

## ITEM OPPORTUNITY SYNOPSIS

<b>Scouting Number:</b>	2024-238
<b>Name of the item to be scouted:</b>	Pulse Amplifier Modules
<b>State item to be used in:</b>	None

### Describe the Item:

<p>Please describe the item application/the end use of the item.</p>	<p>The National Oceanic and Atmospheric Administration (NOAA), Oceanic and Atmospheric Research (OAR), Earth Systems Research Laboratories (ESRL), Physical Sciences Laboratory (PSL) runs a network of S-Band Precipitation Profilers that have been operating in the field for over 10 years. The PSL is in need of replacement pulse amplifier modules for use within their profilers, as the units are currently nonfunctioning. This procurement will support data continuity and continued operation of the radar network. The PSL requires two (2) pulse amplifier modules like the RFHIC Corporation model RRP291K0-10 to use as drop-in replacements.</p>
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### Supplier Information:

<b>Type of Supplier Being Sought (select from the list below):</b>	
Manufacturer	x
Contract Manufacturer	
Distributor	
Other (Please Specify)	
<b>Reason for Scouting Submission (select from the list below)</b>	
2nd Supplier	
Price	
Re-Shore	
Past supplier no longer available	
New Product Startup	
BABA	x
Other (Please Specify)	

### Summary of Technical Specifications and Performance Requirements:

<p>Describe the manufacturing processes (elaborate to provide as much detail as possible)</p>	<p>Unknown except as provided on the attached specs sheet</p>
<p>Provide dimensions / size / tolerances / performance specifications of the item</p>	<p>Similar in form, fit and function to the RFHIC Corporation RRP291K0-10 a pulse amplifier module designed for Radar system application frequencies from 2.7 to 3.1 GHz. The module uses Gallium Nitride (GaN) high-electron-mobility transistors (HEMTs) technology, which performs high breakdown voltage, wide bandwidth, and high efficiency. Electrical Specifications: Operating Frequency: 2700-3100 MHz Operating Bandwidth: 400 MHz Output Pulse Power: 1100 W (min 1000 W) Input Pulse Power: 0 dBm Power Gain: 60.5 dB (min 60 dB) Gain Flatness: +/- 1.0 dB Duty Cycle: 20% Pulse Width: 500 us Efficiency: 35% (min 30%) Amplitude Pulse Droop: 0.5 dB (max 1.0 dB) Harmonics 1 to N: 40 dBc Spurious Level: 60 dBc Rise Time: 200 ns Fall Time: 200 ns Input VSWR: 1.5:1 dB Output VSWR: 1.5:1 dB Switching Time: 0.5 us (max 1 us) Phase Deviation: -20 to 20 ° Absolute Maximum Ratings: Operating Junction Temperature: 225 °C Operating Flange Temperature: -30 to 75 °C Storage Temperature: -30 to 125 °C Operating Voltages: Drain-Source Voltage: nominal voltage 50 V, +/- 5% accuracy Drain-Source Sub Voltage: nominal voltage 12 V, +/- 5% accuracy Shutdown Voltage: TTL Low(0V) : PA ON, TTL High(5V) : PA OFF On/Off Control Voltage: TTL Low(0V) : PA ON, TTL High(5V) : PA OFF Power Supply: Drain-Source Current (AVG): 14 A (max 20 A) Drain-Source Sub Current (AVG): 0.12 A (max 0.2 A) Mechanical Specifications: Mass: 1.3 kg Dimension: 220 mm x 145 mm x 27 mm RF Connector: SMA Female, RF Input; N-type Female, RF Output DC Connector: 3W3 connector, supply; 9pun D-Sub, Control</p>
<p>List required materials needed to make the product, including materials of product components, if applicable</p>	<p>Unknown except as provided on the attached specs sheet</p>

Are there applicable certification requirements?

