# Broadband SPDT RF Switch

DESCRIPTION

- The CG2163X3 is a GaAs MMIC SPDT(Single Pole Double Throw) switch which was developed for 2.4 GHz and 6 GHz dual-band wireless LAN

FEATURES

- Control voltage :
  VC(H) = 1.8 to 5.0 V (3.0V TYP.)
  VC(L) = -0.2 to 0.2 V (0V TYP.)
- Low insertion loss :
  $L_{ins}1$ = 0.40 dB TYP. @ f = 2.4 to 2.5 GHz
  $L_{ins}2$ = 0.50 dB TYP. @ f = 4.9 to 6.0 GHz
- High isolation :
  ISL1 = 40 dB TYP. @ f = 2.4 to 2.5 GHz
  ISL2 = 31 dB TYP. @ f = 4.9 to 6.0 GHz
- Power handling :
  $P_{in(1db)}$ = +33 dBm TYP. @ f = 2.5 GHz
  VC(H) = 3.0 V, VC(L) = 0 V
  $P_{in(1db)}$ = +32 dBm TYP. @ f = 6.0 GHz,
  VC(H) = 3.0 V, VC(L) = 0 V

## PACKAGE

- 6-pin XSON Package
  (1.5mm x 1.5mm x 0.37mm)
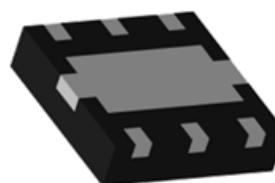
APPLICATIONS

- Dual-band wireless LAN (IEEE802.11a/b/g/n/ac)

ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Description
CG2163X3	CG2163X3-C2	6-pin plastic TSON (Pb-Free)	C06	• Embossed tape 8 mm wide • Pin 1, 6 face the perforation side of the tape • MOQ 10 kpcs/reel
CG2163X3-EVAL	CG2163X3-EVAL			• Evaluation Board with DC block capacitors, power supply bypass capacitors, and RF and DC connectors • MOQ 1

PIN CONFIGURATION AND INTERNAL BLOCK DIAGRAM

(Top View)   (Top View)   (Bottom View)
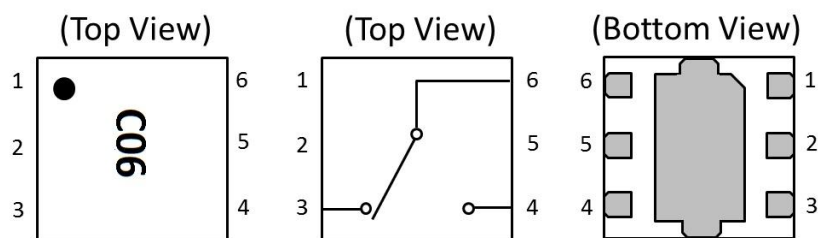
Pin No.	Pin Name
1	GND
2	VC2
3	RF2
4	RF1
5	VC1
6	RFC

Remark Exposed pad : GND

TRUTH TABLE

VC1	VC2	RFC-RF1	RFC-RF2
High	Low	OFF	ON
Low	High	ON	OFF

ABSOLUTE MAXIMUM RATINGS

(T_A = +25˚C, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Control Voltage	VC	6.0[Note 1]	V
Input Power	Pin	+33.5[Note 2]	dBm
Operating Ambient Temperature	T_A	-45 ~ +85	˚C
Storage Temperature	T_{stg}	-55 ~ +150	˚C

Note   1. |VC1 - VC2|≤6.0V
2. 3.0V≤|VC1 - VC2|≤5.0V

RECOMMENDED OPERATING RANGE

(T_A = +25˚C, unless otherwise specified)

| Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f1	2.4	-	2.5	GHz
	f2	4.9	-	6.0	GHz
Switch Control Voltage (H)	VC(H)	+1.8	+3.0	+5.0	V
Switch Control Voltage (L)	VC(L)	-0.2	0	+0.2	V

ELECTRICAL CHARACTERISTICS

(T_A=+25°C, VC(H)=3.0V, VC(L)=0V, Zo=50Ω, DC Block Capacitance=4pF, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss	$L_{ins}1$	f = 2.4 to 2.5 GHz	-	0.40	0.60	dB
	$L_{ins}2$	f = 4.9 to 6.0 GHz	-	0.50	0.80	dB
Isolation	ISL1	f = 2.4 to 2.5 GHz	37	40	-	dB
	ISL2	f = 4.9 to 6.0 GHz	28	31	-	dB
Input Return Loss	$RL_{in}1$	f = 2.4 to 2.5 GHz	-	15	-	dB
	$RL_{in}2$	f = 4.9 to 6.0 GHz	-	15	-	dB
Output Return Loss	$RL_{out}1$	f = 2.4 to 2.5 GHz	-	15	-	dB
	$RL_{out}2$	f = 4.9 to 6.0 GHz	-	15	-	dB
1 dB Compression Point **Note**	$P_{in(1dB)}$	f = 2.4 to 2.5 GHz, VC(H)=1.8V, VC(L)=0V	-	+29	-	dBm
		f = 2.4 to 2.5 GHz, VC(H)=3.0V, VC(L)=0V	-	+33	-	dBm
		f = 4.9 to 6.0 GHz, VC(H)=1.8V, VC(L)=0V	-	+26	-	dBm
		f = 4.9 to 6.0 GHz VC(H)=3.0V, VC(L)=0V	-	+32	-	dBm
3rd Order Input Intercept Point	$IIP3$	f = 2.5GHz 2-tone 5MHz Spacing	-	+55	-	dBm
Switch Control Speed	t_{sw}	50% CTL to 90/10%	-	80	-	ns
Switch Control Current	I_{cont}	RF None	-	2	-	µA

