



2.0-6.0GHz, 30W, 50V GaN Fully matched PA Module

Description

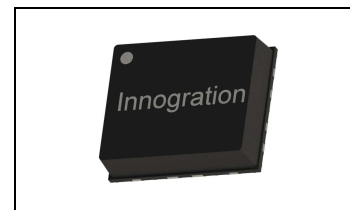
The SMAV2060-30C9 is a 30-watt, single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from 2 to 6GHz. The module is 50 Ω input/output matched and requires minimal external components.

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.

Please notice that

For CW, it is strongly recommended to solder device onto the heatsink directly

For Pulse, it is acceptable to solder device through high density metalized grounding vias



$V_{ds} = 50V, V_{gs} = -2.99V, I_{dq} = 40mA$					
Pulse Peak Power, 100us, 10%					
Freq(MHz)	P-1(dBm)	P-1Gain(dB)	P-3(dBm)	P-3(W)	EFF (%)
2000	44.18	12.2	44.98	31.5	44.2
3000	44.75	15.2	46.02	40.0	55.5
4000	44.27	12.4	45.99	39.8	49.4
5000	44.86	10.0	45.88	38.7	57.3
6000	43.74	10.9	44.95	31.2	52.7

$V_{ds} = 50V, V_{gs} = -2.99V, I_{dq} = 40mA$					
CW Power					
Freq(MHz)	P-1(dBm)	P-1Gain(dB)	P-3(dBm)	P-3(W)	EFF (%)
2000	43.48	11.7	44.72	30.1	44.0
3000	43.85	14.5	45.63	36.6	53.2
4000	42.83	11.7	45.32	34.0	46.1
5000	43.56	9.8	45.37	34.5	53.1
6000	42.56	10.7	44.44	29.0	48.8

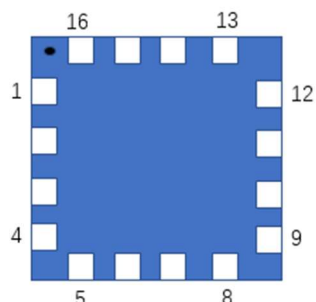
Product Features

- Operating Frequency Range: 2-6GHz
- Operating Drain Voltage: +50 V
- 50 Ω Input/Output
- $P_{sat} \geq 30W$ (Pulse)
- Small signal gain: >12dB, Power gain: >8dB
- Minimum efficiency: >40%
- 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	V _{gs}	Gate bias
7	V _{dd}	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°C, DC test, soldered on heatsink directly	R _{θJC}	3	°C/W

Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		2000		6000	MHz
Power Gain @ P _{sat}		10			dB
P _{SAT}	Pulse		45		dBm
Drain Efficiency @ P _{SAT}		40			%

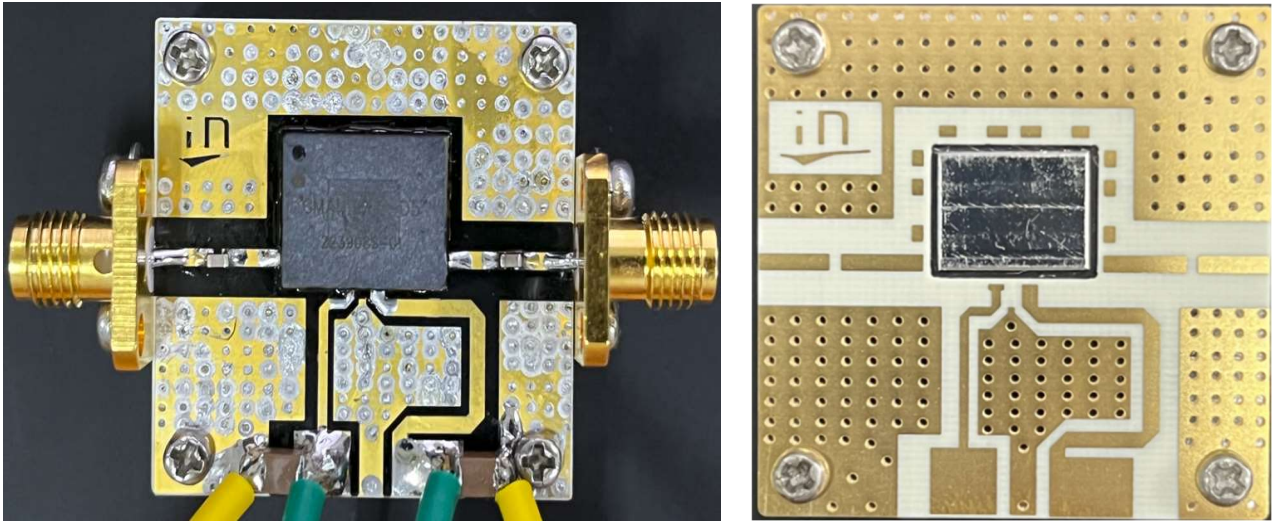
Unless otherwise noted: T_A = 25°C, V_{DD} =50 V, Pulse Width=50 us, Duty cycle=20%

