

# Preliminary

## Wideband Power Amplifier

### RWM0110050-47



#### Product Features

- GaN on SiC Broadband High Power Amplifier
- 20 ~ 1000MHz Operation Bandwidth
- Power Gain Typical 47dB.
- 50W Typical. @P<sub>IN</sub> = 0dBm
- Designed with Class A, AB
- Designed with a compact form factor

#### Applications

- Broadcasting
- Telecommunication Systems
- Medical RF Systems
- RF Test & Measurement
- EMC / Immunity Testing



#### Description

The power amplifier module is designed for Broadcasting, Telecommunication, Medical and Other markets.

Operating frequency range is from 20 ~ 1000MHz.

Gallium Nitride on SiC technology is used and attached on an aluminum sub carrier. Full in/out matching for broadband performance is already applied.

Improved thermal handling by patented technology.

#### Electrical Specifications @ V<sub>CC</sub> = 32V; T<sub>c</sub> = 45°C; Z<sub>s</sub> = Z<sub>L</sub> = 50Ω

| PARAMETER                                                          |                 | UNIT | MIN  | TYP  | MAX  | CONDITION                             |
|--------------------------------------------------------------------|-----------------|------|------|------|------|---------------------------------------|
| Operating Frequency                                                |                 | MHz  | 20   | -    | 1000 | -                                     |
| Small Signal Gain                                                  |                 | dB   | -    | 55.0 | -    | @P <sub>IN</sub> = -30dBm             |
| Power Gain                                                         |                 | dB   | -    | 47.0 | -    | @P <sub>IN</sub> = 0dBm               |
| Gain Flatness                                                      |                 | dBpp | -    | ±1.0 | ±1.5 | @P <sub>IN</sub> = 0dBm               |
| P <sub>OUT</sub>                                                   |                 | dBm  | 46.0 | 47.0 | -    | @P <sub>IN</sub> = 0dBm               |
| OIP3 @ P <sub>o</sub> = +37dBm/Tone<br>(100kHz spacing, CW 2-Tone) |                 | dBm  | 48   | 52   | -    | -                                     |
| Input Return Loss                                                  |                 | dB   | -    | -15  | -9.5 | -                                     |
| Harmonic suppression                                               | 2 <sup>nd</sup> | dBc  | -    | -35  | -20  | CW 1-tone<br>@P <sub>o</sub> = +43dBm |
|                                                                    | 3 <sup>rd</sup> | dBc  | -    | -25  | -10  |                                       |
| Supply Voltage                                                     |                 | V    |      | 32.0 |      | V <sub>cc</sub> (=V <sub>ds</sub> )   |
| Quiescent Current consumption                                      |                 | A    |      | 1.8  | 2.2  | -                                     |
| Current Consumption                                                |                 | A    | -    | 3.8  | 4.4  | @P <sub>IN</sub> = 0dBm               |
| Switch On/Off – PIN No 4.<br>Switching Time*                       |                 | μS   | -    | 3    | 5    |                                       |
| Shut Down(+5V) – PIN No 3.<br>Switching Time                       |                 | mS   | -    | 500  | -    | Mute                                  |
| Shut Down or Switch On/Off<br>TTL Voltage                          |                 | V    | 0    | -    | 0.5  | On : TTL "Low"(Enable)                |
|                                                                    |                 |      | 2.5  | 5    | 5.5  | Off : TTL "High"(30mA@Disable)        |

#### Note.

\*. Gate On/Off : High speed switching

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### Absolute Maximum Ratings

| PARAMETER           | UNIT | RATING                |
|---------------------|------|-----------------------|
| Input RF Power      | dBm  | 2                     |
| Supply Voltage      | V    | 36.0                  |
| Load Mismatch Value | -    | 3 : 1 @all load phase |

\* Input Signal Condition : CW 1-Tone

### Environmental Characteristics

| PARAMETER                  | UNIT | MIN | TYP | MAX | SYMBOL           |
|----------------------------|------|-----|-----|-----|------------------|
| Operating Case Temperature | °C   | -20 | -   | 70  | T <sub>c</sub>   |
| Storage Temperature        | °C   | -40 | -   | 85  | T <sub>stg</sub> |
| Relative Humidity          | %    |     |     | 95  | RH               |

### Ordering Information

| Part Number   | Package                          |
|---------------|----------------------------------|
| RWM0110050-47 | Connector : D-Sub(7W2), SMA Type |

