



GW2159-A

CMOS SOI 0.1 – 6GHz SPDT Switch

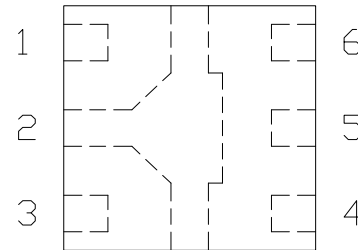
Ver1.0

■ Features

- WLAN 802.11 a/b/g/n/ac Applications
- Low Insertion Loss: 0.4dB@2.5GHz
0.55dB@6.0GHz
- High Isolation: 33dB@2.5GHz
30dB@6.0GHz
- DFN 1.0×1.0mm 6 Leads Green Package
- Low Cost and Good Reliability Performance

■ Pin Functional Schematic and Assignment

(Top View)



■ General Description

GW2159-A is a CMOS silicon-on-insulator(SOI) MMIC SPDT switch in a DFN 1.0×1.0mm 6 leads plastic package. GW2159-A features low insertion loss and positive voltage operation with low DC power consumption. Typical applications are for the variety of analog and digital wireless communication systems.

Pin No.	Pin Name	Description
1	RF1	Output1 Port
2	GND	Ground
3	RF2	Output2 Port
4	VC2	Voltage Control 2
5	RFC	Input Port
6	VC1	Voltage Control 1

■ Electrical Specifications at 25°C with (0, +3V) Control Voltages, 8pF DC cut capacitor

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Insertion Loss	0.1–6.0GHz	-	0.55	0.80	dB
	2.4–2.5GHz	-	0.40	0.60	
	4.9–6.0GHz	-	0.55	0.80	
Isolation (RF1 to RFC , RF2 to RFC)	0.1–6.0GHz	27	30	-	dB
	2.4–2.5GHz	30	33	-	
	4.9–6.0GHz	27	30	-	
Isolation (RF1 to RF2)	0.1–6.0GHz	22	25	-	dB
	2.4–2.5GHz	28	31	-	
	4.9–6.0GHz	22	25	-	
Input/Output Return Loss	0.1–6.0GHz	-	15	-	dB
	2.4–2.5GHz	-	30	-	
	4.9–6.0GHz	-	15	-	
Input Power for 1 dB compression	2.4–6.0GHz $2.3V \leq V_{cont1} - V_{cont2} \leq 3.3V$	-	31	-	dBm
	2.4–6.0GHz $1.8V \leq V_{cont1} - V_{cont2} \leq 2.3V$	-	25	-	
	Intermodulation Intercept Point (IIP3)	For two tones (f=2.5GHz, 2.51GHz)	-	55	-
Switch Time	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF)	-	200	-	ns
Control Current	Input Power +20dBm	-	8	15	μA

Notes: (1) All items are tested in 50Ω system, unless otherwise specified.

(2)DC cut capacitors=1000pF at frequency=0.1 to 0.5GHz.

(3)DC cut capacitors=56pF at frequency=0.5 to 2.0GHz.



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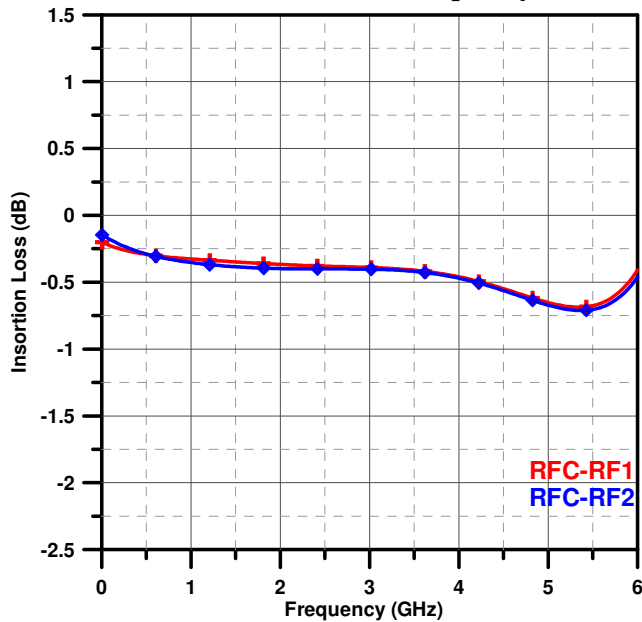
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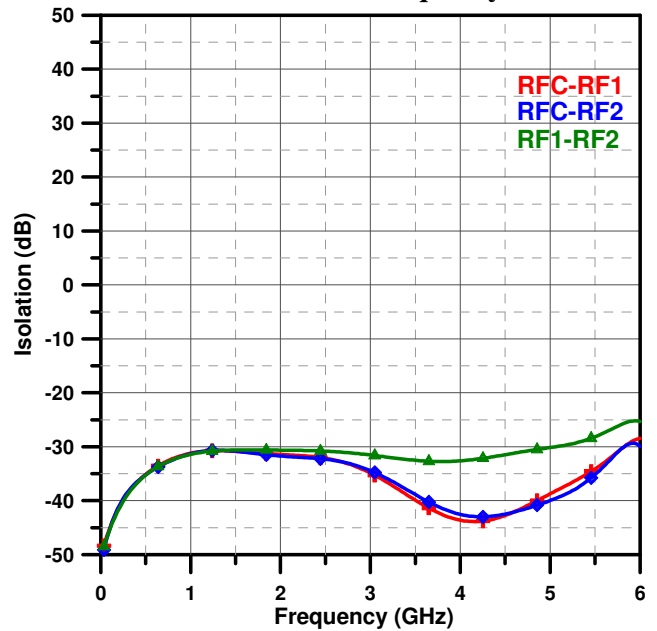
Typical Performance Curves

