



Product Features

- Excellent Insertion Loss and Isolation performance
- High Linearity
- RFFE 2.1 Control Interface
- Broadband frequency range: 0.4 to 5 GHz
- Small package: QFN-16 2.0mm x 2.0mm x 0.55mm
- 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 LX1024 is a Silicon On Insulator (SOI) Single Pole, Four Throw (DP4T) antenna switch with a Mobile Industry Processor Interface (MIPI) which require very low insertion loss, high isolation and high linearity performance.

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

The LX1024 is manufactured in a compact 2.0mm x 2.0mm x 0.55mm, 16-pin surface mount Quad Flat No-Lead (QFN) package.

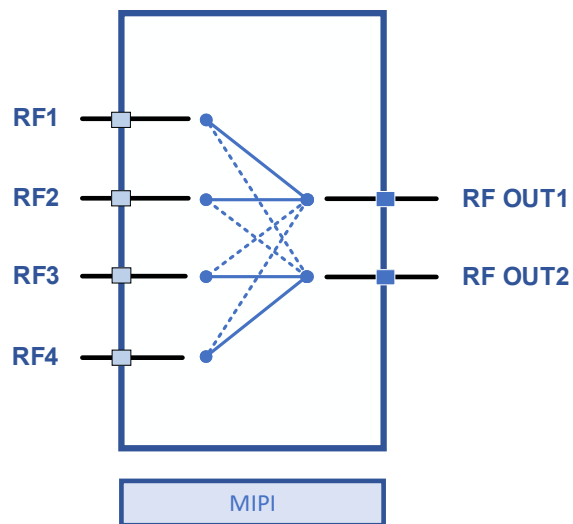


Figure 1 Functional Block Diagram

Absolute Maximum Conditions

Parameters	Symbol	Minimum	Maximum	Units
Digital control signal	V _{IO}	-0.3	2.5	V
RF input power	P _{in}		+38	dBm
Storage temperature	T _{STG}	-55	+150	°C
Operating temperature	T _{OP}	-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
Interface supply	V _{IO}		1.65	1.80	1.95	V
Interface signal:			0.8 * V _{IO}	V _{IO}	V _{IO}	V
High			0	0	0.2 * V _{IO}	
Control current:			200		300	μA
High	I _{CTL}		20		40	
Low						
Turn-on time (PIN = +27 dBm)	T _{ON}	Measured from 50% of final supply voltage to 90% of RF power		10	20	μs
Switching time (PIN = +27 dBm)	T _{SW}	Measured from 50% of final supply voltage to 90% of RF power	1.0		2.0	μs

(V_{IO} = 1.8 V, V_{IH}=1.8V, V_{IL}=0V, T_{OP} = +25 °C, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

RF Specifications

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Units
Operating frequency	f		0.4		5	GHz
Insertion loss	IL	Up to 0.9 GHz		0.41	0.49	dB
		Up to 2.2 GHz		0.62	0.68	
		Up to 2.7 GHz		0.63	0.70	
		Up to 3.8 GHz		0.80	1.10	
		Up to 5.0 GHz		1.40	1.80	
Isolation (Port to any receive port)	Iso	Up to 0.9 GHz	30	35	dB	
		Up to 2.2 GHz	25	30		
		Up to 2.7 GHz	23	27		
		Up to 3.8 GHz	20	23		
		Up to 5.0 GHz	18	20		
2nd Order harmonics	2fo	Pin = +26 dBm,900MHz	-71	-68	dBm	
		Pin = +35 dBm,900MHz	-52	-50		
3rd Order harmonics	3fo	Pin = +26 dBm,900MHz	-80	-77	dBm	
		Pin = +35 dBm,900MHz	-62	-60		
0.1 dB Compression Point 50% duty cycle, VSWR=1:1	P0.1dB	900M, 50Ω		+38		dBm

