

**Product Features**

- Frequency from 5.4 ~ 5.9GHz
- GaN HEMT
- 50 Ohm Input/Output impedance
- High efficiency

**Applications**

- Radar system

**Description**

The RRP54591K2-42 is designed for Radar system application frequencies from 5.4 ~ 5.9GHz.

This module uses GaN HEMT technology which performs high breakdown voltage, wide bandwidth and high efficiency.

**Electrical Specifications @  $V_{DS1}=50V$ ,  $V_{DS2}=6V$   $T=25^{\circ}C$ , 50 $\Omega$  System**

| PARAMETER             | UNIT       | MIN  | TYP  | MAX       | SYMBOL       |
|-----------------------|------------|------|------|-----------|--------------|
| Operating Frequency   | MHz        | 5400 | -    | 5900      | $f_o$        |
| Operating Bandwidth   | MHz        | -    | 500  | -         | BW           |
| Output Pulse Power    | W          | 1100 | 1200 | -         | $P_o$        |
| Input Pulse Power     | dBm        | -    | 19   | -         | $P_i$        |
| Power Gain            | dB         | 40   | 42   | -         | $G_P$        |
| Gain Flatness         | dB         | -    | -    | $\pm 0.5$ | $\Delta G_P$ |
| Duty Cycle            | %          | -    | -    | 10        | DC           |
| Pulse Width           | us         | -    | -    | 100       | PW           |
| Efficiency            | %          | 25   | 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         | -    | -    | 100       | $t_r$        |
| Fall Time             | ns         | -    | -    | 100       | $t_f$        |
| Input VSWR            | dB         | -    | -    | 1.5:1     | VSWR         |
| Output VSWR           | dB         | -    | -    | 1.5:1     | VSWR         |
| Switching Time        | us         | -    | 0.1  | -         | $t_{sw}$     |
| Phase Deviation       | $^{\circ}$ | -20  | -    | 20        | $\Delta\phi$ |

\* Test Pulse conditions = 100us, 10%

\* Custom design available

**Absolute Maximum Ratings**

| PARAMETER                      | UNIT        | RATING    | SYMBOL    |
|--------------------------------|-------------|-----------|-----------|
| Operating Junction Temperature | $^{\circ}C$ | 225       | $T_j$     |
| Operating Flange Temperature   | $^{\circ}C$ | -20 ~ 85  | $T_c$     |
| Storage Temperature            | $^{\circ}C$ | -40 ~ 125 | $T_{STG}$ |

\*The transistor MTTF is  $3.0 \times 10^7$  hours at the junction temperature  $225^{\circ}C$  with duty cycle 10% and pulse width 100us and can vary depending on pulse operating conditions and junction temperatures.

\*Based on the base plate temperature  $50^{\circ}C$ , the expected MTBF of the RRP54591K2-42 is around 146,000 hours.

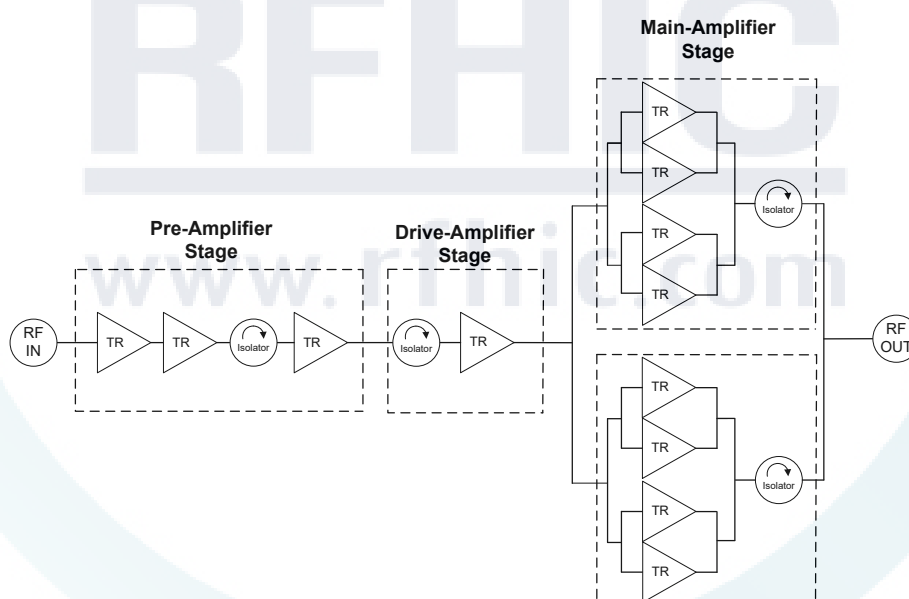
**Operating Voltages**

| PARAMETER                | UNIT | NOMINAL VOLTAGE                            | VOLTAGE ACCURACY | SYMBOL           |
|--------------------------|------|--|------------------|------------------|
| Drain-Source Voltage     | V    | 50   | ± 2%             | V <sub>DS1</sub> |
| Drain-Source Sub Voltage | V    | 6  | ± 2%             | V <sub>DS2</sub> |
| On/Off Control Voltage   | V    | TTL Low(0V) : PA OFF, TTL High(5V) : PA ON |                  | -                |
| Peak Monitor Voltage     | V    | 1.5V@5.65GHz, 60dBm (dB/30mV)              |                  | -                |
| Temp Monitor Voltage     | V    | 0.75V@25°C (1°C/0.01V)                     |                  | -                |

