

# APPROVAL SHEET

**RF Switch Series – RoHS Compliance**

**SPDT GPIO Switch**

**Halogens Free Product**

**For WLAN 2.4G / 5G Application**

**P/N: RFASWA585ATF0C**

\*Contents in this sheet are subject to change without prior notice.

## FEATURES

- Low Insertion Loss : 0.65 dB typ. @ 2.5GHz
- High Isolation : 30 dB typ. @ 2.5GHz
- 1.8 V and 3.3 V logic compatibility
- Miniature footprint : 1.0 x 1.0 x 0.45 mm<sup>3</sup> (QFN package)
- Moisture Sensitive Level 3 (MSL3)
- Human Body Model (HBM) ESD Level - Class 1B

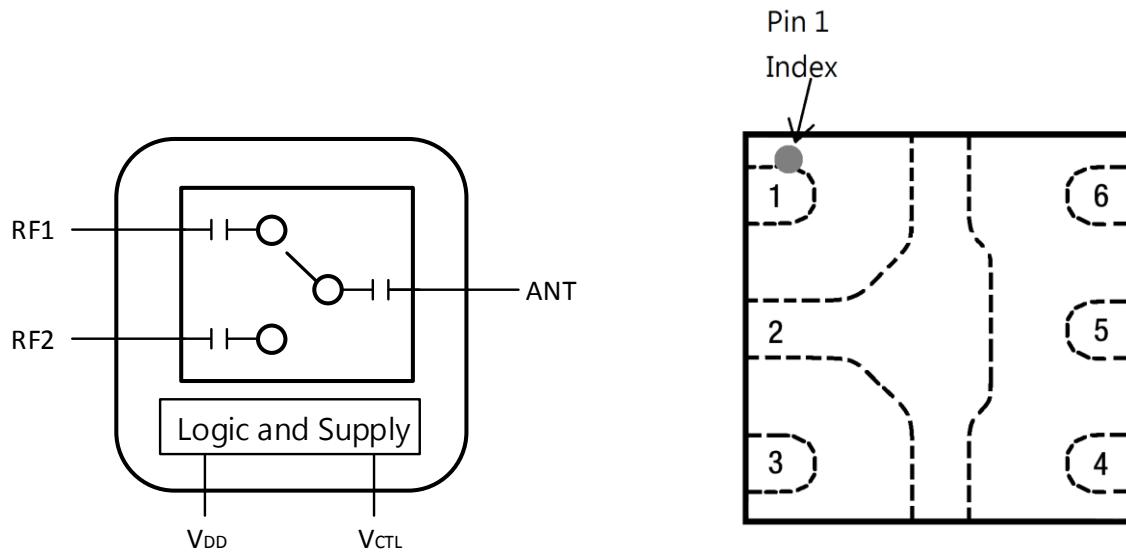
## Description

- The RFASWA585ATF0C is a GaAs pHEMT single pole dual throw (SPDT) switch in a Ultra-miniature 1.0 mm x 1.0 mm package. The RFASWA585ATF0C is ideally suited for applications where high power, low insertion loss, and small size are required. Typical applications are for handset systems that connect separate transmit and receive functions to a common antenna, as well as other related handset and general purpose applications. This part can be used in all systems operating up to 6.0 GHz requiring high power at low control voltage.

## Application

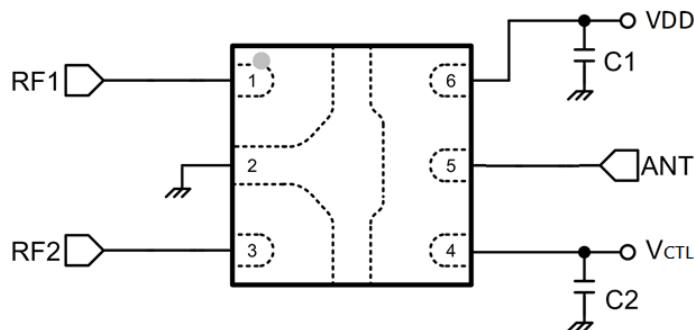
- WLAN 802.11a/b/g/n/ac networks
- ISM band radios
- Low power T/R systems

## Block Diagram and Pin Out (Top View)



## Pin Names and Descriptions

Pin	Name	Description	Pin	Name	Description
1	RF1	RF port 1	4	V <sub>CTL</sub>	DC control voltage
2	GND	Ground	5	ANT	Antenna port
3	RF2	RF port 2	6	VDD	DC supply voltage

**Application Circuit****Parts List**

Parts No.	Value
C1-C2	100 pF

**Absolute Maximum Ratings**

Parameter	Symbol	Minimum	Maximum	Units
RFx Input Power	Pin		+32	dBm
Supply Voltage	VDD		+5.5	V
Operating temperature	T <sub>OP</sub>	-40	+85	°C
Storage temperature	T <sub>ST</sub>	-65	+150	°C

