

Features

- Operation Voltage Range:4.5~5.5V
- Low Power Dissipation:ICC=1μA (Max.) @25°C
- High Speed:t_{PD}=7.5ns(Typ)
- Input compatible with TTL voltage
- ESD Protection Exceeds JESD 22
-2000-V Human-Body Model (A114-A)
-200-V Machine Model (A115-A)
-1000-V Charged-Device Model (C101)

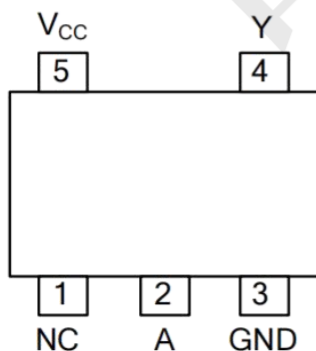
General Description

The NC7ST04 is a Single inverter gate, which provides the Function $Y = \bar{A}$

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
NC7ST04M5X-TP	SOT23-5	Tape and Reel,3000
NC7ST04P5X-TP	SOT353	Tape and Reel,3000

Pin Configuratio

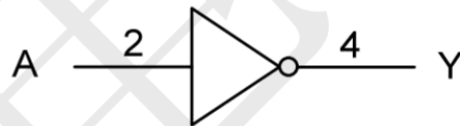


SOT23-5 / SOT353

Applications

- Motor control: Communication induction
- Graphics card
- Advanced Driver Assistance Systems (ADAS)
- Motor Drive&Control
- DLP positive projection system
- Server motherboard

Logic Diagram



Function Table

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

Note: H: high voltage level; L: low voltage level.

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	VCC	-0.5 ~ 7	V
Input Voltage	VIN	-0.5 ~ 7	V
Output Voltage	VOUT	-0.5 ~ VCC+0.5	V
Input Clamp Current	I _{IK}	-20	mA
Output Clamp Current	I _{OK}	±20	mA
Output Current	I _{OUT}	±25	mA
VCC or GND Current	ICC	±50	mA
Storage Temperature	TSTG	-65 ~ +150	°C

Notes: 1. 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.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V _{OH}	V _{CC} =4.5V, I _{OH} =-50μA	4.4	4.5	--	V
		V _{CC} =4.5V, I _{OH} =-8mA	3.94	--	--	
Low-Level Output Voltage	V _{OL}	V _{CC} =4.5V, I _{OL} =50μA	--	--	0.1	V
		V _{CC} =4.5V, I _{OL} =8mA	--	--	0.36	
Input Leakage Current	I _{I(LEAK)}	V _{CC} =5.5V, V _{IN} =V _{CC} or GND	--	--	±0.1	μA
Quiescent Supply Current	I _Q	V _{CC} =5.5V, V _{IN} =V _{CC} or GND I _{OUT} =0	--	--	1	μA
Additional Quiescent Supply Current	ΔI _Q	V _{CC} =5.5V, V _{IN} =3.4V; I _{OUT} =0; other input at V _{CC} or GND	--	--	1.35	mA
Input Capacitance	C _{IN}	V _{IN} =V _{CC} or GND	--	4	10	pF

DYNAMIC CHARACTERISTICS

(Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Time Input(A) to Output(Y)	t_{PLH}	$V_{CC}=5\pm 0.5V, C_L=15pF$	--	4.7	6.7	ns
	t_{PHL}		--	4.7	6.7	
	t_{PLH}	$V_{CC}=5\pm 0.5V, C_L=50pF$	--	5.5	7.7	
	t_{PHL}		--	5.5	7.7	

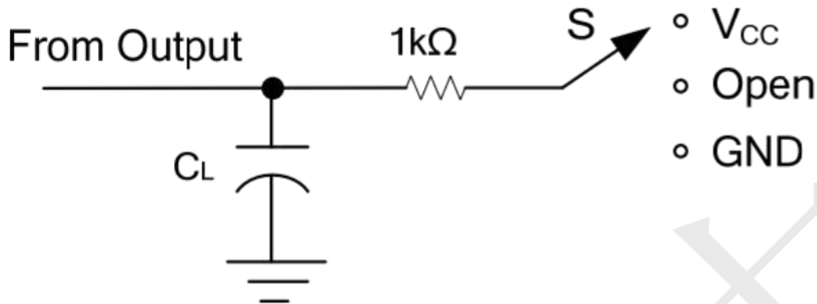
OPERATING CHARACTERISTICS (TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$V_{CC}=5V, f=1MHz, No$ load	--	14	--	pF

RECOMMENDED OPERATING COMDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		4.5	--	5.5	V
Input Voltage	V_{IN}		0	--	5.5	V
Output Voltage	V_{OUT}		0	--	V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta V$	$V_{CC}=5.0\pm 0.5V$	--	--	20	ns/V
Operating Temperature	T_A		-40	--	+125	°C

