

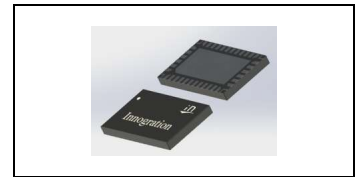


## 2.4-3.5GHz, 2 stages, 50W, S band 28V GaN Quasi-MMIC PA module

### Description

The G2MAH2435-50 is a 50-watt ,2 stage integrated Power Amplifier Module, designed for broad band saturated pulsed CW or linear back off applications, with frequencies from 2.4 to 3.5GHz. The module is 50 Ω input, and partially output matched and requires minimal external components, total effective size less than 2\*2cm.

The module implements innovative quasi-MMIC transistor into module design, housed in cost effective 10\*6mm plastic open cavity package, offers a much lower cost than traditional MMIC solutions.



**It isn't recommended to use this module for CW application.**

- Vds= 28V, Idq1=15 mA , Idq2=135 mA Vgs =-2.48V, pulsed CW, 20 us width, 10% duty cycle.

Parameter	2.3GHz	2.4GHz	2.7GHz	2.9GHz	3.1GHz	3.3GHz	3.5GHz	3.6GHz	Units
Linear Gain	24.3	25.2	26.8	25.9	25.3	25.0	24.5	24.3	dB
Gain@Pin=24.5dBm	22.9	23.5	23.5	23.1	22.9	22.9	22.8	22.4	dB
Pout@Pin=24.5dBm	55.5	63.4	63.6	57.4	55.4	55.5	53.4	48.5	W
Eff@Pin=24.5dBm	42	50	59	57	54	54	53	50	%

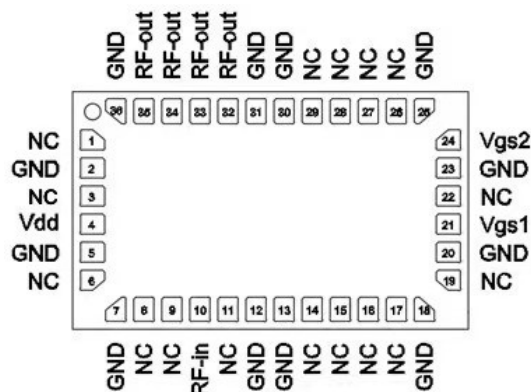
### Product Features

- Operating Frequency Range: 2.4-3.5GHz
- Operating Drain Voltage: +28 V (Up to 32V)
- 50 Ω Input, Output partially matched
- Psat: ≥50W @28V (Pulsed)
- Small signal gain:>24dB, Power gain:>22dB @Pin=24.5dBm
- Efficiency:>50%
- 6x10 mm Surface Mount Package and total design less than 2x2 cm
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

### Applications

- S band pulsed power amplifier within 2.7-3.5Gz
- 4G/5G power amplifier within 2.5-2.7GHz
- 2450MHz ISM applications

### Pin Configuration and Description





Pin No.	Symbol	Description
32,33,34,35	RFout	RF Output
10	RFin	RF Input
21	Vgs1	Gate Bias for 1 <sup>st</sup> stage
24	Vgs2	Gate Bias2 for 2 <sup>nd</sup> stage
4	Vdd	Drain Bias for 1 <sup>st</sup> and 2 <sup>nd</sup> stage
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 <sub>DSS</sub>	150	Vdc
Gate--Source Voltage	V <sub>GS</sub>	-10 to +2	Vdc
Operating Voltage	V <sub>DD</sub>	+36	Vdc
Input CW Power	RFin	27	dBm
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C
Case Operating Temperature	T <sub>c</sub>	+150	°C
Operating Junction Temperature	T <sub>j</sub>	+225	°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case, FEA T <sub>c</sub> = 25°C, 50W Pulsed CW at 3GHz	R <sub>θJC</sub>	3.5	°C/W