**Approval Sheet**
**Electrical Specifications at 25°C with VDD=3.3V, V<sub>CTL</sub>=1.8V, Characteristic Impedance Z<sub>0</sub>=50Ω**

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
<b>RF Specifications`</b>						
Operating	f		2.0		6.0	GHz
Insertion loss	I <sub>L</sub>	2.4 ~ 2.5 GHz 4.8 ~ 6.0 GHz		0.65 0.70	0.75 0.95	dB dB
Isolation (ANT to RF1/2 port)	I <sub>SO</sub>	2.4 ~ 2.5 GHz 4.8 ~ 6.0 GHz	26 25	30 30		dB dB
On state match	VSWR	2.4 ~ 2.5 GHz 4.8 ~ 6.0 GHz		1.50 1.50	1.92 1.92	
RFx Harmonics	2f <sub>0</sub>	f=2.4GHz,Pin=+24dBm		-58		dBm
	3f <sub>0</sub>	f=2.4GHz,Pin=+24dBm		-46		dBm
<b>DC Specification (Decoder)</b>						
Control Voltage(High)	V <sub>CTL(H)</sub>		1.6	1.8	3.6	V
Control Voltage(Low)	V <sub>CTL(L)</sub>		0		0.4	V
Supply voltage	VDD		2.7	3.3	5.0	V
Supply current	I <sub>DD</sub>	V <sub>CTL</sub> =0V, VDD=3.3V		1	20	μA
		V <sub>CTL</sub> =1.8V, VDD=3.3V		220	300	μA
VCTL Current	I <sub>CC</sub>	V <sub>CTL</sub> =1.8V, VDD=3.3V		80	100	μA
<b>Switching Specification</b>						
Switching speed	T <sub>SW</sub>	50% V <sub>CTL</sub> to 90/10% RF		60		ns

Note 1: Performance is guaranteed only under the conditions listed in this Table.

2: Board loss de-embedded.

