RTC6608O : 0.1 – 6.0 GHz SPDT Switch

Description

The RTC6608O is a GaAs pHEMT SPDT antenna switch operating from 0.1 up to 6.0 GHz frequency range. The RTC6608O exhibits low insertion loss, high isolation and low DC power consumption characteristics over broadband range. Due to the excellent performance, RTC6608O undertakes the wonderful choice of transmit/receive function in wireless applications such as WLAN, and IEEE 802.11 a/b/g/n.

Feature

- GaAs pHEMT process
- Low Control Voltage Operation : 0/+3.3 V
- Low Insertion Loss : 0.45 dB at 2.5 GHz and 0.6 dB at 5.8 GHz
- High Isolation : 26 dB at 2.5 GHz and 26 dB at 5.8 GHz
- High P1dB : +32 dBm at 3.3 V
- Package : 6L QFN 1.0*1.0*0.45 mm^3
- RoHS, Pb-free, Halogen Free Compliant
- Moisture Sensitivity Level : MSL-3

Application

- IEEE 802.11b DSSS WLAN
- IEEE 802.11a/b/g/n OFDM WLAN
- WLAN PC Card
- Access Point Applications

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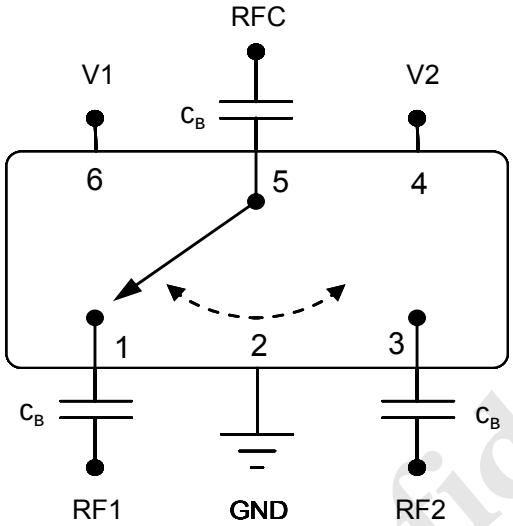
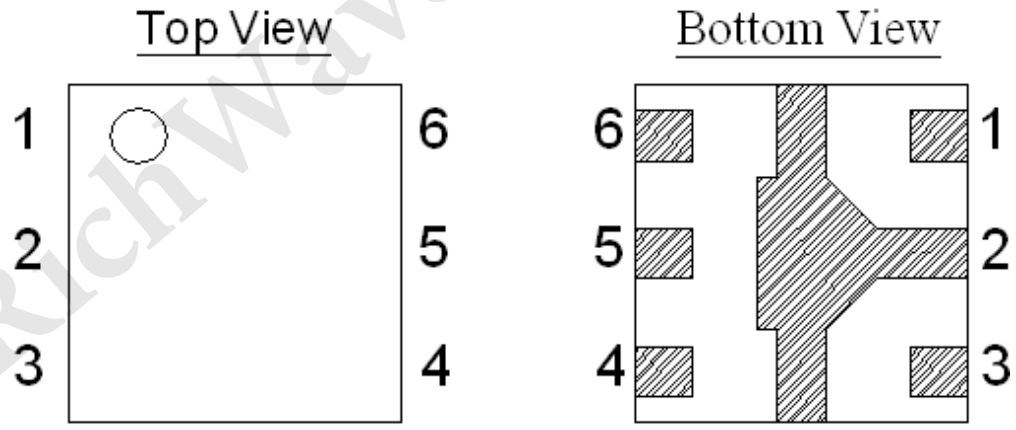
Functional Block Diagram & Pin Out



Note : DC blocking capacitors (C_B) 33pF must be supplied externally on all RF ports.



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Pin Function Description

Pin	Function	Description
1	RF1	RF Signal -1, DC blocking C_B needed
2	GND	Ground
3	RF2	RF Signal -2, DC blocking C_B needed
4	V2	DC control voltage 2
5	RFC	Antenna port, DC blocking C_B needed
6	V1	DC control voltage 1
Paddle		Paddle must be connected to GND

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Absolute Maximum Ratings

Parameter	Rating	Units
Control Voltage (V1, V2)	6	V
Max Input Power (RFC–RF1, RFC–RF2)	+33	dBm
Operating Temperature	-40 to +85	℃
Storage Temperature	-40 to +150	℃
Maximum Junction Temperature	+150	℃

Note : Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only, functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation between operation range maximum and absolute maximum for extended periods may affect device reliability.

