1. DESCRIPTION

The XA214-G4C is a medium-power IC FET SPDT switch in a low-cost miniature SOT363 plastic package. The XA214-G4C features low insertion loss and positive voltage operation with very low DC power consumption. This general purpose switch can be used in a variety of telecommunications applications.

A functional block diagram is shown in Figure 1. The pin configuration and package are shown in Figure 2. Signal pin assignments and functional pin descriptions are provided in Table 1.

2. FEATURES

- Low insertion loss (0.4 dB @ 2.4 GHz)
- Isolation 26 dB @ 2.4 GHz
- Low DC power consumption
- PHEMT process
- Operates at 1.8 V control voltage
- Available lead (Pb)-free and RoHS-compliant

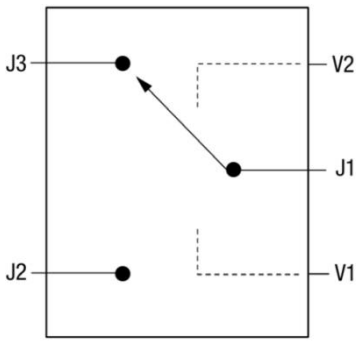
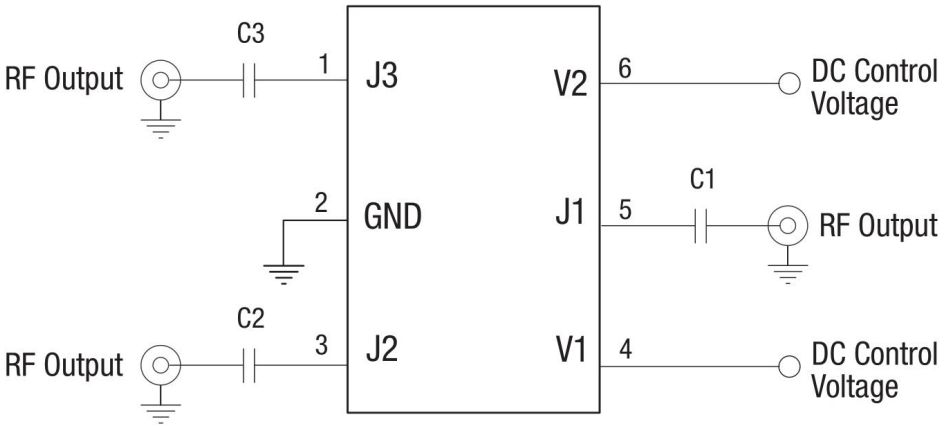


Figure 1. XA214-G4C Block Diagram

3. APPLICATION SCHEMATIC



Note: Use 100 pF blocking capacitors (C1, C2, C3) for >500 MHz operation. Higher values recommended for lower frequency operation. Exposed paddle must be grounded.
Use 10 nF blocking capacitors (C1, C2, C3) for <50 MHz operation.

4. PIN CONFIGURATIONS AND FUNCTIONS

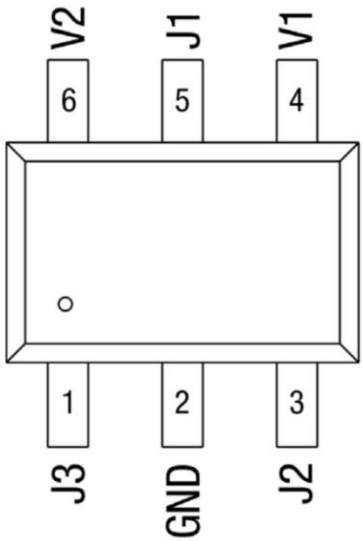


Figure 2. XA214-G4C Pinout
(Top View)

Table 1. XA214-G4C Signal Assignments and Functional Descriptions

Pin	Name	Description	Pin	Name	Description
1	J3	RF output[1]	4	V1	DC control voltage
2	GND	Ground	5	J1	RF output[1]
3	J2	RF output[1]	6	V2	DC control voltage

[1] A 100 pF blocking capacitor is required for >500 MHz operation. Use larger value capacitors for lower frequency operation.

5. ELECTRICAL AND MECHANICAL SPECIFICATIONS

The absolute maximum ratings of the XA214-G4C are provided in Table 2. The electrical specifications of the XA214-G4C are provided in Table 3.

Typical performance characteristics are shown in Figures 3, 4, and 5. Table 4 shows the truth table.

Table 2. XA214-G4C Absolute Maximum Ratings[1]

Parameter	Symbol	Minimum	Maximum	Units
Control voltage	V_{CTL}	-0.2	+8.0	V
Supply voltage	—	—	+8.0	V
RF input power (VCTL = 0 to 8 V): >500 MHz <500 MHz	—	—	 2 500	 W mW
Operating temperature	T_{OP}	-40	+85	°C
Operating temperature (Pinmax < +32 dBm for T_{OP} = 105 °C)	T_{OP}	-40	+105	°C
Storage temperature	T_{STG}	-65	+150	°C

[1] Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value.

ESD HANDLING: Although this device is designed to be as robust as possible, electrostatic discharge (ESD) can damage this device.

This device must be protected at all times from ESD when handling or transporting. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection.

Industry-standard ESD handling precautions should be used at all times.

