Low On Resistance, Quad SPDT Analog Switch

Descriptions

The RLCS4899 is a quad SPDT analog switch featuring ultra-low 0.5Ω on-resistance (typical at 3.0V VCC), operating from 2.3V to 4.5V with break-before-make switching. Its TTL-compatible control inputs integrate smart circuitry to minimize VCC leakage when control voltages are below VCC, enabling direct baseband processor GPIO interfacing without level shifters for optimal power efficiency in mobile applications. The RLCS4899 is available in QFN1.8x2.6-16L package

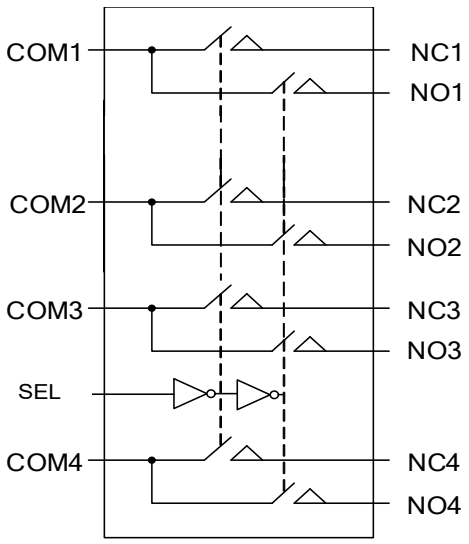
Features

- Supply voltage: 1.5 ~ 5.5V
- ultra-low On Resistance: 1.5 Ω
- -3dB Bandwidth :700MHz
- Rail-to-Rail Signal Range
- Break-Before-Make Switching
- Low quiescent current
- QFN 1.8x2.6-16L Package

Applications

- Cell phones
- PDA
- Digital Camera and Notebook
- LCD Monitor, TV
- Set-Top Box
- Audio and Video Signal Routing
- Other electronics equipment

Functional Block Diagram



Pin Configuration

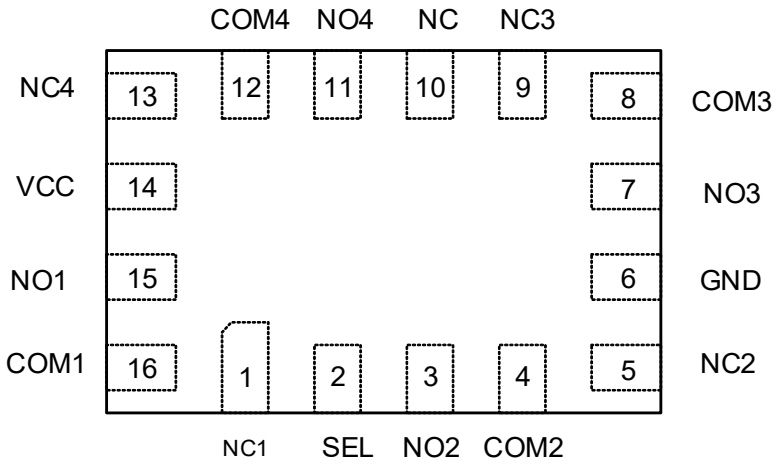


Fig.1 Pin configuration (Top view) QFN1.8x2.6-16L

Pin Descriptions

Pin Number	Symbol	Descriptions
4,8,12,16	COMX	Common Data Port
1,5,9,13	NCX	Data Port (Normally closed)
3,7,11,15	NOX	Data Port (Normally open)
2	SEL	Logic Input Control
14	VCC	Positive Power Supply
6	GND	Ground

Note: X=1 or 2,3,4

Function Descriptions

SEL	Function
0	NC1 Connected to COM1, NC2 Connected to COM2 NC3 Connected to COM3, NC4 Connected to COM4
1	NO1 Connected to COM1, NO2 Connected to COM2 NO3 Connected to COM1, NO4 Connected to COM2

Order Information

Package		Part Number	Quantity Per Reel
QFN1.8x2.6-16L	Tape and Reel	RLCS4899QN16/R6	5,000PCS

Absolute Maximum Ratings (1)

