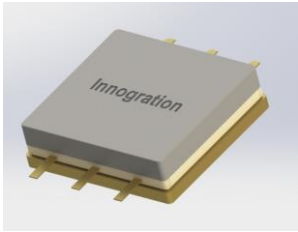
DC-2.3GHz, 25W, 50V GaN Fully matched PA Module



Description

The SMAV0023-25H2C is a 25-watt Psat, CW capable,single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from 10MHz to 2.3GHz. The module is 50 Ω input/output matched and requires minimal external components. When extended to 2.5GHz, it can deliver 20W across the full band.

Please read carefully the soldering notice for H2C package on last page

V_{DS}= 50V, I_{DQ}=50 mA CW

Parameter	10MHz	0.1GHz	0.5GHz	1.0GHz	1.5GHz	2.0GHz	2.3GHz	2.5GHz	Units
Linear Gain	19.7	19.3	19.0	18.1	16.7	15.5	14.7	14.4	dB
Gain@Pin=30dBm	14.3	14.6	15.7	15.2	14.6	14.0	13.4	12.7	dB
Pout@Pin=30dBm	27.0	28.9	36.7	33.4	28.6	25.1	22.1	18.7	W
PAE@Pin=30dBm	62	80	77	60	49	50	48	43	%

Parameter	10MHz	0.1GHz	0.5GHz	1.0GHz	1.5GHz	2.0GHz	2.3GHz	2.5GHz	Units
Gain@P3dB	16.7	16.3	16.0	15.1	13.7	12.5	11.8	11.4	dB
Pout@P3dB	23.1	25.7	35.8	33.5	31.0	32.0	29.5	23.7	W
Eff@P3dB	59	77	76	60	51	54	50	45	%

Product Features

- Operating Frequency Range: 10MHz-2.3GHz (2.5GHz)
- Operating Drain Voltage: +50 V
- 50 Ω Input/Output
- Psat: ⩾25W (CW) (20W)
- Small signal gain:>15dB, Power gain:>11dB
- Minimum efficiency:40%
- 6x10 mm Surface Mount Package
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Applications

- Ultra Broadband Amplifiers
- L/S band pulsed power Amplifier
- Test Instrumentation
- EMC Amplifier Drivers
- 2-way Radios

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	200	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	+55	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= 25°C, DC test	$R_{\theta JC}$	3.2	°C/W

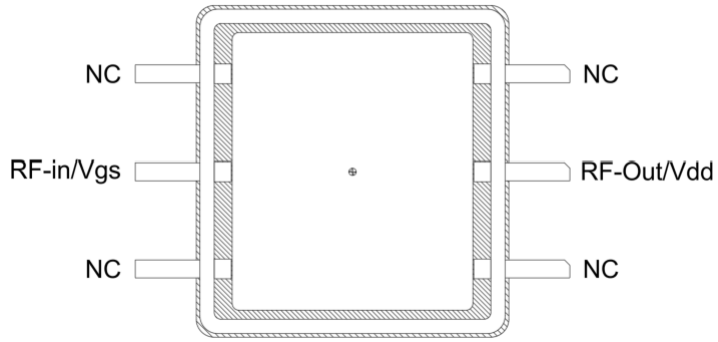
Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		10		2300	MHz
Power Gain @ Psat		11			dB
P_{SAT}		25			W
Drain Efficiency @ P_{SAT}		40			%
Unless otherwise noted: TA = 25°C, V_{DD} =50 V, Pulse Width=20 us, Duty cycle=10%					

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD} =50 V, I_{DQ} =50mA, f = 2GHz

VSWR 10:1 at Psat pulse CW Output Power	No Device Degradation

Pin Configuration and Description



Top View

Pin No.	Symbol	Description
	RF-Out/Vdd	Drain Bias & RF Output
	RF-in/Vgs	Gate Bias & RF Input
	NC	No connection

