



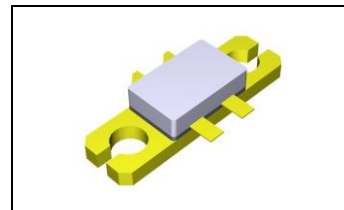
0.2-2GHz, 50W, 50V GaN Fully matched PA Module

Description

The SMAV0020-50G4E is a 50-watt ,single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from 200MHz to 2GHz. The module is 50 Ω input matched and requires minimal external components at output.

It is recommended for pulse application only, **NOT for CW operation**.

Vds=50V, Idq=100mA, Pulsed CW, 20us, 10%



Freq (MHz)	Pin (dBm)	Psat (W)	IDS (A)	Gain (dB)	Eff (%)	2 nd (dBc)	3 rd (dBc)
200	39.4	51	0.13	7.7	78.9	-10.8	-10.2
400	39	50	0.13	8.0	77.1	-21.5	-11.8
600	39	53	0.17	8.3	62.7	-15.8	-12.6
800	39.1	59	0.20	8.6	58.9	-19	-17.7
1000	39.4	60	0.21	8.4	57.3	-17.4	-21.4
1200	39.4	58	0.23	8.3	50.9	-28.6	-31.6
1400	39.3	60	0.25	8.5	48.1	-33.1	-43.1
1600	39.1	67	0.27	9.1	49.3	-33.7	-45
1800	39.1	76	0.26	9.7	58.4	-38.8	-46
2000	39.4	52	0.18	7.7	57.2	-40.3	-38.8

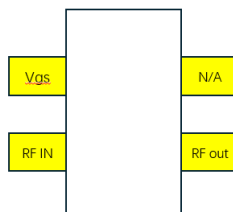
Product Features

- Operating Frequency Range: 200M-2GHz
- Operating Drain Voltage: +50 V
- 50 Ω Input
- Psat: ≥ 50 W(Pulse only)
- Small signal gain:>11dB, Power gain:>7dB @50V
- Efficiency:>45% @50V

Applications

- Ultra Broadband Amplifiers
- VHF, UHF, L band pulsed power Amplifier
- Test Instrumentation
- EMC Amplifier Drivers
- 2-way Radios

Pin Configuration and Description



Top View



Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	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 $T_c = 25^\circ\text{C}$, DC test	$R_{\theta JC}$	1.8	°C/W

Table 3. Electrical Characteristics

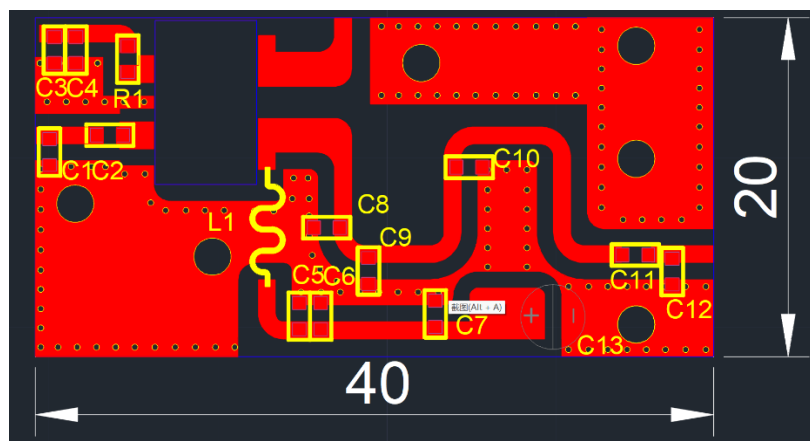
Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		200		2000	MHz
Power Gain @ Psat		7			dB
P_{SAT}			50		W
Drain Efficiency @ P_{SAT}			45		%

Unless otherwise noted: $T_A = 25^\circ\text{C}$, $V_{DD} = 50\text{ V}$, Pulse Width=20 us, Duty cycle=10%

Load Mismatch of per Section (On Test Fixture, 50 ohm system): $V_{DD} = 50\text{ V}$, $I_{DQ} = 100\text{mA}$, $f = 2\text{GHz}$