Parameter	Symbol	Value	Unit
Supply Voltage	VCC	-0.3 ~ 6.5	V
Control Input Voltage	VIN	-0.3 ~ 6.5	V
DC Input Voltage (2)	VINPUT	-0.3 ~ 6.5	V
Continuous Current NO_NC_COM_		±100	mA
Peak Current NO_NC_COM_ (pulsed at 1ms 50% duty cycle)		±200	mA
Peak Current NO_NC_COM_ (pulsed at 1ms 10% duty cycle)		±200	mA
Storage Temperature Range	TSTG	-65 ~ 150	℃
Junction Temperature under Bias	TJ	150	℃
Lead Temperature (Soldering, 10 seconds)	TL	260	℃
Power Dissipation	PD	250	mW

Recommend operating ratings (3)

Parameter	Symbol	Value	Unit
Supply Voltage Operating	VCC	1.5 ~ 5.5	V
Control Input Voltage	VIN	0.0 ~ VCC	V
Input Signal Voltage	VIS	0.0 ~ VCC	V
Operating Temperature	TA	-40 ~ 85	℃
Input Raise and Fall Time(Control Input VCC=2.3~3.6V)	tr,tf	0 ~ 10	ns/V
Thermal Resistance	RθJA	350	℃/W

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.
2. The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.
3. Control input must be held high or Low, it must not float.

DC Electronics Characteristics (Ta=25°C, VCC=4.5V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	VIH	VCC: 3.0 ~ 4.5	1.6			V
		VCC: 2.3 ~ 3.0	1.4			V
Input logic low level	VIL	VCC: 3.0 ~ 4.5			0.6	V
		VCC: 2.3 ~ 3.0			0.4	V
Supply quiescent current	ICC	IOUT=0, VIN =0 or VIN =VCC			1.0	uA
Increase in ICC per input	ICCT	IOUT=0, VCC=4.5 VIN>1.8 or VIN<0.5			2.0	uA
Input leakage current	IIN	VSEL=VCC			±1.0	uA
Off state switch leakage current	IOFF				±1.0	uA
On state switch leakage current	ION				±1.0	uA
On-Resistance	RON	VCC=4.5V, VIS=0~4.5V, ION=100mA,		1.5		Ω
		VCC=3.0V, VIS=0~3.0V, IOUT=100mA,		1.8		Ω
On-Resistance Matching Between Channels	Δ RON	VCC=4.5V, VIS=0.8V, IOUT=100mA,		0.1		Ω
		VCC=3.0V, VIS=0.8V, IOUT=100mA,		0.14		Ω
On-Resistance Flatness	RFLAT(ON)	VCC=4.5V, VIS=0~4.5V, IOUT=100mA,			0.5	Ω
		VCC=3.0V, VIS=0~3.0V, IOUT=100mA,			0.8	Ω

AC Electronics Characteristics (Ta=25°C, VCC=4.5V, unless otherwise noted)

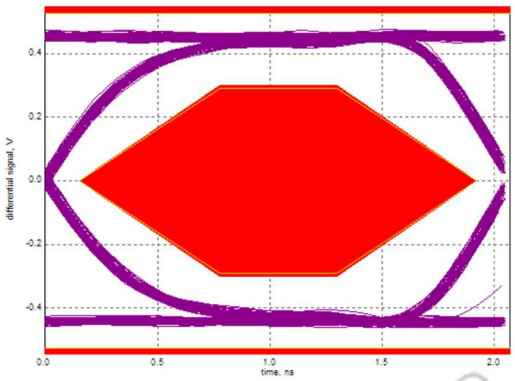
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	TON	VCC=4.5V, VIS=1.5V, CL=35pF, RL=50Ω		200		ns
Turn-Off Time	TOFF	VCC=4.5V, VIS=1.5V, CL=35pF, RL=50Ω		200		ns
Break-Before-Make time	TBBM	Generate by design		100		ns
-3dB Bandwidth	BW	RL=50Ω, CL=0pF		700		MHz
Off isolation (Per Channel)	OIRR	F=100KHz, RL=50Ω		-50		dB
Crosstalk (Channel to Channel)	Xtalk	F=100KHz, RL=50Ω		-50		dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz RL=32Ω, VIS=0.5Vp-p		-80		dB

Capacitance (Ta=25℃ unless otherwise noted)

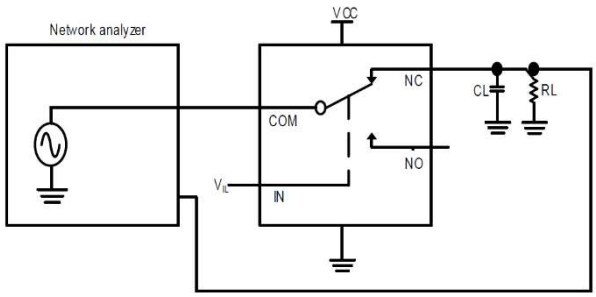
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	COFF	F=1MHz,VCC=3.3V		5		pF
On capacitance	CON	F=1MHz,VCC=3.3V		8		pF

