# Wideband Power Amplifier RWP03040-10

## Product Features

GaN on SiC Broadband High Power Amplifier

20 to 520MHz Operation Bandwidth

Small Signal Gain 39dB min.

40W Typical. P3dB

## Application

HF/VHF


Package : DP-75

## Description

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

Operating frequency range is from 20MHz to 520MHz.

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.

## Typical Specifications

$V_{CC}$ = +28V; T = 25℃; $Z_S = Z_L$ = 50Ω

| No | Item | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| 1 | **Bandwidth** | | 20 | | 520 | MHz |
| 2 | **Small Signal Gain** | | 40 | 42 | 44 | dB |
| 3 | **Gain Variation vs Temperature** | -20°C to 60°C | -2 | | +2 | dB |
| 4 | **Gain Variation vs Frequency** | | | ±1 | ±1.5 | dBpp |
| 5 | **$P_3$dB** | 20MHz to 100MHz | 45 | 46 | | dBm |
| | | 100MHz to 520MHz | 46 | 47 | | |
| 6 | **OIP3 @ Po = +30dBm (1MHz Tone spacing, CW 2-Tone)** | 20MHz to 520 MHz | 50 | 54 | | dBm |
| 7 | **Input Return Loss** | | | -11 | -7 | dB |
| 8 | **Output Return Loss** | | | -7 | -4 | dB |
| 9 | **2nd Harmonic suppression** | CW 1-tone @Po = +30dBm, Freq 200MHz | | -48 | -40 | dBc |
| 10 | **Supply Voltage** | Vcc(=Vds) | 27.5 | 28 | 30 | V |
| 11 | **Quiescent Current consumption** | | 2.8 | 3 | 3.2 | A |
| 12 | **Current Consumption @ $P_3$dB** | CW 1-tone | | 3.8 | 4.5 | A |
| 13 | **On/Off Switching Time** | On : TTL "Low" | | 3 | 5 | uS |
| | | Off : TTL "High"(100mA@Disable) | | | | |
| 14 | **Shut Down or Switch On/Off TTL Voltage** | On : TTL “Low”(Enable) | 0 | | 0.5 | V |
| | | Off : TTL “High” | 2.5 | 5 | 5.5 | |


▪ Tel : 82-31-250-5011

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## Environmental Characteristics

| No | Item | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| 1 | **Operating Temperature** | -20 | | +60 | °C |
| 2 | **Storage Temperature** | -40 | | +105 | °C |
| 3 | **Vibration** | MIL-STD-810G Method 514.6 ANNEX C | | | |

## Absolute Maximum Ratings

| No | Item | Rating | Unit |
|---|---|---|---|
| 1 | **Operating Flange Temperature** | +85 | °C |
| 2 | **Input RF Power** | +13 | dBm |
| 3 | **Supply Voltage** | +30 | V |
| 4 | **Load Mismatch Value** | 3 : 1 @all load phase | |

** Input Signal Condition : CW 1-Tone*

## Ordering Information

| No | Part Number | Package |
|---|---|---|
| 1 | **RWP03040-10** | Pallet |
| 2 | **RWP03040-1H** | Module assembled with RWP03040-10 |

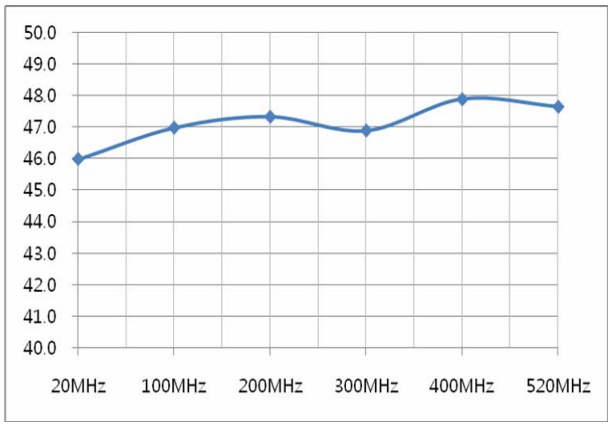
** RWP03040-1H is a SMA connectorized housing version of RWP03040-10. Electrical parameters are all same as RWP03040-10.*

