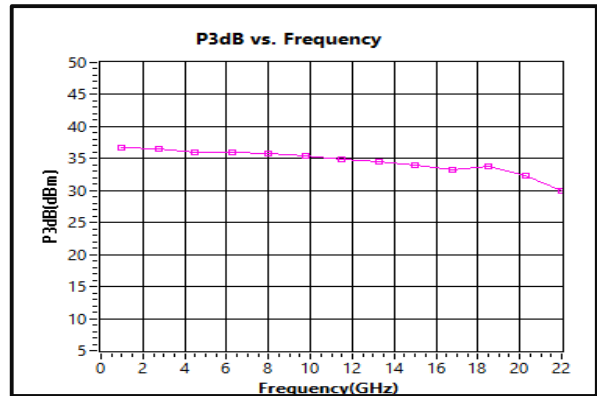
### Gain vs. Output Power



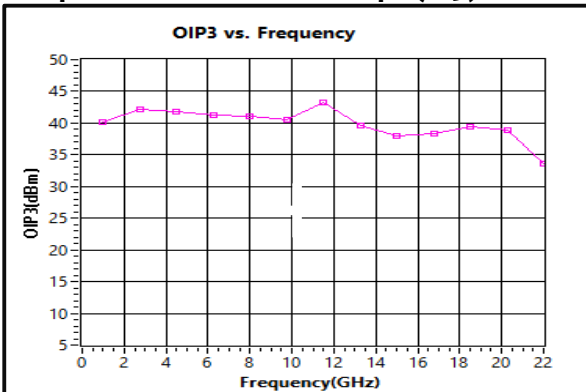
### P1dB vs. Frequency



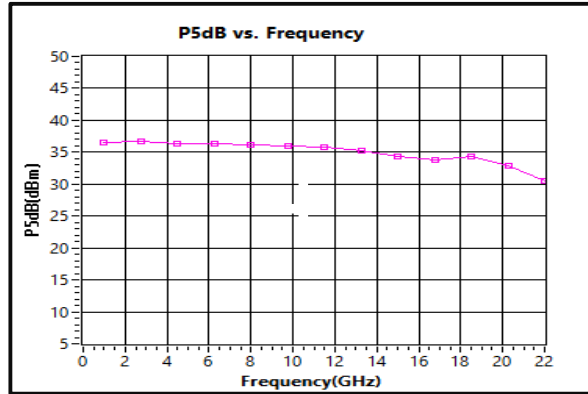
### P3dB vs. Frequency



### Output Third Order Intercept (IP3)



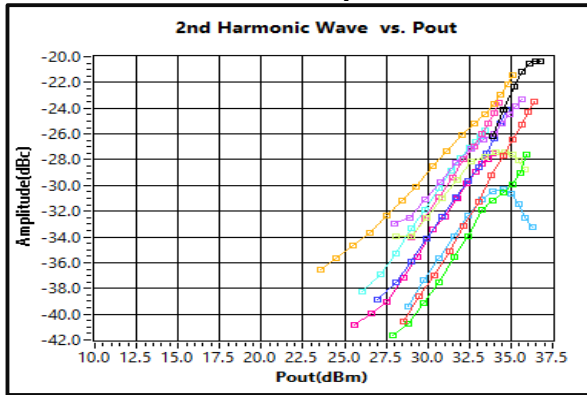
### P5dB vs. Frequency



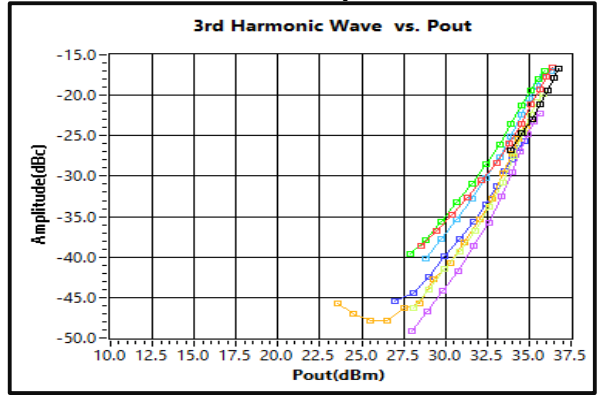
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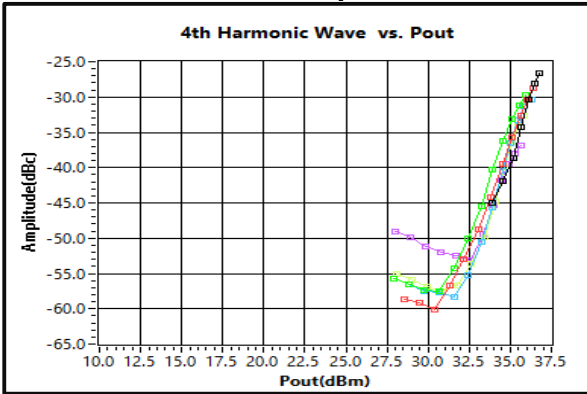
### 2nd Harmonic Wave Output Power



