Low Voltage and High Speed SPDT Analog Switch with True Isolation

Descriptions

The RLCS3257 is a single SPDT low on-resistance analog switch. It can operate from a single 1.5V to 5.5V power supply. The device offers low ON-state resistance and excellent ON-state resistance matching with break-before-make feature, to prevent signal distortion during the transferring of a signal from one channel to another. The device is capable of truly isolation. Even when A overrides VCC, very little current will flow back to the supply.

Features

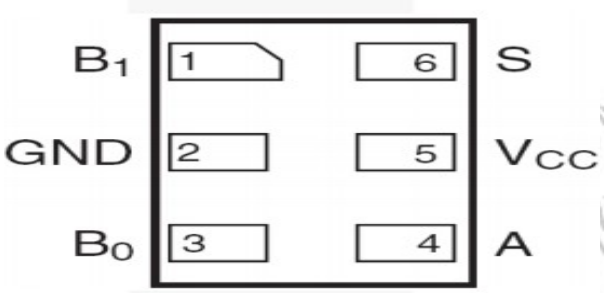
- Low On-resistance, Ron=1.5Ω when V_A=5V
- 1.8V Logic Compatible Control Pin
- V_A Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation: **-100**dB @ 100KHz
- Low Channel-to-Channel Crosstalk: **-97**dB @ 100KHz
- High Bandwidth (-3dB @700MHz) Suitable For USB2.0 High-Speed Routing
- Low Quiescent Current (<2uA) With Very Wide Supply Range (1.5V ~ 5.5V)
- DFN1109-6L Package

Applications

- Audio
- Video
- UART, USB2.0 Signal and Supply Routing
- Cell phones and TWS headset

Functions and Pin Configuration

Pin Number	Symbol	Descriptions
1	B1	Analog/Digital Signal Port (Normally open)
2	GND	Ground
3	B0	Analog/Digital Signal Port (Normally closed)
4	A	Common Signal Port
5	VCC	Single Power Supply
6	S	Logic Input Control



Function Descriptions

Logic Input	Function
S=0	B0=A
S=1	B1=A

Order Information

Package		Part Number	Quantity per Reel
DFN1010-6L	Tape and Reel	RLCS3257QN6/R6	3000PCS

Absolute Maximum Ratings (1)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3 ~ 6.5	V
Control Input Voltage	V_S	-0.3 ~ 6.5	V
Continuous Current Through A, B0, B1		±100	mA
Peak Current Through A, B0, B1 (pulsed at 1ms 50% duty cycle)		±200	mA
Storage Temperature Range	T_{STG}	-55 ~ 150	°C
Junction Temperature under Bias	T_J	150	°C
Lead Temperature (Soldering, 10 seconds)	T_L	260	°C
Thermal resistance	$R_{\theta JA}$	350	°C/W

Recommend operating ratings (2)

Parameter	Symbol	Value	Unit
Supply Voltage Operating	V_{CC}	1.5 ~ 5.5	V
Control Input Voltage	V_S	-0.3 ~ 5.5	V
Input Signal Voltage	V_A	-0.3 ~ 5.5	V
Operating Temperature	T_A	-40 ~ 85	°C

Note:

1. "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.

DC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max	Unit

					.	
Input logic high level	V_{IH}	VCC: 3.3 ~ 5.5V	1.6			V
		VCC: 1.5 ~ 3.3V	1.4			V
Input logic low level	V_{IL}	VCC: 3.3 ~ 5.5V			0.6	V
		VCC: 1.5 ~ 3.3V			0.4	V
Supply quiescent current	I_{CC}	I_A=0, V_S =0 or V_S =VCC			1.0	uA
Increase in I_{CC} per input	I_{CCT}	I_A=0, VCC=4.5V V_S>1.8 or V_S<0.5			1.0	uA
Off state leakage from A to B0(or B1)	I_A	V_A = 5.5V , $V_{B0(or\ B1)}$ = 0V			±2.0	uA
On-Resistance	R_{ON1}	V_A=0 ~ 0.5V, I_A=30mA		3.0	3.5	Ω
	R_{ON2}	V_A=0.5 ~ 2.0V, I_A=30mA		3.6	3.9	Ω
	R_{ON3}	V_A=2.0 ~ 4.0V, I_A=30mA		2.5	3.5	Ω
	R_{ON4}	V_A=4.0 ~ 5.5V, I_A=30mA		1.5	1.8	Ω
On-Resistance Flatness	R_{FLAT1}	V_A=0 ~ 0.5V, I_A=30mA		0.7		Ω
	R_{FLAT2}	V_A=0.5 ~ 2.0V, I_A=30mA		0.5		Ω
	R_{FLAT3}	V_A=2.0 ~ 4.0V, I_A=30mA		1.6		Ω
	R_{FLAT4}	V_A=4.0 ~ 5.5V, I_A=30mA		0.3		Ω
On-Resistance Matching Between Channels	Δ R_{ON}	V_A=0~5.5V, I_A=30mA,		0.1	0.2	Ω

