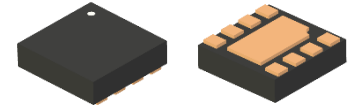


Description

The ASWD-S2-0004 is a high-performance broadband GaAs SPDT switch. Designed for low insertion loss, this SPDT switch maintains low loss up to 8.5 GHz. Typical applications are for UWB and Wi-Fi IEEE 802.11a/b/g/n/ac/ax system. Other applications include test equipment requiring ultra-fast switching speeds. The ASWD-S2-0004 is provided in a compact 2.0mm x 2.0mm x 0.6mm DFN-8L package.



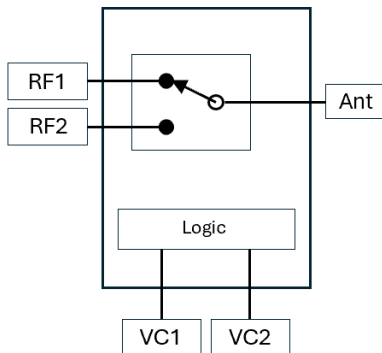
Key Features

- Broadband Performance: 0.1 - 8.5GHz
- Low Insertion Loss: 0.6 dB from 2.0 - 6.0GHz
- High Isolation: 30 dB from 2.0 - 6.0 GHz
- Fast Settling for Low Gate Lag Requirements
- Lead-Free 2 mm 8-Lead DFN Package

Typical Applications

- UWB System
- Wi-Fi IEEE 802.11a/b/g/n/ac/ax system
- GSM/WCDMA/LTE/5G NR receiving
- Ultra-Fast Switching for Test Equipment

Functional Block Diagram



Ordering Information

Part No.	Description
ASWD-S2-0004	0.1~ 8.5GHz SPDT Antenna Switch on Cut Tape
ASWD-S2-0004	0.1~ 8.5GHz SPDT Antenna Switch on Tape & Reel
ASWD-S2-0004-EVB	0.1~ 8.5GHz SPDT Antenna Switch EVB

Absolute Maximum Ratings

Parameter	Symbol	Absolute Maximum			Unit
Control Voltage	V _{CTL}	-	-	8.5	V
Max Input Power	P _{INMAX}	-	-	+34	dBm
Operating Temperature	T _{OP}	-40	-	85	°C
Storage Temperature	T _{STG}	-65	-	150	°C

operation of this device outside the parameter ranges given above may cause permanent damage.

Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Unit
V _{CTL}	2.9	3.0	5.0	V
Pin (RFC – RFX), CW, 50 Ω			25	dBm
T _j at MTTF>105 hrs.	-	150	-	°C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

RF Electrical Specifications

Parameters		Condition	Values			Unit
			Minimum	Typical	Maximum	
Insertion Loss	IL	2.0-6.0 GHz	-	0.6	-	dB
		6.0-8.0 GHz	-	0.9	-	
Isolation	ISL	2.4 GHz	24	29	-	dB
		5.3 GHz	28	33	-	
		5.8 GHz	25	30	-	
		6.0-8.5 GHz	-	20	-	
Return Loss	RL		-	16	-	dB
Input P _{0.1dB}	P _{0.1dB}	2.4 GHz	-	26	-	dBm
		5.3 GHz		26		
		5.8 GHz		25		
2 nd Harmonics	2F0	2.4 GHz Pin = 20dBm	-	-80	-	dBc
		5.3 GHz Pin = 20dBm	-	-71	-	
		5.8 GHz Pin = 20dBm	-	-71	-	
3 rd Harmonics	3F0	2.4 GHz Pin = 20dBm	-	-83	-	dBc
		5.3 GHz Pin = 20dBm	-	-71	-	
		5.8 GHz Pin = 20dBm	-	-72	-	
Turn-on switching time	t _{SW_On}	-	-	13	-	ns
Turn-off switching time	t _{SW_Off}	-	-	35	-	ns

Notes:

1. Production screening tests are done at 1000MHz and 2000MHz.
2. This is just a linearity figure of merit. Refer to 'Recommended Operating Conditions' table for Pin levels

