APPROVAL SHEET

RF Switch Series – RoHS Compliance

SP3T GPIO Switch

Halogens Free Product

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

P/N: RFASWMT2628ATF09

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

FEATURES

- Low Insertion Loss：0.5dB typ. @ 2.7GHz
- High Isolation：24dB typ. @ 2.7GHz
- P_{1dB} compression point：35dBm typ. @ 2.7GHz
- Low control voltage：1.3 to 2.8V
- Miniature footprint：1.1 x 1.1 x 0.55 mm^3
- **M**oisture **S**ensitive **L**evel 3 (MSL3)

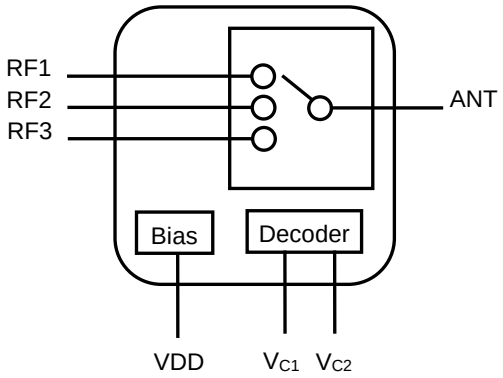
Description

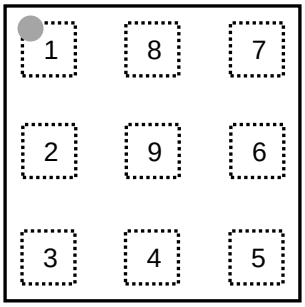
- The RFASWMT2628ATF09 is a CMOS SOI (Silicon On Insulator) Single Pole, Triple Throw (SP3T) switch that operating at 0.5-2.7 GHz. The RFASWMT2628ATF09 is manufactured in a LGA (1.1x1.1x0.55mm^3) package.
- The RFASWMT2628ATF09 features very high isolation with very low DC power consumption.
- The RFASWMT2628ATF09 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)

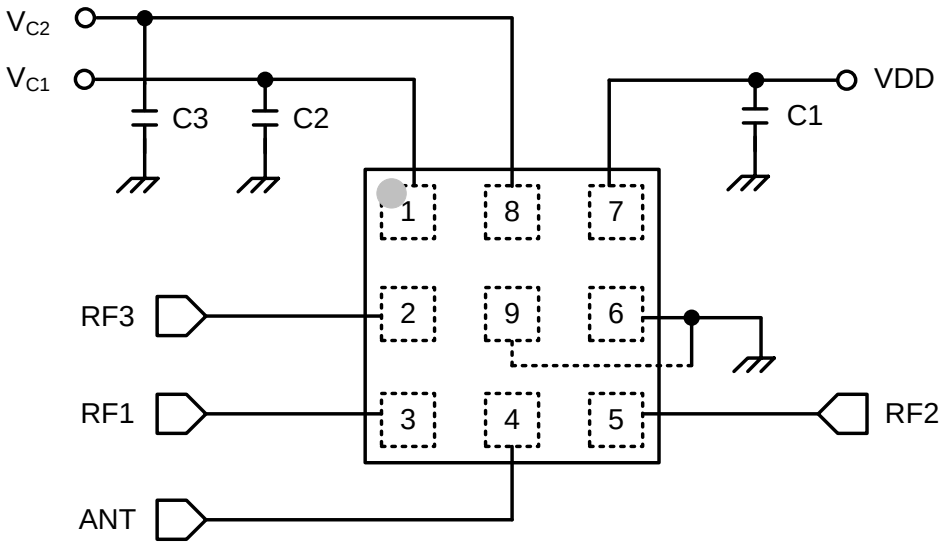




Pin Names and Descriptions

Pin	Name	Description	Pin	Name	Description
1	V_{C1}	DC control voltage 1	6	GND	Ground
2	RF3	RF path 3	7	VDD	DC power supply
3	RF1	RF path 1	8	V_{C2}	DC control voltage 2
4	ANT	Antenna port	9	GND	Ground
5	RF2	RF path 2			

Application Circuit



Parts List

Parts No.	Value
C1-C3	100 pF

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
RFx Input Power	Pin		+36	dBm
DC Supply Voltage	VDD		+5.0	V
DC Control Voltage	V_{CTL}		+3.5	V
Storage temperature	T_{STG}	-40	+150	°C
Operating temperature	T_{OP}	-40	+90	°C

