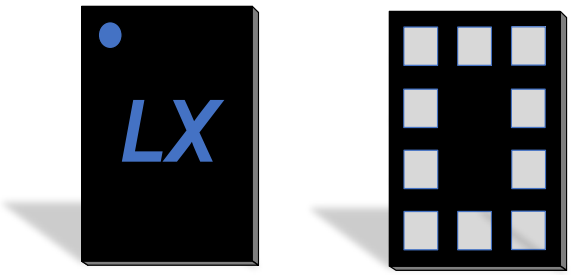


Product Features

- Excellent Insertion Loss and Isolation performance
- High Linearity
- GPIO Control Interface
- Broadband frequency range: 0.7 to 2.7 GHz
- Small package: QFN-10 1.1mm x 1.5mm
- No DC blocking capacitors required
- 1kV HBM ESD Protection on all pins

Product Applications

- 3G/4G multimode cellular tablets and Multi-Mode GSM, EDGE, WCDMA, LTE
- Diversity antenna switching

Product Description

The LX1694 is a Silicon On Insulator (SOI) Single Pole, Twelve Throw (SP4T) antenna tuner which require very low insertion loss, high isolation and high linearity performance.

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

The LX1694 is manufactured in a compact 1.1mm x 1.5mm x 0.45mm ,10 Pin surface mount Quad Flat No-Lead (QFN) package.

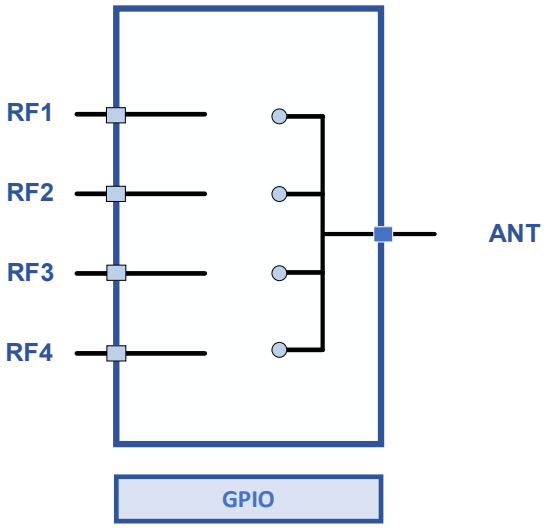


Figure 1 Functional Block Diagram

Absolute Maximum Conditions

Parameters	Symbol	Minimum	Maximum	Units
Supply voltage	V_{DD}		5.8	V
Control voltage	VCTL		2.7	V
RF input power	Pin		+43	dBm
Storage temperature	T_{STG}	-55	+150	℃
Operating temperature	T_{OP}	-40	+90	℃
Human Body Model, Class 1C	ESD	1000		V

1: Test condition 50% duty cycle, VSWR=1:1, +25 º 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_{DD}		2.4	2.85	4.2	V
Supply current, active mode	I_{DD}		85		130	μA
Control signal: High Low			 1.35 0	 1.8 0	 2.70 0.45	V
Control current: High Low	I_{CTL}			0.1		μA
Turn-on time (PIN = +27 dBm)	T_{ON}	Measured from 50% of final VDD supply voltage to 90% of RF power		9		μs
Switching time (PIN = +27 dBm)	T_{SW}	Measured from 50% of final VDD supply voltage to 90% of RF power		5		μs

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

RF Specifications

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Units
Operating frequency	f		0.7		2.7	GHz
Insertion loss	IL	Up to 0.9 GHz Up to 1.9 GHz Up to 2.7 GHz		0.18 0.30 0.50	0.30 0.60 0.85	dB
Isolation (ANT port to any receive port)	I_{SO}	Up to 0.9 GHz Up to 1.9 GHz Up to 2.7 GHz		23 20 15		dB
Isolation (Active RF Ports to other inactive RF Ports)	I_{SO}	Up to 0.9 GHz Up to 1.9 GHz Up to 2.7 GHz		17 13 11		dB
Return loss	RL	All ports, up to 0.9 GHz All ports, up to 1.9 GHz		22 16		dB
2nd Order harmonics	2fo	Pin = +26 dBm,900MHz Pin = +35 dBm,900MHz	-84 -73	-79 -72		dBm
3rd Order harmonics	3fo	Pin = +26 dBm,900MHz Pin = +35 dBm,900MHz	-93 -61	-91 -61		dBm
0.1 dB Compression Point 50% duty cycle, VSWR=1:1	P0.1dB	900M, 50Ω		+43		dBm

