CEL

RF SWITCH
CG2164X3

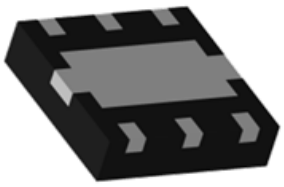
Dual-Band Wireless DPDT RF Switch

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

PACKAGE

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



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 = 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

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	• Embossed tape 8 mm wide • Pin 1, 6 face the perforation side of the tape • MOQ 10 kpcs/reel
CG2164X3-EVAL	CG2164X3-EVAL			• Evaluation Board with DC block capacitors, power supply bypass capacitors, and RF and DC connectors • MOQ 1

This document is subject to change without notice.
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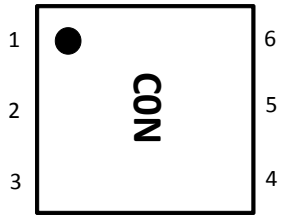
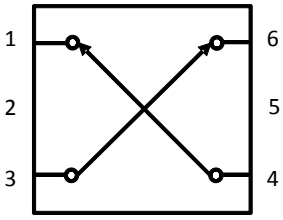
PIN CONFIGURATION AND INTERNAL BLOCK DIAGRAM

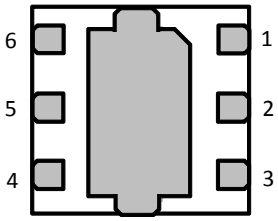
(Top View)



(Top View)



(Bottom View)



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

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

Parameter	Symbol	Rating	Unit
Control Voltage	VC	6.0 Note 1	V
Input Power	P_{in}	+33.0 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	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

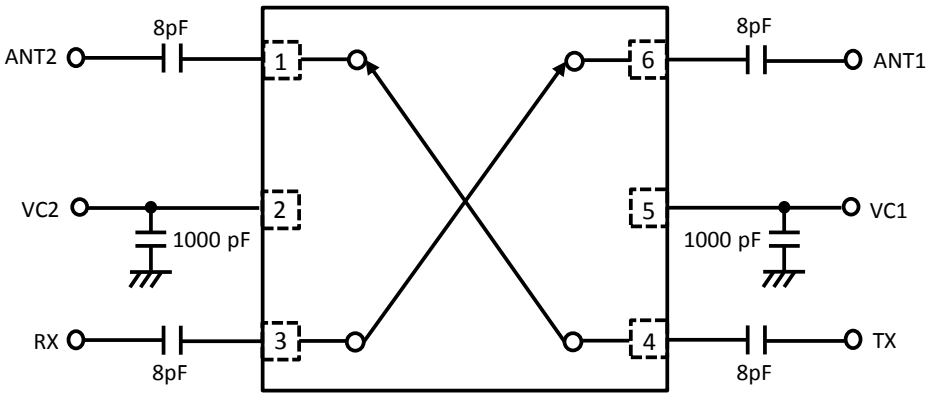
ELECTRICAL CHARACTERISTICS

(T_A=+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	-	0.40	0.60	dB
	Lins2	f = 4.9 to 6.0 GHz	-	0.50	0.80	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 **Note**	$P_{in(0.5dB)}$	f = 2.4 to 2.5 GHz	-	+32	-	dBm
		f = 4.9 to 6.0 GHz	-	+30	-	dBm
2nd Harmonics	2f0	f = 2.5 GHz, P_{in}=+20dBm	-	85	-	dBc
		f = 6.0 GHz, P_{in}=+20dBm	-	80	-	dBc
3rd Harmonics	3f0	f = 2.5 GHz, P_{in}=+20dBm	-	85	-	dBc
		f = 6.0 GHz, P_{in}=+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_{in}(0.5dB) is the measured input power level when the insertion loss increases 0.5dB more than that of the linear range.

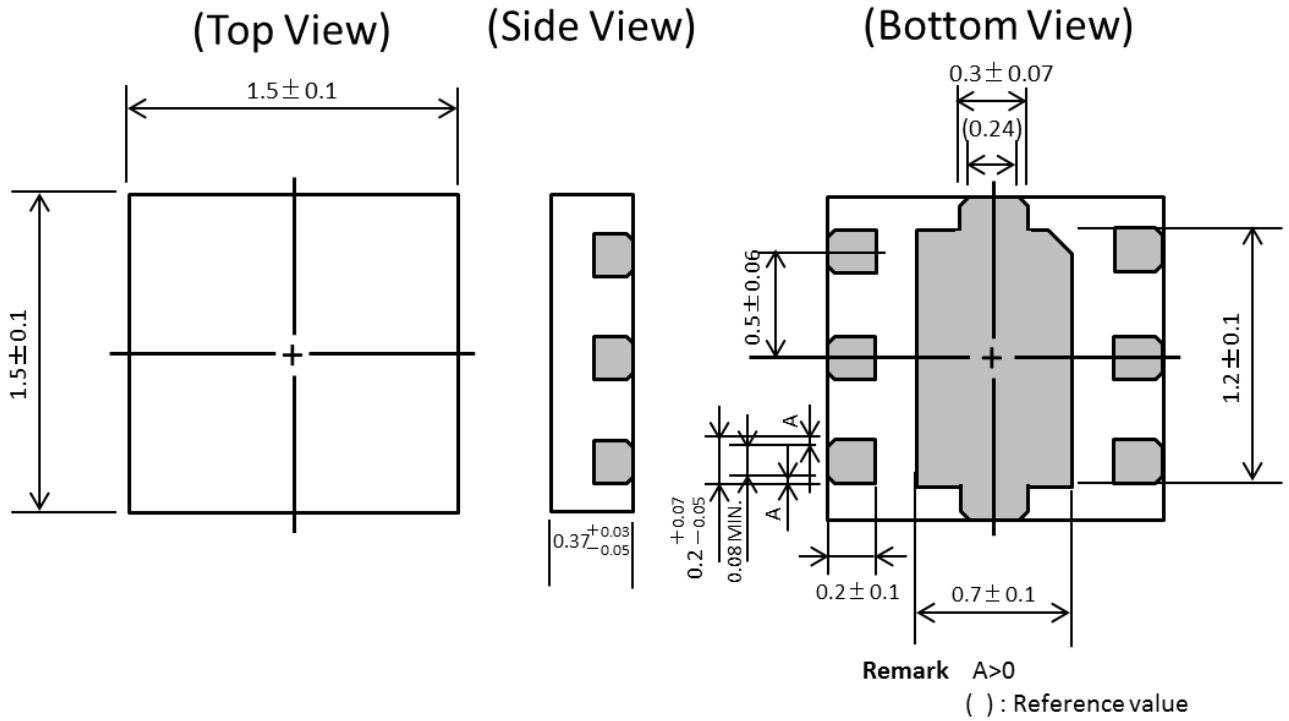
EVALUATION CIRCUIT



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

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This product uses gallium arsenide (GaAs) of the toxic substance appointed in laws and ordinances. GaAs vapor and powder are hazardous to human health if inhaled or ingested.

- Do not dispose in fire or break up this product.
- Do not chemically make gas or powder with this product.
- When discarding this product, please obey the laws of your country.
- Do not lick the product or in any way allow it to enter the mouth.

[CAUTION]

Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions should be used at all times.

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