

SN74CBTLV3257DR-TP

Low On Resistance, Quad SPDT Analog Switch

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Features

- Supply voltage: 1.5 ~ 5.5V
- ultra-low On Resistance: 4.0 Ω
- -3dB Bandwidth :500MHz
- Rail-to-Rail Signal Range
- Break-Before-Make Switching
- Low quiescent current over an Expanded Control Input Range
- Standard Products are Pb-free and halogen-free
- Packaging: SOP-16

Applications

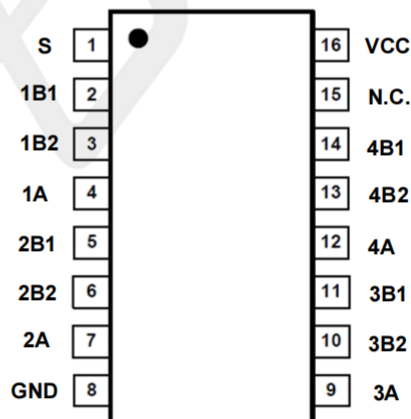
- Other electronics equipment
- Audio and Video Signal Routing
- LCD Monitor, TV and Set-Top Box
- Cell phones, PDA, Digital Camera and Notebook

General Description

The is a high performance, quad, Single Pole Double Throw (SPDT) analog switch that features ultra-low Ron of 4.0 Ω (typical) at 4.5V VCC. The operates over a wide VCC range of 2.3V to 4.5V and is designed for break-before-make operation. The select input is TTL-level compatible.

The is also featured with smart circuitry to minimize VCC leakage current even when the control voltage is lower than VCC supply voltage. This feature suits mobile handset applications by allowing direct interface with baseband processor general-purpose IO with minimal battery consumption. In other word, there is no need of additional device to shift control level to be the same as that of VCC in real application.

PIN CONFIGURATIONS (Top view)



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION	PIN NO.	PIN NAME	DESCRIPTION
1	S	Logic Input Control	9	3A	Common Data Port
2	1B1	Data Port (Normally closed)	10	3B2	Data Port (Normally open)
3	1B2	Data Port (Normally open)	11	3B1	Data Port (Normally closed)
4	1A	Common Data Port	12	4A	Common Data Port
5	2B1	Data Port (Normally closed)	13	4B2	Data Port (Normally open)
6	2B2	Data Port (Normally open)	14	4B1	Data Port (Normally closed)
7	2A	Common Data Port	15	N.C.	No Internal Connection
8	GND	Ground	16	VCC	Positive Power Supply



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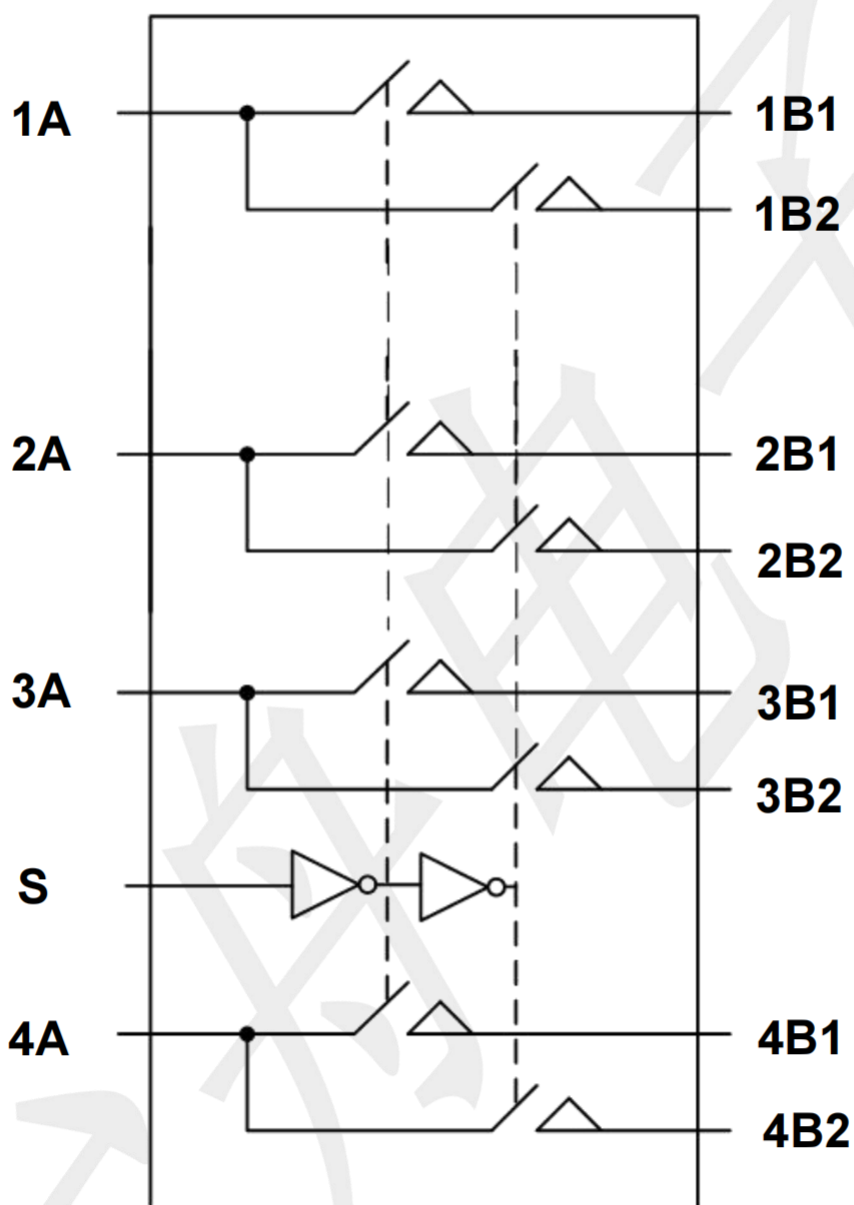
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BLOCK DIAGRAM