**Table 3. Electrical Characteristics**

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		2400		3500	MHz
Power Gain		22	23		dB
P <sub>OUT</sub>	Pin=24.5dBm		47		dBm
Drain Efficiency @ P <sub>SAT</sub>			50		%

Unless otherwise noted: TA = 25°C, V<sub>DD</sub> =28 V, Pulse Width=20 us, Duty cycle=10%

**Load Mismatch of per Section (On Test Fixture, 50 ohm system):** V<sub>DD</sub>=28 V, I<sub>DQ</sub> =15+135 mA, f = 3GHz

VSWR 10:1 at pulse CW Output Power @Pin=24.5dBm	No Device Degradation
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Reference Circuit of Test Fixture Assembly Diagram

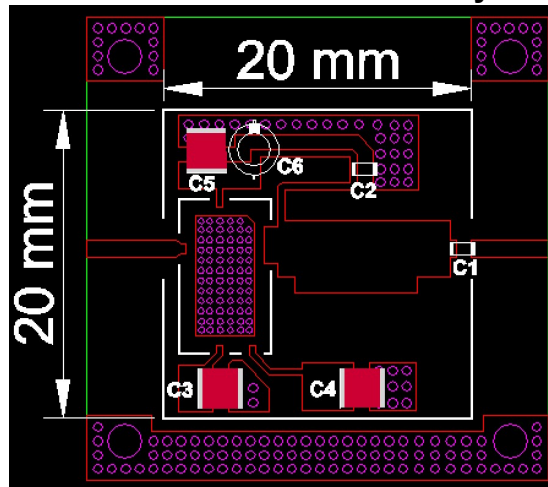


Figure 1. Test Circuit Component Layout

		Part NO.	Vendor
C3,C4,C5	10uF 100V Chip Capacitor	C5750X7S2A106M230KB	TDK
C1,C2	7.5pF Capacitor (0603)		
C6	100uF Capacitor		
PCB	RO4350B,20mil,er=3.48		

