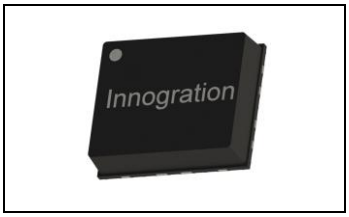
1.5-6.2GHz, 20W, 28V GaN Fully matched PA Module



Description

The GMAH1562-20C9 is a 20-watt ,single stage integrated Power Amplifier Module, designed for brc band applications, with frequencies from 1.5 to 6.2GHz. The module is 50 Ω input/output matched a requires minimal external components. It can work at higher voltage like 32V with increased pov capability

The module implements wideband power amplifier in form of multi chips, housed in cost effective plastic open cavity package, offers a much lower cost than traditional MMIC solutions.

It is strongly recommended to solder this device directly onto the heatsink for CW operation, rather than grounding vias

Pout at 28V and fixed input power, CW

Freq (MHz)	Pin (dBm)	Pout (dBm)	Pout (W)	IDS (A)	Gain (dB)	Eff (%)
1500	37	43.68	23.3	2.05	6.67	40.6
2000	37	43.50	22.4	2.59	6.50	31.0
2500	37	44.18	26.2	2.23	7.18	42.0
3000	37	44.80	30.2	2.56	7.80	42.2
3500	37	44.99	31.6	3.02	7.99	37.3
4000	37	44.57	28.6	3.02	7.57	33.9
4500	37	44.38	27.4	2.60	7.38	37.7
5000	37	44.57	28.6	2.45	7.57	41.8
5500	37	44.69	29.4	2.36	7.69	44.6
6200	37	44.49	28.1	2.58	7.49	38.9

Psat across the full band at different input power referred to later pages, 32V data upon request

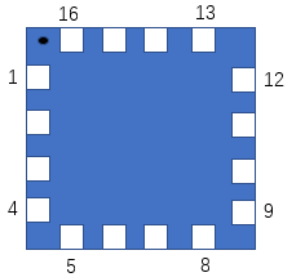
Product Features

- Operating Frequency Range: 1.5-6.2GHz
- Operating Drain Voltage: +28 V
- 50 Ω Input/Output
- Psat≥43 dBm
- Minimum efficiency:>30%
- 12x10 mm Surface Mount Package
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Applications

- Ultra Broadband Amplifiers
- Fiber Drivers
- Test Instrumentation
- EMC Amplifier Drivers
- 2-way Radios

Pin Configuration and Description （Top view）



Pin No.	Symbol	Description
1	RF IN	RF Input
4	Input ISO Port	Connect Input iso resistor(50Ohm) to GND directly
9	RF OUT	RF Output
12	Output ISO Port	Series connection of isolation resistance (50 Ohm) and DC blocking capacitor(1000pF) to GND
6,15	Vgs	Gate bias
7,14	Vdd	Drain bias
Others	NC	No connection
Package Base	GND	DC/RF Ground. **Proposed to be soldered to heatsink plane directly for the best CW thermal and RF performance.**

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	+32	Vdc
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 25°C, DC test, soldered on heatsink directly	RθJC	2.7	°C/W