Function Descriptions

S	Function
0	1B1 Connected to 1A, 2B1 Connected to 2A 3B1 Connected to 3A, 4B1 Connected to 4A
1	1B2 Connected to 1A, 2B2 Connected to 2A 3B2 Connected to 3A, 4B2 Connected to 4A

Absolute Maximum Ratings

(Unless otherwise specified) ⁽¹⁾

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3 ~ 6.5	V
Control Input Voltage	V_{IN}	-0.3 ~ 6.5	V
DC Input Voltage ⁽²⁾	V_{INPUT}	-0.3 ~ 6.5	V
Continuous Current XB1_XB2_XA_		±100	mA
Peak Current XB1_XB2_XA_ (pulsed at 1ms 50% duty cycle)		±200	mA
Peak Current XB1_XB2_XA_ (pulsed at 1ms 10% duty cycle)		±200	mA
Storage Temperature Range	T_{STG}	-65 ~ 150	°C
Junction Temperature under Bias	T_J	150	°C
Lead Temperature (Soldering, 10 seconds)	T_L	260	°C
Power Dissipation	P_D	250	mW

Recommend operating ratings

(Unless otherwise specified) ⁽³⁾

Parameter	Symbol	Value	Unit
Supply Voltage Operating	V_{CC}	1.5 ~ 5.5	V
Control Input Voltage	V_{IN}	0.0 ~ V_{CC}	V
Input Signal Voltage	V_{IS}	0.0 ~ V_{CC}	V
Operating Temperature	T_A	-40 ~ 85	°C
Input Raise and Fall Time(Control Input $V_{CC}=2.3\sim3.6V$)	t_r, t_f	0 ~ 10	ns/V
Thermal Resistance	$R_{\theta JA}$	350	°C/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.

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WWW.TECHPUBLIC.COM**DC Electronics Characteristics**