TYPICAL CHARACTERISTICS

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

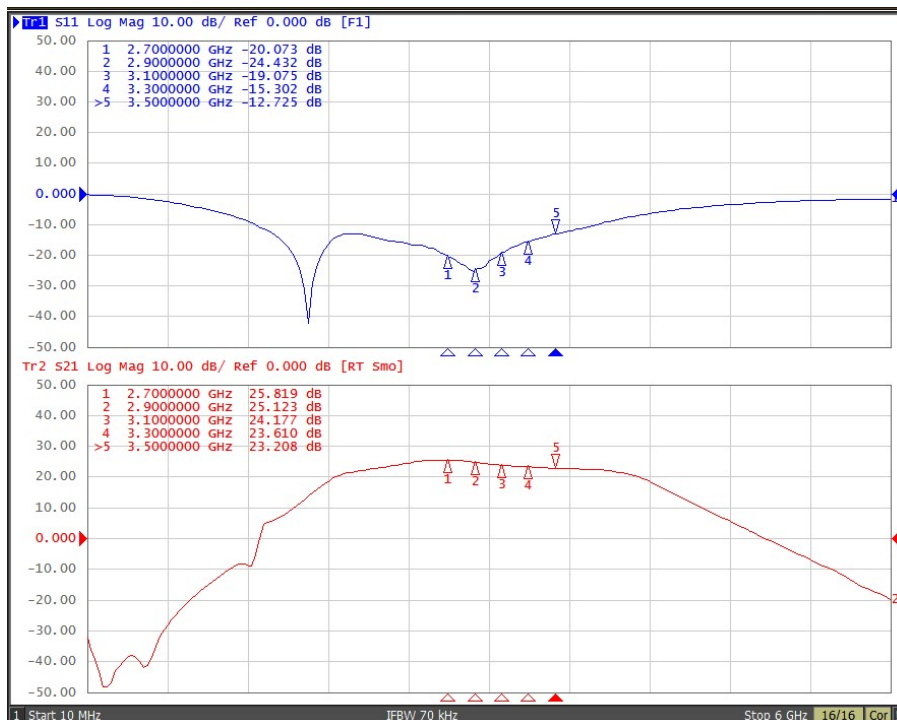




Figure 3. Power Gain