Narrowband Power Amplifier RNP19040-50

Product Features

- GaN on SiC Narrowband High Power Amplifier
- 1800 ~ 1900MHz Operation Bandwidth
- 50W Typical P3dB
- 50% typical Power Efficiency at P3dB
- P3dB 3W Power
- GaN on SiC Chip on board

Applications

- General Purpose

Package Type : DP-75

Description

The power amplifier module is designed for general purpose.
Operating frequency range is from 1800 ~ 1900 MHz.
Gallium Nitride on SiC technology is used and attached on an aluminum sub carrier.
Full in/out matching is already applied.
Improved thermal handling by patented technology.

Electrical Specifications @ Tcc=28℃; T=25℃; Z_S=Z_L=50Ω

PARAMETER	UNIT	MIN	TYP	MAX	CONDITION
Bandwidth	MHz	1800	-	1900	-
Power Gain	dB	31	33	-	@ Pin=14dBm
Gain Flatness	dBpp	-	±1	±1.5	@ Pin=14dBm
Gain Variation vs Temperature	dB	-	±1	±2	-20°C to 60°C, @ Pin=14dBm
Output Power	dBm	46	46.5	-	@ Pin=14dBm
Power Added Efficiency	%	45	50	-	@ Pin=14dBm
Output Power	dBm	47	47.5	-	@ P3dB
Power Added Efficiency	%	50	55	-	@ P3dB
Input Return Loss	dB	-	-10	-6	@Pin=10dBm
Supply Voltage	V	27.5	28	30	Vcc(=Vds)
Quiescent Current consumption	A	-	0.5	0.6	-
On/Off Switching Time	uS	-	2	5	On : TTL "Low"
					On : TTL "Low"
Shut Down or Switch On/Off TTL Voltage	V	0	-	0.5	On : TTL "Low"
		2.5	5	5.5	On : TTL "Low"

Absolute Maximum Ratings

PARAMETER	UNIT	RATING
Operating Flange Temperature	°C	85
Input RF Power	dBm	18
Supply Voltage	V	30
Load Mismatch Value	-	3 : 1 @all load phase

Environmental Characteristics

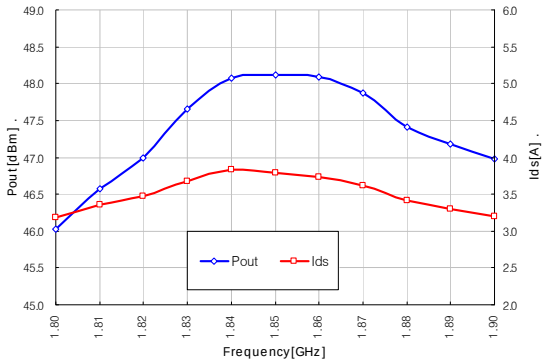
PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Temperature	°C	-20	-	60	Tc
Storage Temperature	°C	-40	-	105	Tstg
Shock & Vibration	MIL-STD-810G Method 514.6 ANNEX C				VI

