SAC2501

GaAs E-pHEMT Low Noise Transistor

Rev 2.1

Features

- Freq: 0.1~8GHz
- Output IP_3：33dBm
- OutputP_{-1}dB：18dBm
- Gain：28dB
- Noise Figure：0.5dB
- Die Size：0.62 mm x0.45 mm x0.1mm

Typical Applications

- RF/ Microwave Radio
- Test and Measurement
- Fiber Optics
- Radar and ECM

General Description

SAC2501 is a high dynamic range, low noise, E-pHEMT transistor. SAC2501 is ideal for cellular/PCS base stations, MMDS, and other systems in the 450 MHz to 6 GHz frequency range.

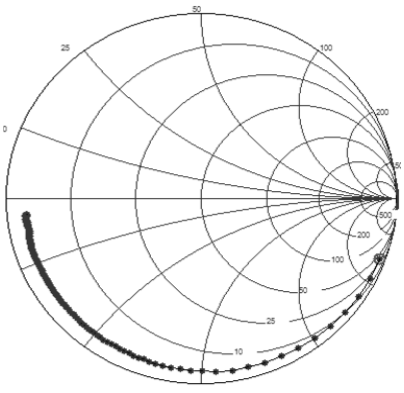
Electrical Performance

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_{DSS}	Saturated Drain Current	V_{ds} =3V, V_{GS}=0V	150	240	330	mA
g_m	Trans-conductance	V_{ds} =3V	260	350	440	mmho
V_{gs}	Operational Gate Voltage	V_{ds} =3V, I_{ds} =60mA	0.4	0.58	0.64	V
V_{th}	Voltage Threshold	V_{ds} =3V, I_{ds} =30mA	200	—	500	mV
NF	Noise Figure	f=300MHz V_{ds} =3V,I_{ds} =60mA Z_0=50Ω	—	0.4	—	dB
OIP_3	Output 3rd Order Intercept Point	f=300MHz V_{ds} =3V,I_{ds} =60mA	—	33	—	dBm
OP_{-1}dB	1dB Compressed Output Power	f=2 GHz V_{ds} =3V,I_{dq} =60mA	—	18	—	dBm
		f=2 GHz V_{ds} =5V,I_{dq} =80mA		24		
		f=2 GHz V_{ds} =8V,I_{dq} =80mA		26		

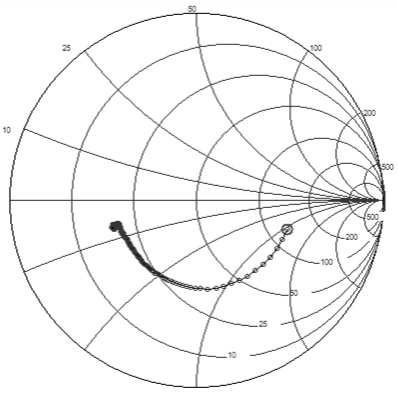
S-parameter Curves

V_{DS}=3V I_{DS}=60mA Fre.0.1～8GHz

S11



S22



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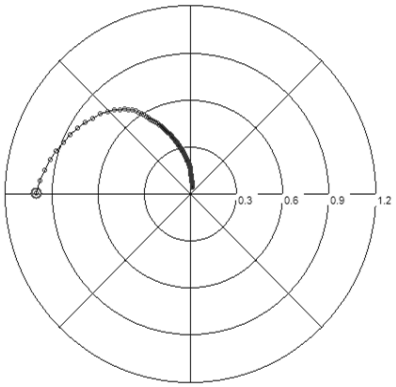
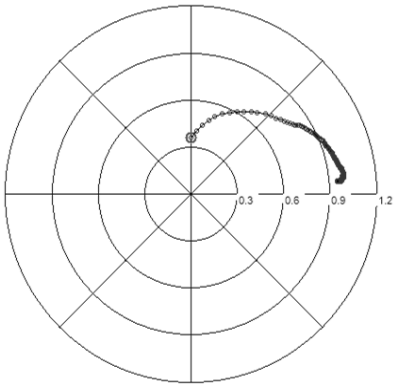
Typical Performance Curve

