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## Dual-Band Wireless DPDT RF Switch

### DESCRIPTION

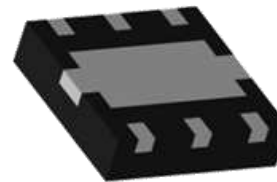
- The CG2164X3 is a GaAs MMIC DPDT (Double Pole Double Throw) switch for 2.5 GHz and 6 GHz dual-band wireless LAN applications

### 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:  
 $L_{ins1} = 0.50$  dB TYP. @  $f = 2.4$  to 2.5 GHz  
 $L_{ins2} = 0.60$  dB TYP. @  $f = 4.9$  to 6.0 GHz
- High Isolation:  
ISL1 = 23 dB TYP. @  $f = 2.4$  to 2.5 GHz  
ISL2 = 15 dB TYP. @  $f = 4.9$  to 6.0 GHz
- Power Handling:  
 $P_{in}(0.5dB) = +32$  dBm TYP. @  $f = 2.5$  GHz,  
VC(H) = 3.0 V, VC(L) = 0 V  
 $P_{in}(0.5dB) = +30$  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)



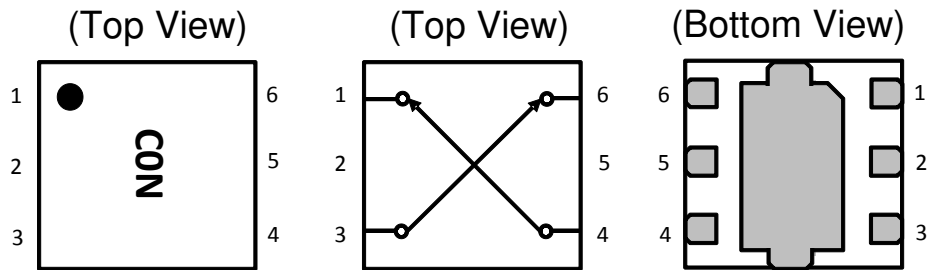
### APPLICATIONS

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

### ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Description
CG2164X3	CG2164X3-C2	6-pin plastic TSON (Pb-Free)	C0N	<ul style="list-style-type: none"> <li>Embossed tape 8 mm wide</li> <li>Pin 1, 6 face the perforation side of the tape</li> <li>MOQ 10 kpcs/reel</li> </ul>
CG2164X3-EVAL	CG2164X3-EVAL			<ul style="list-style-type: none"> <li>Evaluation Board with DC block capacitors, power supply bypass capacitors, and RF and DC connectors</li> <li>MOQ 1</li> </ul>

## PIN CONFIGURATION AND INTERNAL BLOCK DIAGRAM



Pin No.	Pin Name
1	ANT2
2	VC2
3	RX
4	TX
5	VC1
6	ANT1

**Remark** Exposed pad : GND

## TRUTH TABLE

VC1	VC2	ANT1-TX	ANT1-RX	ANT2-TX	ANT2-RX
High	Low	OFF	ON	ON	OFF
Low	High	ON	OFF	OFF	ON

## ABSOLUTE MAXIMUM RATINGS

(TA = +25°C, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Control Voltage	VC	6.0 <sup>Note 1</sup>	V
Input Power	P <sub>in</sub>	+33.0 <sup>Note 2</sup>	dBm
Operating Ambient Temperature	T <sub>A</sub>	-45~+85	°C
Storage Temperature	T <sub>stg</sub>	-55~+150	°C

- Note**
1.  $|VC1 - VC2| \leq 6.0V$
  2.  $3.0V \leq |VC1 - VC2| \leq 5.0V$

## RECOMMENDED OPERATING RANGE

(TA = +25°C, unless otherwise specified)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f	0.05	-	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

