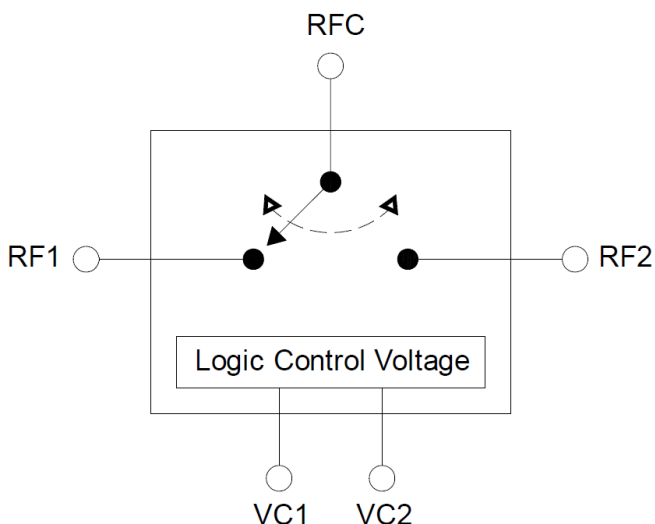


Description

The HWS561 is a Gallium Arsenide (GaAs), Single-Pole, Double-Throw (SPDT) switch. The HWS561 features low insertion loss with very low DC power consumption. The device 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 HWS561 SPDT switch operating frequency from 2.0 to 8.1 GHz in a low cost 1.5mm x 1.5mm x 0.4mm USON-6L plastic lead (Pb) free package.

Function Block Diagram



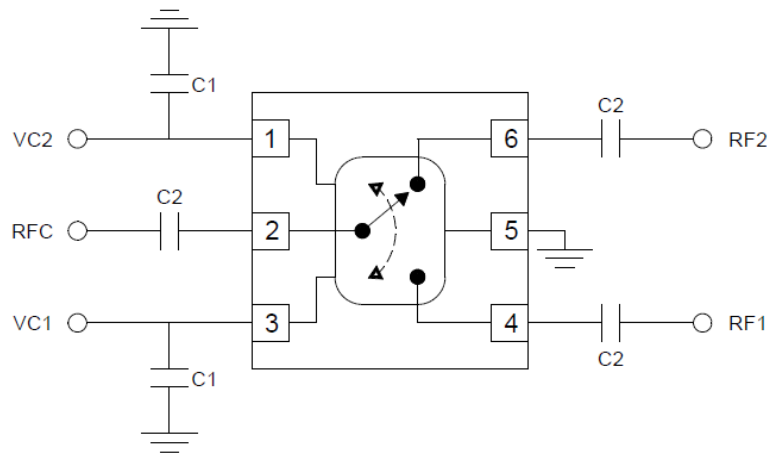
Features

- **Frequency Range** : 2.0 to 8.1GHz
- **Low Insertion Loss** : 0.58 dB @ 2.45 GHz
0.79 dB @ 3.8 GHz
0.81 dB @ 5.8 GHz
0.84 dB @ 7.125 GHz
- **High Isolation** : 27 dB @ 2.45 GHz
27 dB @ 3.8 GHz
26 dB @ 5.8 GHz
25 dB @ 7.125 GHz
- **High IP1dB** : +38dBm
- **Low DC Power Consumption**
- **Miniature USON6L (1.5x1.5x0.4 mm)**
Using Lead (Pb) free materials with RoHS compliant
- **PHEMT Process**

Applications

- **IEEE 802.11 a/b/g/n/ac/ax WLAN**
- **Bluetooth®**

Application Circuit



Pin Assignments

Pin No.	Name	Description
1	VC2	DC Logic Control Voltage and supply Voltage
2	RFC	RF Signal Port
3	VC1	DC Logic Control Voltage and supply Voltage
4	RF1	RF Signal Port
5	GND	Ground
6	RF2	RF Signal Port

Evaluation Board Bill of Material

Component	Value	Description	Supplier	Part Number
IC		HWS561	Hexawave	
C1	100pF	By-pass Capacitor	Walsin	0402N101J500LT
C2	10pF	DC blocking Capacitor	Walsin	0402N100J500LT

Note :

1. C2 = 47pF for operation frequency of 2.0 ~ 3.0 GHz is required on all RF ports.
2. C2 = 10pF for operation frequency of 3.0 ~ 8.1 GHz is required on all RF ports.
3. A larger DC blocking capacitor is recommended for lower frequency operation.
4. For good RF performance, DC blocking capacitors have to be placed at IC RF ports, bypass capacitors should be placed close to terminal of DC to reduce strip line influence of RF characteristics.

