

0.1-5.925GHz SPDT Switch

Features

- Broadband frequency range: 0.1 to 5.925GHz
- Large supply voltage range: 1.65V to 3.6V
- Low insertion loss: 0.42dB@2.4GHz
- High isolation: 36dB@2.4GHz
- Integrated logic
- High switching speed: 130ns typical
- Small SOT363-6L Package

Applications

- IEEE 802.11a/b/g/n/ac/ax/be WLAN Networks
- ISM band radios
- WLAN repeaters
- Low power transmit receive systems
- Smartphones

General Description

The AW13102HSTR is a single-pole dual-throw switch with power handling capability of up to 32dBm and low insertion loss. It can be used to support WLAN, Low power T/R applications.

The symmetrical design of internal ports makes it convenient for PCB routing and adjustment of receiving and transmitting signals. The band/mode switching is realized by the GPIO pins as referenced in the chip block diagram and the control logic.

Typical Application Circuit

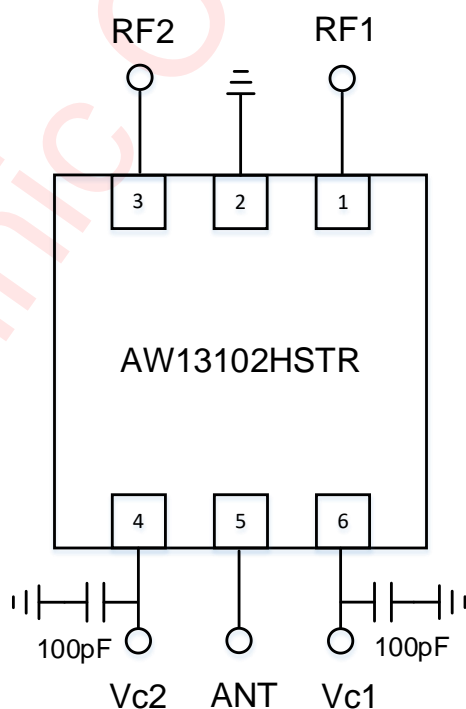


Figure 1 Typical Application Circuit of AW13102HSTR

Pin Configuration And Top Mark

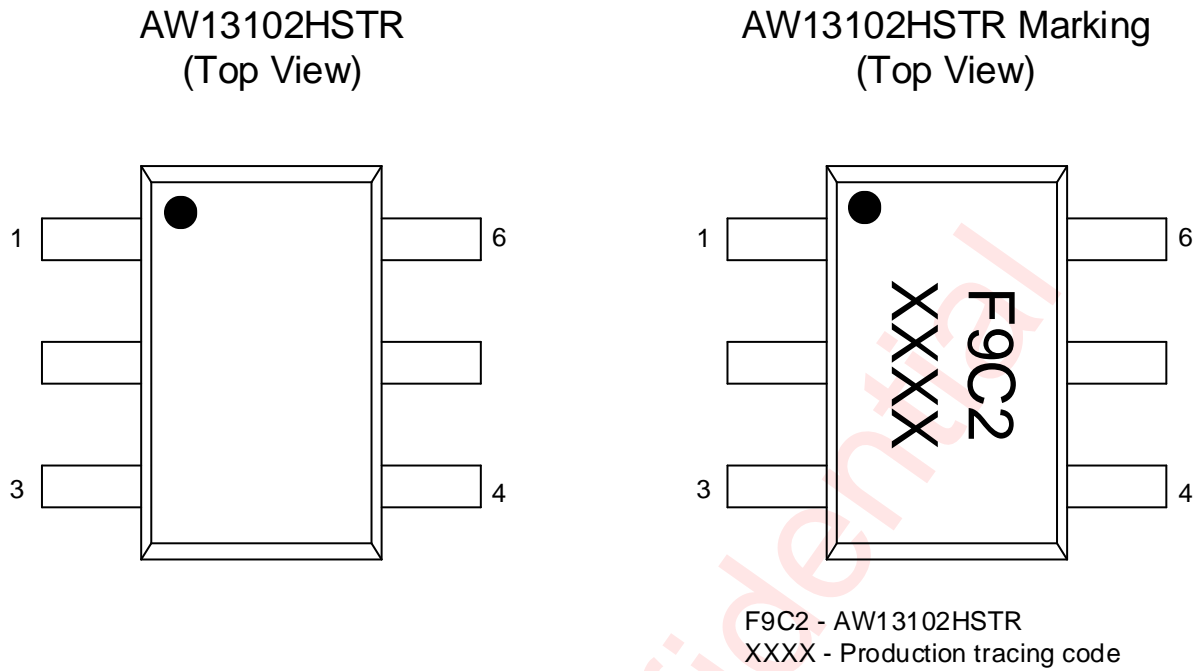


Figure 2 Pin Configuration and Top Mark

Pin Definition

No.	NAME	DESCRIPTION
1	RF1	RF port 1
2	GND	Ground
3	RF2	RF port 2
4	Vc2	Logic control 2
5	ANT	Common Port
