

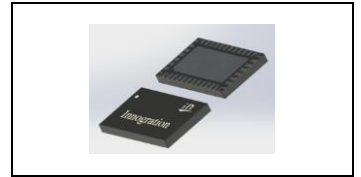


2.4-2.5GHz, 1 stage 1W, S band 28V GaN MMIC PA module

Description

The XMAH2425-1 is a 1-watt , single stage integrated Power Amplifier Module with high gain, high efficiency, designed for CW or linear back off applications, with frequencies from 2.4 to 2.5GHz. The module is 50 Ω input, and output matched and requires minimal external components, without DC block needed

The module implements innovative MMIC concept, housed in cost effective 10*6mm plastic open cavity package.



- VDS= 28V , Vgs =-2.44V, IDQ=5 mA, CW, **as Amplifier**

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
2400	30. 21	1. 1	52. 1	12. 78	31. 17	1. 3	57. 0
2450	30. 27	1. 1	54. 3	13. 13	31. 12	1. 3	58. 7
2500	30. 11	1. 0	54. 8	13. 75	30. 73	1. 2	57. 7

- VDS= 28V , Vgs =-2.5V, CW., **as Oscillator**

Vc (V)	Pout (mW)	Ids (mA)	Osc Freq (MHz)	Eff (%)
0	1160	77. 4	2357	53. 53
1	1200	76. 6	2400	55. 95
2	1160	72	2442	57. 54
3	1160	70	2496	59. 18
3. 3	1150	69. 3	2510	59. 27
4	1160	67. 6	2541	61. 28
5	1090	62. 8	2581	61. 99

Product Features

- Operating Frequency Range: 2.4-2.5GHz
- Operating Drain Voltage: +28 V (Up to 32V)
- 50 Ω Input/Output
- Psat: $\geq 1W$ @28V (CW)
- Power gain:>10dB
- Efficiency:>55%
- 6x10 mm Surface Mount Package

Applications

- 2450MHz ISM applications

Pin Configuration and Description





Pin No.	Symbol	Description
8	RF in	
35	RF out	
11	V _{gs}	
32	V _{ds}	
Others	NC	No internal 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	25	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°C, 1W Pulsed CW at 3GHz	R _{θJC}	TBD	°C/W

Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		2400		2500	MHz
Power Gain		11			dB
P _{OUT}	Pin=20dBm		31		dBm
Drain Efficiency @ P _{SAT}			55		%
Unless otherwise noted: TA = 25°C, V _{DD} =28 V, Pulse Width=20 us, Duty cycle=10%					

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD} =28 V,

VSWR 10:1 at pulse CW Output Power @Pin=13Bm 2.45GHz	No Device Degradation
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Amplifier

TYPICAL CHARACTERISTICS

Figure 1. Network analyzer output S11/S21 (Pin=0dBm)

