

DATA SHEET : CKRF6163XS03

Broadband SPDT Switch for Dual-Band Wireless LAN



Features

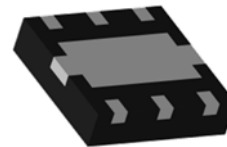
- Control voltage :
 $VC(H) = 1.8 \text{ to } 5.0 \text{ V (3.0V TYP.)}$
 $VC(L) = -0.2 \text{ to } 0.2 \text{ V (0V TYP.)}$
- Low insertion loss :
 $L_{ins1} = 0.40 \text{ dB TYP. @ } f = 2.4 \text{ to } 2.5 \text{ GHz}$
 $L_{ins2} = 0.50 \text{ dB TYP. @ } f = 4.9 \text{ to } 6.0 \text{ GHz}$
- High isolation :
 $ISL1 = 40 \text{ dB TYP. @ } f = 2.4 \text{ to } 2.5 \text{ GHz}$
 $ISL2 = 31 \text{ dB TYP. @ } f = 4.9 \text{ to } 6.0 \text{ GHz}$
- Handling power :
 $P_{in(1dB)} = +33 \text{ dBm TYP. @ } f = 2.5 \text{ GHz,}$
 $VC(H) = 3.0 \text{ V, } VC(L) = 0 \text{ V}$
 $P_{in(1dB)} = +32 \text{ dBm TYP. @ } f = 6.0 \text{ GHz,}$
 $VC(H) = 3.0 \text{ V, } VC(L) = 0 \text{ V}$

Package

- 6-pin Thin SON Package(XS03)
 $(1.5\text{mm} \times 1.5\text{mm} \times 0.37\text{mm})$

Description

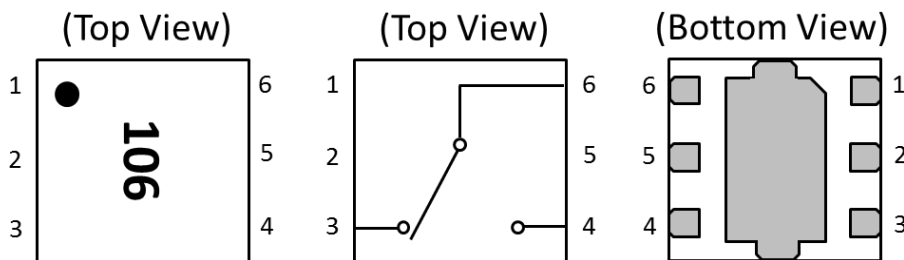
- The CKRF6163XS03 is a GaAs MMIC SPDT(Single Pole Double Throw) switch which was developed for 2.4 GHz and 6 GHz dual-band wireless LAN.



Applications

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

Pin Configuration and Internal Block Diagram



Pin No.	Pin Name
1	NC ^{Note} / GND
2	VC2
3	RF2
4	RF1
5	VC1
6	RFC

Note Non-Connection
Remark Exposed pad : GND

Ordering Information

Part Number	Order Number	Package	Marking	Supplying Form
CKRF6163XS03-C2	CKRF6163XS03-C2	6-pin plastic TSON (Pb-Free)	106	<ul style="list-style-type: none"> • Embossed tape 8 mm wide • Pin 1, 6 face the perforation side of the tape • Qty 10 kpcs/reel

DATA SHEET : CKRF6163XS03



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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}	+33.5 ^{Note 2}	dBm
Operating Ambient Temperature	T _A	-45~+85	°C
Storage Temperature	T _{stg}	-55~+150	°C

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

Recommended Operating Range

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f1	2.4	-	2.5	GHz
	f2	4.9	-	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	RFC-RF1	RFC-RF2
High	Low	OFF	ON
Low	High	ON	OFF

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Electrical Characteristics

($T_A=+25\text{ }^\circ\text{C}$, $V_C(H)=3.0\text{V}$, $V_C(L)=0\text{V}$, $Z_o=50\ \Omega$, DC Block Capacitance=4pF, 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	ISL1	f = 2.4 to 2.5 GHz	37	40	-	dB
	ISL2	f = 4.9 to 6.0 GHz	28	31	-	dB
Input Return Loss	RLin1	f = 2.4 to 2.5 GHz	-	15	-	dB
	RLin2	f = 4.9 to 6.0 GHz	-	15	-	dB
Output Return Loss	RLout1	f = 2.4 to 2.5 GHz	-	15	-	dB
	RLout2	f = 4.9 to 6.0 GHz	-	15	-	dB
1 dB Loss Compression Input Power Note	$P_{in(1dB)}$	f = 2.4 to 2.5 GHz, VC(H)=1.8V, VC(L)=0V	-	+29	-	dBm
		f = 2.4 to 2.5 GHz, VC(H)=3.0V, VC(L)=0V	-	+33	-	dBm
		f = 4.9 to 6.0 GHz, VC(H)=1.8V, VC(L)=0V	-	+26	-	dBm
		f = 4.9 to 6.0 GHz VC(H)=3.0V, VC(L)=0V	-	+32	-	dBm
3rd Order Input Intercept Point	IIP ₃	f = 2.5GHz 2-tone 5MHz Spacing	-	+55	-	dBm
Error Vector Magnitude	EVM	802.11a, 64QAM, 54Mbps, Pin \leq +22dBm	-	2.5	-	%
		802.11g, 64QAM, 54Mbps, Pin \leq +25dBm	-	2.5	-	%
Switch Control Speed	t _{sw}	50% CTL to 90/10%	-	80	-	ns
Switch Control Current	I _{cont}	RF None	-	2	-	μA

