DATA SHEET : CKRF6415XS03

0.5 to 6.0 GHz High Power SPDT Switch

Features

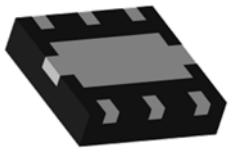
- Control voltage :
  VC(H) = 1.8 to 5.3 V (3.0V TYP.)
  VC(L) = -0.2 to 0.2 V (0V TYP.)
- Low insertion loss :
  L_{ins1} = 0.30 dB TYP. @ f = 0.5 to 2.0 GHz
  L_{ins2} = 0.35 dB TYP. @ f = 2.0 to 2.5 GHz
  L_{ins3} = 0.40 dB TYP. @ f = 2.5 to 3.8 GHz
  L_{ins4} = 0.45 dB TYP. @ f = 3.8 to 6.0 GHz
- High isolation :
  ISL1 = 32 dB TYP. @ f = 0.5 to 2.0 GHz
  ISL2 = 32 dB TYP. @ f = 2.0 to 2.5 GHz
  ISL3 = 32 dB TYP. @ f = 2.5 to 3.8 GHz
  ISL4 = 26 dB TYP. @ f = 3.8 to 6.0 GHz
- Handling power :
  $P_{in(0.5dB)}$ = +34 dBm TYP.
  @ VC(H) = 3.0 V, VC(L) = 0 V

Package

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

Description

- The CKRF6415XS03 is a GaAs MMIC SPDT(Single Pole Double Throw) switch which was developed for WiMAX and wireless LAN

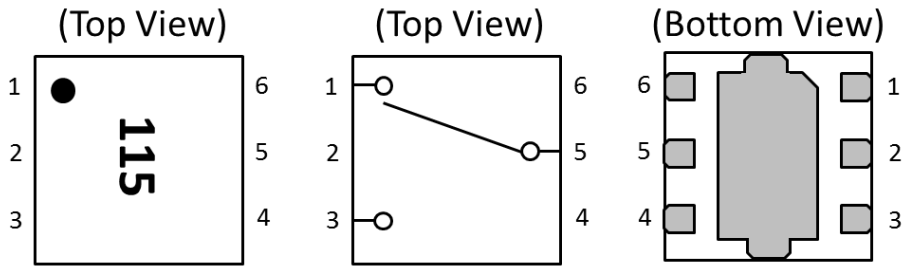


Applications

- WiMAX and wireless LAN

(IEEE802.11a/b/g/n/ac), etc.

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

Ordering Information

Part Number	Order Number	Package	Marking	Supplying Form
CKRF6415XS03-C2	CKRF6415XS03-C2	6-pin TSON (Pb-Free)	115	・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}	+34.5[Note 2]	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

Recommended Operating Range

(T_A = +25℃, unless otherwise specified)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f	0.5	-	6.0	GHz
Switch Control Voltage (H)	VC(H)	+1.8	+3.0	+5.3	V
Switch Control Voltage (L)	VC(L)	-0.2	0	+0.2	V