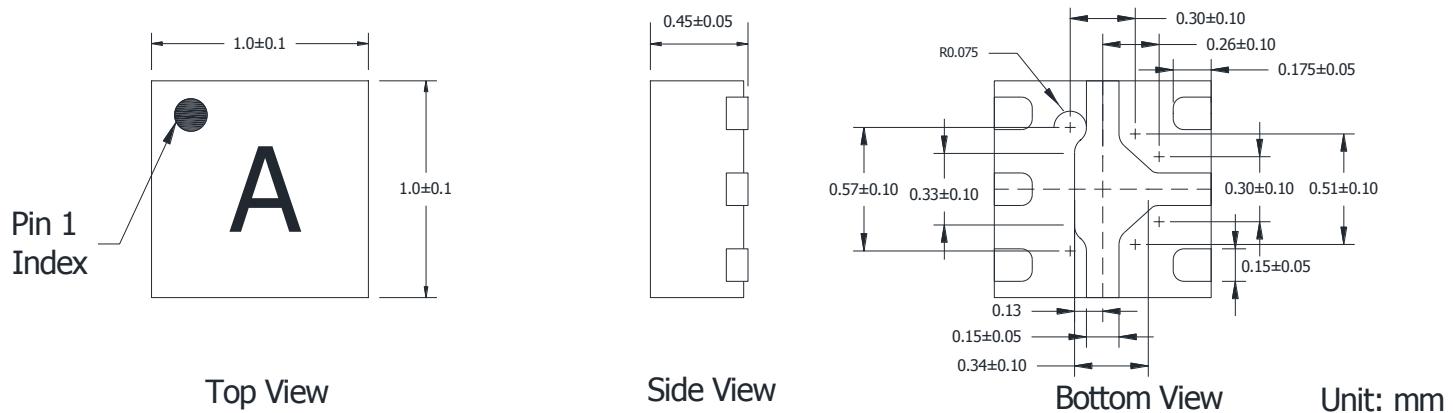
**Logic Table for Switch On-Path**

VDD	V <sub>CTL</sub>	RF1	RF2
1	0	off	on
1	1	on	off

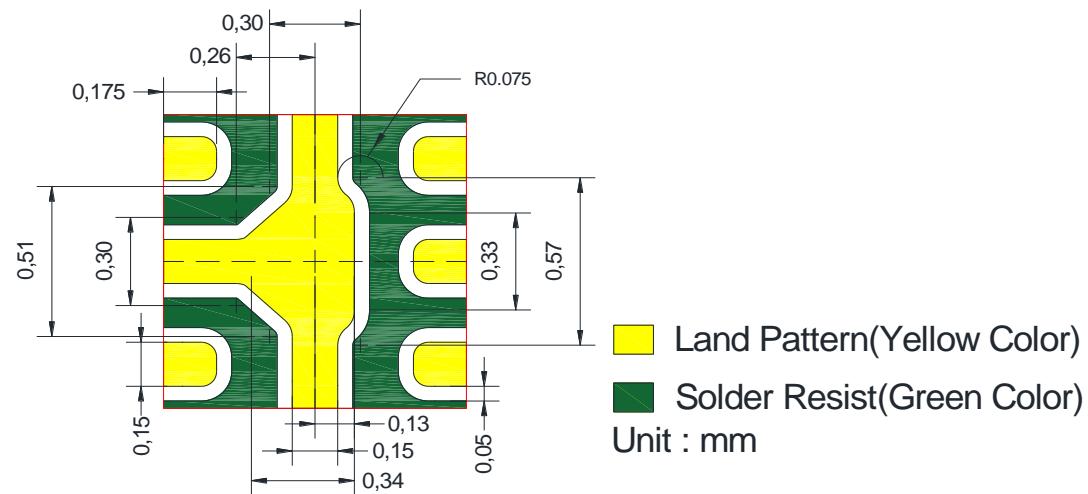
Note 1: "1" indicates VDD = 2.7 to 5 V, VCTL = 1.6 to 3.6 V

"0" indicates VCTL = 0 to 0.4 V.

## Package Dimensions



## Land Pattern



**Reliability test**

TEST	PROCEDURE / TEST METHOD	REQUIREMENT
Solderability JIS C 0050-4.6 JESD22-B102D	*Solder bath temperature : $255 \pm 5^{\circ}\text{C}$ *Immersion time : $5 \pm 0.5$ sec Solder : Sn3Ag0.5Cu for lead-free	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
High temperature JIS C 0021	*Temperature : $90^{\circ}\text{C} \pm 2^{\circ}\text{C}$ *Test duration : 1000+24/-0 hours Measurement to be made after keeping at room temperature for $24 \pm 2$ hrs	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-30 \sim 90^{\circ}\text{C}$ .
Low temperature JIS C 0020	*Temperature : $-30^{\circ}\text{C} \pm 2^{\circ}\text{C}$ *Test duration : 1000+24/-0 hours Measurement to be made after keeping at room temperature for $24 \pm 2$ hrs	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-30 \sim 90^{\circ}\text{C}$ .
Temperature cycle JIS C 0025	1. $30 \pm 3$ minutes at $-30 \pm 3^{\circ}\text{C}$ , 2. 10~15 minutes at room temperature, 3. $30 \pm 3$ minutes at $+90 \pm 3^{\circ}\text{C}$ , 4. 10~15 minutes at room temperature, Total 100 continuous cycles Measurement to be made after keeping at room temperature for $24 \pm 2$ hrs	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-30 \sim 90^{\circ}\text{C}$ .
High temperature operation life (HTOL)	*Temperature : $90^{\circ}\text{C}$ *V = Vmax *Time : 1000+24/-0 hrs. Measurement to be made after keeping at room temperature for $24 \pm 2$ hrs	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-30 \sim 90^{\circ}\text{C}$ .

**Soldering condition**

Typical examples of soldering processes that provide reliable joints without any damage are given in Figure 11.

