

HX19245-686-LGA 0.1-2.7GHzSP4THighPower**AntennaTuningSwitch****Description**

The HX19245-686-LGA is a single-pole four-throw (SP4T) switch designed for high-performance antenna tuning applications in the 100 MHz to 2.7 GHz frequency range. It features optimized RF performance with low on-resistance (R_{on}) and low output capacitance (C_{off}), meeting stringent 3G/LTE standards.

This device combines an SP4T switch and a GPIO controller on a single SOI chip, offering four symmetrical RF ports with consistent low R_{on} and C_{off} across all signal paths. Its excellent linearity makes it ideal for both 3G and LTE applications.

Housed in a compact package measuring just 1.5 mm x 1.1 mm with ten pins, the HX19245-686-LGA has a low profile of only 0.52 mm. It complies with RoHS regulations and is halogen-free.

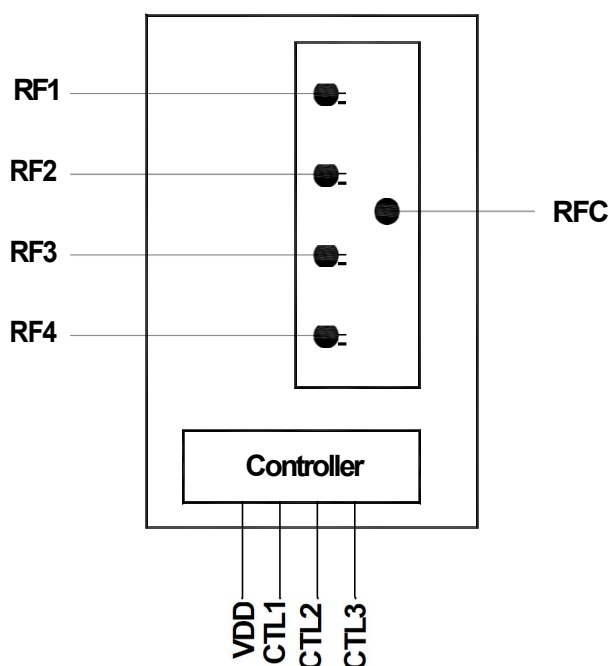
Additionally, the HX19245-686-LGA is rated at Moisture Sensitivity Level 3 (MSL3) at temperatures up to 260°C according to JEDEC J-STD-020 standards.

Features

- ★ Broadband support 0.1-2.7 GHz
- ★ Compatible with UMTS, TD-SCDMA, and LTE
- ★ Advanced SOI process
- ★ Low R_{on}/C_{off}
- ★ Excellent linearity(45 V/+43.1 dBm)
- ★ 4 symmetrical RF ports
- ★ GPIO interface
- ★ Ultra small LGA footprint,
1.5mm x 1.1mm x 0.52mm, 10- pin
- ★ ESD Class 1C
- ★ Green product

Application

- ★Antenna Tuning
- ★Band Switching
- ★Impedance Tuning

Block Diagram

Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage(V _{DD})	4.5	V
Digital Control Voltage(V _{CTL})	3.5	V
RF Input Power	43.1	dBm
Operating Temperature	-40 to 90	°C
Storage Temperature	-55 to 150	°C
ESD-Human Body Mode(HBM)	-2 to 2	kV



ESD Caution

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

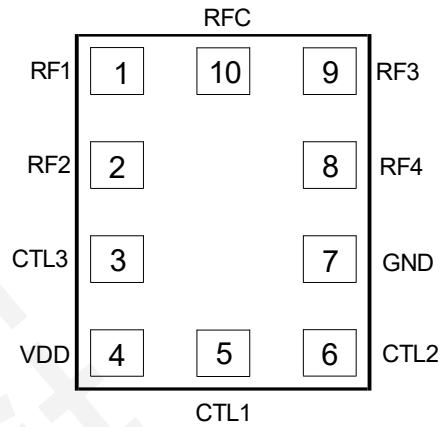
Recommended Operating Conditions

Parameter	Symbol	Condition	Minimum	Typical	Maximum	Unit
Supply Voltage	V _{DD}		1.8	2.8	4.5	V
Supply Current	I _{DD}			65	85	μA
Digital Control Signal High voltage Low voltage	V _{CTL_H} V _{CTL_L}		1.35 0	1.8	3.3 0.4	V
Control Current	I _{CTL}			2	10	μA

Logic Truth Table for Operation Modes

Active	CTL1	CTL2	CTL3
All on	0	0	1
RF1 and RF2 to RFC	0	1	1
RF3 and RF4 to RFC	1	0	1
RF1 to RFC	0	0	0
RF2 to RFC	0	1	0
RF3 to RFC	1	0	0
RF4 to RFC	1	1	0
All off	1	1	1

