

Features

- Operate from 1.65V to 5.5V
- Inputs accept voltages to 5.5V
- IOFF supports partial-power-down mode
- Low power dissipation
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 1000-V Charged-Device Model (C101)

General Description

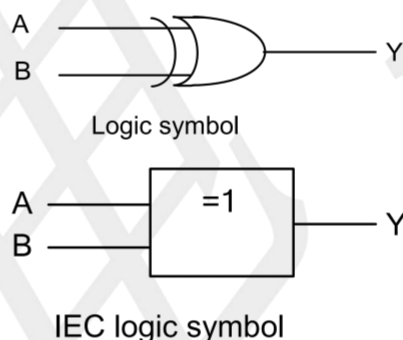
The is a single 2-input EXCLUSIVE-OR gate which provides the Function $Y = A \oplus B$ or $Y = \bar{A}B + A\bar{B}$ in positive logic. Inputs can be driven from either 3.3V or 5V devices. These features allow the use of these devices in a mixed 3.3V and 5V environment.

This device is fully specified for partial Power-down applications using IOFF. The IOFF circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

Applications

- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant(PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drive(SSD): Client and Enterprise
- Wireless Headset, Keyboard, and Mouse

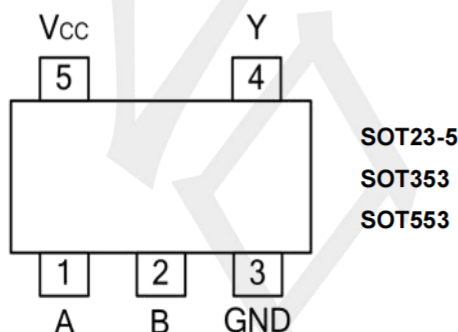
Logic Diagram



ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	Marking
TP74LVC1G86S5	SOT23-5	Tape and Reel,3000	S186
TP74LVC1G86C5	SOT353	Tape and Reel,3000	C186
TP74LVC1G86X5	SOT553	Tape and Reel,4000	CH7

Ordering Information

Pin Configuratio



Function Table

INPUT(A)	INPUT(B)	OUTPUT(Y)
L	L	L
H	L	H
L	H	H
H	H	L

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

Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	VCC		-0.5 ~ +6.5	V
Input Voltage	VIN		-0.5 ~ +6.5	V
Output Voltage	VOUT	Output in the Power-off state	-0.5 ~ +6.5	V
		Output in the High or Low state	-0.5 ~ VCC+0.5	V
VCC or GND Current	ICC	Output in the Power-off state	±100	mA
Continuous Output Current	IOUT	VOUT=0~VCC	±50	mA
Input Clamp Current	IIK	VIN<0	-50	mA
Output Clamp Current	IOK	VOUT<0	-50	mA
Storage Temperature Range	TSTG		-65 ~ +150	°C
Junction to Ambient	θ_{JA}	SOT-23-5	230	°C/W
		SOT353	280	°C/W
		SOT553	250	°C/W
		DFN1510-6	440	°C/W
		DFN0808-4	340	°C/W

Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	VCC	Operating	1.65	--	5.5	V
		Data retention only	1.5	--	--	V
Input Voltage	VIN		0	--	5.5	V
Output Voltage	VOUT	High or low state	0	--	VCC	V
Input Transition Rise or Fall rate	$\Delta t/\Delta v$	VCC=1.8V±0.15V, 2.5V±0.2V	--	--	20	ns/V
		VCC=3.3V±0.3V	--	--	10	ns/V
		VCC=5V±0.5V	--	--	5	ns/V
High-level Output Current	IOH	VCC=1.65V	--	--	-4	mA
		VCC=2.3V	--	--	-8	mA
		VCC=2.7V	--	--	-16	mA
		VCC=3V	--	--	-24	mA
		VCC=4.5V	--	--	-32	mA
Low-level Output Current	IOL	VCC=1.65V	--	--	4	mA
		VCC=2.3V	--	--	8	mA
		VCC=2.7V	--	--	16	mA
		VCC=3V	--	--	24	mA
		VCC=4.5V	--	--	32	mA
Operating Temperature	TA		-40	--	125	°C