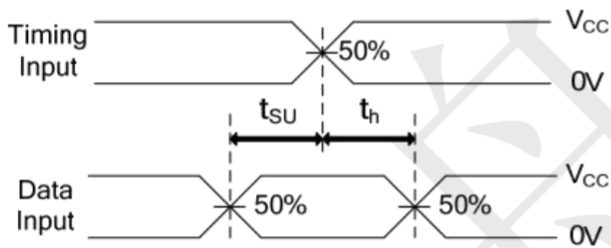
TEST CIRCUIT AND WAVEFORMS



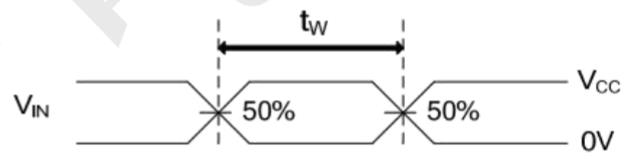
- V_{CC}
- Open
- GND

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

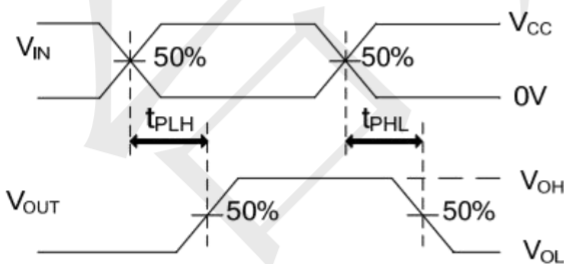
TEST CIRCUIT



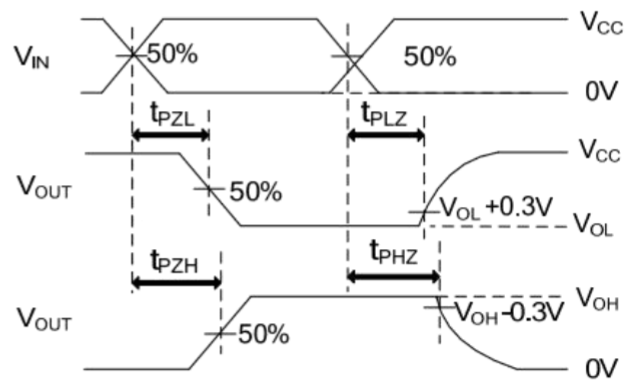
SETUP TIME AND HOLD TIME



PULSE WIDTH



PROPAGATION DELAY TIMES

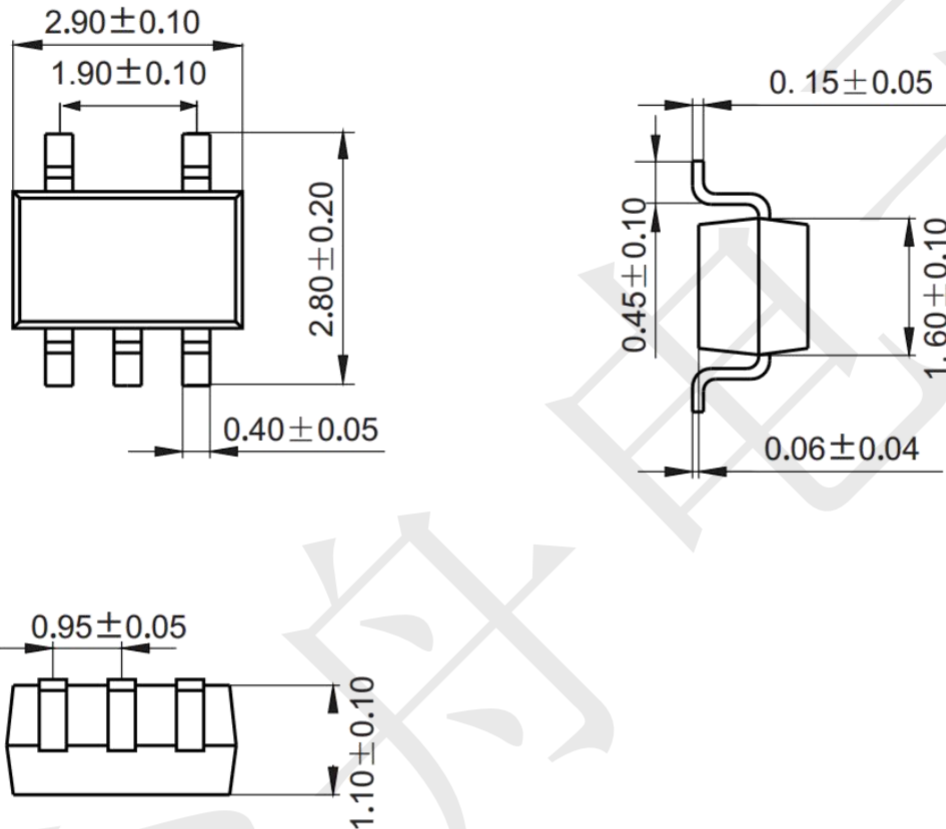


