



## Product Features

- Excellent Insertion Loss and Isolation performance
- High Linearity
- GPIO Control Interface
- Broadband frequency range: 617MHz to 7125MHz
- Small package: QFN 10-1.1mm x 1.5mm x 0.45mm
- No DC blocking capacitors required
- 1kV HBM ESD Protection on all pins

## Product Applications

- 5G multimode cellular tablets and Multi-Mode GSM, EDGE, WCDMA, LTE
- Diversity antenna switching

## Product Description

The LX1022C is a Silicon On Insulator (SOI) Single Pole, double-Throw (DPDT) antenna switch which require very low insertion loss, high isolation and high linearity performance.

The high linearity performance and low insertion loss for 5G, UMTS, CDMA2000, and LTE applications.

The LX1022C is manufactured in a compact 1.1mm x 1.5mm x 0.45mm, 10-pin surface mount Quad Flat No-Lead (QFN) package.

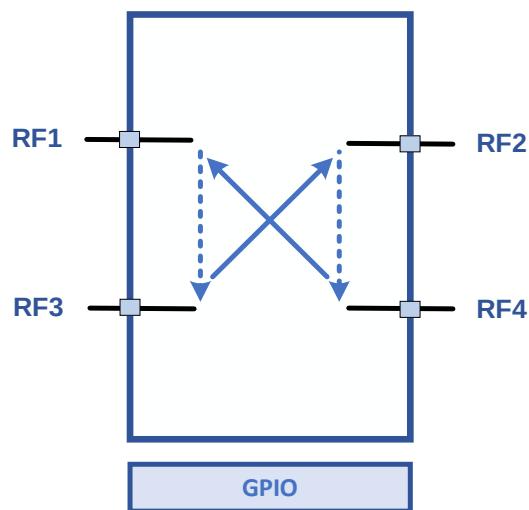


Figure 1 Functional Block Diagram

## Absolute Maximum Conditions

| Parameters                 | Symbol           | Minimum | Maximum | Units |
|----------------------------|------------------|---------|---------|-------|
| Supply voltage             | V <sub>DD</sub>  | 1.6     | 4.8     | V     |
| Control voltage            | V <sub>CC</sub>  | 1.6     | 3.0     | V     |
| RF input power             | P <sub>in</sub>  |         | +38     | dBm   |
| Storage temperature        | T <sub>STG</sub> | -55     | +150    | °C    |
| Operating temperature      | T <sub>OP</sub>  | -40     | +90     | °C    |
| Human Body Model, Class 1C | ESD              | 1000    |         | V     |

1: Test condition 50% duty cycle, VSWR=1:1, +25 °C

**Note:** 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. Exceeding any of the limits listed here may result in permanent damage to the device.

## General Electrical Specifications

| Parameters                        | Symbol           | Test Condition                                                   | Min. | Typ. | Max. | Units |
|-----------------------------------|------------------|------------------------------------------------------------------|------|------|------|-------|
| Supply voltage                    | V <sub>DD</sub>  |                                                                  | 1.6  | 2.8  | 4.8  | V     |
| Supply current, active mode       | I <sub>DD</sub>  |                                                                  | 50   |      | 120  | μA    |
| Control signal:                   |                  |                                                                  |      |      |      |       |
| High                              | V <sub>CTL</sub> |                                                                  | 1.35 | 1.8  | 2.70 | V     |
| Low                               |                  |                                                                  | 0    | 0    | 0.3  |       |
| Control current:                  |                  |                                                                  |      |      |      |       |
| High                              | I <sub>CTL</sub> |                                                                  |      | 5    | 8    | μA    |
| Low                               |                  |                                                                  |      |      |      |       |
| Turn-on time<br>(PIN = +27 dBm)   | T <sub>ON</sub>  | Measured from 50% of final VDD supply voltage to 90% of RF power |      | 5    | 10   | μs    |
| Switching time<br>(PIN = +27 dBm) | T <sub>SW</sub>  | Measured from 50% of final VDD supply voltage to 90% of RF power |      | 2.0  | 3.0  | μs    |

(VDD = 2.85 V, VCT = 1.8 V, TOP = +25 °C, Characteristic Impedance [ZO] = 50 Ω, Unless Otherwise Noted)

