

HX13626-685-LGA 0.1-3.0GHz SP4T Antenna Switch Module for UMTS/TD-SCDMA/LTE

Description

The HX13626-685-LGA is a SP4T (single-pole four-throw) antenna switch module, designed for multimode broadband cellular applications, supporting UMTS, TD-SCDMA and LTE from 100MHz to 3.0GHz. The RF performance is optimized with low insertion loss and low harmonics to guarantee the stringent requirements of all 3G/LTE standards.

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

The HX13626-685-LGA integrates a SP4T switch and a GPIO controller on a single SOI chip. Equipped with 4 symmetrical transmit/receive ports for UMTS/TD-SCDMA/LTE, the HX13626-685-LGA is providing the most versatile combinations of operation in different modes.

Low insertion loss is exhibited in every path in HX13626-685-LGA, from the antenna port to any of the RF port, with high isolation between both opposite and adjacent paths. In addition, the HX13626-685-LGA also achieves excellent linearity performance, suitable for 3G and LTE applications. The internal decoder allows convenient GPIO connections and supports digital control signals. The SOI architecture in HX13626-685-LGA removes the external DC blocking capacitors to save the cost and PCB space for end customers.

The HX13626-685-LGA is encapsulated in a compact 1.1mm x 1.1mm LGA package, with low profile of 0.55mm. This product is RoHS-compliant and halogen free.

The HX13626-685-LGA is rated to Moisture Sensitivity Level 3(MSL3) at 260°C per JEDEC J-STD-020.

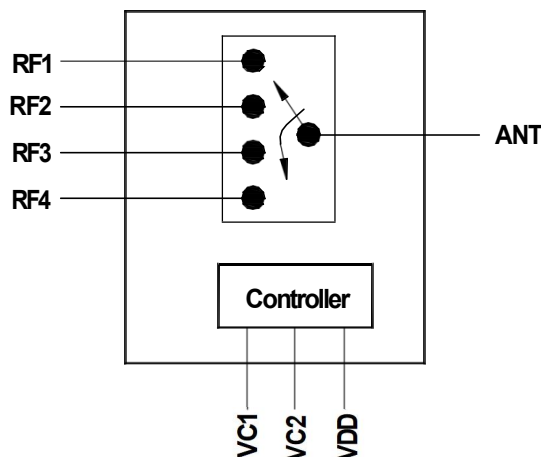
Features

- ★ Broadband support 0.1-3.0GHz
- ★ Compatible with UMTS, TDSCDMA, and LTE
- ★ Advanced SOI process
- ★ Low insertion loss
- ★ Excellent linearity
- ★ 4 symmetrical RF ports
- ★ GPIO control interface
- ★ Ultra small LGA footprint, 1.1mm x 1.1mm x 0.55mm, 9-pin
- ★ Green product

Application

- ★ Transmit/Receive for UMTS/TD-SCDMA/LTE Cellular handsets and data cards
- ★ Diversity for UMTS/LTE

Block Diagram



Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage(VDD)	4.8	V
Control Voltage(VC1,VC2)	3	V
RF Input Power	36	dBm
Operating Temperature	-40 to 90	°C
Storage Temperature	-55 to 150	°C
ESD-Human Body Mode(HBM)	-2.0 to 2.0	kV



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

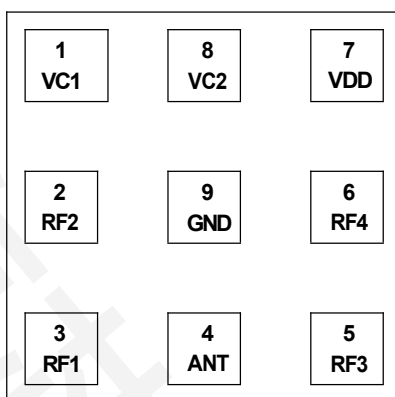
Recommended Operating Conditions

Parameter	Symbol	Condition	Minimum	Typical	Maximum	Unit
Supply Voltage	VDD		1.6	2.8	4.5	V
Supply Current	IDD		30	60	70	μA
Control Voltage(VC1,VC2)	VC	High Low	1.3	1.8 0	3.0 0.5	V
Control Current	ICTR L		0.3	0.5		μA