TP74LVC1G86 Series

SINGLE 2-INPUT EXCLUSIVE-OR GATE

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

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V _{IH}	V _{CC} =1.65V ~ 1.95V	0.65×V _{CC}	--	--	V
		V _{CC} =2.3V ~ 2.7V	1.7	--	--	V
		V _{CC} =3V ~ 3.6V	2	--	--	V
		V _{CC} =4.5V ~ 5.5V	0.7×V _{CC}	--	--	V
Low-Level Input Voltage	V _{IL}	V _{CC} =1.65V ~ 1.95V	--	--	0.35×V _{CC}	V
		V _{CC} =2.3V ~ 2.7V	--	--	0.7	V
		V _{CC} =3V ~ 3.6V	--	--	0.8	V
		V _{CC} =4.5V ~ 5.5V	--	--	0.3×V _{CC}	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65 ~ 5.5V, I _{OH} =-100μA	V _{CC} -0.1	--	--	V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2	--	--	V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9	--	--	V
		V _{CC} =3.0V, I _{OH} =-16mA	2.4	--	--	V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3	--	--	V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8	--	--	V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65 ~ 5.5V, I _{OL} =100μA	--	--	0.1	V
		V _{CC} =1.65V, I _{OL} =4mA	--	--	0.45	V
		V _{CC} =2.3V, I _{OL} =8mA	--	--	0.3	V
		V _{CC} =3.0V, I _{OL} =16mA	--	--	0.4	V
		V _{CC} =3.0V, I _{OL} =24mA	--	--	0.55	V
		V _{CC} =4.5V, I _{OL} =32mA	--	--	0.55	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0 ~ 5.5V, V _{IN} =5.5V or GND	--	--	±5	uA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V	--	--	±10	uA
Quiescent Supply Current	I _Q	V _{CC} =1.65 ~ 5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0A	--	--	10	uA
Additional Quiescent Supply Current Per Input Pin	ΔI _Q	V _{CC} =3 ~ 5.5V, One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND	--	--	500	uA
Input Capacitance	C _I	V _{CC} =3.3V, V _{IN} =V _{CC} or GND	--	6	--	pF

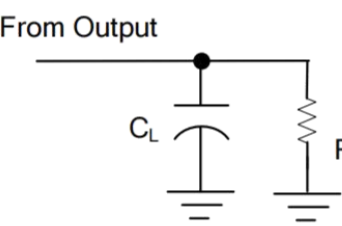
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V	--	22	--	pF
		V _{CC} =2.5V	--	22	--	pF
		V _{CC} =3.3V	--	22	--	pF
		V _{CC} =5.0V	--	24	--	pF

SWITCHING CHARACTERISTICS (TA = 25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions		MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t _{PLH} / t _{PHL}	CL=15pF RL=1MΩ	V _{CC} =1.8±0.15V	2.1	--	9.1	nS
			V _{CC} =2.5±0.2V	1	--	4.5	nS
			V _{CC} =3.3±0.3V	0.6	--	4	nS
			V _{CC} =5±0.5V	0.8	--	3.3	nS
	t _{PLH} / t _{PHL}	CL=30pF	V _{CC} =1.8±0.15V, RL=1KΩ	3.5	--	9.9	nS
			V _{CC} =2.5±0.2V, RL=500Ω	1.8	--	5.5	nS
		CL=50pF RL=500Ω	V _{CC} =3.3±0.3V	1.3	--	5	nS
			V _{CC} =5±0.5V	1	--	4	nS

