Wideband Power Amplifier RWP1027200-53

Product Features

- GaN on SiC Broadband High Power Amplifier
- 1000 ~ 2500MHz Operation Bandwidth
- Power Gain Typical 50dB @ Pin 3dBm
- 200W Typical @ Pin 3dBm

Applications

- Aerospace & Defense
- Military
- Electronic Warfare
- Rader
- SATCOM
- Communication
- EMI/RFI
- Jamming

Description

The power amplifier module is designed for broadcasting, telecommunications, and medical purposes.
The operating frequency range is from 1,000 ~ 2,500MHz.
Gallium Nitride on Silicon carbide (GaN-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_{CC} = 36V; Tc = 45°C; $Z_S = Z_L$ = 50Ω

PARAMETER	UNIT	MIN	TYP	MAX	CONDITION
Operating Frequency	MHz	1000	-	2500	-
Power Gain @ Pin 3dBm	dB	48.0	50		
Power Gain Flatness @ Pin 3dBm	dBpp	-	±1.0	±1.5	
Saturation Output Power	dBm	51.0	53.0	-	
Input Return Loss	dB	-	-9	-5	-
Supply Voltage	V	35.5	36	36.5	Vcc(=Vds)
Quiescent Current consumption	A	-	1.8	2.2	-
Current Consumption @ POUT 150Watt	A	-	14	20	CW 1-tone

Absolute Maximum Ratings

PARAMETER	UNIT	RATING
Input RF Power	dBm	5
Supply Voltage	V	37.5
Load Mismatch Value	-	3 : 1 @all load phase

* Input Signal Condition : CW 1-Tone

Environmental Characteristics

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Flange Temperature	°C	-10	-	60	Tc
Storage Temperature	°C	-30	-	85	Tstg
Vibration	MIL-STD-810G Method 514.6 ANNEX C				VI

Mechanical Specifications

PARAMETER	UNIT	TYP
Dimension	㎜	223(L) x 131(W) x 30(H)
RF Connector	-	RF Input : SMA Female
		RF Forward(Coupling) : SMA Female FWD OUT : Typical 12dBm (RF OUT @ 49dBm)
		RF Output : N-Type Female
Weight	kg	1.3
DC Connector	-	C7W2 / D-SUB / Male type
Cooling	-	External Heat-sink

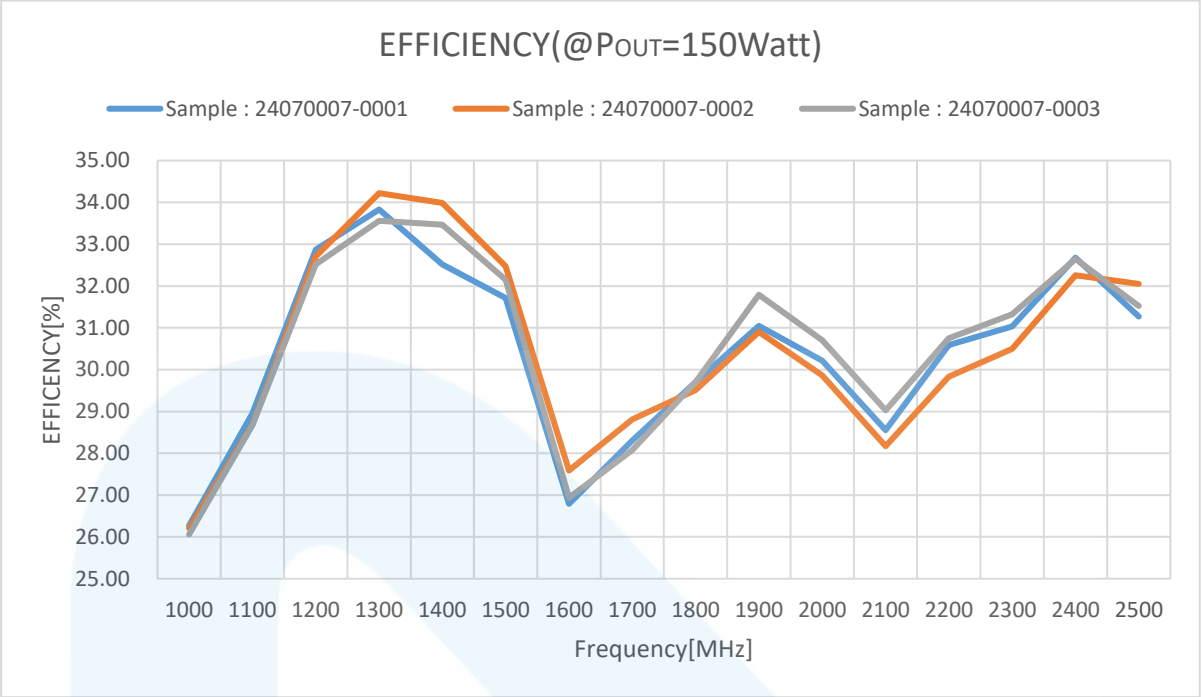
Typical Performance #3 QTY Samples @ Tc 45°C