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD}=50V, I_{DQ}=40 mA, f = 3.5 GHz

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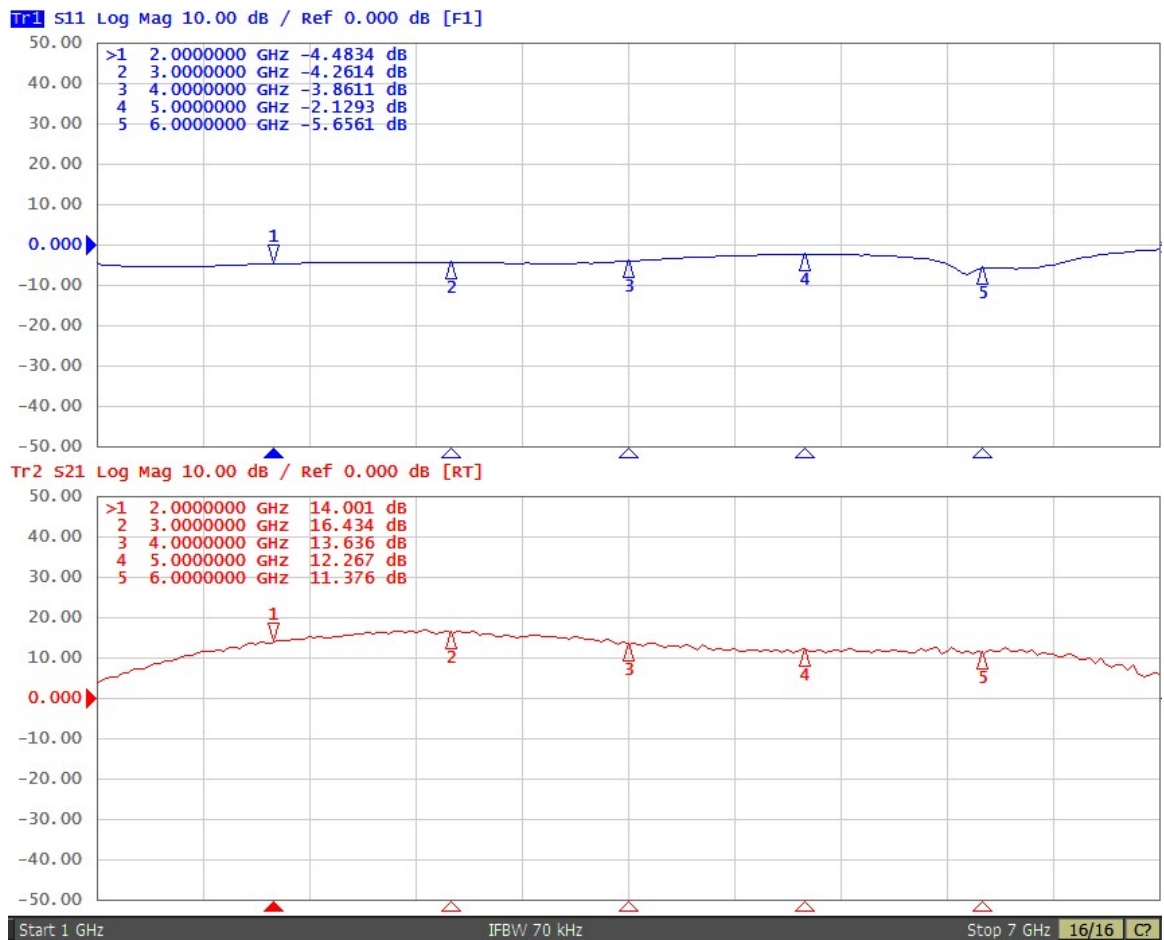
Reference Circuit of Test Fixture Assembly Diagram