*For more information, please contact RFHIC*

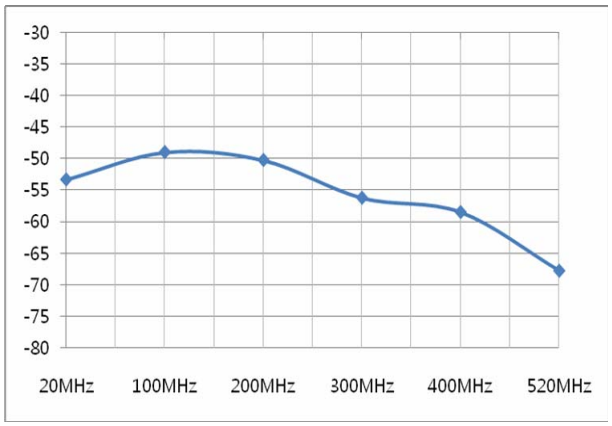
## RWP03040-10 Typical Performance @ 25℃

| Frequency (MHz) | P1dB (dBm) | P3dB (dBm) | Current@P1dB (A) | Current@P3dB (A) | 2nd Harm @30dBm(dBc) | OIP3@1GHz(dBm) (30dBm/Tone) |
|---|---|---|---|---|---|---|
| 20 | 45.5 | 46.0 | 2.7 | 2.68 | -57.51 | 55.7 |
| 100 | 46.2 | 47.0 | 2.9 | 3.00 | -49.11 | 56.9 |
| 200 | 46.6 | 47.3 | 3.5 | 3.77 | -48.43 | 56.3 |
| 300 | 45.8 | 46.9 | 3.4 | 3.80 | -52.39 | 54.8 |
| 400 | 46.8 | 47.9 | 3.5 | 3.85 | -71.33 | 54.8 |
| 520 | 46.1 | 47.7 | 3.5 | 4.03 | -57.16 | 55.0 |

