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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## 6GHz Medium Power SPDT Switch

### DESCRIPTION

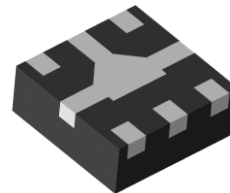
- The CG2185X2 is a pHEMT GaAs FET SPDT (Single Pole Double Throw) Switch. This device can operate from 2.0GHz to 6.0GHz, with low insertion loss and high isolation.

### 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 :  
 $L_{ins1} = 0.35$  dB TYP. @  $f = 2.0$  to 2.5 GHz  
 $L_{ins2} = 0.40$  dB TYP. @  $f = 4.9$  to 6.0 GHz
- High isolation :  
ISL1 = 28 dB TYP. @  $f = 2.0$  to 2.5 GHz  
ISL2 = 26 dB TYP. @  $f = 4.9$  to 6.0 GHz
- Power handling :  
 $P_{in(1dB)} = +32$  dBm TYP.  
@ VC(H) = 3.0 V, VC(L) = 0 V

### PACKAGE

- 6-pin plastic Thin Small SON (XS02) Package (1.0mm x 1.0mm x 0.37mm)



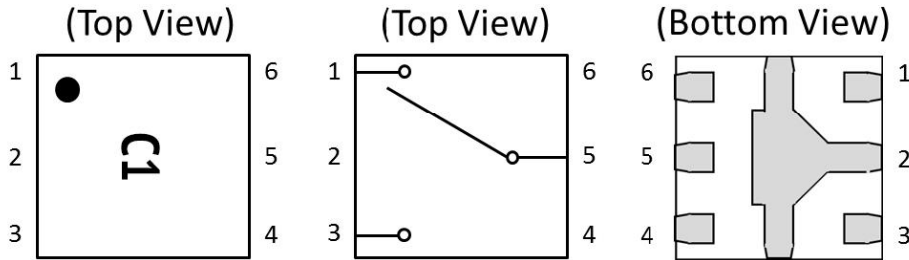
### APPLICATIONS

- Bluetooth
- Wireless LAN (IEEE802.11 a/b/g/n/ac)
- ISM band radios

### ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Description
CG2185X2	CG2185X2-C2	6-pin plastic TSSON (XS02) (Pb-Free)	C1	<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>
CG2185X2-EVAL	CG2185X2-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	RF1
2	GND
3	RF2
4	VC2
5	RFC
6	VC1

Remark Exposed pad : GND

## TRUTH TABLE

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

## 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 <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| ≤ 6.0V  
 2. 3.0V ≤ |VC1 - VC2| ≤ 5.0V

## RECOMMENDED OPERATING RANGE

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f	2.0	-	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)