* Input Signal Condition : CW 1-Tone

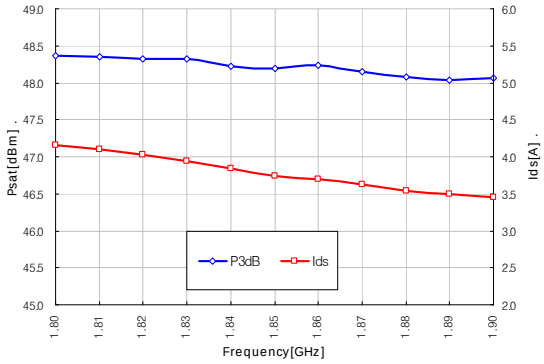
Typical Performance @ 25°C

	Test Condition : Fixed Input Power=14dBm				Test Condition : P3dB		
Frequency	Pout	Ids @Pout	Power Gain @Pout	Drain Efficiency @Pout	P3dB	Ids[A] @ Psat	Drain Efficiency @P3dB
MHz	dBm	A	dB	%	dBm	A	%
1.8	46.03	3.18	31.71	45.04	48.37	4.16	58.93
1.8	46.58	3.35	32.39	48.47	48.36	4.10	59.71
1.82	47.00	3.47	32.89	51.56	48.32	4.02	60.26
1.83	47.66	3.67	33.59	56.71	48.32	3.95	61.40
1.84	48.07	3.83	34.04	59.83	48.22	3.84	61.71
1.85	48.13	3.79	34.15	61.23	48.19	3.75	62.88
1.86	48.09	3.74	34.16	61.57	48.24	3.70	64.30
1.87	47.87	3.62	33.96	60.43	48.15	3.63	64.31
1.88	47.41	3.41	33.49	57.60	48.08	3.54	64.73
1.89	47.18	3.30	33.30	56.55	48.04	3.50	64.99
1.9	46.98	3.20	33.21	55.72	48.07	3.46	66.21

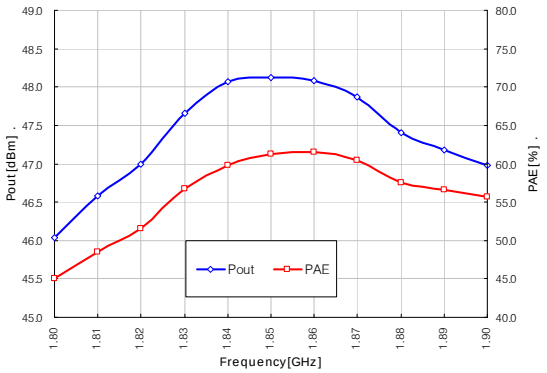
Output Power @ Pin=14dBm & Ids vs. Frequency



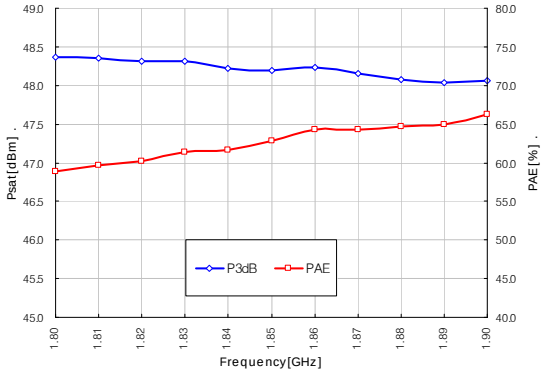
P3dB & Ids vs. Frequency



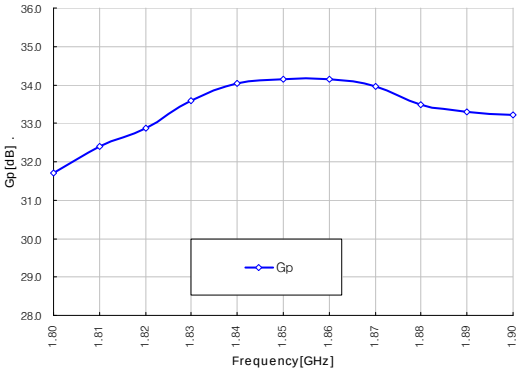
Output Power @ Pin=14dBm & PAE vs. Frequency



