

PRELIMINARY DATA SHEET : CKRF6001XQ03



2.3 to 6.0 GHz SP4T Switch for WiFi/WiMAX/LTE

Features

- Control voltage :
 $VC(H) = 1.8 \text{ to } 5.0 \text{ V (3.3V TYP.)}$
 $VC(L) = -0.2 \text{ to } 0.2 \text{ V (0V TYP.)}$
- Low Insertion Loss :
 $L_{ins1} = 0.45 \text{ dB TYP. @ } f = 2.5 \text{ GHz}$
 $L_{ins2} = 0.80 \text{ dB TYP. @ } f = 5.85 \text{ GHz}$
- High Isolation :
 $ISL1 = 37 \text{ dB TYP. @ } f = 2.5 \text{ GHz}$
 $ISL2 = 36 \text{ dB TYP. @ } f = 5.85 \text{ GHz}$
- Handling power :
 $Pin (1dB) = +35 \text{ dBm TYP. @ } f = 5.85 \text{ GHz,}$
 $VC(H) = 3.3 \text{ V, } VC(L) = 0 \text{ V}$

Package

- 12-pin Thin QFN (XQ03) Package
 $(2.5\text{mm} \times 2.5\text{mm} \times 0.37\text{mm})$

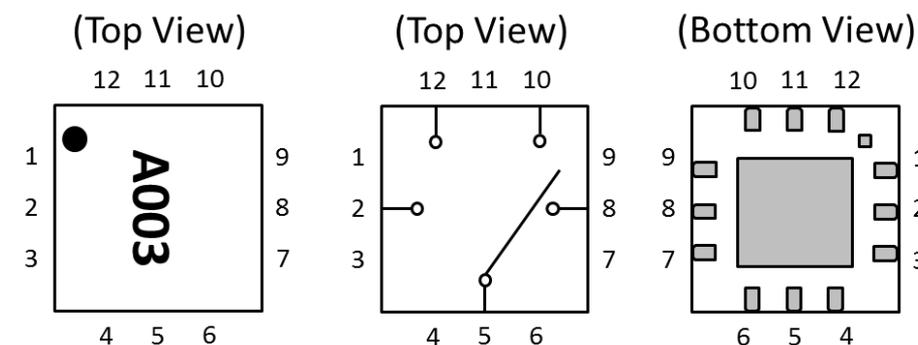
Description

- The CKRF6001XQ03 is a pHEMT GaAs SP4T (Single Pole Four Throw) switch. This device can operate frequency from 2.3GHz to 5.85GHz, having the low insertion loss and high isolation.

Applications

- Wireless LAN (IEEE 802.11 a/b/g/n)
- WiMAX, LTE

Pin Configuration And Internal Block Diagram



Pin No.	Pin Name
1	GND
2	RF4
3	VC3
4	VC4
5	RFC
6	VC1
7	VC2
8	RF1
9	GND
10	RF2
11	GND
12	RF3

Ordering Information

Part Number	Order Number	Package	Marking	Supplying Form
CKRF6001XQ03-C2	CKRF6001XQ03-C2	12-pin Thin QFN (XQ03) Package (Pb free)	A003	<ul style="list-style-type: none"> • Embossed tape 8 mm wide • Pin 1, 9 face the perforation side of the tape • Qty 10 Kpcs/reel

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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}	+36.5 ^{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	2.3	-	5.85	GHz
Switch Control Voltage (H)	VC(H)	+1.8	+3.3	+5.0	V
Switch Control Voltage (L)	VC(L)	-0.2	0	+0.2	V

Truth Table

VC1	VC2	VC3	VC4	RFC-RF1	RFC-RF2	RFC-RF3	RFC-RF4
High	Low	Low	Low	ON	OFF	OFF	OFF
Low	High	Low	Low	OFF	ON	OFF	OFF
Low	Low	High	Low	OFF	OFF	ON	OFF
Low	Low	Low	High	OFF	OFF	OFF	ON

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Electrical Characteristics

($T_A=+25^{\circ}\text{C}$, $V_C(\text{H})=3.3\text{V}$, $V_C(\text{L})=0\text{V}$, DC Block Capacitance=56pF, $Z_0=50\Omega$, unless otherwise specified)

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Insertion Loss	$L_{\text{INS}1}$	f=2.5GHz	---	0.45	0.60	dB
	$L_{\text{INS}2}$	f=5.85GHz	---	0.80	1.10	dB
Isolation	ISL1	f=2.5GHz	35	37	---	dB
	ISL2	f=5.85GHz	33	36	---	dB
Input Return Loss	$RL_{\text{in}1}$	f=2.5GHz	20	25	---	dB
	$RL_{\text{in}2}$	f=5.85GHz	16	20	---	dB
Output Return Loss	$RL_{\text{out}1}$	f=2.5GHz	20	25	---	dB
	$RL_{\text{out}2}$	f=5.85GHz	16	20	---	dB
0.1dB Loss Compression Input Power ^{Note 1}	$P_{\text{in}(0.1\text{dB})}$	f=2.5GHz	---	+33	---	dBm
		f=5.85GHz	---	+32	---	dBm
1dB Loss Compression Input Power ^{Note 2}	$P_{\text{in}(1\text{dB})}$	f=2.5GHz	---	+36	---	dBm
		f=5.85GHz	---	+35	---	dBm
3rd Order Input Intercept Point	IIP_3	f=2.5GHz, 2-tone 1MHz Spacing	---	+57	---	dBm
		f=5.85GHz, 2-tone 1MHz Spacing	---	+60	---	dBm
2nd Harmonics	2f ₀	f=2.5GHz, $P_{\text{in}}=+27\text{dBm}$	---	-85	---	dBc
		f=5.85GHz, $P_{\text{in}}=+27\text{dBm}$	---	-85	---	dBc
3rd Harmonics	3f ₀	f=2.5GHz, $P_{\text{in}}=+27\text{dBm}$	---	-75	---	dBc
		f=5.85GHz, $P_{\text{in}}=+27\text{dBm}$	---	-75	---	dBc
Switching Speed	T_{SW}	50% CTL to 90/10% RF	---	150	---	ns
Switch Control Current	I_{CONT}	RF none	---	10	---	uA