ENABLE AND DISABLE TIMES

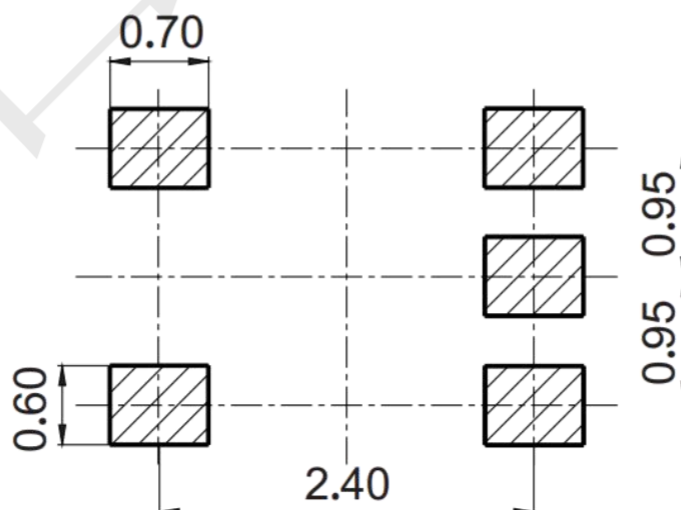
Note: C_L includes probe and jig capacitance.
 $PRR \leq 1\text{MHz}$, $Z_O = 50\Omega$, $t_R \leq 3\text{ns}$, $t_F \leq 3\text{ns}$

Package information (Unit: mm)

SOT23-5

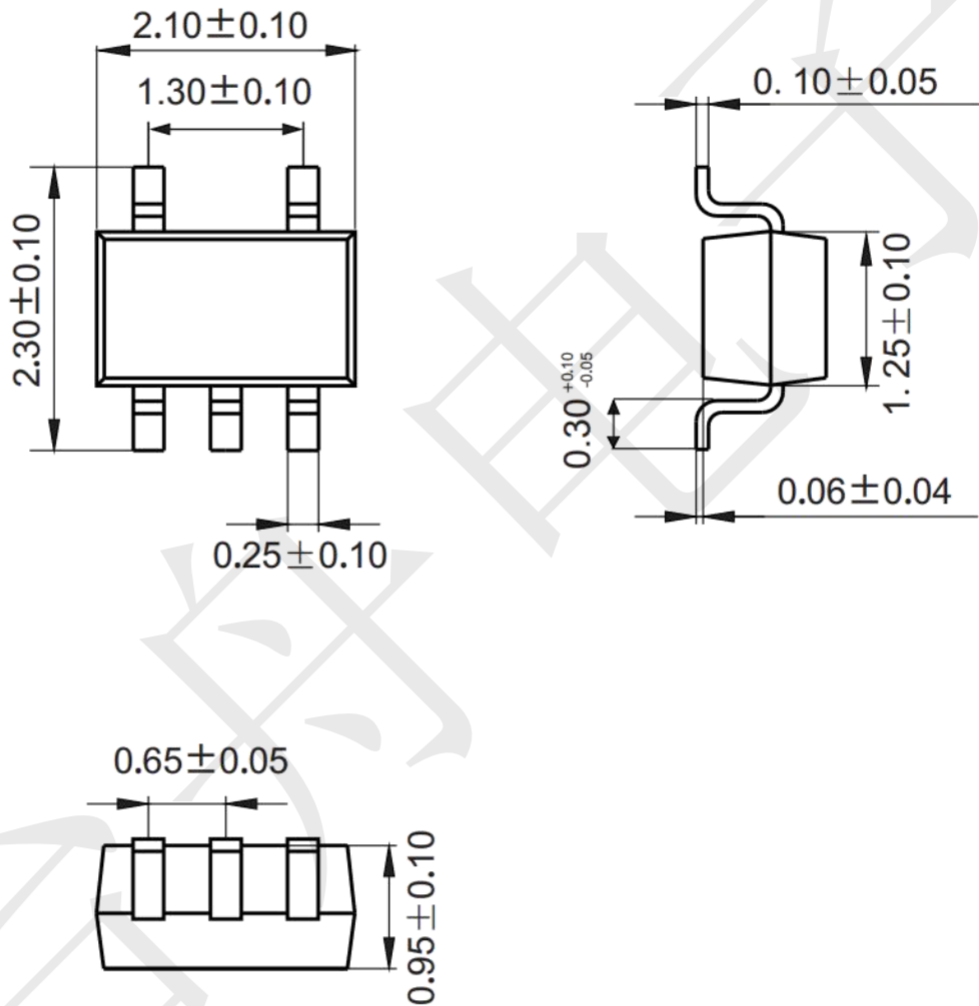


Mounting Pad Layout (Unit: mm)



Package information

SOT353 (Unit: mm)



Mounting Pad Layout (unit: mm)