Truth Table

Low Insertion Loss Path	V1	V2
RFC – RF1	L	H
RFC – RF2	H	L

Recommended Operating Range

Parameter	Symbol	Min	Typ	Max	Unit
Operation Frequency	f1	0.1	–	6.0	GHz
Control Voltage High	V1, V2	2.8	3.3	3.6	V
Control Voltage Low	V1, V2	0	0	0.2	V

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Electrical Specification

All measurements made in a 50Ω system with control voltage 0/+3.3V, T=25℃, unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Insertion Loss	IL_1	2.4 – 2.5 GHz	–	0.45	0.65	dB
	IL_2	4.9 – 6.0 GHz	–	0.6	0.8	dB
Isolation (RF1,2 to RFC)	Iso_1	2.4 – 2.5 GHz	23	27	–	dB
	Iso_2	4.9 – 6.0 GHz	26	34	–	dB
Isolation (RF1 to RF2)	Iso_3	2.4 – 2.5 GHz	22	26	–	dB
	Iso_4	4.9 – 6.0 GHz	22	26	–	dB
Return loss (Insertion loss state)	RL_1	2.4 – 2.5 GHz	15	22	–	dB
	RL_2	4.9 – 6.0 GHz	15	20	–	dB
Input power for 1dB compression	P1dB_2.8	V = 2.8V	–	30	–	dBm
	P1dB_3.3	V = 3.3V	–	32	–	dBm
2^{nd} harmonic	2fo	f = 2.45 GHz Pin = +25 dBm	–	42	–	dBc
3^{rd} harmonic	3fo	f = 2.45 GHz Pin = +25 dBm	–	59	–	dBc
Error Vector Magnitude, WLAN	EVM_2.5%	f = 2.45 GHz, WLAN,802.11g,OFDM, 54Mbps, 64QAM, P_{in} for 2.5% error	–	24.5	–	dBm
Switching rise/fall time	tr	10/90% to 90/10% RF	–	80	–	ns
Switching on/off time	tc	50% Vc to 90/10% RF	–	100	–	ns
Control Current	Ictl	V = 3.3 V, RF none	–	1	100	μA

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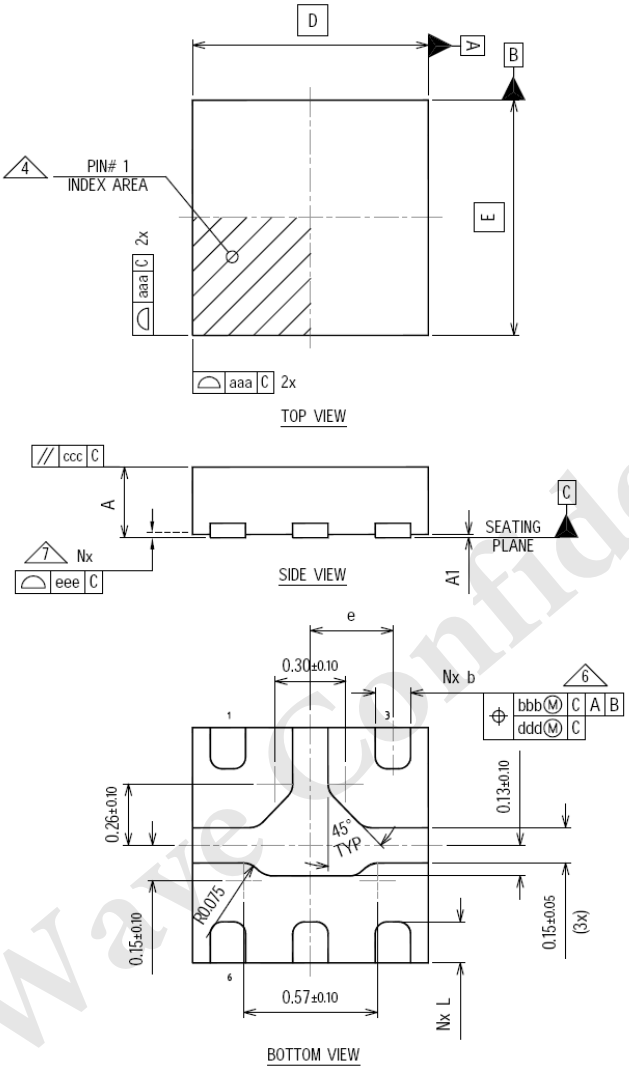
Package Outline Dimension