Truth Table

Reg_1C	REG_00	REG_01	LOSS	ISO
38	13	0	RFIN1-RFOUT1	RFIN1-RFIN2
			RFIN2-RFOUT2	
38	16	0	RFIN2-RFOUT1	RFIN2-RFIN3
			RFIN3-RFOUT2	
38	1C	0	RFIN3-RFOUT1	RFIN3-RFIN4
			RFIN4-RFOUT2	
38	13	1	RFIN1-RFOUT2	RFIN1-RFIN2
			RFIN2-RFOUT1	
38	16	1	RFIN2-RFOUT2	RFIN2-RFIN3
			RFIN3-RFOUT1	
38	1C	1	RFIN3-RFOUT2	RFIN3-RFIN4
			RFIN4-RFOUT1	

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Register definition

Register 0, Address: 0x00 (MODE_CTRL)				
Register 0	Description	Default	Notes	Trig
[7:0]	MODE_CTRL	0x0	Switch control. See Truth Table	Yes
Register 1B, Address: 0x1B				
Register 1B	Description	Default	Notes	Trig
[7:4]	Reserved	0x00	Reserved	No
[3:0]	GSID	0000	Group slave ID	No
Register 1C Address: 0x1C (PM_TRIG)				
Register 28	Description	Default	Notes	Trig
[7:6]	PWR_MODE	10	00 = Normal Operation (ACTIVE) 01 = Default Settings (STARTUP) 10 = Low Power (LOW POWER) 11 = Reserved	No
[5]	Trigger Mask 2	0	Trigger Enable: 0 Trigger Disable: 1	No
[4]	Trigger Mask 1	0	Trigger Enable: 0 Trigger Disable: 1	No
[3]	Trigger Mask 0	0	Trigger Enable: 0 Trigger Disable: 1	No
[2]	Trigger Register 2	0	1 = Latch Register 2 contents	No
[1]	Trigger Register 1	0	1 = Latch Register 1 contents	No
[0]	Trigger Register 0	0	1 = Latch Register 0 contents	No
Register 1D, Address: 0x01D (PM_ID)				
Register 29	Description	Default	Notes	Trig
[7:0]	Product ID	0X1E	Product ID = 0X1E	No
Register 30, Address: 0x01E (MAN_ID)				
Register 30	Description	Default	Notes	Trig
[7:0]	Manufacturer ID	0x78	Manufacturer ID [7:0] = 0x78	No
Register 31 Address: 0x1F (USID)				
Register 31	Description	Default	Notes	Trig
[7:4]	Manufacturer ID	0x2	Manufacturer ID [11:8]	No
[3:0]	User ID	0x6	The default value at reset is selected via pin USID.	No