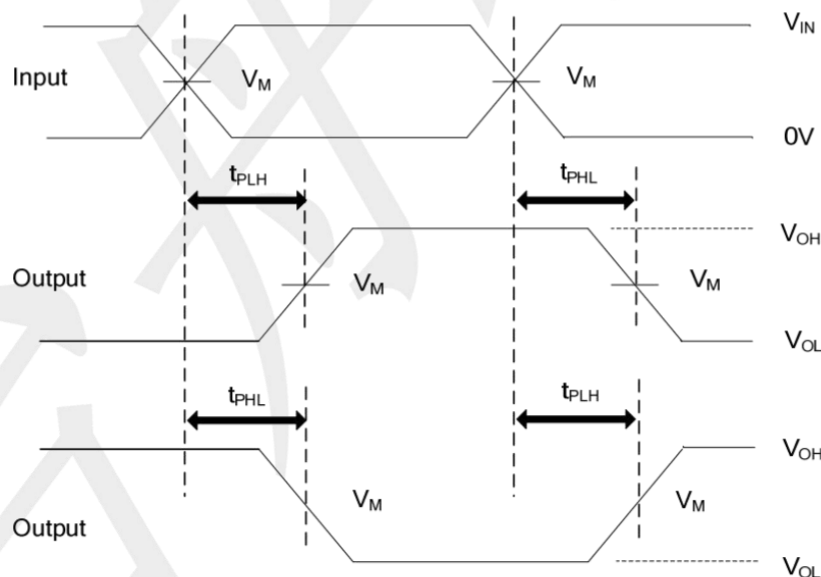
TEST CIRCUIT AND WAVEFORMS



From Output

TEST CIRCUIT

V _{CC}	Inputs		V _M	C _L	R _L
	V _{IN}	t _R , t _F			
1.8V±0.15V	V _{CC}	≤2ns	V _{CC} /2	15pF	1MΩ
2.5V±0.2V	V _{CC}	≤2ns	V _{CC} /2	30pF	1KΩ
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF	1MΩ
				30pF	500Ω
				50pF	500Ω
5V±0.5V	V _{CC}	≤2.5ns	V _{CC} /2	15pF	1MΩ
				50pF	500Ω



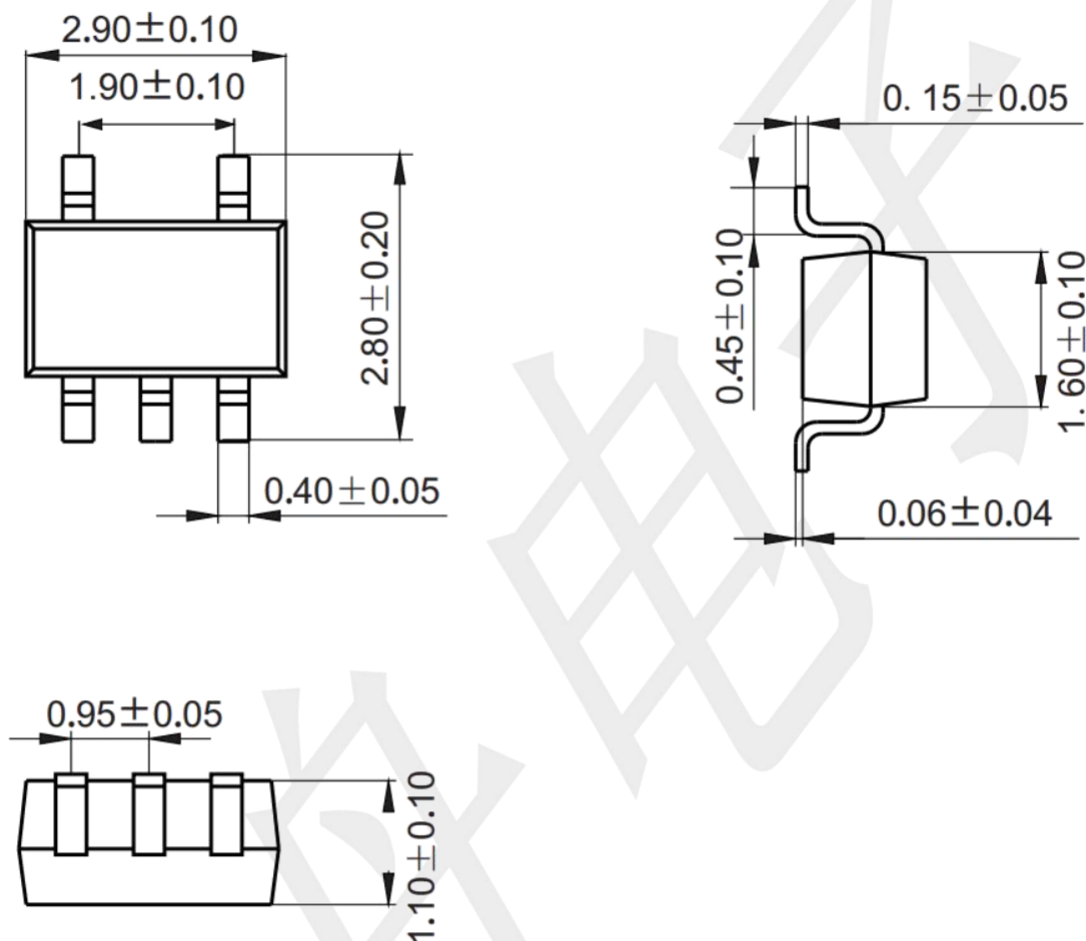
PROPAGATION DELAY TIMES

Note: CL includes probe and jig capacitance.