AC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

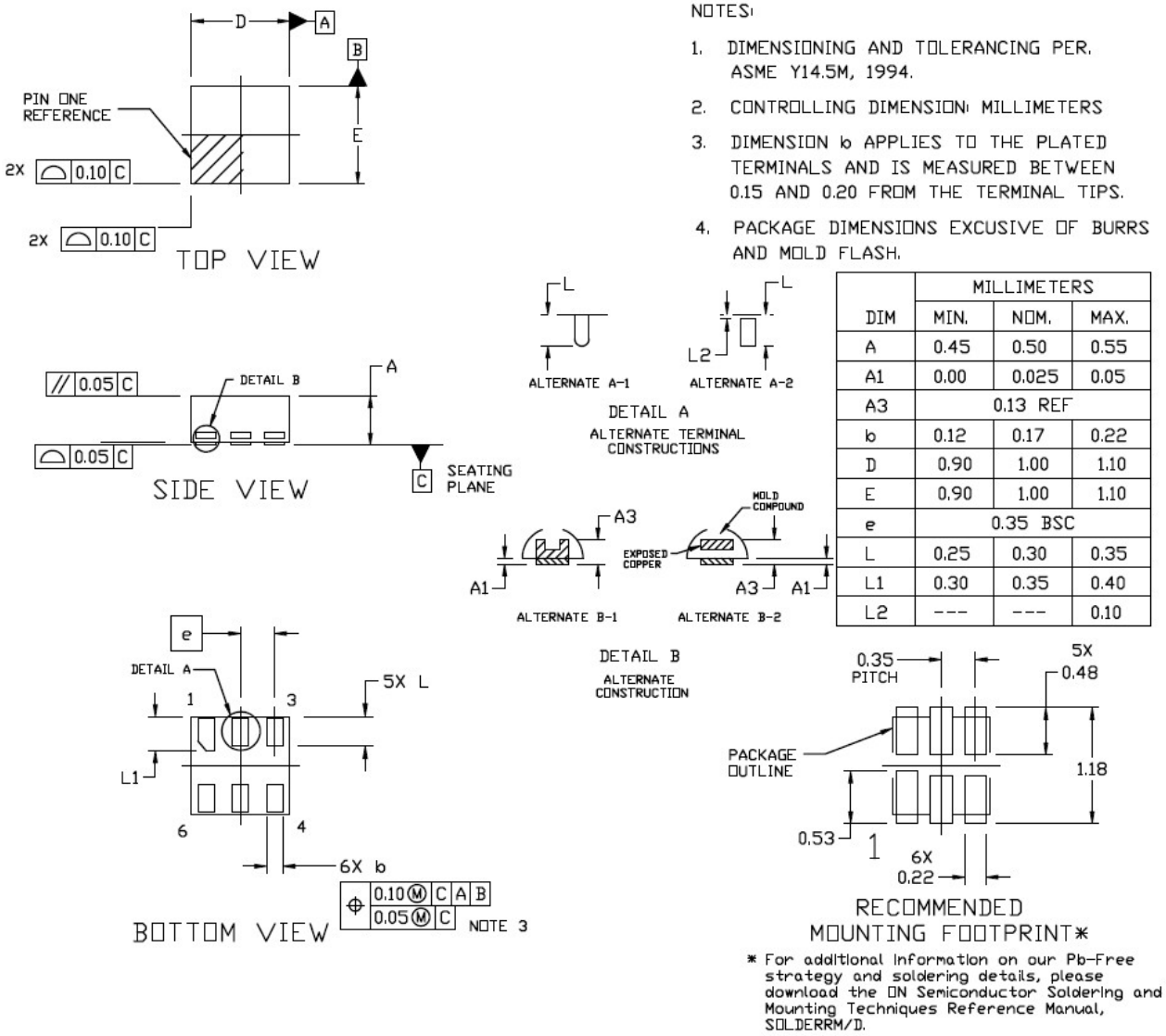
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	T_{ON}	V_A=1.5V, C_L=35pF, R_L=50Ω		200		ns
Turn-Off Time	T_{OFF}	V_A=1.5V, C_L=35pF, R_L=50Ω		200		ns
Break-Before-Make time	T_{BBM}	V_A=1.5V, C_L=35pF, R_L=50Ω		500		ns
-3dB Bandwidth	BW	R_L=50Ω, C_L=0pF		700		MHz
Off isolation	OIRR	F=1KHz, R_L=50Ω		-81		dB
		F=10KHz, R_L=50Ω		-80		dB
Crosstalk	Xtalk	F=1KHz, R_L=50Ω		-83		dB
		F=10KHz, R_L=50Ω		-82		dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz V_A=600mVp-p @R_L=32Ω,		-80		dB

Capacitance (Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C_{OFF}	F=100KHz, VCC=3.3		5		pF
On capacitance	C_{ON}	F=100KHz, VCC=3.3		7		pF

Package Outline Dimensions

DFN 1.1x0.9-6L



NOTES:

1. DIMENSIONING AND TOLERANCING PER. ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO THE PLATED TERMINALS AND IS MEASURED BETWEEN 0.15 AND 0.20 FROM THE TERMINAL TIPS.
4. PACKAGE DIMENSIONS EXCUSIVE OF BURRS AND MOLD FLASH.

	MILLIMETERS		
DIM	MIN.	NOM.	MAX.
A	0.45	0.50	0.55
A1	0.00	0.025	0.05
A3	0.13 REF		
b	0.12	0.17	0.22
D	0.90	1.00	1.10
E	0.90	1.00	1.10
e	0.35 BSC		
L	0.25	0.30	0.35
L1	0.30	0.35	0.40
L2	---	---	0.10

* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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