VSWR 10:1 at $P_{out} = 50\text{W}$, pulse CW Output Power	No Device Degradation
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Reference Circuit of Test Fixture Assembly Diagram



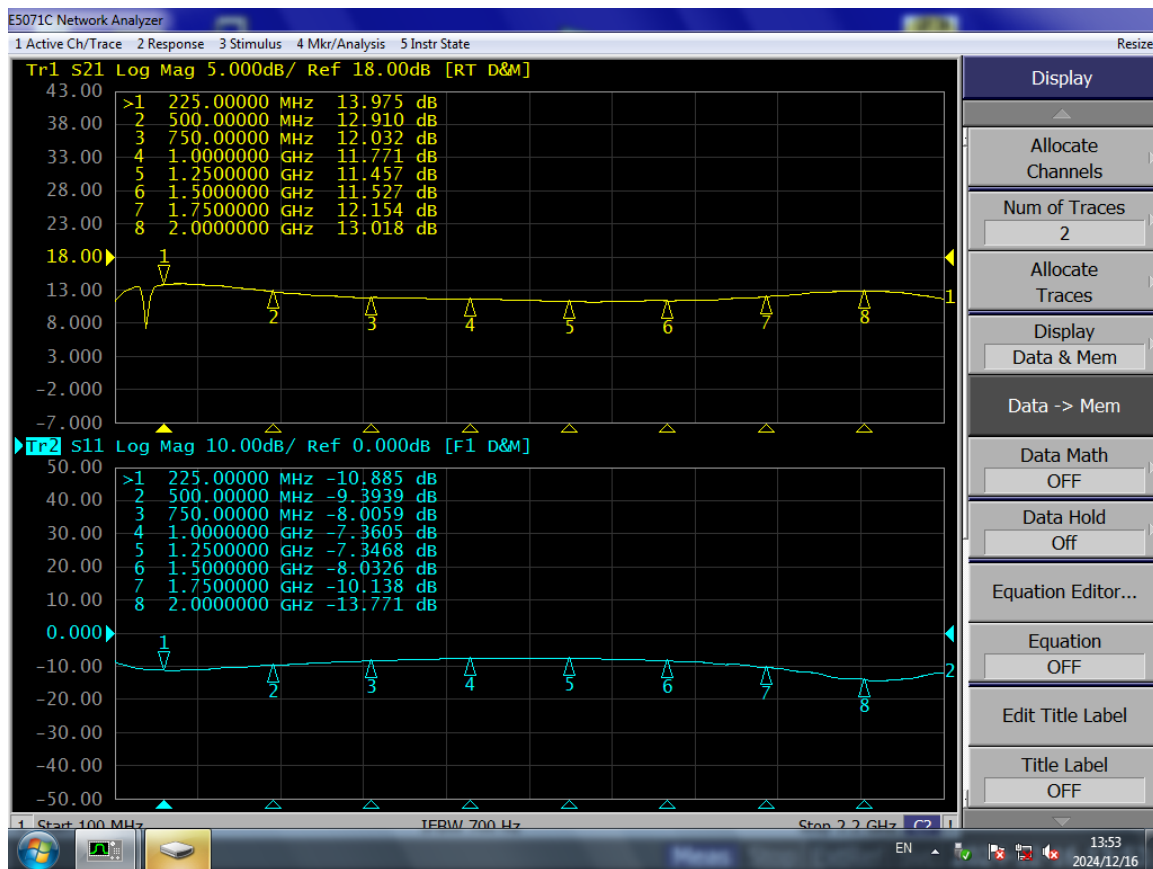
Component	Description	Suggestion
C1	1pF MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.
C2,C4,C5,C11,	51pF MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.
C6	240pF MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.
C8	2pF MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.



