Wideband Power Amplifier RWS02520-1K

RFHIC

Product Features

- GaN on SiC Broadband High Power Amplifier
- 100 ~ 600MHz Operation Bandwidth
- Small Signal Gain 44dB min.
- 20W Typical. P1dB

Applications

- Semiconductor equipment
- Communications
- VHF/UHF

Description

The power amplifier module is designed for Broadcasting, Telecommunication, Medical and Other markets.
Operating frequency range is from 100 ~ 600MHz.
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_{CC} = 28V; V_{DC} = 7V; T = 25°C ;$Z_S = Z_L$ = 50Ω

PARAMETER	UNIT	MIN	TYP	MAX	CONDITION
Operating Frequency	MHz	100	-	600	-
Small Signal Gain	dB	44	46	48	-
Gain Variation vs Temperature	dB	-2	-	2	-20 ~ 60°C
Gain Variation vs Frequency	dBpp	-	±1	±1.5	-
P_1dB	dBm	41	43	-	100 ~ 600MHz
Input Return Loss	dB	-	-14	-10	-
2nd Harmonic suppression (2W)	dBc	-	-50	-45	CW 1-tone @Po = +33dBm
3rd Harmonic suppression (2W)	dBc	-	-50	-40	
2nd Harmonic suppression (5W)	dBc	-	-50	-40	CW 1-tone @Po = +37dBm
3rd Harmonic suppression (5W)	dBc	-	-40	-30	
Group delay	nS	-	0.7	1	Across frequency band
	nS	-	0.07	0.2	Unit to unit
Supply Voltage	V	27.5	28	30	Vcc(=Vds)
		6	7	7.5	V_{DC}
Quiescent Current consumption	A	-	2.4	2.5	-
Current Consumption @ Pout 33dBm	A	-	2.3	2.5	CW 1-tone
On/Off Switching Time*	uS	-	3	5	On : TTL "Low"
					Off : TTL "High"(30mA@Disable)
On/Off Switching TTL Voltage	V	0	-	0.5	On : TTL “Low”(Enable)
		2.5	5	5.5	Off : TTL “High”
Shut Down LVTTL Voltage**	V	2.5	3	3.6	On : LVTTL “High”(Enable)
		0	-	0.5	Off : LVTTL “Low”

Note.
*. Gate On/Off : High speed switching
**. Drain On/Off : 300ms delay

Absolute Maximum Ratings

PARAMETER	UNIT	RATING
Operating Flange Temperature	°C	85
Input RF Power	dBm	10
Supply Voltage	V	30
Load Mismatch Value	-	3 : 1 @all load phase

* Input Signal Condition : CW 1-Tone

Environmental Characteristics

PARAMETER	UNIT	MIN	TYP	MAX
Operating Temperature	°C	-20	-	60
Storage Temperature	°C	-40	-	105
Vibration	MIL-STD-810G Method 514.6 ANNEX C			

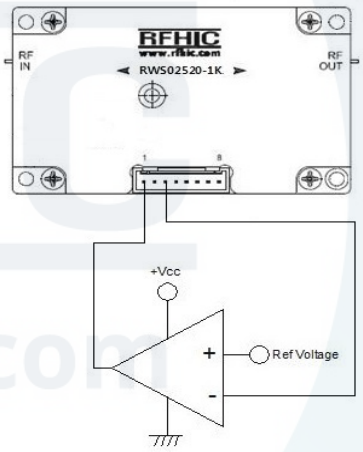
Typical Performance @ 25°C

Frequency	P1dB	Current @ P1dB	Harmonics @ Pout = 33dBm		Harmonics @ Pout = 37dBm		Ids @ Pout = 33dBm	Ids @ Pout = 37dBm
			2nd	3rd	2nd	3rd		
(MHz)	(dBm)	(A)	(dBc)	(dBc)	(dBc)	(dBc)	(A)	(A)
100	44.18	2.32	-56.83	-50.63	-54.33	-42.10	2.31	2.23
200	43.91	2.48	-48.25	-49.80	-47.64	-41.37	2.32	2.25
300	43.63	2.66	-56.05	-52.85	-54.62	-43.97	2.34	2.29
400	44.06	2.82	-62.40	-51.37	-58.93	-42.19	2.36	2.33
500	43.72	2.80	-59.05	-54.31	-55.86	-45.26	2.36	2.34
600	44.52	2.81	-55.39	-58.92	-51.41	-49.93	2.35	2.31

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.

