TPG3157HC6

SINGLE-POLE,DOUBLE-THROW ANALOG SWITCH

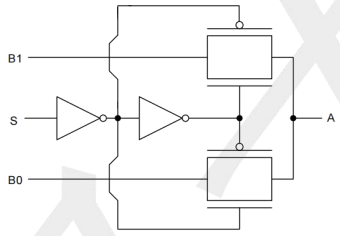
Features

- Low On-resistance, Ron=1.5Ω when A=5V
- 1.8V Logic Compatible Control Pin
- A Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation: -100dB @ 100KHz
- Low Channel-to-Channel Crosstalk: -97dB @ 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)

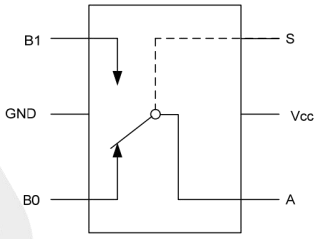
Applications

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

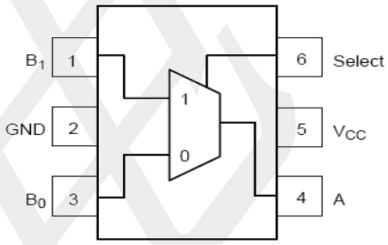
Logic Diagram

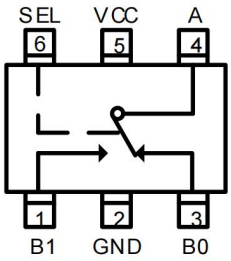


Logic Symbol



Analog Symbol





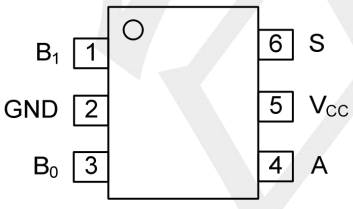
General Description

The is a low voltage single-pole,double-throw (SPDT) analog switch intending for use in chopping,modem, signal gating, and signal multiplexing for analog-to-digital and digital -to-analog conversion systems.

PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	B1	Independent input or output
2	GND	Ground (0 V)
3	B0	Independent input or output
4	A	Common output or input
5	VCC	Supply voltage
6	S	Select input

Pin Configuratio



SOT363

Function Table

INPUT(S)	OUTPUT(Y)
L	B0 Connected to A
H	B1 Connected to A

Note:H: HIGH voltage level;L: LOW voltage level.

Absolute Maximum Ratings

(Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.3 ~ +6.5	**V**
Switch Voltage	V_S	-0.3 ~ +6.5	**V**
Input Voltage	V_{IN}	-0.3 ~ +6.5	**V**
Continuous Current Through A, B0, B1		±128	**mA**
Peak Current Through A, B0, B1 (pulsed at 1ms 50% duty cycle)		±200	**mA**
Storage Temperature Range	T_{STG}	-55 ~ +150	℃
Operating Junction Temperature	T_J	150	℃
Junction to Ambient	$R\theta_{JA}$	350	℃/W

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Recommend operating ratings

(Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Operating	V_{CC}	1.5 ~ 5.5	**V**
Control Input Voltage	V_{SEL}	-0.3 ~ 5.5	**V**
Input Signal Voltage	V_A	-0.3 ~ 5.5	**V**
Operating Temperature	T_A	-40 ~ +85	℃

Electrical Characteristics (TA =25°C，unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	VCC=3.3V ~ 5.5V	1.6	--	--	V
		VCC=1.5V ~ 3.3V	1.4	--	--	V
Low-Level Input Voltage	V_{IL}	VCC=3.3V ~ 5.5V	--	--	0.6	V
		VCC=1.5V ~ 3.3V	--	--	0.4	V
Supply quiescent current	I_{CC}	I_A=0, V_{SEL} =0 or V_{SEL} =VCC	--	--	1.0	uA
Increase in ICC per input	I_{CCT}	I_A=0, VCC=4.5V V_{SEL}>1.8 or V_{SEL}<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	--	3.6	3.9	Ω
	R_{ON2}	V_A=0.5 ~ 2.0V, I_A=30mA	--	3.0	3.5	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	--	1.6	--	Ω
	R_{FLAT2}	V_A=0.5 ~ 2.0V, I_A=30mA	--	0.7	--	Ω
	R_{FLAT3}	V_A=2.0 ~ 4.0V, I_A=30mA	--	0.5	--	Ω
	R_{FLAT4}	V_A=4.0 ~ 5.5V, I_A=30mA	--	0.3	--	Ω
On-Resistance Matching Between Channels	ΔR_{ON}	V_A=0~5.5V, I_A=30mA	--	0.1	0.2	Ω

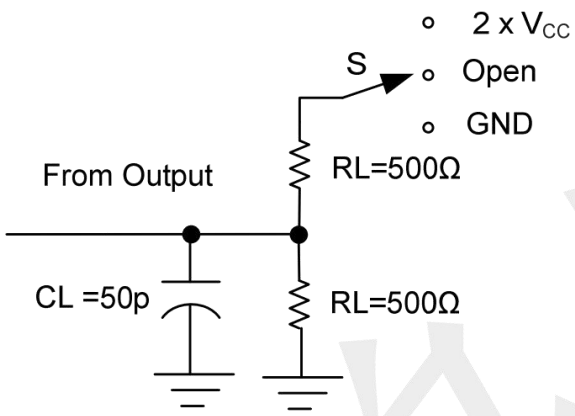
AC Electronics Characteristics (Ta=25oC, VCC=3.3V, unless otherwise noted)

