

SAC3138

GaAs MMIC Power Amplifier
14~18GHz

Rev 1.0

Features

- Frequency: 14~18GHz
- Gain: 18dB
- Output P_{-1dB}: 31 dBm Typ. 30dBm Min.
- Supply Voltage: +5V/-Vg
- IM3: -27dBc@Pout/Tone=26dBm/16GHz
- PAE:30%
- Balanced Amplifier
- Die Size: 2.2mmx2.5mmx0.1mm

Typical Applications

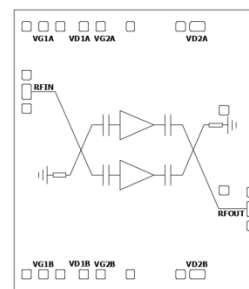
- VSAT
- Radar

General Description

SAC3138 is a balanced GaAs MMIC power amplifier. SAC3138 provides 18 dB of gain, and 31dBm of output power for 1 dB compression and 30% PAE from +5V supply.

The chip has surface passivation for protection and backside via holes and gold metallization to allow a conductive epoxy die attach process. This device is well suited for communications, Point to Point radio and VSAT applications.

Functional Diagram



Electrical Performance

T_A=25°C, V_D=+5V, I_D=1100mA, Z₀=50Ω

Parameter	Min.	Typ.	Max.	Units
Frequency Range	14~18			GHz
Small Signal Gain	15	18	23	dB
Small Signal Gain Flatness	—	±1	±2	dB
Input VSWR/Output VSWR	—	1.3	1.5	:1
Reverse Isolation	—	-45	—	dB
Output Power for 1 dB Compression (OP _{-1dB})	30	31	—	dBm
Output IP ₃	—	40*	—	dBm
Power Added Efficiency	—	30**	—	%
Supply Current (I _b)	—	1100	1500	mA
Thermal Resistance	—	8	—	°C/W

*Pout/Tone=26dBm, fc=16GHz, Δf=4MHz

**Pout=P_{-1dB}

Absolute Maximum Ratings

Maximum Input Power	+23dBm CW 30s	Operating Temperature	-55°C~+85°C
Channel Temperature	+150°C	Storage Temperature	-55°C~+150°C
Maximum V _D	+6V		

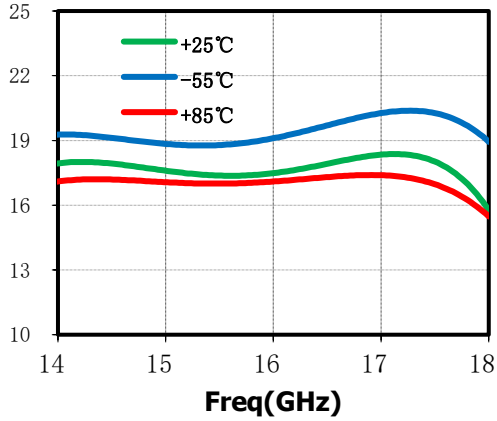
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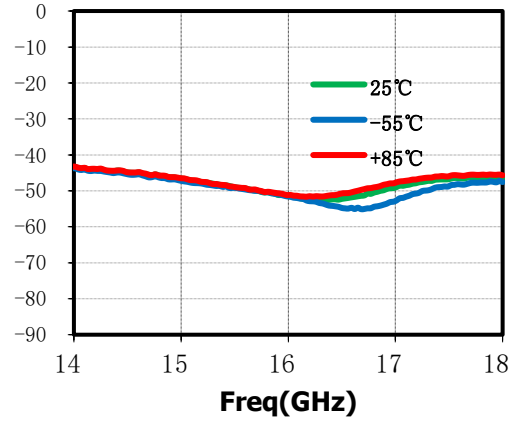
Typical Performance Curve

