DATA SHEET : CKRF2164XS03

Broadband DPDT Switch for 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} = 0.50 dB TYP. @ f = 2.5 GHz
  L_{ins} = 0.60 dB TYP. @ f = 6.0 GHz
- High isolation :
  ISL = 23 dB TYP. @ f = 2.5 GHz
  ISL = 15 dB TYP. @ f = 6.0 GHz
- Handling power :
  $P_{in(0.5dB)}$ = +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

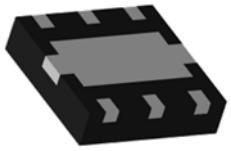
- Dual-band wireless LAN
  (IEEE802.11a/b/g/n), etc.

Package

- 6-pin Thin SON Package(XS03)
  (1.5mm x 1.5mm x 0.37mm)

Description

- The CKRF2164XS03 is a GaAs MMIC DPDT(Double Pole Double Throw) switch which was developed for 0.05 GHz and 6 GHz dual-band wireless LAN



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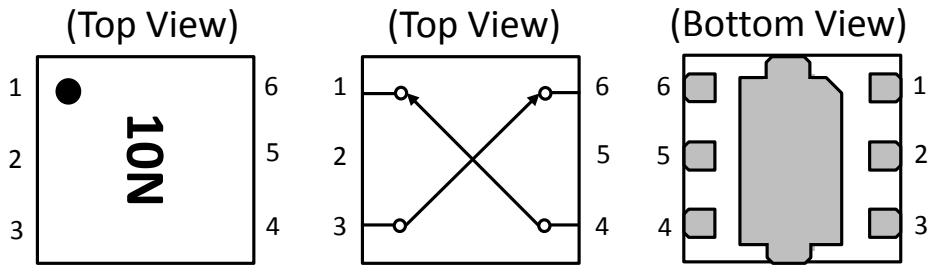
Pin Configuration and Internal Block Diagram



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

Remark Exposed pad : GND

Ordering Information

Part Number	Order Number	Package	Marking	Supplying Form
CKRF2164XS03-C2	CKRF2164XS03-C2	6-pin TSON (Pb-Free)	10N	・Embossed tape 8 mm wide ・Pin 1, 6 face the perforation side of the tape ・Qty 10 kpcs/reel

Absolute Maximum Ratings

(T_A = +25℃, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Control Voltage	VC	6.0[Note 1]	V
Input Power	$P_{in}1$	+33[Note 2]	dBm
	$P_{in}2$	+26[Note 3]	dBm
Operating Ambient Temperature	T_A	-45～+85	℃
Storage Temperature	T_{stg}	-55～+150	℃

Note 1. |VC1 - VC2|≦6.0V

2. 3.0V≦|VC1 – VC2|≦5.0V, f ≧ 0.5GHz

3. 3.0V≦|VC1 – VC2|≦5.0V, f = 0.05GHz

Recommended Operating Range

(T_A = +25℃, 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

Truth Table

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

・Electrical Characteristics 1

(T_A=+25℃, 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 = 0.05 to 0.5 GHz Note1	-	0.40	0.65	dB
	Lins2	f = 0.5 to 1.0 GHz Note1	-	0.45	0.70	dB
	Lins3	f = 1.0 to 2.0 GHz Note1	-	0.50	0.75	dB
	Lins4	f = 2.0 to 2.5 GHz	-	0.50	0.75	dB
	Lins5	f = 2.5 to 4.9 GHz	-	0.55	0.90	dB
	Lins6	f = 4.9 to 6.0 GHz	-	0.60	1.00	dB
Isolation (ANT to TX,RX)	ISL1	f = 0.05 to 0.5 GHz Note1	32	35	-	dB
	ISL2	f = 0.5 to 1.0 GHz Note1	26	29	-	dB
	ISL3	f = 1.0 to 2.0 GHz Note1	21	24	-	dB
	ISL4	f = 2.0 to 2.5 GHz	20	23	-	dB
	ISL5	f = 2.5 to 4.9 GHz	13	16	-	dB
	ISL6	f = 4.9 to 6.0 GHz	12	15	-	dB
Isolation (ANT1 to ANT2, TX to RX)	ISL7	f = 0.05 to 0.5 GHz Note1	34	37	-	dB
	ISL8	f = 0.5 to 1.0 GHz Note1	27	30	-	dB
	ISL9	f = 1.0 to 2.0 GHz Note1	22	25	-	dB
	ISL10	f = 2.0 to 2.5 GHz	22	25	-	dB
	ISL11	f = 2.5 to 4.9 GHz	15	18	-	dB
	ISL12	f = 4.9 to 6.0 GHz	15	18	-	dB
Input Return Loss	RLin1	f = 0.05 to 2.0 GHz Note1	-	20	-	dB
	RLin2	f = 2.0 to 6.0 GHz	-	15	-	dB
Output Return Loss	RLout1	f = 0.05 to 2.0 GHz Note1	-	20	-	dB
	RLout2	f = 2.0 to 6.0 GHz	-	15	-	dB
0.5 dB Loss Compression Input Power **Note2**	$P_{in(0.5dB)}$	f = 0.05 GHz	-	+24.5	-	dBm
		f = 0.5 to 1.0 GHz	-	+31	-	dBm
		f = 2.4 to 2.5 GHz	-	+32	-	dBm
		f = 4.9 to 6.0 GHz	-	+30	-	dBm