10-2300MHz

TYPICAL CHARACTERISTICS

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

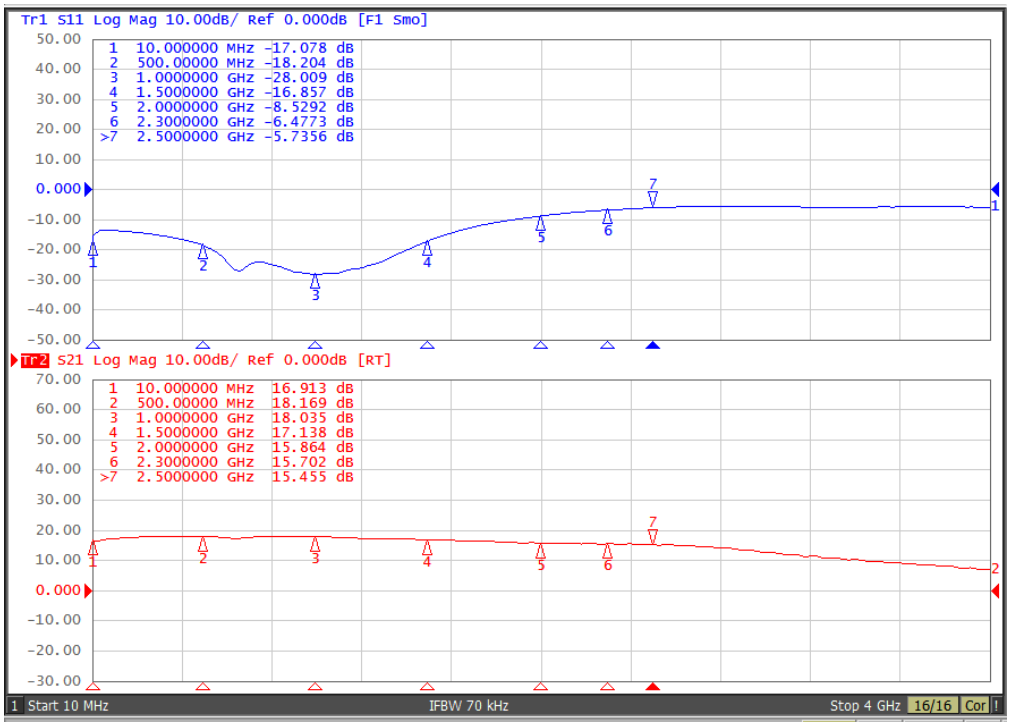


Figure 2 . AM/AM Plot

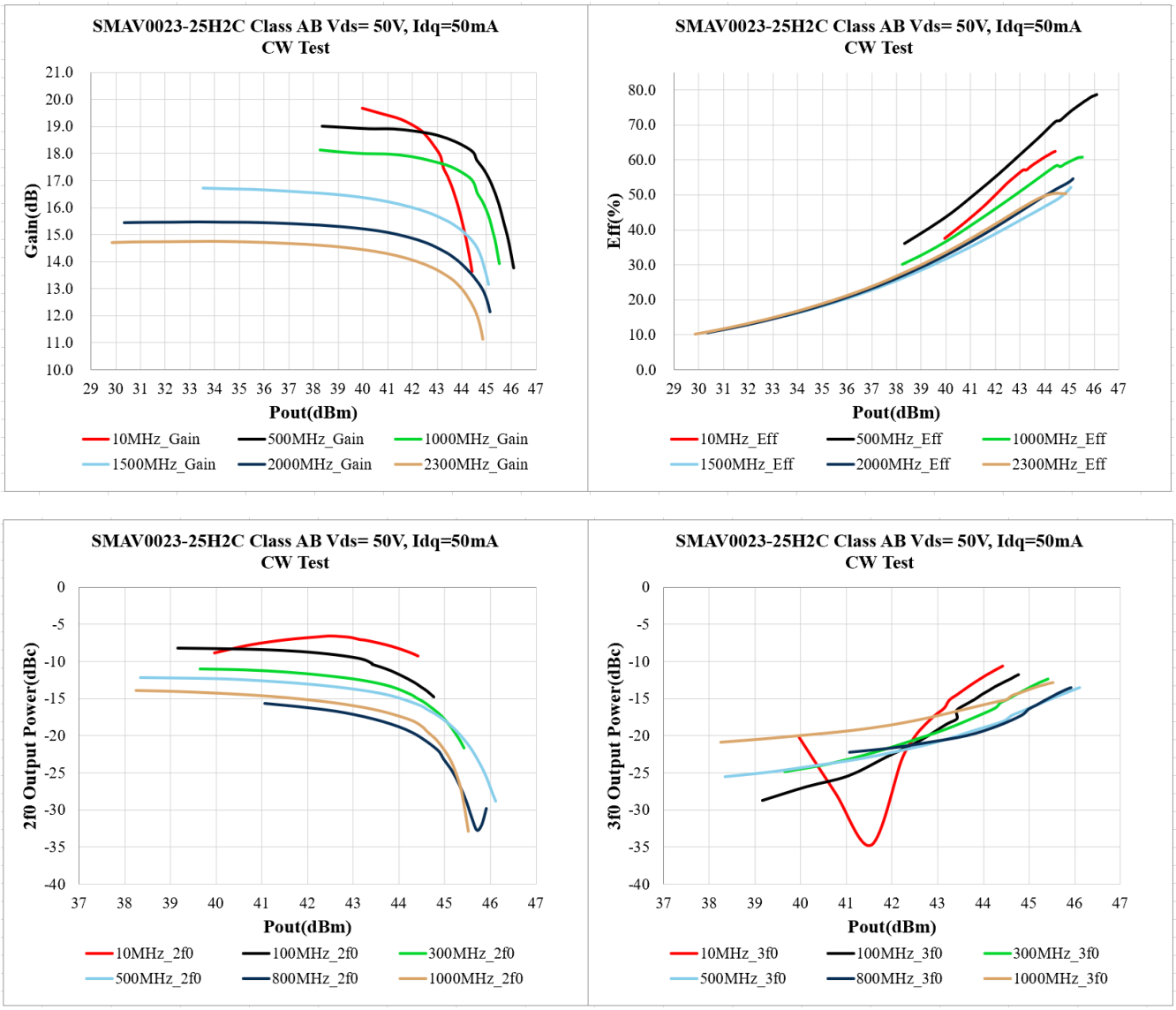


