

APPROVAL SHEET

RF Switch Series – RoHS Compliance

SPDT GPIO Switch

Halogens Free Product

Any 2G/3G/4G Band for TRx system

P/N: RFASWA370ATF09

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

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FEATURES

- Low Insertion Loss : 1.15dB typ. @ 5.85GHz
- High Isolation : 25dB typ. @ 5.85GHz
- Low control voltage : 1.8 to 3.0 V
- Miniature footprint : 1.5 x 1.5 x 0.45 mm³
- Moisture Sensitive Level 3 (MSL3)

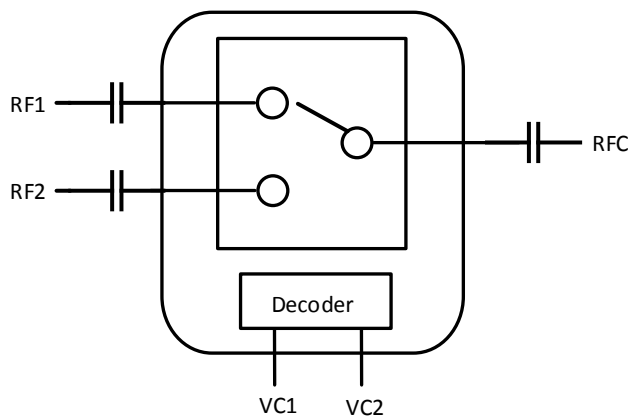
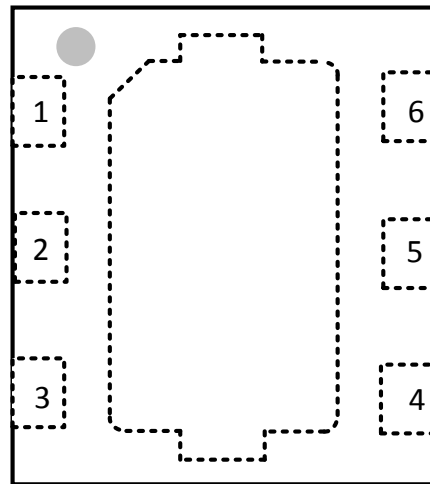
Description

- The RFASWA370ATF09 is a SOI (Silicon On Insulator) single-ports dual throw (SPDT) high power switch operating at 0.5-6.0 GHz in a QFN-6 (1.5 x 1.5 x 0.45 mm³) package.
- The RFASWA370ATF09 features very high isolation with very low DC power consumption.

Application

- Multi-mode 2G/3G, LTE application receive system.

Block Diagram and Pin Out (Top View)

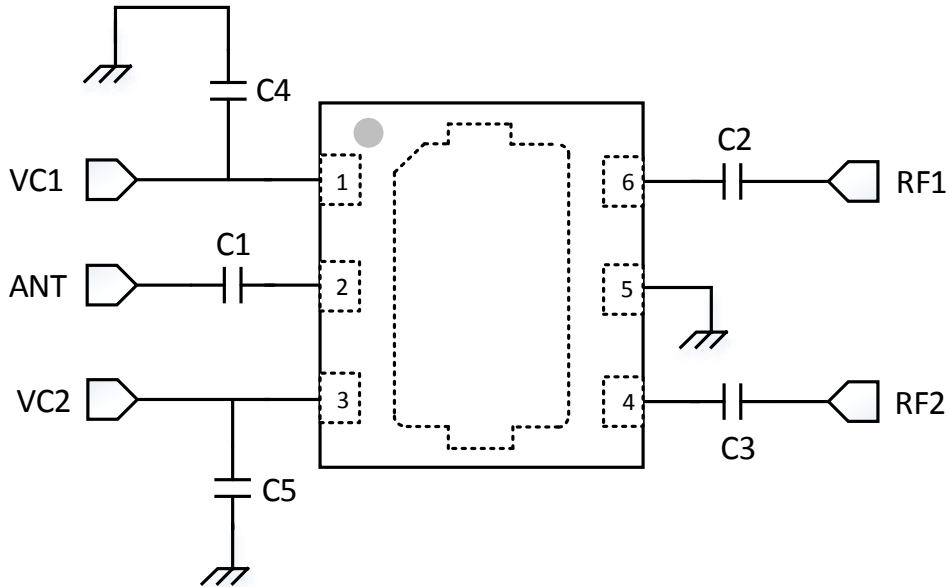


Pin Names and Descriptions

Pin	Name	Description	Pin	Name	Description
1	VC1	DC control voltage 1	4	RF2	RF path 2
2	ANT	Antenna port	5	GND	Ground
3	VC2	DC control voltage 2	6	RF1	RF path 1