Truth Table

VC1	VC2	RFC-RF1	RFC-RF2
High	Low	ON	OFF
Low	High	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	Condition	MIN.	TYP.	MAX.	Unit
Insertion Loss	L_{INS1}	f=0.5 to 2.0GHz **Note 1**	---	0.30	0.50	dB
	L_{INS2}	f=2.0 to 2.5GHz	---	0.35	0.55	dB
	L_{INS3}	f=2.5 to 3.8GHz	---	0.40	0.60	dB
	L_{INS4}	f=3.8 to 6.0GHz	---	0.45	0.70	dB
Isolation	ISL1	f=0.5 to 2.0GHz **Note 1**	29	32	---	dB
	ISL2	f=2.0 to 2.5GHz	29	32	---	dB
	ISL3	f=2.5 to 3.8GHz	29	32	---	dB
	ISL4	f=3.8 to 6.0GHz	23	26	---	dB
Return Loss	RL1	f=0.5 to 2.0GHz **Note 1**	15	20	---	dB
	RL2	f=2.0 to 2.5GHz	15	20	---	dB
	RL3	f=2.5 to 6.0GHz	10	15	---	dB
0.1dB Loss Compression Input Power **Note 2**	$P_{in(0.1dB)}$	f=0.5 to 2.0GHz **Note 1**	---	+32	---	dBm
		f=2.0 to 6.0GHz	---	+31	---	dBm
		f=0.5 to 6.0GHz **Note 1** VC(H)=5.0V	---	+35	---	dBm
0.5dB Loss Compression Input Power **Note 3**	$P_{in(0.5dB)}$	f=0.5 to 2.0GHz **Note 1**	---	+34	---	dBm
		f=2.0 to 6.0GHz	---	+34	---	dBm
3rd Order Input Intercept Point	IIP_3	f=2.5GHz, 2-tone 1MHz Spacing	---	60	---	dBm
2nd Harmonics	2f0	f=2.5GHz, P_{in}=+20dBm	---	-90	---	dBc
		f=6.0GHz, P_{in}=+20dBm	---	-90	---	dBc
3rd Harmonics	3f0	f=2.5GHz, P_{in}=+20dBm	---	-90	---	dBc
		f=6.0GHz, P_{in}=+20dBm	---	-90	---	dBc

Note 1. DC block capacitance = 56pF at f=0.5 to 2.0GHz

Note 2. $P_{in(0.1dB)}$ is the measured input power level when the insertion loss increases 0.1dB more than that of the linear range.

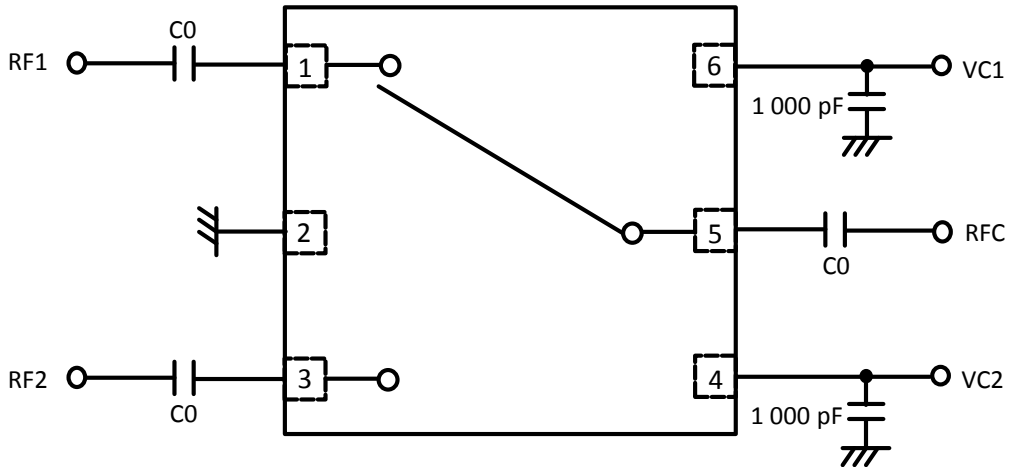
Note 3. $P_{in(0.5dB)}$ is the measured input power level when the insertion loss increases 0.5dB more than that of the linear range.

Electrical Characteristics 2

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

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Error Vector Magnitude	EVM	802.11a, 64QAM, 54Mbps, Pin≦+25dBm	---	0.5	---	%
		802.11g, 64QAM, 54Mbps, Pin≦+25dBm	---	0.5	---	%
		802.11ac, 256QAM, MCS9, 80MHz, Pin≦+25dBm	---	0.5	---	%
Switch Control Current	I_{CONT}	RF none	---	2	10	uA
Switching Speed	T_{SW}	50% CTL to 90/10% RF	---	100	250	ns