Pin-Out



Top View

Pin Definitions

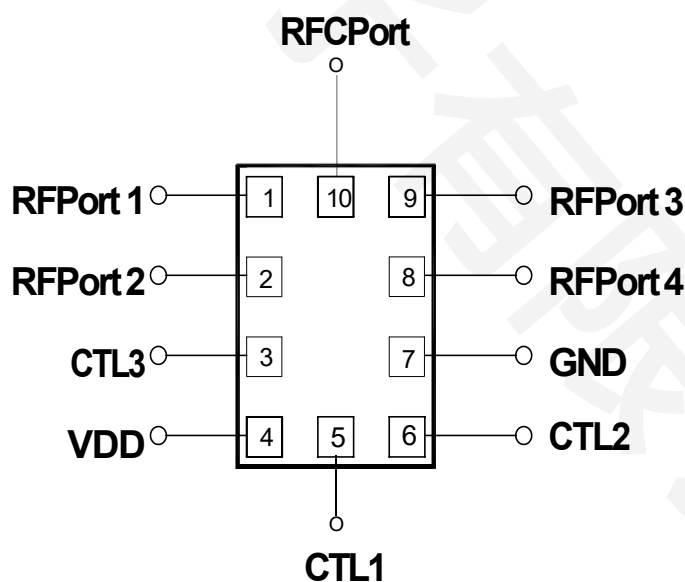
Pin	Name	Description
1	RF1	RF Port1
2	RF2	RF Port2
3	CTL3	Logic Control Signal 3
4	VDD	Supply Voltage
5	CTL1	Logic Control Signal 1
6	CTL2	Logic Control Signal 2
7	GND	Ground
8	RF4	RF Port4
9	RF3	RF Port3
10	RFC	RF Common Port

UMTS/TD-SCDMA/LTE RF Electrical Specifications

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

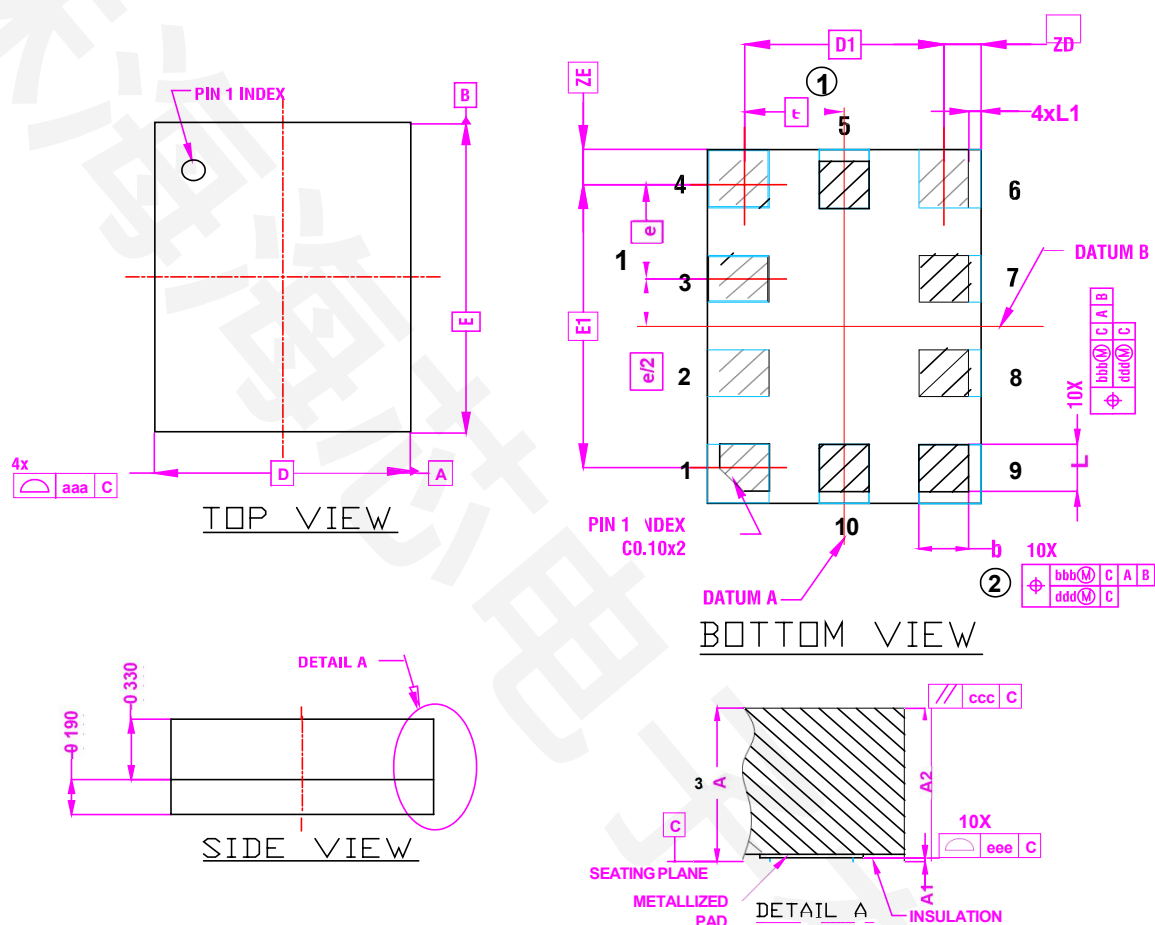
Parameter	Condition	Minimum	Typical	Maximum	Unit
Insertion Loss	0.1GHz to 1GHz		0.27	0.47	dB
	1GHz to 2.2GHz		0.72	1.02	
	2.2GHz to 2.7GHz		0.94	1.24	
On resistance	R_{on}		1.1	1.3	Ω
Off capacitance	C_{off}		140	170	fF
Ports isolation from any active path to other port:	0.1GHz to 1GHz	21	24		dB
	1GHz to 2.2GHz	14	17		
	2.2GHz to 2.7GHz	11	14		
P_0 1dB	0.1 to 2.7 GHz	41.5	43.1		dBm
Harmonics($2f_0$)	$f_0 = 824 - 915\text{MHz}$, $P_{IN} = 35\text{dBm}$		-73	-63	dBm
	$f_0 = 1710 - 2690\text{MHz}$, $P_{IN} = 33\text{dBm}$		-69	-62	
Harmonics($3f_0$)	$f_0 = 824 - 915\text{MHz}$, $P_{IN} = 35\text{dBm}$		-61	-55	
	$f_0 = 1710 - 2690\text{MHz}$, $P_{IN} = 33\text{dBm}$		-57	-53	
Switching Time	10% to 90% RF		4	8	μs

