SAC3227

GaAs MMIC SPDT SWITCH
50MHz～40GHz

Rev 1.0

Features

- Frequency Range：50MHz～40GHz
- Isolation：＞30dB@40GHz
- Insertion Loss：2.3dB@40GHz
- Control I/O is compatible with LVTTL
- Die size：0.7mm×0.82mm×0.1mm

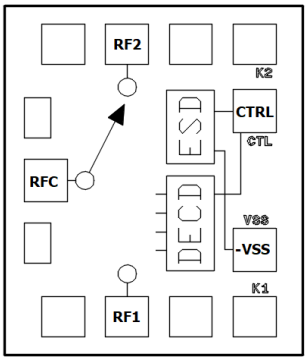
Typical Applications

- Radar and ECM
- Test and Measurement

General Description

SAC3227 is a broadband reflective GaAs pHEMT SPDT MMIC chip. The switch works from 50MHz to 40GHz. The switch features over 30dB isolation and smaller than 2.3dB insertion loss across the whole frequency band. The switch control works both in TTL and LVTTL modes.

Functional Diagram



Electrical Performance (T_A=25℃, V_{SS}=-5V, Z_0=50Ω)

Parameter		Test Frequency	Min.	Typ.	Max.	Unit
Insertion Loss		50MHz~40GHz	-	-2.3	-2.65	dB
Isolation (RFC-RF1/RF2)			-25	-30	-	dB
VSWR (RFC，RF1，RF2)			-	1.5	1.8	:1
Switching1 RF Power，10%~90% RF Power，90%~10%		2GHz	-	50	-	nS
Switching 2 50%CTRL~90% RF Power；50%CTRL~10% RF Power			-	150	-	nS
Input $P_{-0.2dB}$		50MHz	-	8	-	dBm
		100MHz	-	11	-	
		10GHz	-	18	-	
		40GHz	-	15	-	
Digital Control Inputs	High	-	3.2	-	5	V
	Low		0		0.25	
Supply Voltage			-	-5	-	
Supply Current			-	1.5	4	mA
Digital Control Current				180	800	uA

RoHS

SuperApex, LLC
2801 Lakeside Drive, Suite 208, Bannockburn, IL 60015, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

Absolute Maximum Ratings

Hot Switching	+12dBm	Operating Temperature	-55℃～+85℃
Control Inputs	-0.25~5.25V	Storage Temperature	-65℃～+150℃
ESD Sensitivity	HBM Class 1A,V_{SS}/CTRL	Channel Temperature	150℃