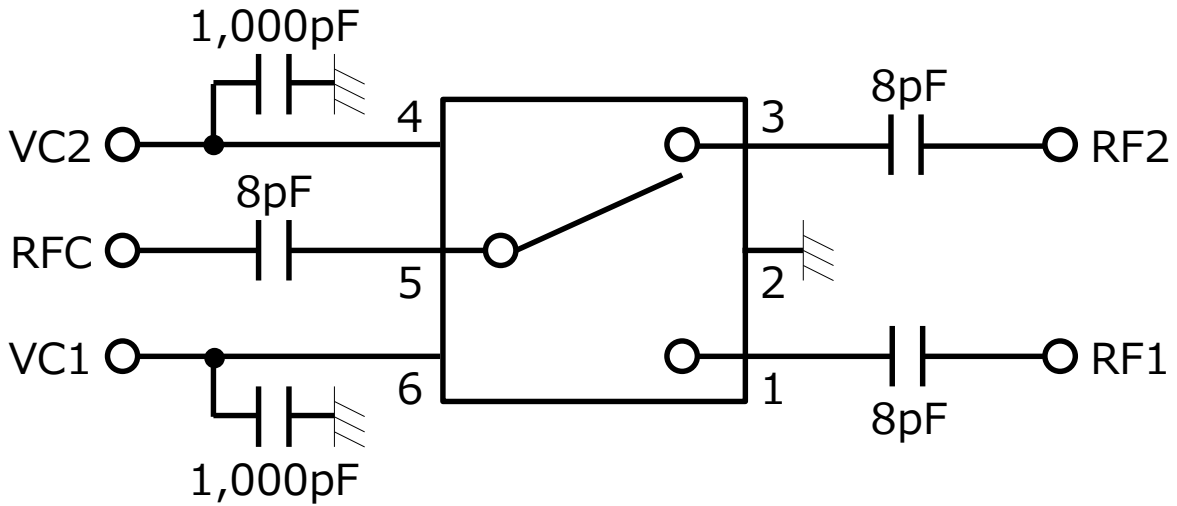
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss	Lins1	f = 2.0 to 2.5 GHz	-	0.35	0.55	dB
	Lins2	f = 4.9 to 6.0 GHz	-	0.40	0.60	dB
Isolation	ISL1	f = 2.0 to 2.5 GHz	25	28	-	dB
	ISL2	f = 4.9 to 6.0 GHz	23	26	-	dB
Input Return Loss	RL <sub>in</sub> 1	f = 2.0 to 2.5 GHz	23	26	-	dB
	RL <sub>in</sub> 2	f = 4.9 to 6.0 GHz	15	18	-	dB
Output Return Loss	RL <sub>out</sub> 1	f = 2.0 to 2.5 GHz	21	24	-	dB
	RL <sub>out</sub> 2	f = 4.9 to 6.0 GHz	15	18	-	dB
0.1 dB Loss Compression Input Power <b>Note 1</b>	P <sub>in(0.1 dB)</sub>	f = 2.5 GHz, VC(H)=1.8V, VC(L)=0V	+20	+23	-	dBm
		f = 2.5 GHz, VC(H)=3.0V, VC(L)=0V	+26	+29	-	dBm
		f = 6.0 GHz, VC(H)=1.8V, VC(L)=0V	+19	+22	-	dBm
		f = 6.0 GHz VC(H)=3.0V, VC(L)=0V	+26	+29	-	dBm
1 dB Loss Compression Input Power <b>Note 2</b>	P <sub>in(1 dB)</sub>	f = 2.5 GHz, VC(H)=1.8V, VC(L)=0V	+24	+27	-	dBm
		f = 2.5 GHz, VC(H)=3.0V, VC(L)=0V	+29	+32	-	dBm
		f = 6.0 GHz, VC(H)=1.8V, VC(L)=0V	+22	+25	-	dBm
		f = 6.0 GHz VC(H)=3.0V, VC(L)=0V	+29	+32	-	dBm
3rd Order Input Intercept Point	IIP3	f = 2.5GHz 2-tone 5MHz Spacing	-	+55	-	dBm
Switching Speed	t <sub>sw</sub>	50% CTL to 90/10%	-	50	150	ns
Switch Control Current	I <sub>cont</sub>	RF None	-	2	10	μA

**Note 1.** P<sub>in(0.1dB)</sub> is the measured input power level when the insertion loss increases 0.1dB more than that of the linear range.

**2.** P<sub>in(1dB)</sub> is the measured input power level when the insertion loss increases 1dB more than that of the linear range.



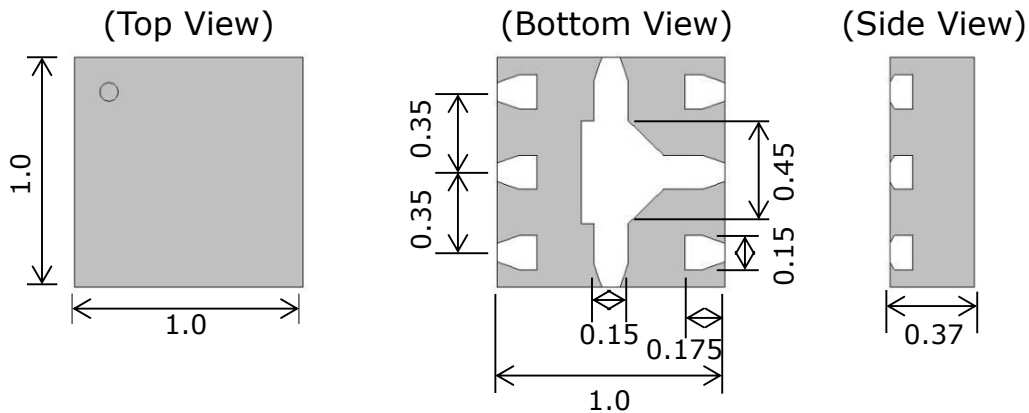
## EVALUATION CIRCUIT



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 TSSON (XS02) (Unit: mm)



## RECOMMENDED SOLDERING CONDITIONS

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

## REVISION HISTORY

Version	Change to current version	Page(s)
CDS-0004-02 (Issue A) February 17, 2016	Initial datasheet	N/A
CDS-0004-02 (Issue B) March 24, 2016	Added Eval Board ordering information. Updated Marking information.	Page 1,2
CDS-0004-02 (Issue C) August 11, 2016	Removed "preliminary"	All
CDS-0004-02 (Issue D) January 11, 2017	Added "Recommended Soldering Conditions" section	5

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**CEL Headquarters** • 4590 Patrick Henry Drive • Santa Clara, CA 95054 • Tel: (408) 919-2500 • [www.cel.com](http://www.cel.com)

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