Pin-out Information

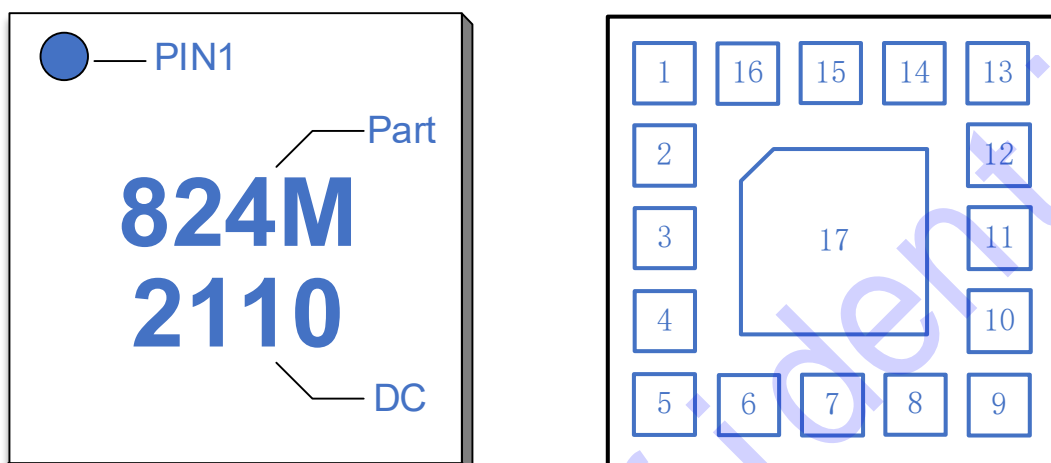
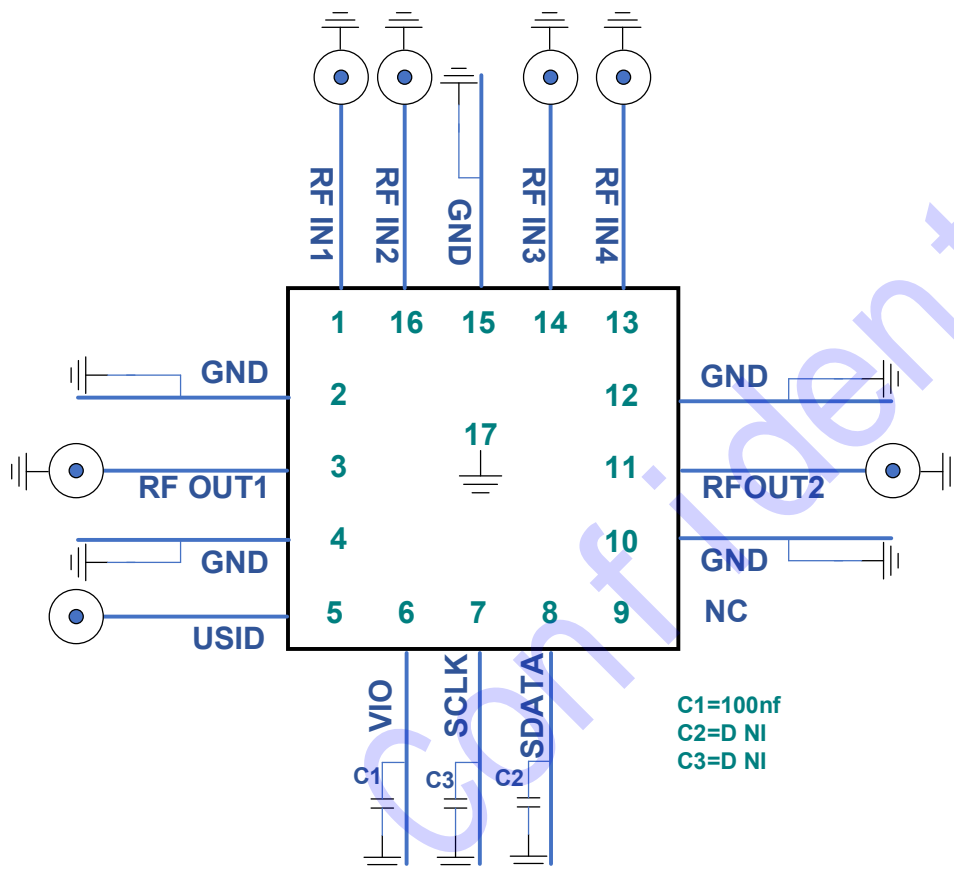


Figure 2 Pin-out Information

Table 1. Pin Description

Pin #	Name	Description	Pin #	Name	Description
1	RFIN1	RF Input Port 1	10	GND	Ground
2	GND	Ground	11	RFOUT2	RF Output Port 2
3	RFOUT1	RF Output Port 1	12	GND	Ground
4	GND	Ground	13	RFIN4	RF Input Port 4
5	USID	USID Select Pin	14	RFIN3	RF Input Port 3
6	VIO	Supply Voltage	15	GND	GND
7	SCLK	RFFE Clock Bus	16	RFIN2	RF Input Port 2
8	SDATA	RFFE Data Bus	17	GND	Ground
9	NC	Not Connected (can be grounded)			