Symbol	MAXIMUM	NOMINAL	MINIMUM
A	0.40	0.45	0.50
A1	0.00	0.02	0.05
b	0.10	0.15	0.20
D	0.90	1.00	1.10
E	0.90	1.00	1.10
e	0.30	0.35	0.40
L	0.100	0.175	0.250
aaa	0.05		
bbb	0.07		
ccc	0.05		
ddd	0.05		
eee	0.05		
N	6		
ND	3		
Notes	1,2		

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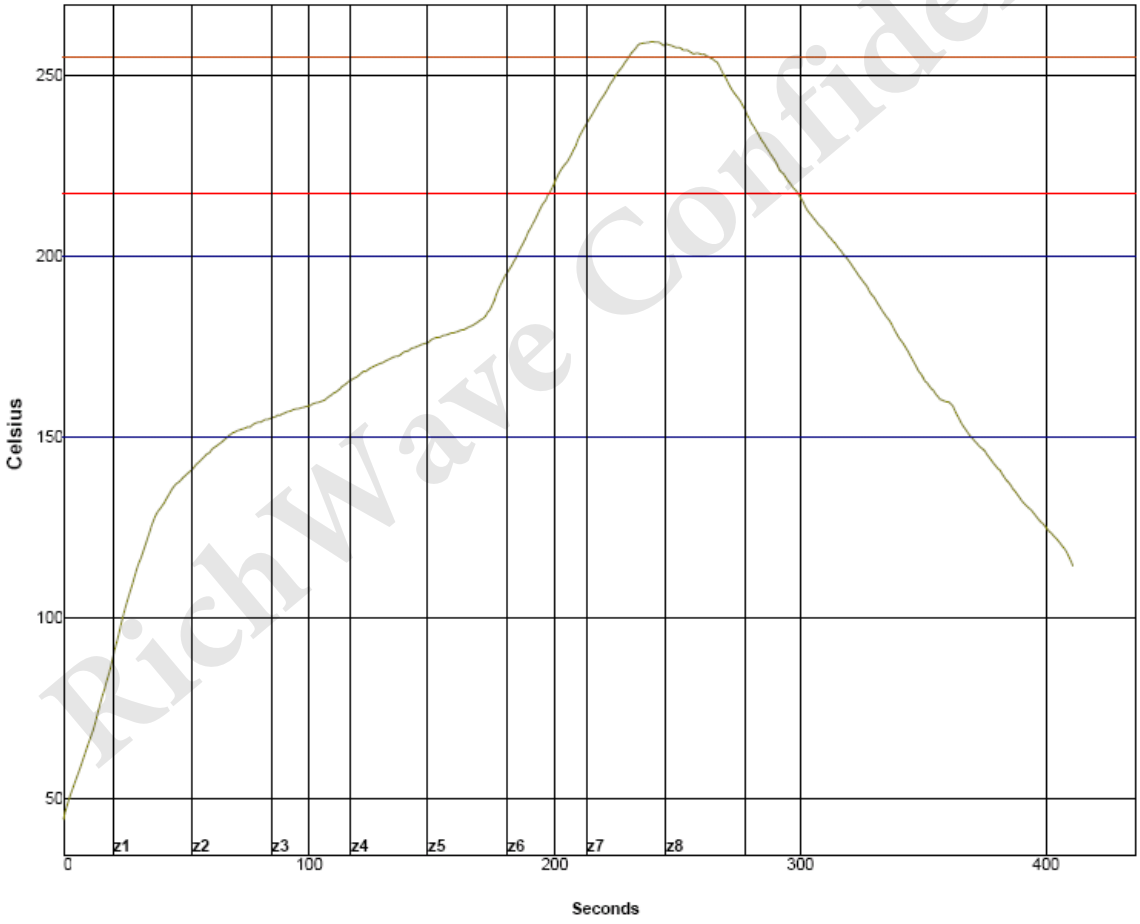
Recommended Solder Reflow Profiles

Average ramp-up rate (200˚C to peak)	3˚C/second max.
Preheat temperature 175 (+/-25) ˚C	60~120secs
Temperature maintained above 217˚C	60~150secs
Time within 5˚C of actual peak temperature	30 seconds min.
Peak temperature range	(260 +2/-2)˚C
Ramp down rate	6˚C/second max.
Time 25˚C to peak temperature	8 minutes max.

* Follow JEDEC spec J-STD-020D



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