### 3rd Harmonic Wave Output Power

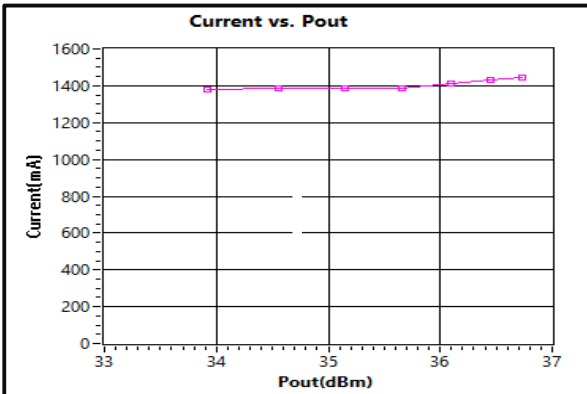


### 4th Harmonic Wave Output Power



1.0(GHz)	
2.8(GHz)	
4.5(GHz)	
6.2(GHz)	
8.0(GHz)	
9.8(GHz)	
11.5(GHz)	
13.2(GHz)	
15.0(GHz)	
16.8(GHz)	
18.5(GHz)	
20.2(GHz)	
22.0(GHz)	

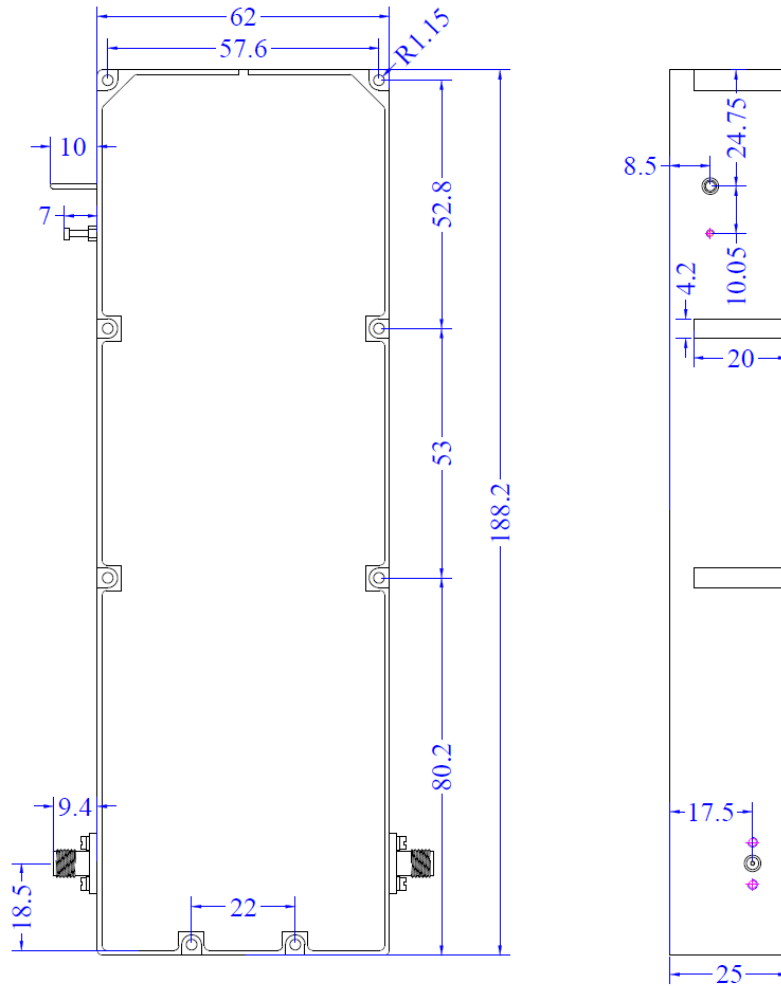
