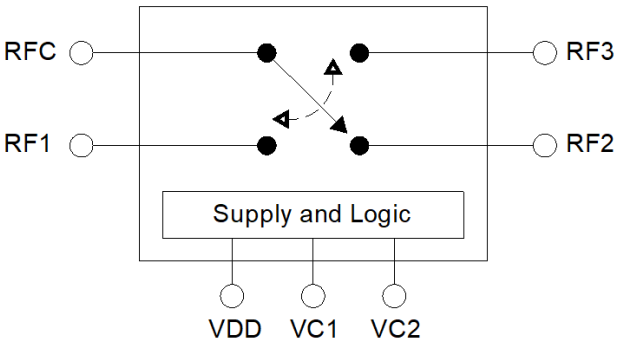
■Description

The HWS584 is a CMOS Silicon-On-Insulator (SOI), Single-Pole, Triple-Throw (SP3T) high power switch. The device is ideally suited for applications where high power, low insertion loss and small size are required, and can be used in many wireless digital communication systems like WLAN, IEEE 802.11 a/b/g/n/ac/ax and Bluetooth® for transmit/receive selection or antenna diversity function. The HWS584 SP3T switch operating frequency from 0.1 to 7.2 GHz in a low cost 1.5mm x 1.5mm x 0.44 mm USON-8L plastic lead (Pb) free package.

■Features

- **Frequency Range**：0.1 to 7.2 GHz
- **Insertion Loss**：0.45 dB @ 2.4 GHz
  0.90 dB @ 5.0 GHz
  0.90 dB @ 7.2 GHz
- **Isolation**：34.0 dB @ 2.4 GHz
  24.5 dB @ 5.0 GHz
  22.0 dB @ 7.2 GHz
- **IP1dB**：32.0 dBm @ 2.4 GHz
  32.0 dBm @ 5.0 GHz
  32.0 dBm @ 7.2 GHz
- **Miniature USON6L (1.5x1.5x0.44 mm)**
  Using Lead (Pb) free materials with RoHS compliant
- **HBM ESD Classification Level**：TBD
- **CDM ESD Classification Level**：TBD
- **Moisture Sensitivity Level**：TBD

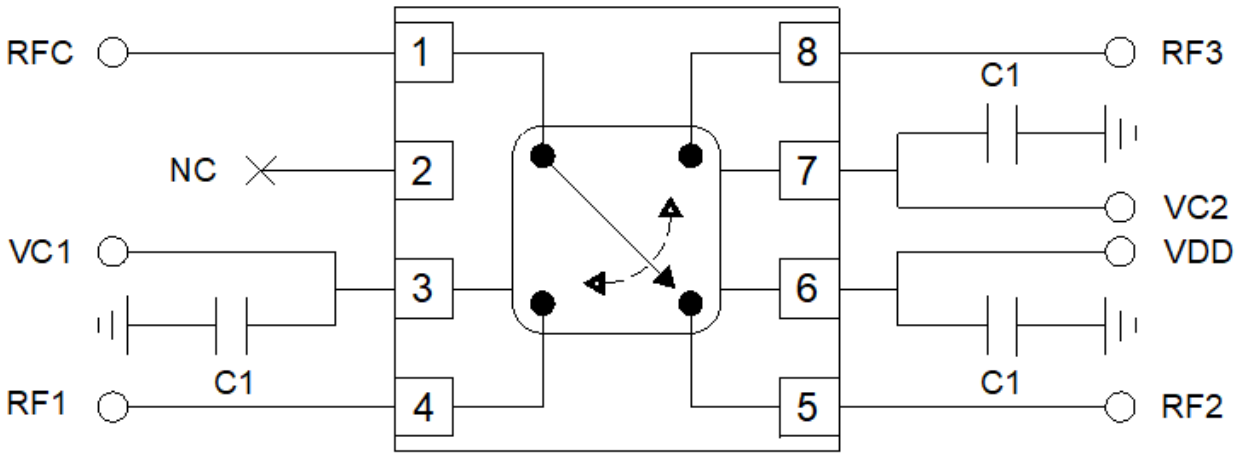
■Functional Block Diagram



■Applications

- **IEEE 802.11 a/b/g/n/ac/ax WLAN**
- **Bluetooth®**
- **Sub-1G**
- **UWB**

■Application Circuit



■Pin Assignments

Pin No.	Name	Description
1	RFC	RF Signal Port
2	NC	
3	VC1	DC Logic Control Voltage
4	RF1	RF Signal Port
5	RF2	RF Signal Port
6	V_{DD}	Supply Voltage
7	VC2	DC Logic Control Voltage
8	RF3	RF Signal Port

