

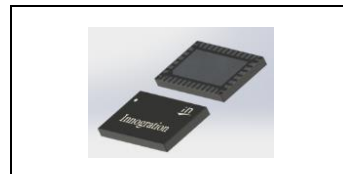


500-2500MHz, 20W, 28V 2 stages GaN PA Module

Description

The G2MAH0525-20 is a 20-watt peak power, integrated Power Amplifier Module, designed for broad band applications, with frequencies from 500 to 2500 MHz. The module is 50 Ω input and requires minimal external components at interstage and output stage. The module offers a much smaller footprint than traditional discrete component solutions.

It is the cost and application optimization of GMAH0225-15T6



$V_{DS}=28V, I_{DQ_driver}=15mA, V_{gs_driver}=-2.50V, I_{DQ_final}=50mA, V_{gs_final}=-2.45V$, CW and Pulsed CW

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
500	41.23	13.27	46.90	18.22	43.1	20.62	51.55
600	41.97	15.74	45.33	17.3	43.08	20.32	48.71
700	42.63	18.32	44.82	16.78	43.57	22.75	48.08
800	41.11	12.91	31.0	16.52	43.75	23.71	48.32
900	42.55	17.99	42.86	17.99	43.5	22.39	45.74
1000	41.32	13.55	34.06	18.73	43.1	20.42	39.46
1100	42.61	18.24	41.02	19.7	43.75	23.71	44.30
1200	42.08	16.14	38.44	20.26	43.61	22.96	43
1300	41.35	13.65	34.8	21.02	43.4	21.88	41.78
1400	41.93	15.60	32.57	19.97	43.9	24.55	39.67
1500	40.23	10.54	26.71	20.49	43.00	20.23	34.17
1600	40.87	12.22	28.71	20.71	43.4	21.88	36.17
1700	39.9	9.77	25.51	20.82	43.25	21.13	35.34
1800	39.87	9.71	25.41	20.23	43.55	22.65	37.34
1900	40.5	11.22	29.68	20.86	43.1	20.42	37.59
2000	39.28	8.47	23.10	21.27	43.09	20.41	32.8
2100	41.76	15	34.56	21.95	43.92	24.66	41.74
2200	4.86	15.35	36.30	21.53	44.65	29.17	45.5
2300	42.01	15.89	39.13	20.5	44.06	25.47	46.41
2400	41.27	13.40	39.22	19.75	43.84	24.21	49.69
2500	41.33	13.58	43.7	19.81	43.33	21.52	49.93

Applications

- Tactical communication
- Wideband spectrum management
- LMR
- Benchtop Amplifier
- EMC test



Pin Configuration and Description

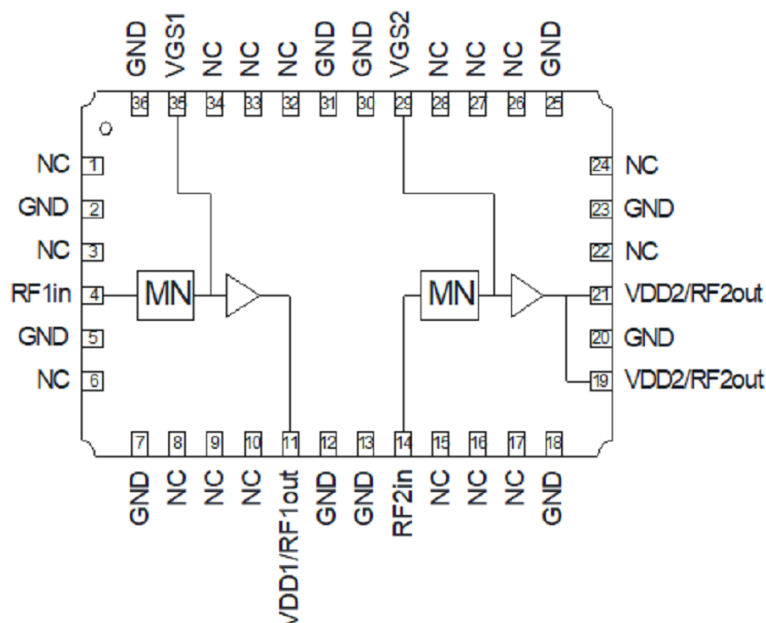


Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	150	Vdc
Gate--Source Voltage	V_{GS}	-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 $T_C=87^{\circ}\text{C}$, $T_J=175^{\circ}\text{C}$, DC test	$R_{\theta JC}$	3.5	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model(HBM) (JEDEC Standard JS-001-2012)	TBD
Charged Device Model (CDM) (JEDEC Standard JESD22-C101F)	TBD

Table 4. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		500		2500	MHz
P_{SAT}			20		W
Drain Efficiency @ P_{SAT}		30	40		%

Unless otherwise noted: $T_A = 25^{\circ}\text{C}$, $V_{DD} = 28\text{ V}$, Pulse Width=100 us, Duty cycle=10%

Load Mismatch of per Section (On Test Fixture, 50 ohm system): $V_{DD} = 28\text{V}$, $f = 2.5\text{ GHz}$