Figure 3. Pout, Power Gain and, efficiency vs. Frequency @Pin=30dBm

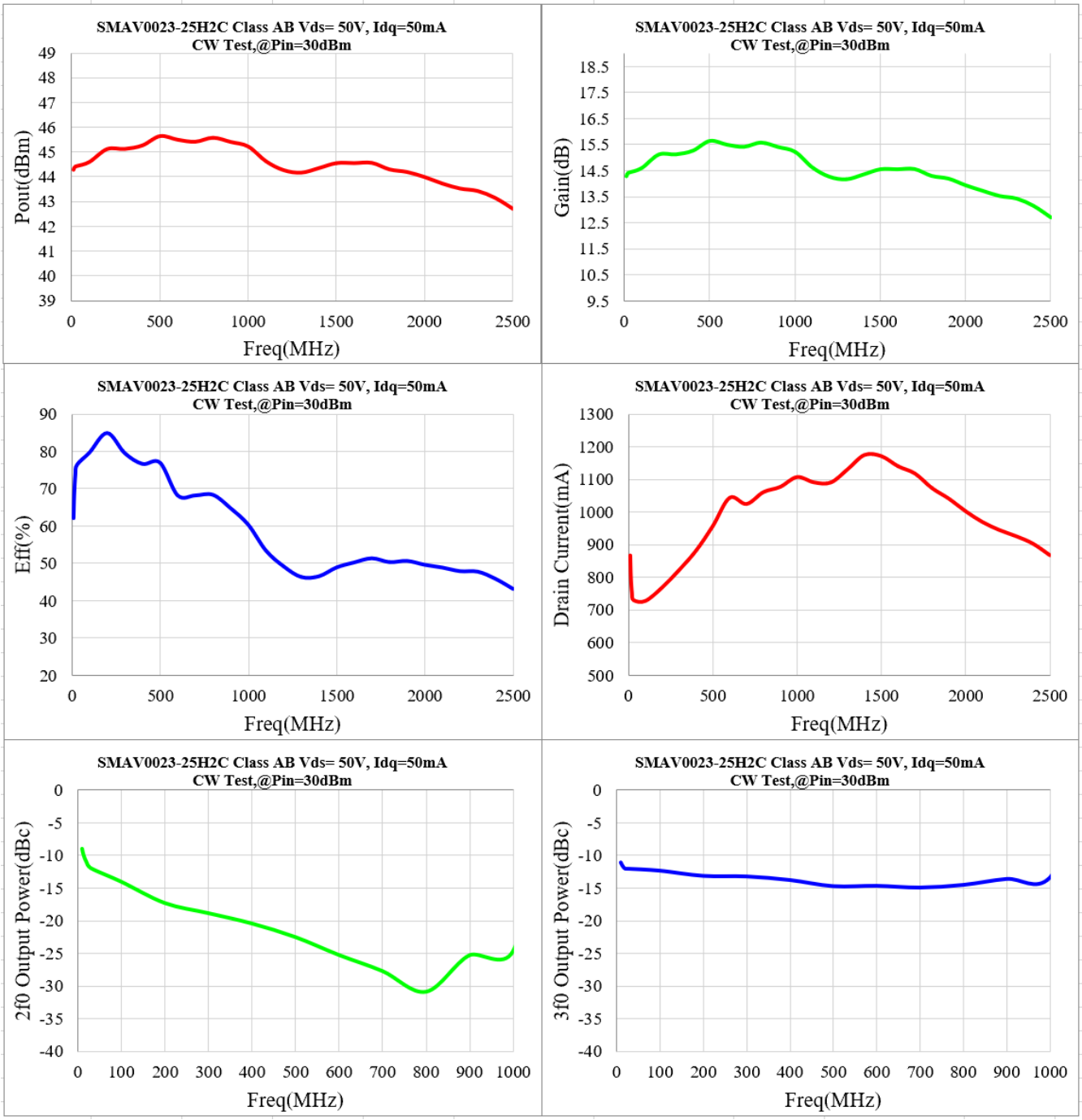
