

XMSSJJ3G0PA-054

XM054-02

CMOS Very Small 1 bit Control SPDT Switch for 0.01~3.8GHz

■ Applications

SPDT Switch for General purpose.

■ Features

- Small Package6 pin Leadless Package
(1.00mm×0.65mm×0.55mm|max, RoHS Compliant)
- ESD HBM.....1000V
- ESD CDM500V
- IEC61000-4-2Level 1
- MSL1

■ Absolute Maximum Ratings

Symbol	Parameter	Conditions	Rating	Unit
Vdd	Supply Voltage	Ta = 25°C	4.0	V
CTL	Control Voltage	Ta = 25°C	4.0	V
Pin	RF Input Power	Ta = 25°C VDD = 2.7V CTL(H) = 1.8V, CTL(L) = 0V	20	dBm
Top	Operating Temperature	-	-40 to 85	°C
Tstg	Storage Temperature	-	-55 to 150	°C

■ DC Electrical Specifications

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit	
Vdd	Supply Voltage		1.6		3.8	V	
Idd	Supply Current	Ta = 25°C, Vdd = 2.7V CTL(H) = 1.8V, CTL(L) = 0V	-	1	2	uA	
CTL(H)	Control Voltage (High)	Ta = -40~85°C, VDD = 1.6~3.8V	1.3	1.8	3.8	V	
CTL(L)	Control Voltage (Low)	Ta = -40~85°C	1.6V ≤ Vdd < 2.3V	-0.2	0	0.3	V
			2.3V ≤ Vdd ≤ 3.8V	-0.2	0	0.45	V
Ictl	Control Current	Ta = 25°C, Vdd = 2.7V CTL(H) = 1.8V, CTL(L) = 0V	-	0.01	0.2	uA	

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■ **Electrical Specifications**

(Ta=25°C, Vdd=2.7V, CTL(H)=1.8V, CTL(L)=0V, Pin=0dBm)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
f0	Operation Frequency	-	0.01		3.8	GHz
IL	ANT to Port1	1GHz	-	0.20	0.35	dB
		2GHz	-	0.23	0.45	dB
		2.7GHz	-	0.28	0.5	dB
		3.8GHz	-	0.49	0.7	dB
	ANT to Port2	1GHz	-	0.19	0.35	dB
		2GHz	-	0.21	0.45	dB
		2.7GHz	-	0.26	0.5	dB
		3.8GHz	-	0.43	0.7	dB
ISO	ANT to Port1 ANT to Port2	1GHz	37.5	42	-	dB
		2GHz	31.5	35	-	dB
		2.7GHz	24.5	29	-	dB
		3.8GHz	14	17	-	dB
	Port1 to Port2	1GHz	37.5	43	-	dB
		2GHz	37.5	42	-	dB
		2.7GHz	29.5	36	-	dB
		3.8GHz	16.5	20	-	dB
Pin 0.5dB	Input Power for 0.5dB Compression	1.0 GHz		21		dBm

■ **Reference Electrical Characteristic**

(Ta=25°C, Vdd=2.7V, CTL(H)=1.8V, CTL(L)=0V, 50ohm)

Symbol	Parameter	Conditions	Typ.	Unit
HD2	2 nd Harmonics, f=836.5MHz	Pin = +15dBm	-103	dBc
	2 nd Harmonics, f=1885MHz	Pin = +15dBm	-88	dBc
	2 nd Harmonics, f=2700 MHz	Pin = +15dBm	-72	dBc
HD3	3 rd Harmonics, f=836.5MHz	Pin = +15dBm	-73	dBc
	3 rd Harmonics, f=1885MHz	Pin = +15dBm	-71	dBc
	3 rd Harmonics, f=2700 MHz	Pin = +15dBm	-63	dBc
HD4	4 th Harmonics, f=836.5MHz	Pin = +15dBm	-105	dBc
	4 th Harmonics, f=1885MHz	Pin = +15dBm	-115	dBc