Absolute Maximum Ratings

<i>Parameter</i>	<i>Symbol</i>	<i>Maximum</i>	<i>Units</i>
Control Voltage	VC	6	V
RF Input Power	Pin	+38	dBm
Operating Temperature	T _{op}	-40 to +85	°C
Storage Temperature	T _{STG}	-65 to +150	°C

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

Recommended Operating Ranges

<i>Parameter</i>	<i>Symbol</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
Operation Frequency	Freq.	2.0		8.1	GHz
Control Voltage (Low)	VC_L	0	0	0.2	V
Control Voltage (High)	VC_H	1.8	3.3	5	V

Logic Truth Table of Switch (ON-Path)

<i>VC1 (Pin3)</i>	<i>VC2 (Pin1)</i>	<i>Insertion Loss Path</i>
H	L	RFC to RF1
L	H	RFC to RF2

Note : "H" = VC_H, "L" = VC_L.

Electrical Specifications

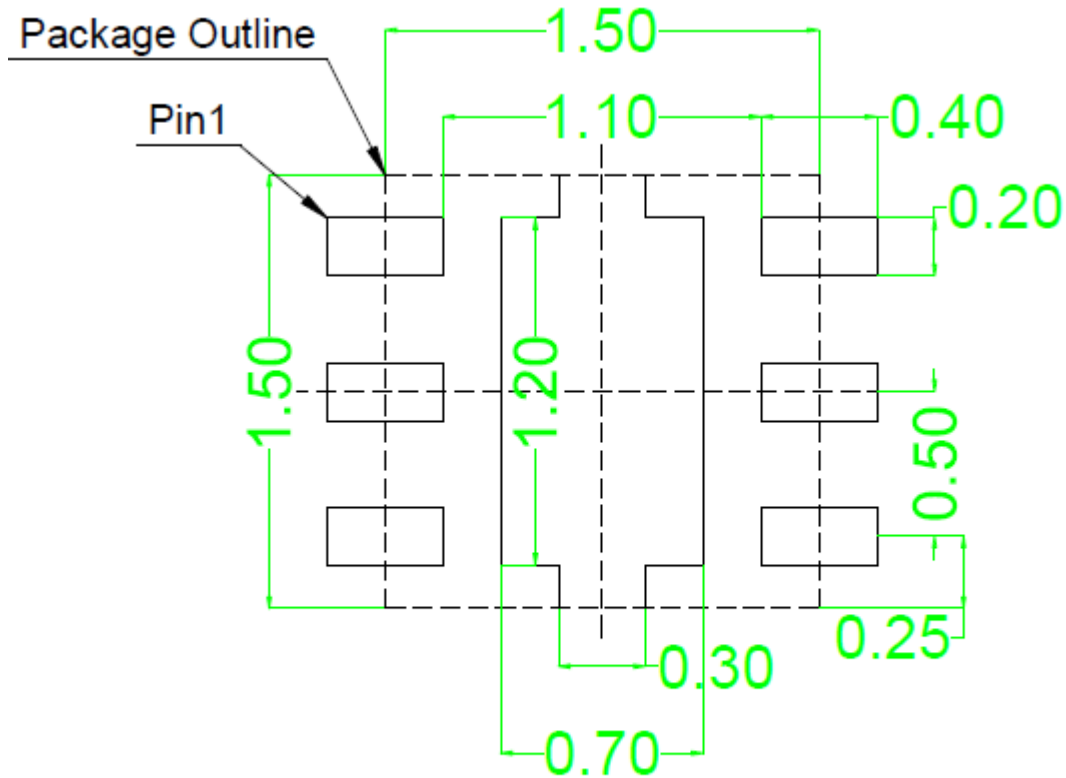
Temperature = 25°C, Impedance 50Ω with VC = 0/3.3V, Pin = 0dBm, unless otherwise noted