Typical Characteristics (Ta=25℃, VCC=3.3V, unless otherwise noted)

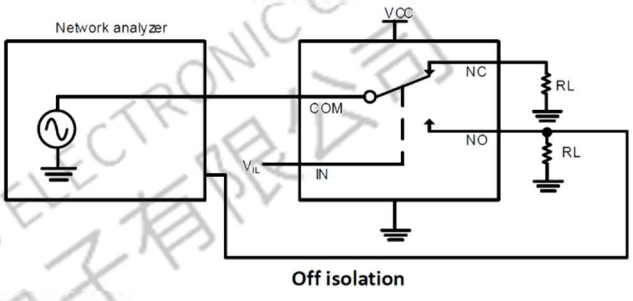
Bandwidth



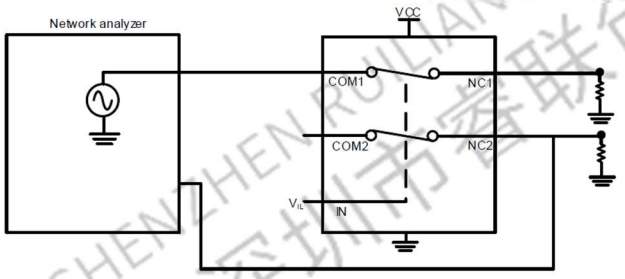
Eye Diagram (480Mbps)



Bandwidth

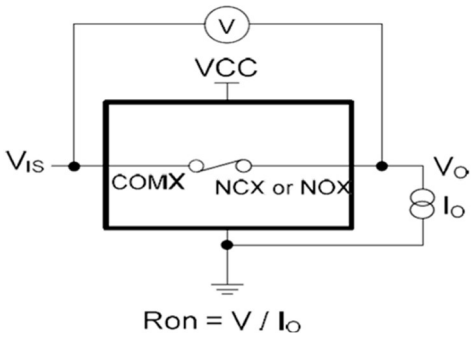


Off isolation

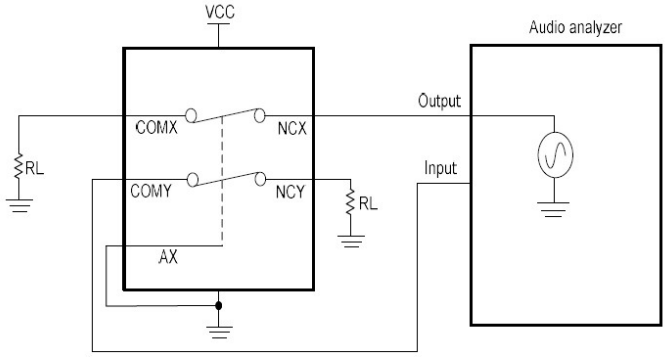


Crosstalk

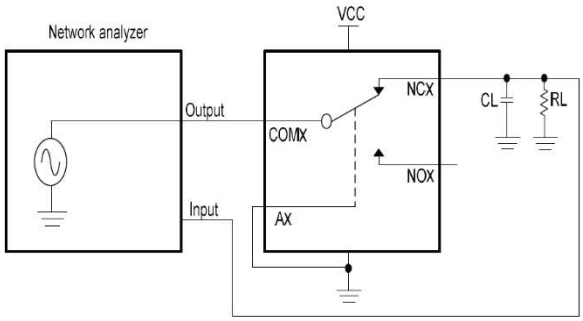
Test Circuits



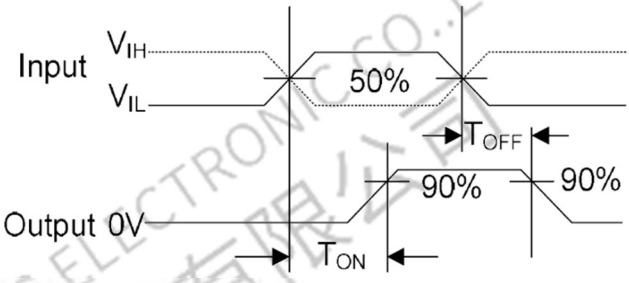
ON-Resistance (RoN)