Table 3. Electrical Characteristics when production test

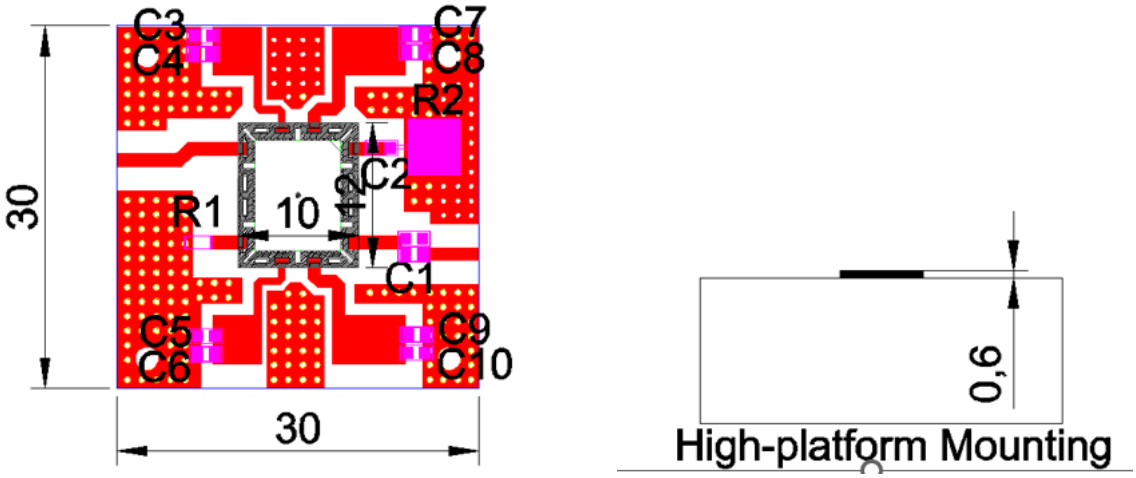
Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		1500		6200	MHz
Power Gain @ Psat		9			dB
P_{SAT}	Pulse		43		dBm
Drain Efficiency @ P_{SAT}		30			%
Unless otherwise noted: TA = 25°C, V_{DD} =28 V, Pulse Width=50 us, Duty cycle=20%					

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD} =28 V, I_{DQ} =25 mA, f = 3.5 GHz

VSWR 10:1 at Psat pulse CW Output Power	No Device Degradation

Reference Circuit of Test Fixture Assembly Diagram

Figure 1. Test Circuit Component Layout



Component	Description	Suggestion
C1 C4 C5 C8 C9	8.2 pF	MQ400805 BEIJING YUANLU HONGYUAN ELECTRONICTECHNOLOGYCO., LTD
C2 C3 C6 C7 C10	1uF	0805
R1	100 Ohm x 2 Parallel	1206
R2	50 Ohm	RFR 50-60
PCB	20Mil Rogers 4350	

TYPICAL CHARACTERISTICS

Figure 2. Network analyzer output S11/S21 (Pin=0dBm)

