Wideband Power Amplifier RWM03125-10

Product Features

- GaN on SiC Broadband High Power Amplifier
- 20 ~ 520MHz Operation Bandwidth
- 125W typical P3dB
- 50% typical Power Efficiency at P3dB
- Fast En/Disable Switching

Applications

- General Purpose
- Communication system



Description

The power amplifier module is designed for general purpose.
Operating frequency range is from 20 ~ 520MHz.
Gallium Nitride on SiC Technology is used and attached on a copper sub carrier.
Improved thermal handling by patented technology.
The amplifier includes thermal overload & input power overdrive protection, external voltage variable attenuator port and current monitor.

Electrical Specifications @ VDD=28VDC, T=25°C, 50Ω System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency Range	MHz	20	-	520	BW
Output Power @P3dB, CW-Signal	Watt	-	125	-	P_{3dB}
Power Gain (VVA = 0V or GND)	dB	50	55	-	Gp
Power Gain Flatness	dB	-	±1.0	±2.0	ΔGp
Gain Adjustable Range	dB	25	-	-	VVA
Gain Variation	dB	-	-	±1.5	ΔG_{TEMP}
Input Return Loss	dB	-	-10	-7	S11
Power Efficiency @ P3 dB	%	-	50	-	%
Switching Time (Enable =TTL Low)	usec	-	4	5	T_{sw}
Spurious Signals	dBc	-	-70	-60	Spur
Operating Voltage	Volt	27.5	28	30	VDC
Quiescent Current consumption	Amp	-	1.7	2	IDQ
Current Consumption @ P3 dB, VDC=28V	Amp	-	9.0	13.0	IDD

Absolute Maximum Ratings

PARAMETER	UNIT	MAX	SYMBOL
Input Power	dBm	8	P_{in}
Load VSWR	-	2.5 : 1	-

Note
When input power is over maximum rating, internal limiter will be operated for protection.

Alarm Functions

DESCRIPTION	SPECIFICATIONS	HPA STATUS
Over Current Protection	Shutdown : 13A±1A Recovery time : after 60sec or DC power off and on	Amplifier shutdown (current consumption : 380mA @ amplifier shutdown)
Over Heat Protection	Shutdown : over 85℃ Recovery : under 60℃	
Over Input Power Protection	RF input level : 8dBm ±2dB	No shutdown, just gain is only reduced. (amplifier gain : -35~ -40dB)

Environmental Characteristics

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Case Temperature	℃	-30	-	85	Tc
Storage Temperature	℃	-45	-	105	Tstg
Relative humidity w/o condensation	%	-	-	95	RH
Altitude	Feet	10,000	30,000	-	ALT
Shock & Vibration	-	Per Mil Std 810E			SH / VI

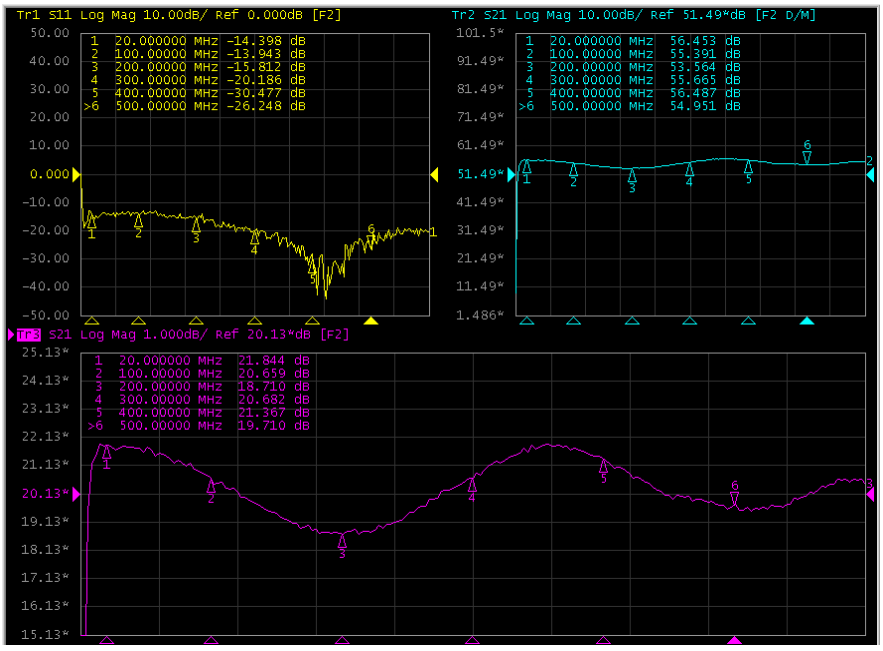
Note
When case temperature limits over +85C, module will be shutdown.

