

## Product Features

GaN on SiC Broadband High Power Amplifier  
 20 to 1000MHz Operation Bandwidth  
 Small Signal Gain 38dB min  
 20W Typical. P3dB

## Application

HF/VHF/UHF



Package : DP-75

## Description

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

Operating frequency range is from 20MHz to 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.

## Typical Specifications

$V_{CC} = +28V$ ;  $T = 25^{\circ}C$ ;  $Z_S = Z_L = 50\Omega$

No	Item	Conditions	Min	Typ	Max	Unit
1	Bandwidth		20		1000	MHz
2	Small Signal Gain		38	40	42	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 <sub>3dB</sub>	20MHz to 400MHz	42	44		dBm
		400 MHz to 1000MHz	41	43		
6	OIP3 @ P <sub>o</sub> = +33dBm (1MHz Tone spacing, CW 2-Tone)	20MHz to 400 MHz	50	53		dBm
		400 MHz to 700 MHz	47	50		
		700 MHz to 1000 MHz	45	47		
7	Input Return Loss			-15	-10	dB
8	Output Return Loss			-10	-7	dB
9	2 <sup>nd</sup> Harmonic suppression	CW 1-tone @P <sub>o</sub> = +30dBm, Freq 500MHz		-35	-30	dBc
10	Supply Voltage	V <sub>cc</sub> (=V <sub>ds</sub> )	27.5	28	30	V
11	Quiescent Current consumption		1.7	1.9	2.1	A
12	Current Consumption @ P <sub>3dB</sub>	CW 1-tone		2.3	3	A
13	On/Off Switching Time	On : TTL "Low"		3	5	uS
		Off : TTL "High"(300mA@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	

## 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	+10	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	RWP05020-10	Pallet
2	RWP05020-1H	Module assembled with RWP05020-10

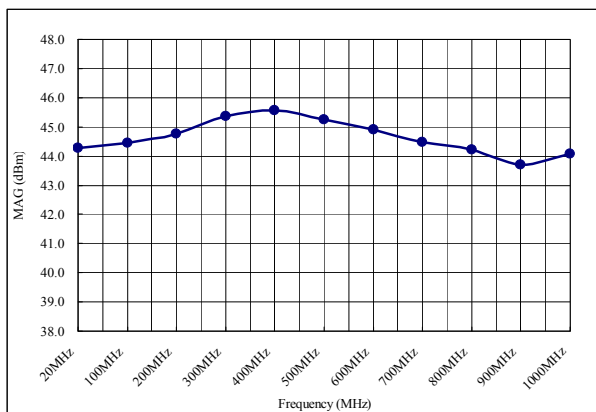
\* RWP05020-1H is a SMA connectorized housing version of RWP05020-10. Electrical parameters are all same as RWP05020-10.

For more information, please contact RFHIC

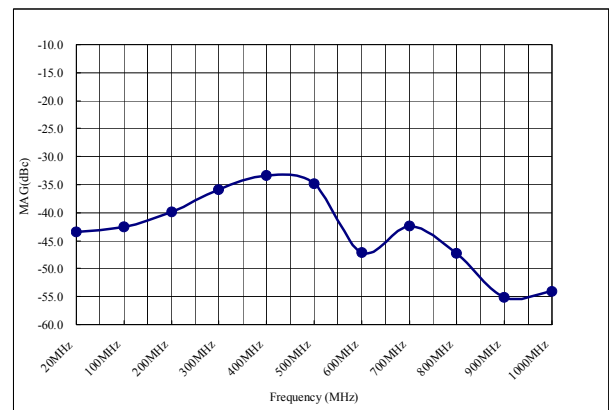
## RWP05020-10 Typical Performance @ 25°C

Frequency	P1dB	P3dB	Current@P1dB	Current@P3dB	2nd Harm	OIP3 (30dBm/Tone)
(MHz)	(dBm)	(dBm)	(A)	(A)	@30dBm(dBc)	(dBm)
20	42.4	44.3	1.9	2.2	-43.4	54.4
100	42.5	44.5	2.0	2.2	-42.5	54.9
200	43.3	44.8	2.1	2.3	-39.9	55.1
300	44.2	45.4	2.1	2.3	-35.8	54.6
400	44.6	45.6	2.1	2.3	-33.4	53.6
500	43.7	45.3	2.0	2.3	-34.9	52.2
600	43.9	44.9	2.0	2.2	-47.1	51.4
700	43.4	44.5	1.9	2.1	-42.5	49.4
800	42.8	44.2	1.8	1.9	-47.3	48.3
900	42.0	43.7	1.8	2.0	-55.1	47.5
1000	41.7	44.1	2.0	2.3	-54.1	47.1