Yes	
No	x
Please explain:	
<b>Are there any applicable regulations that apply to the production of this item?</b>	
Yes	
No	x
Please explain:	
<b>Are there any other standards / requirements?</b>	
Yes	
No	x
Please explain:	
<b>NAICS CODES:</b>	
NAICS 1	334413 Semiconductor and related device manufacturing
NAICS 2	
<b>Additional Comments:</b>	
Additional technical comments:	All offered products must be completely compatible (form, fit, and function) with existing radar network without need for modification to product or system.
<b>Volume and Pricing:</b>	
Estimated Potential Business Volume (i.e. #units per day, month, year):	One-time purchase
Estimated Target Price/Unit Cost Information:	Quantity of two (2) amplifier modules \$10,276.81 each
<b>Delivery Requirements:</b>	
When is it needed by? (Immediate, 30 days, 6 months, etc.)	Anticipate award of contract by end of current fiscal year (9/20/2024), with delivery by 60 days after date of award.
Describe packaging requirements (i.e. individually/group packaging, etc.)	Best available. Product must be delivered undamaged.
Where will this item be shipped?	Boulder, CO
<b>Additional Comments:</b>	
Is there other information you would like to include?	This is a Simplified Acquisition, which has a shorter lead time to completion than an action over \$250,000.00. It is expected that this requirement will be awarded within the next 30-60 days, and any timely scouting (requested completed within 15 days from submission) would be appreciated to align with Simplified Acquisition requirements for posting and the Buy American Act Waiver process. Department of Commerce Point of Contact information for questions including BABA/Buy American compliance: Marcelle Loveday, Director Acquisition Policy & Workforce Office of Acquisition Management M Loveday@doc.gov Please copy scouting@nist.gov on all correspondence

# Preliminary

## Pulse Amp Module

### RRP291K0-10



#### Product Features

- Frequency from 2.7 ~ 3.1GHz
- GaN HEMT
- 50 Ohm Input/Output impedance
- High efficiency

#### Applications

- Radar system



#### Description

The RRP291K0-10 is designed for Radar system application frequencies from 2.7 ~ 3.1GHz. This module uses GaN HEMT technology which performs high breakdown voltage, wide bandwidth and high efficiency.

#### Electrical Specifications @ $V_{DS}=50V$ , $T=25^{\circ}C$ , $50\Omega$ System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	MHz	2700	-	3100	$f_o$
Operating Bandwidth	MHz	-	400	-	BW
Output Pulse Power	W	1000	1100	-	$P_o$
Input Pulse Power	dBm	-	0	-	$P_i$
Power Gain	dB	60	60.5	-	$G_p$
Gain Flatness	dB	-	-	$\pm 1.0$	$\Delta G_p$
Duty Cycle	%	-	-	20	DC
Pulse Width	us	-	-	500	PW
Efficiency	%	30	35	-	$E_{ff}$
Amplitude Pulse Droop	dB	-	0.5	1.0	Droop
Harmonics 1 to N	dBc	40	-	-	$H_N$
Spurious Level	dBc	60	-	-	Spur
Rise Time	ns	-	-	200	$t_r$
Fall Time	ns	-	-	200	$t_f$
Input VSWR	dB	-	-	1.5:1	VSWR
Output VSWR	dB	-	-	1.5:1	VSWR
Switching Time	us	-	0.5	1	$t_{sw}$
Phase Deviation	$^{\circ}$	-20	-	20	$\Delta\phi$

\* Test Pulse conditions = 100us, 10%

\* Above electrical specifications is measured by connecting electrolytic condenser 10,000uF to DC. Please make sure that electrolytic condenser is connected properly while testing the module.