(25°C, Vcont(high)=3V, Vcont(low)=0V, DC cut capacitors=8pF)

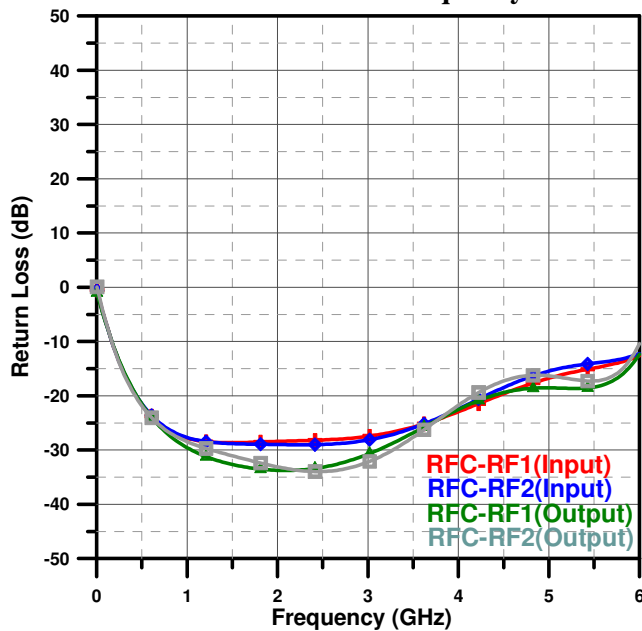
Insertion Loss v.s. Frequency



Isolation v.s. Frequency

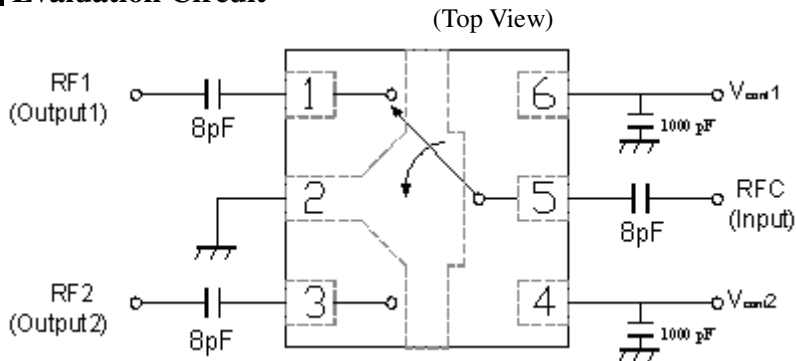


Return Loss v.s. Frequency





■ Evaluation Circuit



Note: Exposed pad in the bottom must be connected to ground by via holes.

■ Truth Table

Vcont1	Vcont2	Input-Output1	Input-Output2
High	Low	ON (Insertion Loss)	OFF (Isolation)
Low	High	OFF (Isolation)	ON (Insertion Loss)

High: 1.6V to 3.5V

Low: 0V to 0.4V

■ Recommended Operating Conditions

Parameter	MIN.	MAX.	Unit
Control Voltage (High)	+1.6	+3.5	V
Control Voltage (Low)	0	+0.4	V
Operating frequency	0.1	6.0	GHz

■ Absolute Maximum Ratings

Parameter	Absolute Maximum	Unit
Switch Control Voltage	3.5	V
Max input Power, $2.3V \leq VC1-VC2 \leq 3.3V$	31	dBm
Max input Power, $1.8V \leq VC1-VC2 \leq 2.3V$	25	dBm
Operating Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

Operational exceeding any one of these limits may cause permanent damage to this device.

