

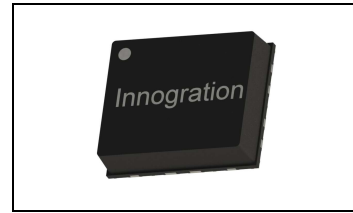


0.7-4.2GHz, 20W, 32V GaN Fully matched PA Module

Description

The GMAH0742-20C9 is a 20-watt ,single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from 0.7 to 4.2GHz. The module is 50 Ω input/output matched and requires minimal external components.

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.



Vds= 32V, Vgs=-2.48V, Idq=40mA					
Pulse Peak Power, 50us, 20%					
Freq(MHz)	P-1(dBm)	P-1Gain(dB)	P-3(dBm)	P-3(W)	Eff (%)
700	41.69	12.8	42.69	18.6	56.3
800	42.12	14.0	43.21	21.0	60.1
1000	42.98	14.6	43.91	24.6	60.4
1200	43.21	15.0	44.21	26.4	60.8
1400	43.74	14.7	44.52	28.3	60.5
1600	43.78	14.7	44.49	28.1	60.0
1800	43.57	14.6	44.24	26.5	57.2
2000	43.57	13.8	44.29	26.9	53.8
2200	43.87	14.1	44.69	29.4	56.9
2400	44.04	13.4	44.80	30.2	57.4
2600	44.08	13.0	44.84	30.5	55.9
2800	43.92	12.7	44.82	30.4	57.6
3000	43.44	13.5	44.70	29.5	56.4
3200	43.72	12.9	44.70	29.5	58.0
3400	43.20	13.3	44.40	27.6	57.8
3600	43.26	13.8	44.44	27.8	58.1
3800	43.26	13.7	43.92	24.7	58.3
4000	42.64	13.3	43.29	21.3	54.6
4200	42.32	13.3	43.02	20.0	51.7

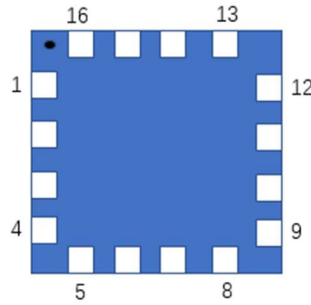
Product Features

- Operating Frequency Range: 0.7-4.2GHz
- Operating Drain Voltage: +32V
- 50 Ω Input/Output
- Psat ≥ 20W
- Small signal gain: >12dB, Power gain: >10dB
- Minimum efficiency: >50%
- 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
4	RF IN	RF Input
9	RF OUT	RF Output
6	V _{gs}	Gate bias
7	V _{dd}	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. Soldered through high density vias or copper coin also allowed, but will result in excessive junction temperatures and different RF performance

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	150	Vdc
Gate--Source Voltage	V _{ES}	-10 to +2	Vdc
Operating Voltage	V _{DD}	+36	Vdc
Storage Temperature Range	T _{stg}	-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 = 87°C, T _j =185°C, DC test	R _{θJC}	5	°C/W