Mechanical Specifications

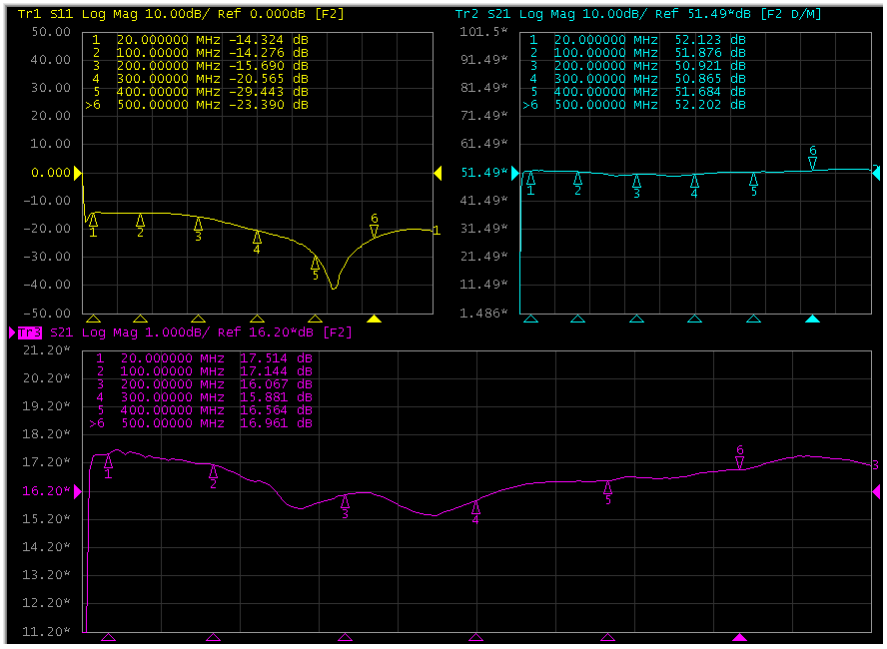
PARAMETER	UNIT	VALUE	LIMIT
Dimensions	Inch mm	6.4 x 3.4 x 1.1 162.6 x 86.4 x 27.0	-
Weight	lb. Kg	1.3 0.63	-
RF Connectors In/Out	-	SMA female	-
DC & Control Signals Connector	-	9-Pin / D-Sub / Male type	-
Cooling	-	External Heat-sink	-

Performance Graph

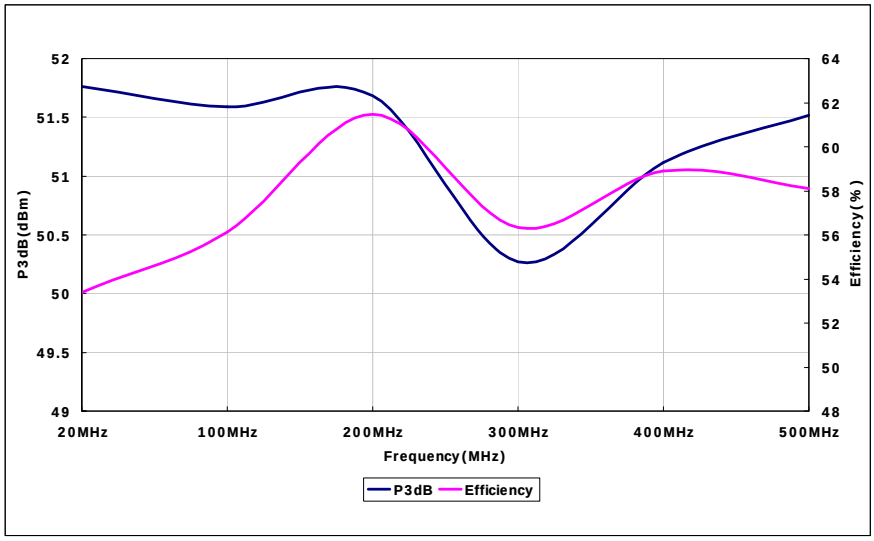
1) Input Power = -40dBm, Ta : 25℃ , TC : 50℃, Output offset applied to Trace2



