

HX13563-670-LGA 0.4-2.7GHz SP12T Switch with MIPI RFFE Interface for Diversity Applications

Description

The HX13563-670-LGA is a single-pole, twelve-throw (SP12T) switch specifically designed for diversity applications operating within the frequency range of 400 MHz to 2.7 GHz. Its RF performance has been optimized to ensure low insertion loss, thereby meeting the stringent requirements set forth by all 3G and LTE standards.

No external DC blocking capacitors are necessary as long as no DC voltage is applied across any RF path.

The HX13563-670-LGA is compatible with RFFE serial control. It exhibits low insertion loss across every path from the antenna port to any of the RF ports, while maintaining high isolation between both opposite and adjacent paths. Furthermore, the HX13563-670-LGA demonstrates excellent linearity performance, making it suitable for both 3G and LTE applications. The SOI architecture employed in the HX13563-670-LGA eliminates the need for external DC blocking capacitors, thus reducing costs and saving PCB space for end customers.

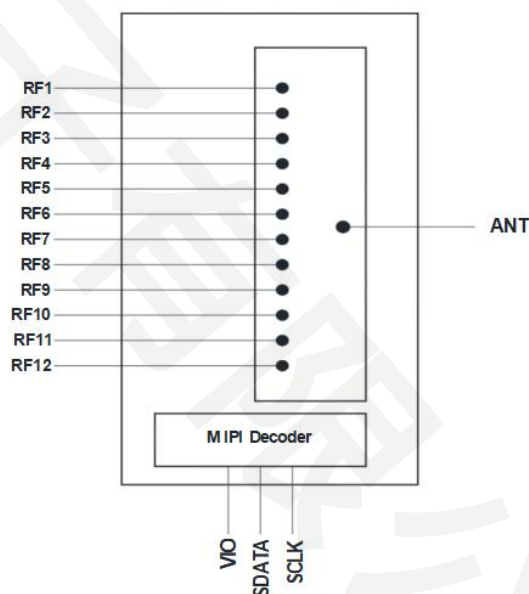
Encapsulated in a compact 2.5 mm x 2.5 mm, 20-pin QFN package with a low profile of just 0.55 mm, this product complies with RoHS regulations and is halogen-free.

The HX13563-670-LGA is rated at Moisture Sensitivity Level 1 (MSL1) at temperatures up to 260°C according to JEDEC J-STD-020 standards.

Features

- ★ Broadband support 0.4-2.7GHz
- ★ Compatible with UMTS, TD-SCDMA, and LTE
- ★ Advanced SOI process
- ★ Excellent linearity
- ★ Low insertion loss
- ★ MIPI RFFE interface
- ★ No external DC blocking capacitor required
- ★ Green product
- ★ Small QFN package, 2.5mm x 2.5mm x 0.55mm, 20-pin

Block Diagram



Application

- ★ Diversity for UMTS/LTE

Absolute Maximum Ratings

Parameter	Rating	Unit
MIPI Supply Voltage(V _{io})	2.1	V
RF Input Power	32	dBm
Operating Temperature	-30 to 90	°C
Storage Temperature	-55 to 150	°C
ESD-Human Body Mode(HBM)	-1 to 1	kV



ESD Caution

Appropriate precautions in handling, packaging and testing devices must be observed.

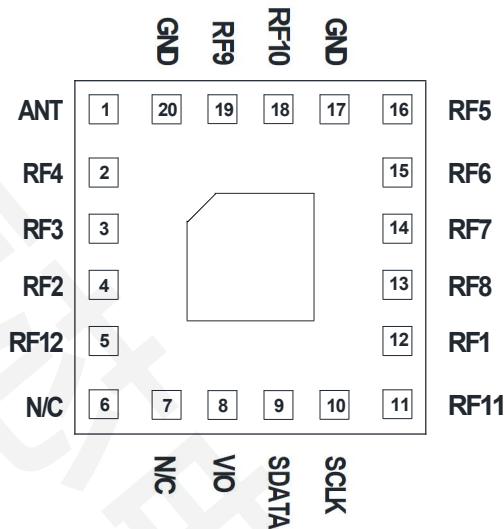
Recommended Operating Conditions

Parameter	Symbol	Condition	Minimum	Typical	Maximum	Unit
MIPI Supply Voltage	V _{io}		1.65	1.8	2	V
VIO Current	I _{vo}			0.023	0.03	mA