and, efficiency and Pout @Pin=24.5dBm, P3dB vs. Frequency

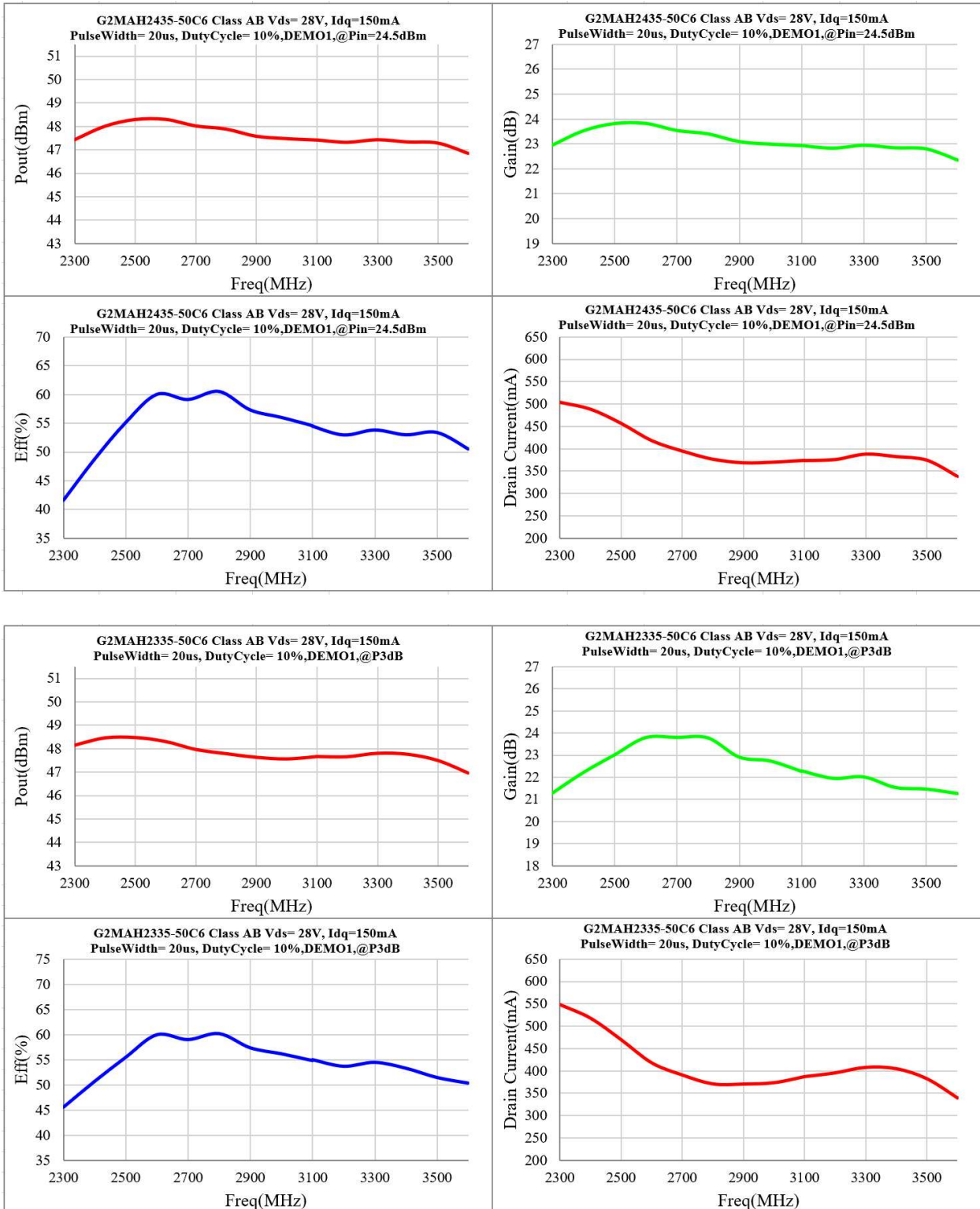
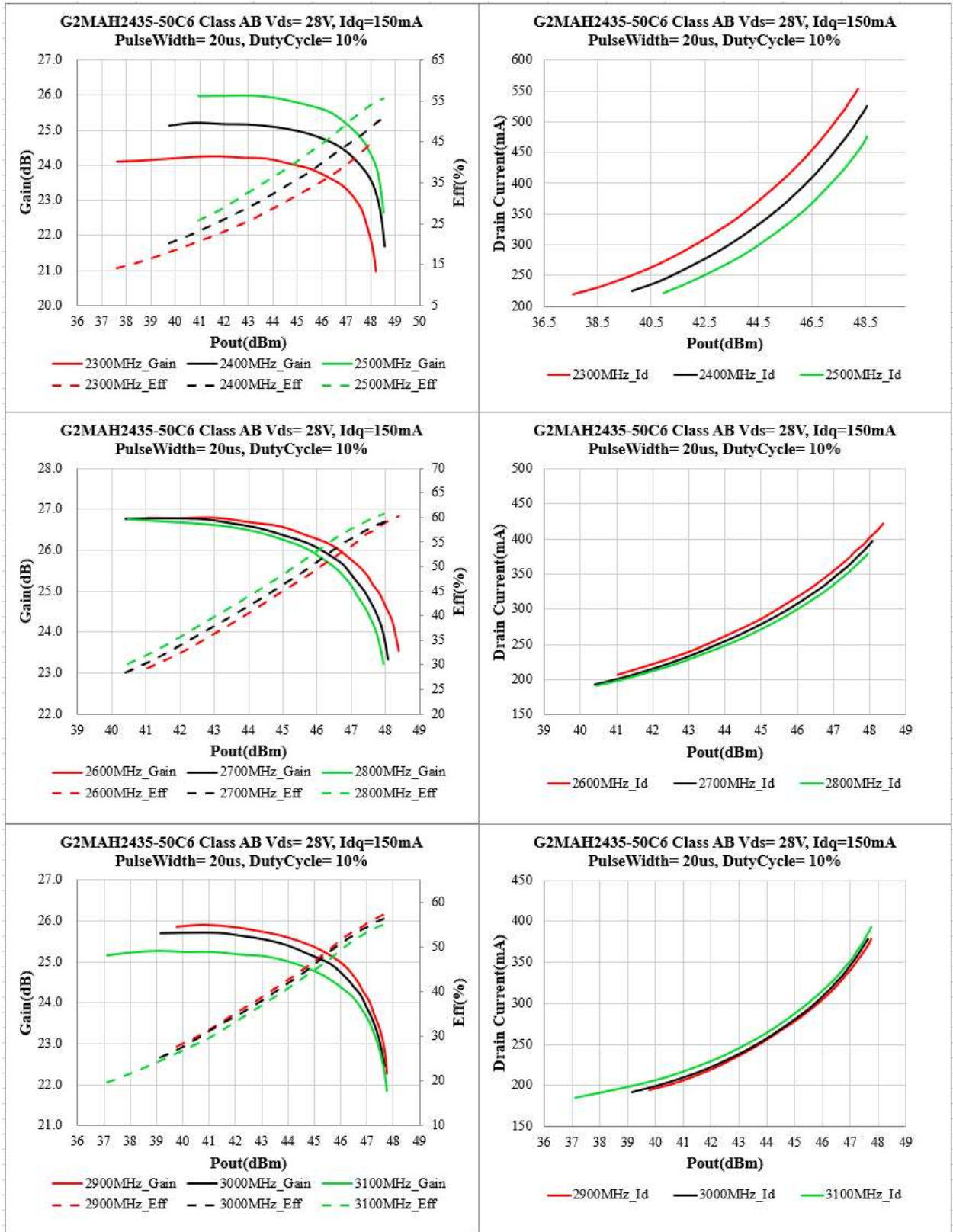