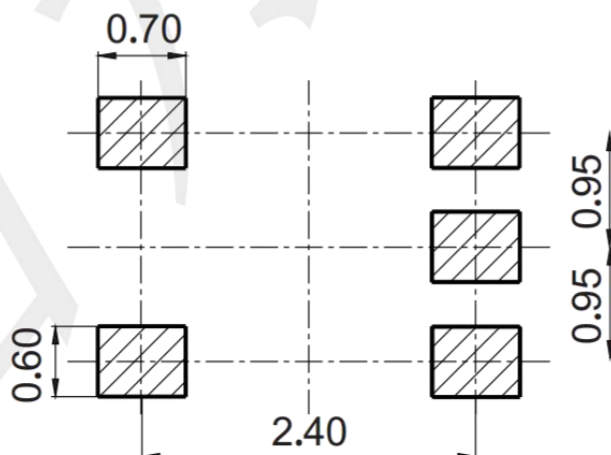
All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_O = 50Ω.

Package informantion

SOT23-5 (Unit: mm)

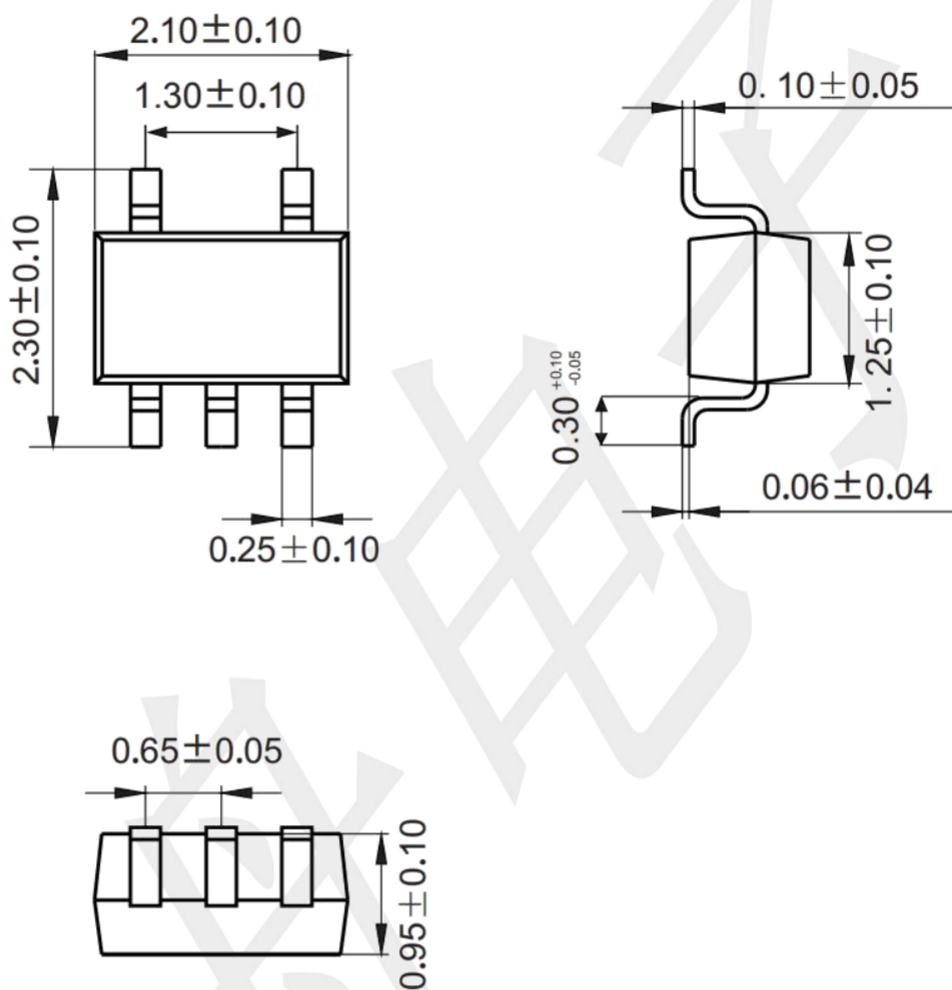


Mounting Pad Layout (Unit: mm)