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□ **(Reference) IMD2/3 performance**

IMD2

Band5

CW1: Pin= +10dBm at 836.5MHz at Rx port
 CW2: Pin= -20dBm at 1718.0MHz at antenna port
 IMD2 at 881.5= -130dBm

Band2

CW1: Pin= +10dBm at 1885.0MHz at Rx port
 CW2: Pin= -20dBm at 3850.0MHz at antenna port
 IMD2 at 1965.0MHz= -116dBm

IMD3

Band5

CW1: Pin= +10 ~ +15dBm at 836.5MHz at Rx port
 CW2: Pin= -15dBm at 791.5MHz at antenna port

CW1 Pin (dBm)	IMD3 at 881.5 MHz (dBm)
10	-100
15	-75

Band1

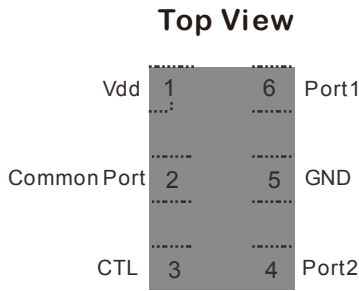
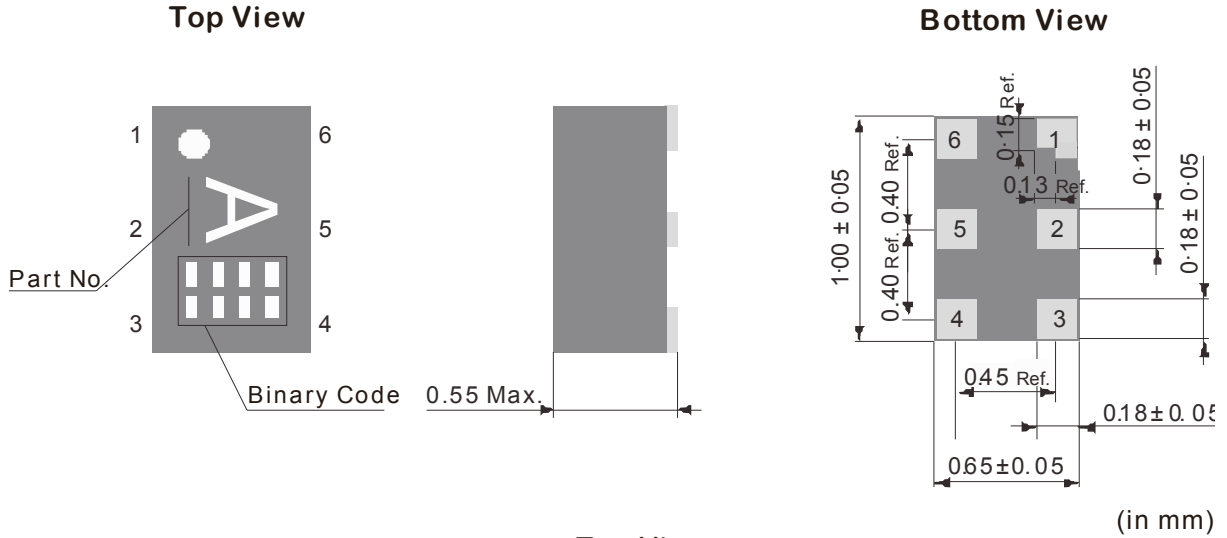
CW1: Pin= +10 ~ +15dBm at 1950MHz at Rx port
 CW2: Pin= -15dBm at 1760MHz at antenna port