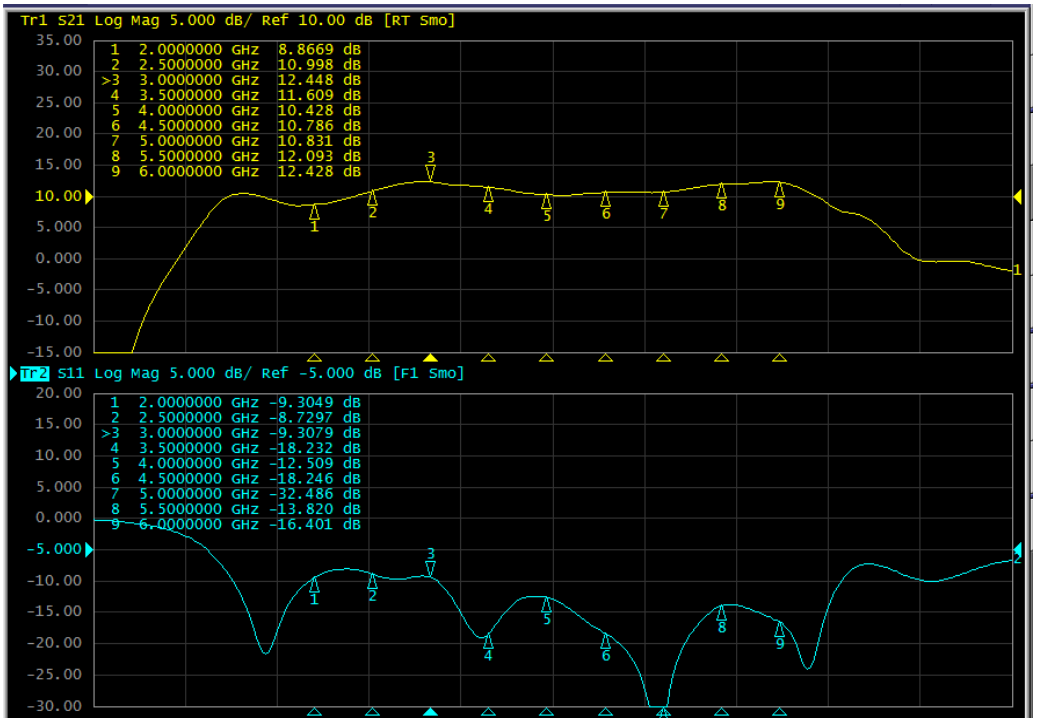
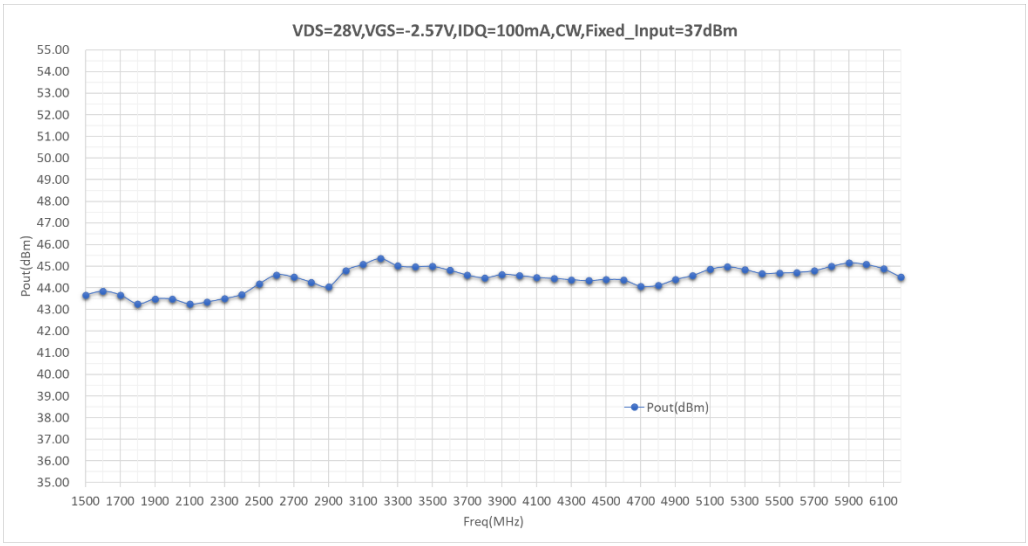
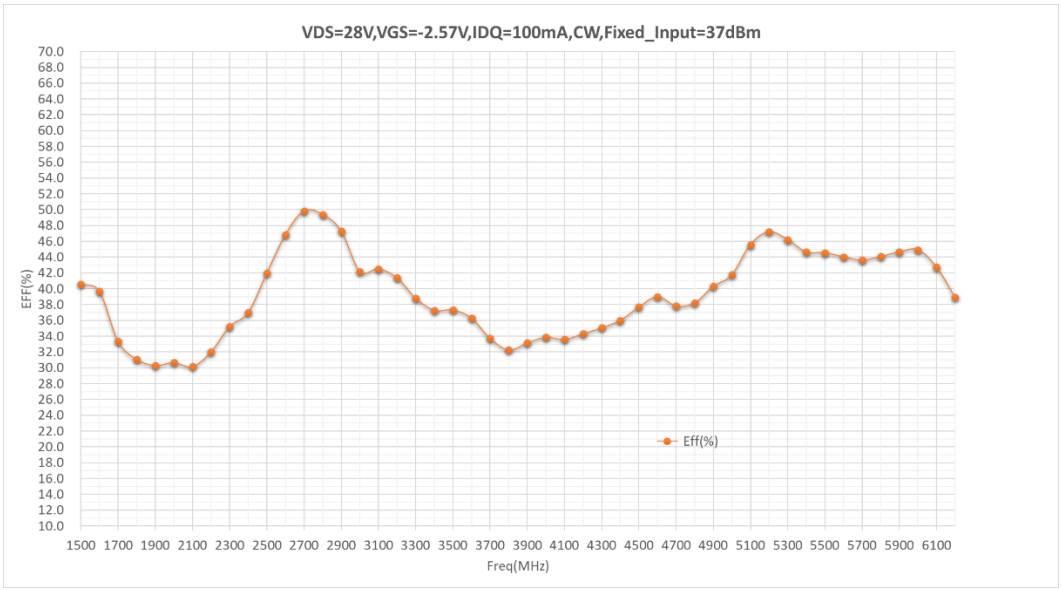