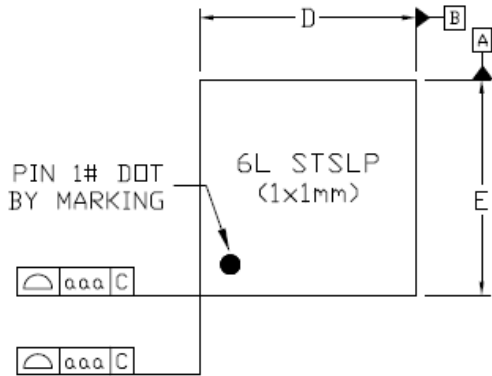


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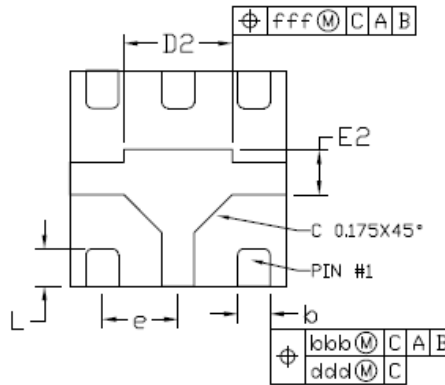
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DFN 1.0x1.0mm 6Lead Package Dimensions (Unit: mm)

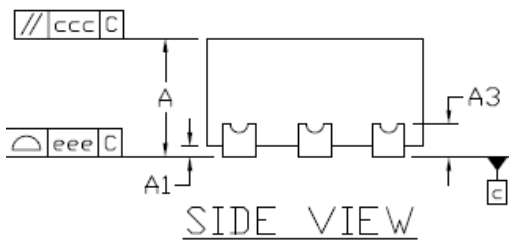


TOP VIEW



BOTTOM VIEW

Dimensional Ref.			
REF.	Min.	Nom.	Max.
A	0.450	0.550	0.600
A1	0.00	---	0.050
A3	0.152 Ref.		
D	0.950	1.000	1.050
E	0.950	1.000	1.050
D2	0.450	0.500	0.550
E2	0.160	0.210	0.260
b	0.100	0.150	0.200
e	0.350 BSC		
L	0.125	0.175	0.225
Tol. of Form&Position			
aaa	0.10		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		
fff	0.10		

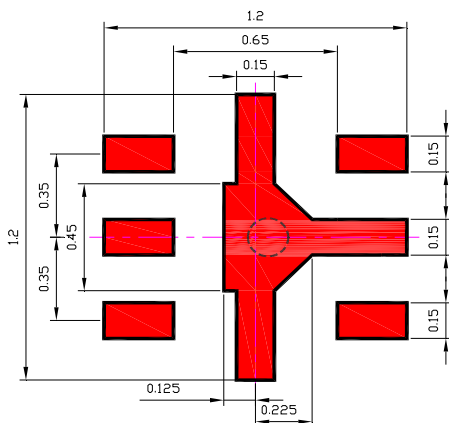


SIDE VIEW

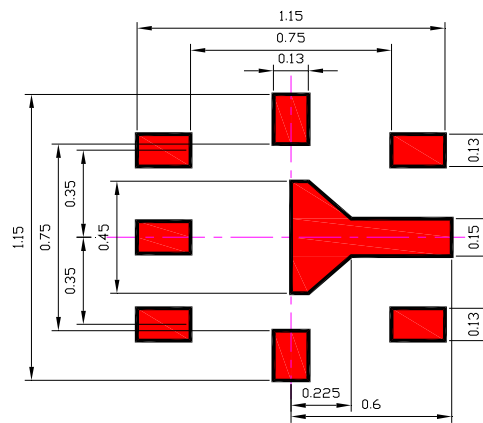
Notes

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER JEDEC MO-220.

Mounting Pad and Solder Mask Layout Dimensions (Unit: mm)



Mounting Pad



Solder Pad

Stainless thickness : 0.1mm~0.08mm

Remark : The mounting pad layouts in this document are for reference only.



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■ Recommended Soldering Conditions

Ver1.0

This product should be mounted and soldered under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions	Rating
Infrared Reflow	Peak temperature (package surface temperature) Time at peak temperature Time at temperature of 200 °C or higher Preheating time at 120 to 180 °C Maximum number of reflow processes Maximum chlorine content of rosin flux (%mass)	260 °C or below 10 seconds or less 60 seconds or less 120±30 seconds 3 times 0.2%(Wt.) or below
Wave Soldering	Peak temperature (molten solder temperature) Time at peak temperature Preheating temperature (package surface temperature) Maximum number of flow processes Maximum chlorine content of rosin flux (%mass)	260 °C or below 10 seconds or less 120 °C or below 1 times 0.2%(Wt.) or below
Partial Heating	Peak temperature (terminal temperature) Soldering time (per side of device) Maximum chlorine content of rosin flux (%mass)	350 °C or below 3 seconds or less 0.2%(Wt.) or below

Caution Do not use different soldering methods together (except for partial heating).