Truth Table

CLT1	CLT2	ANT-RFX
0	0	ANT-RF1 on
0	1	ANT-RF2 on
1	0	ANT-RF3 on
1	1	ANT-RF4 on

Pin-out Information

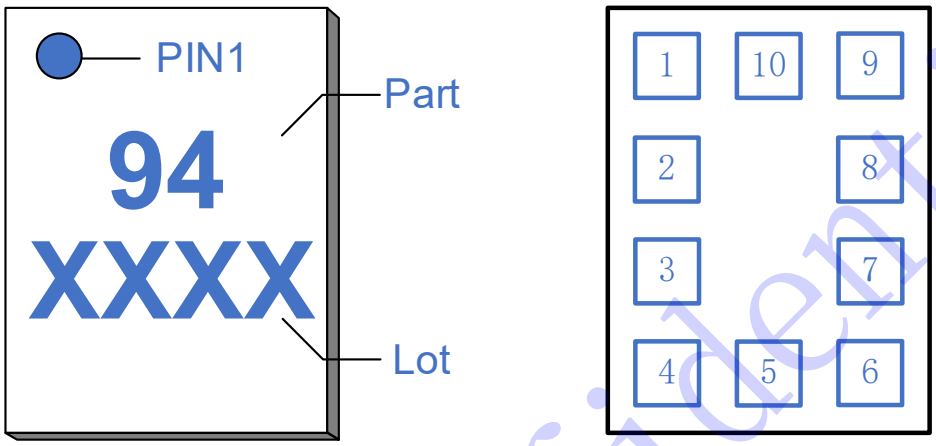


Figure 2 Pin-out Information

Table 1. Pin Description

Pin #	Name	Description	Pin #	Name	Description
1	RF1	RF port 1	6	VTL2	Control voltage2
2	RF2	RF port 2	7	GND	Ground
3	GND	Ground	8	RF4	RF port 4
4	VDD	Supply voltage	9	RF3	RF port 3
5	CTL1	Control voltage1	10	RFC	RF Common port