CW1 Pin (dBm)	IMD3 at 2140.0MHz (dBm)
10	-97
15	-76

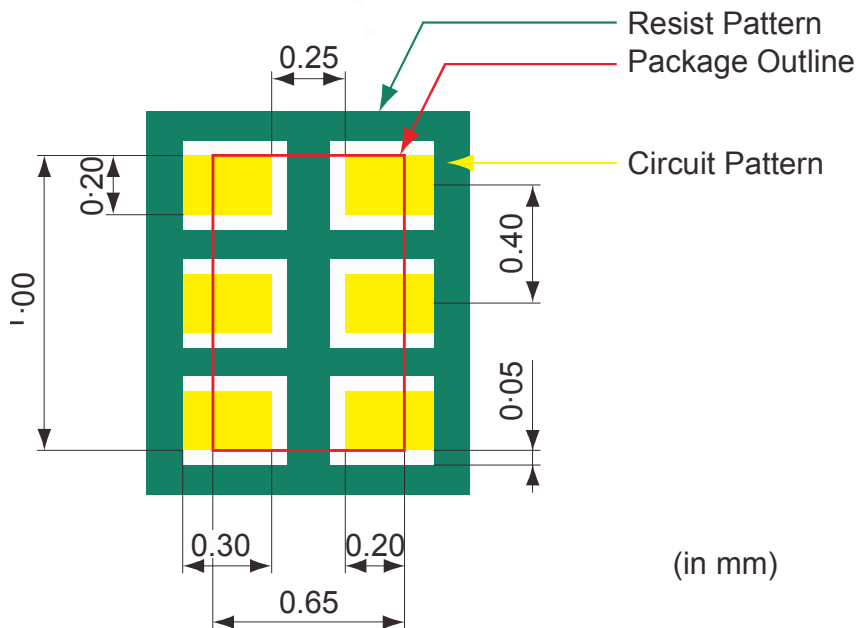
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■ Package Outline and Pin Connections



■ Land Pattern



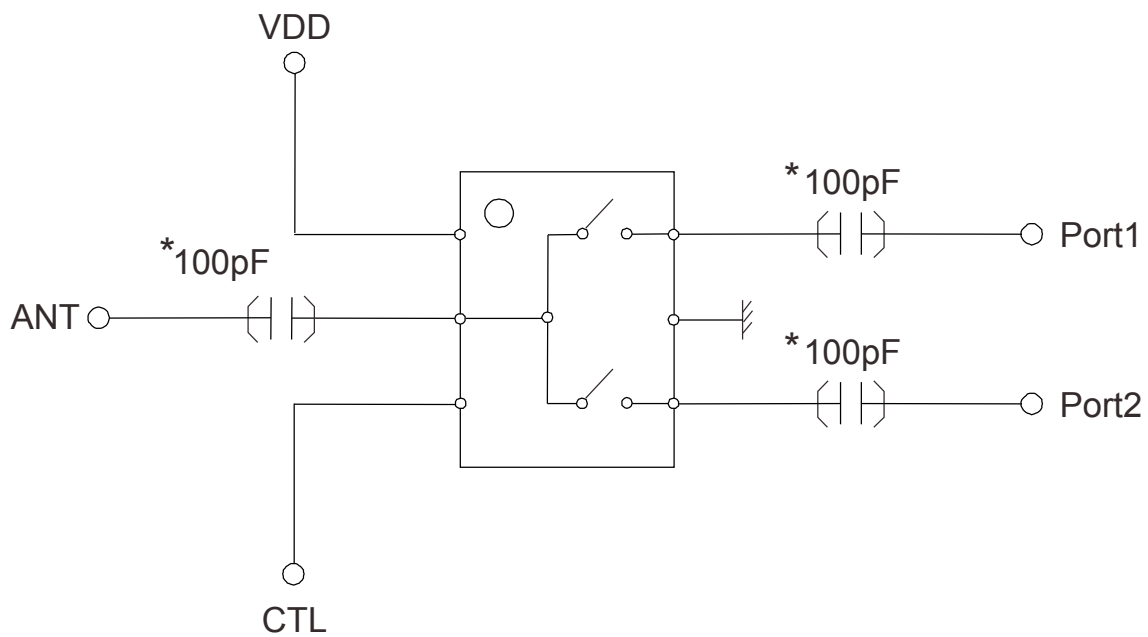
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■ Truth Table

