SAC3231

GaAs MMIC PIN Switch
15GHz~50GHz SP2T

Rev 1.1

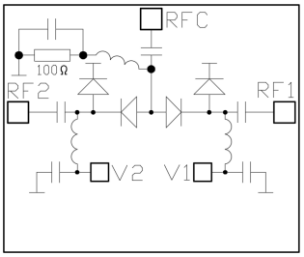
Features

- Frequency: 15~50GHz
- Insertion Loss: 2dB@50GHz
- Isolation: 40dB@50GHz
- Reflective switch

Description

SAC3231 is a wideband reflective SP2T switch, The device is fully passivated and has a layer of PBO for scratch protection. Each RF port contains DC blocking capacitors and a DC bias circuit consisting of high impedance lines and decoupling capacitor.

Functional Diagram



Electrical Performance

T_{BASE}=25℃, Z_0=50Ω, +15mA/-5V, CW

Parameter	Min.	Typ.	Max.	Units
Frequency	15	—	50	GHz
Insertion Loss	—	1.5	2.5	dB
RFC Return Loss	—	13	—	dB
RF_X Return Loss	—	12	—	dB
Isolation	30	40	—	dB
Forward Bias Current	10	15	35	mA
Switching Speed	—	25	—	nS
Forward Bias Voltage	—	1	—	V

Absolute Maximum Ratings

Input Power	+28dBm (-V：-15V)	**Operating Temperature (T_{BASE})**	-55℃~+85℃
Junction Temperature	150℃	**Storage Temperature**	-55℃~+150℃
Forward Bias Current	40mA	**Reverse Bias Voltage（-V）**	-30V

RoHS

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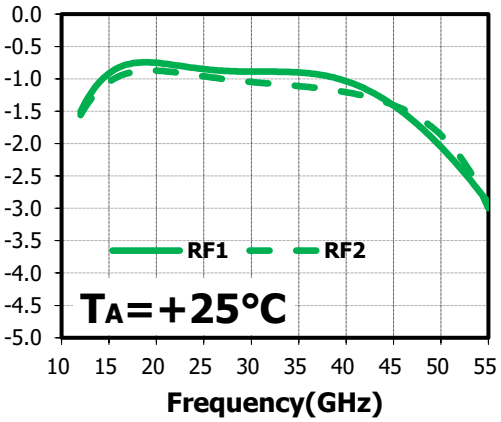
Typical Performance Curve

The following curves are taken from SAC3231 evaluation board. De-embedding operation has been Implemented.
+15mA/-5V, CW, T_{BASE}=+25℃

Insertion Loss(dB)RFC2RF$_X$ vs.Frequency



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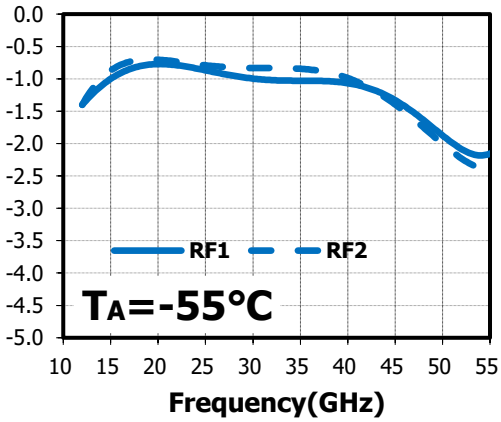

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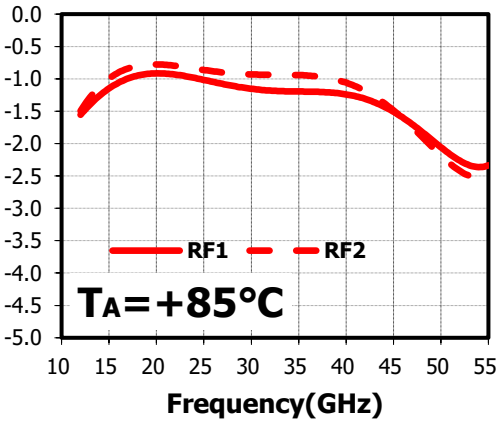
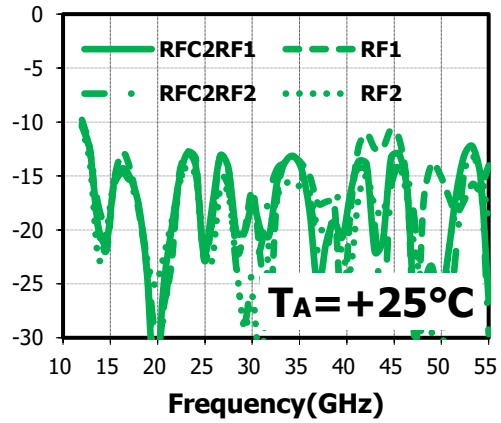


