

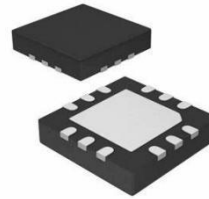
SAC2502Q3

GaAs Enhancement Mode pHEMT in a QFN3x3 package

Rev 1.1

Features

- Enhancement mode operation
- 800um gate width
- High linearity performance
- High output power and PAE
- Low cost QFN3x3 package
- Package Size: 3mm×3mm×1.2mm



General Description

SAC2502Q3 is a 0.25um T-gate length GaAs Paedomorphic High Electron Mobility Transistor chip(Wg=800um) packaged in a QFN3x3 surface-mount plastic package, which has high associated gain and high dynamic range in single supply. The device can be used in circuits up to 10 GHz and suitable for low noise and medium power amplifier applications including a wide range of commercial and military applications.

Electrical Performance

Symbol	Parameter	Conditons	Min.	Typ.	Max.	Units
V_{GS}	Operational Gate Voltage	$V_{DS}=3V, I_{DS}=60mA$	0.4	0.52	0.72	V
I_{DSS}	Saturated Drain Current	$V_{DS}=3V, V_{GS}=0V$	—	0.018	0.12	uA
g_m	Transconductance	$V_{DS}=3V, I_{DS}=60mA$	500	700	—	mmho
V_P	Pinch-off voltage	$V_{DS}=3V, I_{DS}=1mA$	0.25	—	0.45	V
$I_{D_{MAX}}$	Maximum drain current	$V_{DS}=3V, V_{GS}=0.9V$	—	100	130	mA
NF	Noise Figure, $\Gamma_s=\Gamma_{OPT}, f=2GHz$	$V_{DS}=3V, I_{DS}=40mA$	—	0.18	—	dB
	$\Gamma_s=50ohm, f=2GHz$		—	0.3	—	dB
	$\Gamma_s=50ohm, f=6GHz$		—	0.7	—	dB
OP_{-1dB}	1dB Compressed output power	$V_{DS}=5V, f=6GHz, Tuned$ for Max. OP_{-1dB}	—	23	—	dBm

* S-parameters files available upon request

Absolute Maximum Ratings

Symbol	Parameter	Absolute Maximum	Units
V_{GS}	Gate - Source Voltage	0~+1.2	V
V_{GD}	Gate Drain Voltage	12	V
I_{DS}	Drain Current	170	mA
P_{diss}	Total Power Dissipation	870	mW
$P_{in_{max}}$	RF Input Power	13	dBm
I_{GS}	Gate Source Current	2	mA
T_{CH}	Channel Temperature	150	°C
T_{STG}	Storage Temperature	-60~150	°C
θ_{jc}	Thermal Resistance	90	°C/W

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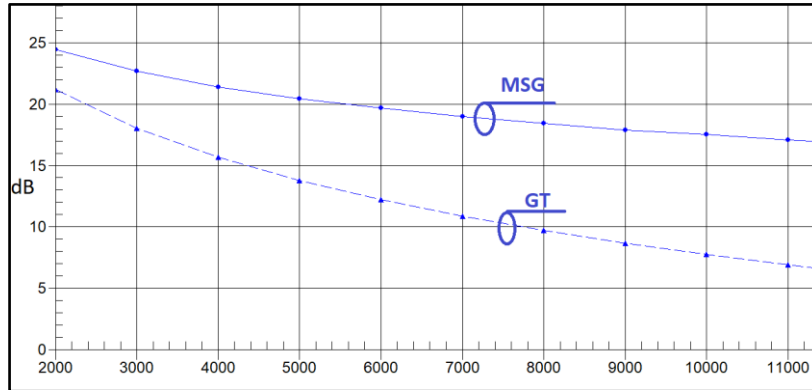


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Typical Scattering Parameters