Mode	VDD	CTRL
ANT-Port1	H	L
ANT-Port2	H	H

■ Evaluation Circuit



* DC blocking capacitor = 100pF
for Cellular Band usage

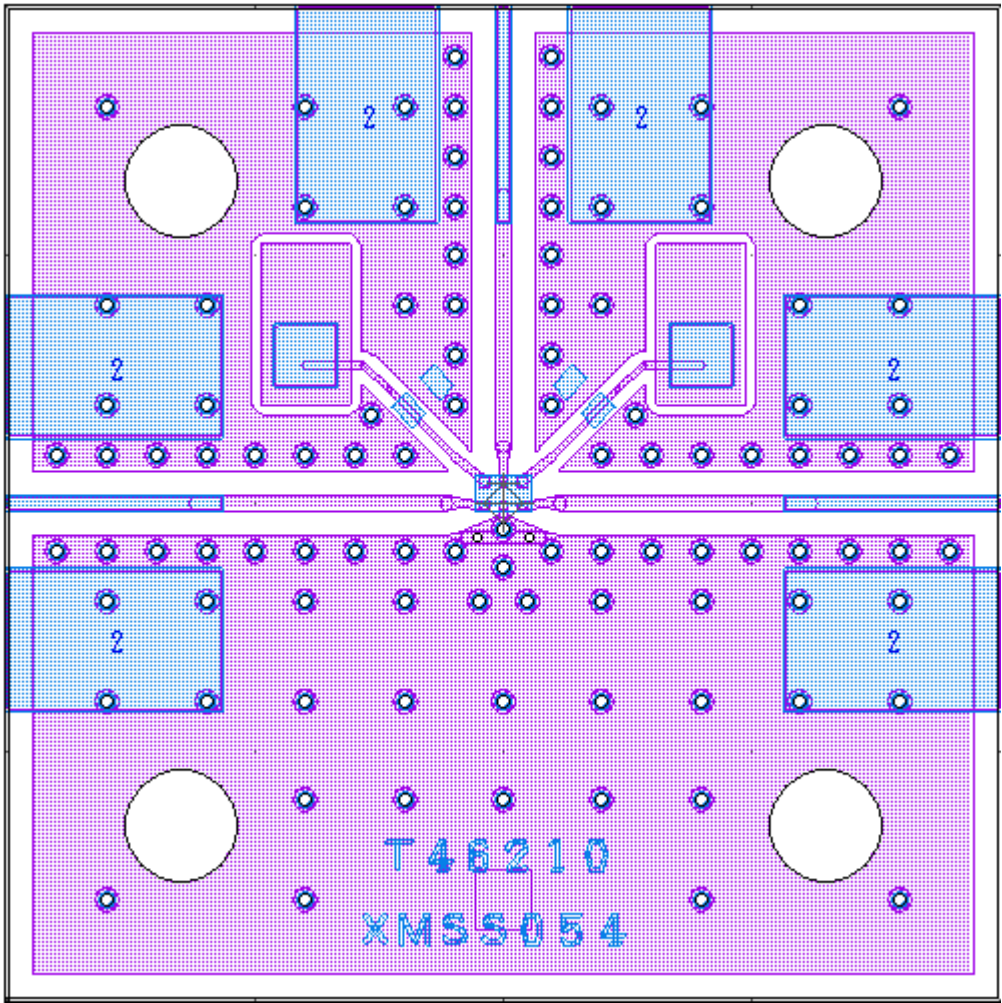
These additional parts below are NOT required.

1. DC blocking capacitors on RF ports can be removed if DC Voltage from external = 0V.
2. DC bypass capacitors on Vdd & control lines are not required.

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■ Evaluation Board



Substrate

Transmission Line: 50Ω

Material:FR4($\epsilon_r=4.4$)

Size:20mm x 20mm

Thickness:0.2mm+Dummy 0.8mm



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Preliminary

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Change History

Version	Date	Author	Comment
-	Aug. 24. 2017	Y.Asahi	Initial