Application circuit



Evaluation Board

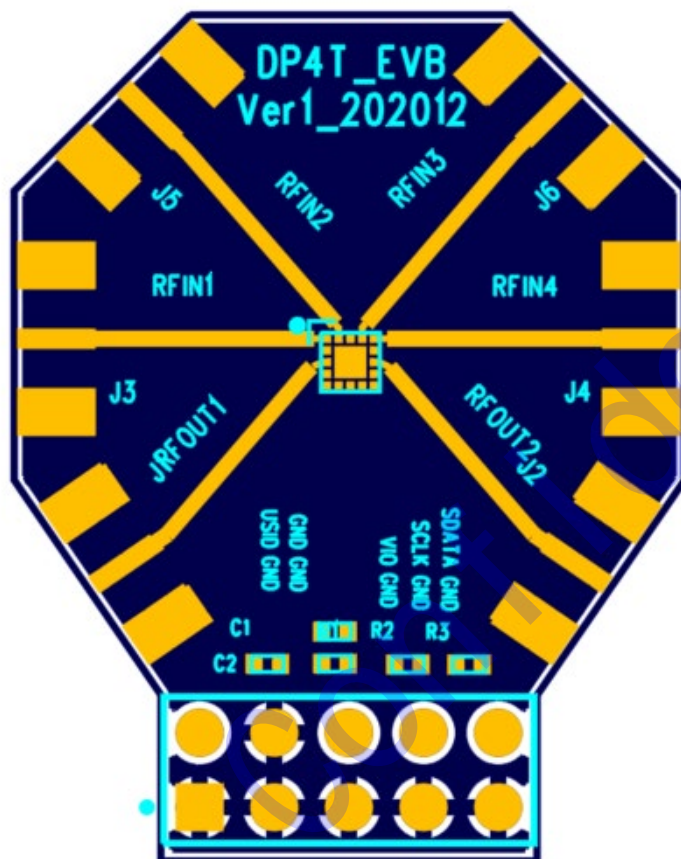
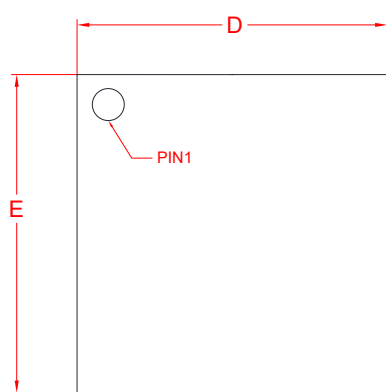
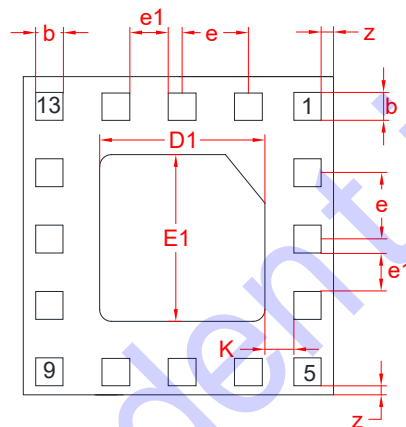


Figure 4 Evaluation Board Assembly Diagram

Package Outline Dimension



TOP-VIEW:



BOTTOM-VIEW:

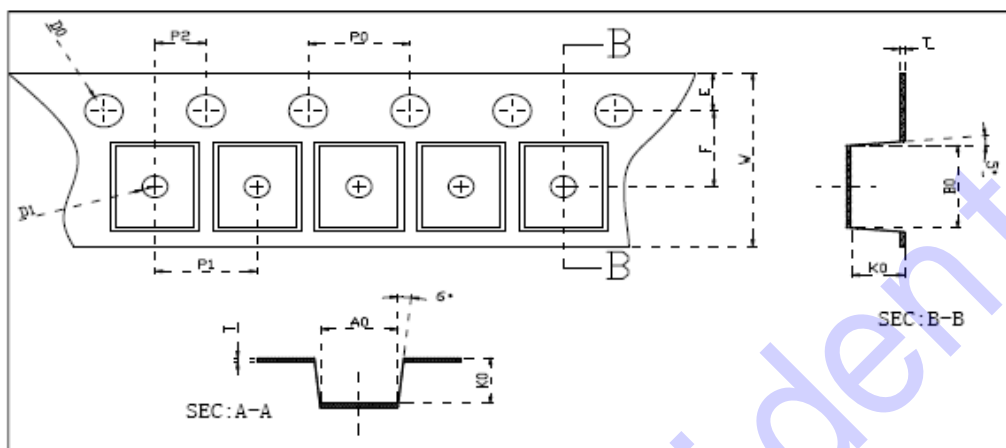


FRONT-VIEW:

