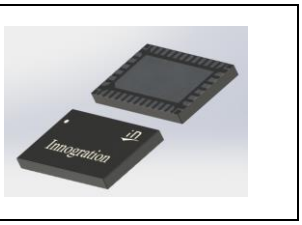
5-8GHz, 15W, 28V High Gain GaN Fully matched PA Module

Description



The X2MAH5080-15 is a 15-watt capable **,2 stage/high gain** integrated Power Amplifier Module, designed for broad band applications, with frequencies from 5 to 8GHz. The module is 50 Ω input/output matched and requires minimal external components. It can work at higher voltage like 32V with increased power capability

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.

V_{DS}= 28V, V_{gs1}=-2.6V I_{dq1}=6mA, V_{gs2}=-2.39V I_{dq2}=20mA, V_{gs3}=-2.35 V I_{dq3}=20mA, CW					
Freq (MHz)	**P1(dBm)**	**P1 Gain(dB)**	**P3dB(dBm)**	**P3dB(W)**	**EFF (%)**
5000	**41.14**	**21.1**	**42.30**	**17.0**	**44.4**
5500	**42.69**	**23.2**	**43.55**	**22.6**	**51.4**
6000	**42.52**	**26.9**	**43.23**	**21.1**	**54.8**
6500	**42.95**	**25.5**	**43.97**	**24.9**	**51.1**
7000	**42.87**	**24.3**	**43.58**	**22.8**	**47.3**
7500	**42.27**	**25.8**	**42.85**	**19.3**	**41.4**
7800	**41.16**	**24.3**	**41.88**	**15.4**	**31.6**
8000	**40.28**	**23.6**	**41.49**	**14.1**	**30.1**

Recommended driver: GMAH0095-2 or G2MAH0180-2 (resistor network or attenuator might needed for interstage VSWR)

Product Features

- Operating Frequency Range: 5-8GHz
- Operating Drain Voltage: +28 V up to 32V
- 50 Ω Input/Output
- Psat≥41.5 dBm
- Small signal gain:>22dB, Power gain:>19dB
- Minimum efficiency:>30%
- 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

Pin No.	Symbol	Description
1	VD1	Driver Amplifier, Drain Bias
3	VGS1	Driver Amplifier, Gate Bias
6	RF IN	RF Input
11	VGS2	Final Amplifier Path 1, Gate Bias
22	RF OUT	RF Output
27	VD2	Final Amplifier, Drain Bias
32	VGS3	Final Amplifier Path 2, Gate Bias
4,8-10,14-17,19,21,24,26,28,29,33-35	NC	No connection
2,5,7,12,13,18,20,23,25,30,31,36	GND	Internal Grounding, recommend connecting to Epad ground
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
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 T_C= 85°C, T_J=175°C, DC test	RθJC	TBD	°C/W

Table 3. Electrical Characteristics

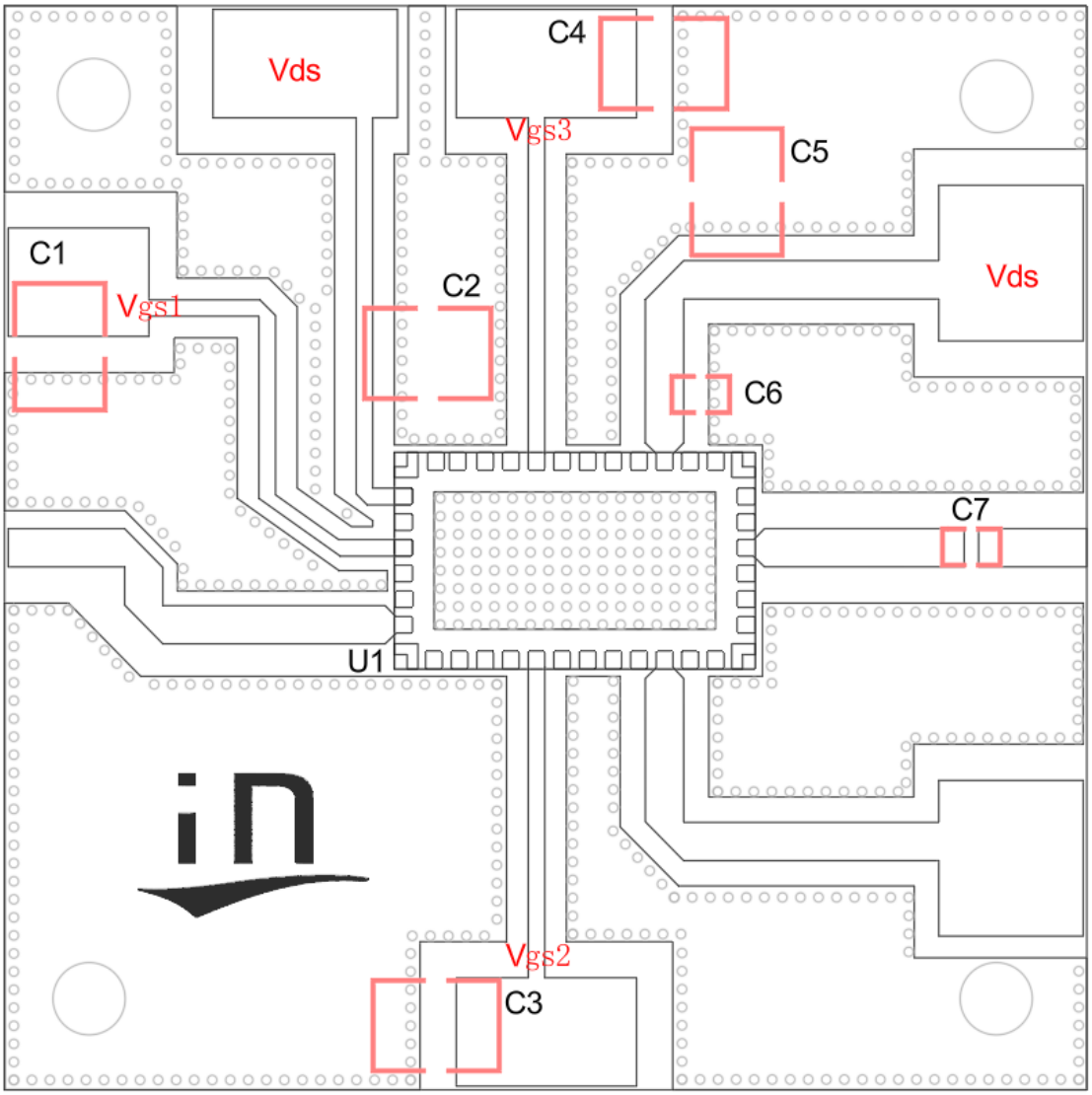
Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		5000		8000	MHz
Power Gain @ Psat		19			dB
P_{SAT}	Pulse		41.5		dBm
Drain Efficiency @ P_{SAT}		30			%
Unless otherwise noted: TA = 25°C, V_{DD} =28 V, Pulse Width=50 us, Duty cycle=20%					

