SAC3953

SUPERAPEX CORPORATION

GaAs MMIC Driver Amplifier
54～58GHz 20dBm

Rev1.0

Features

- Frequency: 54~58GHz
- Gain: 17dB
- Output P_{-1}dB: 20dBm
- Supply Voltage: +5V/-Vg
- Balanced Amplifier
- Full Passivation for Enhanced Reliability
- Die Size: 2.3mm×1.24mm×0.1mm

Typical Applications

- Point-to-Point Radios
- HAPS

General Description

SAC3953 is a balanced GaAs MMIC driver amplifier, which operates between in 54~58GHz. SAC3953 provides 17dB of small signal gain, and 20dBm of output P_{-1}dB while requiring 300mA from a +5V supply voltage

The chip offers full passivation for increased reliability and moisture protection

Electrical Performance

T_A=25℃, V_D=+5V, I_{DQ}=300mA, Z_0=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range	54~58			GHz
Small Signal Gain	14	17	—	dB
Small Signal Gain Flatness	—	±1.5	±2	dB
Reverse Isolation	—	-35	—	dB
Input/ Output VSWR	—	1.35	2.5	:1
Noise Figure	—	10	—	dB
Output Power for 1 dB Compression (OP_{-1}dB)	18	20	—	dBm
Output IM_3	—	-28*	—	dBc
Supply Current (I_D)	—	300**	550	mA
Drain Voltage (V_D)	5	—	6	V
Thermal Resistance	26			℃/W

* Pout/Tone=0dBm, Fc=57GHz, Δf=4MHz

** Adjust Vg between -1V to -0.4V to achieve I_D= 300 mA typical.

Absolute Maximum Ratings

Maximum Input Power	+14dBm，CW 1min	Operating Temperature	-55℃~+85℃
Channel Temperature	+150℃	Storage Temperature	-55℃~+150℃
Maximum V_D	6.5V		

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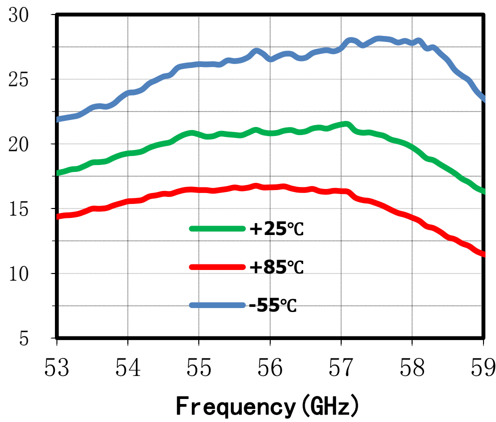
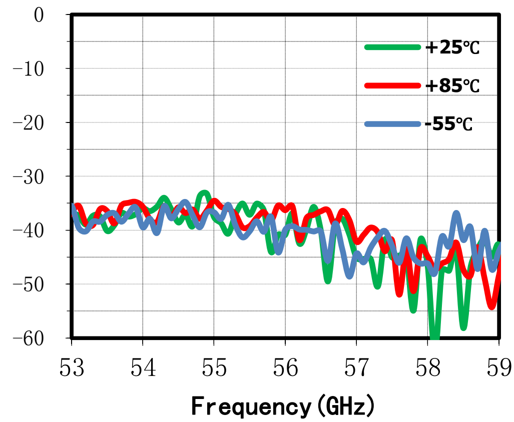
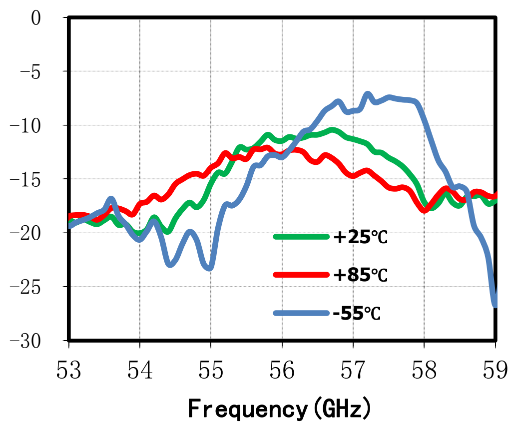
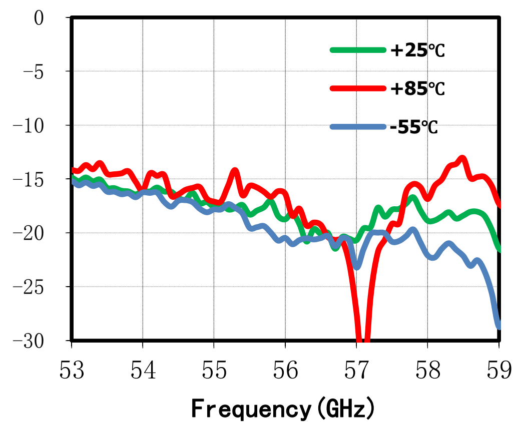
Typical Small Signal Performance Curve