Figure 3. Pout, Eff, Gain Vs Frequency When fixed Pin @28V





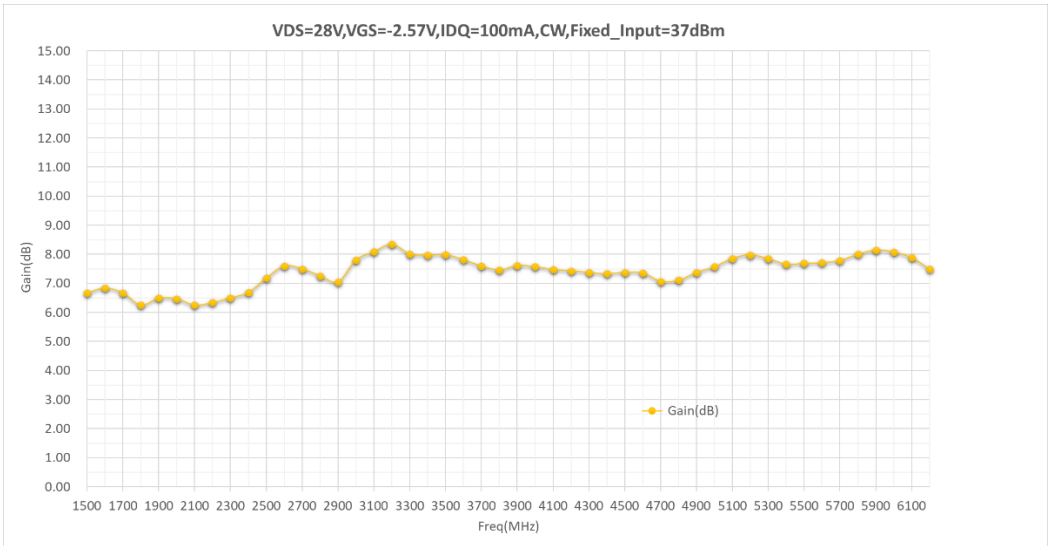