### Mechanical Specifications

| PARAMETER           | UNIT | TYP                      |
|---------------------|------|--------------------------|
| Dimension           | mm   | 117.5(L) x 75(W) x 25(H) |
| Weight              | g    | 380                      |
| RF IN/OUT Connector | -    | SMA Female               |
| Cooling             | -    | External Heat-sink       |

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**Typical Performance @ 45°C**

| Frequency (MHz) | RF Input Power (dBm) | RF Output Power (dBm) | RF Output Power (W) | Power Gain (dB) | Current Consumption (A) | Supply Voltage (V) | Efficiency (%) |
|-----------------|----------------------|-----------------------|---------------------|-----------------|-------------------------|--------------------|----------------|
| 20              | 0                    | 45.76                 | 37.67               | 45.76           | 2.66                    | 28.00              | 50.58          |
| 100             |                      | 47.09                 | 51.17               | 47.09           | 3.34                    | 28.00              | 54.71          |
| 200             |                      | 46.56                 | 45.29               | 46.56           | 3.63                    | 28.00              | 44.56          |
| 300             |                      | 46.97                 | 49.77               | 46.97           | 3.95                    | 28.00              | 45.00          |
| 400             |                      | 47.33                 | 54.08               | 47.33           | 4.07                    | 28.00              | 47.45          |
| 500             |                      | 47.02                 | 50.35               | 47.02           | 3.73                    | 28.00              | 48.21          |
| 600             |                      | 46.69                 | 46.67               | 46.69           | 3.97                    | 28.00              | 41.98          |
| 700             |                      | 45.86                 | 38.55               | 45.86           | 3.45                    | 28.00              | 39.90          |
| 800             |                      | 46.11                 | 40.83               | 46.11           | 3.07                    | 28.00              | 47.50          |
| 900             |                      | 45.92                 | 39.08               | 45.92           | 3.18                    | 28.00              | 43.89          |
| 1000            |                      | 46.05                 | 40.27               | 46.05           | 3.69                    | 28.00              | 38.98          |

| Frequency (MHz) | RF Input Power (dBm) | RF Output Power (dBm) | RF Output Power (W) | Power Gain (dB) | Current Consumption (A) | Supply Voltage (V) | Efficiency (%) |
|-----------------|----------------------|-----------------------|---------------------|-----------------|-------------------------|--------------------|----------------|
| 20              | 0                    | 46.67                 | 46.45               | 46.67           | 2.92                    | 32.00              | 49.71          |
| 100             |                      | 47.89                 | 61.52               | 47.89           | 3.62                    | 32.00              | 53.11          |
| 200             |                      | 47.26                 | 53.21               | 47.26           | 3.82                    | 32.00              | 43.53          |
| 300             |                      | 47.60                 | 57.54               | 47.60           | 4.16                    | 32.00              | 43.23          |
| 400             |                      | 47.89                 | 61.52               | 47.89           | 4.28                    | 32.00              | 44.92          |
| 500             |                      | 47.63                 | 57.94               | 47.63           | 3.91                    | 32.00              | 46.31          |
| 600             |                      | 47.40                 | 54.95               | 47.40           | 4.15                    | 32.00              | 41.38          |
| 700             |                      | 46.81                 | 47.97               | 46.81           | 3.67                    | 32.00              | 40.85          |
| 800             |                      | 47.04                 | 50.58               | 47.04           | 3.30                    | 32.00              | 47.90          |
| 900             |                      | 46.73                 | 47.10               | 46.73           | 3.38                    | 32.00              | 43.54          |
| 1000            |                      | 46.63                 | 46.03               | 46.63           | 3.78                    | 32.00              | 38.05          |