PARAMETER	SYMBOL	TEST 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=25oC unless otherwise noted)

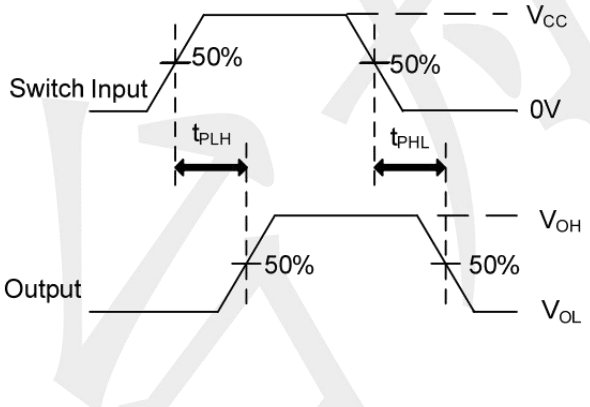
PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Off capacitance	C_{OFF}	F=100KHz, VCC=3.3	--	5.0	--	pF
On capacitance	C_{ON}	F=100KHz, VCC=3.3	--	7.0	--	pF

TEST CIRCUIT AND WAVEFORMS

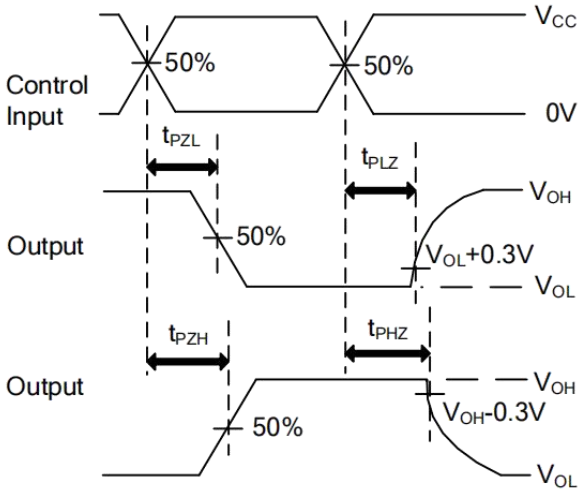


TEST CIRCUIT

TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	2 x V_{CC}



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

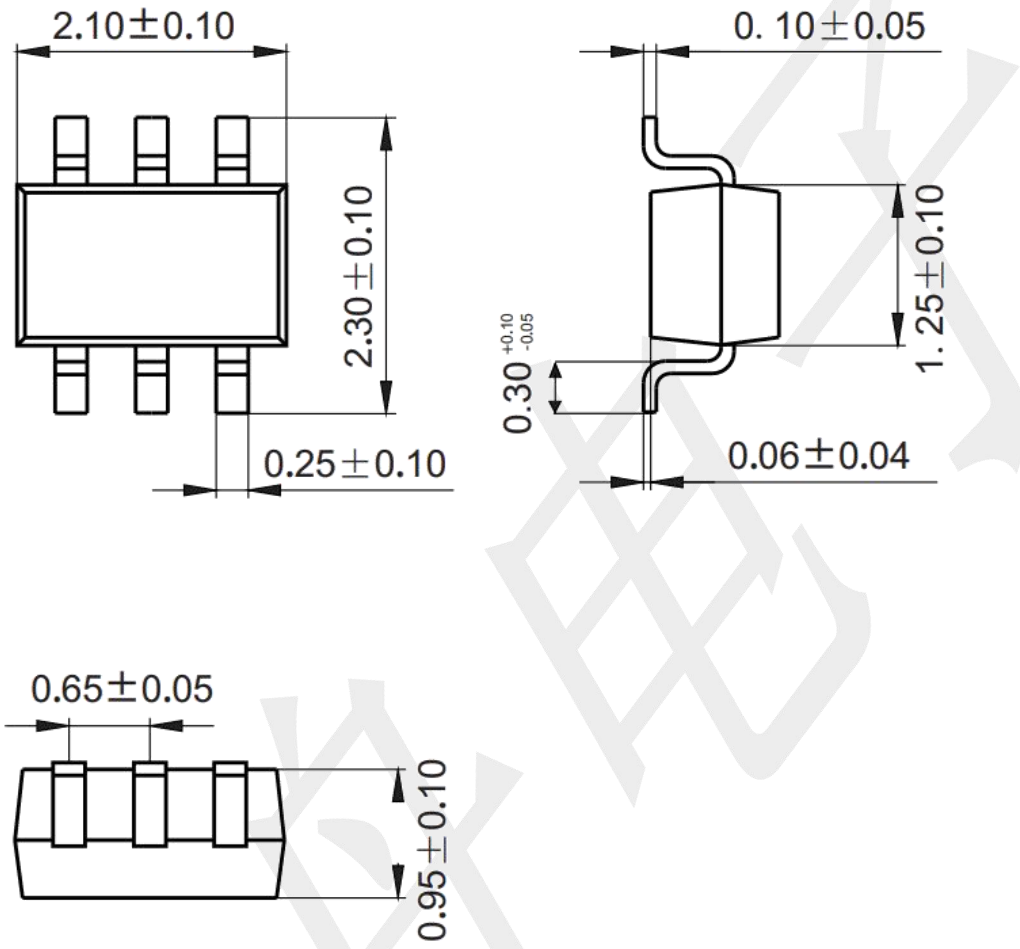


VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES

Note: C_L includes probe and jig capacitance.
PRR ≤1MHz, Z_O = 50Ω, t_R ≤2.5ns, t_F ≤2.5ns.

Package information

SOT363 (Unit: mm)



Mounting Pad Layout (unit: mm)