	Sample : 24070007-0001							Harmonic @ POUT 49dBm	
FREQUENCY	PSAT		POUT	Currnet	EFFICENCY	Power Detector@Pout = 49dBm		2nd	3rd
MHz	dBm	WATT	WATT	A	%	D-SUB [Pin#5][V]	RF Monitor [dBm]	dBc	
1000	54.06	254.7	150.0	16.13	26.27	0.81	11.77	-16	-29
1100	54.07	255.3		14.57	28.95	0.80	12.04	-22	-29
1200	53.99	250.6		12.86	32.87	0.80	12.10	-26	-51
1300	53.71	235.0		12.55	33.83	0.79	12.40	-23	-39
1400	53.30	213.8		13.01	32.52	0.78	12.38	-28	-40
1500	53.16	207.0		13.34	31.71	0.80	11.89	-23	-38
1600	53.04	201.4		15.73	26.79	0.80	12.00	-30	-40
1700	53.96	248.9		14.92	28.31	0.83	11.50	-30	-46
1800	54.10	257.0		14.20	29.70	0.83	11.60	-37	-63
1900	53.70	234.4		13.58	31.05	0.85	11.50	-45	≤-60
2000	53.25	211.3		13.98	30.21	0.83	11.78	-54	≤-60
2100	52.74	187.9		14.84	28.55	0.82	12.57	-37	≤-60
2200	53.28	212.8		13.87	30.59	0.85	12.94	-36	≤-60
2300	53.26	211.8		13.69	31.03	0.88	14.22	-43	≤-60
2400	53.26	211.8		13.14	32.68	0.83	15.02	-39	≤-60
2500	52.64	183.7		13.54	31.27	0.79	12.25	-58	≤-60