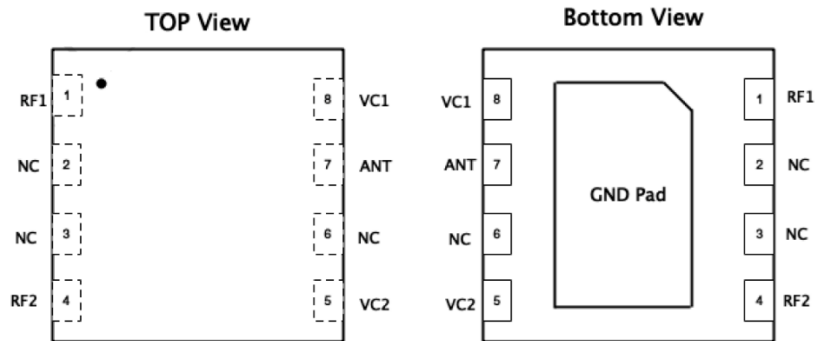
DC Electrical Specifications

Parameter	Symbol	Absolute Maximum			Unit
Control Voltage	V _{CTL_H}	2.9	3.0	5.0	V
	V _{CTL_L}	0	0	0.4	V
Control Current	I _{CTL}	-	1	-	uA

Control Logic

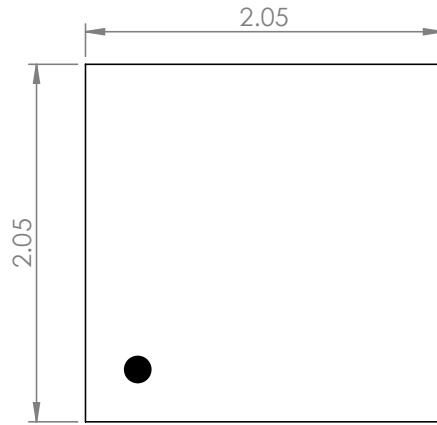
Control VC1	Control VC2	RFC-RF1	RFC-RF2
1	0	ON	OFF
0	1	OFF	ON

Pin Configuration

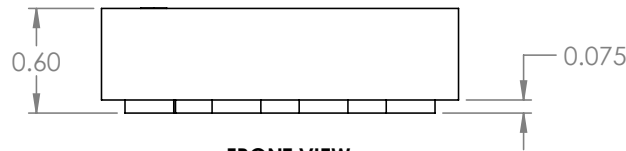


Pin	Name	Description
1	RF1	RF Port
2	NC	N/C
3	NC	N/C
4	RF2	RF Port
5	VC2	Voltage Control
6	NC	N/C
7	ANT	Antenna Port
8	VC1	Voltage Control
9	EPAD	Ground