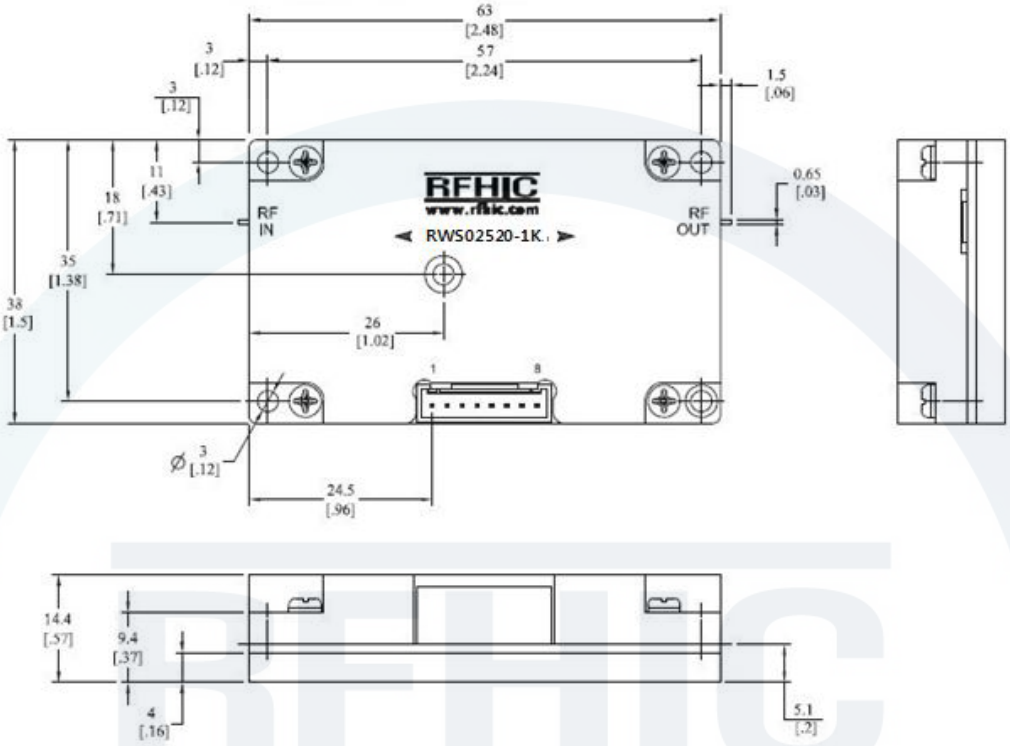
2. Thermal Grease or Metal Thermal Interface Materials are recommended for heat dissipation. An example would be spreading thermal grease on the bottom of the device



Comparator Block (with hysteresis gap)

Package Dimensions

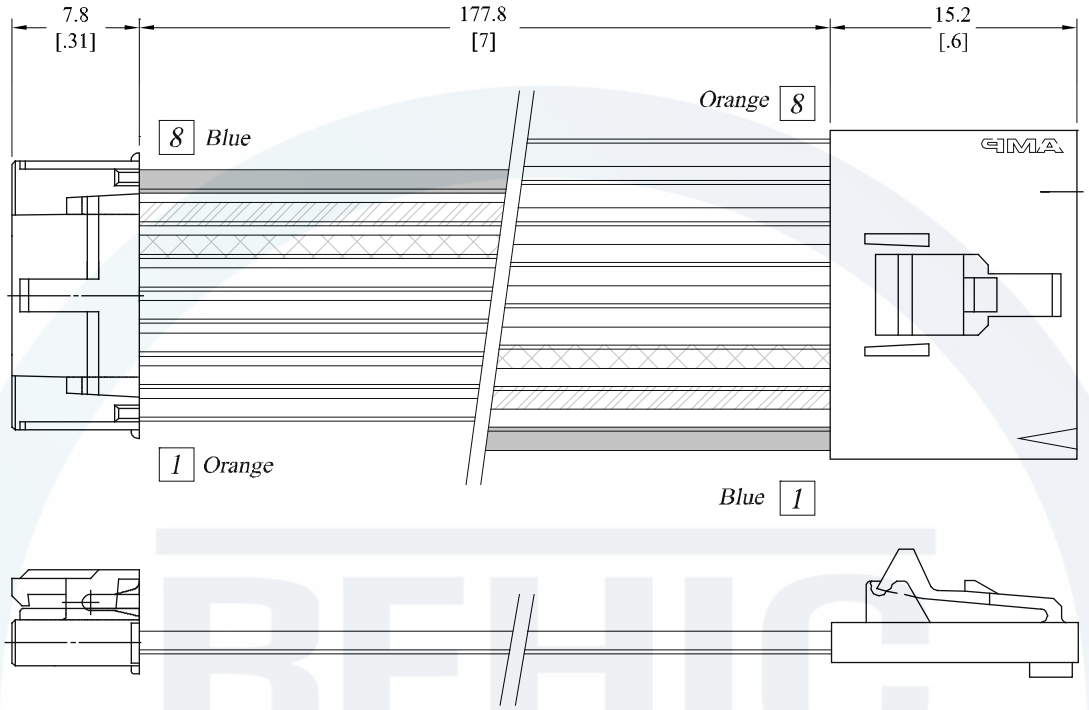
* Unit: mm[inch] | Tolerance: ±0.2[.008]



Pin Description			
Pin No	**Function**	**Pin No**	**Function**
1	Shut Down(+3V)	5	GND
2	Switch ON/OFF	6	+28V(Vcc)
3	Temp Monitor	7	+28V(Vcc)
4	GND	8	+7V(V_{DC})

Cable Assembly

Cable length : 7 inch | 22AWG



Pin Description					
SMH200-08 (Yeonho electronics)			104257-7 (TE connectivity)		
Pin No	Function		Pin No	Function	
1	+7V(V_{DC})	Orange	1	Shut Down(+3V)	Blue
2	+28V(Vcc)	Red	2	Switch ON/OFF	Brown
3	+28V(Vcc)	Red	3	Temp Monitor	Yellow
4	GND	Black	4	GND	Black
5	GND	Black	5	GND	Black
6	Temp Monitor	Yellow	6	+28V(Vcc)	Red
7	Switch ON/OFF	Brown	7	+28V(Vcc)	Red
8	Shut Down(+3V)	Blue	8	+7V(V_{DC})	Orange

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RWS02520-1K	2023.2.02	1.2	Electrical Specifications Modification & Cable Assembly Addition	-
RWS02520-1K	2014.1.20	1.1	Electrical Specifications Modification	-
RWS02520-1K	2013.7.26	1.0		-