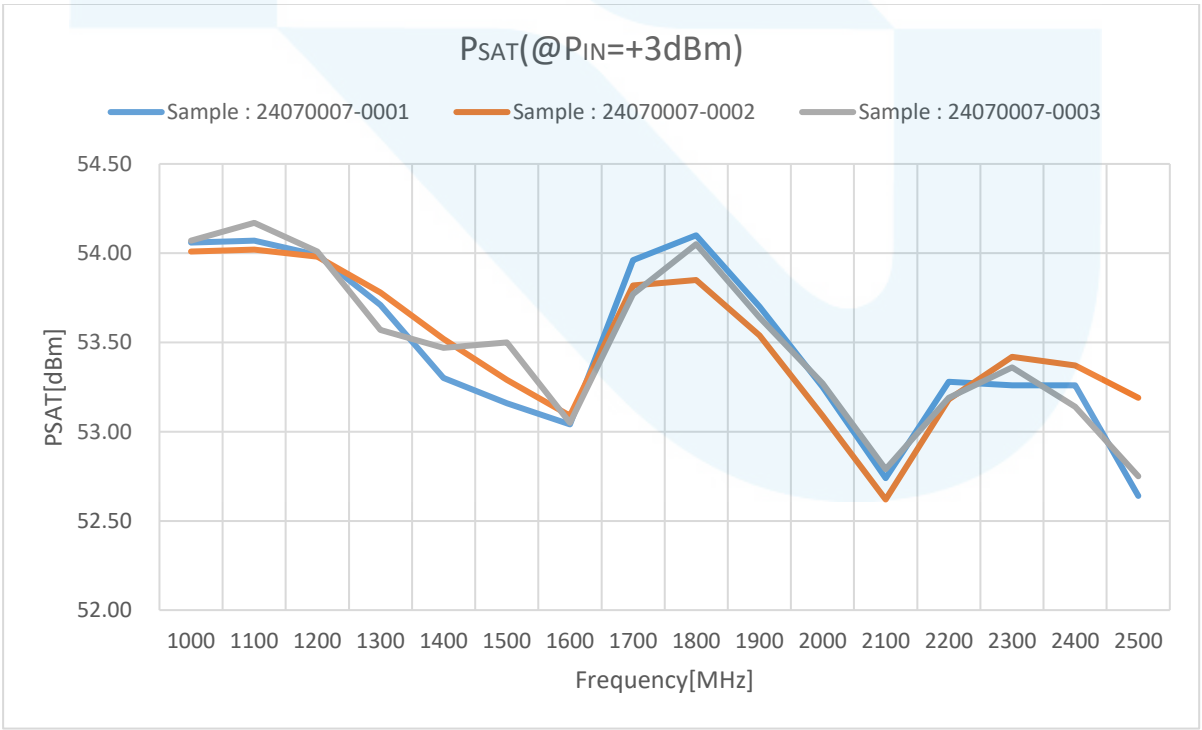
	Sample : 24070007-0002							Harmonic @ POUT 49dBm	
FREQUENCY	PSAT		POUT	Currnet	EFFICENCY	Power Detector@Pout = 49dBm		2nd	3rd
MHz	dBm	WATT	WATT	A	%	D-SUB [Pin#5][V]	RF Monitor [dBm]	dBc	
1000	54.01	251.8	150.0	16.20	26.21	0.83	11.86	-16	-28
1100	54.02	252.3		14.80	28.69	0.83	12.10	-23	-32
1200	53.98	250.0		12.91	32.71	0.83	12.14	-25	-49
1300	53.78	238.8		12.40	34.22	0.82	12.46	-23	-38
1400	53.52	224.9		12.48	33.99	0.82	12.36	-27	-44
1500	53.29	213.3		13.04	32.47	0.84	11.86	-23	-36
1600	53.09	203.7		15.36	27.59	0.84	11.94	-32	-41
1700	53.82	241.0		14.71	28.81	0.86	11.34	-33	-47
1800	53.85	242.7		14.36	29.51	0.86	11.32	-38	-63
1900	53.54	225.9		13.71	30.90	0.87	11.11	-44	≤-60
2000	53.09	203.7		14.17	29.86	0.85	11.25	-58	≤-60
2100	52.62	182.8		14.96	28.17	0.85	11.83	-40	≤-60
2200	53.18	208.0		14.16	29.83	0.89	11.87	-38	≤-60
2300	53.42	219.8		13.88	30.50	0.89	12.77	-41	≤-60
2400	53.37	217.3		13.08	32.26	0.91	14.02	-40	≤-60
2500	53.19	208.4		13.33	32.05	0.93	15.11	-56	≤-60

	Sample : 24070007-0003							Harmonic @ POUT 49dBm	
FREQUENCY	PSAT		POUT	Currnet	EFFICENCY	Power Detector@Pout = 49dBm		2^{nd}	3^{rd}
MHz	dBm	WATT	WATT	A	%	D-SUB [Pin#5][V]	RF Monitor [dBm]	dBc	
1000	54.07	255.3	150.0	16.24	26.06	0.86	11.70	-17	-29
1100	54.17	261.2		14.73	28.67	0.86	11.95	-25	-31
1200	54.01	251.8		12.98	32.52	0.85	11.99	-25	-47
1300	53.57	227.5		12.62	33.56	0.85	12.29	-24	-37
1400	53.47	222.3		12.63	33.47	0.85	12.26	-27	-44
1500	53.50	223.9		13.21	32.15	0.86	11.80	-23	-36
1600	53.05	201.8		15.74	26.94	0.86	11.91	-33	-40
1700	53.77	238.2		15.10	28.08	0.88	11.36	-33	-46
1800	54.05	254.1		14.19	29.70	0.88	11.44	-36	-59
1900	53.64	231.2		13.33	31.79	0.89	11.31	-40	≤-60
2000	53.27	212.3		13.75	30.70	0.89	11.56	-55	≤-60
2100	52.79	190.1		14.59	29.03	0.88	12.27	-41	≤-60
2200	53.19	208.4		13.78	30.75	0.93	12.49	-36	≤-60
2300	53.36	216.8		13.56	31.32	0.94	13.58	-40	≤-60
2400	53.14	206.1		12.94	32.65	0.91	14.72	-42	≤-60
2500	52.75	188.4		13.44	31.52	0.88	13.57	-59	≤-60

