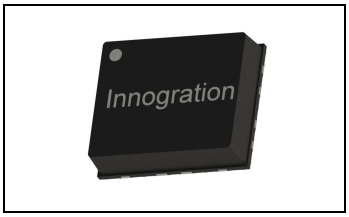
# 2.0-6.0GHz, 30W, 50V GaN Fully matched PA Module




## 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.

| Vds= 50V, Vgs=-2.99V,Idq=40mA | | | | | |
|---|---|---|---|---|---|
| Pulse CW, 50us,20% | | | | | |
| Freq(MHz) | P-1(dBm) | P-1Gain(dB) | P-3(dBm) | P-3(W) | Eff (%) |
| 2000 | 43.68 | 12.7 | 44.88 | 30.7 | 43.1 |
| 2400 | 43.78 | 14.3 | 45.22 | 33.3 | 50.1 |
| 2800 | 44.80 | 15.1 | 45.98 | 39.6 | 59.8 |
| 3200 | 44.75 | 14.3 | 46.10 | 40.7 | 51.3 |
| 3600 | 44.44 | 14.3 | 46.03 | 40.0 | 49.5 |
| 4000 | 44.12 | 12.7 | 45.75 | 37.6 | 45.5 |
| 4400 | 44.62 | 11.6 | 46.12 | 40.9 | 54.3 |
| 4800 | 44.20 | 11.4 | 45.89 | 38.8 | 58.6 |
| 5200 | 44.26 | 10.6 | 45.68 | 37.0 | 59.8 |
| 5600 | 43.74 | 10.8 | 45.17 | 32.9 | 54.0 |
| 6000 | 43.63 | 11.8 | 45.31 | 34.0 | 52.9 |

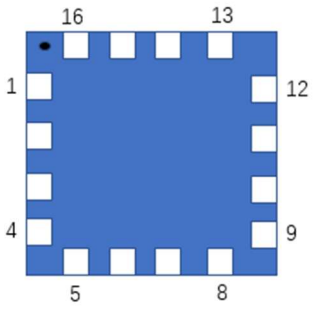
## Product Features

- Operating Frequency Range: 2-6GHz
- Operating Drain Voltage: +50 V
- 50 Ω Input/Output
- Psat≥30W (Pulse)
- Small signal gain:>12dB, Power gain:>9dB
- 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 | 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 | 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<br>$T_C$= 85°C, DC test, surface mounted through vias | $R_{\theta JC}$ | 3.4 | °C/W |

**Table 3. Electrical Characteristics**

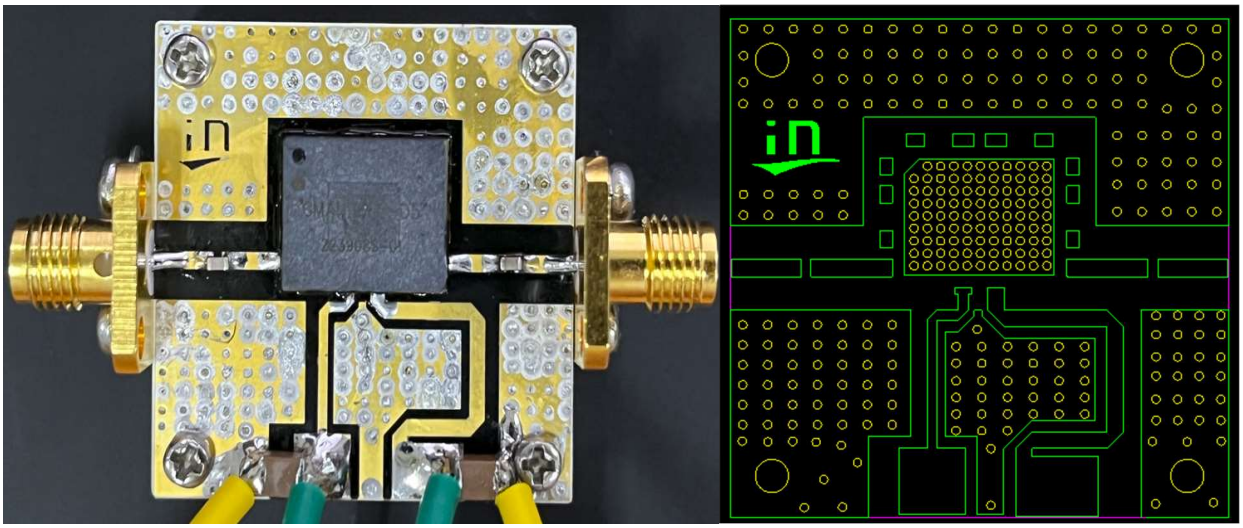
| Parameter | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Frequency Range | | 2000 | | 6000 | MHz |
| Power Gain @ Psat | | 10 | | | dB |
| $P_{SAT}$ | Pulse | | 45 | | dBm |
| Drain Efficiency @ $P_{SAT}$ | | 40 | | | % |
| Unless otherwise noted: TA = 25°C, $V_{DD}$ =50 V, Pulse 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 |