C9	0.8pF MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.
C10,C12	0.6pF MQ300805	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.
C3,C7	10nF 1210	/
C13	470uF/63V	/
L1	0.8mm wire , 2mm inner diameter, 7Turns	DIY
R1	51Ω 0805	/

TYPICAL CHARACTERISTICS

Figure 1. Network analyzer output S11/S21 (Pin=0dBm) @50V



Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads

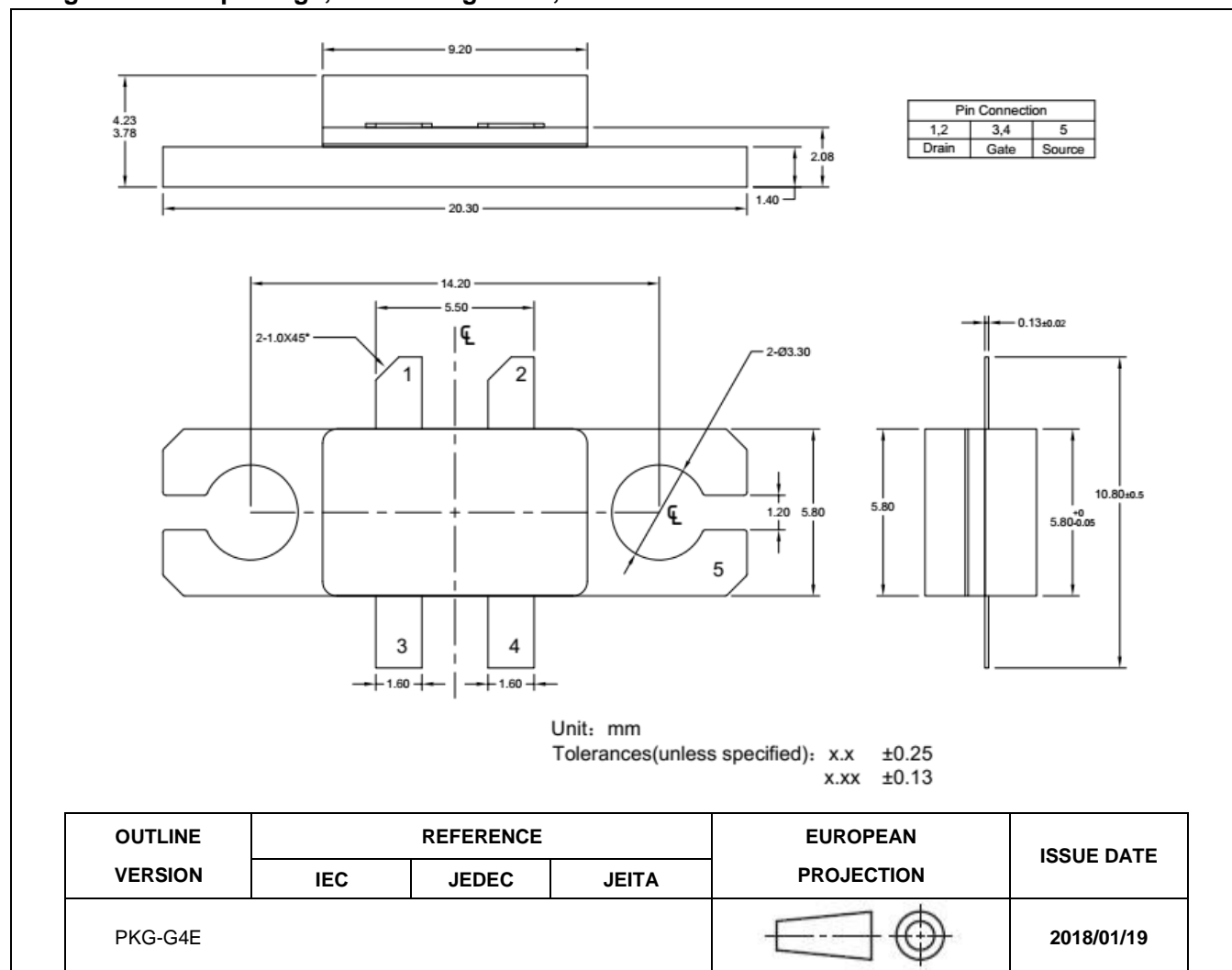


Figure 1. Package Outline PKG-G4E



Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2024/12/16	V1.0	Production datasheet
2025/2/8	V1.1	Modify the typo of name, SMAV0025 to SMAV0020

Application data based on SYX-24-47

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