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
A2	0.119	0.127	0.135
b	0.15	0.20	0.25
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D1	0.95	1.00	1.05
E1	0.95	1.00	1.05
z	0.10REF		
e	0.35	0.40	0.45
e1	0.15	0.20	0.25
K	0.15	0.20	0.25

Figure 5 Package Outline Dimension

Package Dimensions (5000pcs)



W	8.00±0.10	T	0.20±0.05	D1	1.00±0.10	单位	MM
E	1.75±0.10	F	3.50±0.10	D0	1.50±0.10	材质	PC+PS
P0	4.00±0.10	P1	4.00±0.10	P2	2.00±0.10		
A0	2.18±0.10	B0	2.20±0.10	K0	0.75±0.10		

Figure 6 Tape and Reel Dimensions

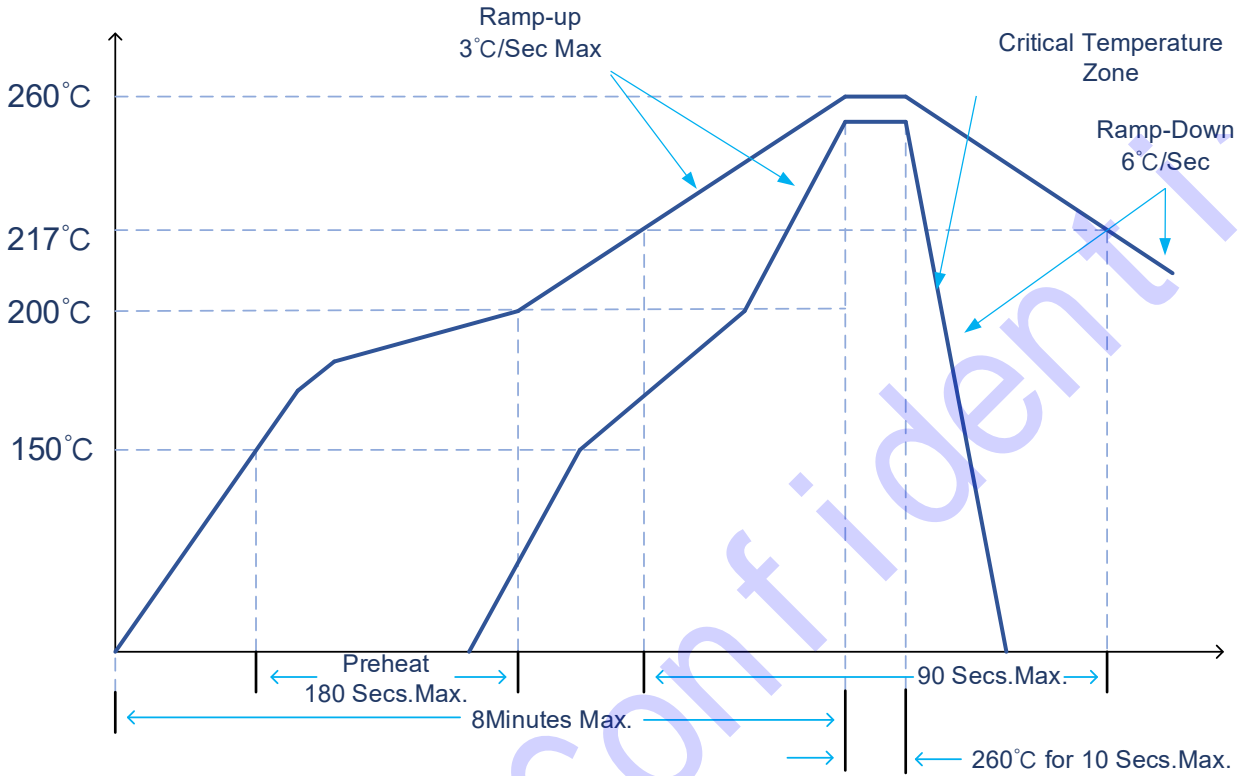
Declaration of No Harmful Substances

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



NOTE: Reflow Profile with 240°C peak also acceptable.