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Application Circuit



Parts List

Parts No.	Value
C1-C3	47 pF
C4-C5	1000 pF

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
RFx Input Power	Pin		+30	dBm
DC Control Voltage	V _{VC1-2}	0	+3.0	V
Operating temperature	T _{OP}	-40	+85	°C
Storage temperature	T _{ST}	-40	+125	°C

Exceeding absolute maximum ratings may cause permanent damage. Operation between operating range maximum and absolute maximum for extended periods may reduce reliability.

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Electrical Specifications at 25°C with $V_{C1} = V_{C2} = 0/3.0V$, Characteristic Impedance $Z_0 = 50\Omega$, Pin=0dBm

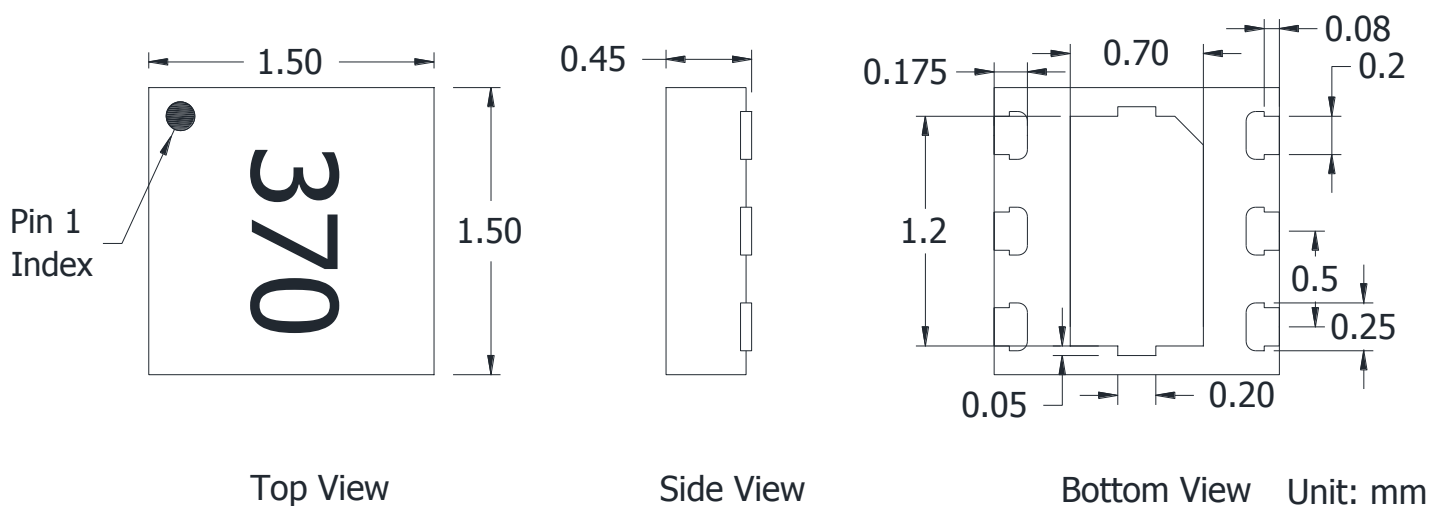
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
RF Specifications						
Operating v	f		0.5		6.0	GHz
Insertion loss	IL	0.5 ~ 2.7 GHz 2.7 ~ 3.8 GHz 3.8 ~ 5.85 GHz	-	0.70 0.90 1.15	0.80 1.00 1.30	dB dB
Isolation	Iso	0.5 ~ 2.4 GHz 2.4 ~ 2.5 GHz 2.5 ~ 3.8 GHz 3.8 ~ 5.85 GHz	-	32 32 28 25	-	dB
On state match	VSWR	0.5 ~ 5.85 GHz	-	1.38	1.67	-
Input Power 1dB Compression Point	P_{1dB}	0.5 ~ 6.0 GHz $V_{CTL} = 3V$	-	+30	-	dBm
Switching Specification						
Switching speed	T_{SW}	50% V_{CTL} to 90/10% RF	-	0.3	0.4	μs

Note : All measurements made in a 50 Ω system with 0/+3.0V control voltages, unless otherwise specified.