Logic Truth Table for Operation Modes

MODE	VC1	VC2
RF1	0	1
RF2	1	0
RF3	1	1
RF4	0	0

Pin-Out



Pin Definitions

Pin	Name	Description
1	VC1	Control logic signal
2	RF2	RF Port 2
3	RF1	RF Port 1
4	ANT	Antenna port
5	RF3	RF Port 3
6	RF4	RF Port 4
7	VDD	Supply voltage
8	VC2	Control logic signal
9	GND	Ground

UMTS/TD-SCDMA/LTE RF Electrical Specifications

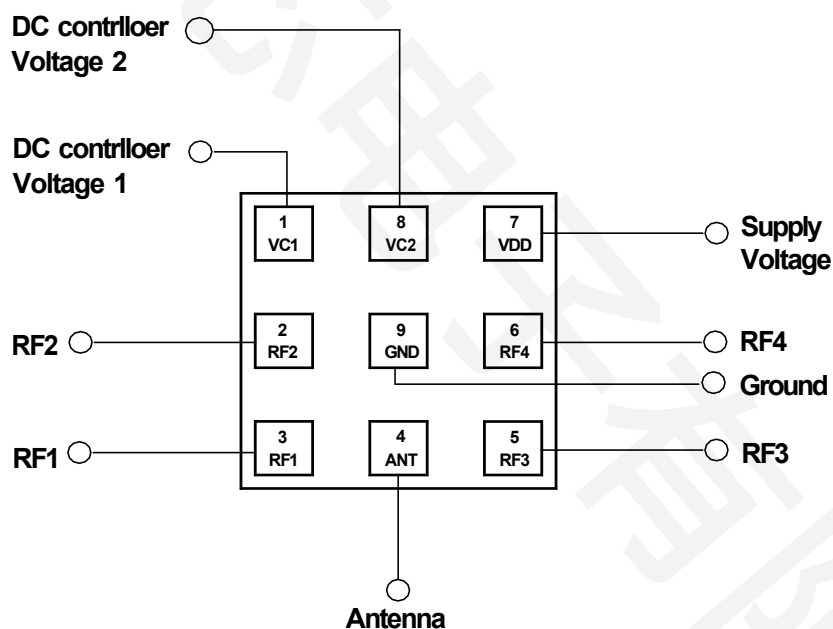
(Test Condition $V_{DD} = 2.8V$, $VC1/VC2 = 1.8V/0V$, $P_{IN} = 0dBm$, $T_c = 25^{\circ}C$, 50Ω , unless otherwise specified)

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		0.4 0.5 0.6	0.6 0.7 0.8	dB
Return Loss	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	18 14 12	25 22 19		dB
Isolation, RF1 to RF2	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	40 30 25	49 36 28		dB
Isolation, RF1 to RF3	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	37 27 20	42 31 24		dB
Isolation, RF1 to RF4	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	40 30 25	46 35 28		dB
Isolation, RF2 to RF1	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	37 25 19	40 29 23		dB
Isolation, RF2 to RF3	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	32 22 17	36 27 21		dB
Isolation, RF2 to RF4	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	40 30 24	45 34 28		dB

Isolation, RF3 to RF1	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	37 27 20	41 30 23		dB
Isolation, RF3 to RF2	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	37 27 21	41 31 25		dB
Isolation, RF3 to RF4	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	39 31 25	50 36 29		dB
Isolation, RF4 to RF1	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	30 22 17	34 26 21		dB
Isolation, RF4 to RF2	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	35 27 23	40 31 27		dB
Isolation, RF4 to RF3	698MHz to 960MHz 1710MHz to 1980MHz 2300MHz to 2690MHz	34 25 20	38 29 24		dB