6	Vc1	Logic control 1

Table1

Functional Block Diagram

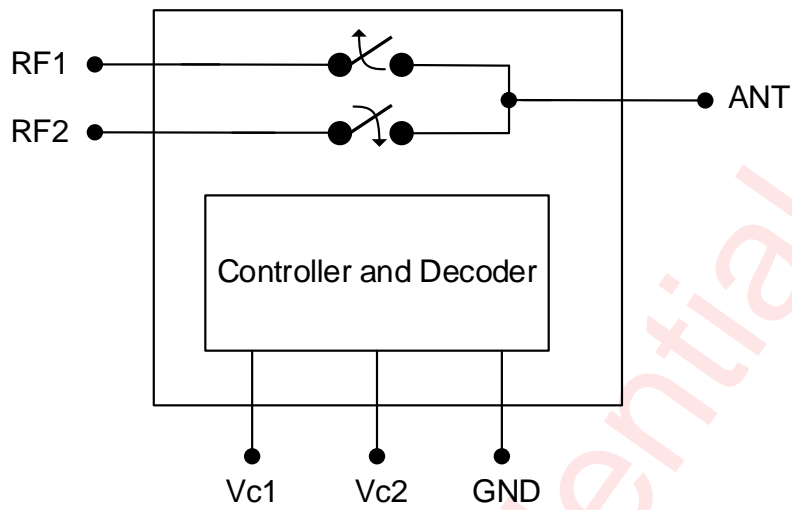


Figure 3 Functional Block Diagram

Ordering Information

Part Number	Temperature	Package	Marking	Moisture Sensitivity Level	Environmental Information	Delivery Form
AW13102HSTR	-40°C~105°C	SOT363-6L	F9C2	MSL3	ROHS+HF	3000 units/ Tape and Reel

Absolute Maximum Ratings(NOTE1)

PARAMETERS		RANGE	
Control Voltage Range	VCTL	-0.3V to 5V	
RF input power(RF1/RF2)		VCTL=1.8V	31.5 dBm
		VCTL=3.3V	32.5 dBm
Operating Free-air Temperature Range		-40°C to 105°C	
Storage Temperature T _{STG}		-65°C to 150°C	
Lead Temperature (Soldering 10 Seconds)		260°C	
ESD (NOTE 2)			
HBM		±1000V	
CDM		±500V	

NOTE1: Conditions out of those ranges listed in "absolute maximum ratings" may cause permanent damages to the device. In spite of the limits above, functional operation conditions of the device should within the ranges listed in "recommended operating conditions". Exposure to absolute-maximum-rated conditions for prolonged periods may affect device reliability.

NOTE2: The human body model is a 100pF capacitor discharged through a 1.5kΩ resistor into each pin.

HBM Test method: ESDA/JEDEC JS-001-2024. CDM Test method: ESDA/JEDEC JS-002-2025.