VSWR 10:1 at 20W pulse CW Output Power	No Device Degradation
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Reference Circuit of Test Fixture Assembly Diagram

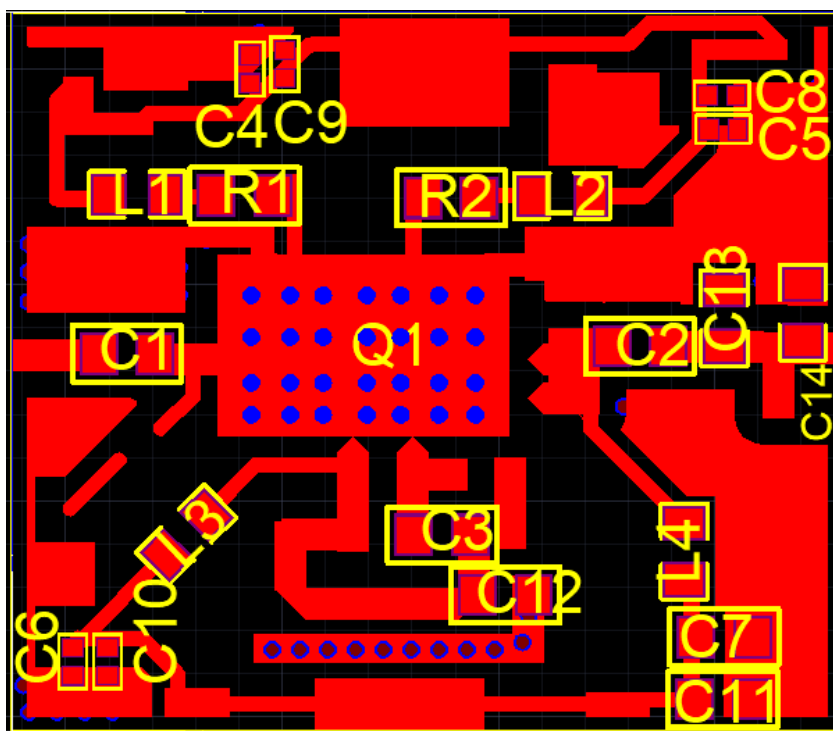


Figure 1. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

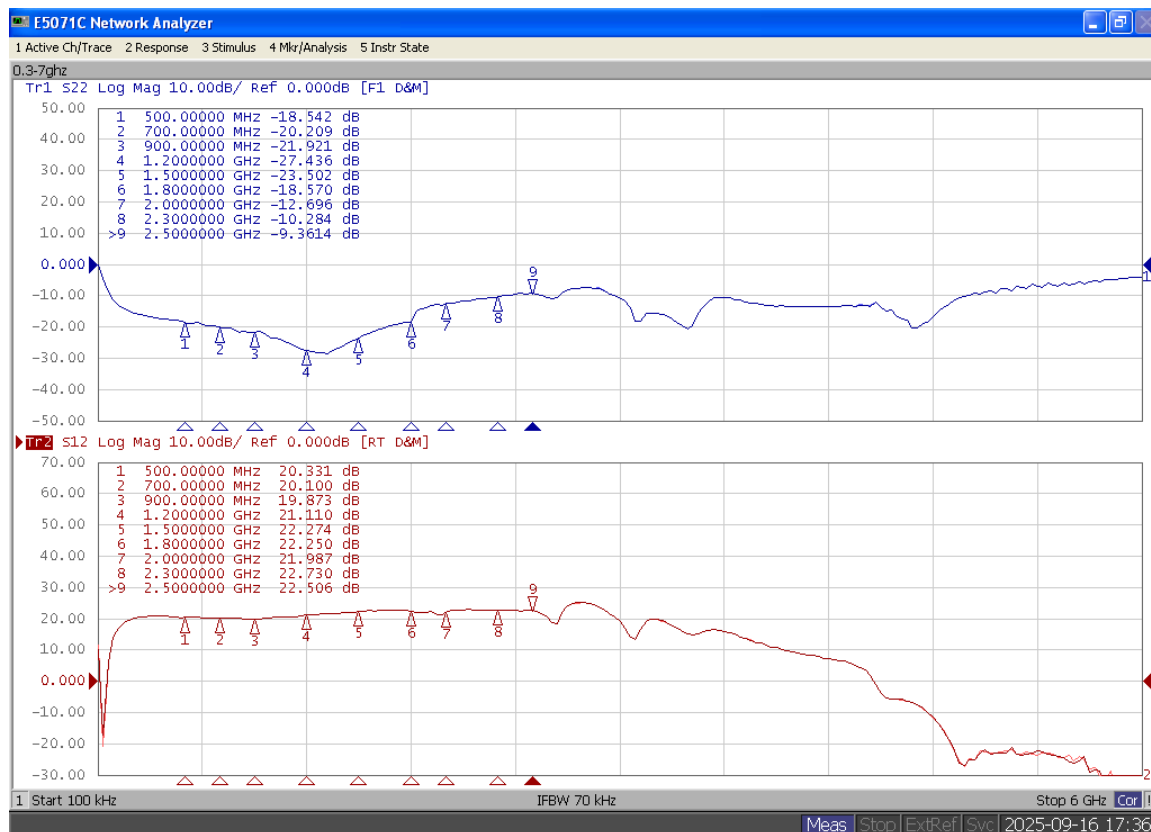
Part	Quantity	Description	Part Number	Manufacture
C1	1	82pF High Q Capacitor	251SHS820BSE	TEMEX
C2	1	56pF High Q Capacitor	251SHS560BSE	TEMEX
C3	1	200pF High Q Capacitor	251SHS201BSE	TEMEX
C4,C5,C6	3	47pF High Q Capacitor	251SHS470BSE	TEMEX
C7	1	100pF High Q Capacitor	251SHS101BSE	TEMEX
C12	1	0.4pF High Q Capacitor	251SHS0R4BSE	TEMEX
C13	1	1.2pF High Q Capacitor	251SHS1R2BSE	TEMEX
C14	1	0.7pF High Q Capacitor	251SHS0R7BSE	TEMEX
C8,C9	2	1uF Capacitor	/	/
C10,C11	2	10uF MLCC	GRM32EC72A106ME05	Murata
L1,L2	2	3.3nH Inductance	/	/
L3	1	560nH Inductance	/	/