Return Loss(dB)RFC2RF$_X$ vs.Frequency



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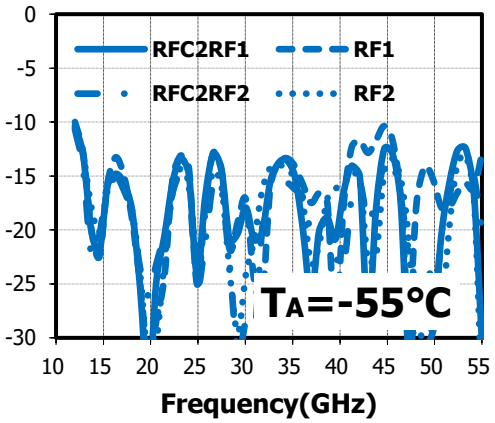

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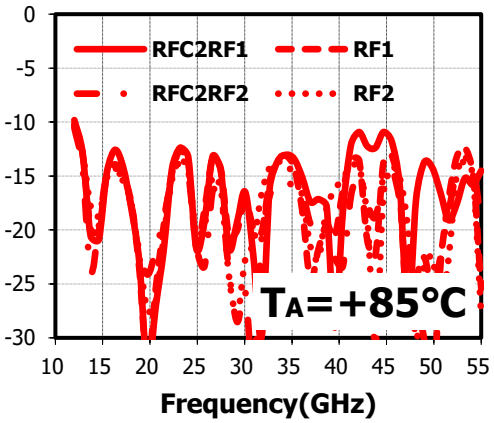
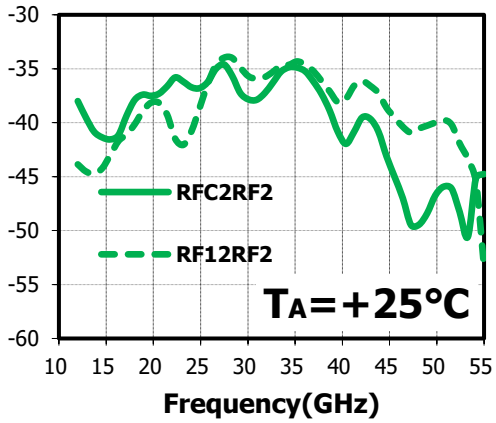
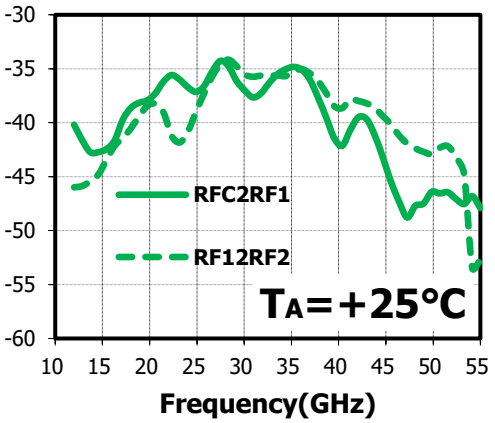


Isolation(dB) RF1 ON vs.Frequency

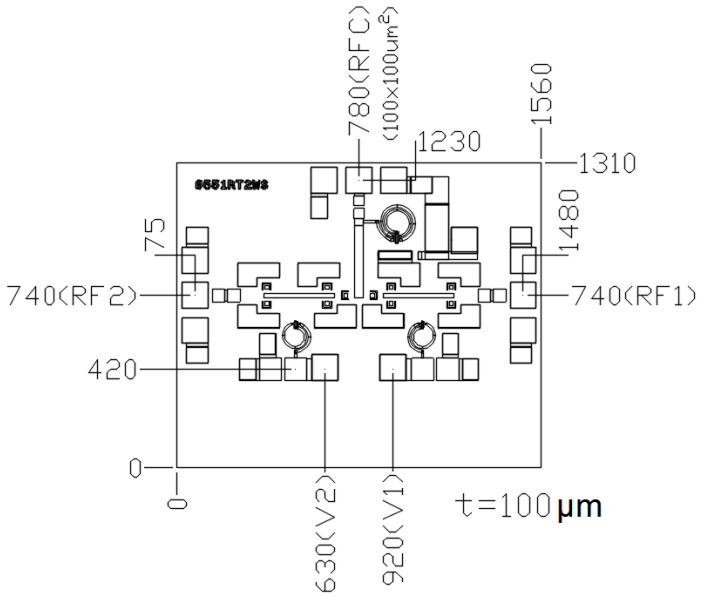


Isolation(dB) RF2 ON vs.Frequency



Die Outline Drawing

(All dimensions in μm)



Truth Table

Inputs		RF Path	
V1	V2	RFC-RF1	RFC-RF2
-V	+V	ON	OFF
+V	-V	OFF	ON

1．-V is reverse bias voltage, A -5V voltage can be used to reverse bias the PIN diode of the chip, for high power applications, a higher negative voltage can be used,

2．+V is forward bias voltage, A voltage of 3-5 V can be used to forward bias the PIN diode, forward bias current is set using external bias resistors placed at pads V1 and V2.

Attention:

1. The back of bare chip is RF and DC ground.
2. The RFC and RFx ports are AC coupled， the withstand voltage is 30V.

Revision History

Revision	Date	Comment
1.0	2024-05-31	First Release
1.1	2025-02-24	Modify V1/V2 coordinates

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