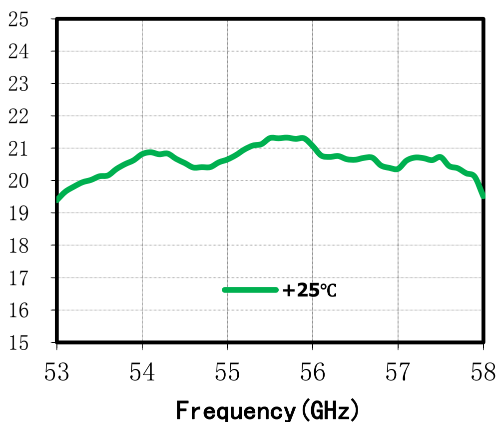
V_D=+5V, I_{DQ}=300mA, On probe measurement

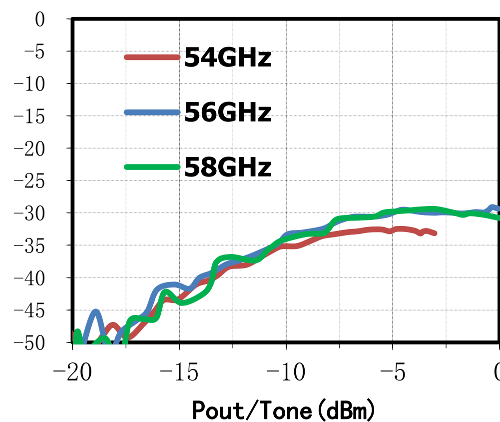












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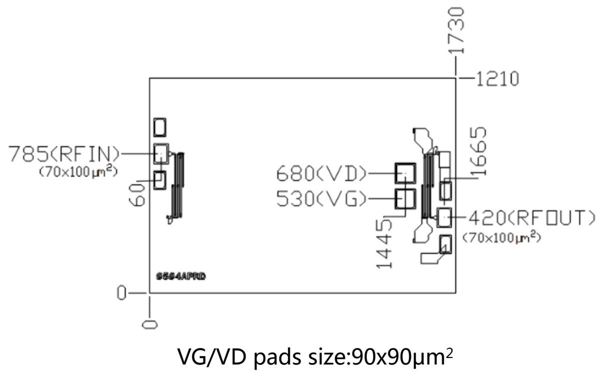
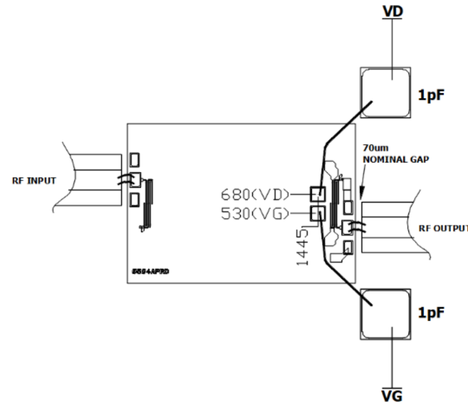
Die Outline(μm)



VG/VD pads size:90x90μm²

Assembly Diagram



Notes

1. SAC3953 is biased with a positive drain supply and negative gate supply. The recommended gate voltage is set to -0.2 to -1V when the drain voltage is set to 5V.
2. The back of chip is RF ground.
3. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 0.8mil thermosonic wedge bonding is highly recommended as the loop height will be minimized.
4. Bypass SLCs should be placed as close as possible to the chip.
5. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

Revision History

Revision	Date	Comment
1.0	Apr. 2022	First Release

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