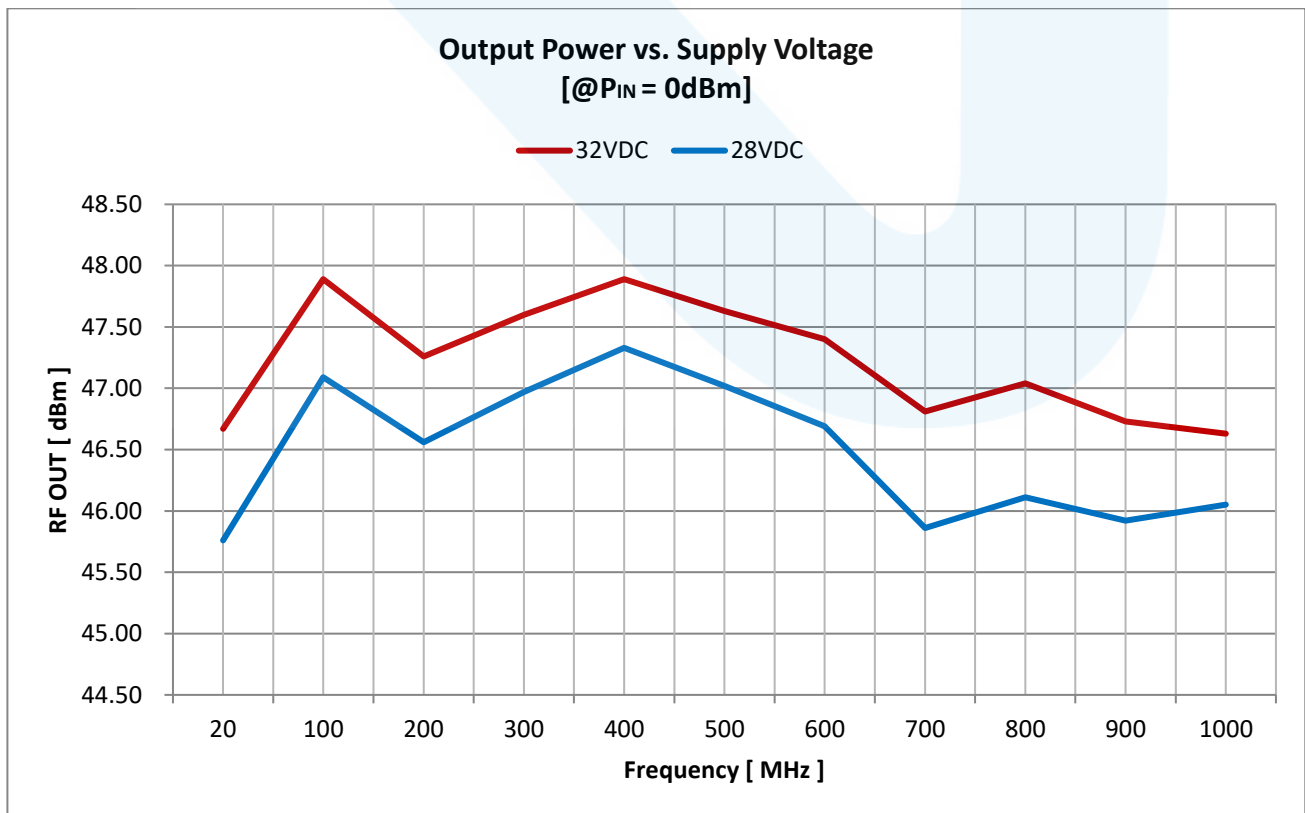
< Table 1. Typical Performance (28 Vs 32 VDC) >

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| Frequency (MHz) | Harmonic @43dBm 2nd [dBc] | Harmonic @43dBm 3rd [dBc] | IMD @37dBm/tone (dBc) | OIP3 @37dBm/tone (dBm) | Noise Figure (dB) |
|-----------------|---------------------------|---------------------------|-----------------------|------------------------|-------------------|
| 20              | -25                       | -16                       | 25                    | 52.5                   | 9.7               |
| 100             | -35                       | -19                       | 25                    | 52.5                   | 7.7               |
| 200             | -36                       | -14                       | 26                    | 53.0                   | 7.1               |
| 300             | -39                       | -19                       | 27                    | 53.5                   | 6.7               |
| 400             | -28                       | -26                       | 27                    | 53.5                   | 6.6               |
| 500             | -33                       | -26                       | 26                    | 53.0                   | 6.9               |
| 600             | -31                       | -32                       | 25                    | 52.5                   | 6.9               |
| 700             | -33                       | -34                       | 24                    | 52.0                   | 6.9               |
| 800             | -59                       | -42                       | 24                    | 52.0                   | 7.0               |
| 900             | -38                       | -52                       | 24                    | 52.0                   | 6.8               |
| 1000            | -32                       | -51                       | 25                    | 52.5                   | 7.2               |

