

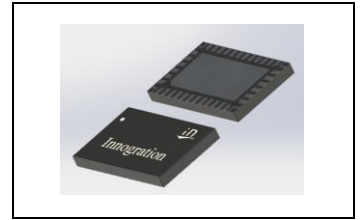


5-8GHz, 15W, 28V High Gain GaN Fully matched PA Module

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
- $P_{sat} \geq 41.5$ 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_{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 $T_c=85^\circ\text{C}, T_J=175^\circ\text{C}, \text{DC test}$	$R_{\theta JC}$	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			%

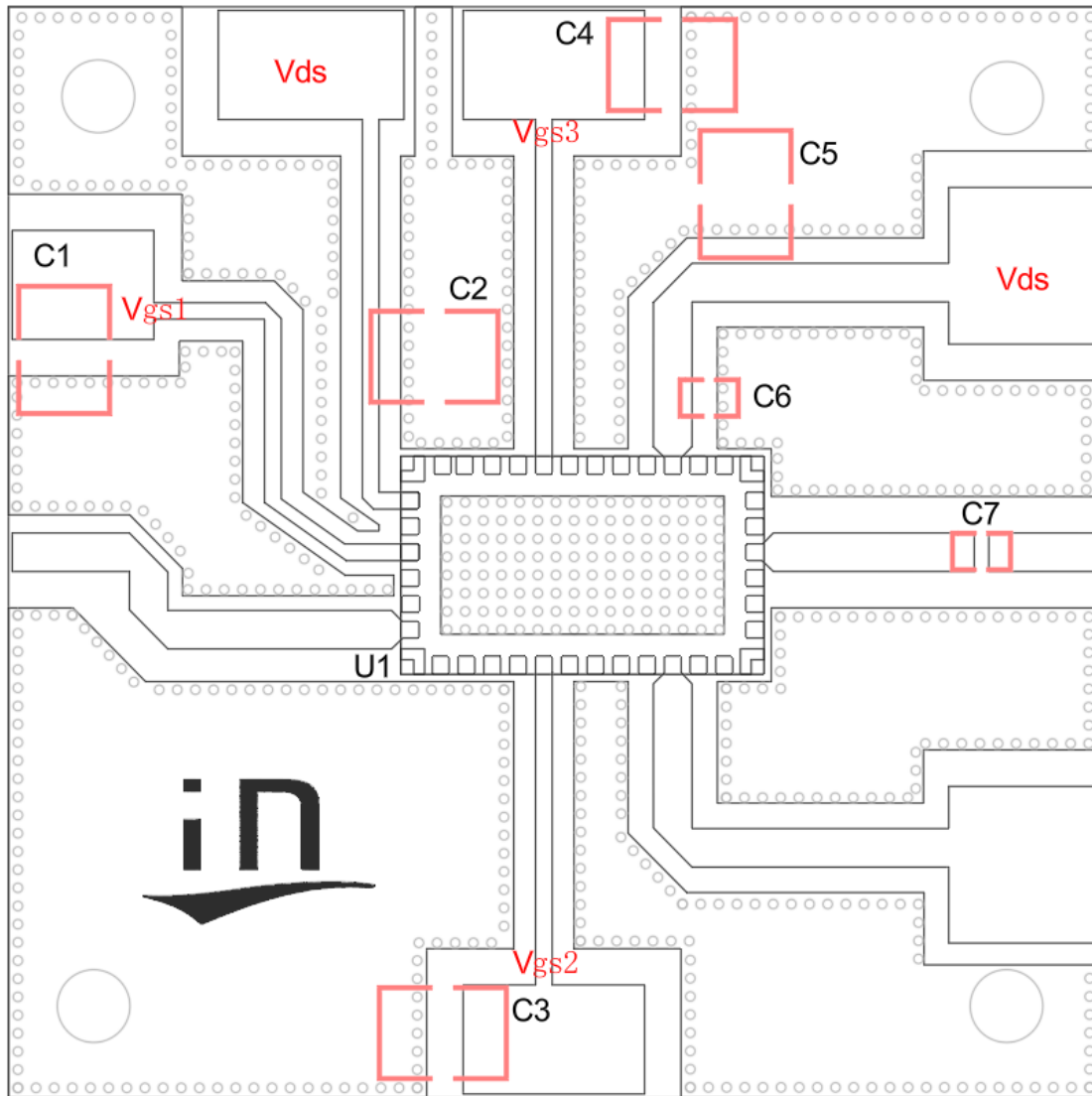
Unless otherwise noted: $T_A = 25^\circ\text{C}, V_{DD} = 28\text{ V}, \text{Pulse Width} = 50\text{ us}, \text{Duty cycle} = 20\%$