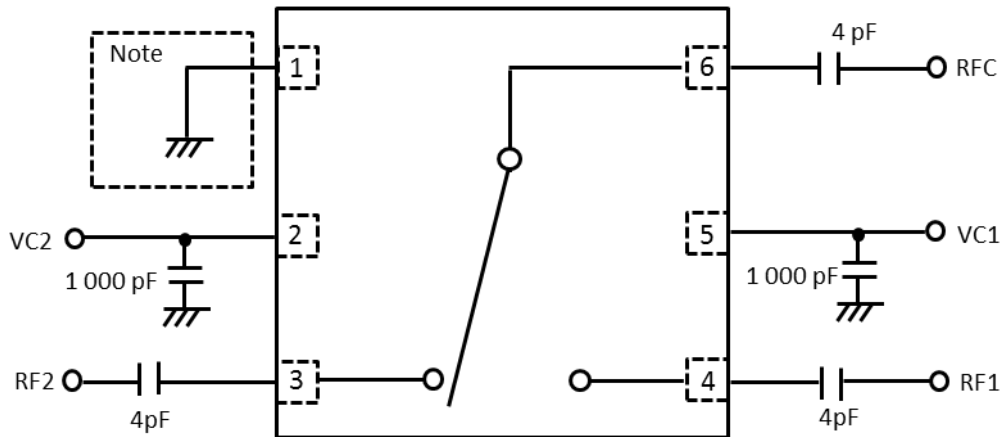
Note $P_{in(1dB)}$ is the measured input power level when the insertion loss increases 1dB more than that of the linear range.

DATA SHEET : CKRF6163XS03



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Evaluation Circuit

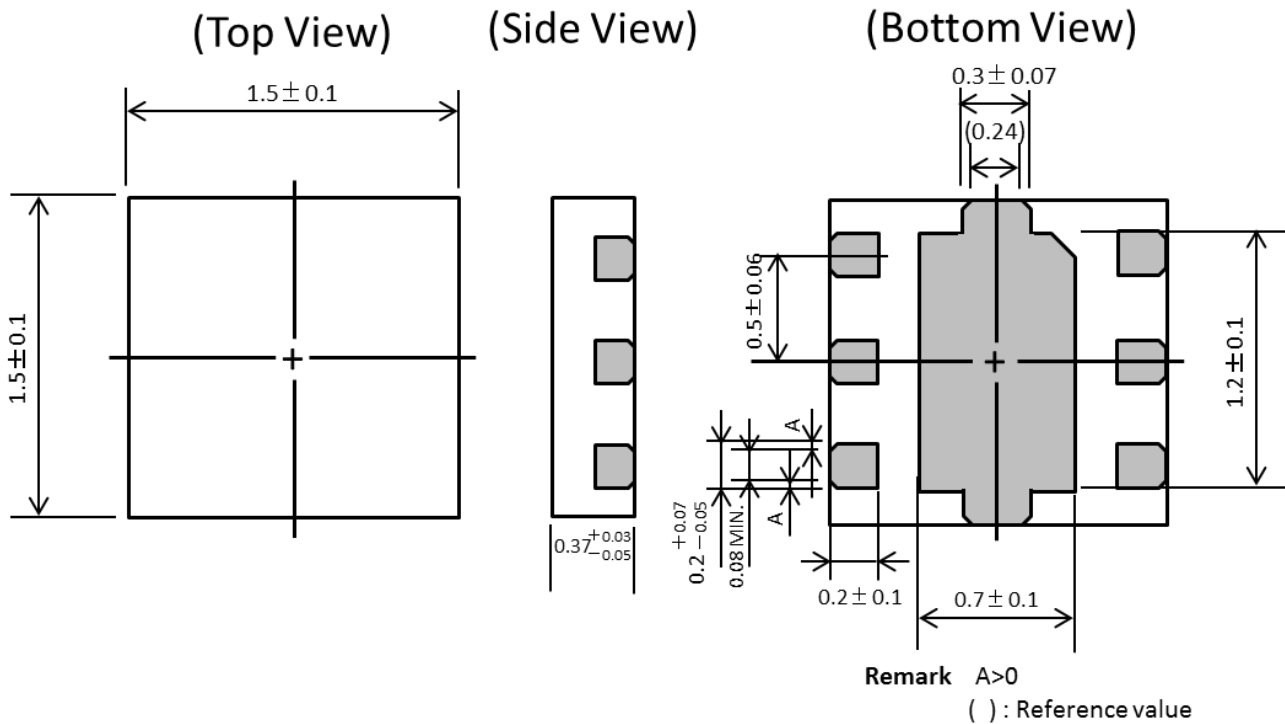


Note: It is recommended to connect the pin directly to the ground, or not to connect the pin to anything.

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)



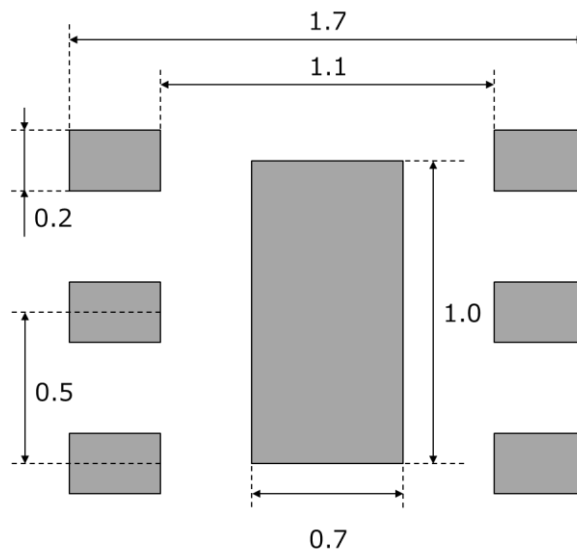
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PCB Layout Footprint

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.

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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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