Electrical Characteristics

DC Characteristics

PARAMETER		TEST CONDITION	MIN	TYP	MAX	UNIT
VCTL	Supply Voltage		1.65		3.6	V
ICTL	Supply Current	VCTL= 1.8V		20	40	μ A
		VCTL= 3.3V		45	90	μ A
VCTL_H	Control logic High		1.65		VCTL	V
VCTL_L	Control logic Low		0		0.45	V

Vc1=2.8~3.6V/0V, Vc2=0/2.8~3.6V, PIN=0dBm, TEMP=+25°C, Z₀=50Ω. (unless otherwise noted)

PARAMETER		TEST CONDITION	MIN	TYP	MAX	UNIT
T _{sw}	Switching On/Off Time	50% of final control voltage to 10%/90% of final RF power, switching between RF1/2		130	300	ns
IL	Insertion loss (ANT to RF1/RF2)	0.1-0.96GHz		0.30	0.42	dB
		0.96-2.2GHz		0.41	0.54	dB
		2.3-2.7GHz		0.42	0.56	dB
		3.3-3.8GHz		0.46	0.63	dB
		3.8-4.2GHz		0.51	0.75	dB
		4.4-5GHz		0.63	0.90	dB
		5.15-5.925GHz		0.75	1.20	dB
ISO	Isolation (ANT to RF1/RF2)	0.1-0.96GHz	38	44		dB
		0.96-2.2GHz	31	36		dB
		2.3-2.7GHz	31	36		dB
		3.3-3.8GHz	30	35		dB
		3.8-4.2GHz	26	31		dB
		4.4-5GHz	18	23		dB
		5.15-5.925GHz	14	19		dB
RL ^[1]	Input return loss (ANT to RF1/RF2)	0.1-0.96GHz	20	27		dB
		0.96-2.2GHz	18	25		dB
		2.3-2.7GHz	17	24		dB
		3.3-3.8GHz	15	22		dB
		3.8-4.2GHz	14	21		dB
		4.4-5GHz	13	19		dB
		5.15-5.925GHz	12	18		dB
2f ₀ ^[1]	Second harmonics (ANT to RF1/RF2)	PIN=+24dBm, 2400MHz		-72	-62	dBm
3f ₀ ^[1]	Third harmonics (ANT to RF1/RF2)	PIN=+24dBm, 2400MHz		-71	-61	dBm
2f ₀ ^[1]	Second harmonics (ANT to RF1/RF2)	PIN=+24dBm, 5800MHz		-64	-54	dBm
3f ₀ ^[1]	Third harmonics (ANT to RF1/RF2)	PIN=+24dBm, 5800MHz		-66	-56	dBm
P _{0.1dB} ^[1]	0.1dB Compression Point (ANT to RF1/RF2)	0.1GHz~5.925GHz 25% DC		32		dBm

[1] Minimum and/or maximum limit is guaranteed by design and by statistical analysis of device characterization data. The specification is not guaranteed by production testing.

Vc1=1.8V/0V, Vc2=0/1.8V, PIN=0dBm, TEMP=+25°C, Z₀=50Ω. (unless otherwise noted)