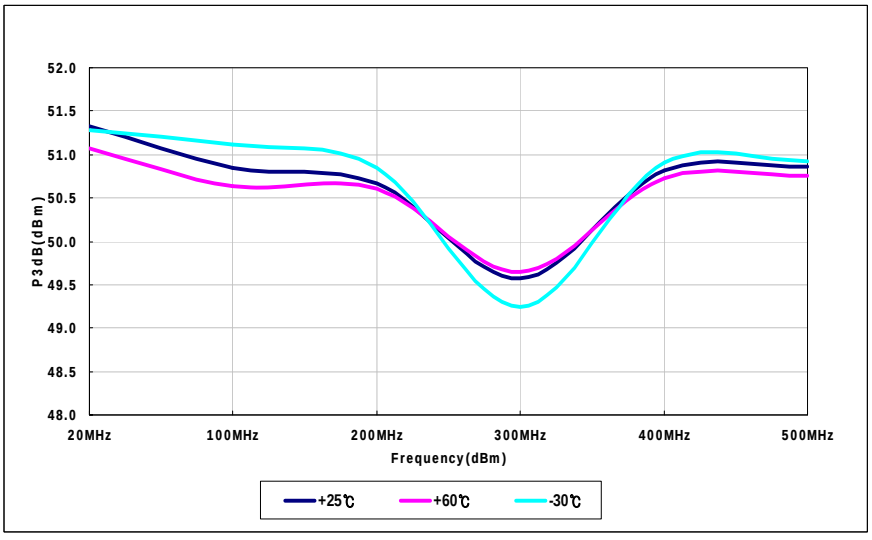
2) Input Power = -1dBm, Ta : 25℃ , TC : 50℃, Output offset applied to Trace2