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

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



Component	Value	Description
U1	X2MAH5080_15	PA Module
C1、C2、C3、C4、C5	10uF	TDK1206
C6、C7	3.9pF	ATC600S

TYPICAL CHARACTERISTICS

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

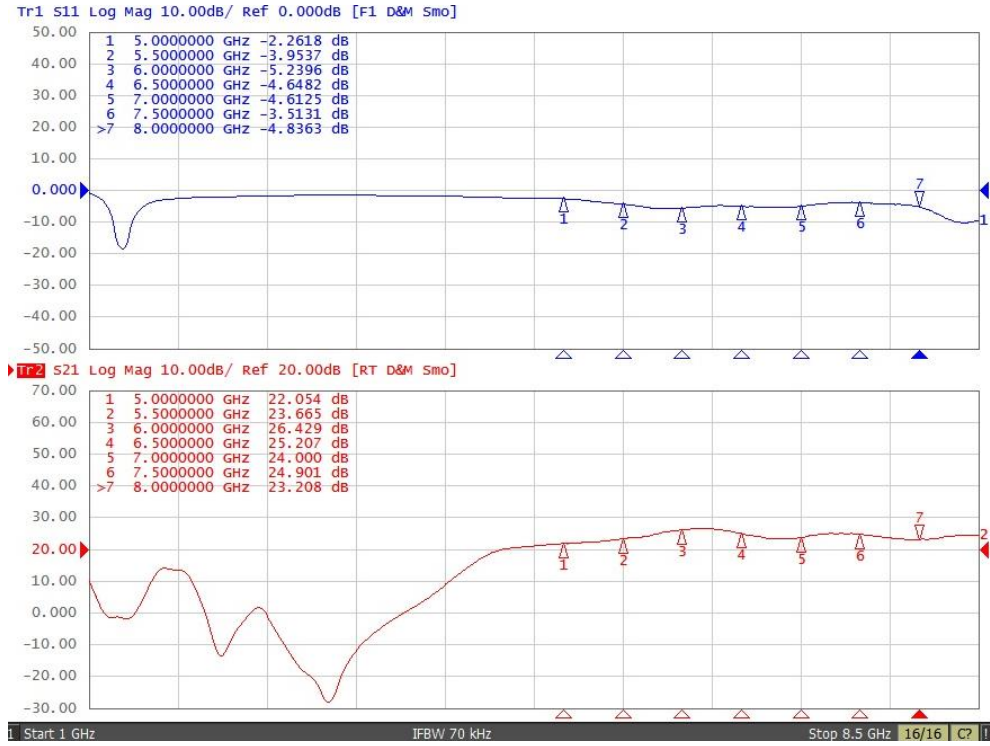
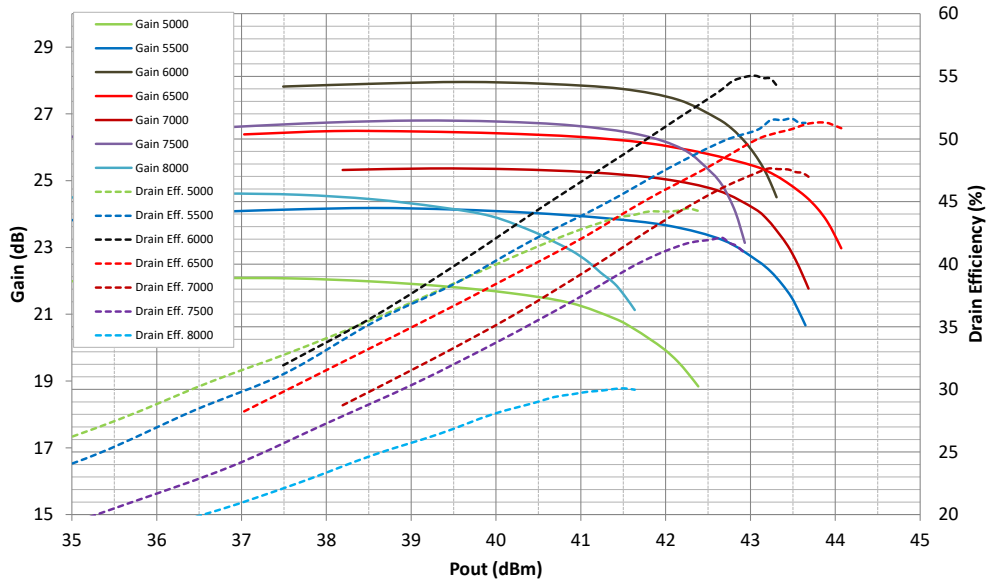


Figure 3. Pout gain, eff as function of Pout at 28V under pulsed CW





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

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.