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD} =28 V, I_{DQ} =25 mA, f = 8 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)

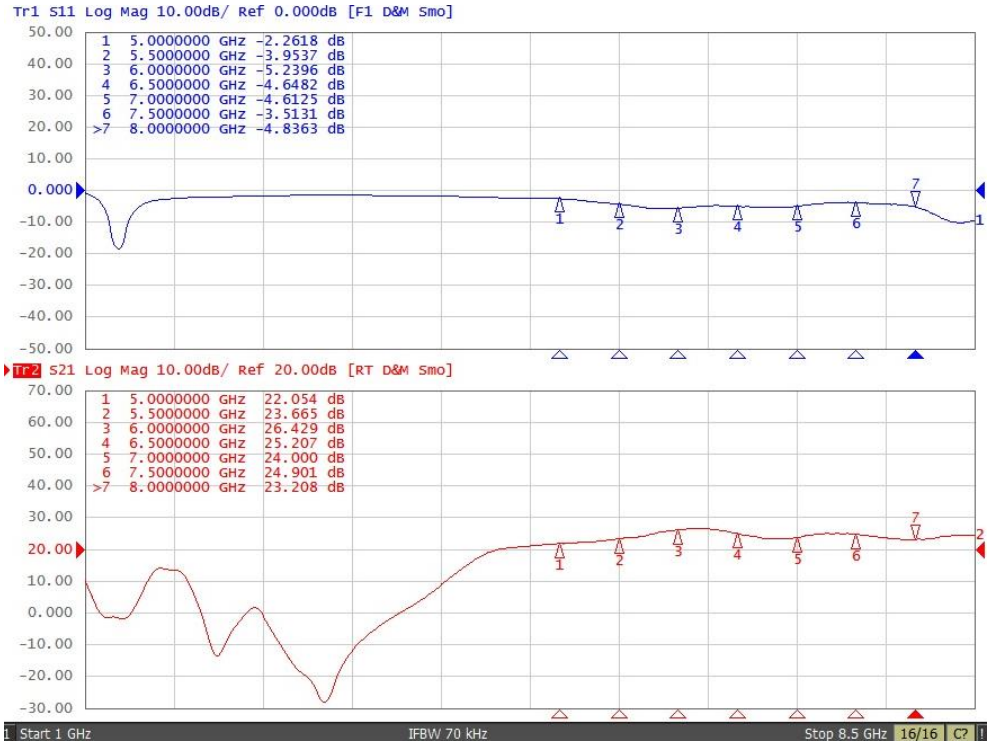
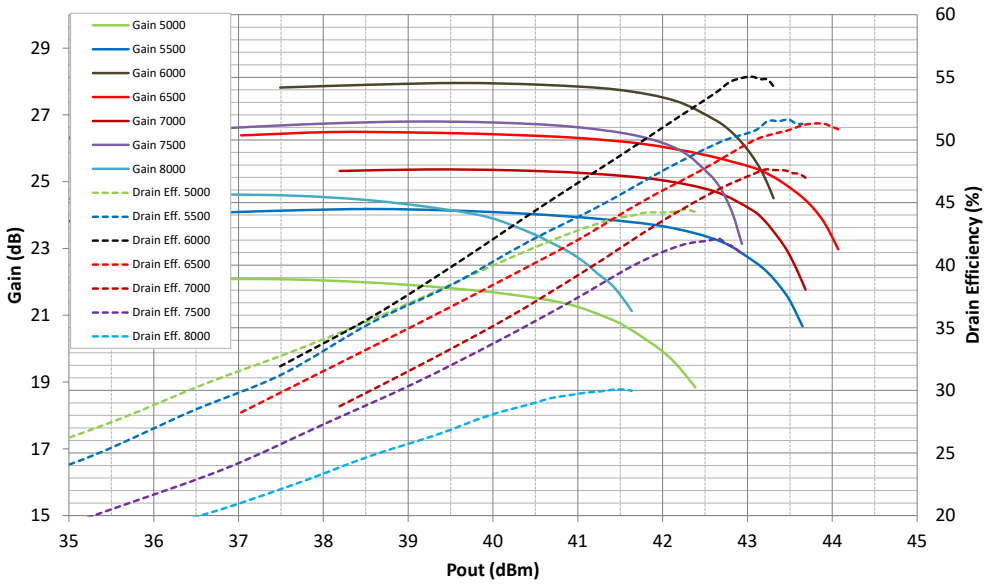
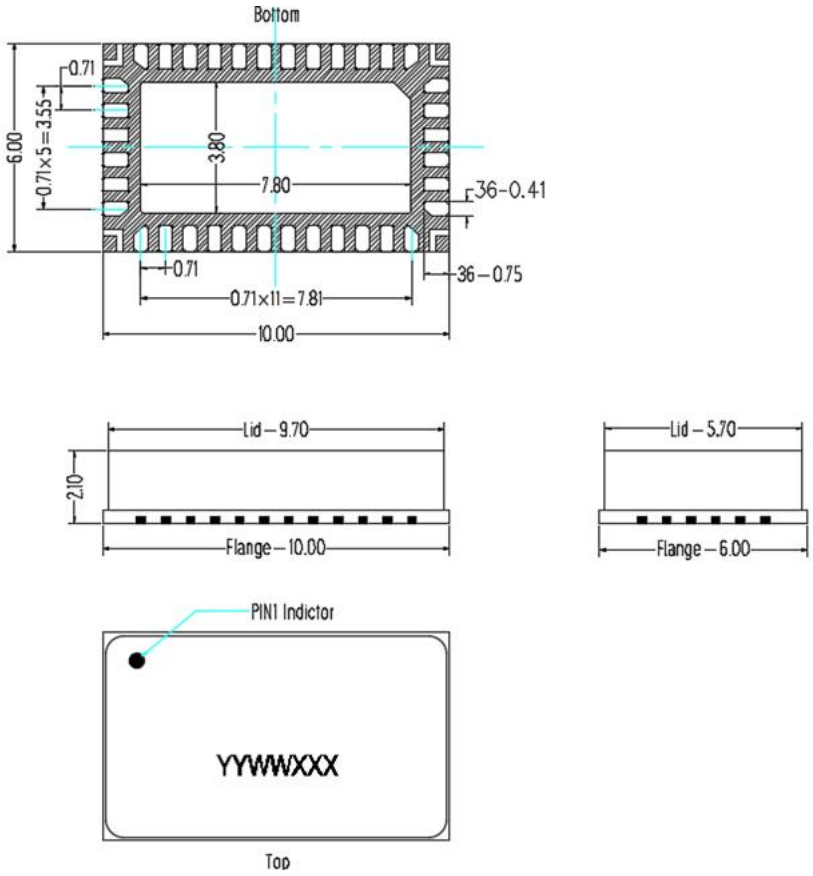


Figure 3. Pout gain，eff as function of Pout at 28V under pulsed CW



Package Dimensions

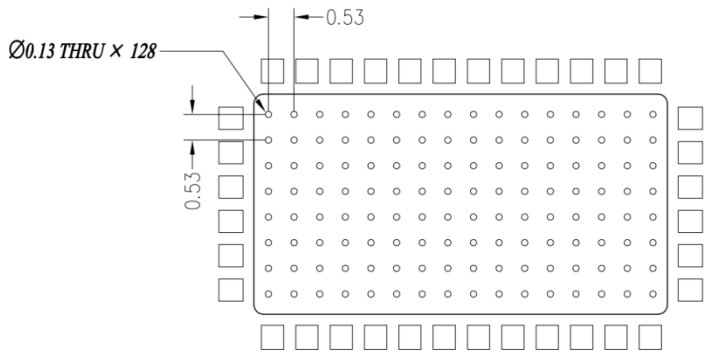
10*6 Plastic Package



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
2025/12/5	Rev 1.0	Preliminary Datasheet

Application data based on HJ-25-20

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