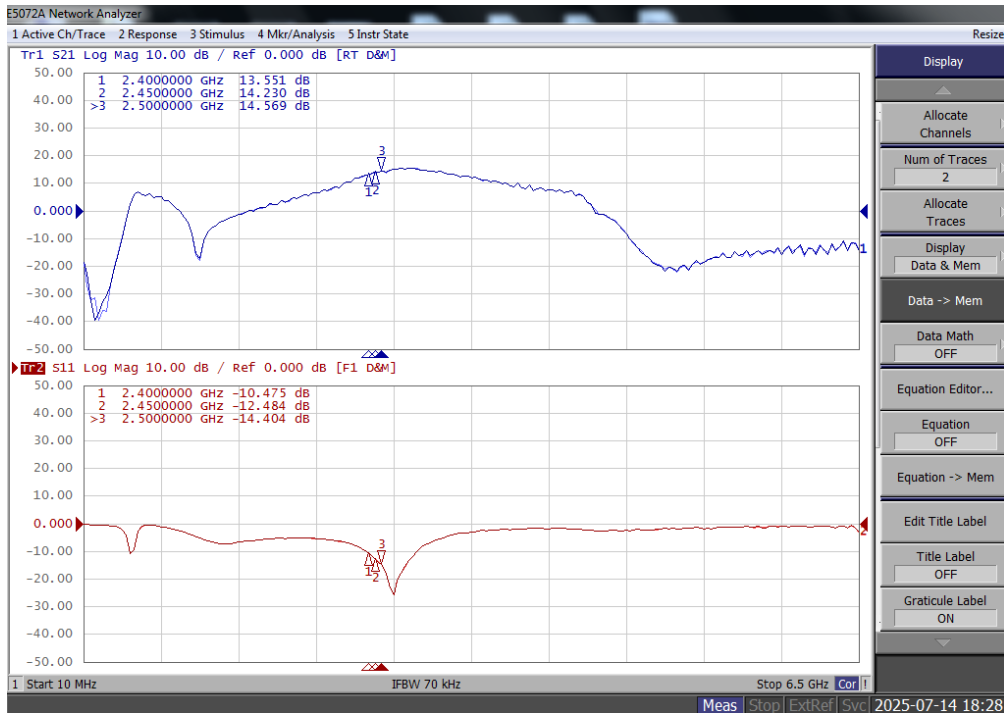
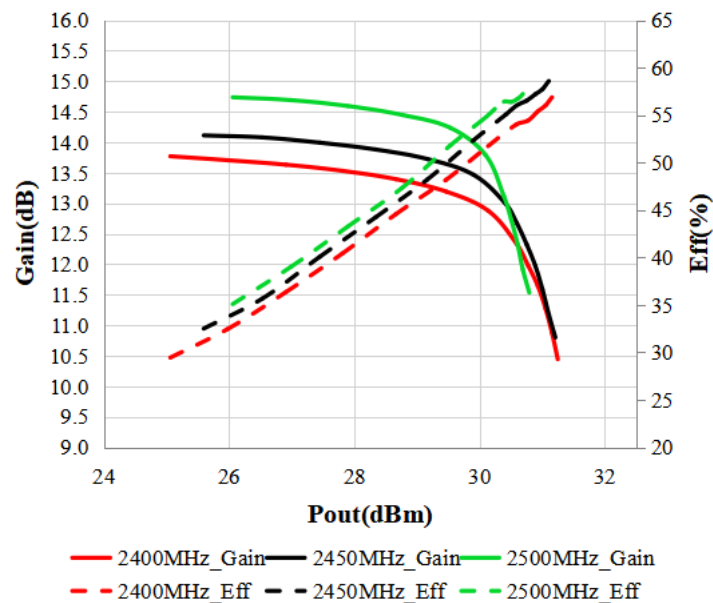
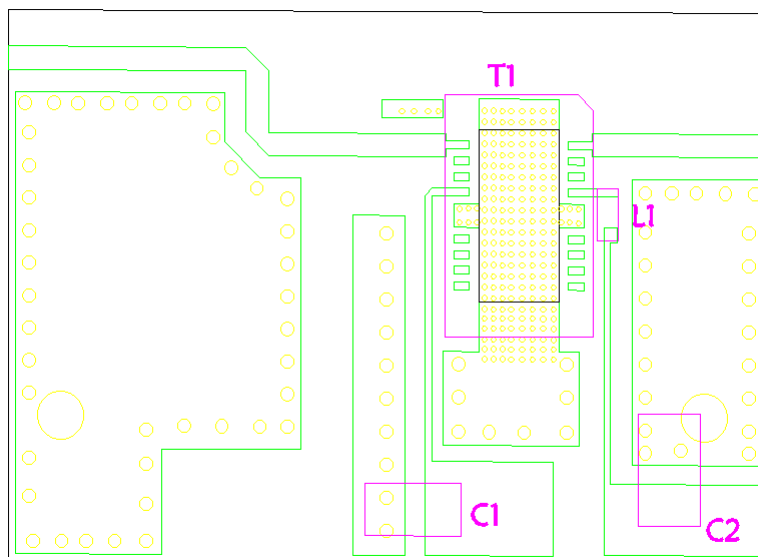


