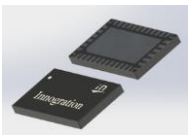
2-12GHz,2 stages, 1W, 28V GaN Fully matched PA Module



Description

The G2MAH201C-1 is a 1watt ,2 stage integrated Power Amplifier Module, designed for broad band applications from 2 to 12GHz . The module is 50 Ω input/output matched and requires minimal external components.

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

V_{DS}= 28V, I_{DQ1}=10 mA, I_{DQ2}=10 mA

Parameter	1.5GHz	2.0GHz	4.0GHz	6.0GHz	8.0GHz	10.0GHz	12.0GHz	13.0GHz	Units
Linear Gain	18.7	19.7	20.7	21.2	21.0	20.7	18.3	16.4	dB
Gain@Pin=15dBm	16.7	17.6	19.1	19.0	17.0	17.3	16.5	15.2	dB
Pout@Pin=15dBm	1.5	1.8	2.6	2.5	1.6	1.7	1.4	1.1	W
Eff@Pin=15dBm	18	27	25	22	15	16	16	12	%

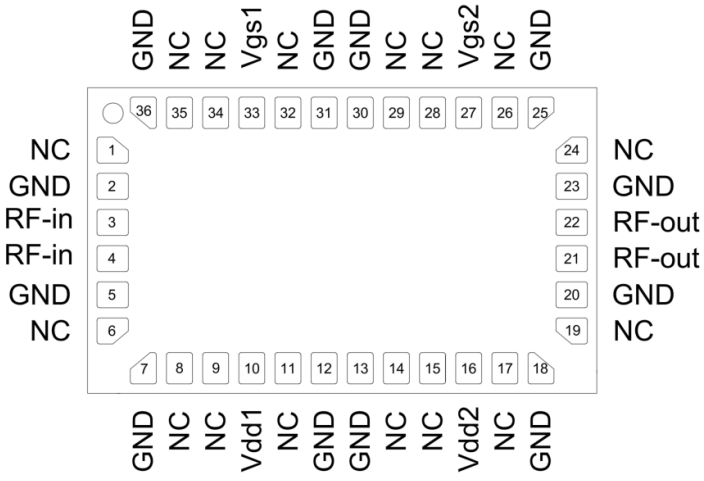
Product Features

- Operating Frequency Range: 2-13GHz
- Operating Drain Voltage: +28 V (Up to 32V)
- 50 Ω Input/Output
- Psat: ⩾30dBm @28V, ⩾31dBm @32V
- Small signal gain:>16dB, Power gain:>14dB @Pin=15dBm
- Minimum efficiency:>15%
- 6x10 mm Surface Mount Package

Applications

- Ultra Broadband Amplifiers typically 2-12GHz, 6-12G, 8-12GHz
- Fiber Drivers
- Test Instrumentation
- EMC Amplifier Drivers
- 2-way Radios

Pin Configuration and Description



Top View

Pin No.	Symbol	Description
21,22	RFout	Transistor 1, RF Output
3,4	RFin	Transistor 1, RF Input
33	Vgs1	Transistor 1, Gate Bias1
27	Vgs2	Transistor 1, Gate Bias2
10	Vdd1	Transistor 1, Drain Bias1
16	Vdd2	Transistor 1, Drain Bias2
Others	NC	No connection
2,5,7,12, 13,18,20,23,25, 30, 31,36 Package Base	GND	DC/RF Ground. Must be soldered to EVB ground plane over array of vias for thermal and RF performance. Solder voids under Pkg Base will result in excessive junction temperatures causing permanent damage.

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}	+36	Vdc
Input CW Power	RFin	21	dBm
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, FEA T_C= 25°C, DC test	$R_{\theta JC}$	8	°C/W

Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		2000		13000	MHz
Power Gain		16			dB
P_{OUT}	Pin=15dBm	30			dBm
Drain Efficiency @ P_{SAT}		10			%
Unless otherwise noted: TA = 25°C, V_{DD} =28 V, Pulse Width=100 us, Duty cycle=10%					

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD} =28 V, I_{DQ1+2} =10+10 mA, f = 3.5 GHz