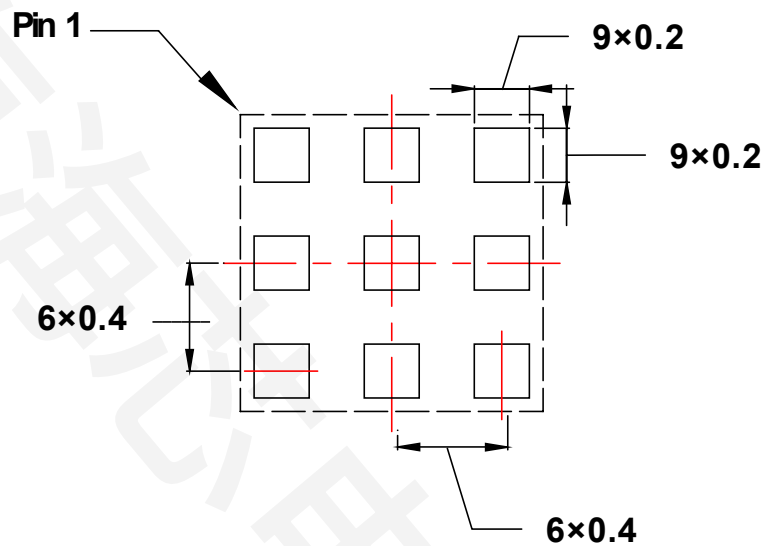
Parameter	Condition	Minimum	Typical	Maximum	Unit
Harmonics @ VSWR = 1 : 1	$f_0 = 787\text{MHz}$; PIN = 26dBm; CW $2f_0$ $3f_0$		-52 -50		dBm
Maximum Power (Pmax)	698MHz to 2690MHz		36		dBm
Switching On/OFF Time	From 50% VC to 90/10% of final RF ampitude		0.75		μs

Application Schematic

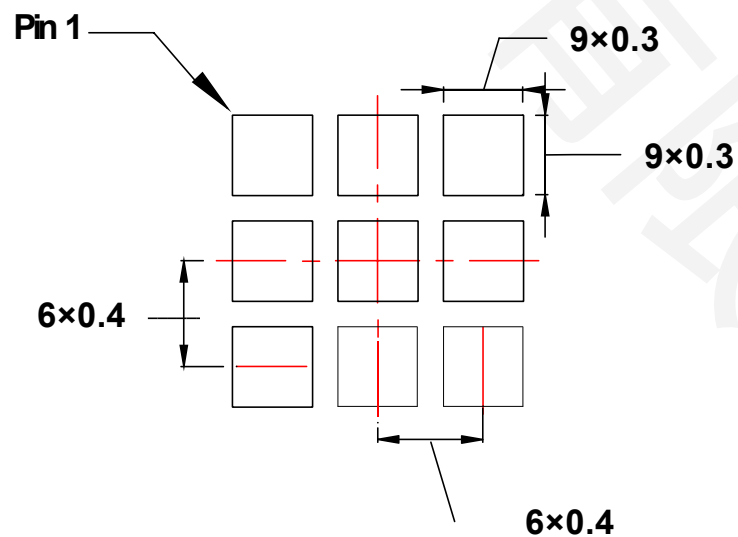


1. RF input and output are 50-Ohm microstrip.
2. Decoupling capacitors may be added for VDD & VC1/VC2 according to different applications.

