

# DATA SHEET : CKRF2406MM66



## L, S-band Middle Power SPDT Switch

### Features

- Control voltage :  
 $VC(H) = 1.8$  to  $5.0$  V (3.0 V TYP.)  
 $VC(L) = -0.2$  to  $0.2$  V (0 V TYP.)
- Low Insertion Loss :  
 $L_{ins1} = 0.30$  dB TYP. @  $f = 0.05$  to  $0.5$  GHz  
 $L_{ins2} = 0.30$  dB TYP. @  $f = 0.5$  to  $1.0$  GHz  
 $L_{ins3} = 0.30$  dB TYP. @  $f = 1.0$  to  $2.0$  GHz  
 $L_{ins4} = 0.35$  dB TYP. @  $f = 2.0$  to  $2.5$  GHz  
 $L_{ins5} = 0.35$  dB TYP. @  $f = 2.5$  to  $3.0$  GHz
- High Isolation :  
 $ISL1 = 38$  dB TYP. @  $f = 0.05$  to  $0.5$  GHz  
 $ISL2 = 32$  dB TYP. @  $f = 0.5$  to  $1.0$  GHz  
 $ISL3 = 27$  dB TYP. @  $f = 1.0$  to  $2.0$  GHz  
 $ISL4 = 25$  dB TYP. @  $f = 2.0$  to  $2.5$  GHz  
 $ISL5 = 23$  dB TYP. @  $f = 2.5$  to  $3.0$  GHz
- Handling power :  
 $P_{in(0.5dB)} = +32$  dBm TYP. @  $f = 3.0$  GHz,  
 $VC(H) = 3.0$  V,  $VC(L) = 0$  V

### Applications

- Wireless LAN (IEEE 802.11 b/g)

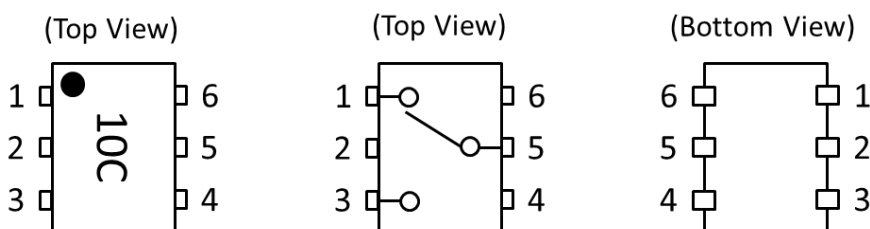
### Package

- 6-pin lead-less mini mold package  
(1.5mm x 1.1mm x 0.55mm)

### Description

- The CKRF2406MM66 is a pHEMT GaAs SPDT (Single Pole Double Throw) switch. This device can operate frequency from 0.05 to 3.0GHz, having the low insertion loss and high isolation.

### Pin Configuration And Internal Block Diagram



Pin No.	Pin Name
1	RF1
2	GND
3	RF2
4	VC2
5	RFC
6	VC1

### Ordering Information

Part Number	Order Number	Package	Marking	Supplying Form
CKRF2406MM66-C2	CKRF2406MM66-C2	•6-pin lead-less mini mold package (Pb-Free)	10C	•Embossed tape 8 mm wide •Pin 1, 6 face the perforation side of the tape •Qty 9 Kpcs/reel

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### Absolute Maximum Ratings

( $T_A=+25^{\circ}\text{C}$ , unless otherwise specified)

Parameter	Symbol	Rating	Unit
Control Voltage	VC	6.0 <sup>Note 1</sup>	V
Input Power	$P_{in1}$	+33 <sup>Note 2</sup>	dBm
	$P_{in2}$	+29 <sup>Note 3</sup>	dBm
Operating Ambient Temperature	$T_A$	-45~+85	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-55~+150	$^{\circ}\text{C}$

- Note
1.  $|VC1 - VC2| \leq 6.0\text{V}$
  2.  $3.0\text{V} \leq |VC1 - VC2| \leq 5.0\text{V}$ ,  $f \geq 0.5\text{GHz}$
  3.  $3.0\text{V} \leq |VC1 - VC2| \leq 5.0\text{V}$ ,  $0.4\text{GHz} \leq f \leq 0.05\text{GHz}$

### Recommended Operating Range

( $T_A=+25^{\circ}\text{C}$ , unless otherwise specified)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f	0.05	-	3.0	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

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### Electrical Characteristics

( $T_A=+25^{\circ}\text{C}$ ,  $V_C(H)=3.0\text{V}$ ,  $V_C(L)=0\text{V}$ ,  $Z_0=50\Omega$ , DC Block Capacitance=56pF, unless otherwise specified)