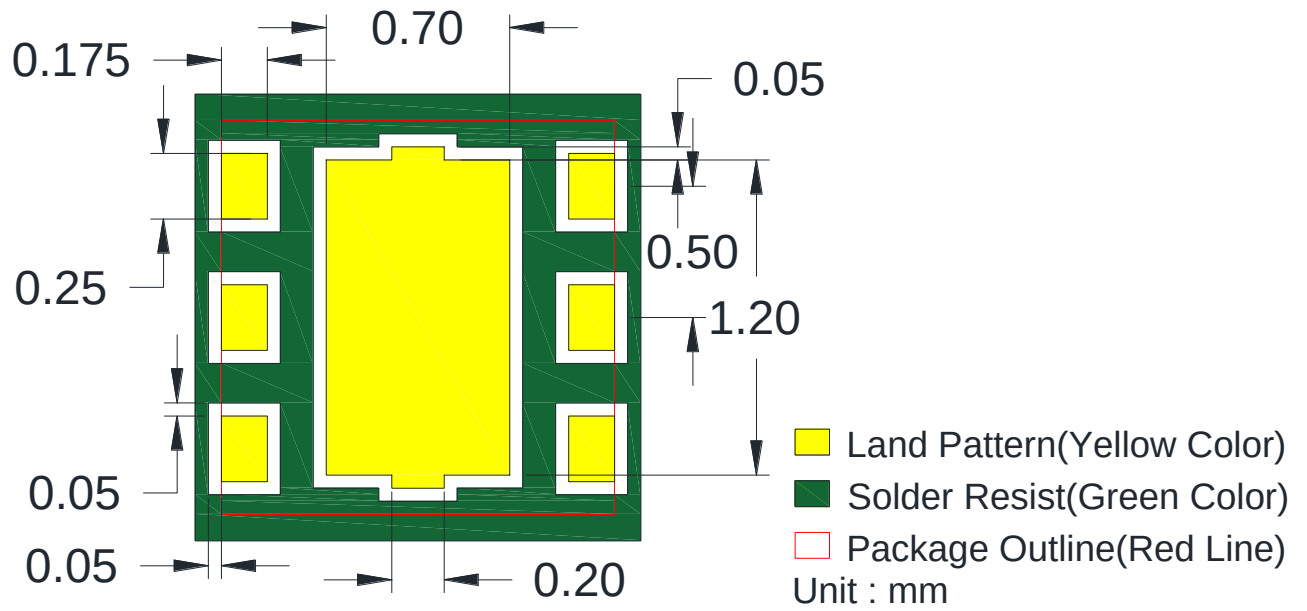
Logic Table for Switch On-Path (High=3V ,Low= 0V)

V_{C1}	V_{C2}	RF1	RF2
1	0	on	off
0	1	off	on

Package Dimensions



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Solder Land Pattern



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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 ± 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 ± 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 ± 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 ± 3 minutes at $-30 \pm 3^{\circ}\text{C}$, 2. 10~15 minutes at room temperature, 3. 30 ± 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 ± 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°C *VDD = 4.8V *Time : $1000+24/-0$ hrs. Measurement to be made after keeping at room temperature for 24 ± 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.