< Table 2. Typical Performance >



< Chart 1. Typical Performance (RF OUT : 28 Vs 32 VDC) >

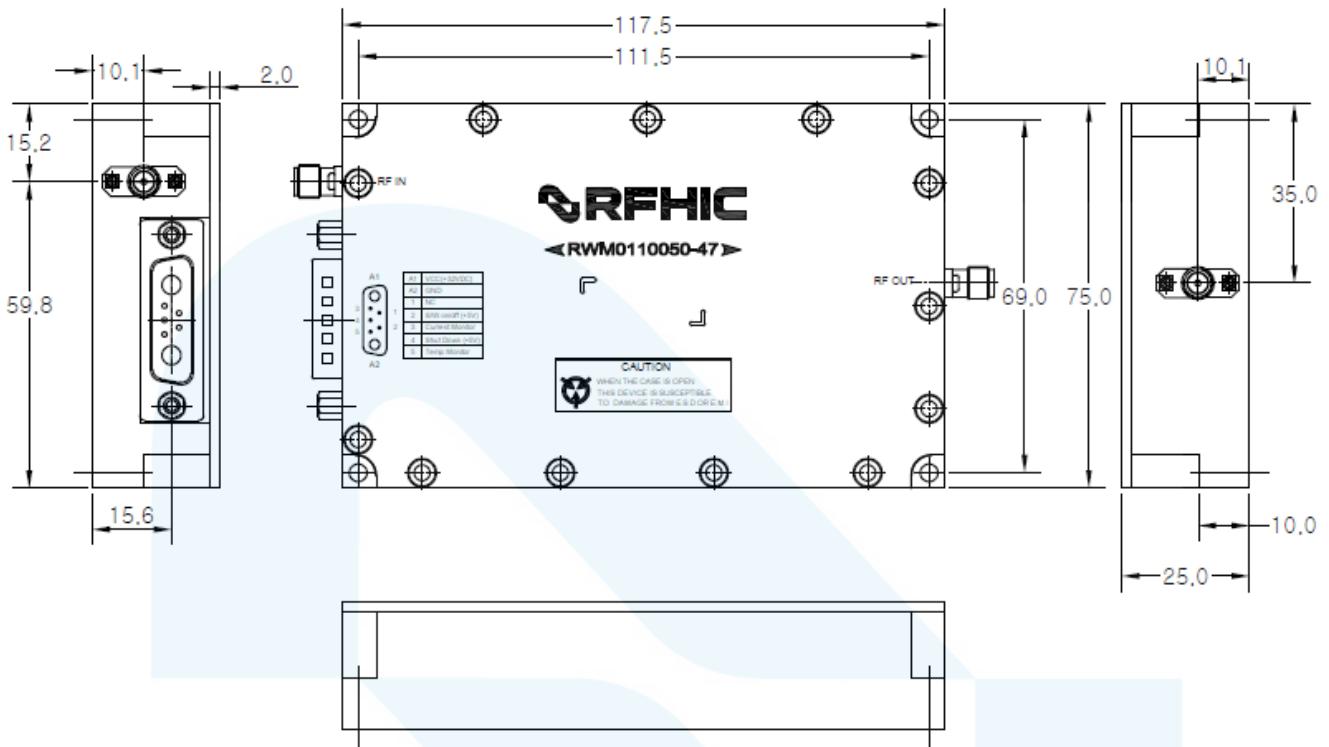
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#### Package Dimensions



Type1. SMA Connectorized Module [With D-SUB 7W2 male Type]

| Pin Description ( 7W2 / D-SUB / Male type ) |                   |     |                                                                                |
|---------------------------------------------|-------------------|-----|--------------------------------------------------------------------------------|
| Pin No                                      | Description       | I/O | Specifications                                                                 |
| A1                                          | Vcc               | I   | +32VDC                                                                         |
| A2                                          | GND               | I   | Ground                                                                         |
| 1                                           | NC                | -   | OPEN                                                                           |
| 2                                           | S/W On/off (+5V)* | I   | Enable : TTL "Low", Disable : TTL "High"<br>(Low : 0 ~ 0.5V, High : 2.5 ~ 5V)  |
| 3                                           | Current Monitor   | O   | Reference voltage : 500mV @ 0A<br>Analog voltage relative to IDD @20mV / 100mA |
| 4                                           | Shut Down (+5V)*  | I   | Enable : TTL "Low", Disable : TTL "High"<br>(Low : 0 ~ 0.5V, High : 2.5 ~ 5V)  |
| 5                                           | Temp Monitor      | O   | Reference voltage : 750mV @ 25°C, Scale : 10mV/°C                              |

\*. Internal pull-down resistor included

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**Revision History**

| Part Number   | Release Date | Version | Modification         | Data Sheet Status |
|---------------|--------------|---------|----------------------|-------------------|
| RWM0110050-47 | 2026.04.15   | 0.1     | -                    | Preliminary       |
| RWM0110050-47 | 2026.08.04   | 0.2     | Noise Figure Deleted | Preliminary       |



**Certification**

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

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