### Current vs. Pout





### -WP Outline Drawing:

All Dimensions in mm



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

\*\*\*Includes current protection and over temp shutdown protection\*\*\*





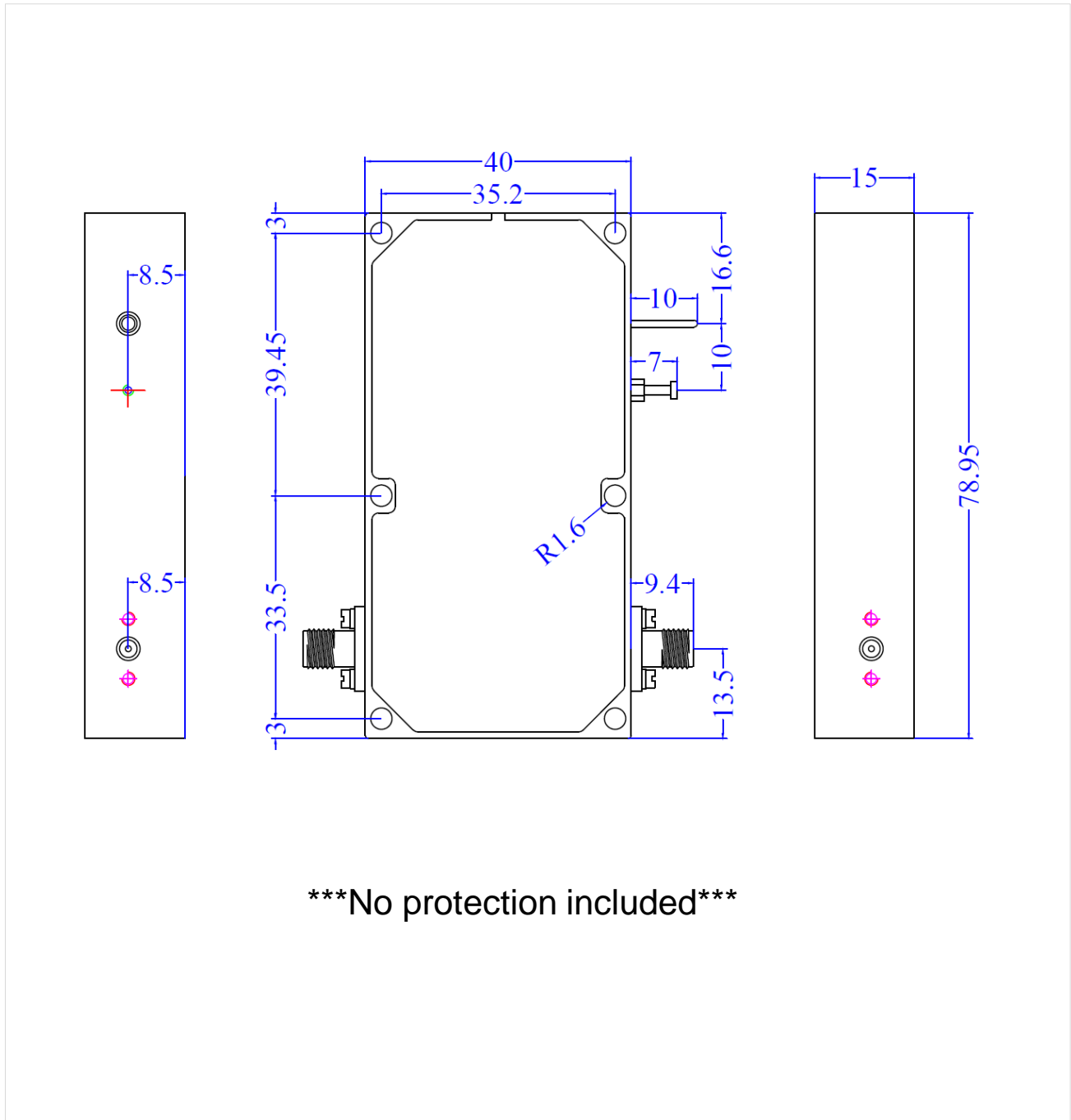
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## RFLUPA01M22GA

