

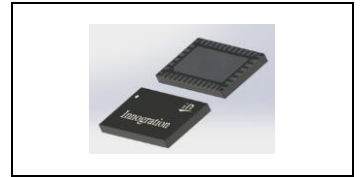


## 2-12GHz, 2 stages, 1W, 28V GaN Fully matched PA Module

### 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  $\Omega$  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.



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

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	%

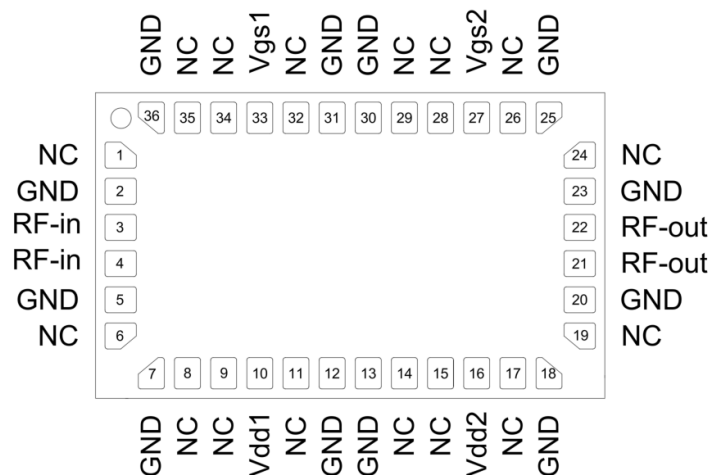
### Product Features

- Operating Frequency Range: 2-13GHz
- Operating Drain Voltage: +28 V (Up to 32V)
- 50  $\Omega$  Input/Output
- Psat:  $\geq 30dBm$  @28V,  $\geq 31dBm$  @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	$V_{DS}$	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	$T_{stg}$	-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, FEA $T_c = 25^\circ\text{C}$ , 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: $T_A = 25^\circ\text{C}$ , $V_{DD} = 28\text{ V}$ , Pulse Width=100 us, Duty cycle=10%					

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

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

## Reference Circuit of Test Fixture Assembly Diagram

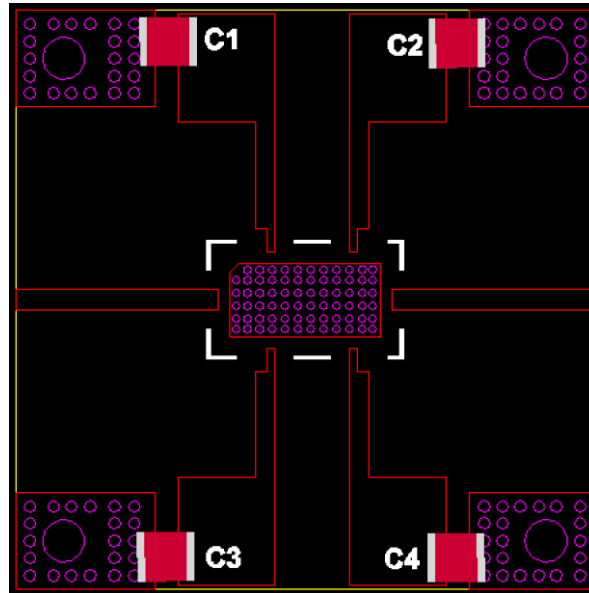


Figure 1. Test Circuit Component Layout

		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)