■Evaluation Board Bill of Material

Component	Value	Description	Supplier	Part Number
IC		HWS584	Hexawave	
C1	100pF	By-pass Capacitor	Murata	GRM1555C1H101JA01D

Note :

1. The internal DC voltage at each RF port is zero voltage, and if an external DC voltage will be coupled to RF port, then DC blocking capacitor is required.
2. Information in the above application is for reference only, and does not guarantee the mass production design of the device.

■Absolute Maximum Ratings

Parameter	Symbol	Maximum	Units
Supply Voltage	V_{DD}	4.2	V
Control Voltage	VC	4.2	V
RF Input Power	Pin	+32	dBm
Operating Temperature	T_{op}	-40 to +85	℃
Storage Temperature	T_{STG}	-65 to +150	℃
HBM ESD Classification Level		TBD	
CDM ESD Classification Level		TBD	

Note： If the satisfied of any one or more of the above conditions will lead to equipment damage.

■Recommended Operating Ranges

Parameter	Symbol	Min	Typ	Max	Unit
Operation Frequency	Freq.	0.1		7.2	GHz
Supply Voltage	V_{DD}	1.6	3.3	3.6	V
Control Voltage (Low)	VC_L	0	0	0	V
Control Voltage (High)	VC_H	1.6	3.3	V_{DD}	V

Note：Recommended Operating Ranges indicate conditions for which the device is intended to be functional, but does not guarantee specific performance limits.

■Logic Truth Table of Switch (ON-Path)

VC1 (Pin3)	VC2 (Pin7)	Insertion Loss Path
L	L	RFC to RF1
H	L	RFC to RF2
H	H	RFC to RF3

Note：

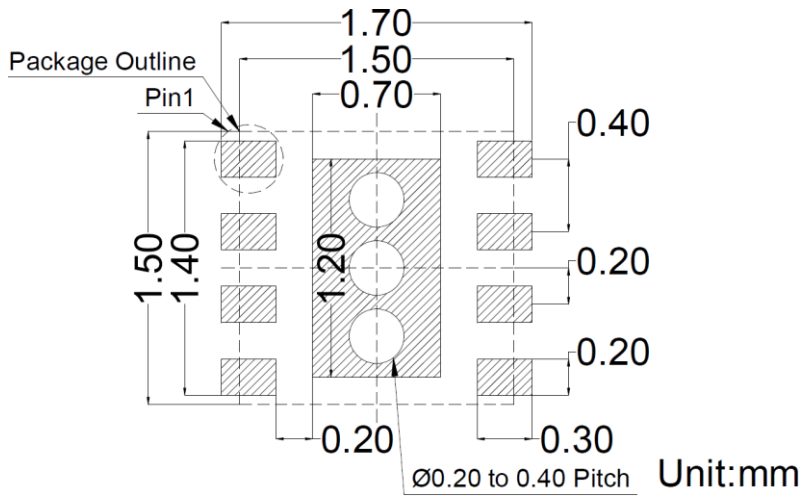
1. *"H" = VC_H, "L" = VC_L.*
2. *Any modes other than those listed above are not supported.*