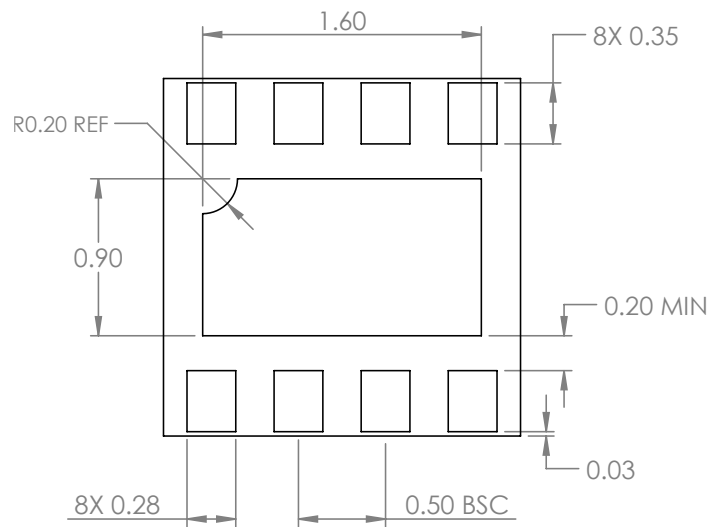
Product Dimensions



TOP VIEW



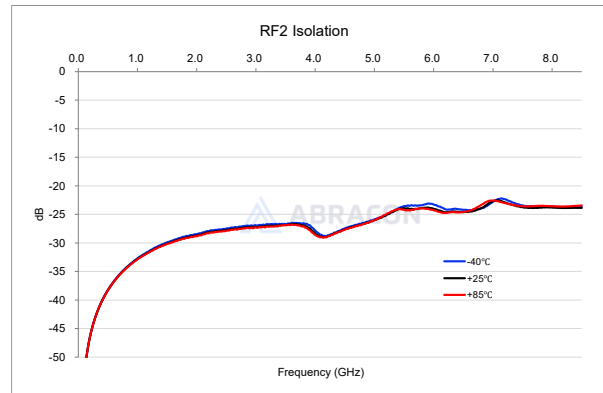
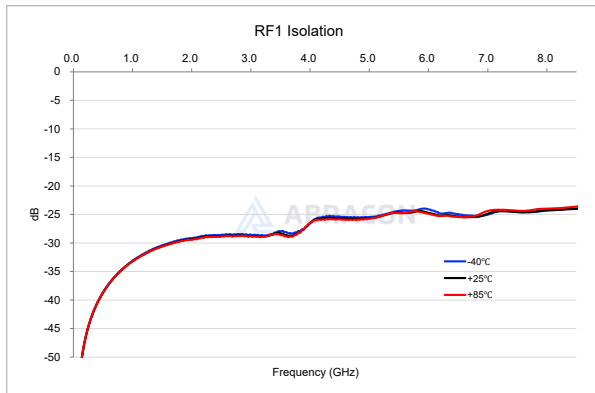
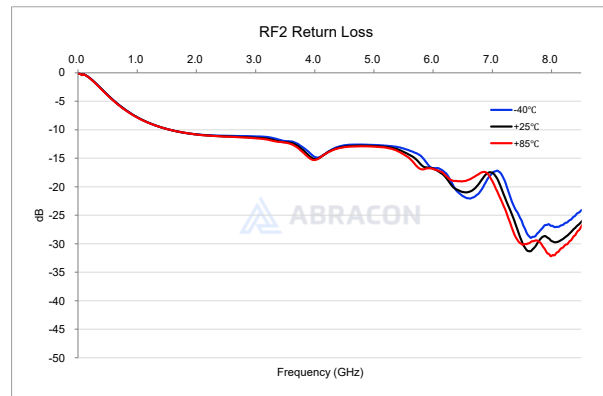
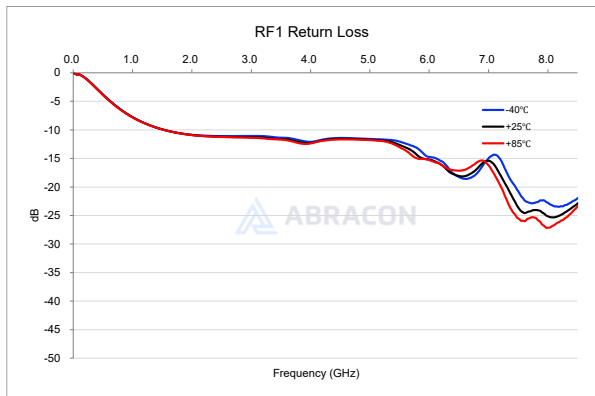
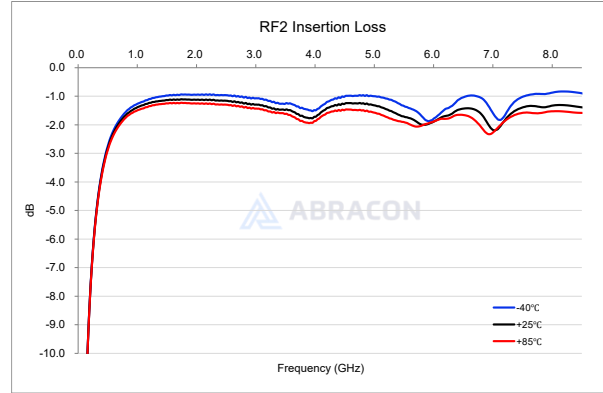
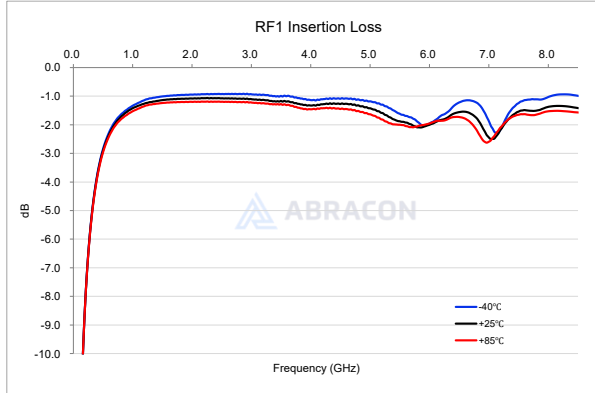
FRONT VIEW



