APPROVAL SHEET

RF Switch Series

SPDT GPIO Switch

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

P/N: RFASWA630ATF09

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

FEATURES

- Low Insertion Loss：0.50dB typ. @ 2.7GHz
- High Isolation：20dB min. @ 2.7GHz
- Low control voltage：1.2V to 2.3V
- Miniature footprint：1.1 x 0.7 x 0.55 mm^3

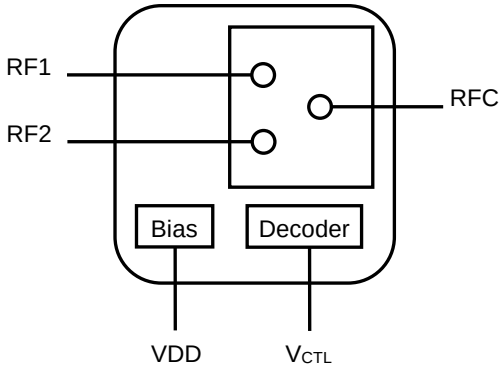
Description

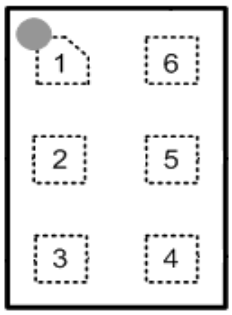
- The RFASWA630ATF09 is a SOI (Silicon On Insulator) Single-Pole, Double-Throw (SPDT) switch that operating at 0.1~2.7 GHz in a LGA Package (1.1x0.7x0.55mm^3).
- The RFASWA630ATF09 features very high isolation with very low DC power consumption.
- The RFASWA630ATF09 has ESD protection devices to achieve excellent ESD performances. No DC Blocking capacitors are required for all RF ports unless DC is biased externally.

Application

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

Block Diagram and Pin Out (Top View)

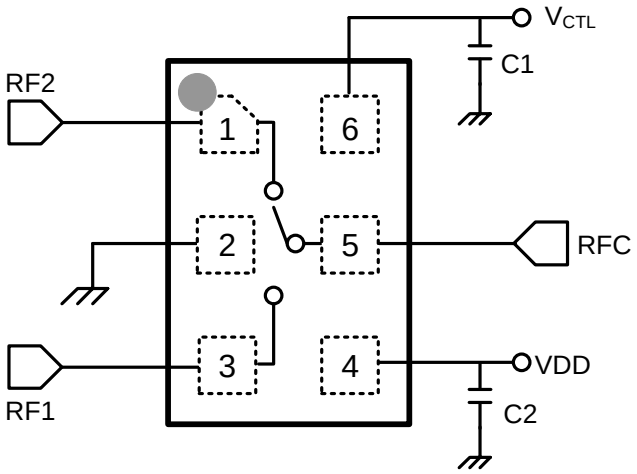




Pin Names and Descriptions

Pin	Name	Description	Pin	Name	Description
1	RF2	RF path 2	4	VDD	DC power supply
2	GND	Ground	5	RFC	RF common port
3	RF1	RF path 1	6	V_{CTL}	DC control voltage

Application Circuit



Note: No DC Blocking capacitors are required because of the all RF ports integrated DC blocking capacitors.

Parts List

Parts No.	Value
C1-C2	1000 pF

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
RFx Input Power	Pin		+35	dBm
DC Supply Voltage	VDD	+2.5	+4.0	V
DC Control Voltage	V_{CTL}	-0.2	+2.8	V
Storage temperature	T_{STG}	-55	+150	°C
Operating temperature	T_{OP}	-35	+90	°C
HBM ESD Voltage, All Pins	V_{ESD}[1]	-	+3000	V
MM ESD Voltage, All Pins	V_{ESD}[2]	-	+100	V

Note 1：Human Body Model ESD Voltage, Class 2
Note 2：Machine Model ESD Voltage, Class A

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

(Top= 25°C, VDD=2.8V, V_{CTL}=0/1.8V, Characteristic Impedance ZO= 50 Ω, Unless Otherwise Noted)