Logic Truth Table for Operation Modes

Register 0								
MODE	D7	D6	D5	D4	D3	D2	D1	D0
RF1	X	0	0	0	0	1	0	0
RF2	X	0	0	0	0	1	1	1
RF3	X	0	0	0	1	0	0	1
RF4	X	0	0	0	1	0	1	1
RF5	X	0	0	0	1	1	0	0
RF6	X	0	0	0	0	0	0	1
RF7	X	0	0	0	0	0	1	0
RF8	X	0	0	0	0	0	1	1
RF9	X	0	0	0	1	0	1	0
RF10	X	0	0	0	1	0	0	0
RF11	X	0	0	0	0	1	0	1
RF12	X	0	0	0	0	1	1	0

Pin-Out(Top View)



Pin Definitions

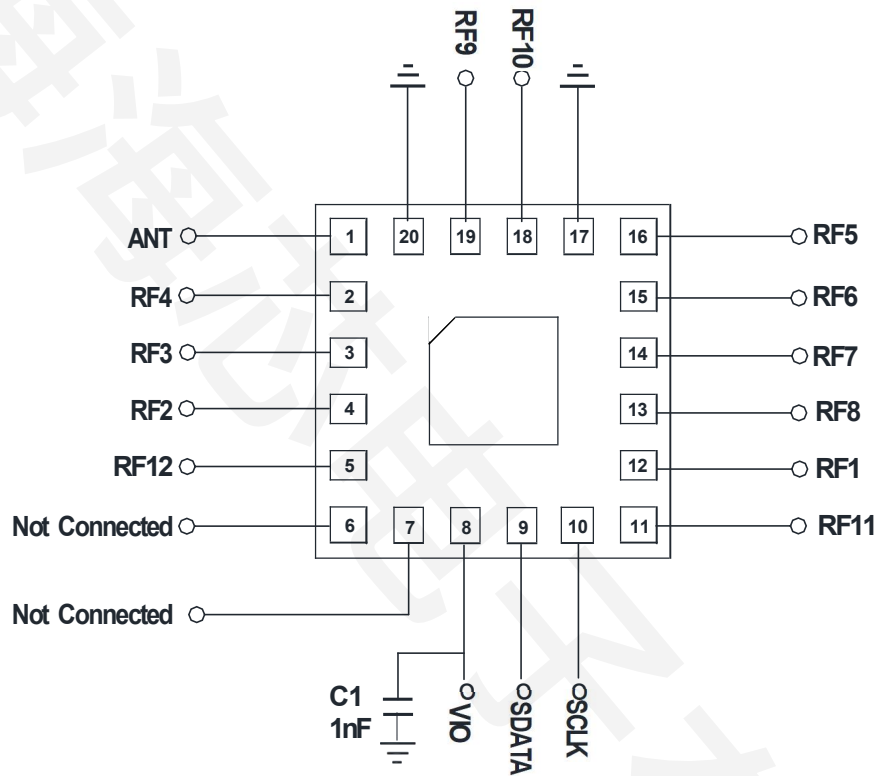
Pin	Name	Description
1	ANT	Antenna port
2	RF4	RF Port 4
3	RF3	RF Port 3
4	RF2	RF Port 2
5	RF12	RF Port 12
6	N/C	Not Connected
7	N/C	Not Connected
8	VIO	MIPI decoder interface voltage
9	SDATA	MIPI Data
10	SCLK	MIPI Clock
11	RF11	RF Port 11
12	RF1	RF Port 1
13	RF8	RF Port 8
14	RF7	RF Port 7
15	RF6	RF Port 6
16	RF5	RF Port 5
17	GND	Ground
18	RF10	RF Port 10
19	RF9	RF Port 9
20	GND	Ground