BOTTOM VIEW

Unit: mm

Performance Plots

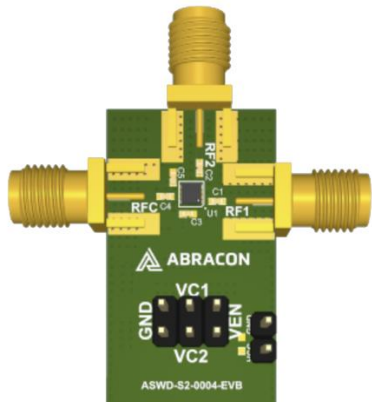


ASWD-S2-0004

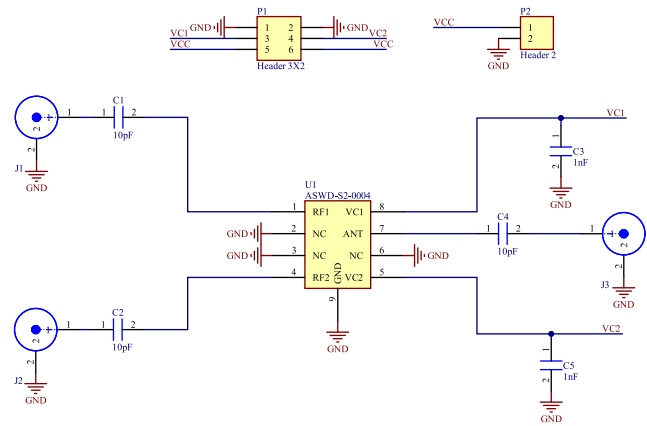
0.1~ 8.5GHz SPDT Antenna Switch



Evaluation Board ASWD-S2-0004-EVB



EVB



Schematic

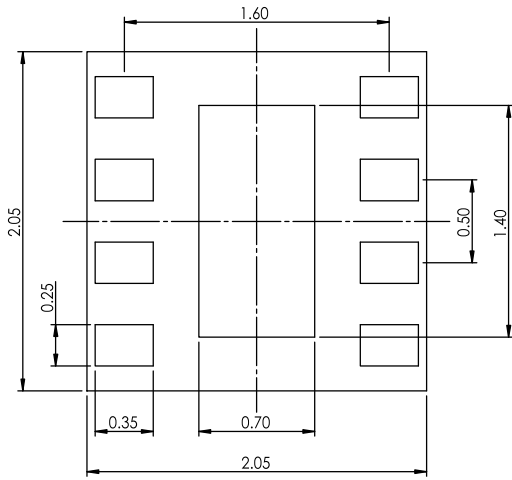
Bill of Material

Component	Description	Manufacturer	Manufacturer Part	QTY
U1	SPDT Antenna Switch	Abrakon	ASWD-S2-0004	1
C1, C2, C4	Capacitor (10pF)	Murata	GRM0222C1C100GA03	3
C3, C5	Capacitor (1nF)	Murata	GRM022R60J102KE19	2

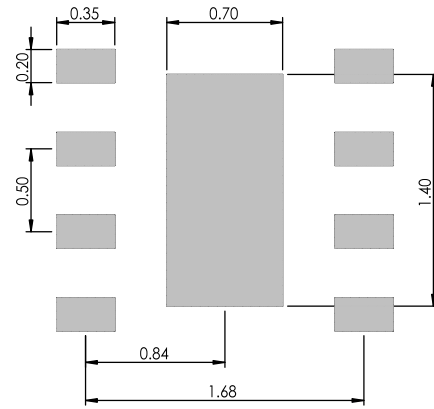
NOTES:

1. Input and output are 50-ohm lines.

IC Footprint & PCB Land Pattern



Footprint



Land Pattern

Reflow Profile [JEDEC J-STD-020]

Solder paste: Sn/3.0Ag/0.5Cu

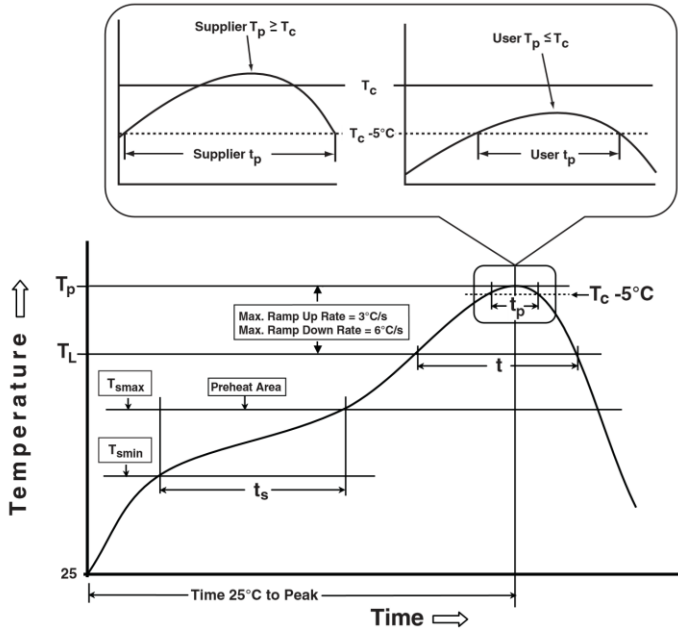


Table 1

SnPb Eutectic Process Classification Temperatures (T _c)		
Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