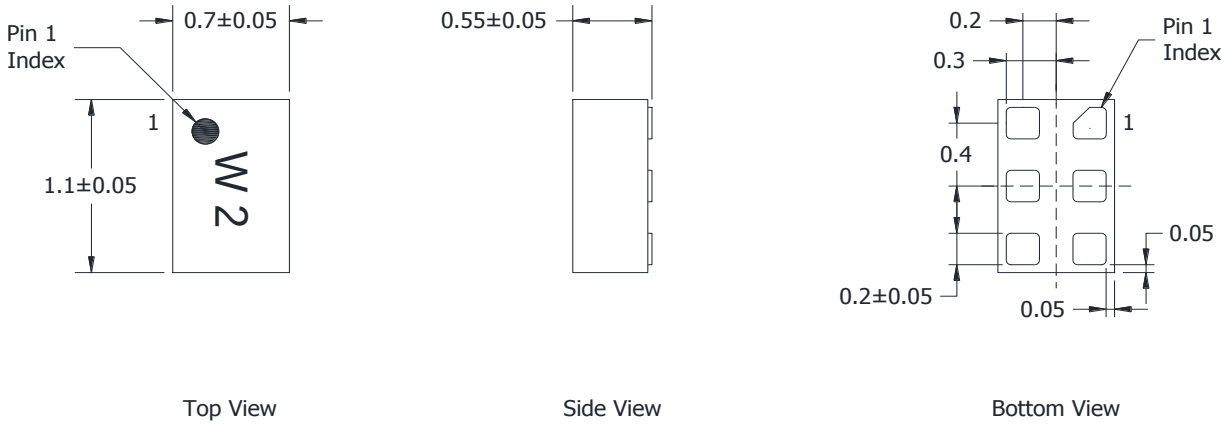
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
RF Specifications						
Operating Frequency	f		0.1	-	2.7	GHz
Insertion Loss (RFC to RF1/2 port)	IL	0.1 ~ 1.0 GHz 1.0 ~ 2.2 GHz 2.2 ~ 2.7 GHz		0.30 0.45 0.50	0.55 0.60 0.65	dB dB dB
Isolation (RFC to RF1/2 port)	Iso	0.1 ~ 1.0 GHz 1.0 ~ 2.2 GHz 2.2 ~ 2.7 GHz	30 22 20	33 25 23		dB dB dB
On state match	VSWR	0.1 ~ 2.7 GHz		1.2	1.5	-
RFx harmonics	2fo, 3fo	PIN = +26 dBm, f = 0.1 ~ 2.7 GHz VSWR = 2.5:1		81		dBc
DC Specification (Decoder)						
Supply Voltage	VDD		2.50	2.80	3.50	V
Supply Current	I_{DD}	VDD= 3.5V		60	90	μA
Control Voltage(High)	$V_{CTL(H)}$		1.20	1.80	2.30	V
Control Voltage(Low)	$V_{CTL(L)}$		0		0.45	V
Control Current	I_{CTL}	V_{CTL}= 2.3V			10	μA
Switching Specification						
Switching speed	T_{SW}	50% V_{CTL} to 90/10% RF		2	5	μs

Note：All measurements made in a 50Ω system with 0/+1.8V control voltages, unless otherwise specified.

Logic Table for Switch On-Path (High=1.8V ,Low= 0V)