3) P3dB & Efficiency vs Frequency

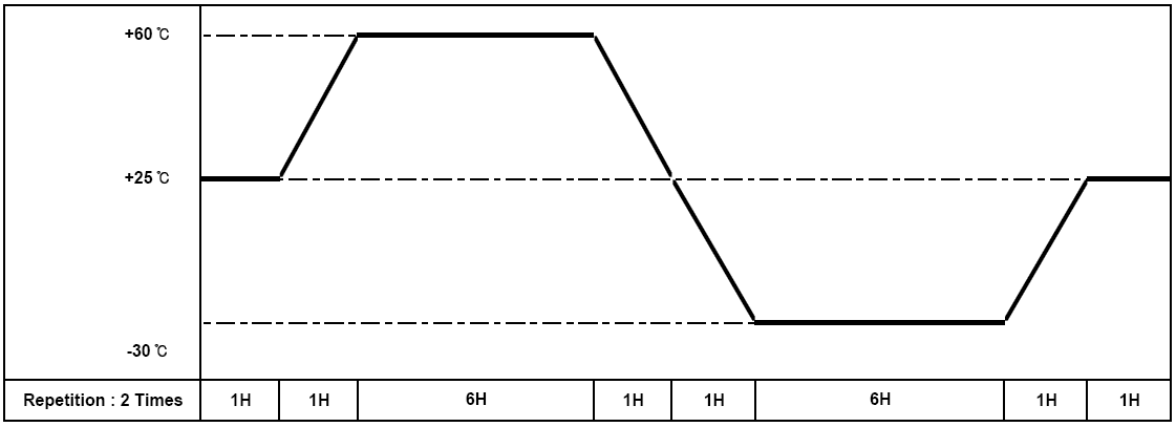


4) Efficiency vs Frequency



Environment Performance Data

1) Cycle Table & Data

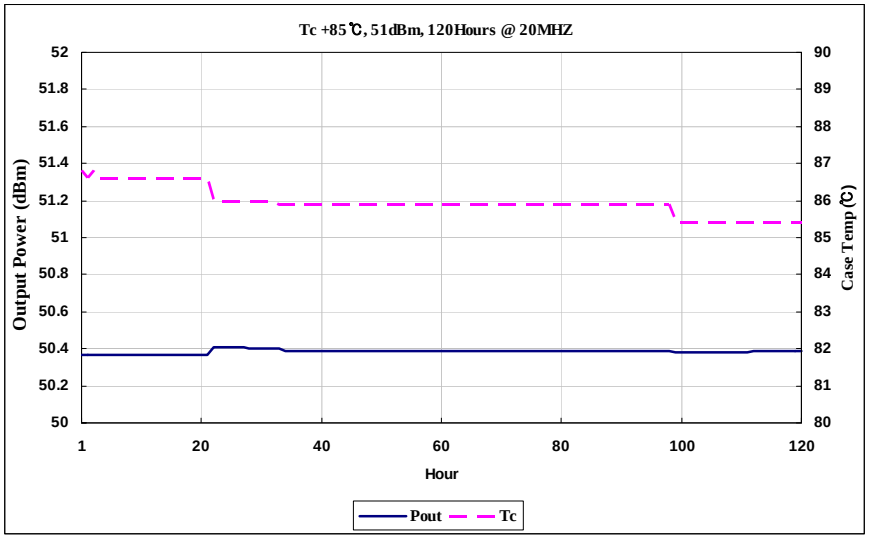


Test Condition	Ta : 25℃, Tc : 50℃		Ta : 60℃, Tc : 85℃	
	P3dB	Ids	P3dB	Ids
MHz	dBm	A	dBm	A
20	51.4	9.96	51.0	9.63
100	50.0	8.26	50.0	8.20
200	50.7	8.47	50.7	8.44
300	49.6	6.86	49.7	6.93
400	50.7	7.81	50.6	7.80
500	51.7	9.58	51.5	9.42
Test Condition	**Ta : -30℃, Tc : -5℃**		**Cold Start @ Tc : -30℃**	
	P3dB	**Ids**	**P3dB**	**Ids**
MHz	dBm	A	dBm	A
20	51.6	9.98	51.7	10.12
100	50.5	8.62	50.5	8.68
200	50.8	8.39	51.1	8.73
300	49.0	6.06	48.6	5.78
400	50.6	7.43	50.4	7.26
500	51.0	8.79	51.3	9.03

2) High Power, High Temperature Test Graph

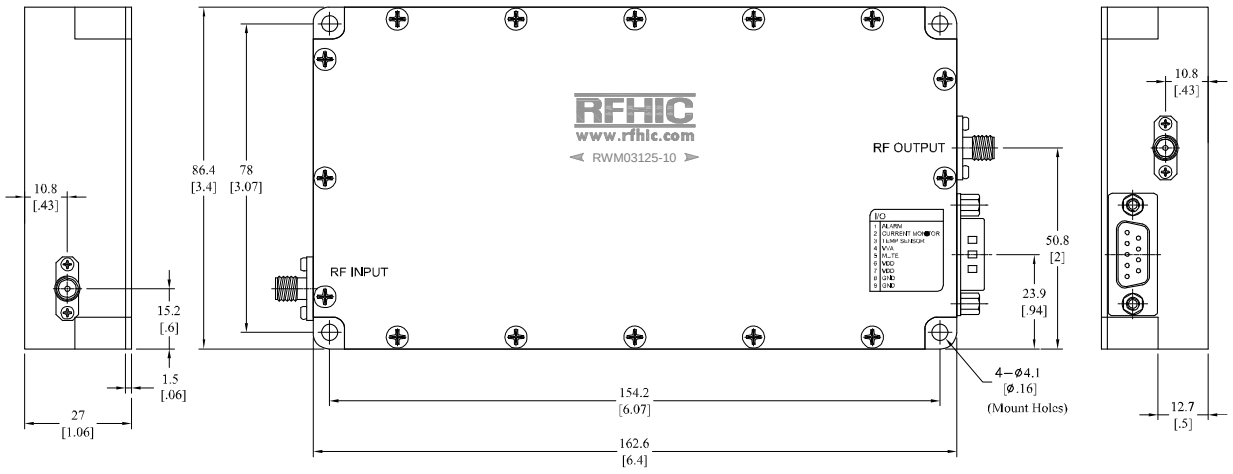
Test Condition

a) Ambient temperature : 60℃
b) Case temperature : 85℃
c) Test frequency : 20MHz
d) Output power lever : 51dBm
e) Continuous time : 120 Hours



Outline Drawing

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



DC & Interface Connector Pin Description

Pin No	Description	I/O	Specification
1	Alarm Monitor	O	Normal : TTL ”Low” (0V) Alarm : TTL ”High” (5V) (Over current or Over temperature alarm status)
2	Current Monitor	O	Reference voltage : 13.5V@1.7A, Scale : 500mV/1000mA
3	Temperature Monitor	O	Reference voltage : 750mV@25℃, Scale : 10mV/℃
4	VVA	I	Maximum Gain = 0 VDC or “Open” Minimum Gain = 5 VDC
5	Mute (On/Off Switching)	I	Enable : TTL “Low”(0~0.5V) or “Open” Disable : TTL “High”(2.5~5.0V)
6,7	VDD	I	28 VDC
8,9	GND	I	Ground

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RWM03125-10	2012.9.28	1.0	-	-

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