Table 3. XA214-G4C Electrical Specifications[1]

(V_{CTL} = 0 to 3 V, T_{OP} = +25℃, Characteristic Impedance = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Insertion loss[2]	IL	0.5 to 1.0 GHz 1.0 to 2.0 GHz 2.0 to 3.0 GHz	—	0.3 0.4 0.4	0.5 0.6 0.6	dB dB dB
Isolation	ISO	0.5 to 1.0 GHz 1.0 to 2.0 GHz 2.0 to 3.0 GHz	27 24 22	30 27 25	—	dB dB dB
VSWR[3]	VSWR	0.5 to 1.0 GHz 1.0 to 2.0 GHz 2.0 to 3.0 GHz	—	1.1:1 1.1:1 1.4:1	—	—
Switching characteristics: Rise/fall On/off Video feedthrough	—	10/90%or 90/10% RF 50% control to 90/10% RF t_R=1ns,bandwidth=500MHz	—	10 20 25	—	ns ns mV
1 dB input compression point: 0.5 to 3.0 GHz 0.5 to 3.0 GHz	IP1dB	V_{CTL} = 0 to 1.8 V V_{CTL} = 0 to 3 V	—	+20 +27	—	dBm dBm
Third order intercept point @ 0.5 to 3.0 GHz	IP3	+5 dBm two-tone input power, V_{CTL} = 0 to 3 V	—	+40	—	dBm
Thermal resistance	—	—	—	25	—	°C/W
Control voltages	—	V_{LOW} = 0 to 0.2 V @ 20 µA max. V_{HIGH} = 2.7 V @ 100 µA max. to 5 V @ 200 µA max.				

[1] Performance is guaranteed only under the conditions listed in this table.

[2] Insertion loss changes by 0.003 dB/°C.

[3] Insertion loss state.

Table 4. XA214-G4C Truth Table

V1	V2	J1–J2	J1–J3
VHIGH	0	Isolation	Insertion loss
0	VHIGH	Insertion loss	Isolation

6. TYPICAL PERFORMANCE CHARACTERISTICS

(V_{CTL} = 0 to 3 V, T_{OP} = +25 ℃, P_{IN} = 0 dBm, Characteristic Impedance [Zo] = 50 Ω, C_{BL} = 100 pF, Unless Otherwise Noted)

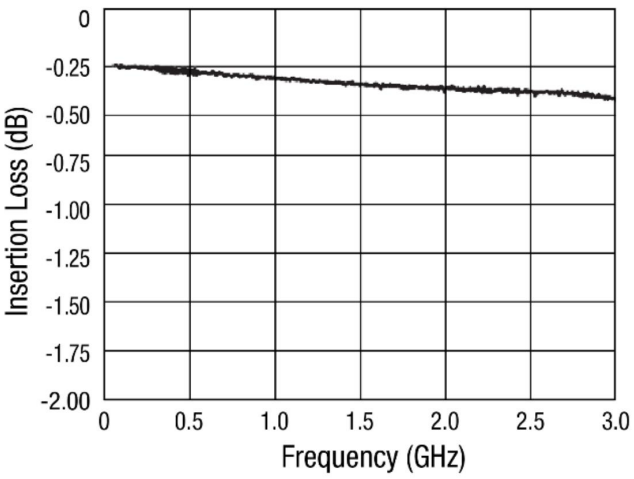


Figure 3. Insertion Loss vs Frequency

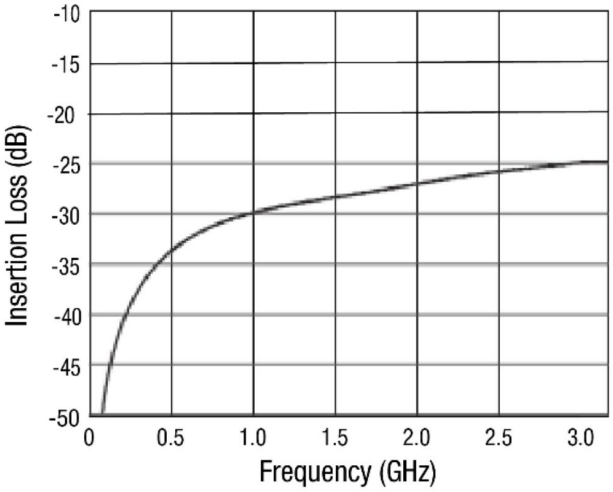


Figure 4. Isolation vs Frequency

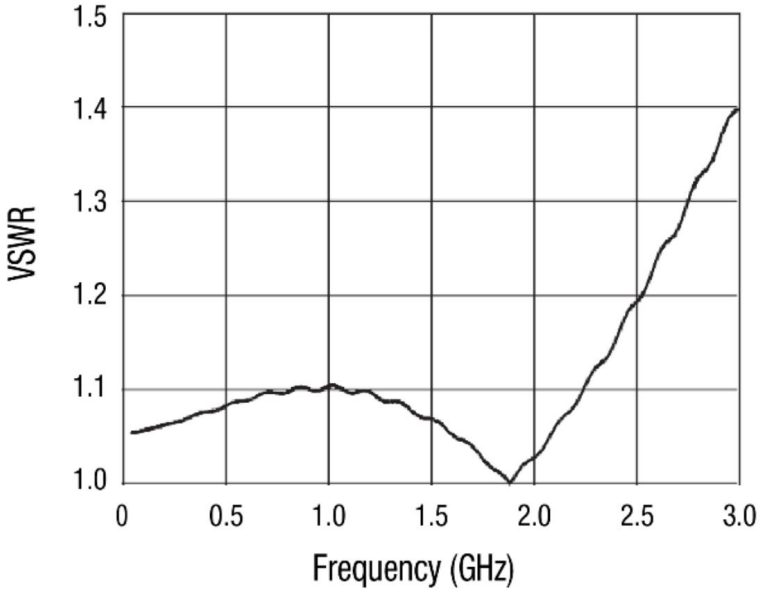


Figure 5. VSWR vs Frequency

7. ORDERING INFORMATION

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XA214-G4C	G4C	SOT363	2.10 * 1.22	-40 to 85	MSL3	T&R	3000

8. DIMENSIONAL DRAWINGS