TECH PUBLIC
台舟电子

TPSN74LV4053ADR

Low On Resistance, triple SPDT Analog Switch

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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 over an Expanded Control Input Range
- Standard Products are Pb-free and halogen-free
- Packaging: SOP-16

General Description

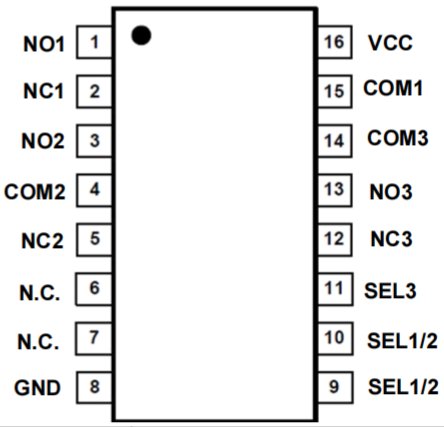
The is a high performance, quad, Single Pole Double Throw (SPDT) analog switch that features ultra-low Ron of 0.5 Ω (typical) at 3.0V VCC. The operates over a wide VCC range of 2.3V to 4.5V and is designed for break-before-make operation. The select input is TTL-level compatible.

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.

Applications

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

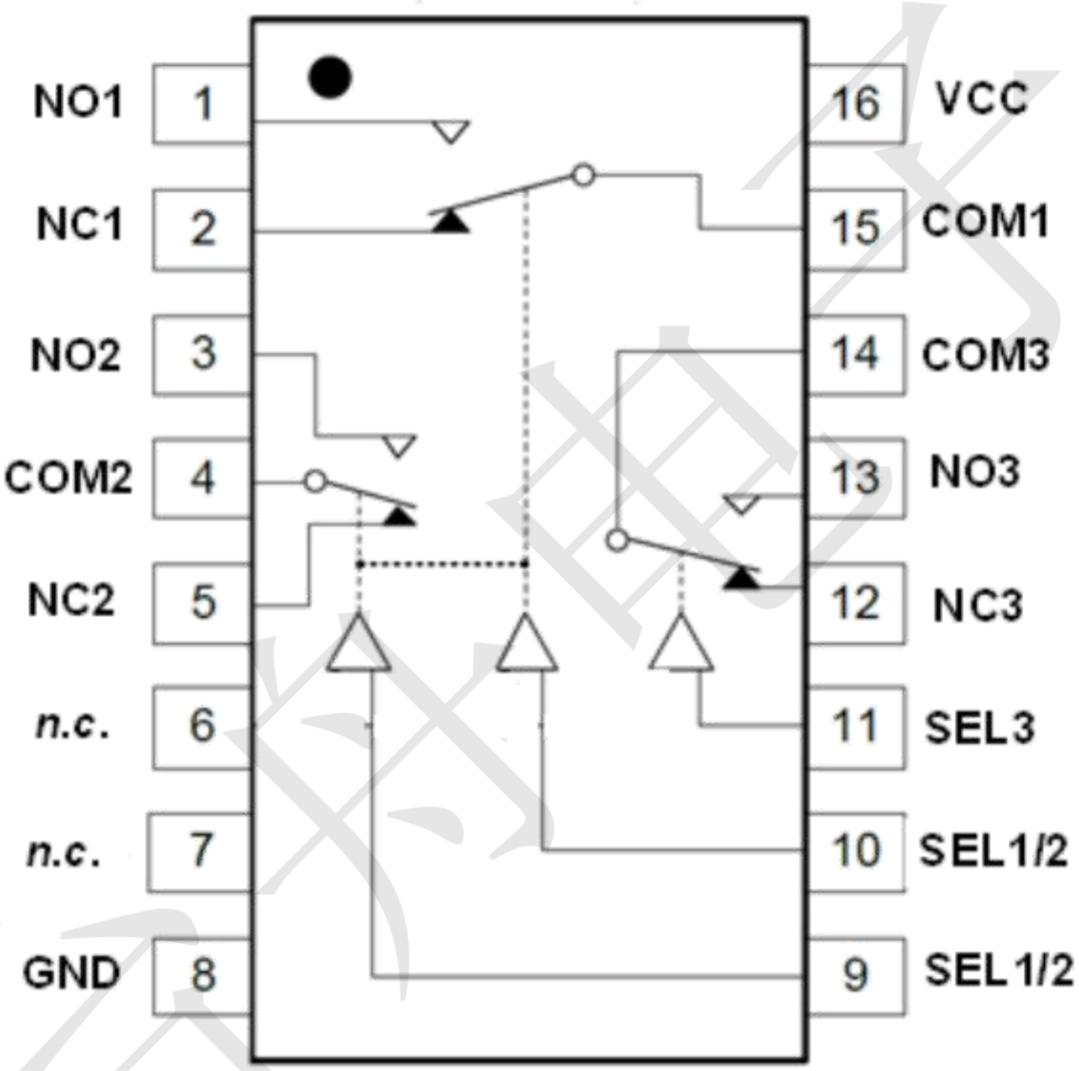
PIN CONFIGURATIONS (Top view)