Figure 3. Power Gain and, efficiency Vs Pout

XTAH25001C6 Class AB $V_{ds}=28V$, $I_{dq}=4.7mA$
CW Test





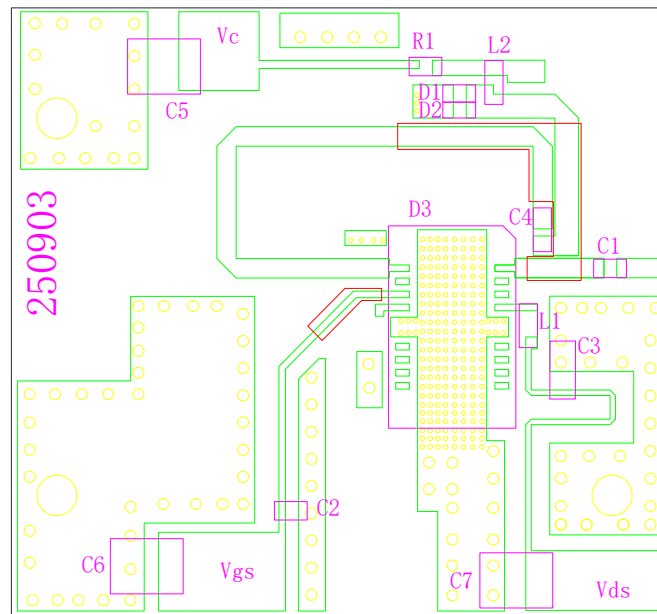
BOM of Test Circuit

Designator	Footprint	Comment	Quantity
C1,C2	1210	10uF/100V	2
L1	0603	1.5nH	1
T1		XTAH25001C6	1

Oscillator

TYPICAL CHARACTERISTICS



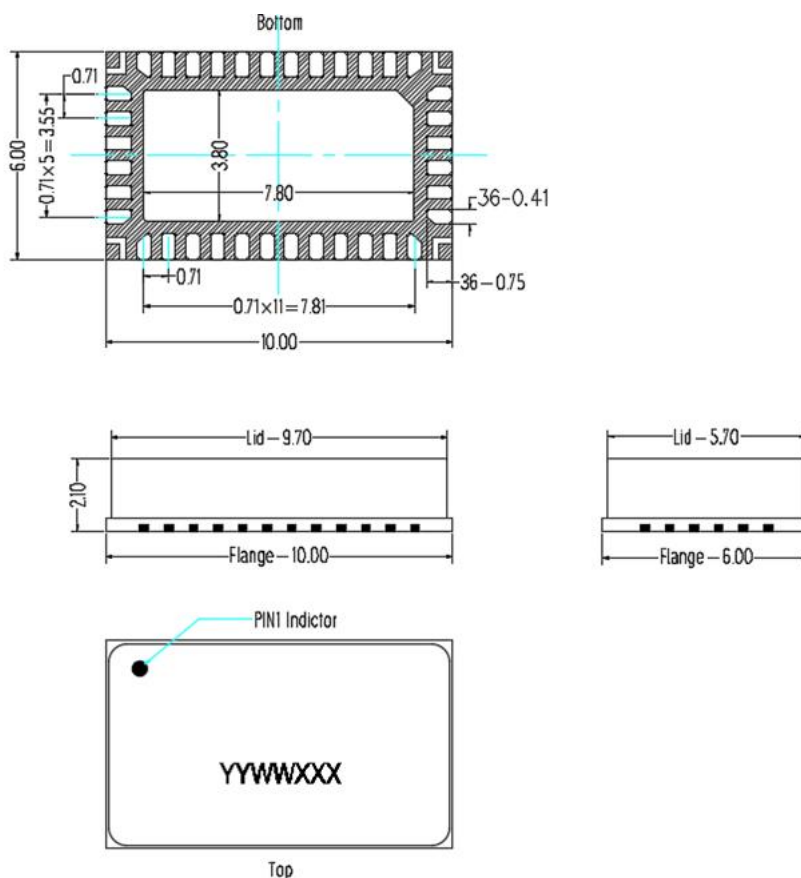


BOM of Test Circuit

Designator	Footprint	Comment	Quantity
C1, C2, C3	0603	0.7pF	3
C4	0603	0.2pF	1
C5, C6, C7	1210	10uF/100V	3
R1	0603	560R	1
L1	0603	8.2nH	1
L2	0603	82nH	1
D1, D2	SC-79	SMV1234-079	2
D3	C6	XMAH2425-1	1

Package Dimensions

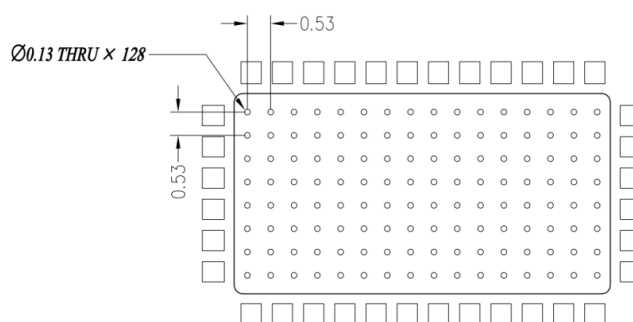
10*6 Plastic Package



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
2025/7/15	Rev 1.0	Advanced Datasheet Creation
2025/9/16	Rev 2.0	Add Osc application data

Application data based on LWH-25-30/LSM-25-29

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