UMTS/TD-SCDMA/LTE RF Electrical Specifications

(Test Condition $P_{IN} = 0\text{dBm}$, $T_c = 25^\circ\text{C}$, 50Ω , unless otherwise specified)

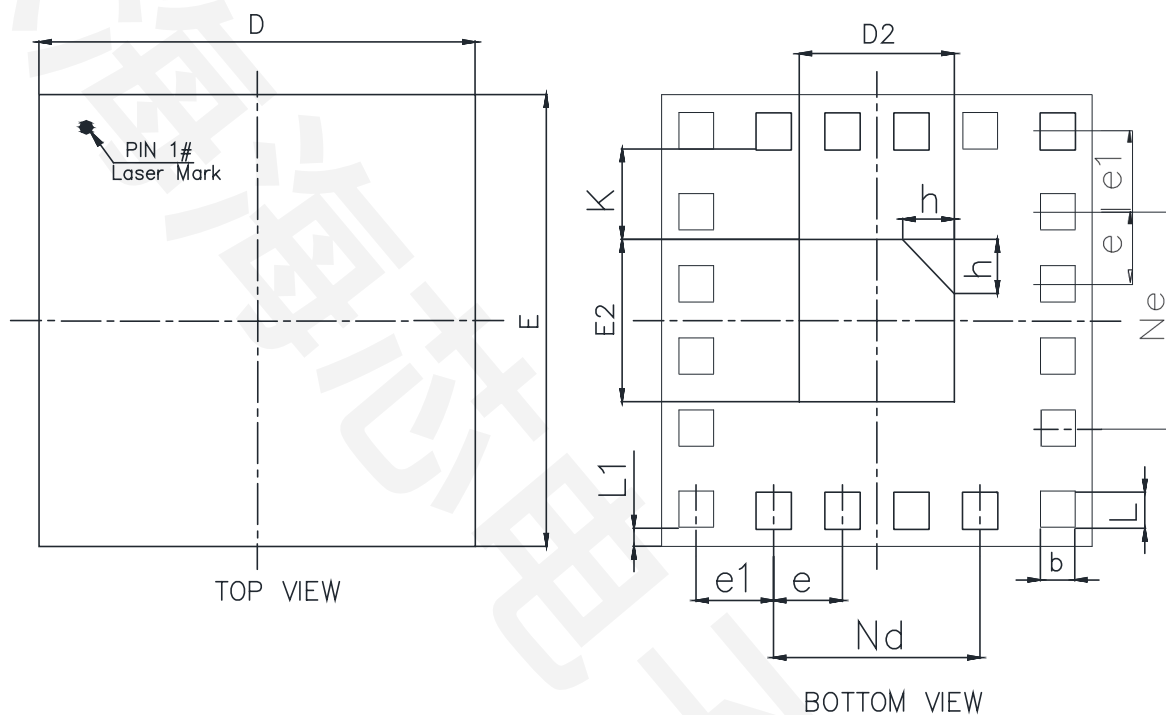
Parameter	Condition	Minimum	Typical	Maximum	Unit
Frequency	UMTS/LTE Band 5/8/12/13/14/17/20 UMTS/TD-SCDMA/LTE Band 1/2/3/4/34/39 LTE Band 7/38/40/41	698 1710 2300		960 2170 2690	MHz
Insertion Loss	698MHz to 960MHz 1710MHz to 2170MHz 2300MHz to 2690MHz		0.34 0.43 0.46	0.5 0.6 0.7	dB
Adjacent Port Isolation	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	21 15 12	25 19 18		dB
Non-Adjacent Port Isolation	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	28 22 18	33 26 24		dB
IMD2	Receive Freq: 881.5MHz Tone1: 836.5MHz at 20dBm Tone2: 45MHz at -15 dBm Tone2: 1718MHz at -15 dBm		-87.34 -107.5		dBm
	Receive Freq: 1960MHz Tone1: 1880MHz at 20dBm Tone2: 80MHz at -15 dBm Tone2: 3840MHz at -15 dBm		-102.2 -106.5		dBm
	Receive Freq: 2140MHz Tone1: 1950MHz at 20dBm Tone2: 190MHz at -15 dBm Tone2: 4090MHz at -15 dBm		-104.2 -106.4		dBm
IMD3	Receive Freq: 881.5MHz Tone1: 836.5MHz at 20dBm Tone2: 791.5MHz at -15 dBm Tone2: 2554.5MHz at -15 dBm		-108 -107.5		dBm
	Receive Freq: 1960MHz Tone1: 1880MHz at 20dBm Tone2: 1800MHz at -15 dBm Tone2: 5720MHz at -15 dBm		-103.7 -107.4		dBm
	Receive Freq: 2140MHz Tone1: 1950MHz at 20dBm Tone2: 1760MHz at -15 dBm Tone2: 6040MHz at -15 dBm		-104.8 -109.8		dBm
Switching Time	10% to 90% RF		0.36		μs