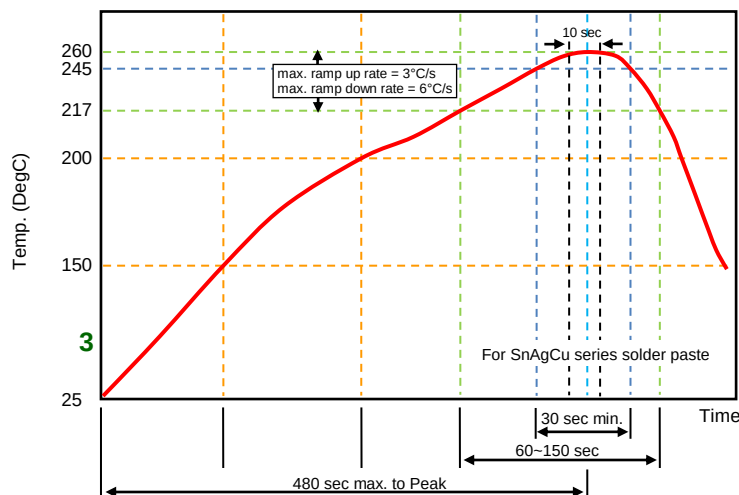


Figure 11. Infrared soldering profile

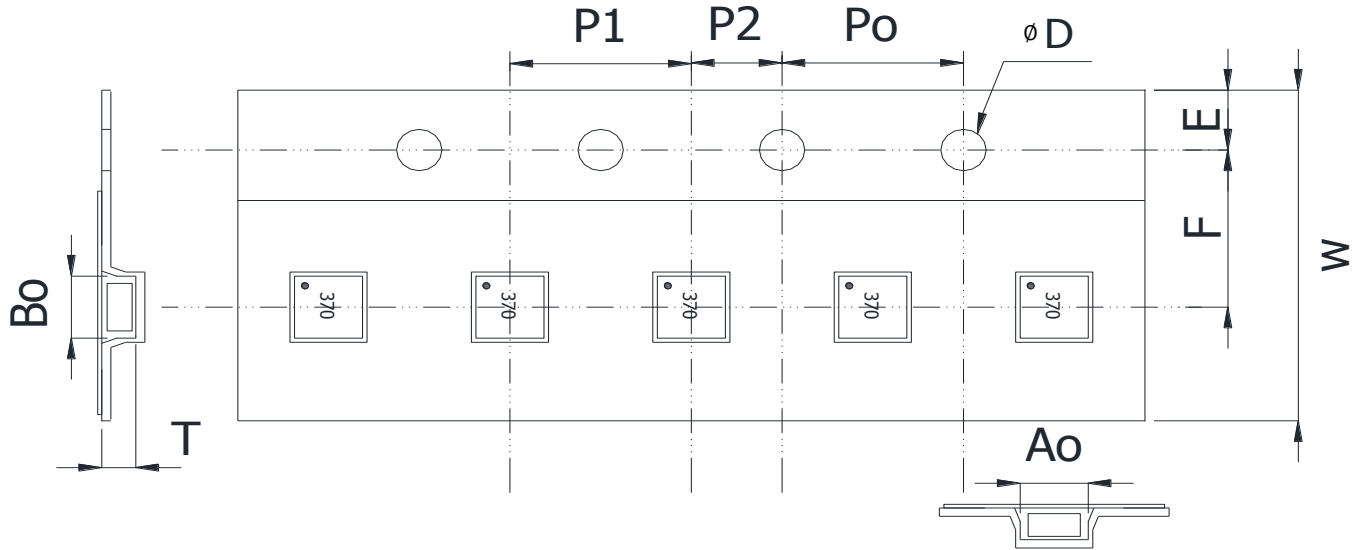
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Ordering code

RF	ASW	A	370A	T
RF module RF: Walsin RF Switch Device	Module type ASW: Antenna Switch	Application A: SPDT	Design Code	Packing T: Taping

Minimum Ordering Quantity: 3000 pcs per reel.

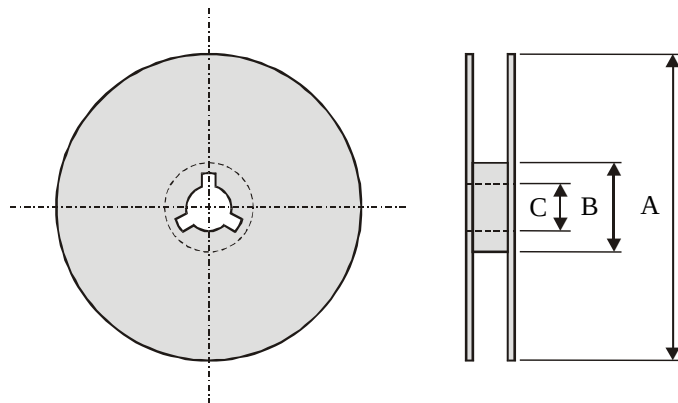
Packaging



Plastic Tape specifications (unit :mm)

Index	Ao	Bo	∅ D	T	W
Dimension (mm)	1.70 ± 0.05	1.70 ± 0.05	1.55 ± 0.05	0.60 ± 0.05	8.0 ± 0.30
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.20	4.00 ± 0.10	2.00 ± 0.05

Reel dimensions



Index	A	B	C
Dimension (mm)	∅ 178.0	∅ 54.0	∅ 13.2

Taping Quantity : 3000 pieces per 7" reel

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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, which can be confirmed.
- (2) Storage environment condition.
 - Products should be storage in the warehouse on the following conditions.
 - Temperature : -10 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 son 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.