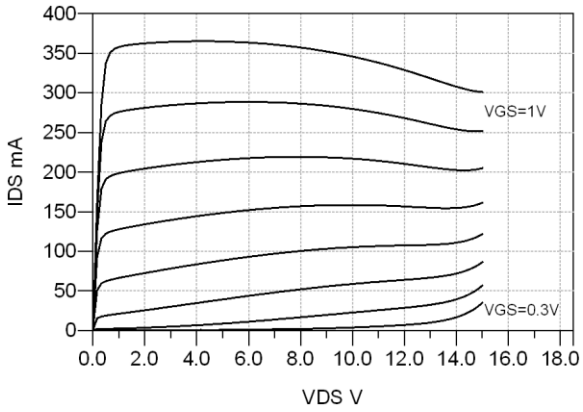
S21



S12



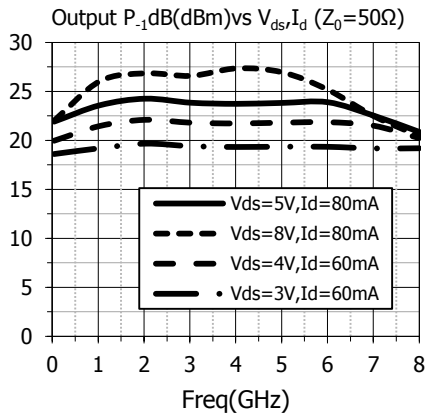
Typical I-V Curves

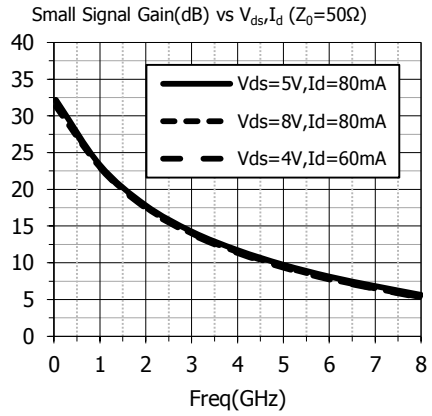


Absolute Maximum Ratings

Symbol	Parameter	Absolute Maximum	Units
V_{GS}	Gate - Source Voltage	-5～1.2	V
V_{GD}	Gate Drain Voltage	15	V
I_{DS}	Drain Current	350	mA
P_{diss}	Total Power Dissipation	1100	mW
$P_{in\ max}$	RF Input Power	17	dBm
I_{GS}	Gate Source Current	2	mA
T_{CH}	Channel Temperature	150	℃
T_{STG}	Storage Temperature	-60~125	℃
Θ_{jc}	Thermal Resistance	TBD	℃/W