■Electrical Specifications

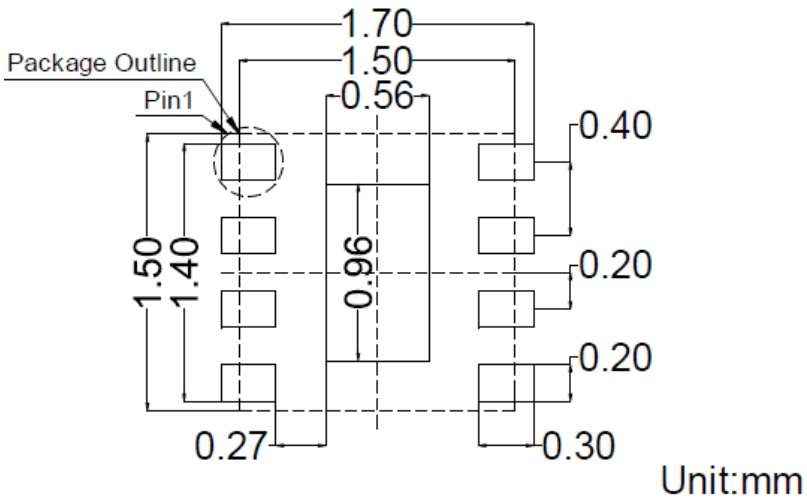
Temperature = 25℃, Impedance 50Ω with VC = 0/3.3V, Pin = 0dBm, unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Insertion Loss	IL	2.4 – 2.5 GHz		0.45		dB
		4.9 – 6.0 GHz		0.90		dB
		6.0 – 7.2 GHz		0.90		dB
Isolation (RF1, RF2, RF3 to RFC)	ISO-1	2.4 – 2.5 GHz		34.0		dB
		4.9 – 6.0 GHz		24.5		dB
		6.0 – 7.2 GHz		22.0		dB
Isolation (RF1 to RF2, 3) (RF2 to RF1, 3) (RF3 to RF1, 2)	ISO-2	2.4 – 2.5 GHz		31.0		dB
		4.9 – 6.0 GHz		26.5		dB
		6.0 – 7.2 GHz		21.0		dB
Return Loss	RL	2.4 – 2.5 GHz		20.5		dB
		4.9 – 6.0 GHz		13.0		dB
		6.0 – 7.2 GHz		13.5		dB
Input Power for 0.1 dB Compression	P0.1dB	@ 2.4 GHz @ 5.0 GHz @ 7.2 GHz		32		dBm
2nd Harmonic	2fo	f = 2.5GHz @20 dBm		-68.5		dBm
3rd Harmonic	3fo			-62.0		dBm
Switching on/off Time	Ts	50% VC to 90/10% RF		77.6		ns
Supply Current	Idd	V_{DD} = 3.3V, VC = 0/3.3V (No RF Signal)		15	20	uA
Control Current	I_{ctrl}	V_{DD} = 3.3V, VC = 3.3V (No RF Signal)		1	10	uA