\* Custom design available

**Preliminary**  
**Pulse Amp Module**  
**RRP291K0-10**



**Absolute Maximum Ratings**

PARAMETER	UNIT	RATING	SYMBOL
Operating Junction Temperature	°C	225	T <sub>J</sub>
Operating Flange Temperature	°C	-30 ~ 75	T <sub>C</sub>
Storage Temperature	°C	-30 ~ 125	T <sub>STG</sub>

**Operating Voltages**

PARAMETER	UNIT	NOMINAL VOLTAGE	VOLTAGE ACCURACY	SYMBOL
Drain-Source Voltage	V	50	± 5%	V <sub>DS1</sub>
Drain-Source Sub Voltage	V	12	± 5%	V <sub>DS2</sub>
Shutdown Voltage	V	TTL Low(0V) : PA ON, TTL High(5V) : PA OFF		V <sub>DC1</sub>
On/Off Control Voltage	V	TTL Low(0V) : PA ON, TTL High(5V) : PA OFF		V <sub>DC2</sub>

**Power Supply**

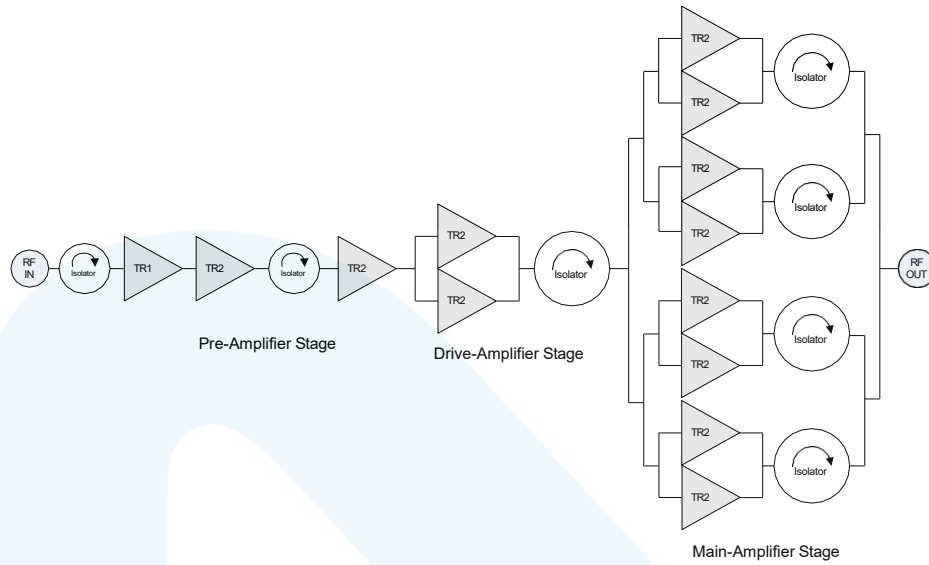
PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Drain-Source Current(AVG)	A	-	14	20	I <sub>DS1</sub>
Drain-Source Sub Current(AVG)	A	-	0.12	0.2	I <sub>DS2</sub>

\* Duty Cycle 20%, Pulse Width 200us

**Preliminary**  
**Pulse Amp Module**  
**RRP291K0-10**



**Block diagram**



**Mechanical Specifications**

PARAMETER	UNIT	TYP
Mass	kg	1.3
Dimension	mm	220 x 145 x 27
RF Connector	-	SMA Female : RF Input
		N-type Female : RF Output
DC Connector	-	3W3 connector : Supply
		9Pin D-Sub : Control