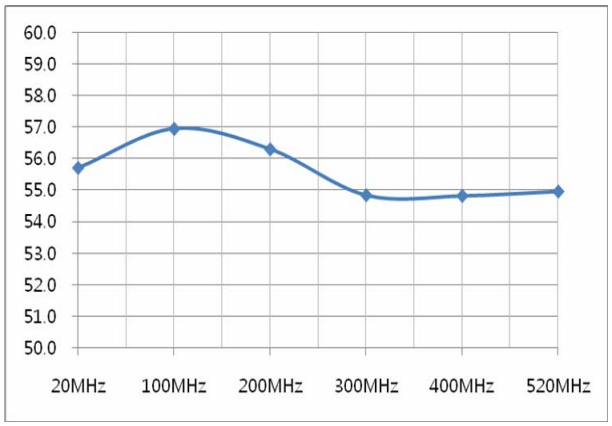
**P3dB**



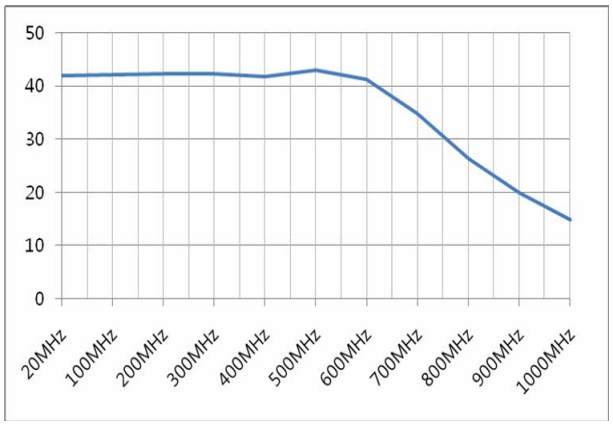

**2nd Harmonics**



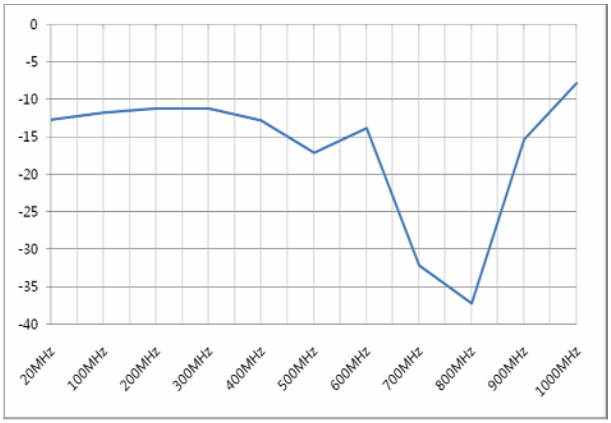

**OIP3**



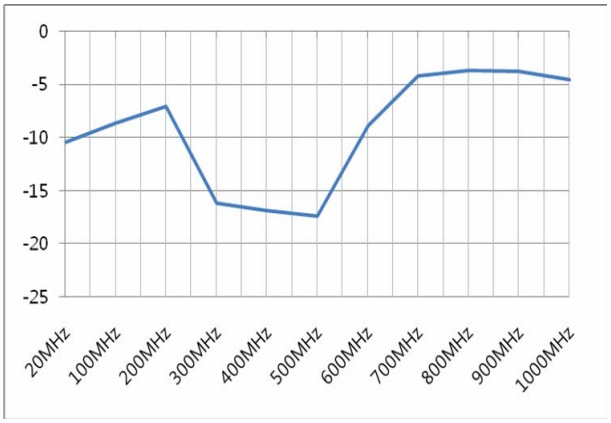

**Gain**



**Input Return Loss**



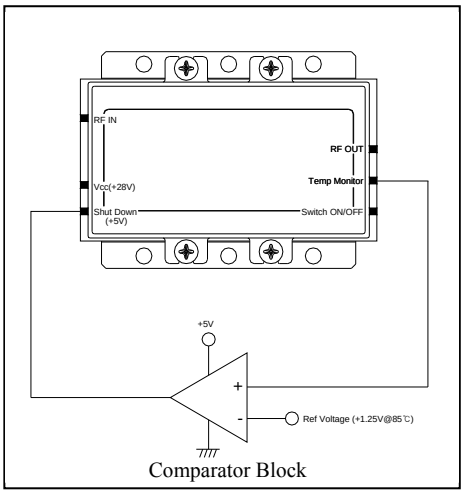

**Output Return Loss**




## Precautions

**1**. This product is designed to be used for broadband amplification.
Heat generation is higher when there is no RF signal in the device. Therefore, the worst case scenario is when there is no RF signal, and the amplifier is “on” with current draw.
The temperature must be calculated properly.
Case temperature must maintain below 85°C.
Right side drawing notes how to use a temperature monitoring function to protect against overheating.

**2**. Thermal Grease or Metal Thermal Interface Materials are recommended for heat dissipation. An example would be spreading thermal grease on the bottom of the device.