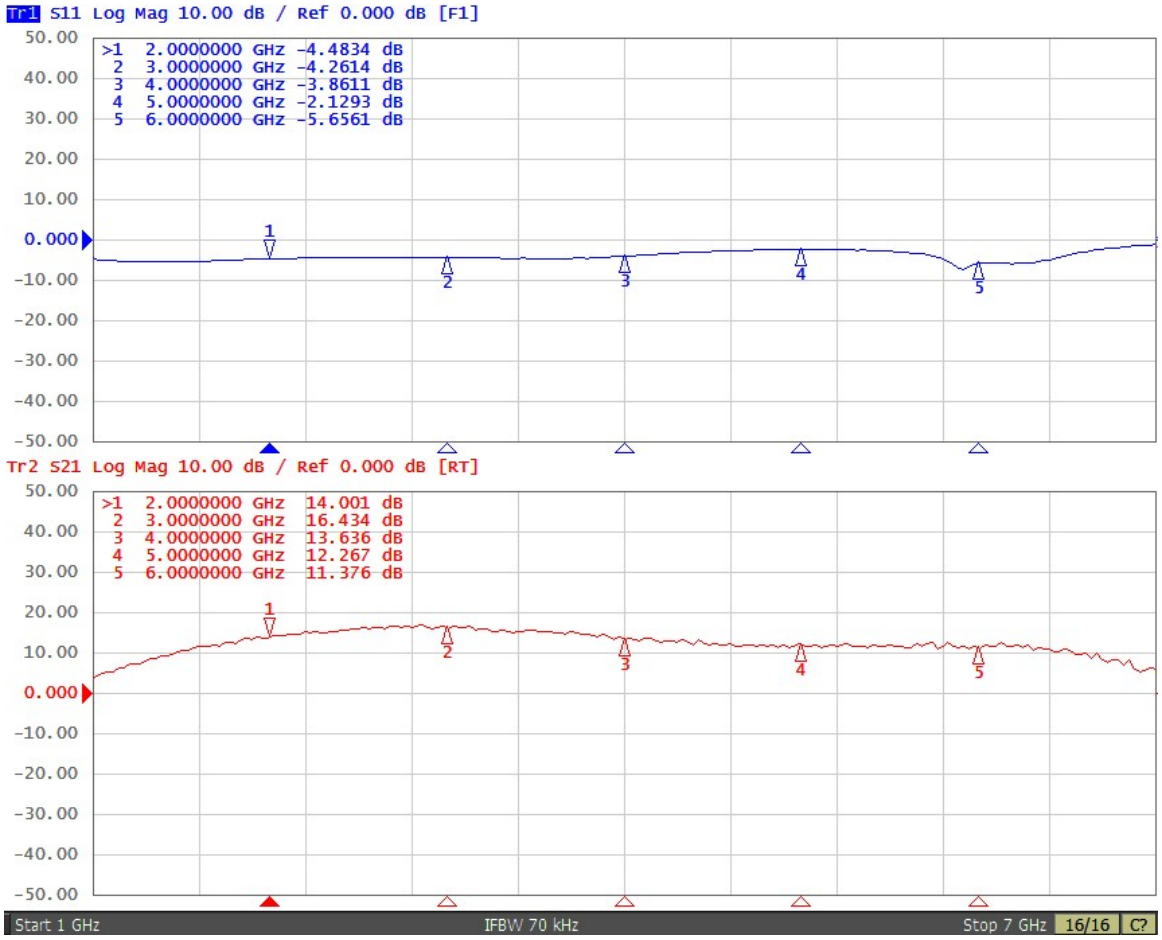
## Reference Circuit of Test Fixture Assembly Diagram