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION	PIN NO.	PIN NAME	DESCRIPTION
1	NO1	Data Port (Normally open)	9	SEL1/2	Logic Input Control
2	NC1	Data Port (Normally closed)	10	SEL1/2	Logic Input Control
3	NO2	Data Port (Normally open)	11	SEL3	Logic Input Control
4	COM2	Common Data Port	12	NC3	Data Port (Normally closed)
5	NC2	Data Port (Normally closed)	13	NO3	Data Port (Normally open)
6	N.C.	No Internal Connection	14	COM3	Common Data Port
7	N.C.	No Internal Connection	15	COM1	Common Data Port
8	GND	Ground	16	VCC	Positive Power Supply

BLOCK DIAGRAM



Pin configuration (Top view)

Function Descriptions

SEL1/2, SEL3	Function
0	NC1 = COM1, NC2= COM2, NC3 = COM3
1	NO1 = COM1, NO2= COM2, NO3 = COM3

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 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	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}=2.3~3.6V)	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.

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}=0~4.5V, I_{ON}=100mA,	--	1.5	--	Ω
		VCC=3.0V, V_{IS}=0~3.0V, I_{OUT}=100mA,	--	1.8	--	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}=0~4.5V, I_{OUT}=100mA,	--	--	0.5	Ω
		VCC=3.0V, V_{IS}=0~3.0V, 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	--	700	--	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

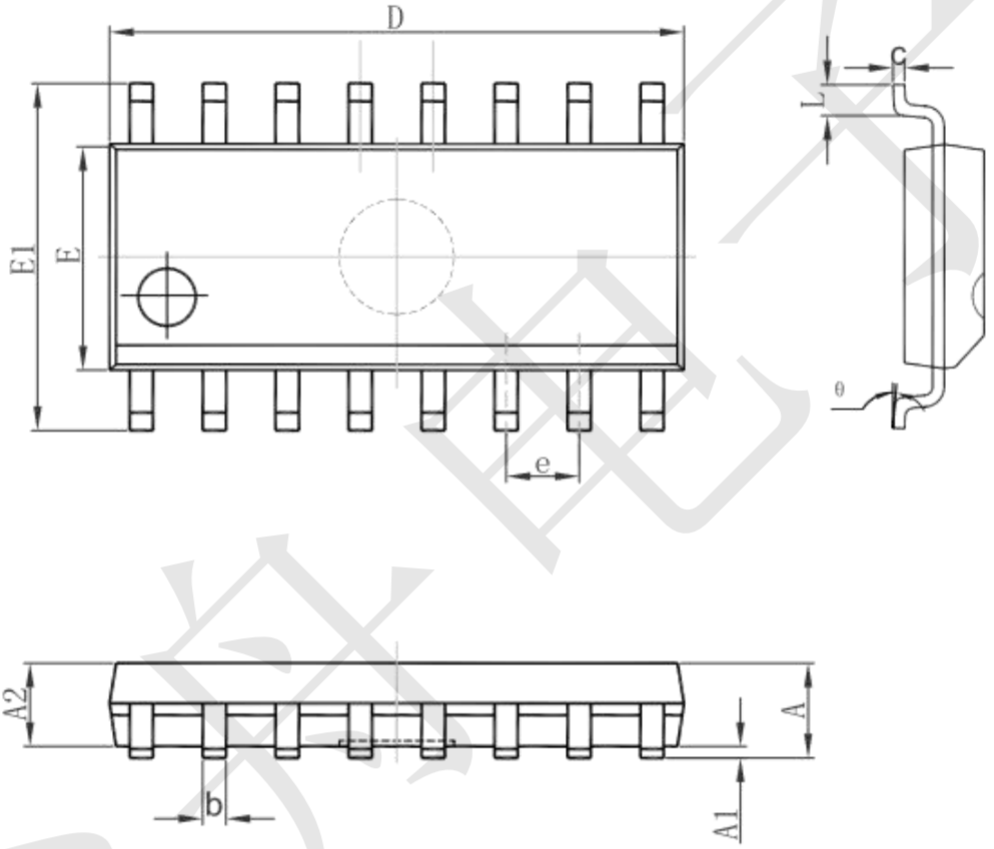
Capacitance

(Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C_{OFF}	F=1MHz, VCC=3.3V	--	5	--	pF
On capacitance	C_{ON}	F=1MHz, VCC=3.3V	--	8	--	pF

Package informantion

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°