Comparator Block

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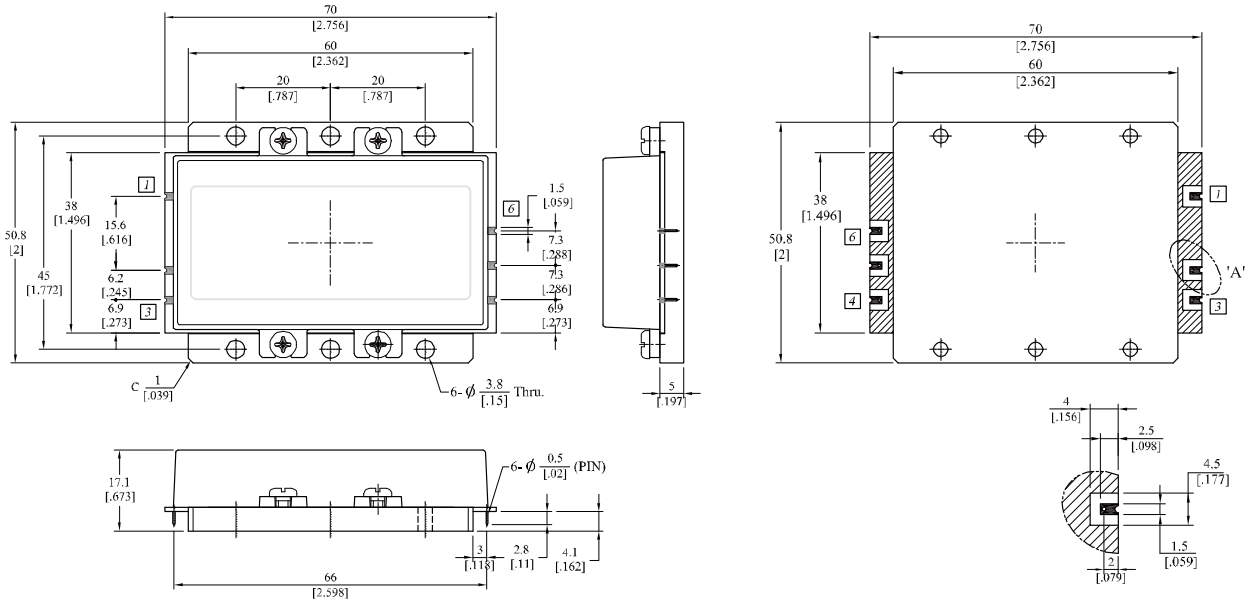
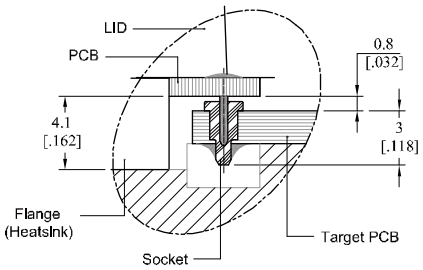
## Package Dimensions (Type: DP-75)

(Unit : mm/[inch], Tolerance : ±0.2/[.008])

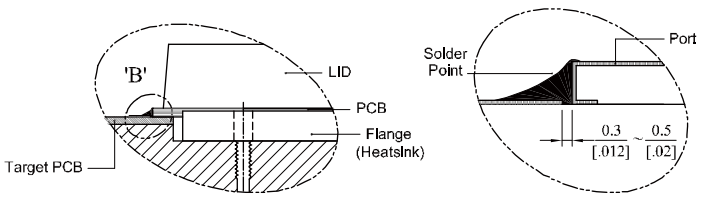



## How to connect the amplifier to a target PCB

### Method-I (with Pin)




### Method-II (without Pin) - *If you cut out the pin*




## Pin Description

| Pin No | Port Name | Function |
|---|---|---|
| 1 | **RF IN** | RF Input |
| 2 | **Vcc(+28V)** | DC Supply |
| 3 | **Shut Down(+5V)** | Shut Down @ TTL High, Enable @ TTL Low |
| 4 | **Switch ON/OFF** | Disable @ TTL High (Switch Status : Off) |
| 5 | **Temp Monitor** | 0.65V @ 25℃, Scale : 10mV/℃ (Accuracy : ±3℃) |
| 6 | **RF OUT** | RF Output |

** Terminal Pin Information : ASK206091,AA (Acethink, Pin) , ASK20556,AA-1(Acethink, Pin Socket)*

** Recommended Screw Torque : 8.0kgf.cm±1 using SEMS M3 10mm Bolt*

**Note :**