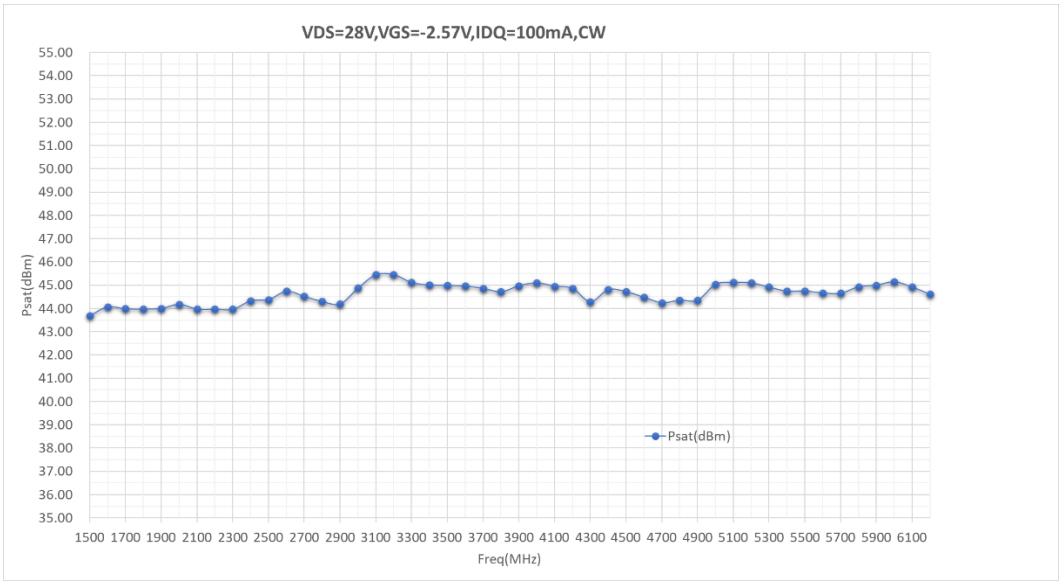
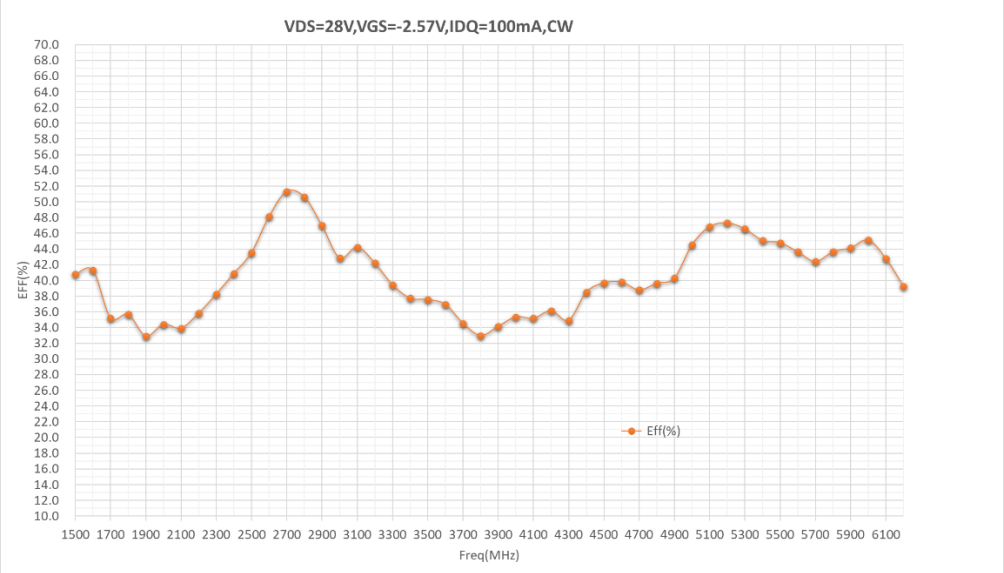
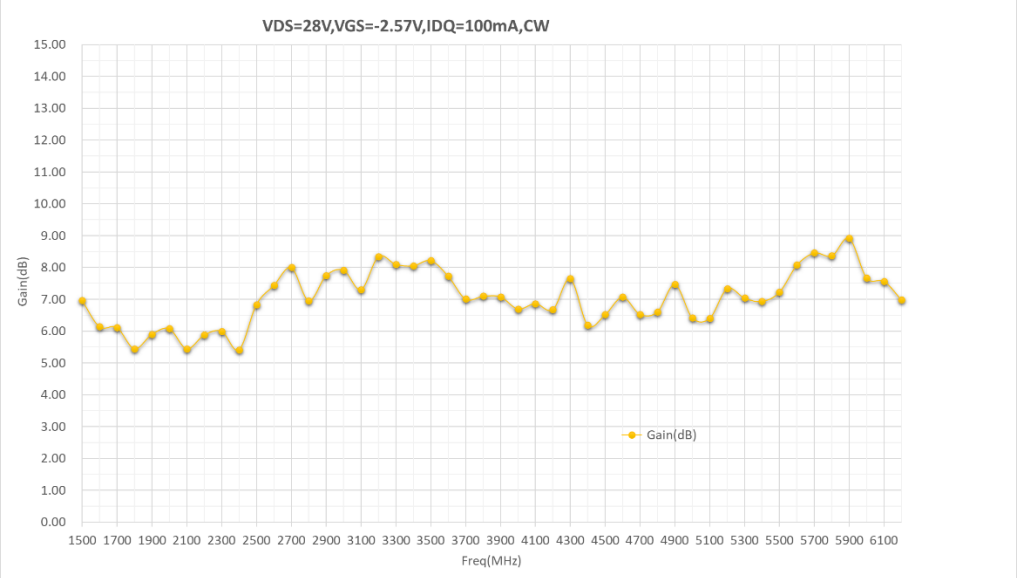