Table 2

Pb-Free Process Classification Temperatures (T _c)			
Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
<1.6mm	260°C	260°C	260°C
1.6mm - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

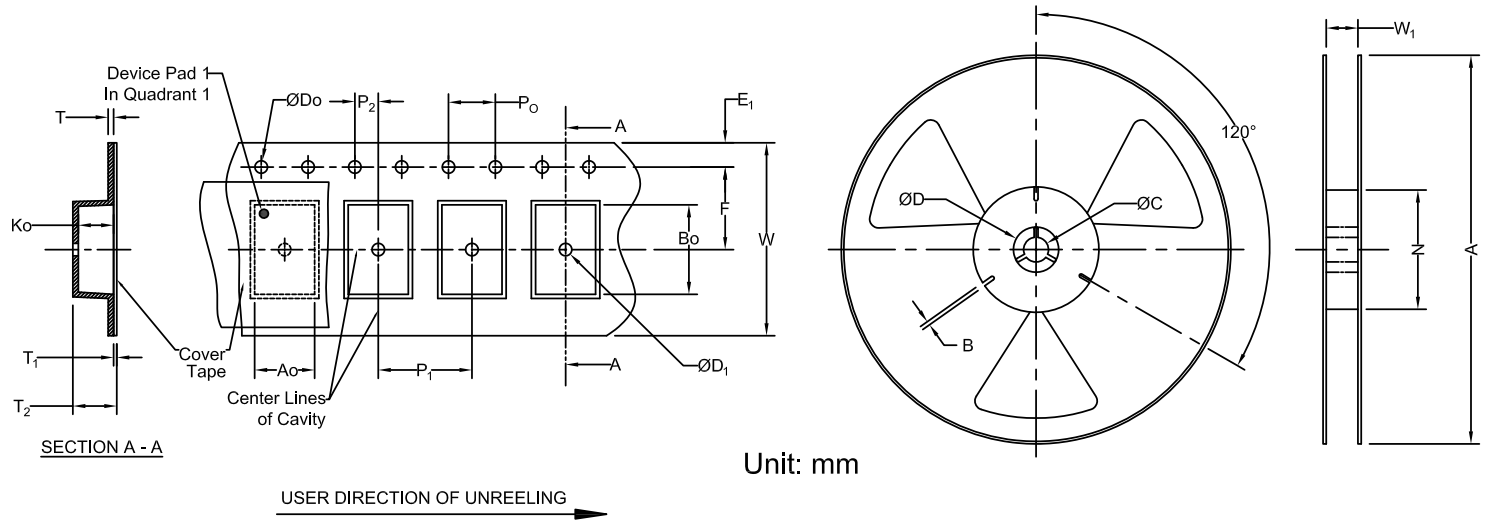
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T _{ssmin})	100°C	150°C
Temperature maximum (T _{ssmax})	150°C	200°C
Time (T _{ssmin} to T _{ssmax}) (t _s)	60 – 120 sec.	60 – 120 sec.
Average ramp-up rate (T _{ssmax} to T _p)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T _L)	183°C	217°C
Time at Liquidous (T _L)	60 – 90 sec.	60 – 90 sec.
Peak package body temperature (T _p)*	See Table 1	See Table 2
Time (T _p)** within 5°C of the specified classification temperature (T _c)	20 sec.	10 sec.
Ramp-down rate (T _p to T _{ssmax})	3°C/sec. max	3°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

Packaging

Tape & Reel Dimension



Unit: mm

Carrier Tape Specifications (mm)										
E1	D0	P0	P2	F	P1	W	A0	B0	K0	Reel Qty
1.75 ± 0.1	1.55 ± 0.05	4.0 ± 0.1	2.0 ± 0.05	3.5 ± 0.05	2.0 ± 0.05	8.0 ± 0.1	2.25 ± 0.1	2.25 ± 0.05	0.7 ± 0.1	5,000

Reel Specifications (mm)					
A	W1	N	B	C	D
177.8	8.4 ± 1.5	53.6	1.5	13.2 ± 0.3	20.2