# Preliminary

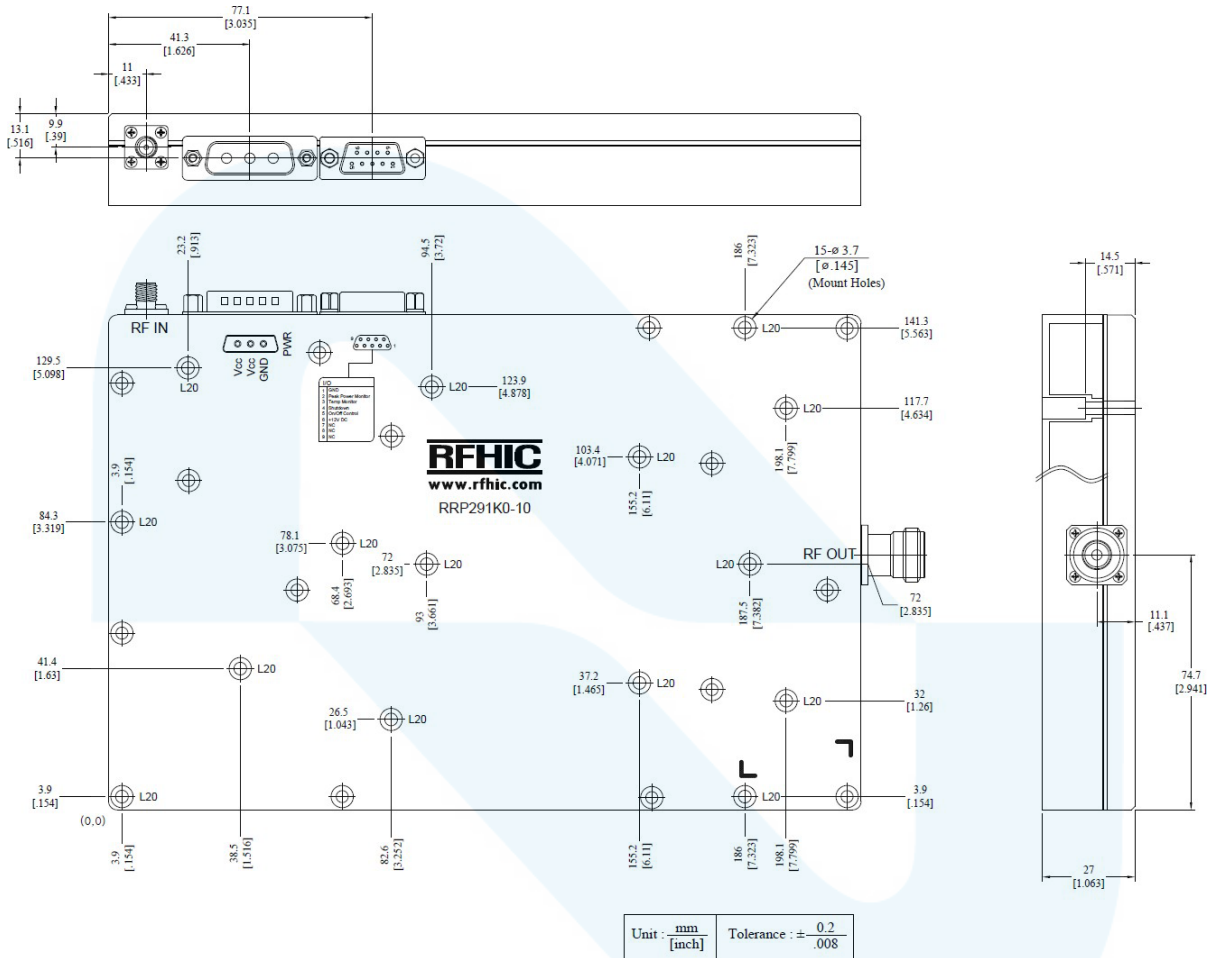
## Pulse Amp Module

### RRP291K0-10



### Outline Drawing

\* Unit: mm[inch] | Tolerance ±0.2[.008]



### Pin Description

Supply : 3W3 Connector			
Pin No	Description	Pin No	Description
A1	GND	A2 & A3	V <sub>DS1</sub> (+50V)
Control : 9Pin D-Sub			
Pin No	Description	Pin No	Description
1	GND	6	V <sub>DS2</sub> (+12V)
2	Peak Power Monitor	7	NC
3	Temp Monitor	8	NC
4	Shutdown	9	NC
5	On/Off Control	-	-

**Preliminary**  
**Pulse Amp Module**  
**RRP291K0-10**



**Revision History**

Part Number	Release Date	Version	Modification	Data Sheet Status
RRP291K0-10	2012.12.28	1.1	-	-
RRP291K0-10	2012.12.28	1.0	Version update	-
RRP291K0-10	2012.9.6	0.1	-	Preliminary



**Certification**

This product is manufactured by a company that is certified for the AS9100D quality management system.

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