Note1 DC block capacitance = 1,000pF at f=0.05 to 2.0GHz

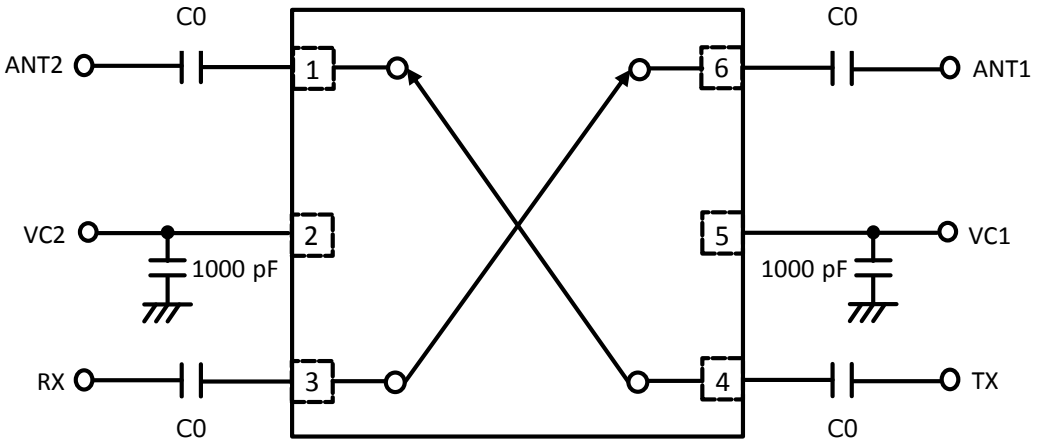
Note2 $P_{in(0.5dB)}$ is the measured input power level when the insertion loss increases 0.5dB more than that of the linear range.

・Electrical Characteristics 2

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

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
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	IIP_3	f = 2.5GHz 2-tone 1MHz Spacing	-	+55	-	dBm
Error Vector Magnitude	EVM	802.11a, 64QAM, 54Mbps, Pin≦+24.5dBm	-	2.5	-	%
		802.11g, 64QAM, 54Mbps, Pin≦+25dBm	-	2.5	-	%
Switch Control Speed	t_{sw}	50% CTL to 90/10%	-	30	-	ns
Switch Control Current	I_{cont}	Non RF	-	2	-	μA

