



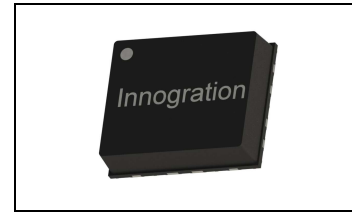
1.0-4.0GHz, 30W, 50V GaN Fully matched PA Module

Description

The SMAV1040-30C9 is a 30-watt, single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from 1 to 4GHz. The module is 50 Ω input/output matched and requires minimal external components.

When used at 28V ,it can enable >15W CW Psat across the same 1 to 4GHz.

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.



Vds= 50V, Vgs=-2.99V, Idq=30mA					
Pulse Peak Power, 50us, 20%					
Freq(MHz)	P-1(dBm)	P-1Gain(dB)	P-3(dBm)	P-3(W)	Eff (%)
1000	43.95	13.1	45.40	34.7	48.9
2000	43.31	13.6	44.80	30.2	36.9
3000	43.77	13.6	45.70	37.1	45.7
4000	44.17	13.8	45.67	36.9	52.4

Vds= 28V, Vgs=-2.99V, Idq=30mA					
CW					
Freq(MHz)	P-1(dBm)	P-1Gain(dB)	P-3(dBm)	P-3(W)	Eff (%)
1000	40.58	11.5	42.13	16.3	58.8
2000	39.92	11.6	42.19	16.6	44.9
3000	40.79	12.5	43.03	20.1	62.7
4000	39.40	12.0	41.87	15.4	59.3

Product Features

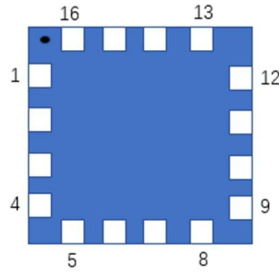
- Operating Frequency Range: 1-4GHz
- Operating Drain Voltage: +50 V / 28V
- 50 Ω Input/Output
- Psat ≥ 30W (Pulse) / 15W(CW)
- Small signal gain: >13dB, Power gain: >10dB @50V
- Minimum efficiency: >35% @50V
- 12x10 mm Surface Mount Package
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Applications

- Ultra Broadband Amplifiers
- Fiber Drivers
- Test Instrumentation
- EMC Amplifier Drivers
- 2-way Radios



Pin Configuration and Description (Top view)



Pin No.	Symbol	Description
4	RF IN	RF Input
9	RF OUT	RF Output
6	Vgs	Gate bias
7	Vdd	Drain bias
Others	NC	No connection
Package Base	GND	DC/RF Ground. Proposed to be soldered to heatsink plane directly for the best CW thermal and RF performance. Soldered through high density vias or copper coin also allowed ,but will result in excessive junction temperatures and different RF performance

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	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 $T_c = 85^\circ\text{C}$, DC test, surface mounted through vias	$R_{\theta JC}$	3.2	°C/W

Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		1000		4000	MHz
Power Gain @ Psat		10			dB
P_{SAT}	Pulse		45		dBm
Drain Efficiency @ P_{SAT}		35			%

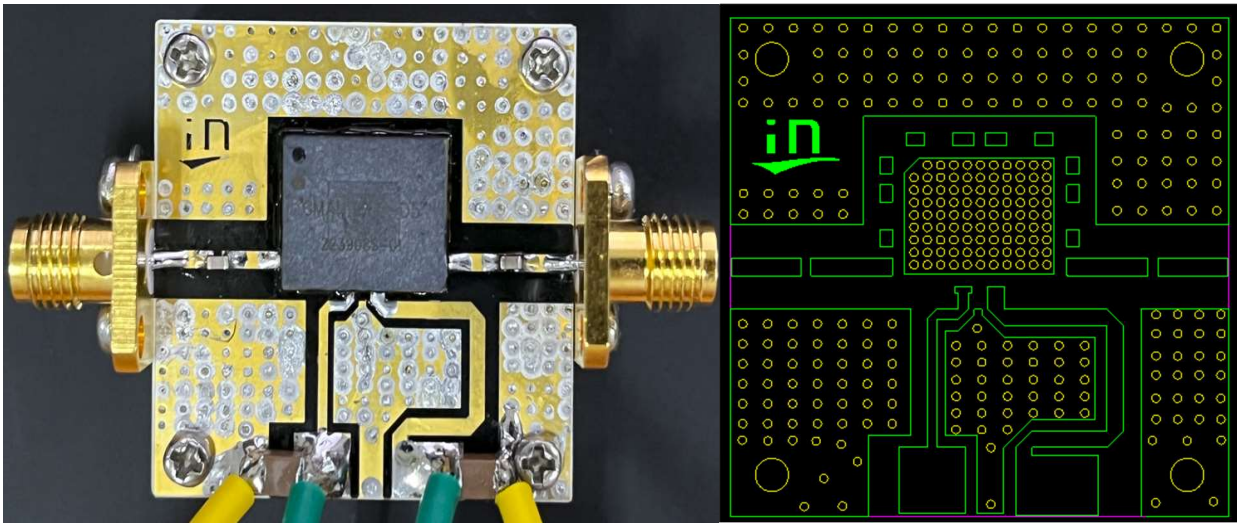
Unless otherwise noted: $T_A = 25^\circ\text{C}$, $V_{DD} = 50\text{ V}$, Pulse Width=50 us, Duty cycle=20%