Table 3. Electrical Characteristics

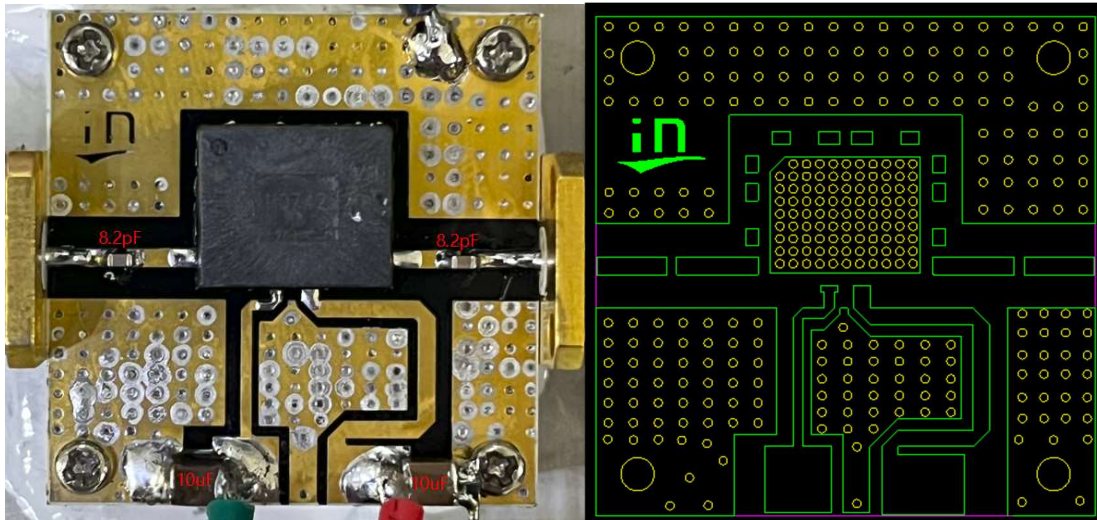
Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		700		4200	MHz
Power Gain @ Psat		10			dB
P _{SAT}	Pulse		43		dBm



Drain Efficiency @ P _{SAT}		50		%
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} =40 mA, f = 3.5 GHz				
VSWR 10:1 at Psat pulse CW Output Power	No Device Degradation			

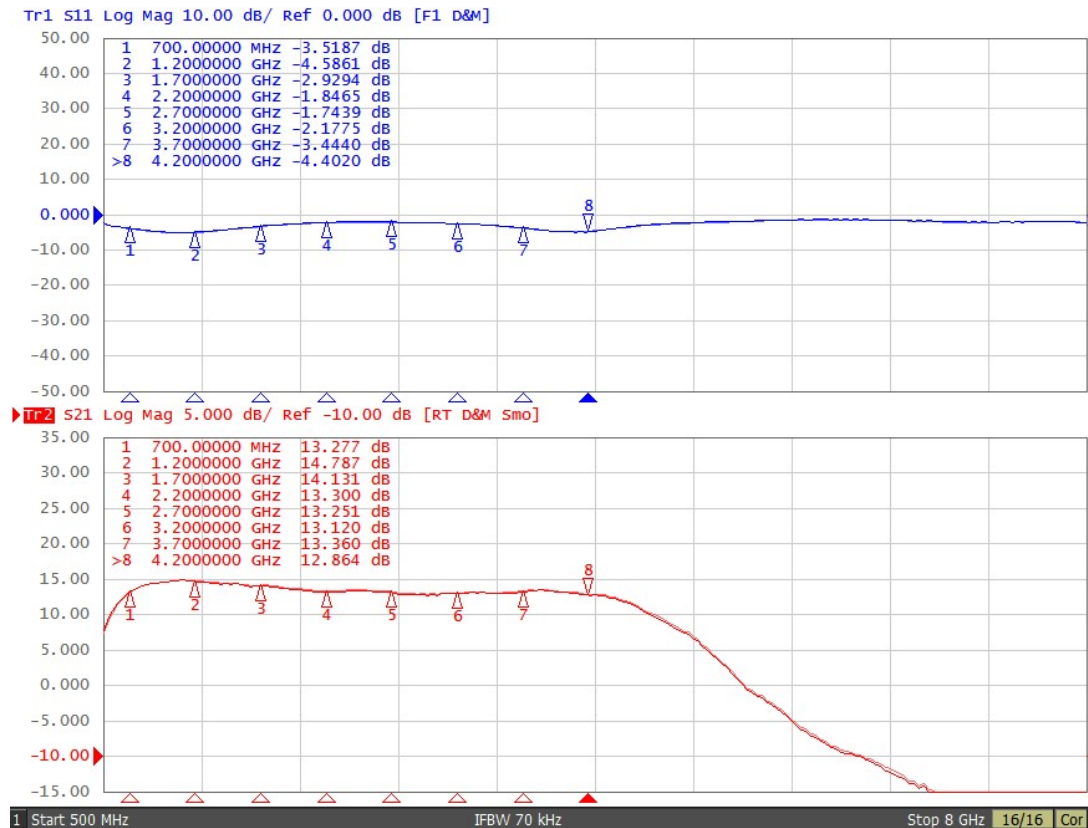
Reference Circuit of Test Fixture Assembly Diagram