V_{CTL}	RF1	RF2
0	on	off
1	off	on

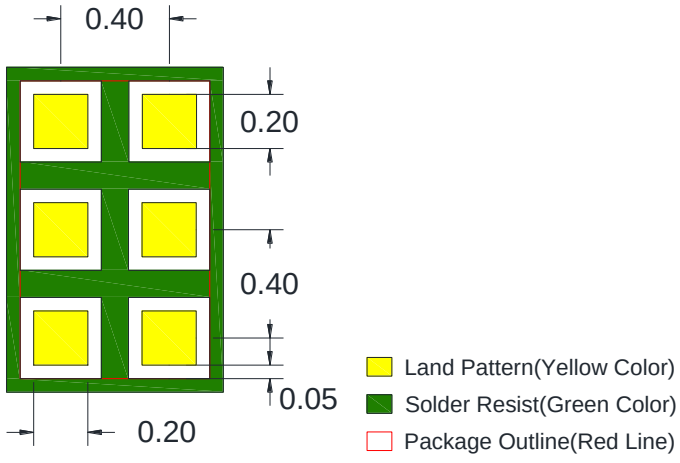
Package Dimensions



Top View　　Side View　　Bottom View

Unit: mm

Solder Land Pattern

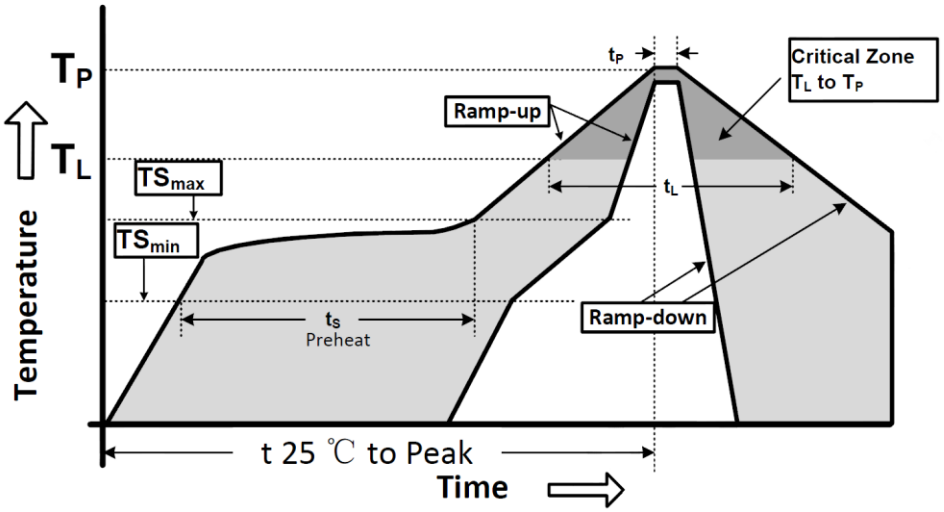


Unit : mm

Reliability test

TEST	PROCEDURE / TEST METHOD	REQUIREMENT
Solderability JIS C 0050-4.6 JESD22-B102D	*Solder bath temperature：255 ± 5°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°C±2°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 ~ 90°C.
Low temperature JIS C 0020	*Temperature：-30°C±2°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 ~ 90°C.
Temperature cycle JIS C 0025	1. 30±3 minutes at -30±3°C, 2. 10~15 minutes at room temperature, 3. 30±3 minutes at +90±3°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 ~ 90°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 ~ 90°C.

Soldering Condition



Soldering Condition as Below

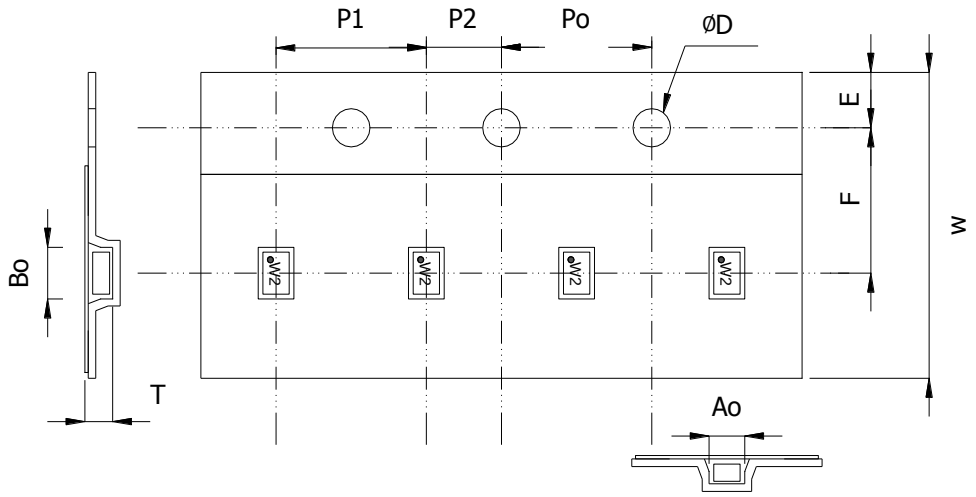
Profile Parameter	Lead-Free Assembly, Convection, IR/Convection
Ramp-up rate (TS_{max} to T_p)	3°C/second max.
Preheat temperature (TS_{min} to TS_{max})	150°C to 200°C
Preheat time (t_s)	60 - 180 seconds
Time above TL, 217°C (t_L)	60 - 150 seconds
Peak temperature (T_p)	260°C
Time within 5°C of peak temperature (t_p)	20 - 40 seconds
Ramp-down rate	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Ordering code

RF	ASW	A	630A	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 pieces per reel.

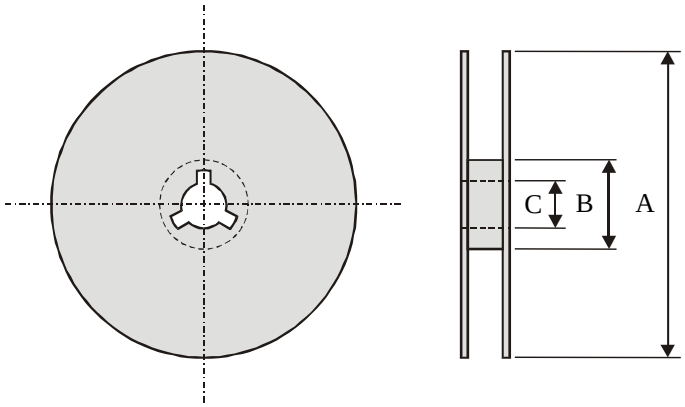
Packaging



Plastic Tape specifications (unit :mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	0.85 ± 0.03	1.25 ± 0.03	1.50 ± 0.10	0.60 ± 0.03	8.00 ± 0.20
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178.0	Φ60.0	Φ13.2

Taping Quantity : 3000 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, 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.