<i>Parameter</i>	<i>Symbol</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
Insertion Loss	IL	2.4 – 2.5 GHz		0.58		dB
		3.6 – 3.8 GHz		0.79		dB
		4.9 – 6.0 GHz		0.81		dB
		6.0 – 7.125 GHz		0.84		dB
		7.2 – 8.1 GHz		0.89		dB
Isolation (RF1, RF2 to RFC)	ISO-1	2.4 – 2.5 GHz		27		dB
		3.6 – 3.8 GHz		28		dB
		4.9 – 6.0 GHz		33		dB
		6.0 – 7.125 GHz		43		dB
		7.2 – 8.1 GHz		35		dB
Isolation (RF1 to RF2)	ISO-2	2.4 – 2.5 GHz		27		dB
		3.6 – 3.8 GHz		27		dB
		4.9 – 6.0 GHz		26		dB
		6.0 – 7.125 GHz		25		dB
		7.2 – 8.1 GHz		23		dB
Return Loss	RL	2.4 – 2.5 GHz		21		dB
		3.6 – 3.8 GHz		15		dB
		4.9 – 6.0 GHz		18		dB
		6.0 – 7.125 GHz		22		dB
		7.2 – 8.1 GHz		25		dB
Input Power for 0.1 dB Compression	IP0.1dB	@ 2.45 GHz @ 7.125 GHz		36 36		dBm
Input Power for One dB Compression	IP1dB	@ 2.45 GHz @ 7.125 GHz		38 38		dBm
2nd Harmonic	2fo	Pin = 20 dBm @ 2.45G		-75		dBc
3rd Harmonic	3fo	Pin = 20 dBm @ 2.45G		-75		dBc
Control Current	I _{ctrl}	VC = 3.3V		10		uA

Temperature = 25°C, Impedance 50Ω with VC = 0/1.8V, Pin = 0dBm, unless otherwise noted