Note $Pin_{(1dB)}$ is the measured input power level when the insertion loss increases 1dB more than that of the linear range.
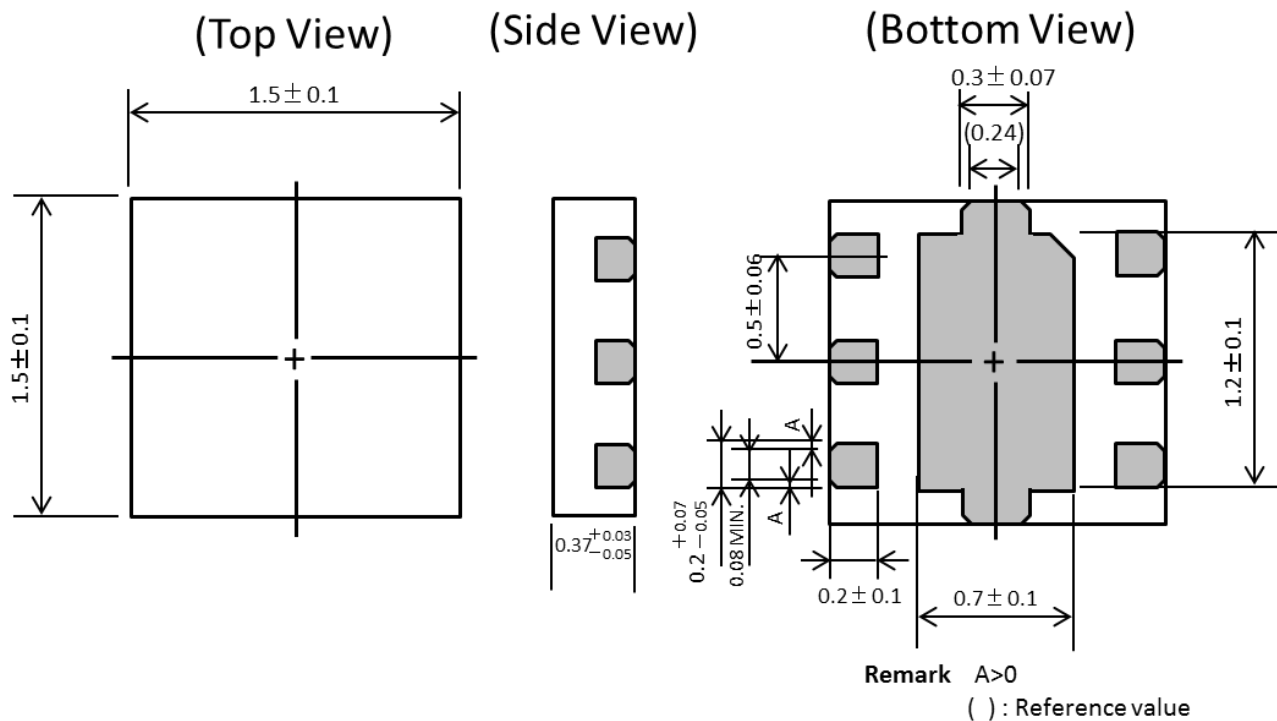
EVALUATION CIRCUIT
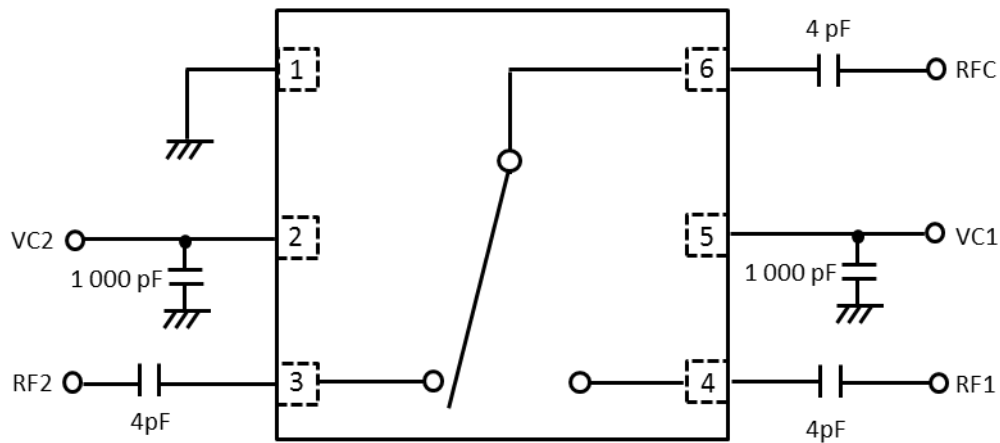
The application circuits and their parameters are for reference only and are not intended for use in actual designs.
DC Blocking Capacitors are required at all RF ports.

PACKAGE DIMENSIONS

6-pin Plastic XSON (Unit: mm)

Remark A>0
( ) : Reference value

REVISION HISTORY

Version	Change to current version	Page(s)
CDS-0015-03 (Issue A) February 17, 2016	Initial datasheet	N/A
CDS-0015-03 (Issue B) March 11, 2016	Added Eval Board ordering information	1
CDS-0015-03 (Issue C) March 15, 2016	Updated "Note" definition	3
CDS-0015-03 (Issue D) April 4, 2016	Updated Marking information	1, 2
CDS-0015-03 (Issue E) May 9, 2016	Correction to Truth Table: VC1 and VC2	2
CDS-0015-03 (Issue F) August 11, 2016	Removed "preliminary"	All

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