VDS=3V IDS=40mA



Typical Noise Parameters

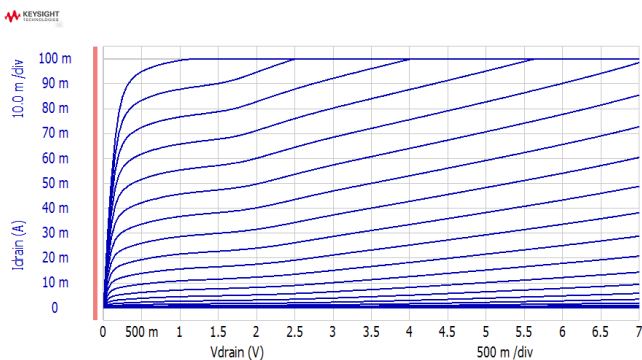
VDS = 3V, IDS = 40 mA

FREQ(GHz)	NFmin(dB)	Gamma Opt(MAG)	Gamma Opt(ANG)	RN
2	0.11	0.43	42.5	0.03
3	0.17	0.432	64.6	0.04
4	0.24	0.437	84	0.04
5	0.3	0.447	100.8	0.04
6	0.36	0.459	115.1	0.04
7	0.42	0.474	127.3	0.04
8	0.48	0.492	137.4	0.04
9	0.54	0.512	145.6	0.04
10	0.6	0.534	152.2	0.04
11	0.66	0.557	157.3	0.03
12	0.72	0.581	161.1	0.03
13	0.78	0.606	163.8	0.03
14	0.85	0.631	165.6	0.03
15	0.91	0.656	166.6	0.03
16	0.97	0.68	167.1	0.03
17	1.03	0.703	167.2	0.03
18	1.09	0.726	167.1	0.03
19	1.15	0.746	167	0.03
20	1.21	0.765	167.1	0.03
21	1.27	0.781	167.5	0.03
22	1.33	0.794	168.5	0.03
23	1.39	0.805	170.3	0.02
24	1.46	0.811	172.9	0.02
25	1.52	0.814	176.7	0.02
26	1.58	0.813	-178.2	0.02

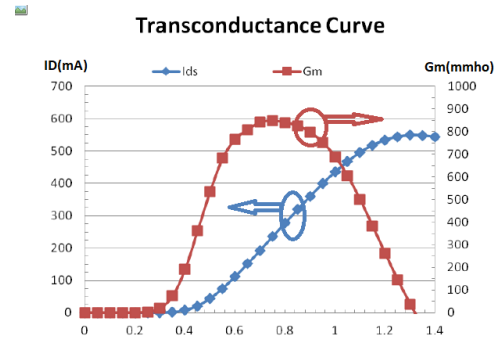
FREQ(GHz)	Associated Gain(dB)	NF(dB) Zs=50ohm
2	19.35	0.26
3	18.47	0.41
4	17.63	0.56
5	16.82	0.71
6	16.05	0.86
7	15.31	1.01
8	14.62	1.16
9	13.96	1.3
10	13.34	1.45
11	12.75	1.6
12	12.21	1.75
13	11.7	1.9
14	11.22	2.05
15	10.79	2.2
16	10.39	2.35
17	10.03	2.5
18	9.7	2.65
19	9.42	2.79
20	9.17	2.94
21	8.95	3.09
22	8.78	3.24
23	8.64	3.39
24	8.54	3.54
25	8.48	3.69
26	8.45	3.84

Typical I_D - V_D Parameters

VGS sweep from 0~0.75V



Transconductance Parameters



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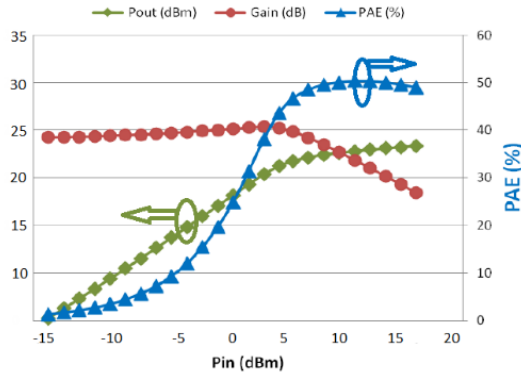
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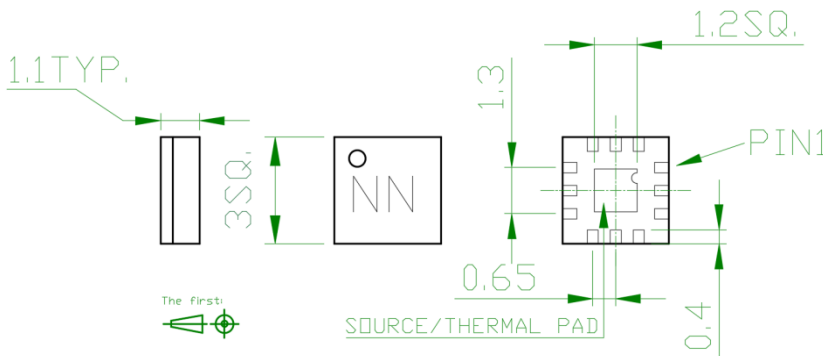
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Load-Pull Parameters



Package Dimensions



Pin Functions

Pin No.	Func.	Pin No.	Func.
1	NC	7	NC
2	GATE	8	DRAIN
3	NC	9	NC
4	SOURCE	10	SOURCE
5	SOURCE	11	SOURCE
6	SOURCE	12	SOURCE

Note:

1. All dimensions are in mm

Attention:

1. The moisture resistant grade of products is 2A, the storage environment $\leq 30^{\circ}$ C/60% RH, The surrounding workshop Life is 4 weeks.
2. After un-packing, It is necessary to bake the parts for 6 hours in 125+/-5 degree environment before soldering.