VSWR 10:1 at pulse CW Output Power @Pin=15dBm	No Device Degradation

Reference Circuit of Test Fixture Assembly Diagram

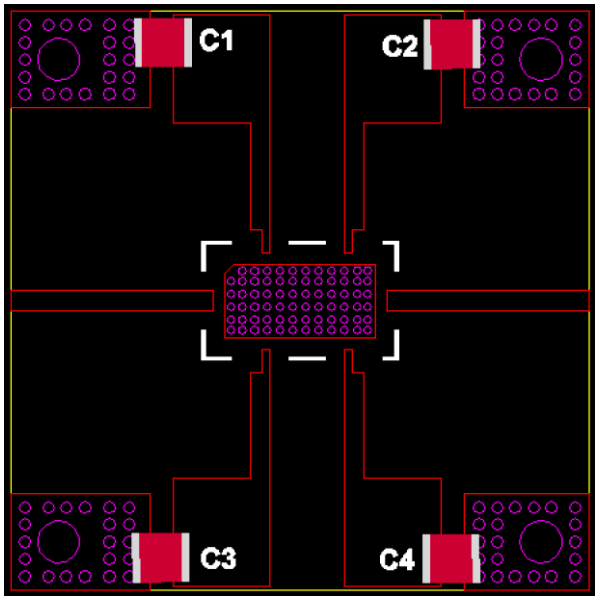


Figure 1. Test Circuit Component Layout

		Part NO.	Vendor
C1, C2,C3, C4	50V 1uF Chip Capacitor	GRM21BR71H105KA12L	muRata
PCB	RO4350B,20mil,er=3.48		

TYPICAL CHARACTERISTICS

Figure 2. Network analyzer output S11/S21 (VDS= 28V, IDQ1=10 mA IDQ2=10 mA, Pin=0dBm)