Evaluation Circuit

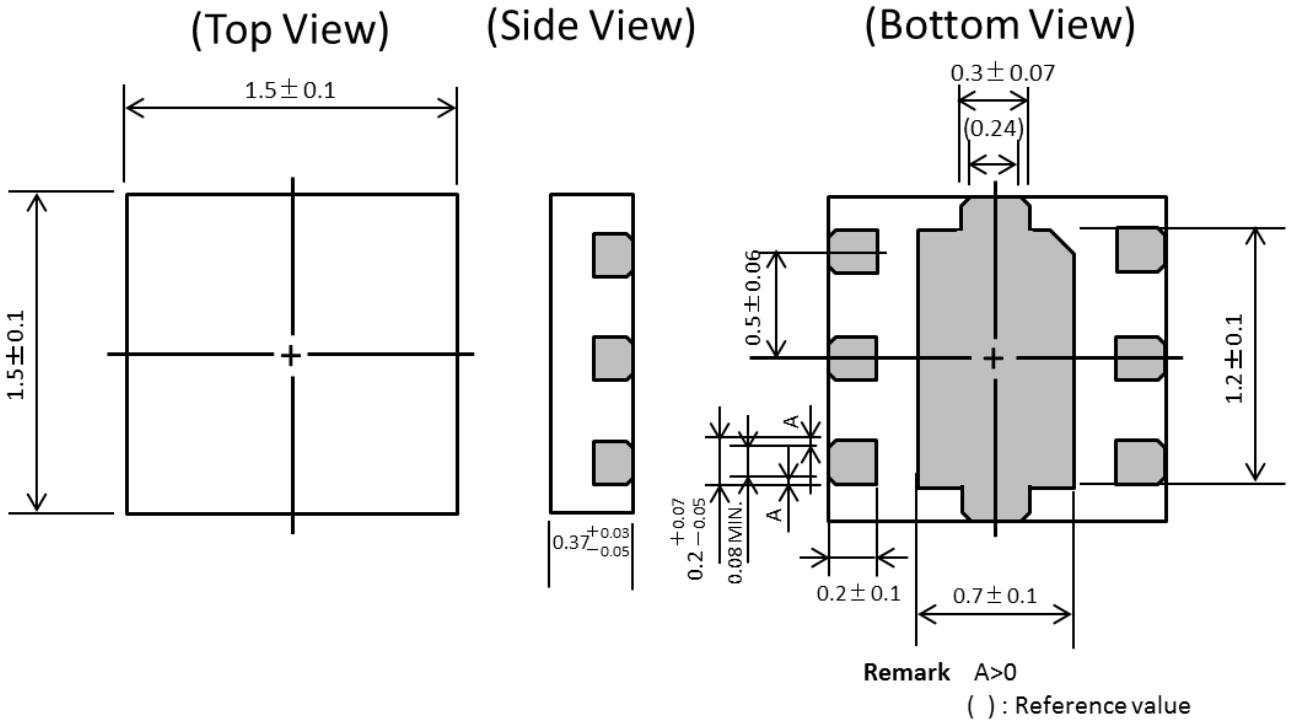


Note C0 : 0.05 to 2.0 GHz 1,000pF
2.0 to 6.0 GHz 8pF

The application circuits and their parameters are for reference only and are not intended for use in actual design-ins. This device is used it is necessary to use DC Block Capacitance.

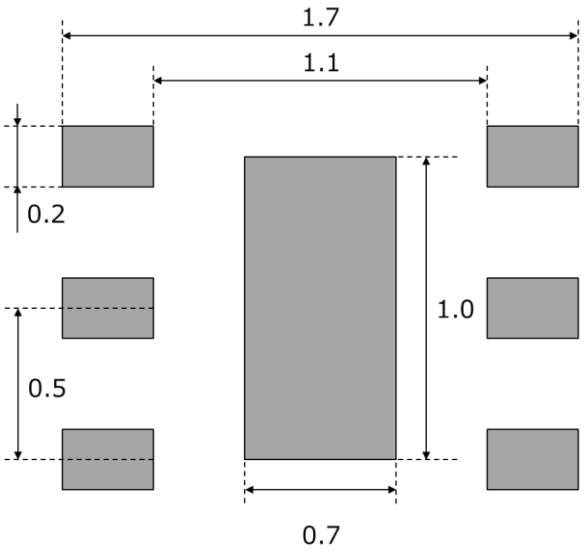
Package Dimensions

6-pin TSON (Unit : mm)



PCB Layout Footprint

6-pin TSON (Unit : mm)



The PCB Layout Footprint in this document is for reference only.

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- Do not dispose in fire or break up this product.
- Do not chemically make gas or powder with this product.
- When discard this product, please obey the law 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.

CHUO DENSHI KOGYO CO., LTD
3400 Kooyama, Matsubase, Uki-City,
Kumamoto 869-0512, Japan
Tel : +81-964-32-2730
Fax : +81-964-32-3549
URL : http://www.en.cdk.co.jp/

Contact info for inquiries
Electronic Devices Division Sales and Planning Department
TEL : +81-964-32-2750
E-mail : info@cdk.co.jp
FAX : +81-964-32-3549