## RF Specifications

VDD=2.8V, VCTLH=1.8V, VCTLL=0V, PIN=0dBm, ZO=50Ω, TA=25°C, Unless Otherwise Stated

| Parameters                                           | Symbol | Test Condition       | Min. | Typ. | Max. | Units |
|------------------------------------------------------|--------|----------------------|------|------|------|-------|
| Operating frequency                                  | f      |                      | 617  |      | 7125 | MHz   |
| Insertion loss                                       | IL     | Up to 0.9 GHz        |      | 0.30 | 0.35 | dB    |
|                                                      |        | Up to 2.1 GHz        |      | 0.35 | 0.40 |       |
|                                                      |        | Up to 2.7 GHz        |      | 0.42 | 0.47 |       |
|                                                      |        | Up to 3.8 GHz        |      | 0.50 | 0.55 |       |
|                                                      |        | Up to 4.2 GHz        |      | 0.55 | 0.60 |       |
|                                                      |        | Up to 5.0 GHz        |      | 0.58 | 0.65 |       |
|                                                      |        | Up to 5.9 GHz        |      | 0.65 | 0.75 |       |
|                                                      |        | Up to 7.125 GHz      |      | 0.75 | 0.85 |       |
| Isolation ( port to any receive port)                | Iso    | Up to 0.9 GHz        | 30   | 35   |      | dB    |
|                                                      |        | Up to 2.1 GHz        | 29   | 33   |      |       |
|                                                      |        | Up to 2.7 GHz        | 27   | 30   |      |       |
|                                                      |        | Up to 3.8 GHz        | 25   | 28   |      |       |
|                                                      |        | Up to 4.2 GHz        | 23   | 25   |      |       |
|                                                      |        | Up to 5.0 GHz        | 18   | 20   |      |       |
|                                                      |        | Up to 5.9 GHz        | 16   | 18   |      |       |
|                                                      |        | Up to 7.125 GHz      | 14   | 16   |      |       |
| 2nd Order harmonics                                  | 2fo    | Pin = +26 dBm,900MHz | -70  | -66  |      | dBm   |
|                                                      |        | Pin = +35 dBm,900MHz | -53  | -52  |      |       |
| 3rd Order harmonics                                  | 3fo    | Pin = +26 dBm,900MHz | -68  | -62  |      | dBm   |
|                                                      |        | Pin = +35 dBm,900MHz | -52  | -50  |      |       |
| 0.1 dB Compression Point<br>50% duty cycle, VSWR=1:1 | P0.1dB | 900M, 50Ω            |      | +38  |      | dBm   |

### Truth Table

| VCTL | RF Channel Operating Mode |
|------|---------------------------|
| Low  | RF1-RF3 on, RF2-RF4 on    |
| High | RF1-RF4 on, RF2-RF3 on    |

## Pin-out Information

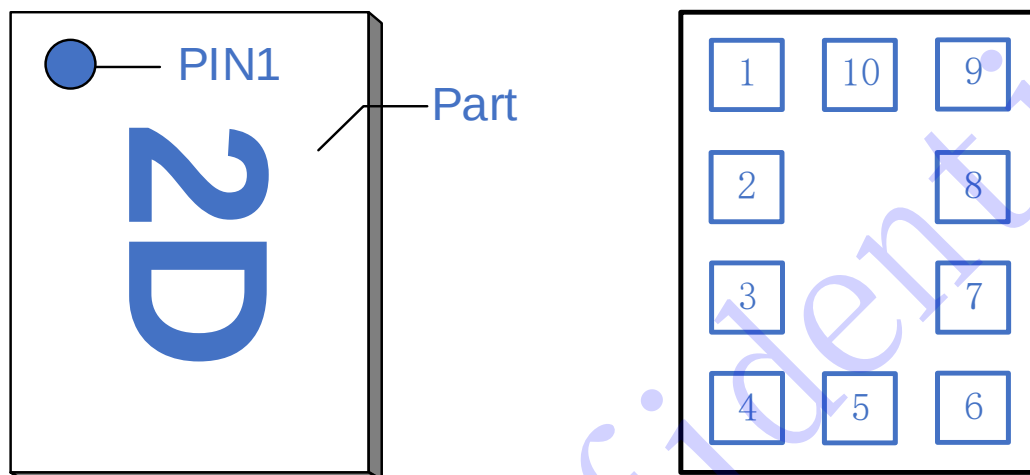


Figure 2 Pin-out Information

Table 1. Pin Description

| Pin # | Name | Description | Pin # | Name | Description         |
|-------|------|-------------|-------|------|---------------------|
| 1     | GND  | Ground      | 6     | RF2  | RF Port 2           |
| 2     | RF3  | RF Port 3   | 7     | GND  | Ground              |
| 3     | GND  | Ground      | 8     | RF4  | RF Port 4           |
| 4     | RF1  | RF Port 1   | 9     | VCTL | Control Voltage Pin |
| 5     | GND  | Ground      | 10    | VDD  | DC Power Supply     |