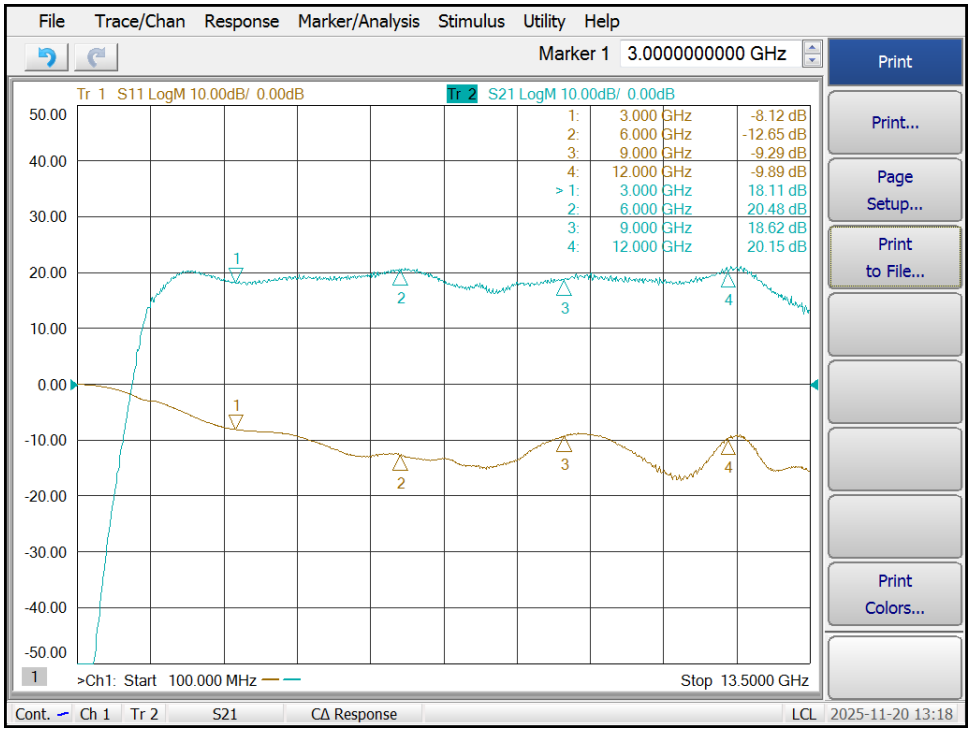
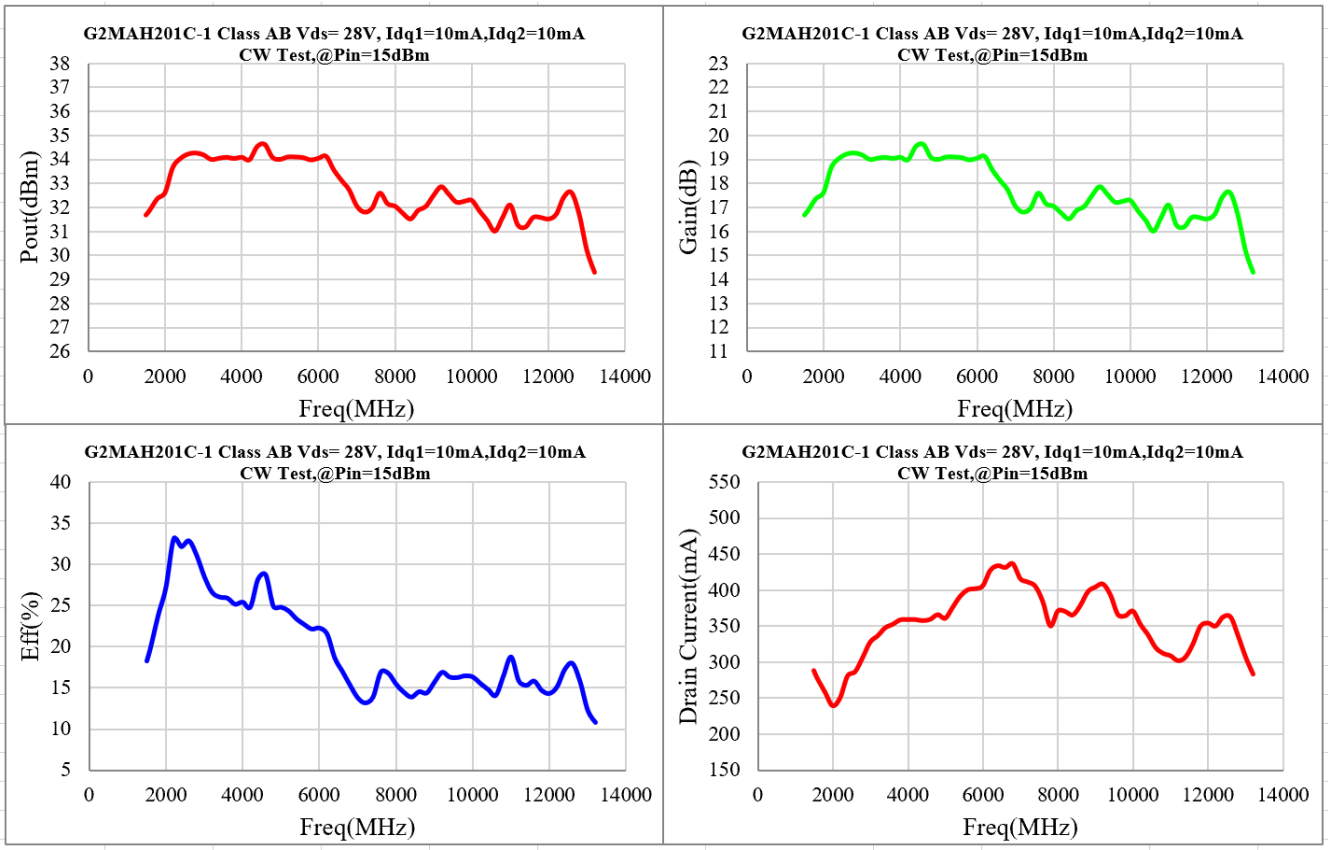
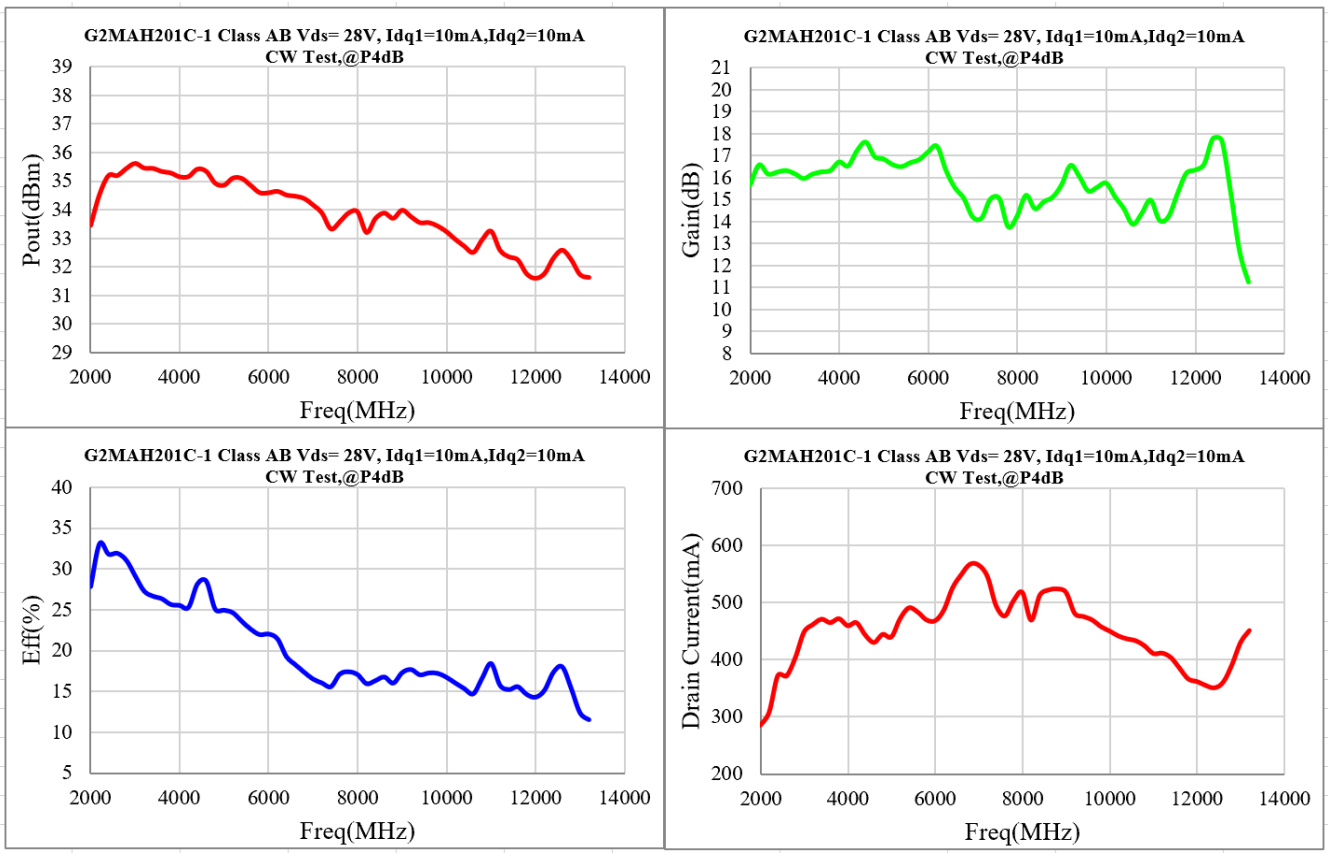