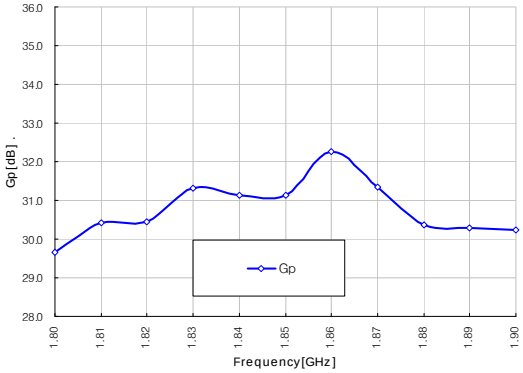
P3dB & PAE vs. Frequency



Power Gain @ Pin=14dBm vs. Frequency



Power Gain @ P3dB vs. Frequency

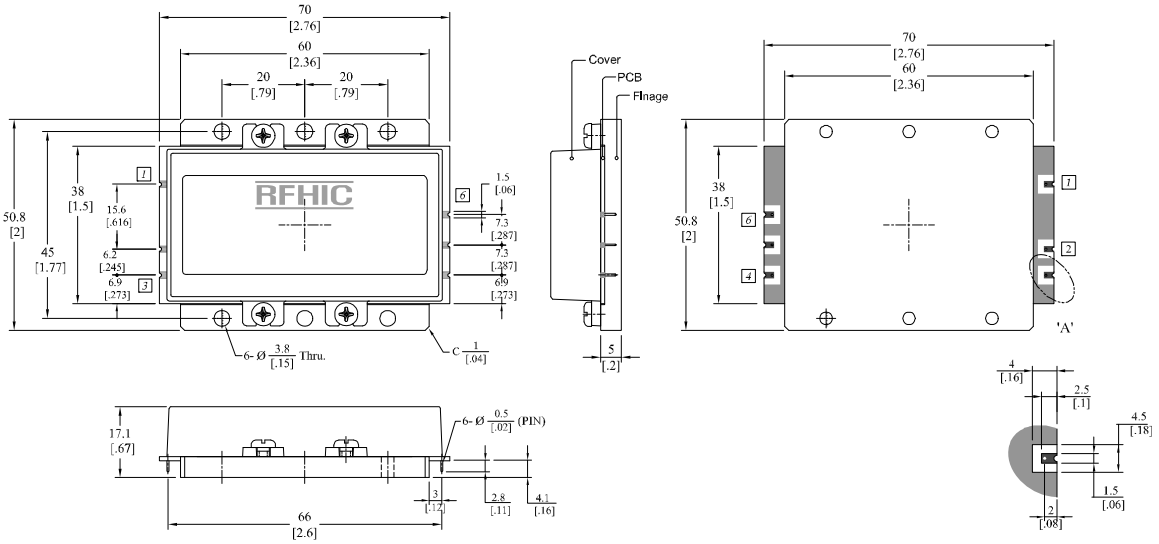


Precautions

1. This product is designed to be used for Narrowband 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.
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)

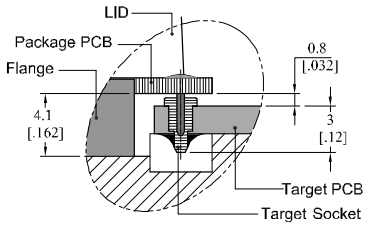
* Unit: mm[inch] | Tolerance ±0.2[.008]



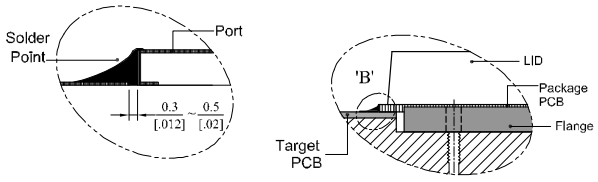
Pin Description			
Pin No	**Function**	**Pin No**	**Function**
1	RF IN	4	Switch ON/OFF
2	Vcc(+28V)	5	GND
3	Shut Down(+5V)	6	RF OUT

How to connected the package to a target PCB

With Pin



Without Pin



*** Mounting Configuration Notes**

1. Ground / thermal via holes are critical for the proper performance of this device.
2. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
3. Mounting screws can be added near the part to fasten the board to a heatsink. Ensure that the ground / thermal via hole region contacts the heatsink.
4. Do not put solder mask on the backside of the PCB in the region where the board contacts the heatsink.
5. RF trace width depends upon the PCB material and construction.
6. Use 1 oz. Copper minimum.

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RNP19040-50	2012.9.28	1.0	-	-