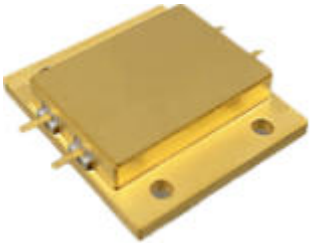
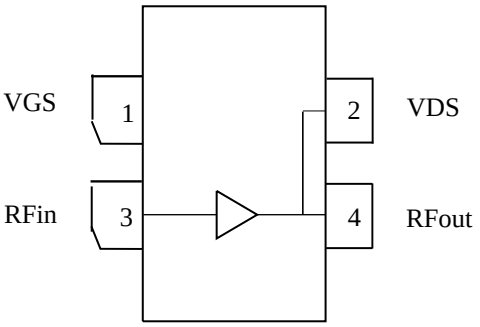
SAC5012

GaN MMIC Power Amplifier
0.6GHz~6GHz 45dBm

Rev 1.0

1. Product Introduction





Pin definition (front view)

★ Missing Angle for signal input

1.1 Product Features

- It can cover the working frequency band range: 0.6-6.0 GHz
- 50 Ω impedance matching, easy to cascade use
- Typical operating voltage: 28 V
- 100% RF test
- Excellent thermal stability
- RoHS compliant

1.2 Overview

SAC5012 is a high power internal matching power transistor, based on domestic materials and processes of GaN device preparation, available operating frequency range: 0.6 ~ 6.0GHz, it can provide the best power and gain performance in 50Ω system under saturated power in continuous wave signal mode.

1.3 Typical performance [1]

Operating frequency (MHz)	Output power [2] (dBm)	Output efficiency [2] (%)	Power gain [2] (dB)
600	44.6	55.9	9.1
1000	45.2	58.2	9.7
1500	45.2	47.0	9.7
2000	45.9	56.7	10.4
2500	45.6	46.2	10.1
3000	45.1	41.3	9.6
3500	46.2	50.4	10.7
4000	45.7	45.4	10.2
4500	46.0	48.0	10.5
5000	45.8	45.7	10.3
5500	45.5	44.3	10.0
6000	45.4	42.0	9.9

[1] Test data based on typical application circuits for reference.

[2] Test conditions: VDS = 28 V, IDQ = 400 mA, continuous wave, input power Pin = 35.5dBm.

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2 Limit parameters

Parameters	Symbols	Numerical value	Units
Drain-source breakdown voltage	V_{DSS}	150	V
Grid source voltage	V_{GS}	-10 ~ +2	V
Drain-source voltage	V_{DS}	0 ~ +28	V
Maximum forward grid current	I_{GMAX}	8.3	mA
Storage temperature	T_{STG}	-65 ~ +150	℃
Channel temperature	T_{CH}	225	℃

3 Thermal Resistance

Parameters	Symbols	Numerical value	Units
Thermal Resistance	Rthjc	TBD	℃/W

4. Electrical performance (TA = 25 ° C)

4.1 DC characteristics

Prameters	Symbols	Minimum value	Typical value	Maximum value	Units
Drain source drain current (V_{GS} = -10 V, V_{DS} = 150 V)	I_{DSS}	-	-	8.3	mA
Drain-source breakdown voltage (V_{GS} = -10 V, ID = 8.3 mA)	$V_{(BR)\ DSS}$	150	-	-	V
Gate threshold voltage (V_{DS} = 28 V, ID = 8.3 mA)	$VGS_{(TH)}$	-4.0	-2.9	-1.0	V
Static grid bias voltage (V_{DS} = 28 V, ID = 400 mA)	$VGS_{(Q)}$	-	-2.7	-	V

4.2 RF Performance (6000 MHz typical Performance [1])

Parameters	Symbols	Minimum value	Typical value	Maximum value	Units
Peak output power	P_{sat}	-	TBD	-	dBm
Drain efficiency	η_D	-	TBD	-	%
Power gain	G_P	-	TBD	-	dB

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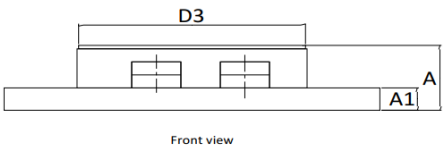
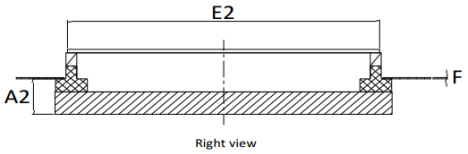
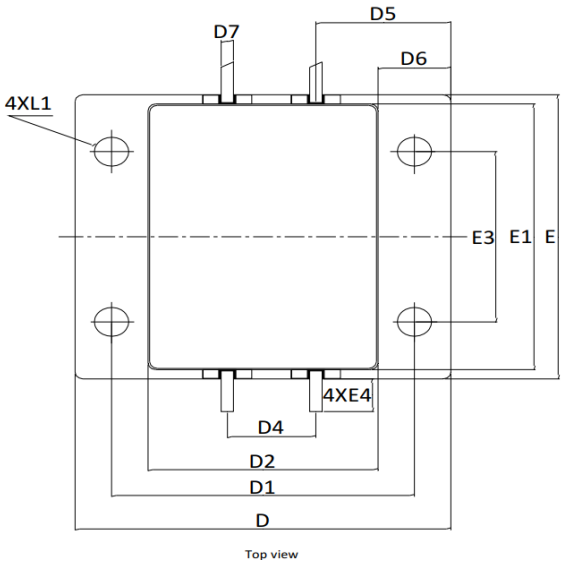
4.3 Load adaptability

Parameters	Results
VSWR 5:1 Operating conditions: VDS=28V 25W power output, cw.	TBD

5. Package size







Serial number	Inch			millimeter		
	Minimum value	Typical value	Maximum value	Minimum value	Typical value	Maximum value
A	0.19	0.19	0.20	4.73	4.95	5.17
A1	0.06	0.07	0.07	1.65	1.70	1.75
A2	0.10	0.11	0.11	2.57	2.70	2.83
D	0.95	0.95	0.96	24.07	24.20	24.33
D1	0.77	0.77	0.77	19.45	19.50	19.55
D2	0.58	0.58	0.59	14.67	14.80	14.93
D3	0.57	0.57	0.58	14.57	14.60	14.63
D4	0.22	0.22	0.23	5.57	5.70	5.83
D5	0.34	0.34	0.35	8.57	8.70	8.83
D6	0.18	0.19	0.19	4.60	4.70	4.80
D7	0.03	0.03	0.04	0.70	0.80	0.90

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E	0.85	0.85	0.86	21.50	21.70	21.90
E1	0.79	0.80	0.80	20.17	20.30	20.43
E2	0.79	0.79	0.79	20.07	20.10	20.13
E3	0.51	0.51	0.51	12.95	13.00	13.05
E4	0.09	0.10	0.11	2.20	2.50	2.80
F	0.00	0.00	0.01	0.10	0.10	0.15
L1	0.08	0.09	0.09	2.15	2.20	2.25

Revision	Date	Comment
1.0	Dec 02, 2024	First Release

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