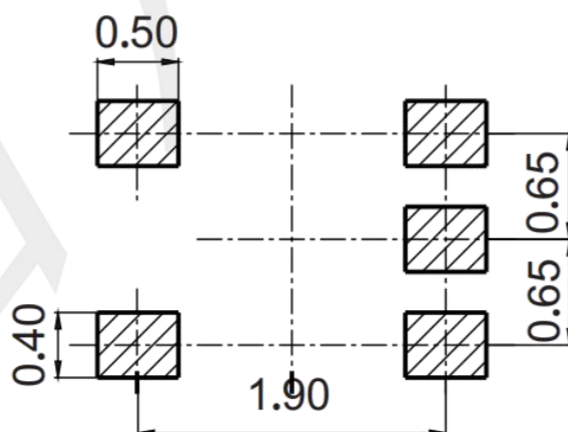


Package information

SOT353 (Unit: mm)

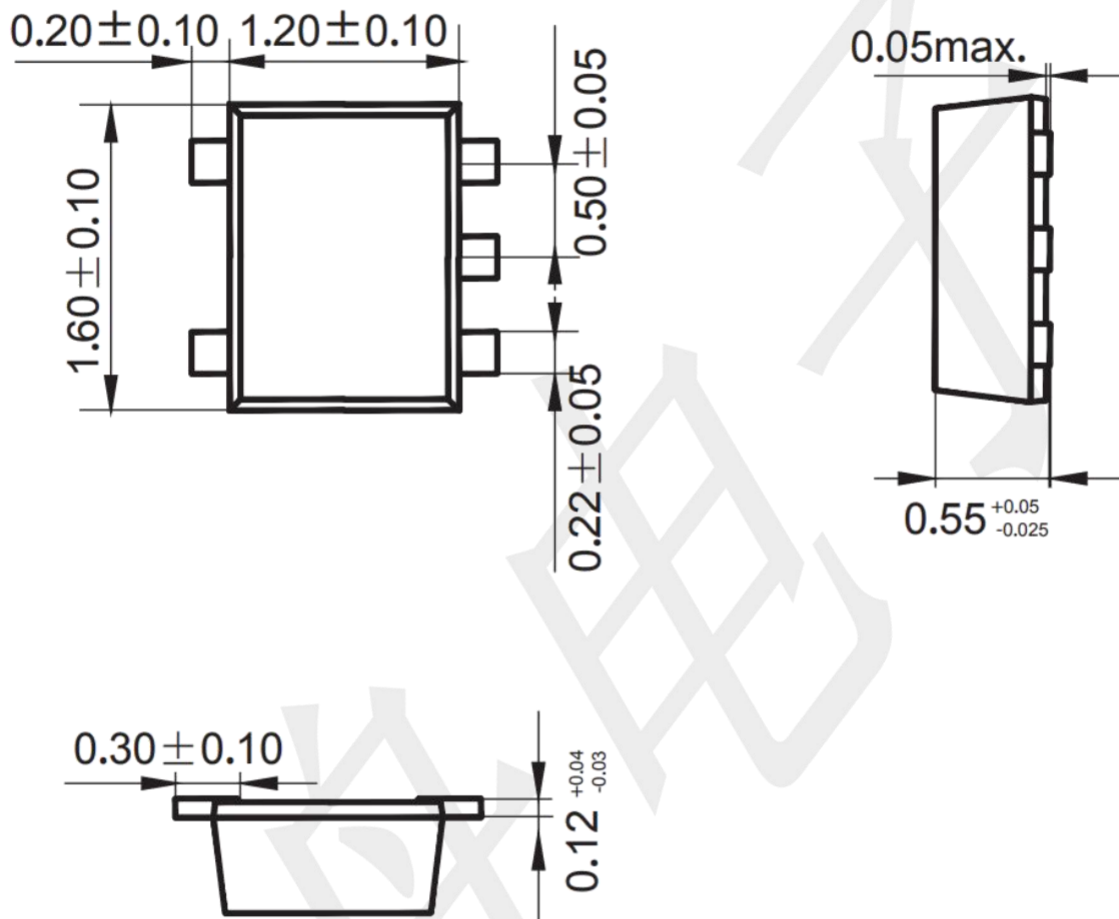


Mounting Pad Layout (Unit: mm)



Package information

SOT553 (Unit: mm)



Mounting Pad Layout (Unit: mm)