$V_D = +5V$ $I_{DQ} = 1100mA$

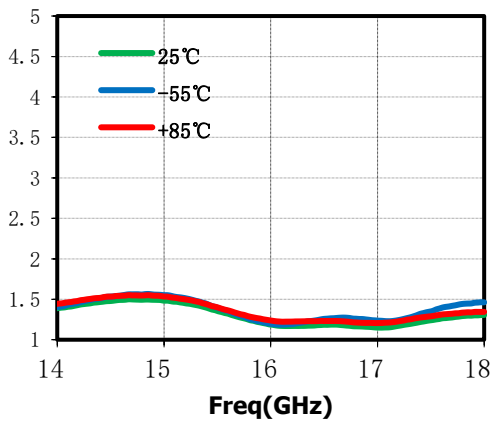
Small Signal Gain(dB)vs. Temperature



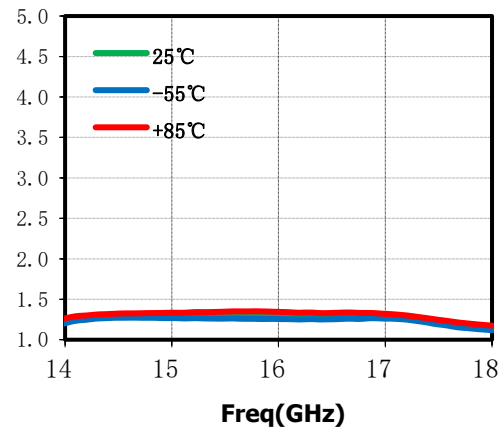
Reverse Isolation(dB)vs. Temperature



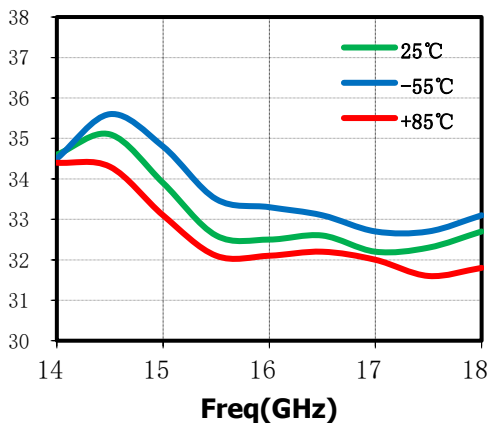
Input VSWR(:1)vs. Temperature



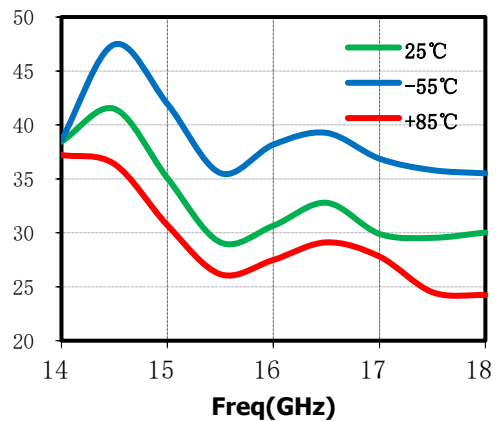
Output VSWR(:1)vs. Temperature



Output P₁(dBm)vs. Temperature



PAE(%)@OP₁dB vs. Temperature

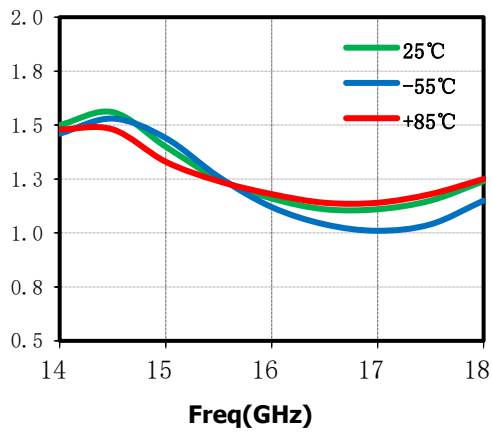


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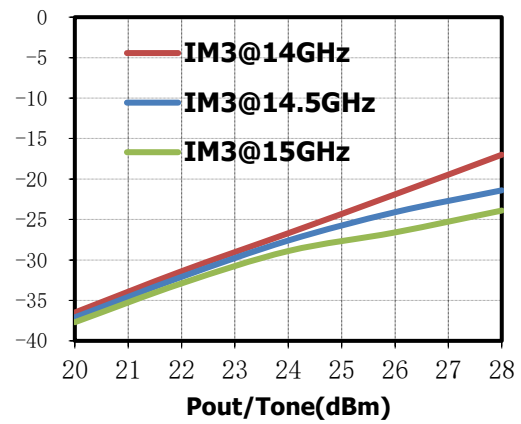
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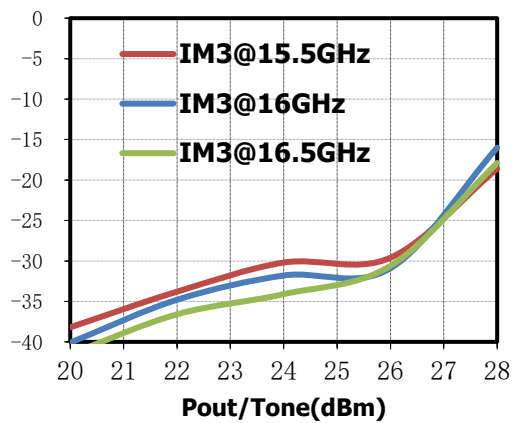