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

Electrical Specifications

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
RF Specifications						
Operating frequency	f		0.5		2.7	GHz
Insertion loss (ANT to RF1/2/3 port)	IL	0.5 ~ 1.0 GHz 1.0 ~ 2.2 GHz 2.2 ~ 2.7 GHz		0.30 0.40 0.50	0.40 0.50 0.65	dB dB dB
Isolation (ANT to RF1/2/3 port)	Iso	0.5 ~ 1.0 GHz 1.0 ~ 2.2 GHz 2.2 ~ 2.7 GHz	30 24 20	35 28 24		dB dB dB
On state match	VSWR	2.0 GHz		1.43	2.0	-
Input Power 1dB Compression Point	P_{1dB}	0.1 ~ 2.7 GHz		+36		dBm
RFx Harmonics	$2f_0$	PIN = +26dBm, f = 0.8 ~ 2.7GHz		-78	-64	dBm
	$3f_0$	PIN = +26dBm, f = 0.8 ~ 2.7GHz		-67	-54	dBm
3^{rd} Order Intermodulation Distortion	IMD3	f1 = 897.5MHz at +21dBm f2 = 852.5MHz at -15dBm, RX= 942.5MHz		-120	-115	dBm
		f1 = 1880MHz at +21dBm f2 = 1800MHz at -15dBm, RX= 1960MHz		-118	-113	dBm
DC Specification (Decoder)						
Supply Voltage	VDD		2.5	2.8	5.0	V
Supply Current	I_{DD}	VDD= 2.8V		71	80	μA
Control Voltage(High)	V_{CTL}		1.3	1.8	2.8	V
Control Voltage(Low)	V_{CTL}		0		0.45	V
Control Current	I_{CTL}	V_{CTL}= 1.8V			1.0	μA
Switching Specification						
Switching speed	T_{SW}	50% V_{CTL} to 90/10% RF		4	8	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_{C1}	V_{C2}	RF1	RF2	RF3
1	0	on	off	off
0	1	off	on	off
1	1	off	off	on

Typical Performance Characteristics

Isolation Matrix : ANT to Off Path

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

On Path	Freq (GHz)	Isolation (dB)		
		RF1	RF2	RF3
RF1	1.0		-37.3	-42.6
	2.2		-28.4	-32.3
	2.7		-25.9	-28.3
RF2	1.0	-35.1		-35.8
	2.2	-27.1		-28.9
	2.7	-23.6		-26.3
RF3	1.0	-38.7	-35.3	
	2.2	-26.1	-27.1	
	2.7	-22.6	-25.0	

Insertion Loss and Return Loss Matrix

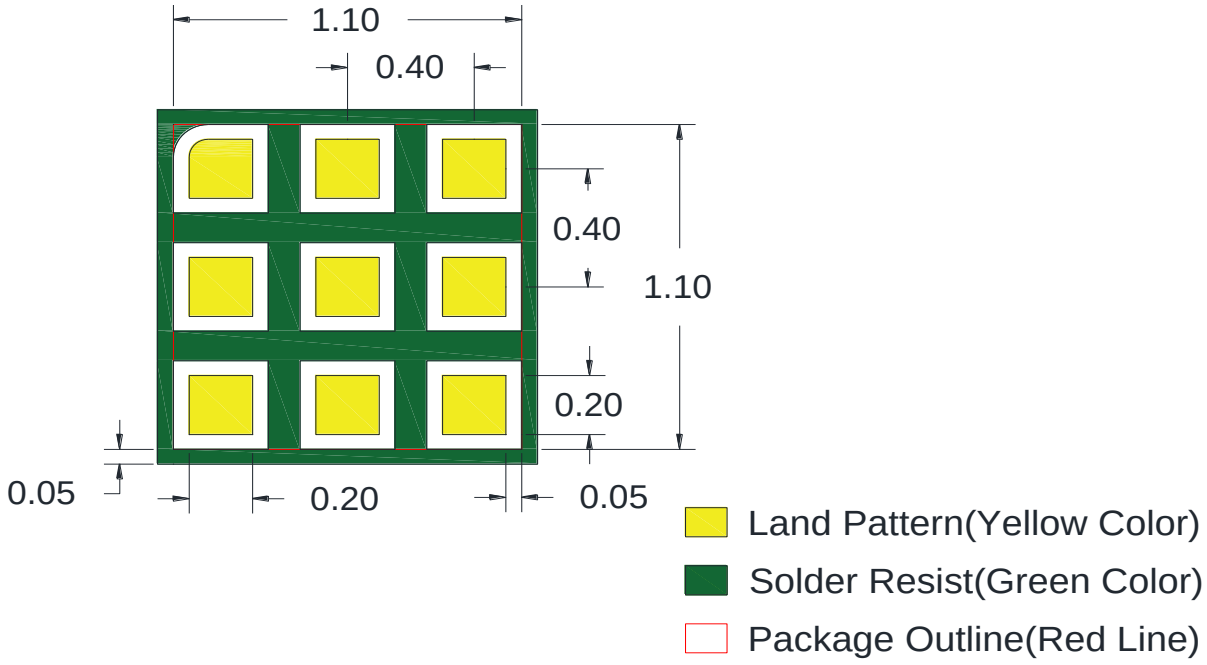
(Top= 25°C, VDD=2.8V, V_{CTL}=0/1.8V, Characteristic Impedance Z_O= 50 Ω, Unless Otherwise Noted)

On_Path	Freq (GHz)	IL (dB)	RL_Pole (dB)	RL_Throw (dB)
RF1	1.0	-0.29	-25.1	-29.3
	2.2	-0.39	-20.1	-20.2
	2.7	-0.48	-16.1	-16.4
RF2	1.0	-0.29	-29.9	-31.1
	2.2	-0.41	-22.6	-22.0
	2.7	-0.50	-17.7	-17.8
RF3	1.0	-0.30	-24.7	-27.5
	2.2	-0.41	-22.6	-22.7
	2.7	-0.50	-17.8	-18.2