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Insertion Loss	$L_{INS1}$	$f=0.05$ to $0.5\text{GHz}$ <sup>Note 1</sup>	---	0.30	0.50	dB
	$L_{INS2}$	$f=0.5$ to $1.0\text{GHz}$	---	0.30	0.50	dB
	$L_{INS3}$	$f=1.0$ to $2.0\text{GHz}$	---	0.30	0.50	dB
	$L_{INS4}$	$f=2.0$ to $2.5\text{GHz}$	---	0.35	0.55	dB
	$L_{INS5}$	$f=2.5$ to $3.0\text{GHz}$	---	0.35	0.55	dB
Isolation	ISL1	$f=0.05$ to $0.5\text{GHz}$ <sup>Note 1</sup>	35	38	---	dB
	ISL2	$f=0.5$ to $1.0\text{GHz}$	29	32	---	dB
	ISL3	$f=1.0$ to $2.0\text{GHz}$	24	27	---	dB
	ISL4	$f=2.0$ to $2.5\text{GHz}$	22	25	---	dB
	ISL5	$f=2.5$ to $3.0\text{GHz}$	20	23	---	dB
Input Return Loss	$RL_{in}$	$f=0.05$ to $3.0\text{GHz}$ <sup>Note 1</sup>	15	20	---	dB
Output Return Loss	$RL_{out}$	$f=0.05$ to $3.0\text{GHz}$ <sup>Note 1</sup>	15	20	---	dB
0.1dB Loss Compression Input Power <sup>Note 2</sup>	$P_{in(0.1dB)}$	$f=0.05\sim 0.5\text{GHz}$ <sup>Note 1</sup>	---	+26	---	dBm
		$f=0.5\sim 3.0\text{GHz}$	---	+30	---	dBm
0.5dB Loss Compression Input Power <sup>Note 3</sup>	$P_{in(0.5dB)}$	$f=0.05\sim 0.5\text{GHz}$ <sup>Note 1</sup>	---	+28	---	dBm
		$f=0.5\sim 3.0\text{GHz}$	---	+32	---	dBm
2nd Harmonics	$2f_0$	$f=3.0\text{GHz}$ , $P_{in}=+20\text{dBm}$	---	-85	---	dBc
3rd Harmonics	$3f_0$	$f=3.0\text{GHz}$ , $P_{in}=+20\text{dBm}$	---	-85	---	dBc
3rd Order Input Intercept Point	$IIP_3$	$f=2.5\text{GHz}$ , 2-tone 1MHz Spacing	---	+58	---	dBm
Error Vector Magnitude	EVM	802.11g, 64QAM, 54Mbps $P_{in}\leq +25\text{dBm}$	---	2.5	---	%
Switch Control Current	$I_{CONT}$	RF none	---	1	10	$\mu\text{A}$
Switching Speed	$T_{SW}$	50% CTL to 90/10% RF	---	50	---	ns

Note 1. DC block capacitance = 1000pF at  $f=0.05$  to  $0.5\text{GHz}$

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.

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.

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### Electrical Characteristics

( $T_A=+25^{\circ}\text{C}$ ,  $V_C(H)=1.8\text{V}$ ,  $V_C(L)=0\text{V}$ ,  $Z_0=50\Omega$ , DC Block Capacitance=56pF, unless otherwise specified)

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Insertion Loss	$L_{INS1}$	$f=0.05$ to $0.5\text{GHz}$ <sup>Note 1</sup>	---	0.30	0.50	dB
	$L_{INS2}$	$f=0.5$ to $1.0\text{GHz}$	---	0.30	0.50	dB
	$L_{INS3}$	$f=1.0$ to $2.0\text{GHz}$	---	0.30	0.50	dB
	$L_{INS4}$	$f=2.0$ to $2.5\text{GHz}$	---	0.35	0.55	dB
	$L_{INS5}$	$f=2.5$ to $3.0\text{GHz}$	---	0.35	0.55	dB
Isolation	ISL1	$f=0.05$ to $0.5\text{GHz}$ <sup>Note 1</sup>	35	38	---	dB
	ISL2	$f=0.5$ to $1.0\text{GHz}$	29	32	---	dB
	ISL3	$f=1.0$ to $2.0\text{GHz}$	24	27	---	dB
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	ISL5	$f=2.5$ to $3.0\text{GHz}$	20	23	---	dB
Input Return Loss	$RL_{in}$	$f=0.05$ to $3.0\text{GHz}$ <sup>Note 1</sup>	15	20	---	dB
Output Return Loss	$RL_{out}$	$f=0.05$ to $3.0\text{GHz}$ <sup>Note 1</sup>	15	20	---	dB
0.1dB Loss Compression Input Power <sup>Note 2</sup>	$P_{in(0.1dB)}$	$f=0.05\sim 0.5\text{GHz}$ <sup>Note 1</sup>	---	+19	---	dBm
		$f=0.5\sim 3.0\text{GHz}$	---	+23	---	dBm
0.5dB Loss Compression Input Power <sup>Note 3</sup>	$P_{in(0.5dB)}$	$f=0.05\sim 0.5\text{GHz}$ <sup>Note 1</sup>	---	+22	---	dBm
		$f=0.5\sim 3.0\text{GHz}$	---	+26	---	dBm
Switch Control Current	$I_{CONT}$	RF none	---	1	10	$\mu\text{A}$
Switching Speed	$T_{SW}$	50% CTL to 90/10% RF	---	50	---	ns

Note 1. DC block capacitance = 1000pF at  $f=0.05$  to  $0.5\text{GHz}$

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.