Application Schematic



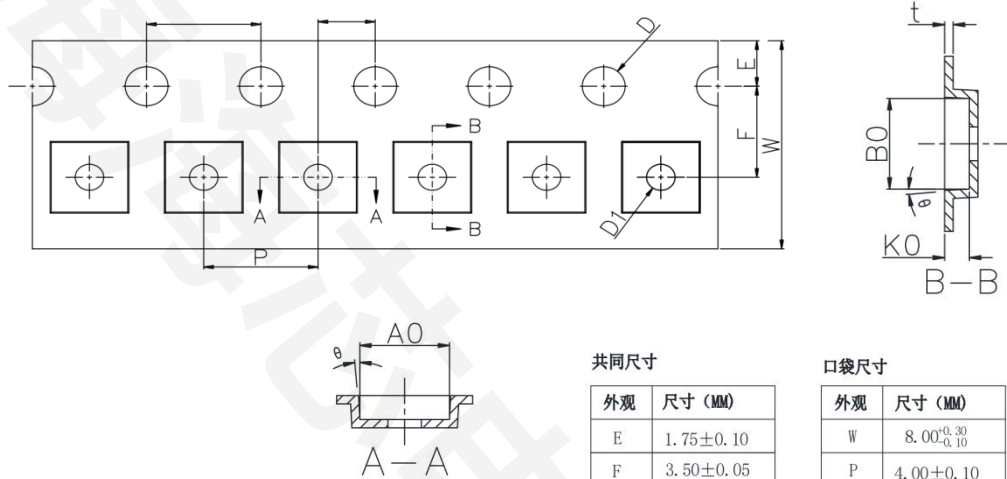
1. RF input and output are 50-Ohm microstrip.
2. The values for capacitors and inductor could be changed according to different applications.

Package Dimensions



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0	0.02	0.05
b	0.15	0.20	0.25
■	0.152REF		
D	2.40	2.50	2.60
D2	0.80	0.90	1.00
■	0.40BSC		
e1	0.45BSC		
Ne	1.20BSC		
Nd	1.20BSC		
E	2.40	2.50	2.60
E2	0.80	0.90	1.00
L	0.15	0.20	0.25
h	0.25	0.30	0.35
L1	0.10REF		
K	0.50RE		

Packaging Information



Package Type	Unit Size	Max Reel Diameter	Type Width	Pocket Pitch	Reel Capacity
Tape and Reel	2.5mm x 2.5mm x 0.55mm	7"	8mm	4mm	3000

Order Information

ORDER NUMBER	TEMPERATURE	PACKAGE DESCRIPTION	TYPE
HX13563-670-LGA	-30°C ~ 90°C	20-Pin, 2.5mm x 2.5mm x 0.55mm QFN Module Halogen Free	Tape & Reel, 3000 pcs per Reel