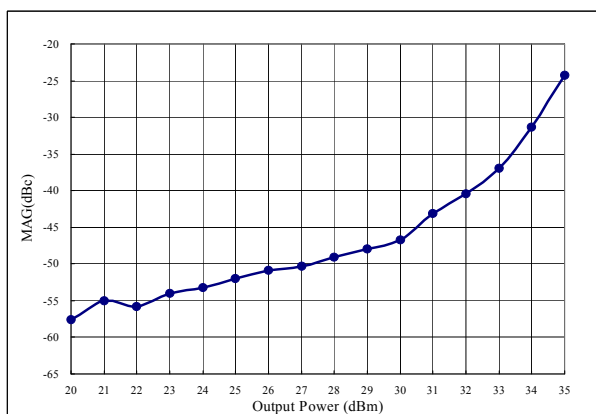
**P3dB**



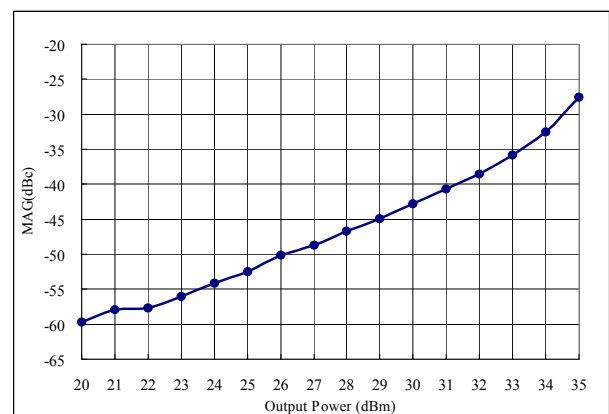
**2<sup>nd</sup> Harmonics**



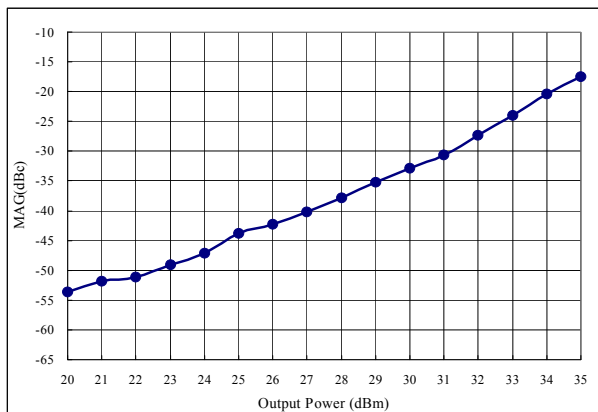
**IM3 @ 20MHz**



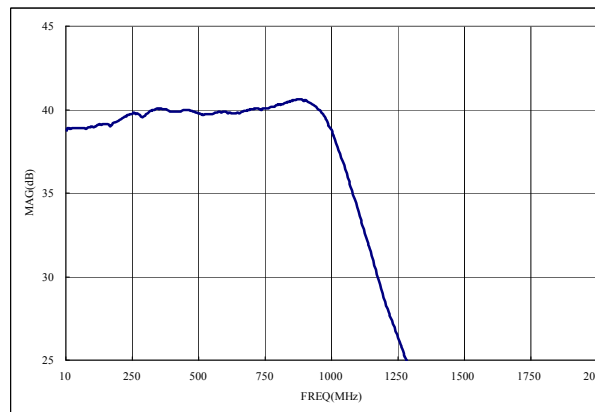
**IM3 @ 500MHz**



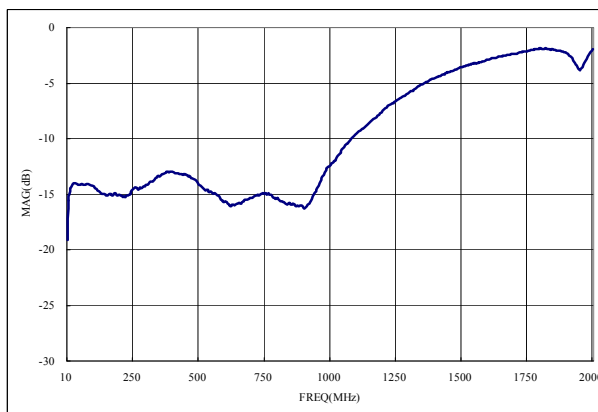
**IM3 @ 1000MHz**



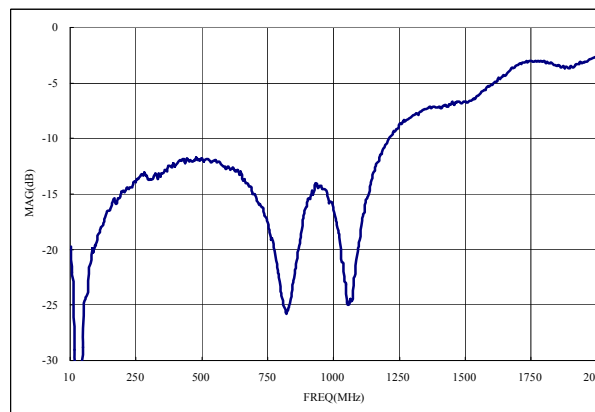
**Gain**



**Input Return Loss**



**Output Return Loss**



## Precautions

1. This product is designed to be used for broadband amplification.

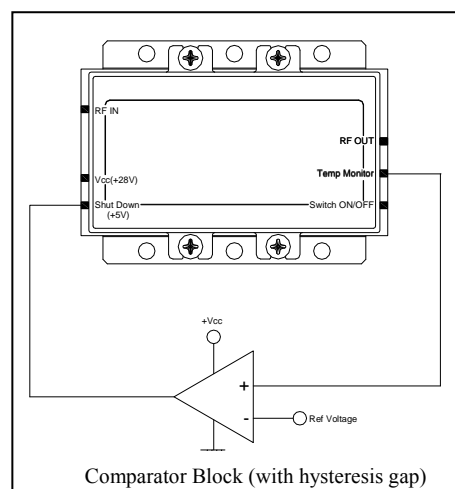
Heat generation is higher when there is no RF signal in the device. Therefore, the worst case scenario is when there is no RF signal, and the amplifier is “on” with current draw.