**Figure 1. Test Circuit Component Layout**

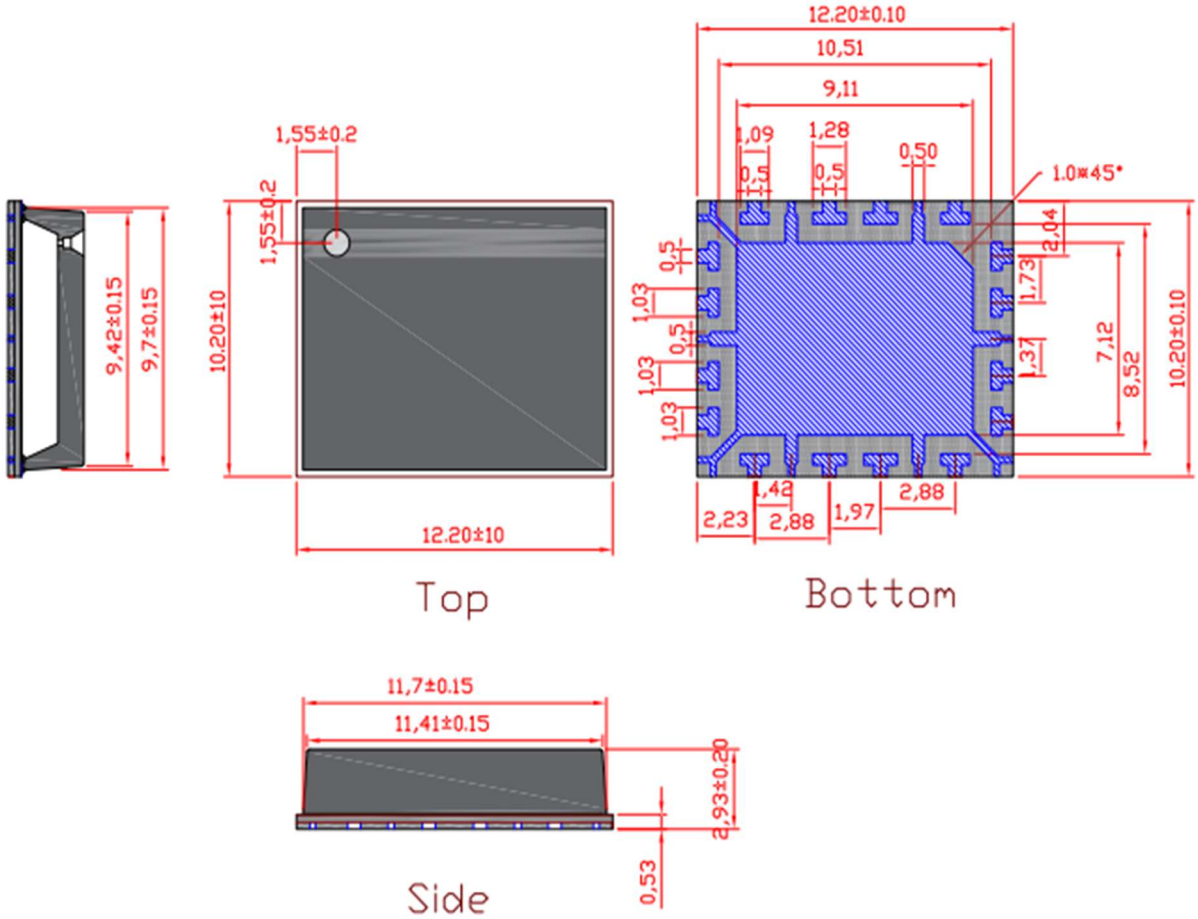


# TYPICAL CHARACTERISTICS

**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 |
| | | |
| | | |

**Application data based on HJ-23-01**

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