Application circuit

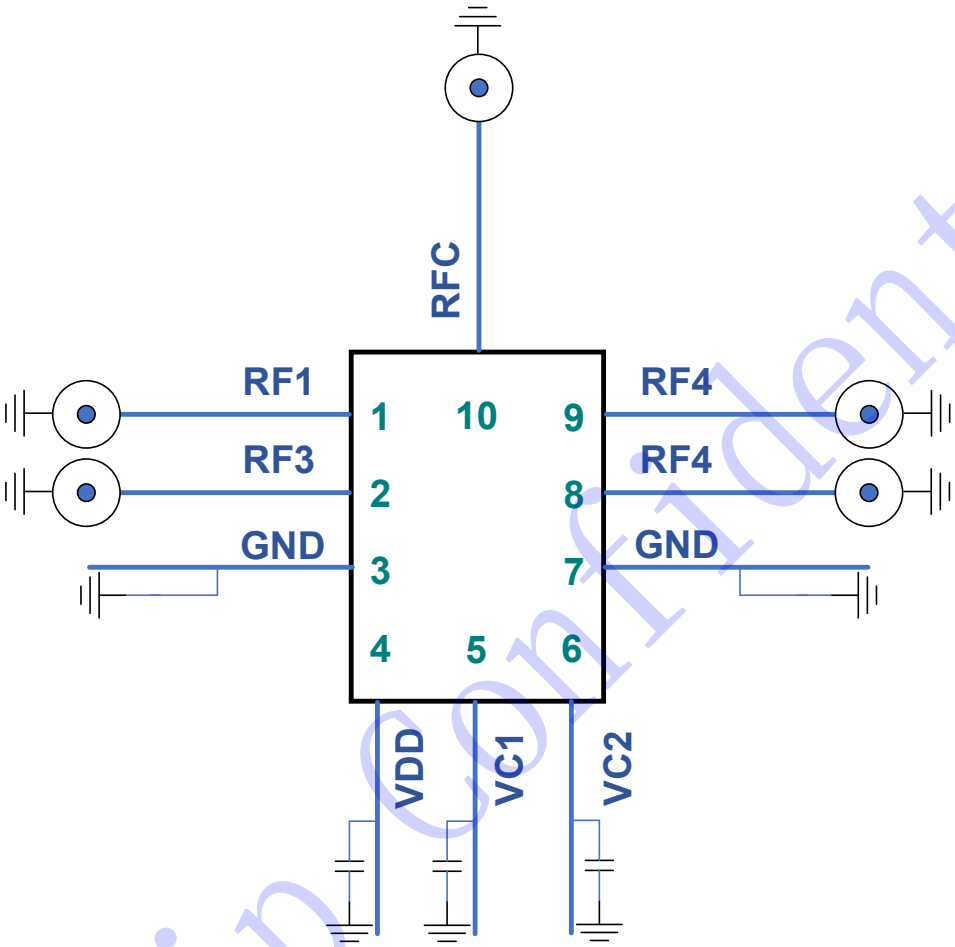


Figure 3 Application circuit

Evaluation Board

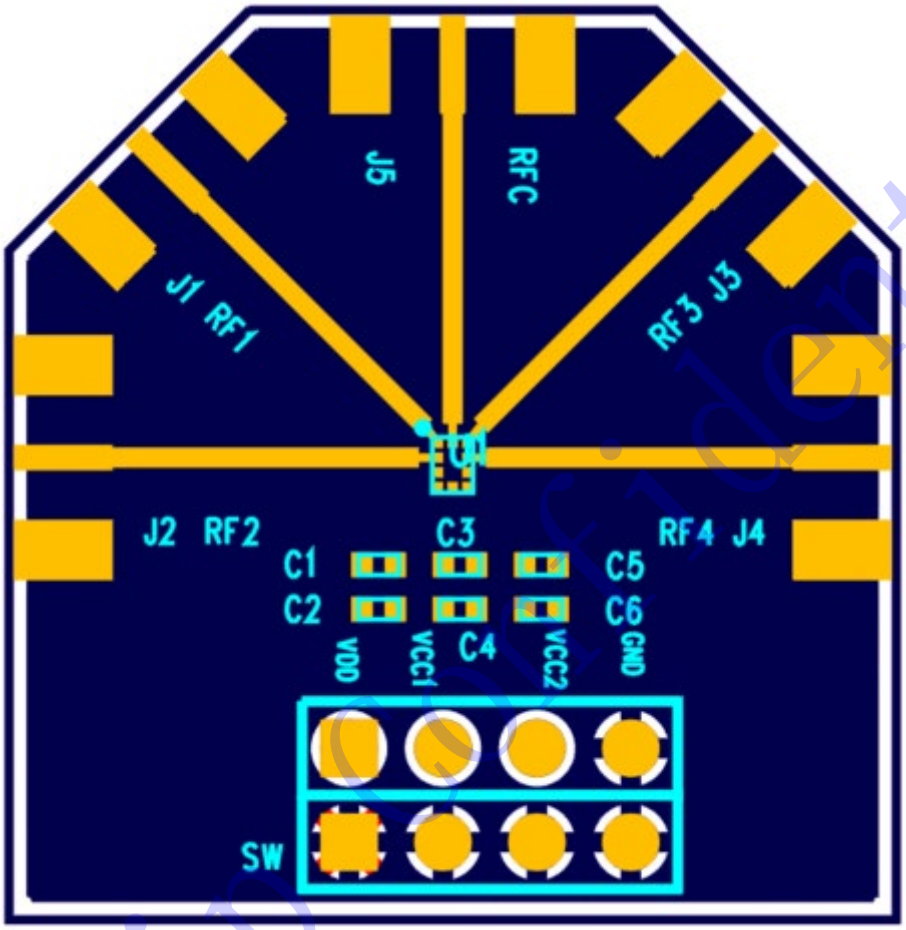
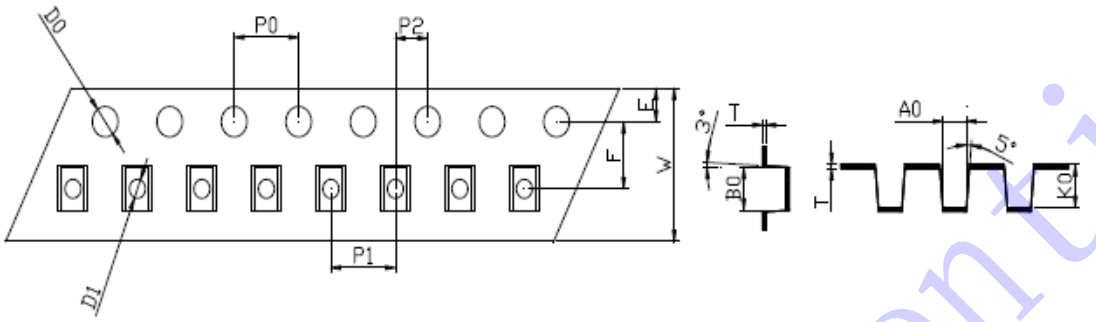


Figure 4 Evaluation Board Assembly Diagram

Package Outline Dimension

Figure 5 Package Outline Dimension

Package Dimensions (5000pcs)



W	8.00±0.05	T	0.20±0.02	D1	0.80±0.10	单位	MM
E	1.75±0.10	F	3.50±0.10	DO	1.60±0.10	材质	ABS
PO	4.00±0.10	P1	4.00±0.10	P2	2.00±0.10		
AO	1.25±0.05	BO	1.88±0.05	KO	0.75±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

Version Information

Version	Description	Data	Reviser
V1.0			