PCB Layout Footprint

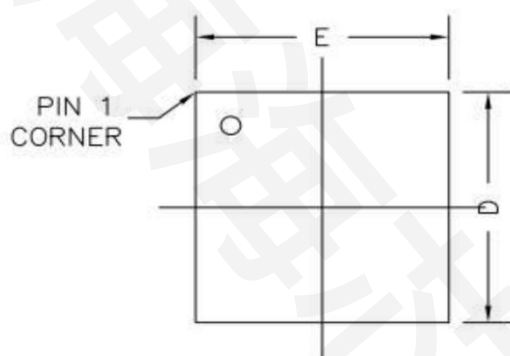


PCB Metal Top View

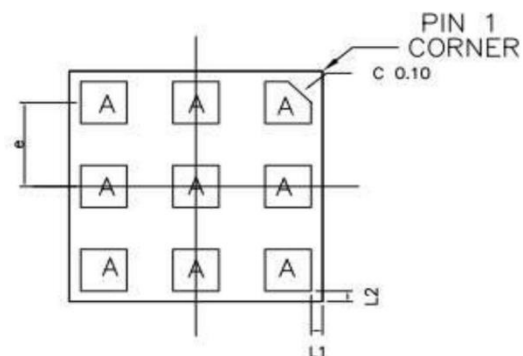


PCB Solder Mask Top View

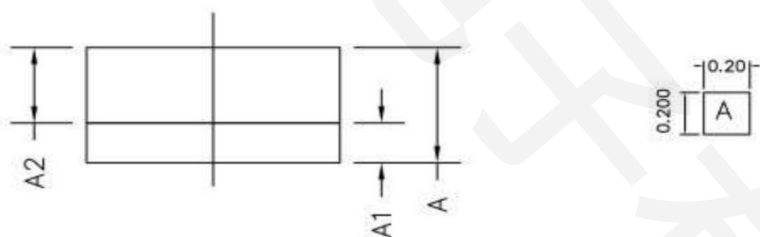
Package Dimensions



TOP VIEW



BOTTOM VIEW

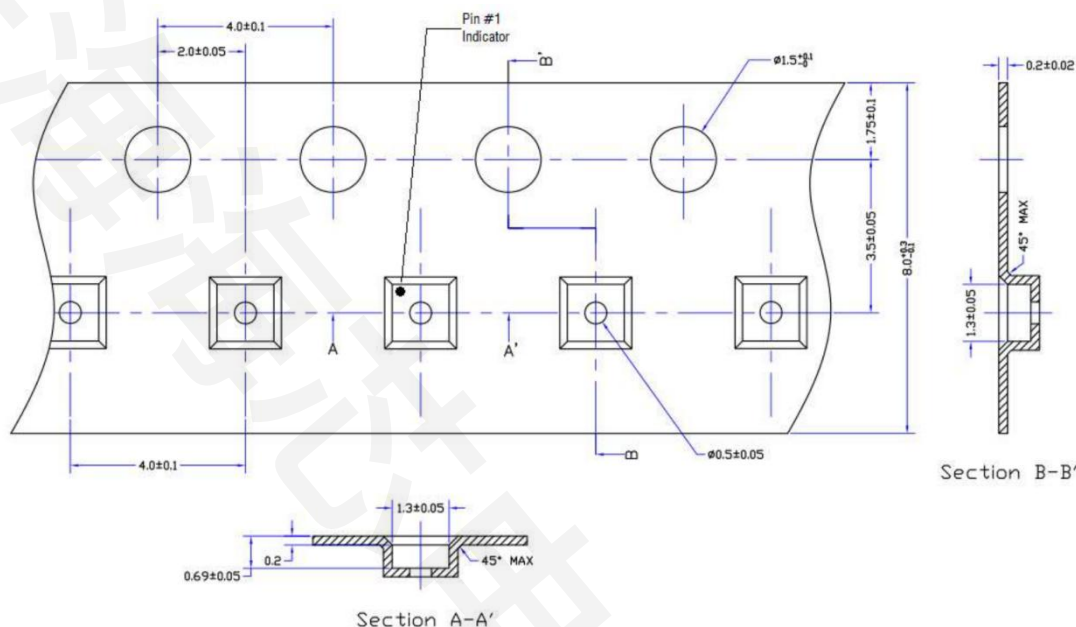


SIDE VIEW

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.16	0.19	0.22
A2	0.32	0.36	0.40
D	1.05	1.10	1.15
E	1.05	1.10	1.15
e	0.40		
L1	0.05		
L2	0.05		

Packaging Information



Package Type	Unit Size	Max Reel Diameter	Type Width	Pocket Pitch	Reel Capacity
Tape and Reel	1.1mm x 1.1mm x 0.55mm	7"	8mm	4mm	3000

Order Information

ORDER NUMBER	TEMPERATURE	PACKAGE DESCRIPTION	TYPE
HX13626-685-LGATR1	-40°C ~ 90°C	9-Pin, 1.1mm x 1.1mm x 0.55mm LGA Module Halogen Free	Tape & Reel, 3000 pcs per Reel