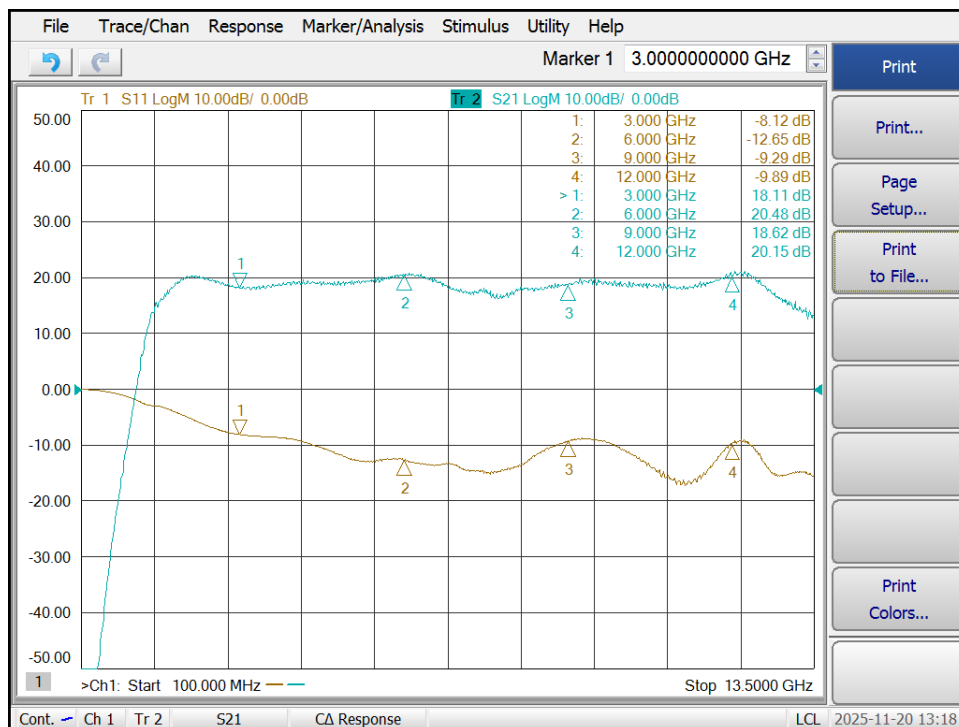
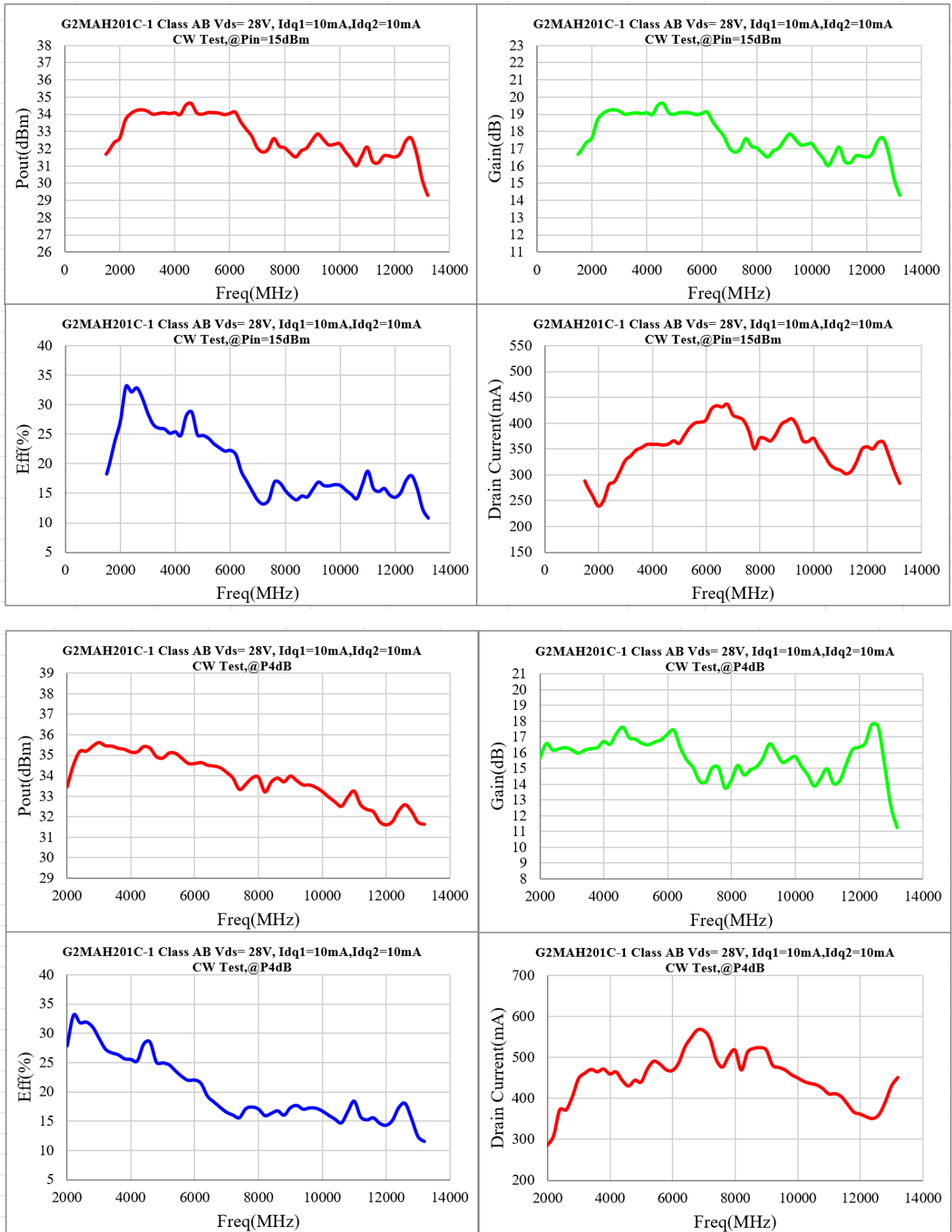