PARAMETER		TEST CONDITION	MIN	TYP	MAX	UNIT
T _{sw} ^[1]	Switching On/Off Time	50% of final control voltage to 10%/90% of final RF power, switching between RF1/2		150	300	ns
IL ^[1]	Insertion loss (ANT to RF1/RF2)	0.1-0.96GHz		0.39	0.58	dB
		0.96-2.2GHz		0.51	0.63	dB
		2.3-2.7GHz		0.52	0.63	dB
		3.3-3.8GHz		0.56	0.81	dB
		3.8-4.2GHz		0.62	0.88	dB
		4.4-5GHz		0.73	1.10	dB
		5.15-5.925GHz		0.85	1.30	dB
ISO ^[1]	Isolation (ANT to RF1/RF2)	0.1-0.96GHz	38	44		dB
		0.96-2.2GHz	31	36		dB
		2.3-2.7GHz	31	36		dB
		3.3-3.8GHz	28	33		dB
		3.8-4.2GHz	25	30		dB
		4.4-5GHz	18	23		dB
		5.15-5.925GHz	14	19		dB
RL ^[1]	Input return loss (ANT to RF1/RF2)	0.1-0.96GHz	18	26		dB
		0.96-2.2GHz	17	24		dB
		2.3-2.7GHz	16	23		dB
		3.3-3.8GHz	15	21		dB
		3.8-4.2GHz	14	20		dB
		4.4-5GHz	13	19		dB
		5.15-5.925GHz	12	18		dB
2f ₀ ^[1]	Second harmonics (ANT pin to RF1/RF2)	PIN=+24dBm, 2400MHz		-61	-51	dBm
3f ₀ ^[1]	Third harmonics (ANT pin to RF1/RF2)	PIN=+24dBm, 2400MHz		-58	-48	dBm
2f ₀ ^[1]	Second harmonics (ANT pin to RF1/RF2)	PIN=+24dBm, 5800MHz		-61	-51	dBm
3f ₀ ^[1]	Third harmonics (ANT pin to RF1/RF2)	PIN=+24dBm, 5800MHz		-60	-50	dBm
P _{0.1dB} ^[1]	0.1dB Compression Point (ANT pin to RF1/RF2)	0.1GHz–5.925GHz 25% DC		30		dBm

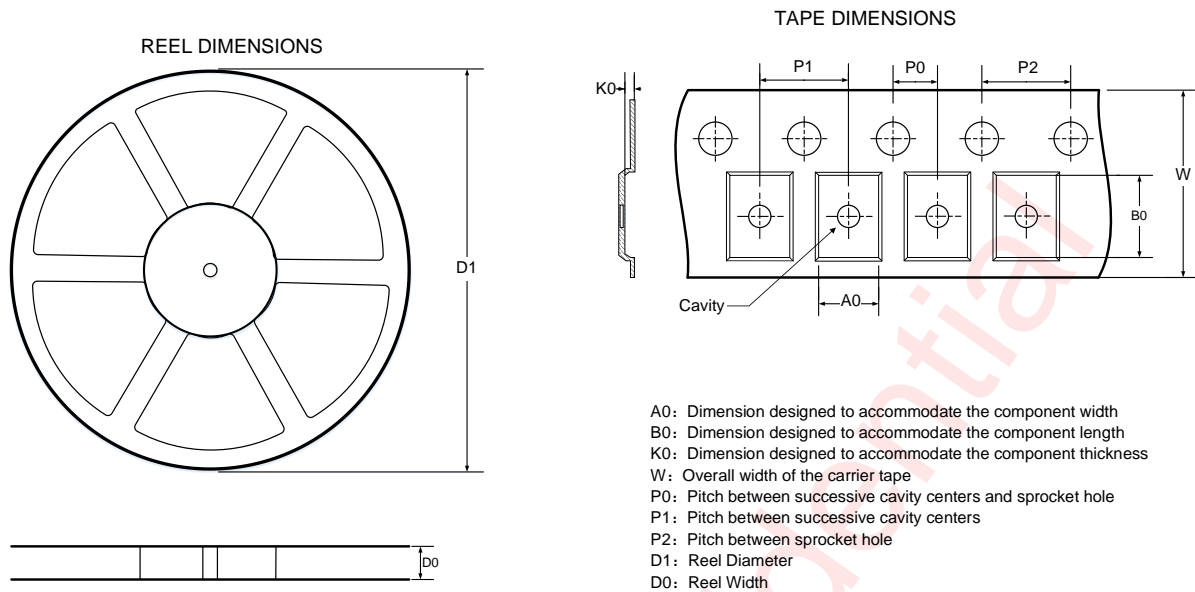
[1] Minimum and/or maximum limit is guaranteed by design and by statistical analysis of device characterization data. The specification is not guaranteed by production testing.