<Table 1. Typical Performance>



<Chart 1. Efficiency #1~3>



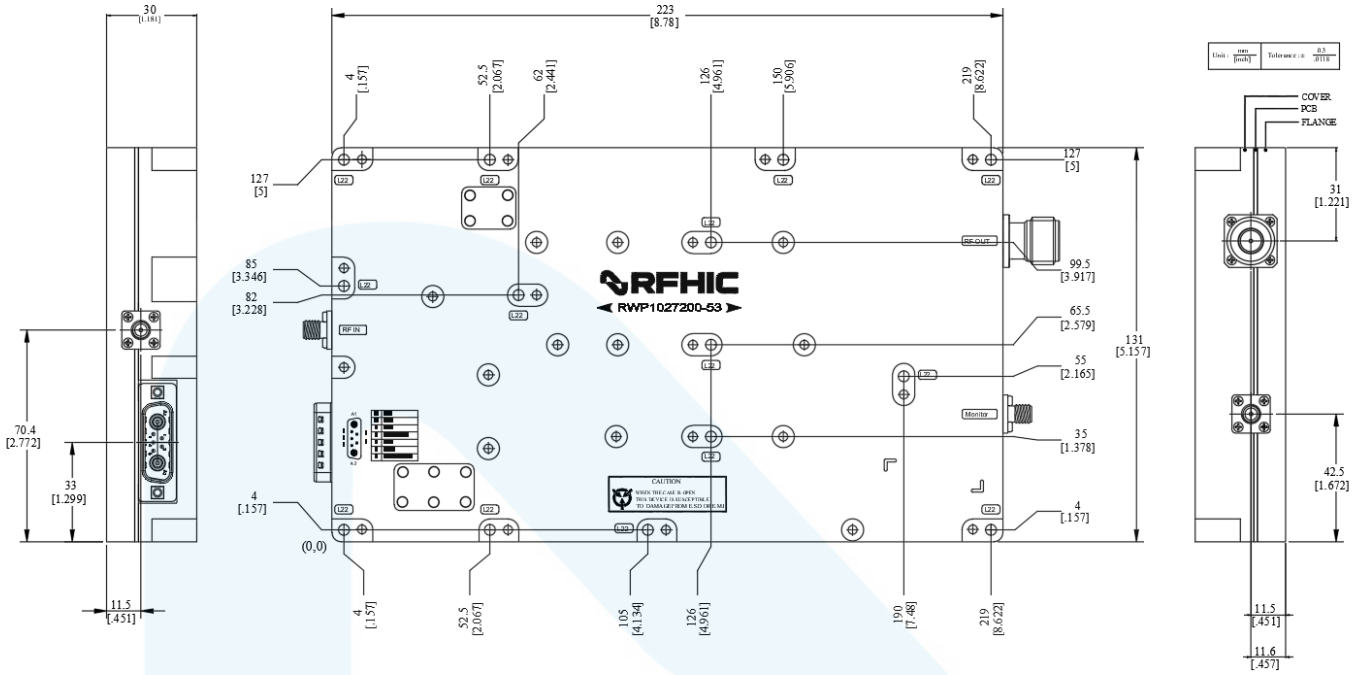
<Chart 2. Saturation Output Power #1~3>

Precautions

1. This product is designed to be used for broadband amplification. Heat generation is higher when there is RF signal in the device. Therefore, the worst case scenario is when there is RF signal.
   The temperature must be calculated properly.
   Case temperature must maintain below 60°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

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



Pin Description (7W2 / D-SUB / Male type)			
Pin No	**Description**	**I/O**	**Specigications**
A1	Vcc	I	+36VDC
A2	GND	I	Ground
1	GND	I	Ground
2	Shut Down	I	Enable : TTL “Low”, Disable : TTL “High” (Low : 0 ~ 0.5V, High : 2.5 ~ 5V) Disable Status : 200mA Current consumption
3	GND	I	Ground
4	Temperature Monitor	O	Reference voltage : 750mV @ 25℃, Scale : 10mV/℃
5	Power Detector	O	Pout 49dBm Voltage : 700 ~ 1000mV, Scale : 25mV/dB

* Recommended Screw Torque : 8.0kgf.cm±1 using SEMS M3 19mm Bolt

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RWP1027200-53	2023.12.15	0.1	-	Preliminary
RWP1027200-53	2024.01.16	1.0	-	
RWP1027200-53	2024.02.01	1.1	-	
RWP1027200-53	2024.08.07	1.2	Sample Measurement Reference Data #1~3	
RWP1027200-53	2025.04.29	1.3	Added Weight specification	
RWP1027200-53	2026.06.02	1.4	Storage Temperature specification changed	

Certification

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