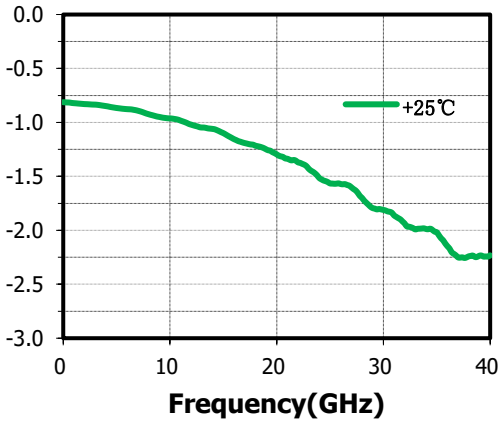
Truth Table

Control Level	States
H	RFC-RF1
L	RFC-RF2

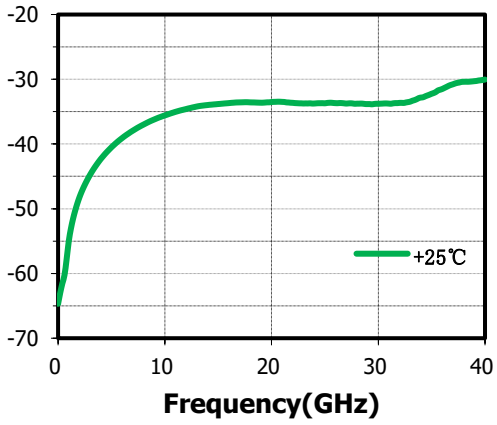
Prober Test Performance Results

T_A=+25℃, Vss=-5V

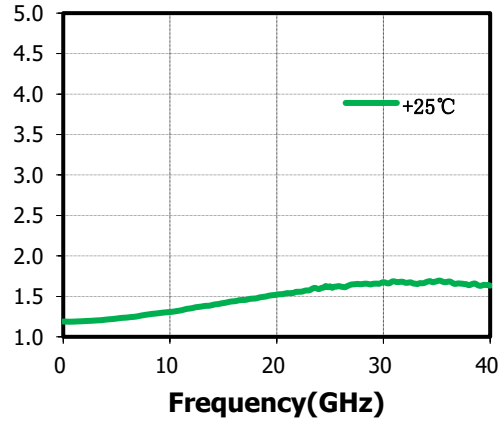
Insertion Loss(dB) vs.Frequency



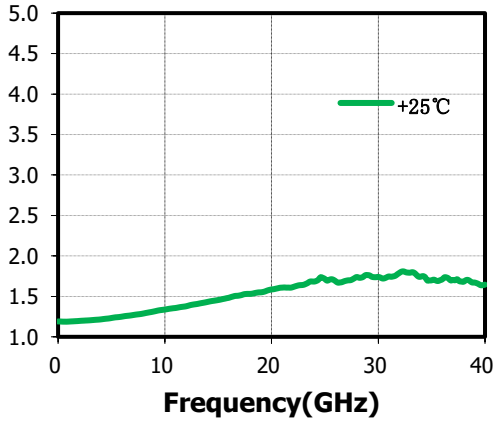
Isolation(dB) vs.Frequency



RFC VSWR(:1) vs.Frequency



RF1/2 VSWR(:1) vs.Frequency



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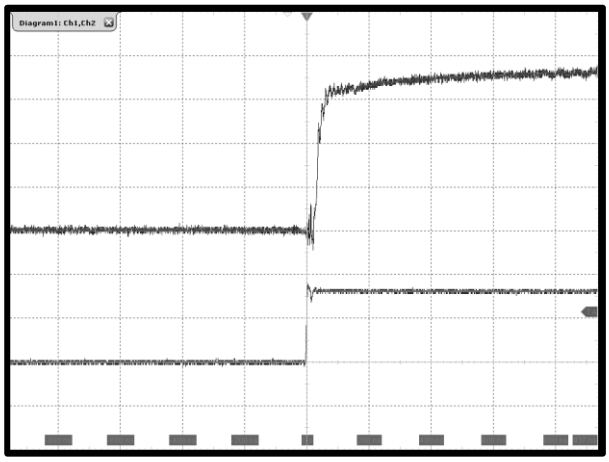
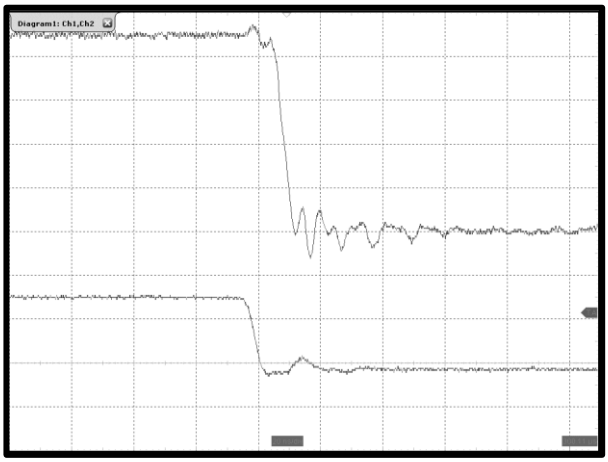
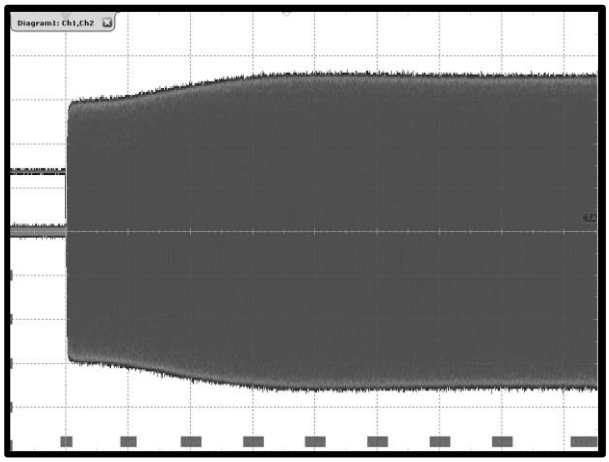
Switching Time I (CTRL-RF, 200nS/div)



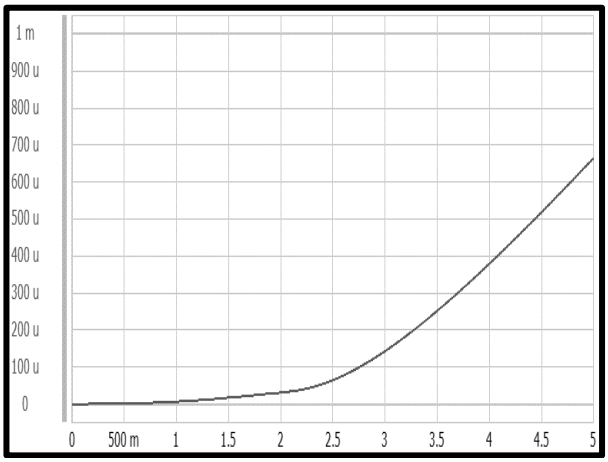
Switching Time II (CTRL-RF, 20nS/div)