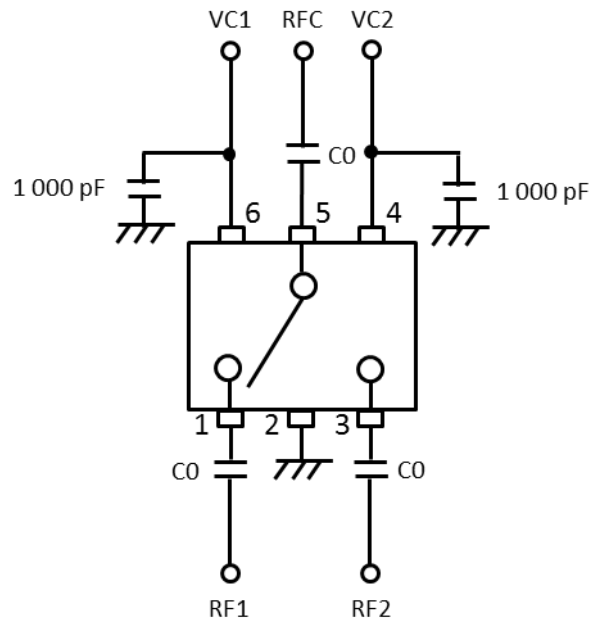
3.  $P_{in(0.5dB)}$  is the measured input power level when the insertion loss increases 0.5dB more than that of the linear range.

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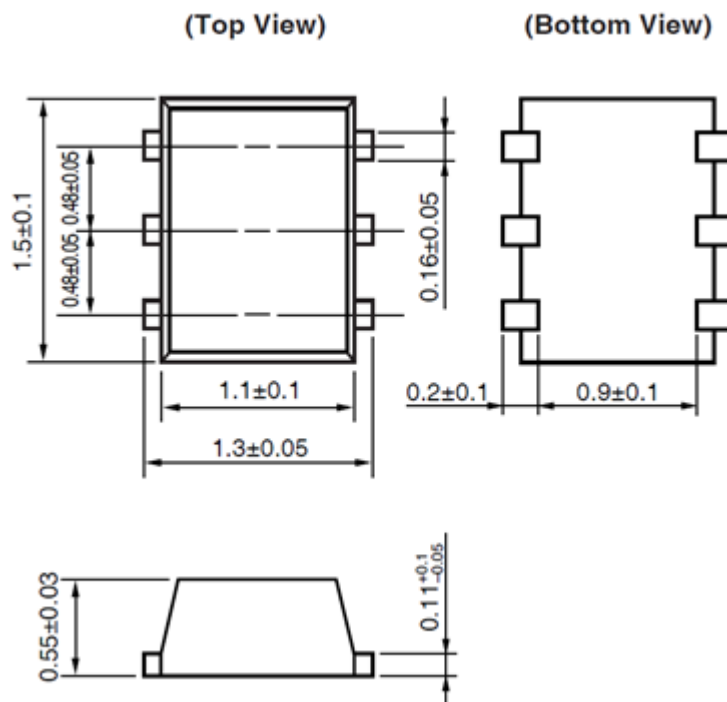
### Evaluation Circuit



**Note** C0 : 0.05 to 0.5 GHz 1000pF  
: 0.4 to 3.0 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



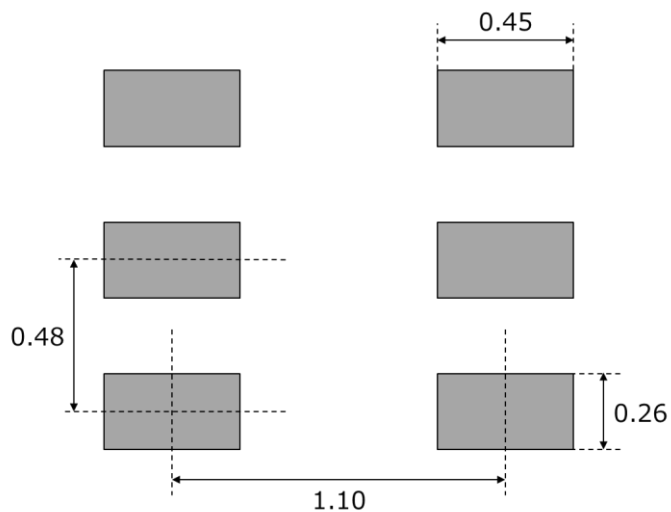
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## L, S-band Middle Power SPDT Switch

### PCB Layout Footprint

6-PIN LEAD-LESS MINIMOLD (1511 PKG) (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.

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