Control Logic

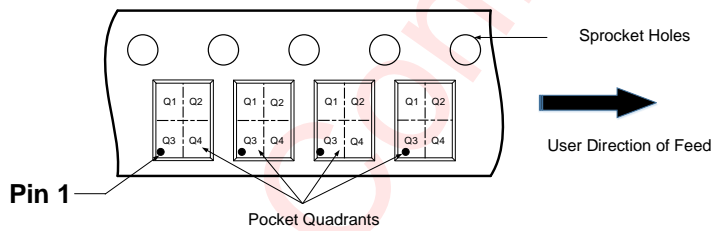
Vc1	Vc2	ANT-RF1	ANT-RF2
1	0	Isolation	Insertion loss
0	1	Insertion loss	Isolation

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Tape and Reel Information



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Note: The above picture is for reference only. Please refer to the value in the table below for the actual size

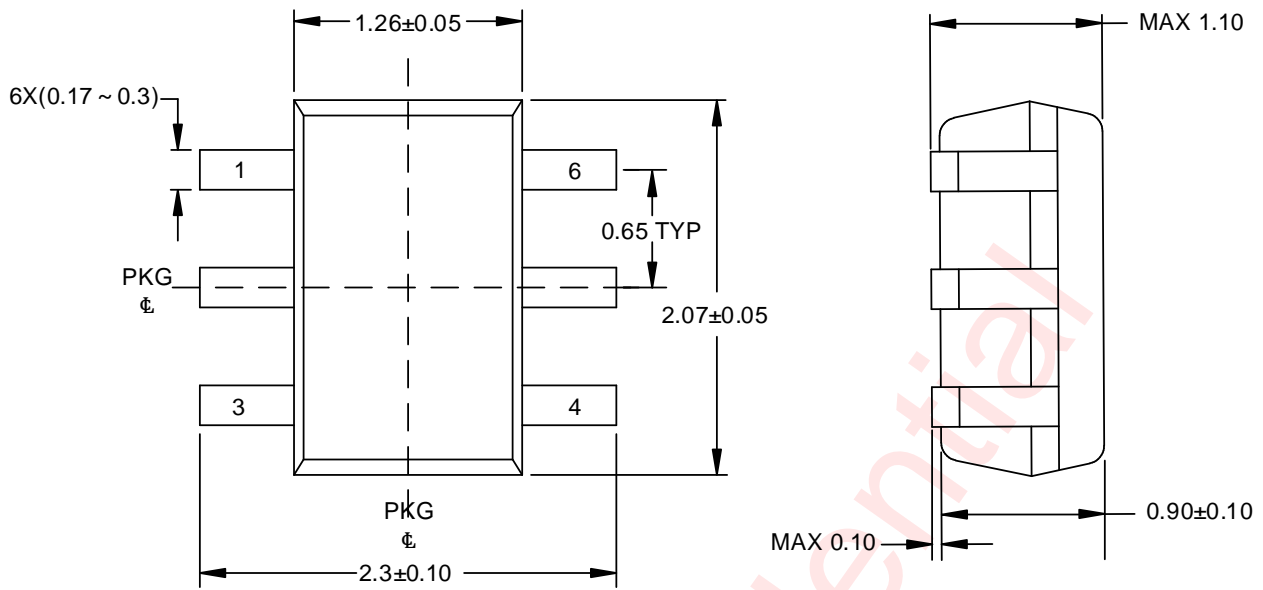
DIMENSIONS AND PIN1 ORIENTATION

D1 (mm)	D0 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
178	8.4	2.4	2.55	1.2	2	4	4	8	Q3