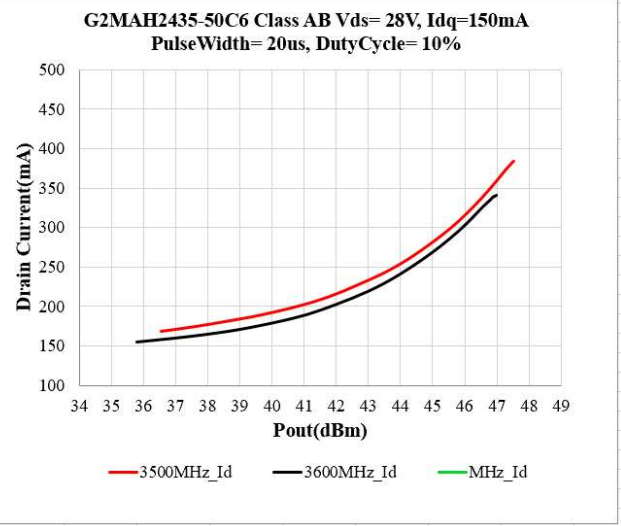
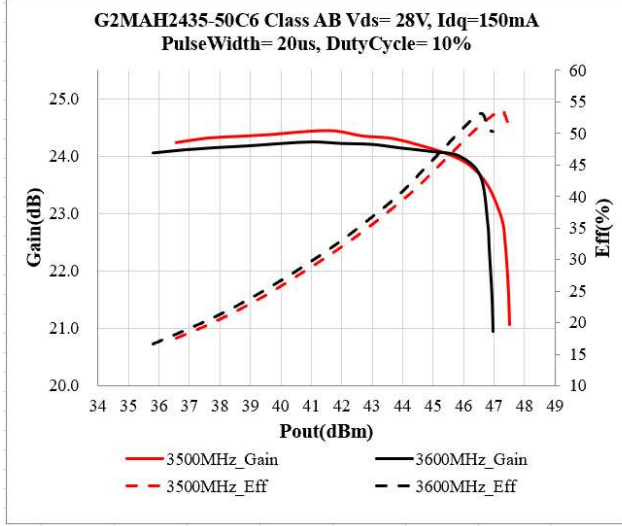
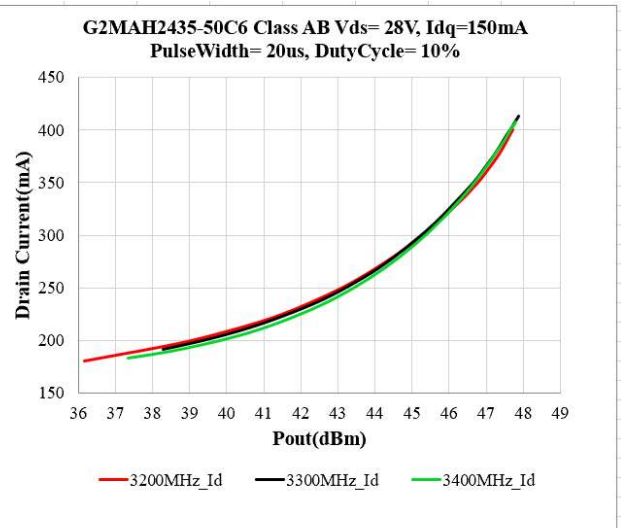
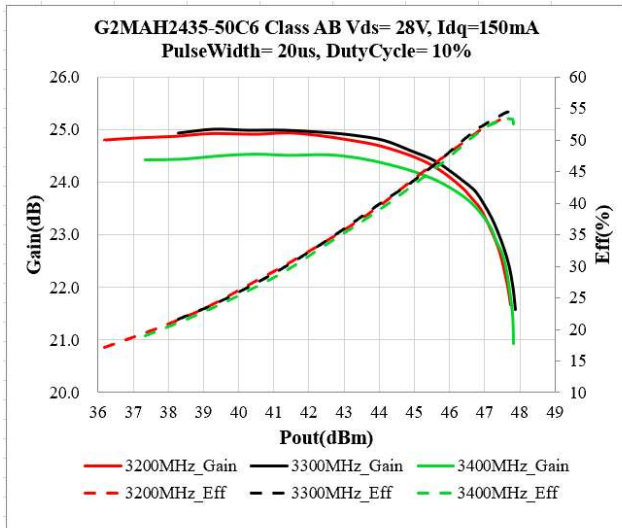