■Recommended Footprint Patterns

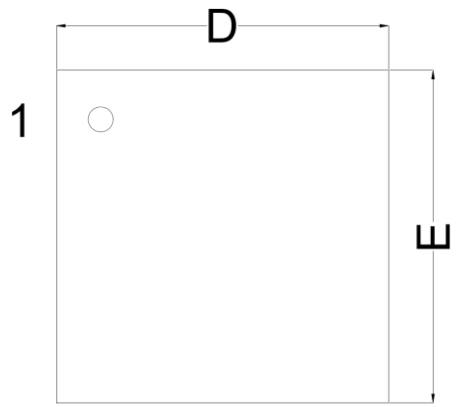


Metallization Top View

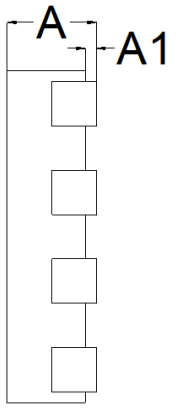


Stencil Aperture Top View

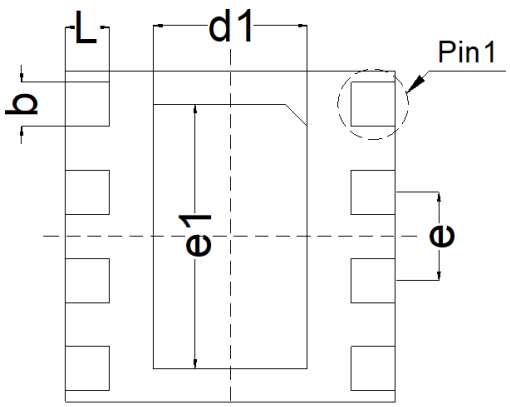
■Package Dimensions



Top View



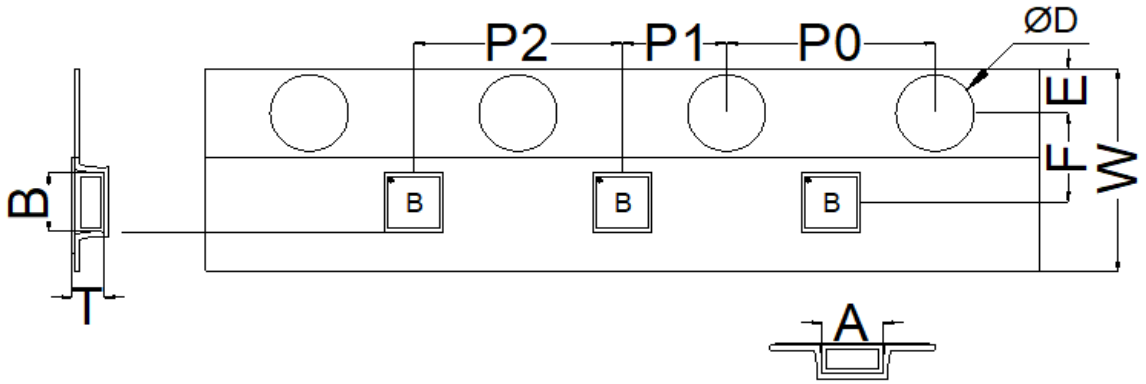
Side View



Bottom View

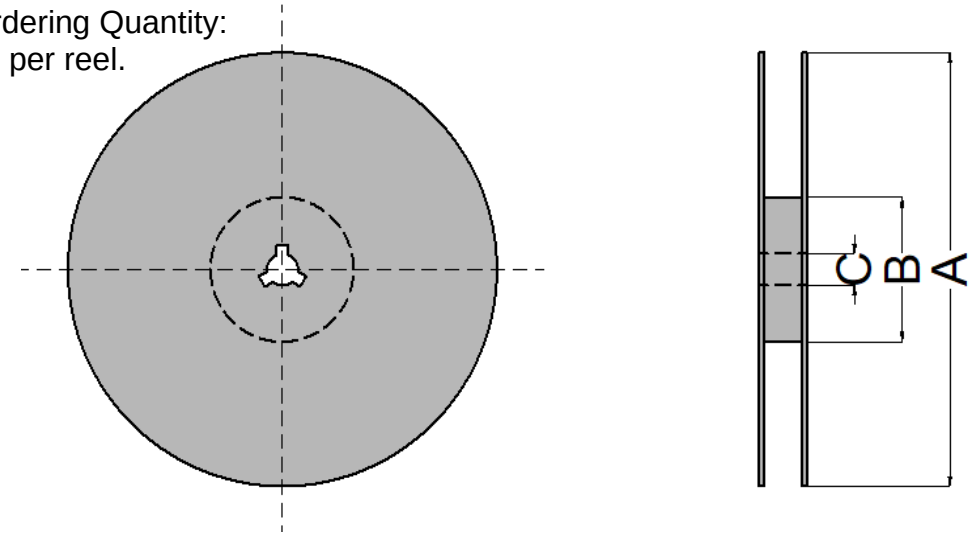
Symbol	Min	Max	Unit
A	0.390	0.490	mm
A1	0.000	0.050	
b	0.150	0.250	
D	1.400	1.600	
d1	0.650 REF		
E	1.400	1.600	
e	0.400 TYP.		
e1	1.200 REF		
L	0.150	0.250	

■Tape and Reel Dimensions



Symbol	Min	Max	Unit
A	1.65	1.75	mm
B	1.65	1.75	
ØD	1.50	1.60	
E	1.65	1.85	
F	3.45	3.55	
P0	3.90	4.10	
P1	1.95	2.05	
P2	3.90	4.10	
T	0.55	0.65	
W	7.70	8.30	

Minimum Ordering Quantity:
5000 pieces per reel.



Symbol	Min	Max	Unit
A	Ø177	Ø179	mm
B	Ø53.5	Ø54.5	
C	Ø13.0	Ø13.5	