**Power Supply**

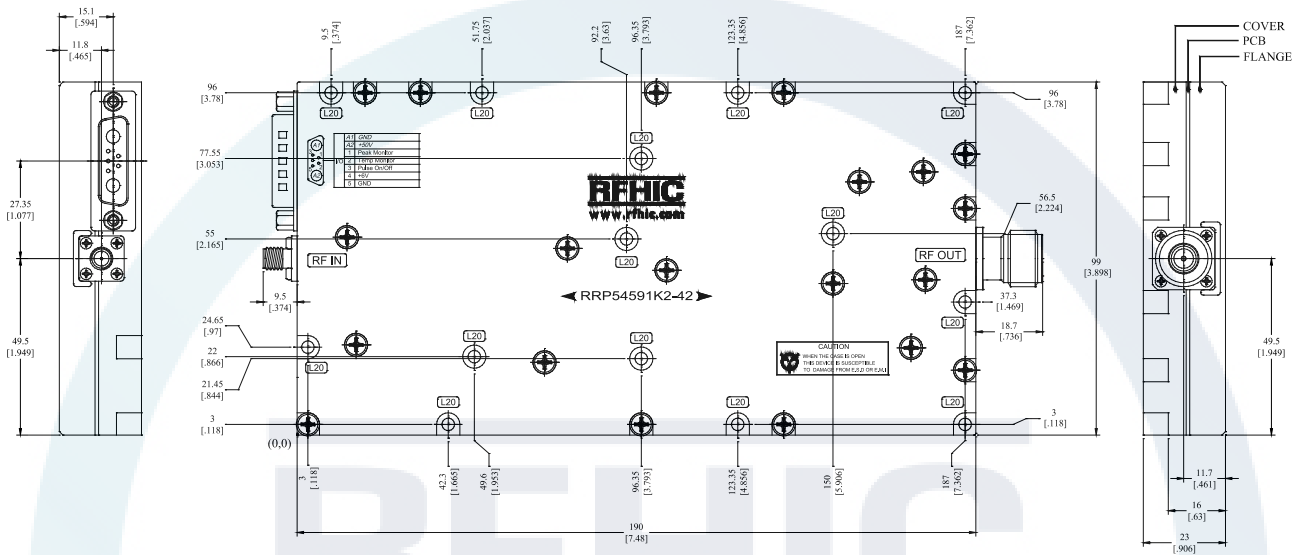
| PARAMETER                     | UNIT | MIN | TYP  | MAX  | SYMBOL           |
|-------------------------------|------|-----|------|------|------------------|
| Drain-Source Current(AVG)     | A    | -   | 8.0  | 10   | I <sub>DS1</sub> |
| Drain-Source Sub Current(AVG) | A    | -   | 0.03 | 0.05 | I <sub>DS2</sub> |

\* Duty Cycle 10%, Pulse Width 100us

**Block diagram****Mechanical Specifications**

| PARAMETER    | UNIT | TYP                          |
|--------------|------|------------------------------|
| Mass         | kg   | 0.8                          |
| Dimension    | mm   | 190 x 99 x 23                |
| RF Connector | -    | SMA Female : RF Input        |
|              |      | N Female : RF Output         |
| DC Connector | -    | 7W2 Combo Connector : Supply |

## Outline Drawing

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

## Pin Description

| Supply : 7W2 Combo Connector |                         |        |                        |
|------------------------------|-------------------------|--------|------------------------|
| Pin No                       | Description             | Pin No | Description            |
| A1                           | GND                     | 1      | Peak Monitor           |
| A2                           | V <sub>DS1</sub> (+50V) | 2      | Temp Monitor           |
|                              |                         | 3      | Pulse On/Off           |
|                              |                         | 4      | V <sub>DS2</sub> (+6V) |
|                              |                         | 5      | GND                    |

**Revision History**

| Part Number   | Release Date | Version | Modification | Data Sheet Status |
|---------------|--------------|---------|--------------|-------------------|
| RRP54591K2-42 | 2017.02.15   | 0.1     | -            | Preliminary       |
| RRP54591K2-42 | 2017.02.16   | 0.2     | -            | Preliminary       |
| RRP54591K2-42 | 2017.04.06   | 0.3     | -            | Preliminary       |
| RRP54591K2-42 | 2017.11.07   | 0.4     | -            | -                 |
| RRP54591K2-42 | 2017.12.19   | 0.5     | -            | -                 |
|               |              |         |              |                   |

**RFHIC**  
www.rfhic.com

RFHIC Corporation reserves the right to make changes to any products herein or to discontinue any product at any time without notice. While product specifications have been thoroughly examined for reliability, RFHIC Corporation strongly recommends buyers to verify that the information they are using is accurate before ordering. RFHIC Corporation does not assume any liability for the suitability of its products for any particular purpose, and disclaims any and all liability, including without limitation consequential or incidental damages. RFHIC products are not intended for use in life support equipment or application where malfunction of the product can be expected to result in personal injury or death. Buyer uses or sells such products for any such unintended or unauthorized application, buyer shall indemnify, protect and hold RFHIC Corporation and its directors, officers, stockholders, employees, representatives and distributors harmless against any and all claims arising out of such unauthorized use. Sales, inquiries and support should be directed to the local authorized geographic distributor for RFHIC Corporation. For customers in the US, please contact the US Sales Team at 919-677-8780. For all other inquiries, please contact the International Sales Team at 82-31-8069-3000.