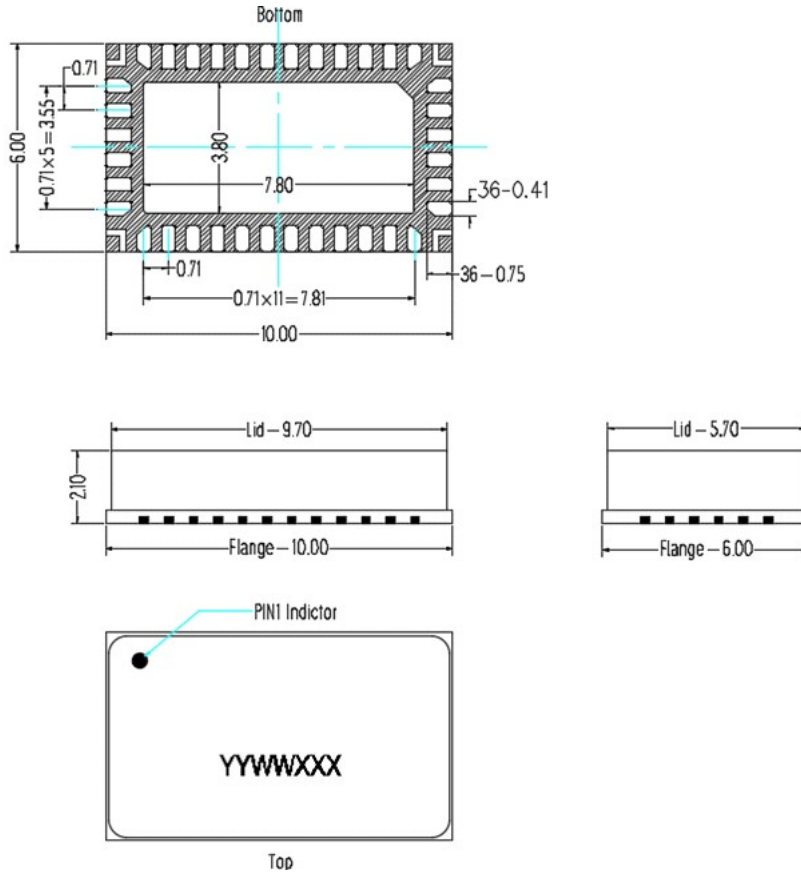
Figure 4. AM/AM Plot





## Package Dimensions

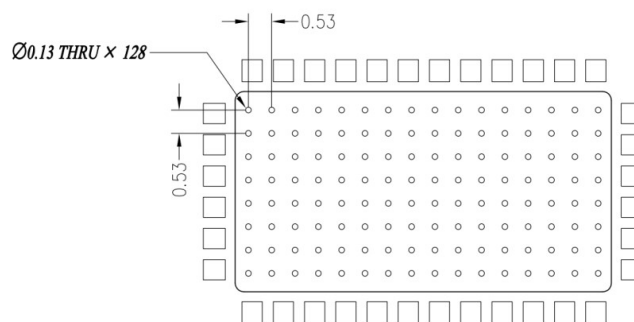
### 10\*6 Plastic Package



#### Notes:

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

<b>Date</b>	<b>Revision</b>	<b>Datasheet Status</b>
2023/12/22	Rev 1.0	Preliminary Datasheet Creation

Application data based on ZHH-23-13

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