Figure 1. Test Circuit Component Layout

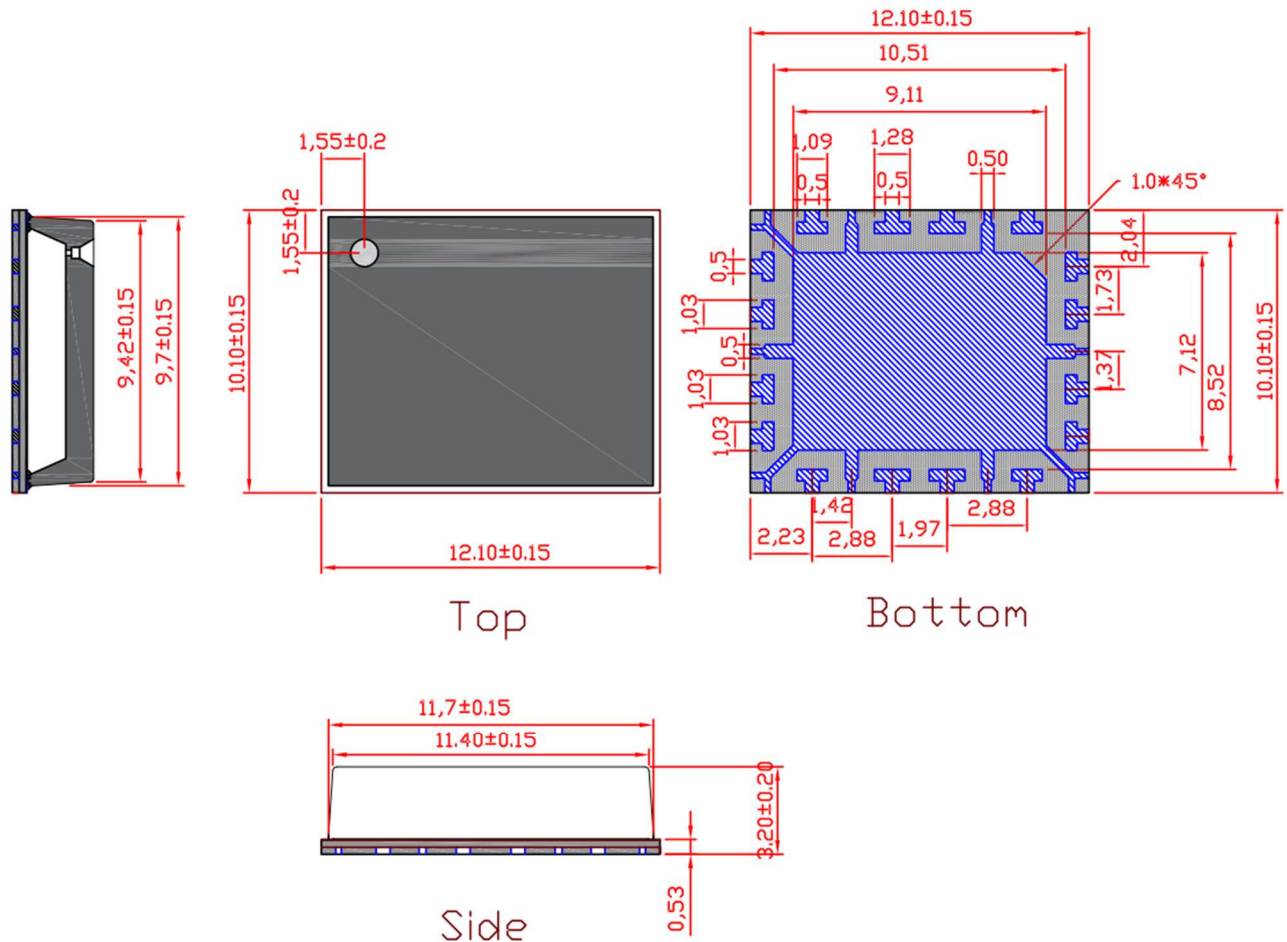


TYPICAL CHARACTERISTICS

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



Package Dimensions (Unit:mm)



Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2023/2/14	Rev 1.0	Preliminary Datasheet
2024/8/21	Rev 2.0	Update to be CW capable by soldering device onto heatsink

Application data based on HJ-23-01

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