## Application circuit

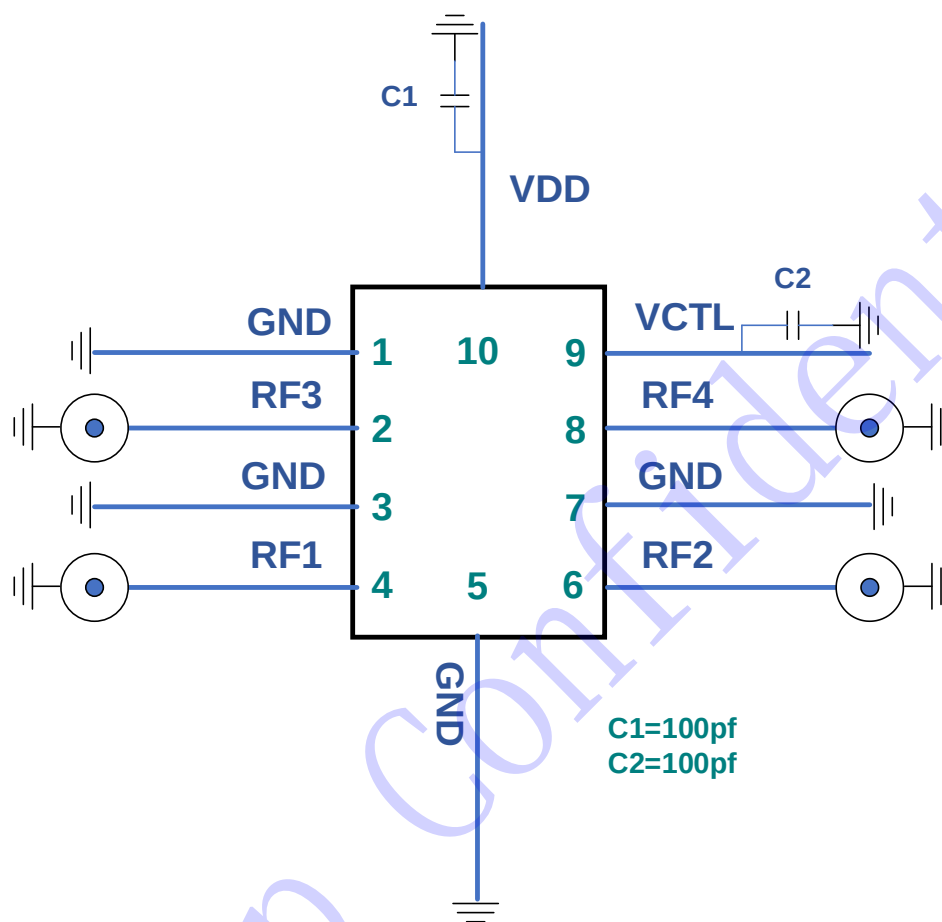


Figure 3 Application circuit

## Evaluation Board

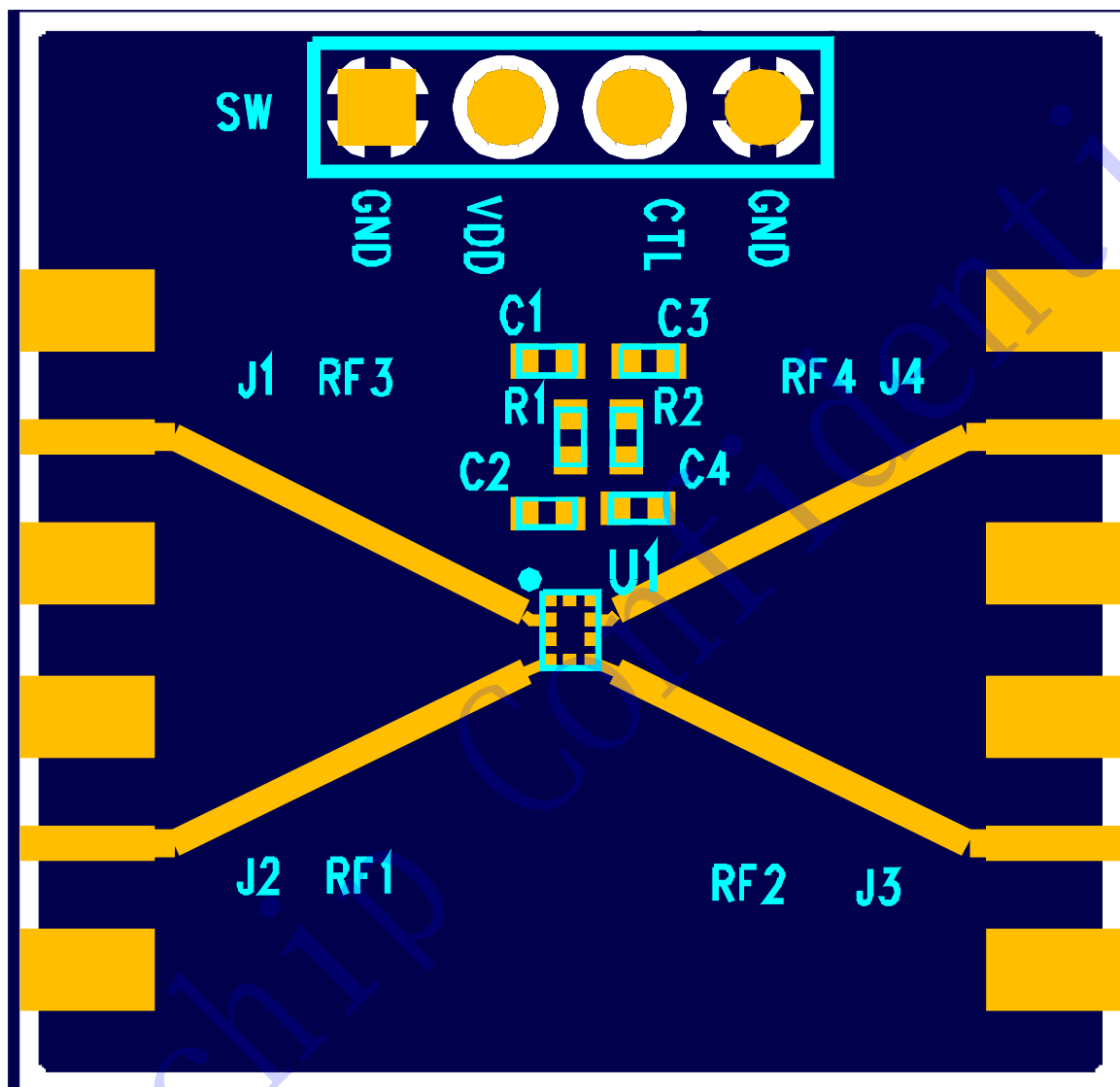


Figure 4 Evaluation Board Assembly Diagram

## Package Outline Dimension

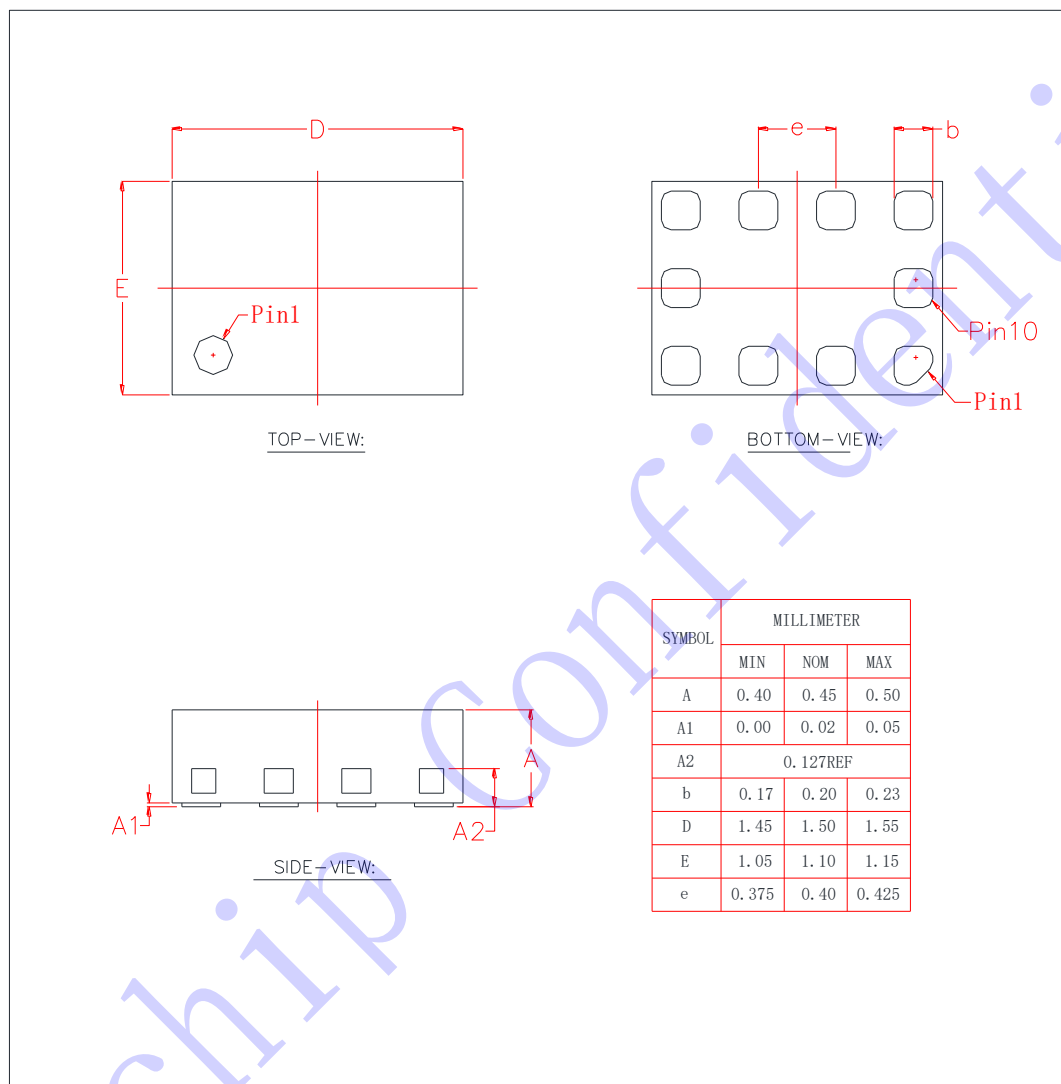
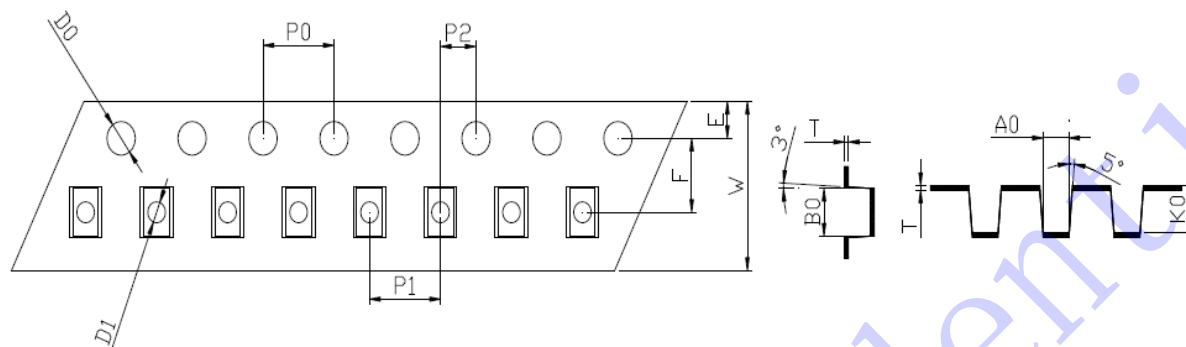


Figure 5 Package Outline Dimension



## Package Dimensions (5000pcs)



|    |                 |    |                 |    |                 |
|----|-----------------|----|-----------------|----|-----------------|
| W  | $8.00 \pm 0.05$ | T  | $0.20 \pm 0.02$ | D1 | $0.80 \pm 0.10$ |
| E  | $1.75 \pm 0.10$ | F  | $3.50 \pm 0.10$ | D0 | $1.60 \pm 0.10$ |
| P0 | $4.00 \pm 0.10$ | P1 | $4.00 \pm 0.10$ | P2 | $2.00 \pm 0.10$ |
| A0 | $1.25 \pm 0.05$ | B0 | $1.88 \pm 0.05$ | K0 | $0.75 \pm 0.05$ |

Figure 6 Tape and Reel Dimensions

## Declaration of No Harmful Substances

This part is compliant with 2005/20/EC packaging directive, 1907/2006/EC REACH directive and the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Lead free
- Halogen Free (Chlorine, Bromine)
- SVHC Free

## Reflow Chart