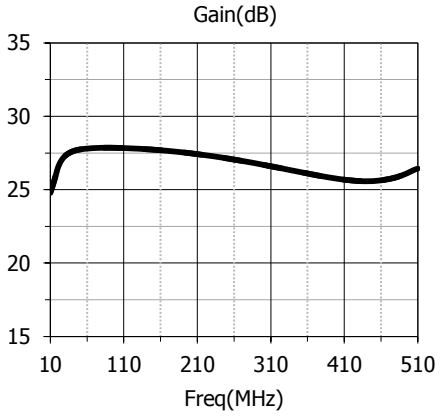
Typical Performance Curve

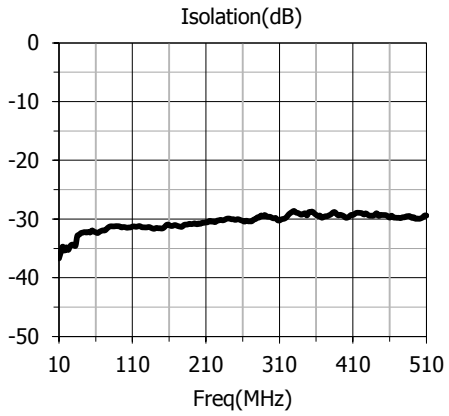


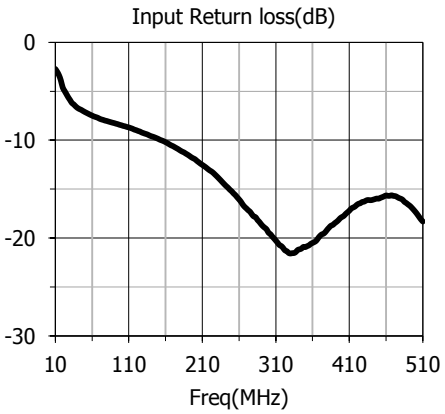


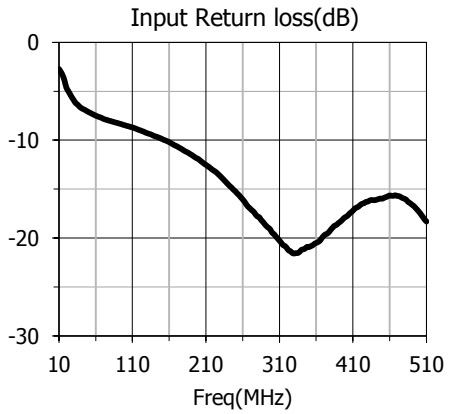
General Description

SAC1011 is an amplifier demo board using SAC2501.The operation frequency from 0.1 to 3GHz, DC operation point are set to V_{DS}=3V， I_{DQ}=60mA .The following are measured curves from VNA directly.









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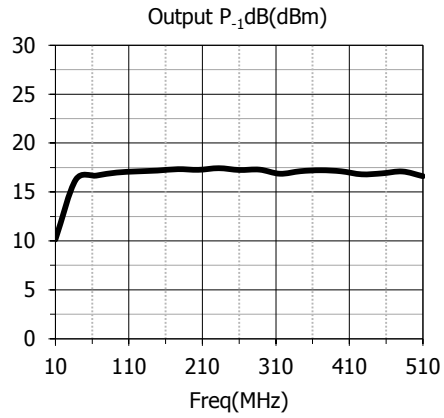
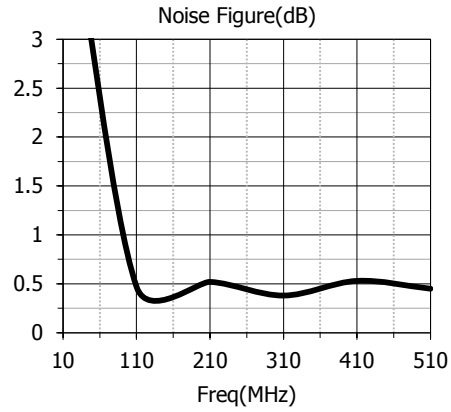
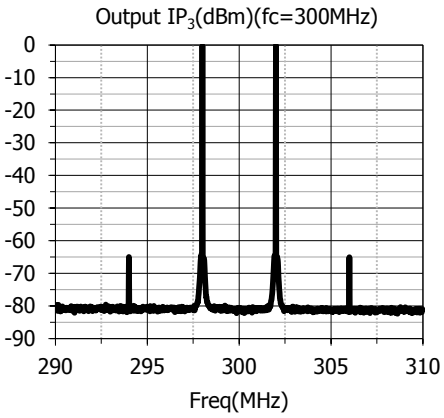
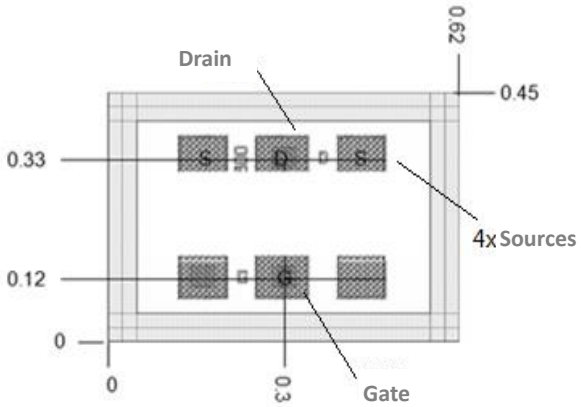






Assembly Diagram



Bonding Pads Size: 100×90um

Attention:

GaAs devices are susceptible to damage from electrostatic discharge. Proper precautions should be observed during handling, assembly and test.