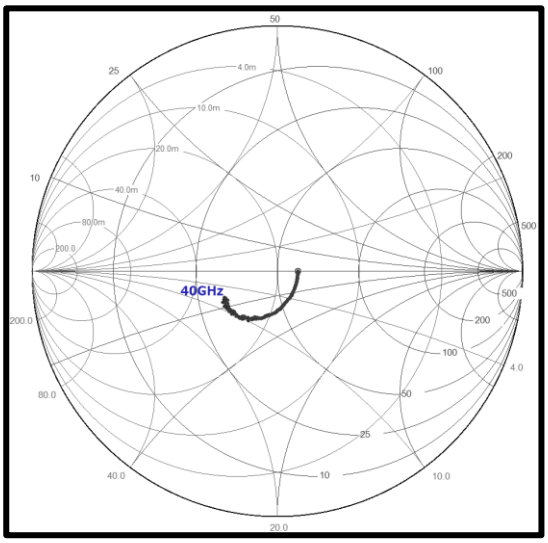
RF Settling Time (f=2GHz, C=1nF, 5uS/div)



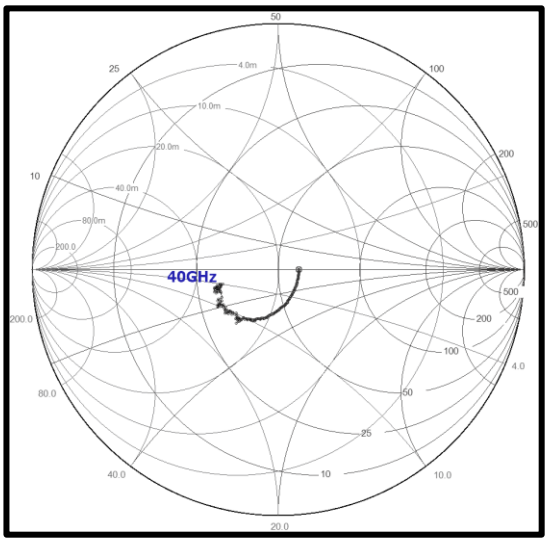
Control Port Current (uA) vs. Control Voltage (V)



S_{RFC}



$S_{RF1/2}$



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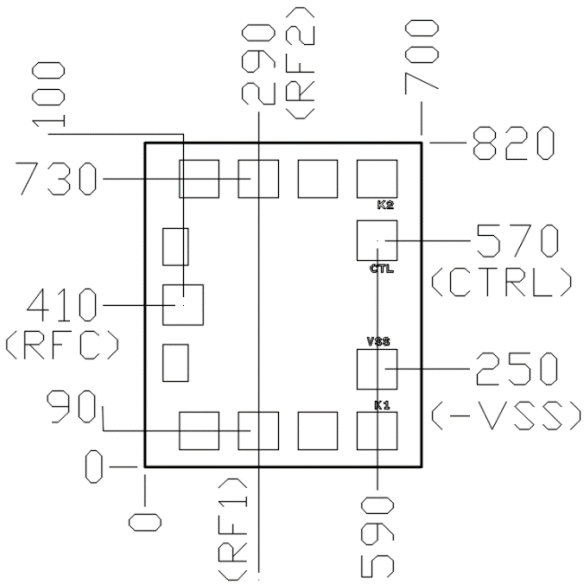
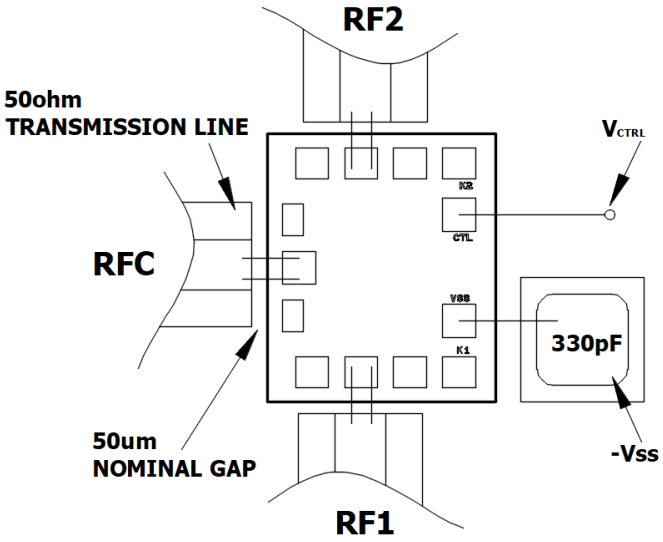
Die outline (μm)



Pad size: 100x100um

Assembly Diagram



Notes

1. GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test;
2. DC blocking capacitor is required for RF port.

Revision History

Revision	Date	Comment
1.0	Mar 4, 2021	First Release

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