Dimensions

Top View Side View Bottom View Unit: mm

Solder Land Pattern



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

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

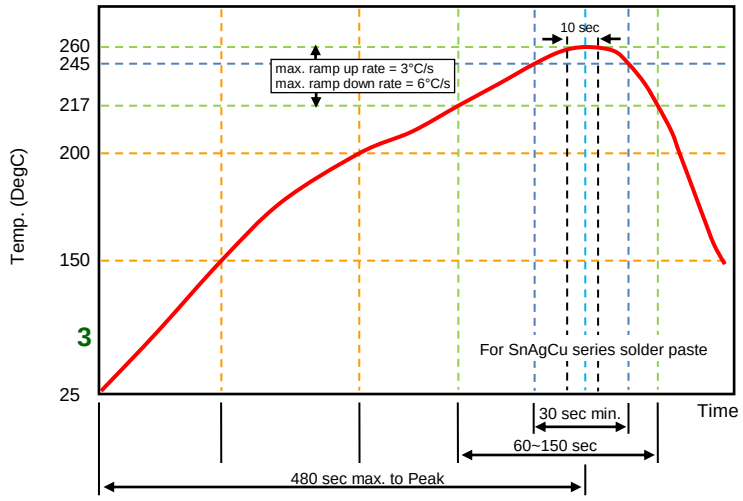


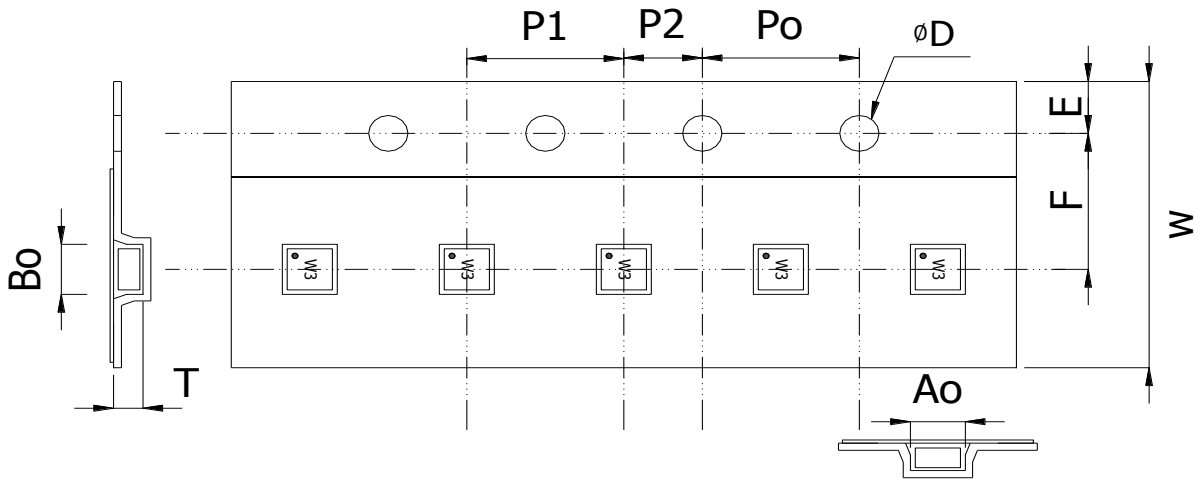
Figure 11. Infrared soldering profile

Ordering code

RF	ASW	M	T2628A	T
RF module RF: Walsin RF Switch Device	**Module type** ASW: Antenna Switch	**Application** M: SP3T	**Design Code**	**Packing** T: Taping

Minimum Ordering Quantity: 3000 pcs per reel.

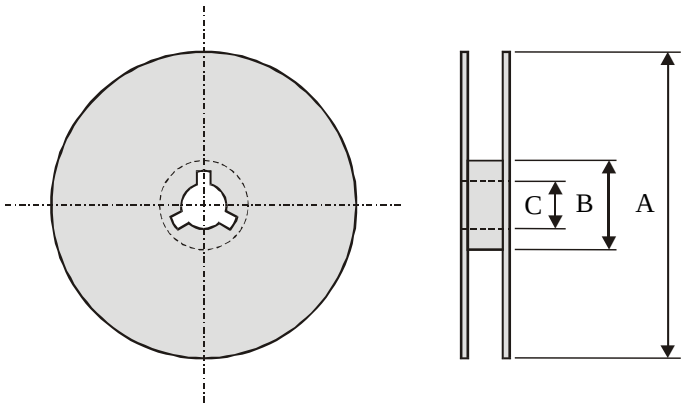
Packaging



Plastic Tape specifications (unit :mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.32 ± 0.10	1.32 ± 0.10	1.50 ± 0.05	0.72 ± 0.10	8.0 ± 0.10
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)	Φ178.0	Φ54.0	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.