Application Schematic



1. RF input and output are 50-Ohm microstrip.
2. Decoupling capacitors may be added for VDD & CTL1/CTL2/CTL3 according to different applica-

Package Dimensions



DIMENSIONAL REFERENCES

unit:mm

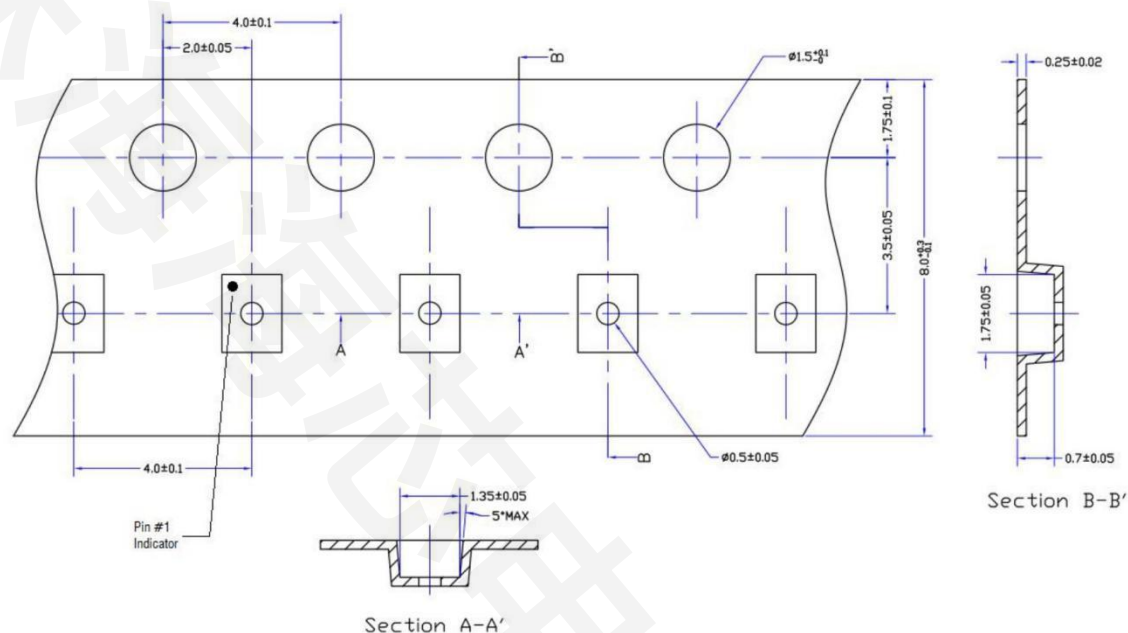
REF.	Min.	Nom.	Max.
A	0.44	0.52	0.60
A1	-	-	0.05
A2	-	-	0.52
b	0.15	0.20	0.25
L	0.15	0.20	0.25
D	1.05	1.10	1.15
E	1.45	1.50	1.55
D1	0.80 BSC		
E1	1.20 BSC		
ZD	0.15 BSC		
ZE	0.15 BSC		
e	0.40 BSC		
L1	0.00	0.05	0.10

DIMENSIONAL REFERENCES

unit:mm

REF.	TOLERANCE OF FORM AND POSITION
aaa	0.10
bbb	0.10
ccc	0.10
ddd	0.08
eee	0.08

Packaging Information



Package Type	Unit Size	Max Reel Diameter	Type Width	Pocket Pitch	Reel Capacity
Tape and Reel	1.5mm x 1.1mm x 0.52mm	7"	8mm	4mm	3000

Order Information

ORDER NUMBER	TEMPERATURE	PACKAGE DESCRIPTION	TYPE
HX19245-686-LGATR1	-40°C ~ 90°C	10-Pin, 1.5mm x 1.1mm x 0.52mm LGA Module Halogen Free	Tape & Reel, 3000 pcs per Reel