All dimensions are nominal

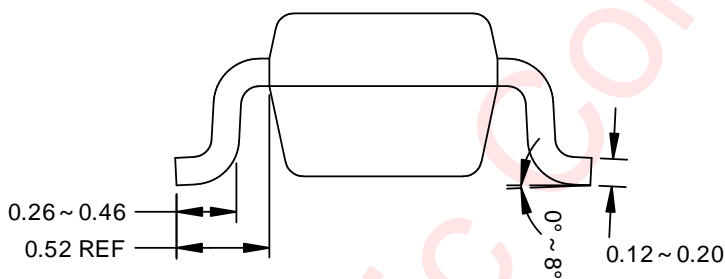
Figure 4 Tape and Reel

Package Description



Top View

Side View

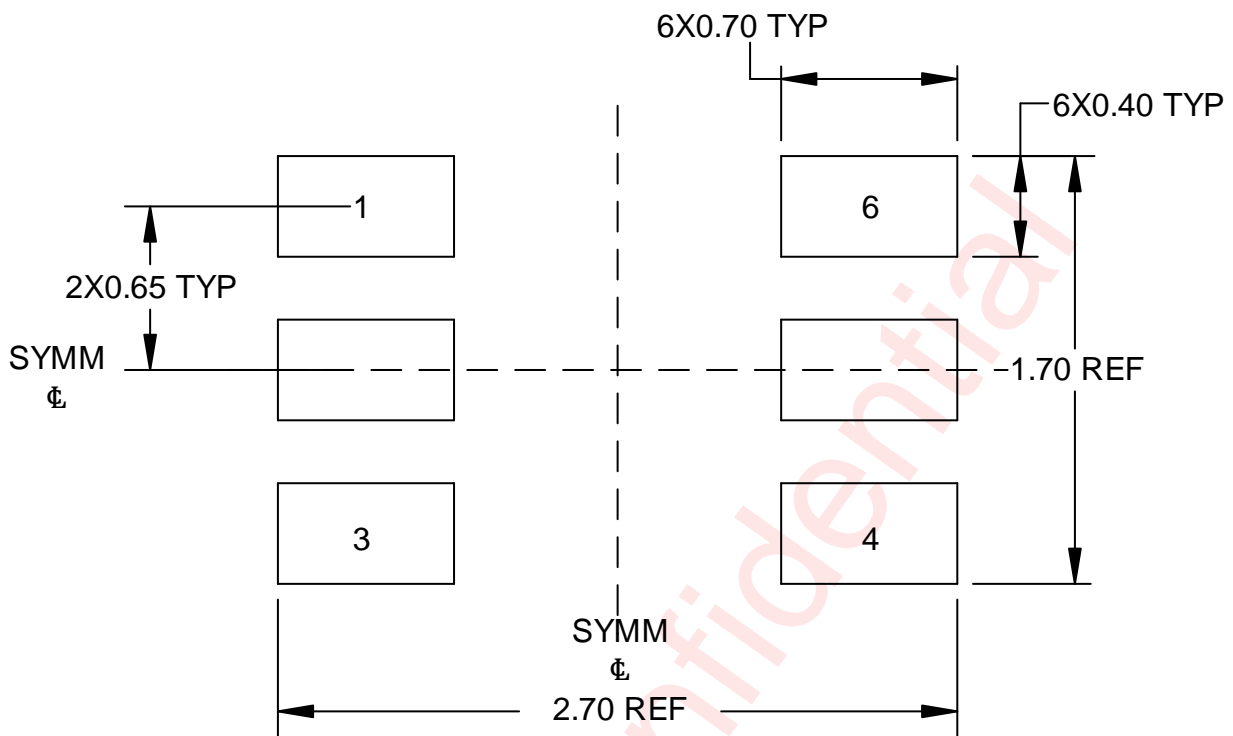
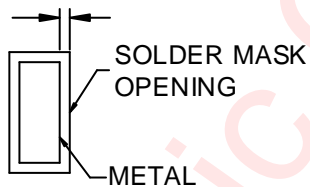


Side View

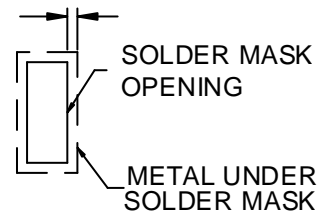
Unit: mm

Figure 5 Package Outline

Land Pattern Data

0.05 MAX
All AROUND

NON SOLDER MASK DEFINED

0.05 MIN
All AROUND

SOLDER MASK DEFINED

Unit: mm

Figure 6 Land Pattern

Revision History

Version	Date	Change Record
V1.0	Oct 2025	Officially Released

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