I_D (A) @OP₋₁dB vs. Temperature



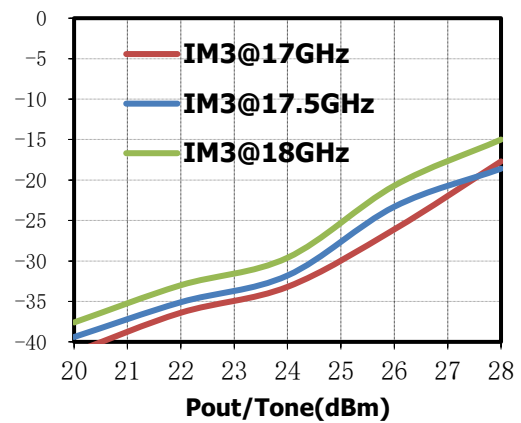
IM3(dBc) vs. Pout/Tone



IM3(dBc) vs. Pout/Tone



IM3(dBc) vs. Pout/Tone



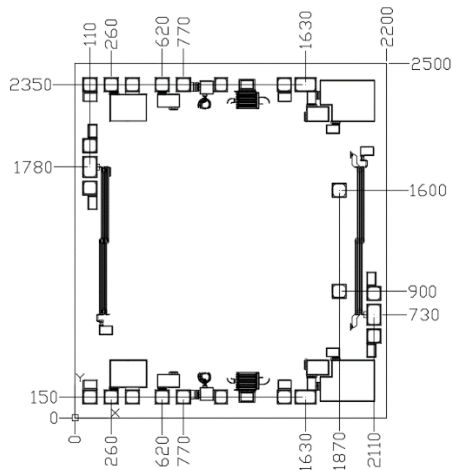
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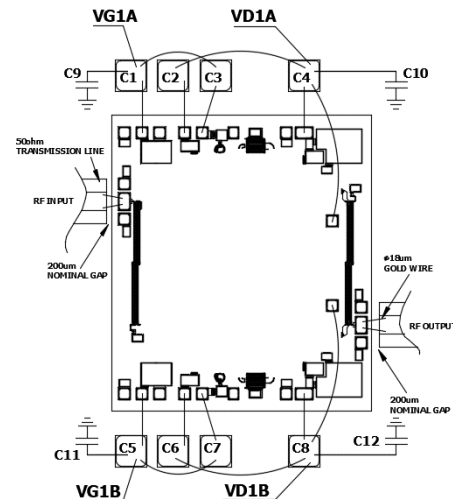
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Die Outline

(All dimensions in μm)



Assembly Diagram



Bonding pad size:

Pad size: RFIN、RFOUT、VD2A、VD2B 130x90um

Others: 90x90um

Components List

Reference Des.	Value	Part Number	Manuf.
C1~C8	300pF	SLC	-
C9~C12	1uF	C1005X5RC105KT	TDK

Attention:

GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.