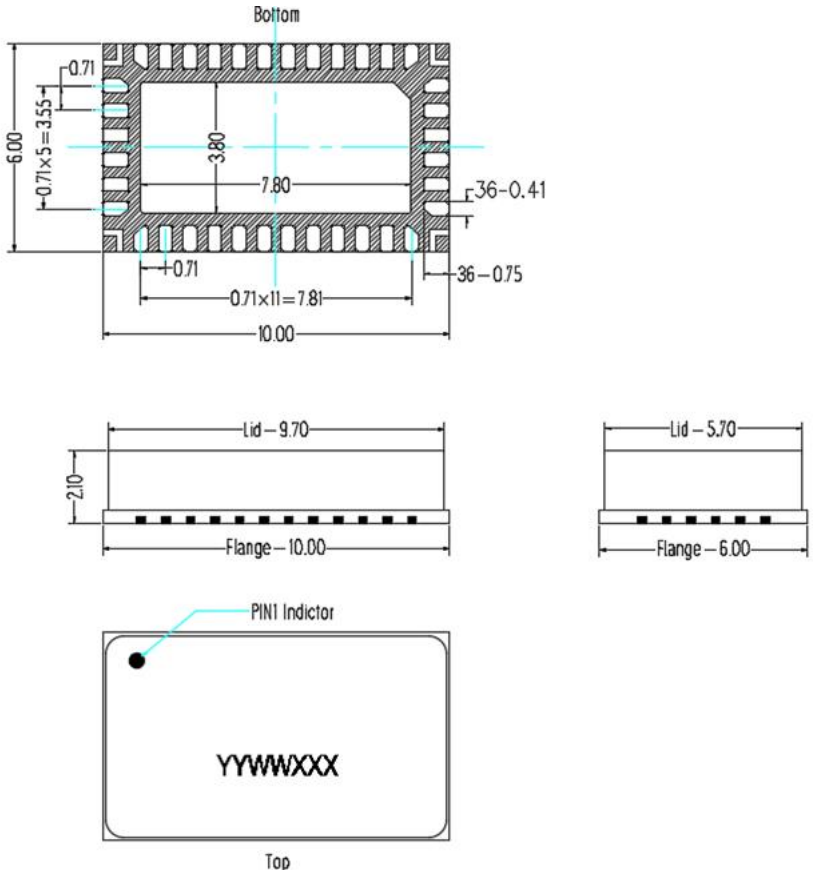
Figure 3. Power Gain and, efficiency and Pout @Pin=15dBm and P4dB





Package Dimensions

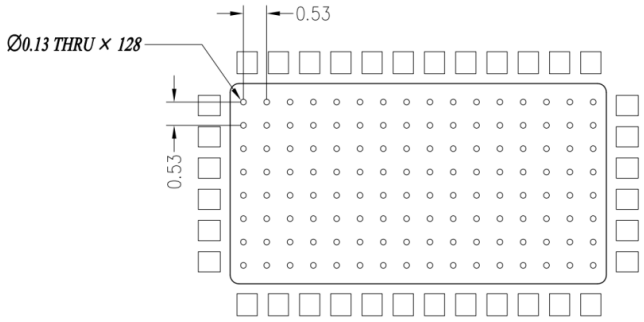
10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are ±0.2mm.

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
2023/11/19	Rev 1.0	Preliminary Datasheet Creation

Application data based on ZHH-25-30

Disclaimers