Figure 1. Test Circuit Component Layout

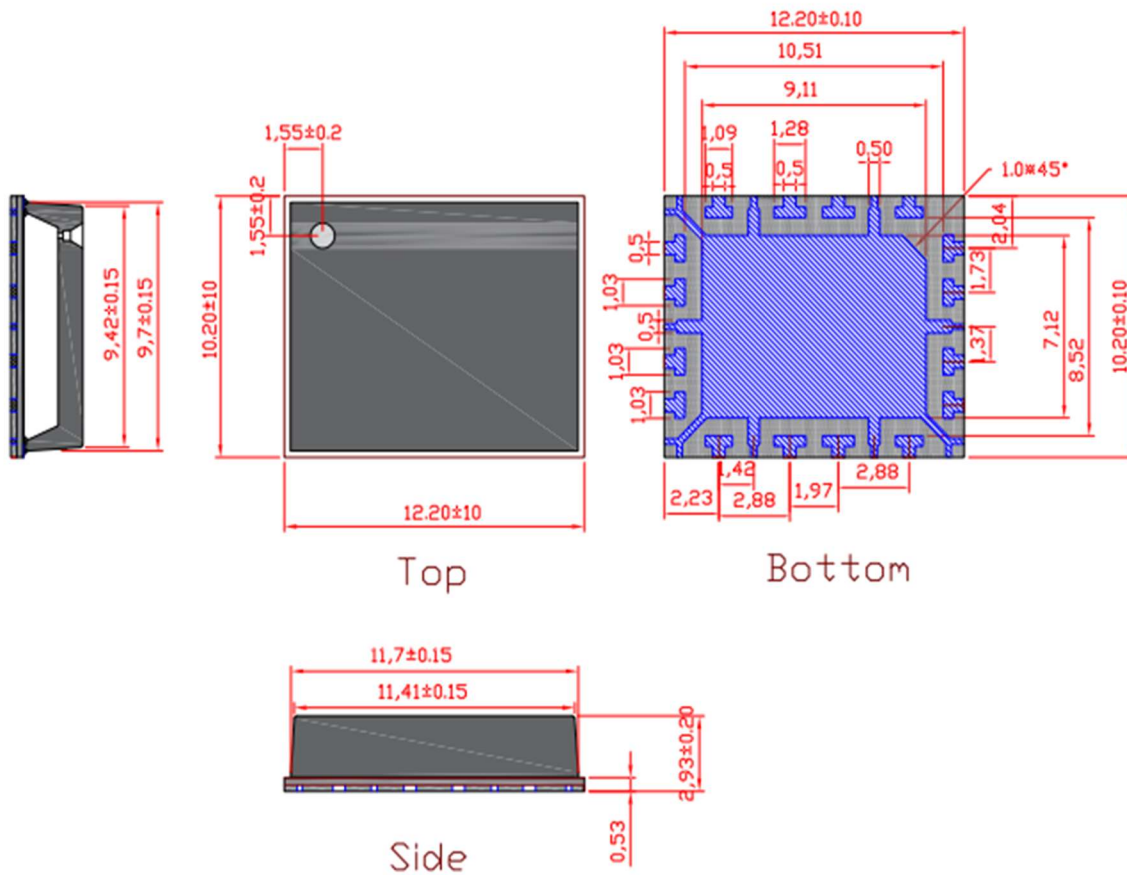


TYPICAL CHARACTERISTICS

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



Package Dimensions (Unit:mm)



Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2023/7/6	Rev 1.0	Preliminary Datasheet
2023/10/9	Rev 2.0	Modify the die configuration and change rating at 32V

Application data based on HJ-23-11

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