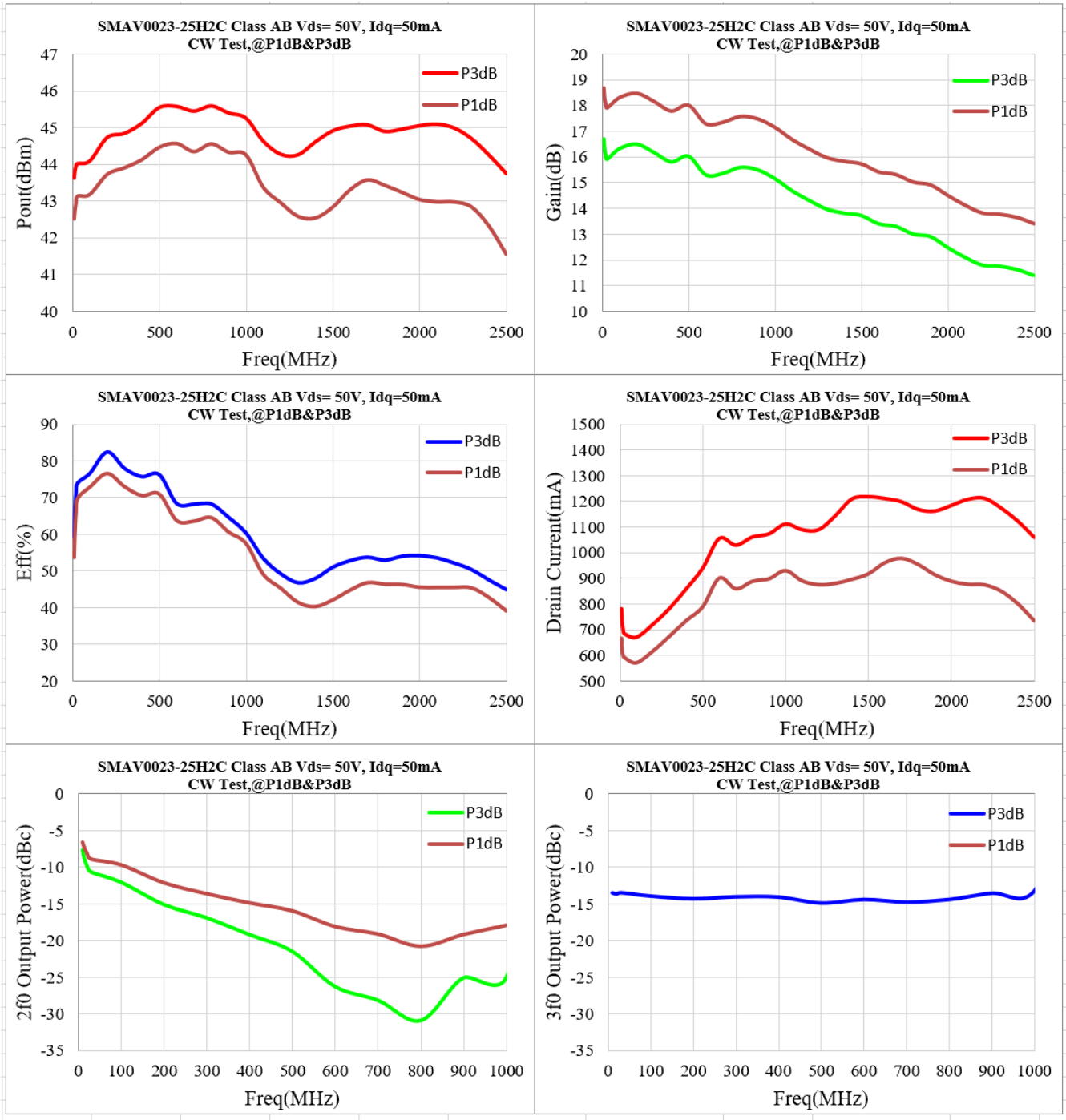
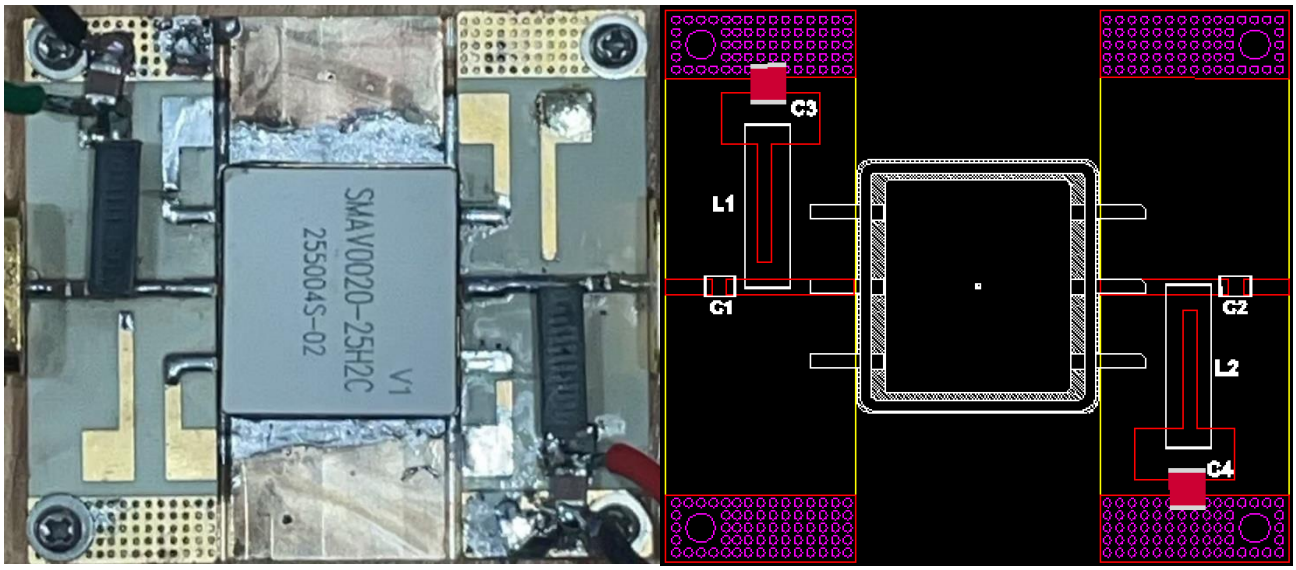