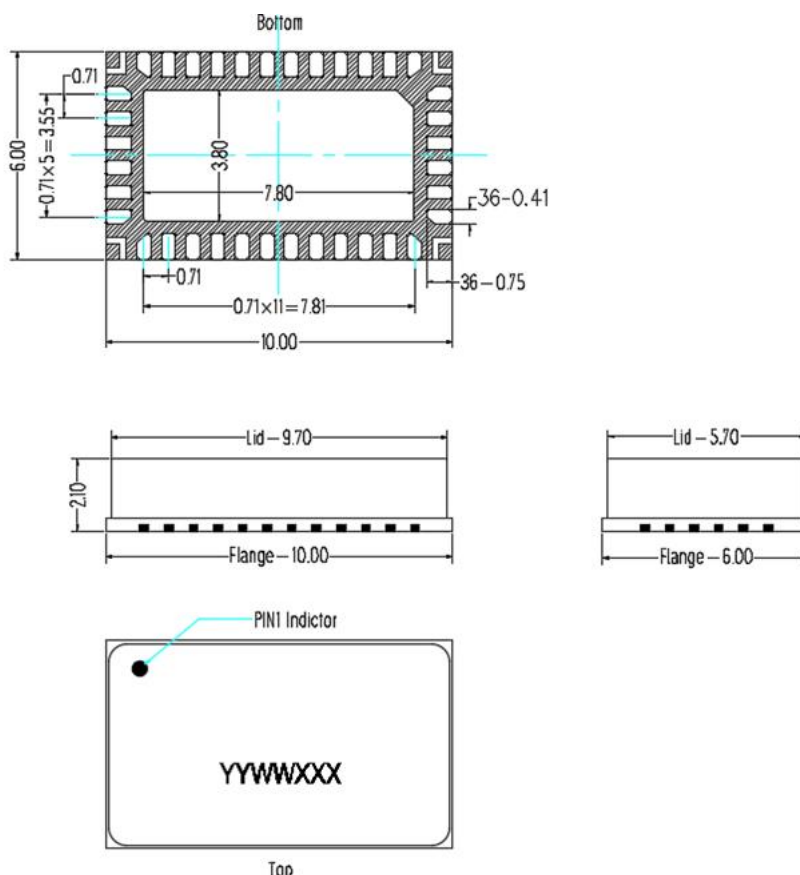


Figure 3. Power Gain and, efficiency and Pout @Pin=15dBm and P4dB



## Package Dimensions

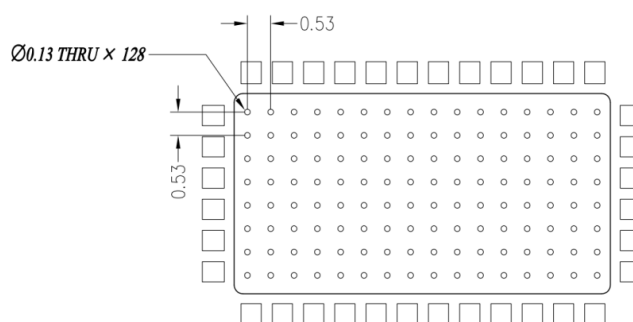
## 10\*6 Plastic Package



Notes:

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

## 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
2023/11/19	Rev 1.0	Preliminary Datasheet Creation

Application data based on ZHH-25-30

## Disclaimers

Specifications are subject to change without notice. Innogrations believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Innogrations for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Innogrations . Innogrations makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose. “Typical” parameters are the average values expected by Innogrations in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer’s technical experts for each application. Innogrations products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogrations product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with Innogrations and authorized distributors

Copyright © by Innogrations (Suzhou) Co.,Ltd.