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	V_{IH}	VCC: 3.0 ~ 4.5	1.6	--	--	V
		VCC: 2.3 ~ 3.0	1.4	--	--	V
Input logic low level	V_{IL}	VCC: 3.0 ~ 4.5	--	--	0.6	V
		VCC: 2.3 ~ 3.0	--	--	0.4	V
Supply quiescent current	I_{CC}	$I_{OUT}=0$, $V_{IN}=0$ or $V_{IN}=VCC$	--	--	1.0	uA
Increase in I_{CC} per input	I_{CCT}	$I_{OUT}=0$, VCC=4.5 $V_{IN}>1.8$ or $V_{IN}<0.5$	--	--	2.0	uA
Input leakage current	I_{IN}	$V_{SEL}=VCC$	--	--	±1.0	uA
Off state switch leakage current	I_{OFF}		--	--	±1.0	uA
On state switch leakage current	I_{ON}		--	--	±1.0	uA
On-Resistance	R_{ON}	VCC=4.5V, $V_{IS}=0\sim4.5V$, $I_{ON}=100mA$,	--	4.0	--	Ω
		VCC=3.0V, $V_{IS}=0\sim3.0V$, $I_{OUT}=100mA$,	--	5.0	--	Ω
On-Resistance Matching Between Channels	ΔR_{ON}	VCC=4.5V, $V_{IS}=0.8V$, $I_{OUT}=100mA$,	--	0.1	--	Ω
		VCC=3.0V, $V_{IS}=0.8V$, $I_{OUT}=100mA$,	--	0.14	--	Ω
On-Resistance Flatness	$R_{FLAT(ON)}$	VCC=4.5V, $V_{IS}=0\sim4.5V$, $I_{OUT}=100mA$,	--	--	0.5	Ω
		VCC=3.0V, $V_{IS}=0\sim3.0V$, $I_{OUT}=100mA$,	--	--	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	T _{ON}	VCC=4.5V, V _{IS} =1.5V, C _L =35pF, R _L =50Ω	--	200	--	ns
Turn-Off Time	T _{OFF}	VCC=4.5V, V _{IS} =1.5V, C _L =35pF, R _L =50Ω	--	200	--	ns
Break-Before-Make time	T _{BBM}	Generate by design	--	100	--	ns
-3dB Bandwidth	BW	R _L =50Ω, C _L =0pF	--	500	--	MHz
Off isolation (Per Channel)	OIRR	F=100KHz, R _L =50Ω	--	-50	--	dB
Crosstalk (Channel to Channel)	Xtalk	F=100KHz, R _L =50Ω	--	-50	--	dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz R _L =32Ω, V _{IS} =0.5Vp-p	--	-80	--	dB

Capacitance

(Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C _{OFF}	F=1MHz, VCC=3.3V	--	6	--	pF
On capacitance	C _{ON}	F=1MHz, VCC=3.3V	--	9	--	pF



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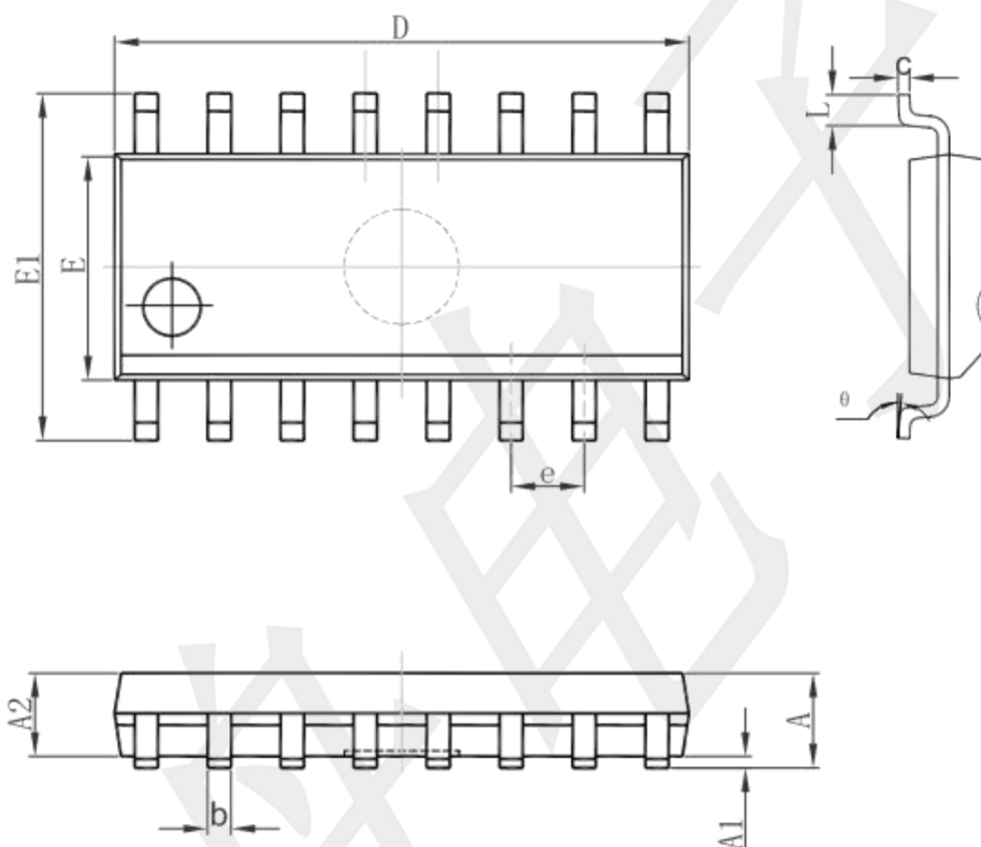
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Package information

SOP-16



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°