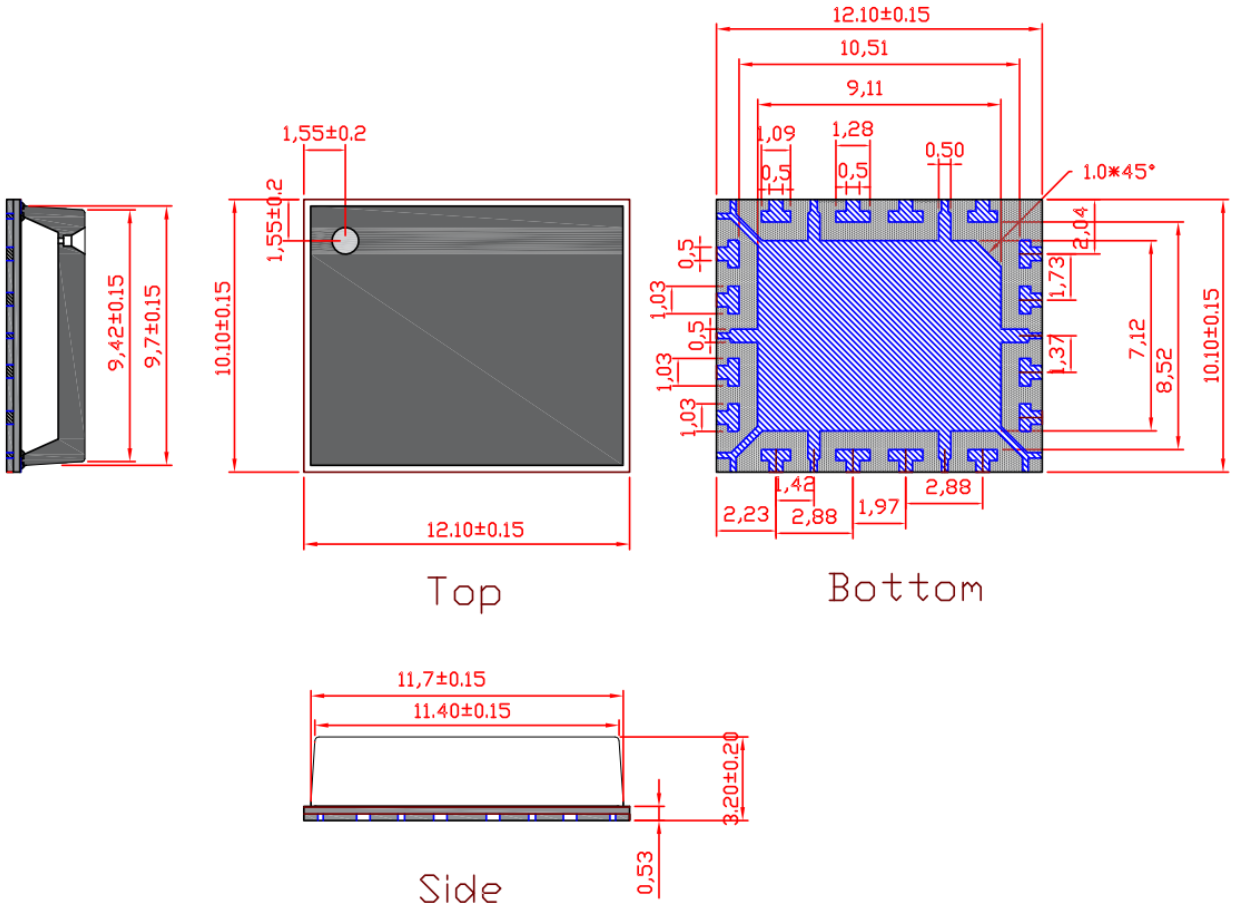
Figure 4. Psat Eff, Gain Vs frequency across the band @28V







Package Dimensions （Unit:mm）



Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2024/12/25	Rev 1.0	Preliminary Datasheet

Application data based on JF-24-17

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