L4	1	100nH Inductance	/	/
R1,R2	2	10 Ω Power Resistor	ESR03EZPF100	ROHM
T1	1	GaN Transistor	G2MAH0525-20	Innegration

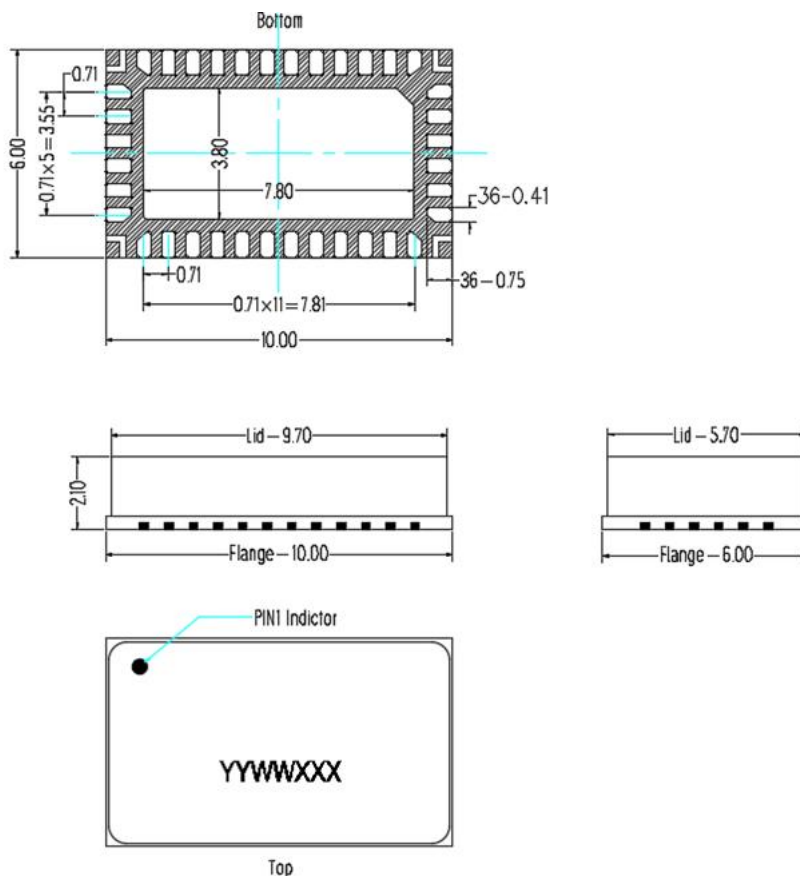
TYPICAL CHARACTERISTICS

Figure 3. Network Analyzer output S11/S21



Package Dimensions

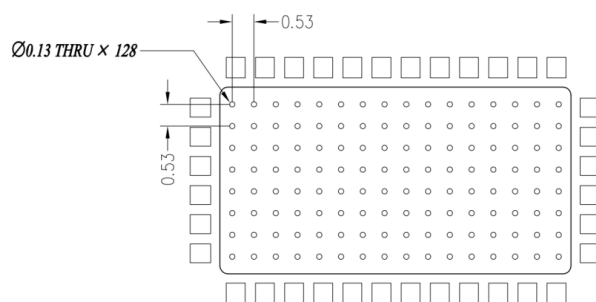
10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are $\pm 0.2\text{mm}$.

Mounting Footprint Pattern



Notes:

1. All dimensions are in mm;
2. Vias are required under the backside paddle of this device for proper RF/DC grounding and thermal dissipation. ALL vias are PTH to ground.



Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2025/9/17	Rev 1.0	Preliminary Datasheet

Application data based on HZH-25-09

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