Evaluation Circuit

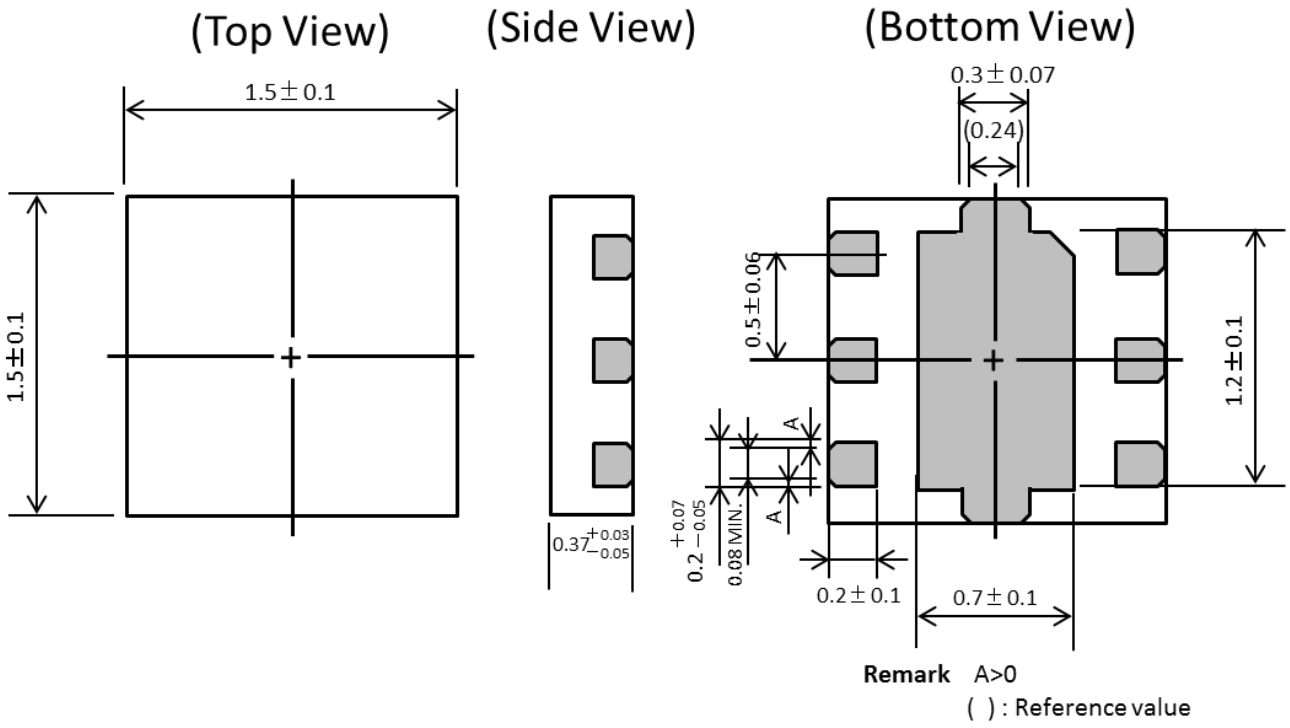


Note C0 : 0.5 to 2.0 GHz 56pF
: 2.0 to 6.0 GHz 8pF

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.

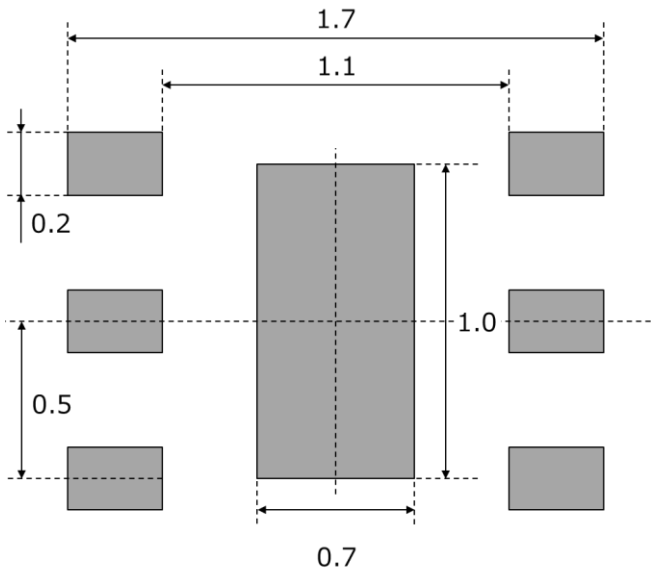
Package Dimensions

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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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 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.

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