Load Mismatch of per Section (On Test Fixture, 50 ohm system): $V_{DD} = 50\text{V}$, $I_{DQ} = 30\text{ mA}$, $f = 3.5\text{ GHz}$

VSWR 10:1 at Psat pulse CW Output Power	No Device Degradation
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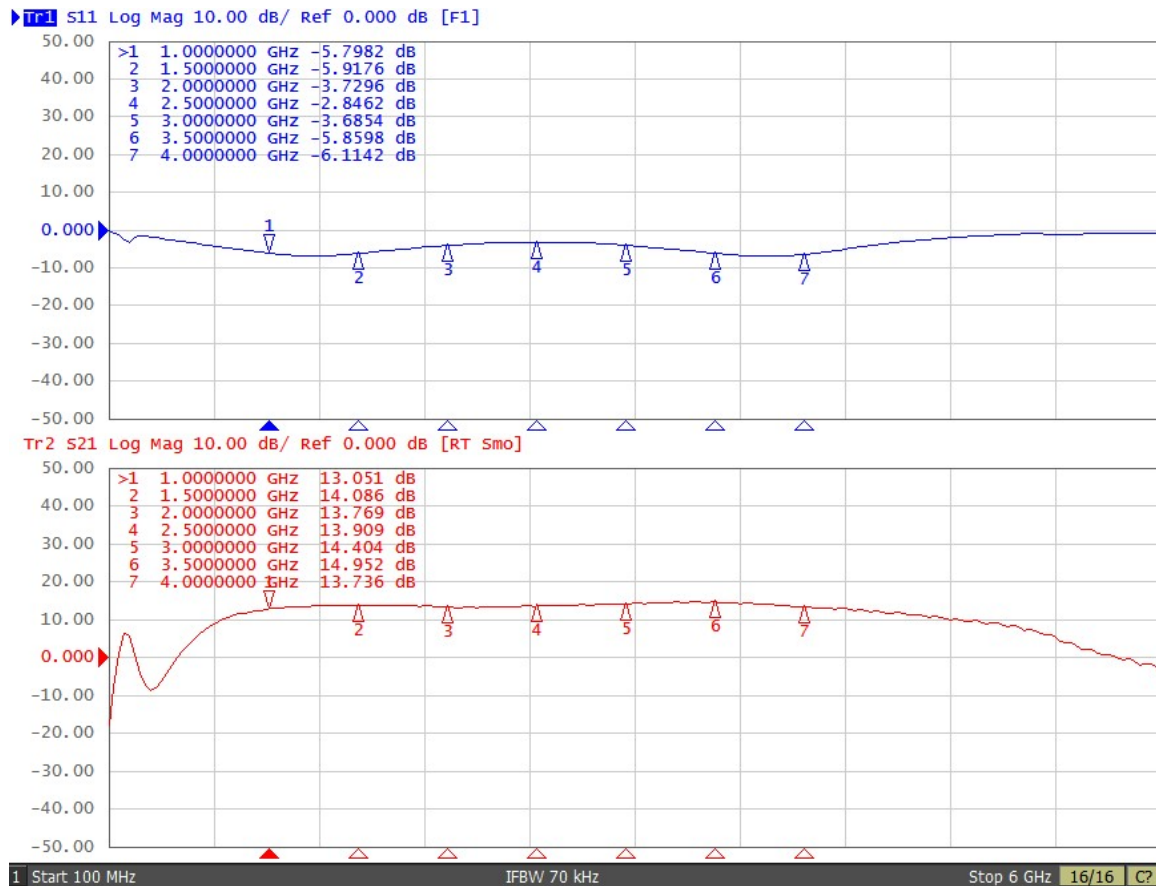
Reference Circuit of Test Fixture Assembly Diagram