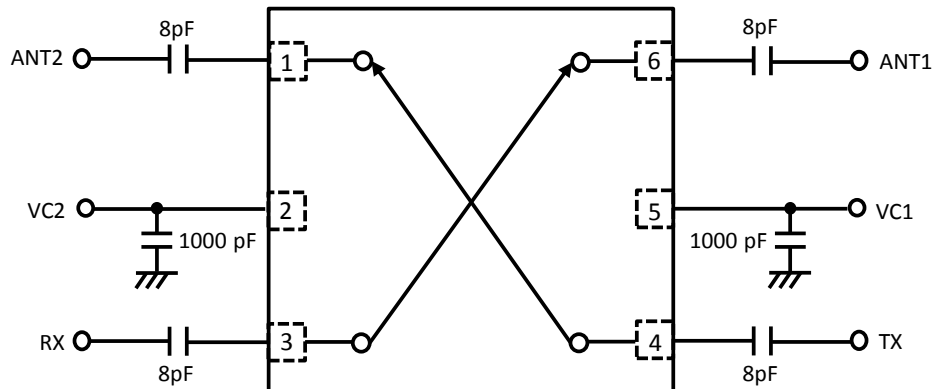
## ELECTRICAL CHARACTERISTICS

(TA=+25°C, VC(H)=3.0V, VC(L)=0V, Zo=50Ω, DC Block Capacitance=8pF, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss	Lins1	f = 2.4 to 2.5 GHz	-	0.50	0.75	dB
	Lins2	f = 4.9 to 6.0 GHz	-	0.60	1.00	dB
Isolation (ANT to TX,RX)	ISL1	f = 2.4 to 2.5 GHz	20	23	-	dB
	ISL2	f = 4.9 to 6.0 GHz	12	15	-	dB
Isolation (ANT1 to ANT2, TX to RX)	ISL3	f = 2.4 to 2.5 GHz	22	25	-	dB
	ISL4	f = 4.9 to 6.0 GHz	15	18	-	dB
Return Loss	RL1	f = 2.4 to 2.5 GHz	-	15	-	dB
	RL2	f = 4.9 to 6.0 GHz	-	15	-	dB
0.5 dB Loss Compression Input Power <sup>Note</sup>	P <sub>in(0.5dB)</sub>	f = 2.4 to 2.5 GHz	-	+32	-	dBm
		f = 4.9 to 6.0 GHz	-	+30	-	dBm
2nd Harmonics	2f <sub>0</sub>	f = 2.5 GHz, P <sub>in</sub> =+20dBm	-	85	-	dBc
		f = 6.0 GHz, P <sub>in</sub> =+20dBm	-	80	-	dBc
3rd Harmonics	3f <sub>0</sub>	f = 2.5 GHz, P <sub>in</sub> =+20dBm	-	85	-	dBc
		f = 6.0 GHz, P <sub>in</sub> =+20dBm	-	85	-	dBc
3rd Order Input Intercept Point	IIP3	f = 2.5GHz 2-tone 1MHz Spacing	-	+55	-	dBm
Switch Control Speed	tsw	50% CTL to 90/10%	-	30	-	ns
Switch Control Current	Icont	Non RF	-	2	-	μA

**Note** P<sub>in(0.5dB)</sub> is the measured input power level when the insertion loss increases 0.5dB more than that of the linear range.

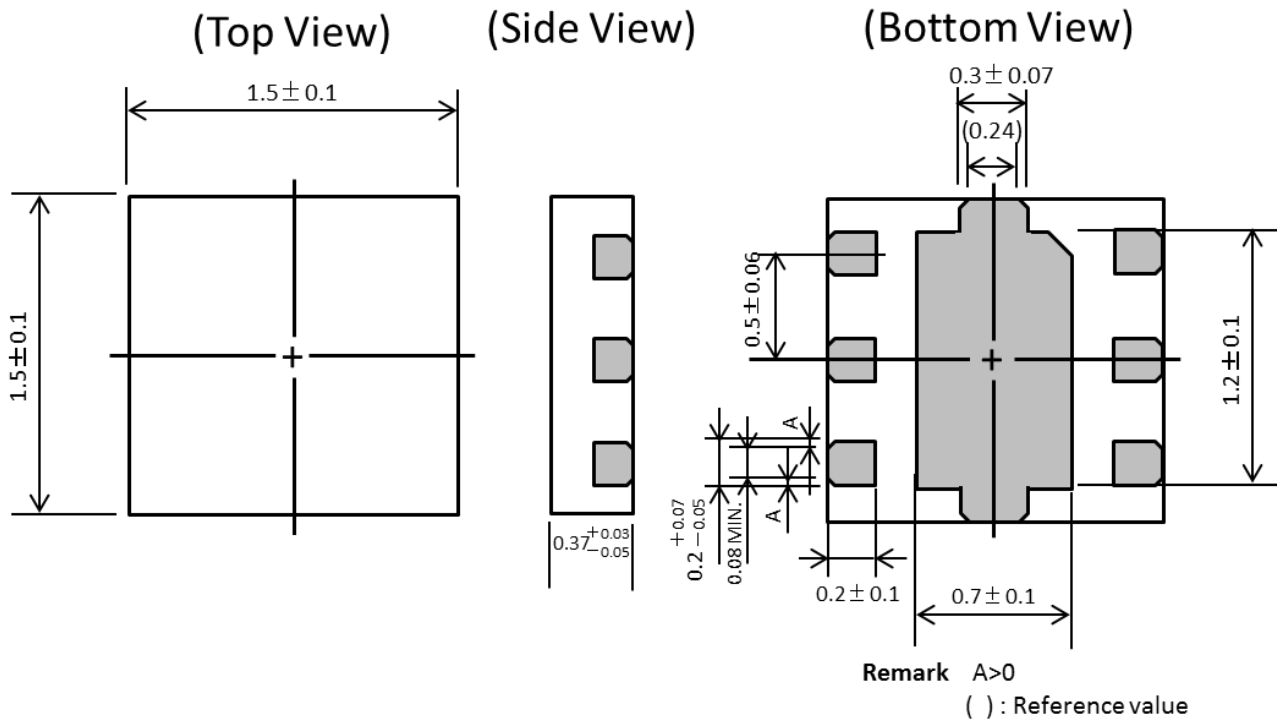
## EVALUATION CIRCUIT



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 TSON (Unit: mm)



## RECOMMENDED SOLDERING CONDITIONS

Recommended Soldering Conditions are available on CEL's [Part Summary page](#) under Associated Documents

## REVISION HISTORY

Version	Change to current version	Page(s)
CDS-0033-01 (Issue A) September 14, 2016	Preliminary datasheet	N/A
CDS-0033-02 (Issue B) December 27, 2016	Revised Electrical Characteristics table Added "Recommended Soldering Conditions" section	3, 5
CDS-0033-03 (Issue A) March 20, 2017	Initial Datasheet. Revised Electrical Characteristics table	3

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