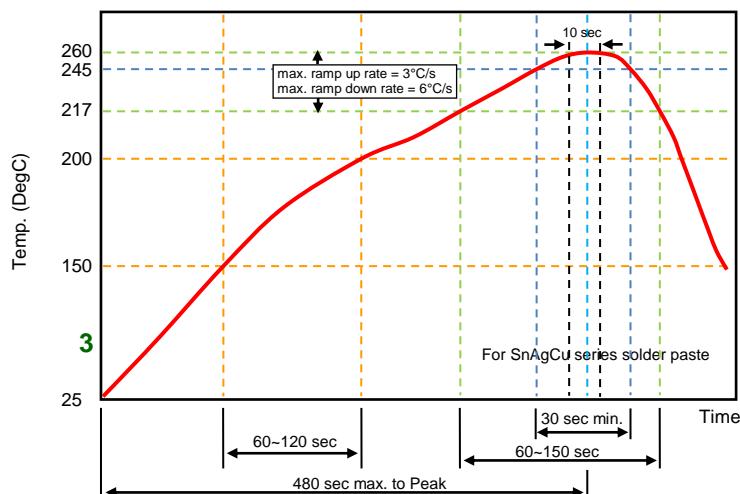
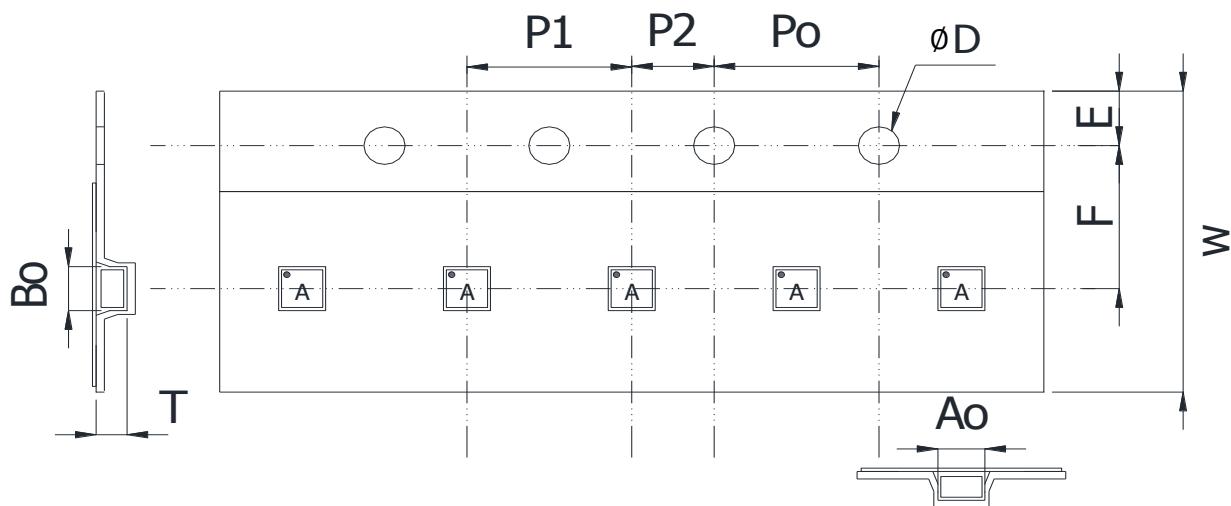


Figure 11. Infrared soldering profile

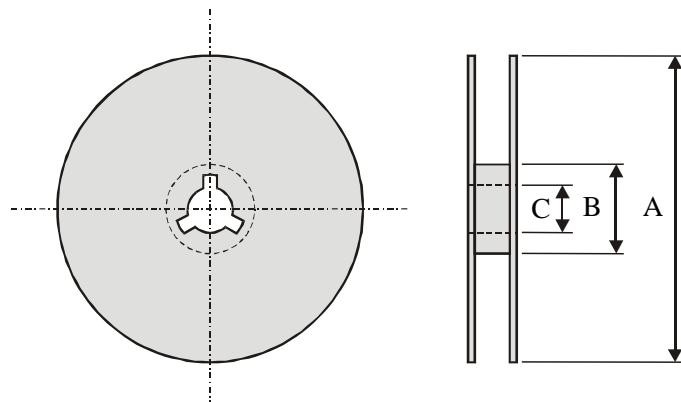
**Ordering code**

RF	ASW	A	585A	T
RF module RF: Walsin RF Switch Device	Module type ASW: Antenna Switch	Application A: SPDT	Design Code	Packing T: Taping

Minimum Ordering Quantity: 5000 pcs per 7" reel.

**Packaging**

**Plastic Tape specifications (unit :mm)**

Index	Ao	Bo	φD	T	W
Dimension (mm)	$1.14 \pm 0.05$	$1.17 \pm 0.05$	$1.50 \pm 0.1/-0.0$	$0.56 \pm 0.05$	$8.0 \pm 0.3/-0.1$
Index	E	F	Po	P1	P2
Dimension (mm)	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$4.00 \pm 0.10$	$4.00 \pm 0.10$	$2.00 \pm 0.05$

**Reel dimensions**


Index	A	B	C
Dimension (mm)	$\Phi 180 \pm 2$	$\Phi 60 \pm 1$	$\Phi 13.1 \pm 0.2$

Taping Quantity : 5000 pieces per 7" reel

**Caution of handling**
**Limitation of Applications**

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

- (1) Aircraft equipment
- (2) Aerospace equipment
- (3) Undersea equipment
- (4) Medical equipment
- (5) Disaster prevention / crime prevention equipment
- (6) Traffic signal equipment
- (7) Transportation equipment (vehicles, trains, ships, etc.)
- (8) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

**Storage condition**

- (1) Products should be used in 6 months from the day of WALSIN outgoing inspection.
- (2) Storage environment condition.
  - Products should be storage in the warehouse on the following conditions.
  - Temperature : +5 to +40°C
  - Humidity : 30 to 70% relative humidity
  - Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
  - Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.
  - Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
  - Products should be storage under the airtight packaged condition.