The temperature must be calculated properly.

Case temperature must maintain below 85°C.

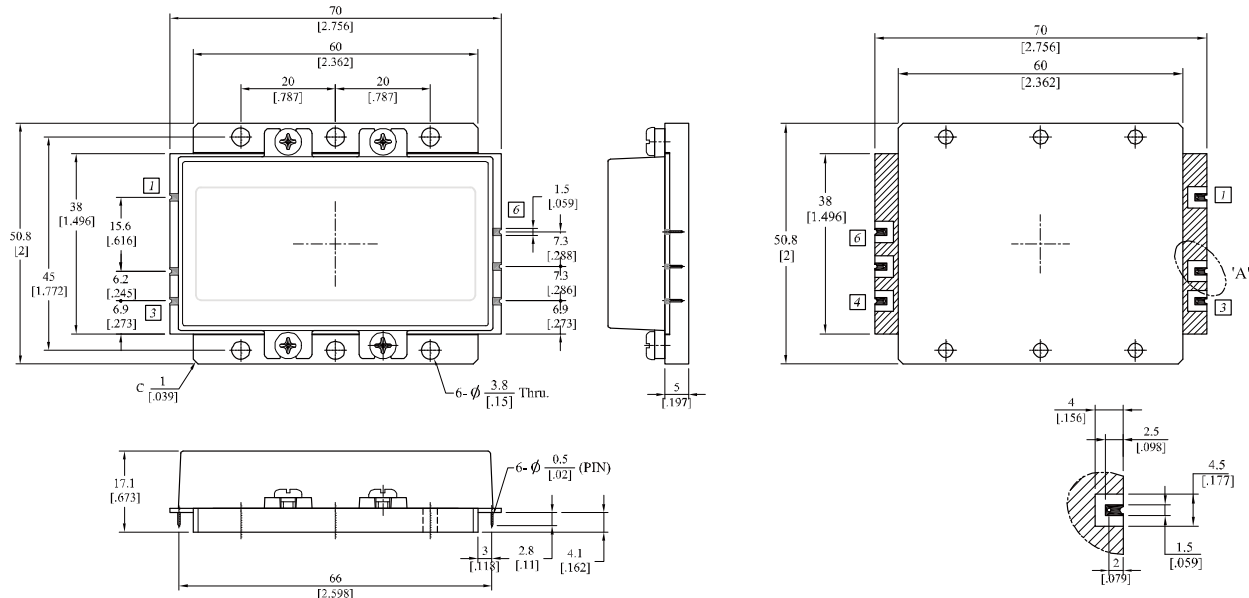
Right side drawing notes how to use a temperature monitoring function to protect against overheating.

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.



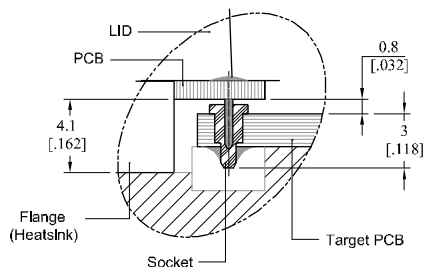
## Package Dimensions (Type: DP-75)

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

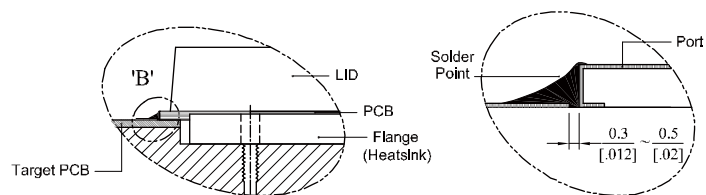


## How to connect the amplifier to a target PCB

### 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	0.85V @ 25°C, Scale : 10mV/°C (Accuracy : ±3°C)
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 :**

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