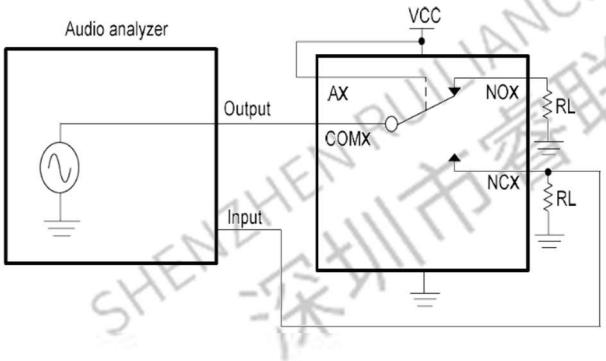
Crosstalk (Xtalk)



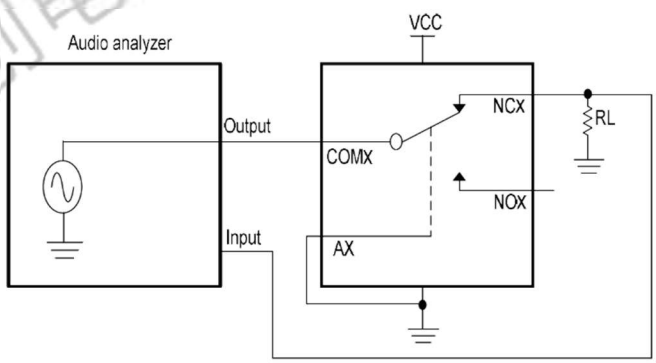
Bandwidth (BW)



ON/OFF Time Waveforms (TON / TOFF)



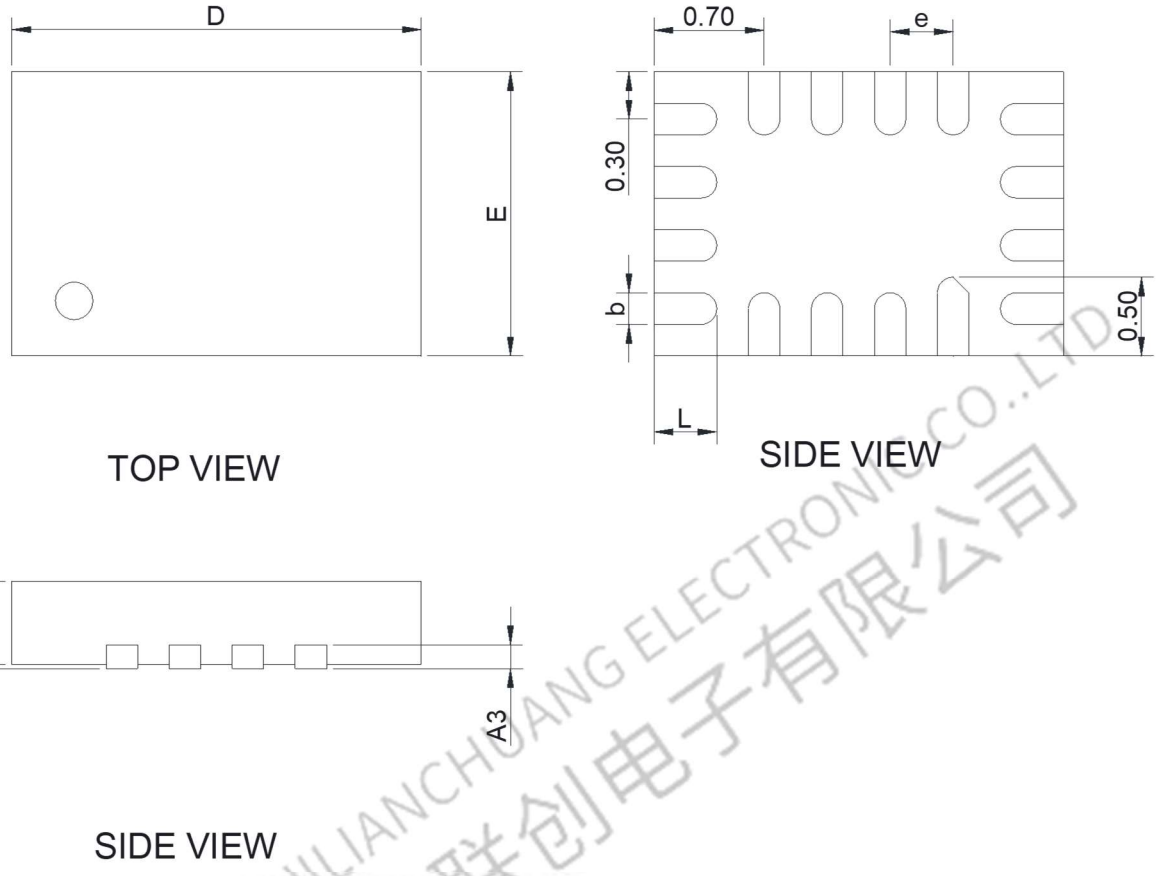
Off isolation (OIRR)