Figure 1. Test Circuit Component Layout

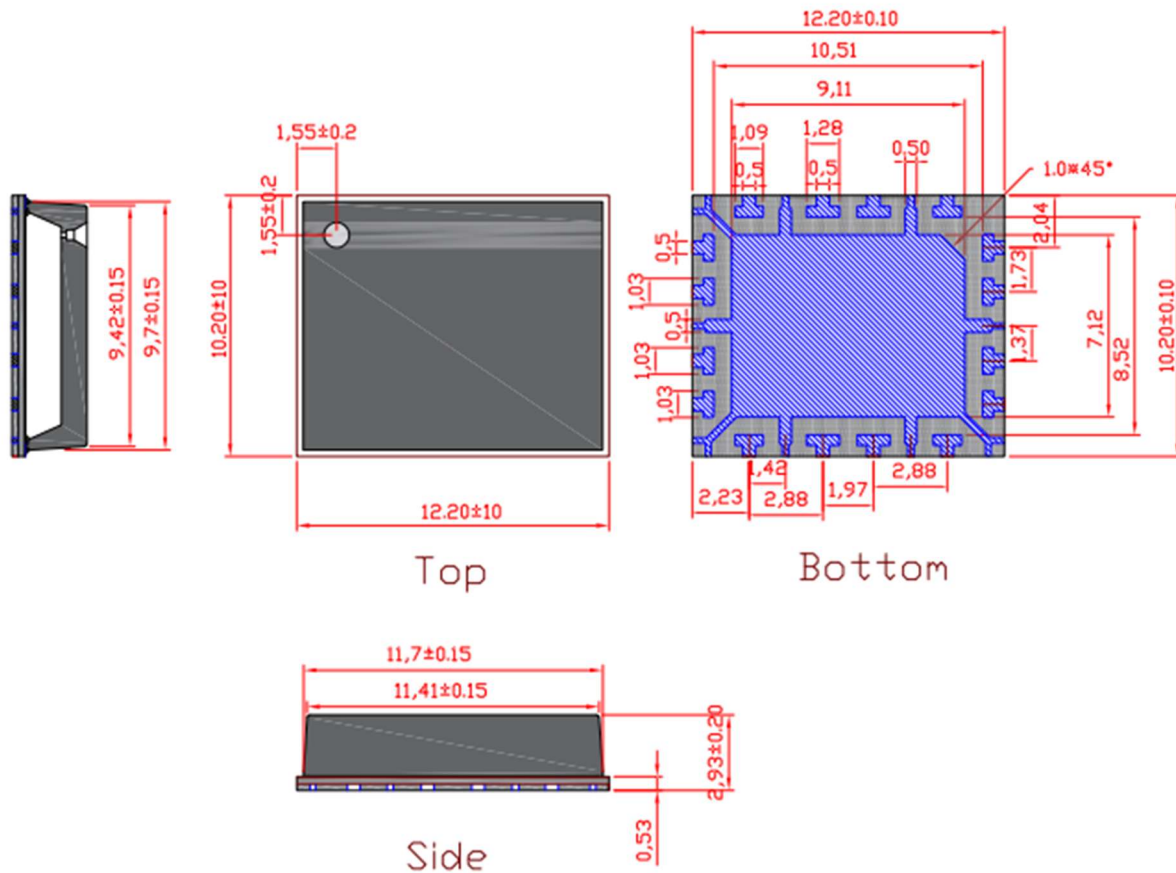


TYPICAL CHARACTERISTICS

Figure 2. Network analyzer output S11/S21 (Pin=0dBm) at 50V



Package Dimensions (Unit:mm)



Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2023/5/5	Rev 1.0	Preliminary Datasheet

Application data based on HJ-23-07

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