Figure 4. Pout, Power Gain and, efficiency vs. Frequency @P1dB，P3dB

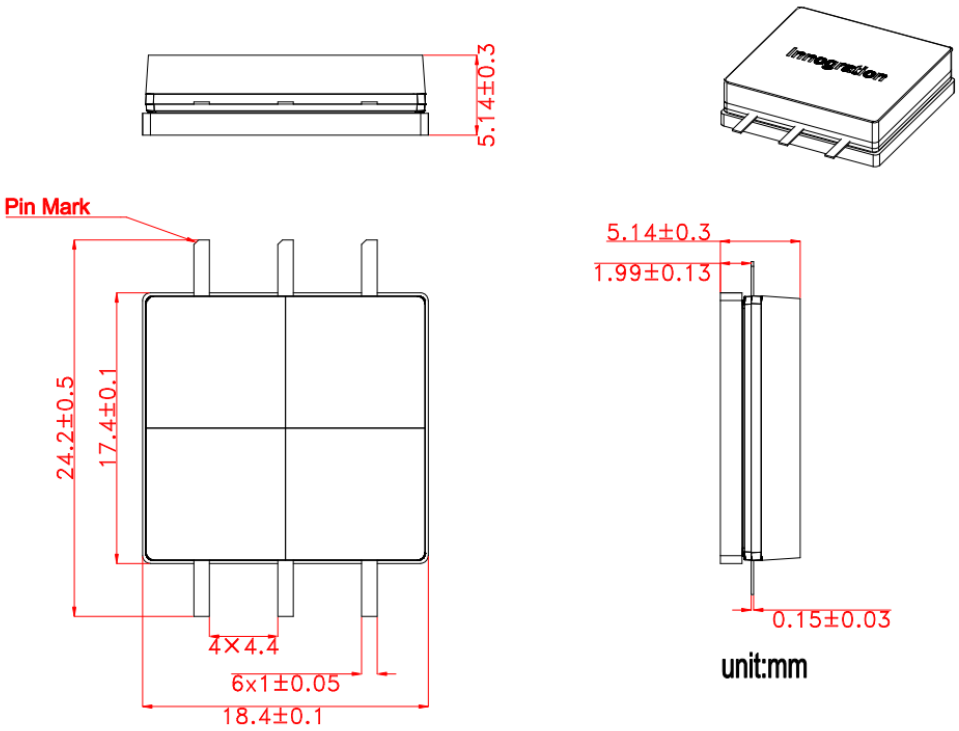


Reference Circuit of Test Fixture Assembly Diagram



		Part NO.	Vendor
C1,C2	50V 1uF Chip Capacitor	GRM21BR71H105KA12L	muRata
C3,C4	10uF 100V Chip Capacitor	C5750X7S2A106M230KB	TDK
L1,L2	1.3uH 4.2A Inductor	4310LC-132KEC	Coilcraft
PCB	RO4350B,20mil,er=3.48		

Package Dimensions （Unit:mm）



When soldering, the temperature of the iron tip must be below 220℃. The contact time between the iron tip and the pins should be as short as possible, not exceeding 10 seconds. The number of repeated soldering operations must not exceed 3 times. Otherwise, it may damage the bond between the ACP lead frame and the pins, resulting in failure of the component's sealing performance.

Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2025/12/18	Rev 1.0	Production Datasheet

Application data based on ZHH-25-31 (2+2*1.2)

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