THD+N

Package Outline Dimensions

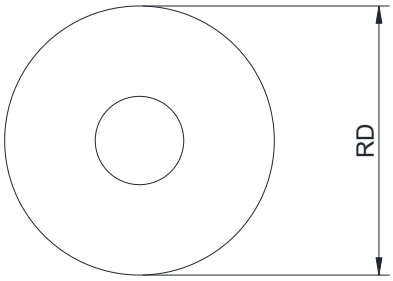
QFN 1.8x2.6-16L



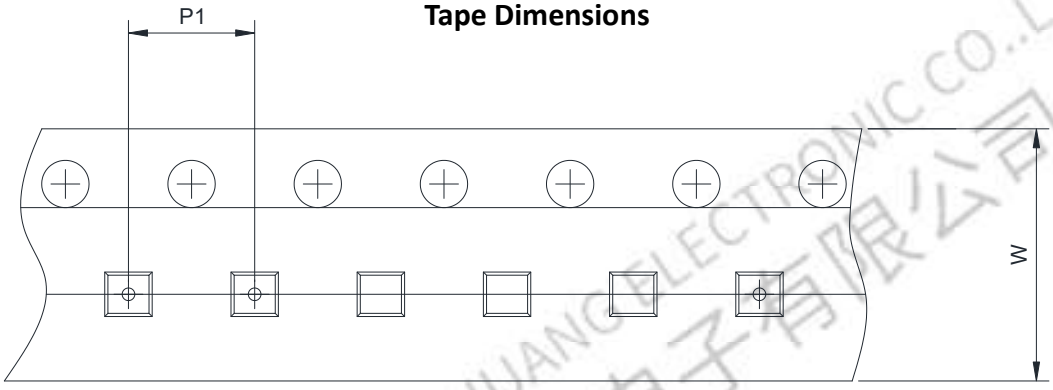
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.50	0.55	0.60
A1	0.00	-	0.05
A3	0.15 Ref.		
D	2.55	2.60	2.65
E	1.75	1.80	1.85
L	0.30	0.40	0.50
b	0.15	0.20	0.25
e	0.40 BSC		

TAPE AND REEL INFORMATION

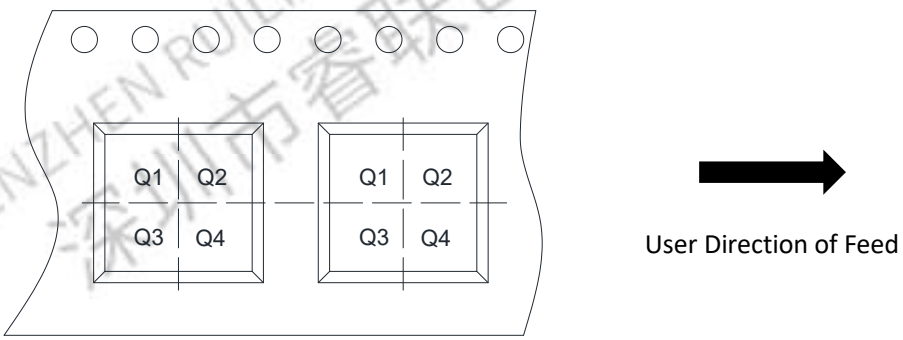
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	**Reel Dimension**	☑ 7inch	☐ 13inch		
W	**Overall width of the carrier tape**	☑ 8mm	☐ 12mm	☐ 16mm	
P1	**Pitch between successive cavity centers**	☐ 2mm	☑ 4mm	☐ 8mm	
Pin1	**Pin1 Quadrant**	☑ Q1	☐ Q2	☐ Q3	☐ Q4

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