Note 1. $P_{\text{in}(0.1\text{dB})}$ is the measured input power level when the insertion loss increases 0.1dB more than that of the linear range.

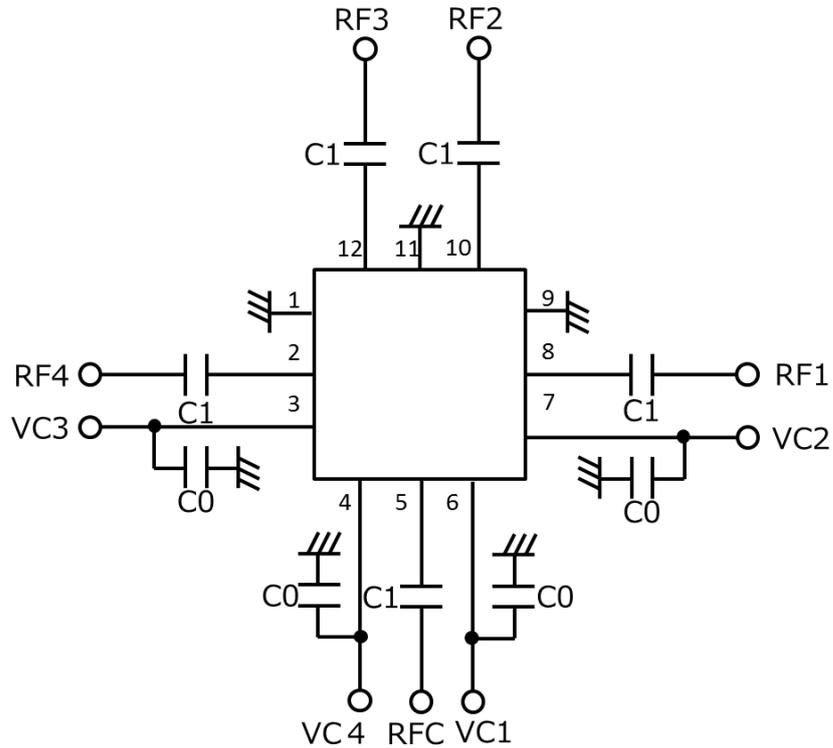
2. $P_{\text{in}(1\text{dB})}$ is the measured input power level when the insertion loss increases 1dB more than that of the linear range.

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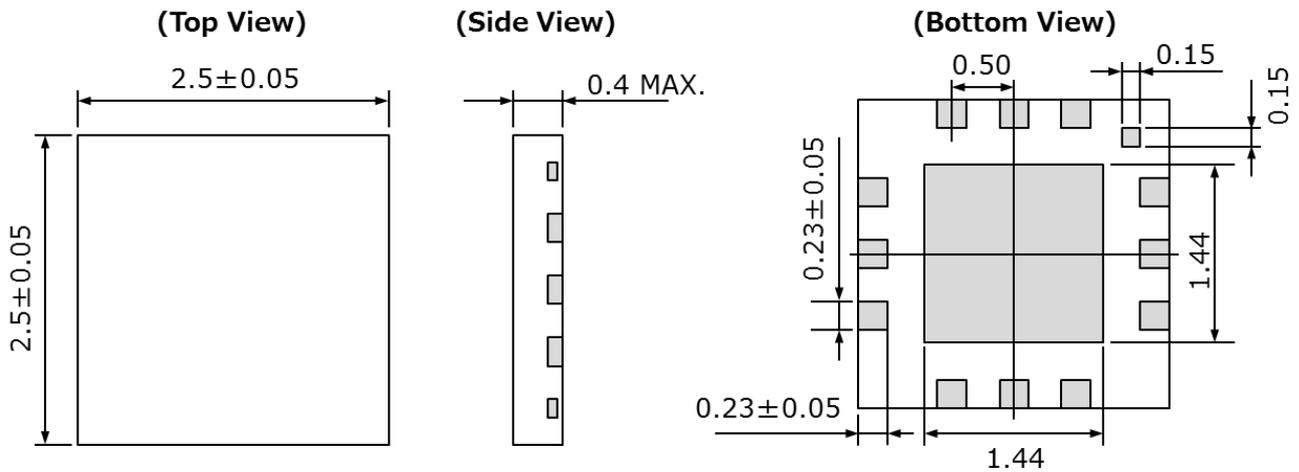
Evaluation Circuit



Note C0 : 1000 pF
C1 : 2.3 to 5.85 GHz 56pF

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



[CAUTION]

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[Caution in the gallium arsenide (GaAs) product handling]

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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