### -NP Outline Drawing:

All Dimensions in mm



\*\*\*No protection included\*\*\*

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

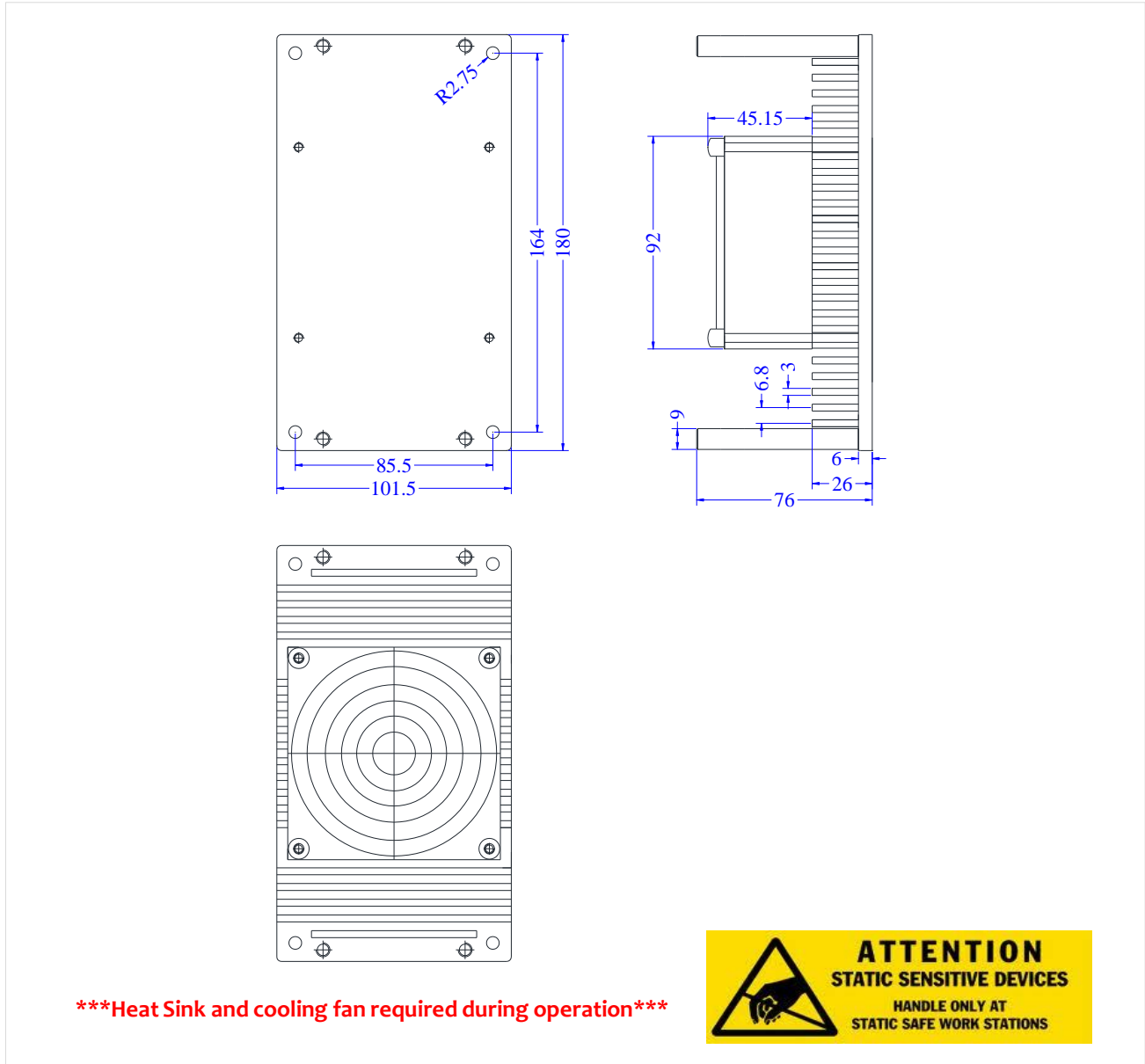


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### -NP Outline Heatsink with Air Cooling Drawing:

All Dimensions in mm



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### Important Notice

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