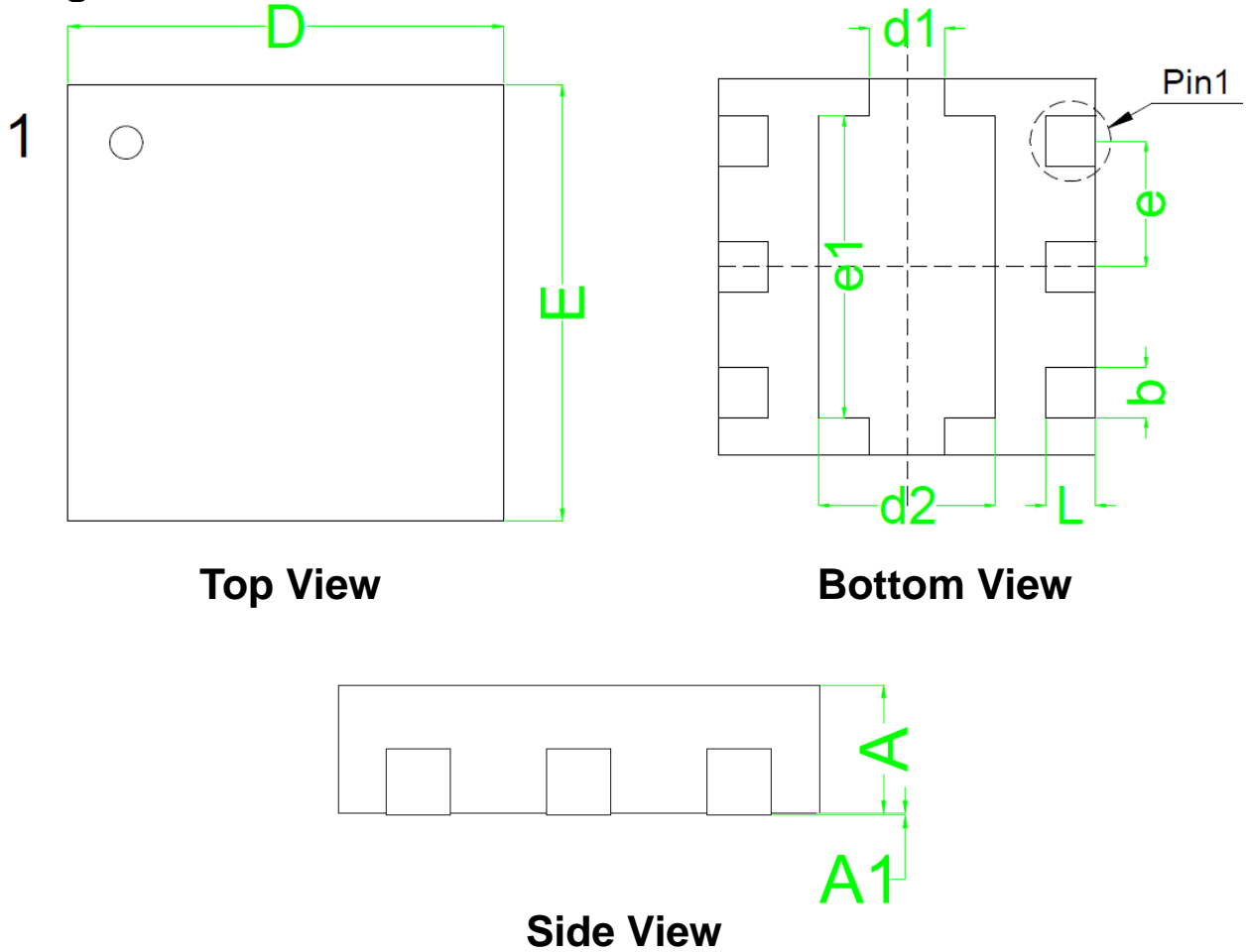
<i>Parameter</i>	<i>Symbol</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
Insertion Loss	IL	2.4 – 2.5 GHz		0.68		dB
		3.6 – 3.8 GHz		0.86		dB
		4.9 – 6.0 GHz		0.88		dB
		6.0 – 7.125 GHz		0.92		dB
		7.2 – 8.1 GHz		0.97		dB
Isolation (RF1, RF2 to RFC)	ISO-1	2.4 – 2.5 GHz		25		dB
		3.6 – 3.8 GHz		27		dB
		4.9 – 6.0 GHz		32		dB
		6.0 – 7.125 GHz		40		dB
		7.2 – 8.1 GHz		36		dB
Isolation (RF1 to RF2)	ISO-2	2.4 – 2.5 GHz		26		dB
		3.6 – 3.8 GHz		27		dB
		4.9 – 6.0 GHz		26		dB
		6.0 – 7.125 GHz		25		dB
		7.2 – 8.1 GHz		23		dB
Return Loss	RL	2.4 – 2.5 GHz		21		dB
		3.6 – 3.8 GHz		15		dB
		4.9 – 6.0 GHz		18		dB
		6.0 – 7.125 GHz		21		dB
		7.2 – 8.1 GHz		25		dB
Input Power for 0.1 dB Compression	IP0.1dB	@ 2.45 GHz @ 7.125 GHz		23 23		dBm
Input Power for One dB Compression	IP1dB	@ 2.45 GHz @ 7.125 GHz		26 25		dBm
Control Current	I _{ctrl}	VC = 1.8V		10		uA

Recommended Footprint Patterns



Unit:mm

Package Dimensions



Symbol	Min	Max	Unit
A	0.350	0.400	mm
A1	0.000	0.050	
b	0.150	0.250	
D	1.450	1.550	
d1	0.300 REF		
d2	0.700 REF		
E	1.450	1.550	
e	0.500 TYP.		
e1	1.200 REF		
L	0.150	0.250	

Contact Information

HEXAWAVE Inc.

1F, 2 Prosperity Road II, Science Park, Hsinchu, Taiwan. (R.O.C.)

Tel : 886-3-578-5100 Fax : 886-3-577-0512

www.hexawave.com