

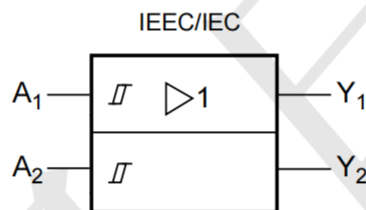
### Features

- Operate From 1.65V to 5.5V
- 5 V tolerant input/output for interfacing with 5 V logic
- $\pm 24\text{mA}$  output drive ( $V_{CC} = 3.3\text{V}$ )
- CMOS low-power consumption and high noise immunity
- $\text{OFF}$  Supports Partial-Power-Down Mode Operation
- Latch-up performance exceeds 100mA
- Specified from  $-40\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 1000-V Charged-Device Model (C101)
- SOT363 Package Available

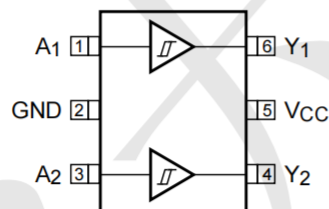
### General Description

The NC7WZ17P6X is a high-performance, low-power, low-voltage, Si-gate CMOS device which provides two independent buffers with Schmitt trigger action. It is capable of transforming slowly changed input signals into sharply defined, jitter-free output signals.

### Logic Diagram



### Pin Configuration



**Marking: Z17Y**

### Function Table

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

H=High Level  
L=Low Level

### Absolute Maximum Ratings

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5 ~ 6.5	V
Input Voltage (Note 2)	$V_{IN}$	-0.5 ~ 6.5	V
Output Voltage (Note 2,3)	High-Impedance	-0.5 ~ 6.5	V
	Power-Off State		
	High State	-0.5 ~ $V_{CC}+0.5$	V
	Low State		
Input Clamp Current ( $V_{IN}<0$ )	$I_{IK}$	-50	mA
Output Clamp Current ( $V_{OUT}<0$ )	$I_{OK}$	-50	mA
Output Current	$I_{OUT}$	$\pm 50$	mA
$V_{CC}$ or GND Current	$I_{CC}$	$\pm 100$	mA
Junction Temperature	$T_J$	+150	°C
Storage Temperature	$T_{STG}$	-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 negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
3. The value of  $V_{CC}$  is provided in the recommended operating conditions table.

### Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$	Operating	1.65		5.5	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$	High or low state	0		$V_{CC}$	V
High-Level Input Voltage	$V_{T+}$	$V_{CC} = 1.65$ V	0.70		1.40	V
		$V_{CC} = 2.3$ V	1.00		1.70	V
		$V_{CC} = 3.0$ V	1.30		2.20	V
		$V_{CC} = 4.5$ V	1.90		3.10	V
		$V_{CC} = 5.5$ V	2.20		3.70	V
Low-Level Input Voltage	$V_{T-}$	$V_{CC} = 1.65$ V	0.30		0.70	V
		$V_{CC} = 2.3$ V	0.40		1.00	V
		$V_{CC} = 3.0$ V	0.60		1.30	V
		$V_{CC} = 4.5$ V	1.10		2.00	V
		$V_{CC} = 5.5$ V	1.40		2.50	V
Hysteresis Voltage	$\Delta V_T$	$V_{CC} = 1.65$ V	0.30		0.80	V
		$V_{CC} = 2.3$ V	0.40		0.90	V
		$V_{CC} = 3.0$ V	0.40		1.10	V
		$V_{CC} = 4.5$ V	0.60		1.30	V
		$V_{CC} = 5.5$ V	0.70		1.40	V
Operating Temperature	$T_A$		-40		+125	°C

Note: All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation.



**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	$V_{OH}$	$V_{CC}=1.65\text{V}\sim 5.5\text{V}$ , $I_{OH}=-100\mu\text{A}$	$V_{CC}$ -0.1			V
		$V_{CC}=1.65\text{V}$ , $I_{OH}=-4\text{mA}$	1.20			V
		$V_{CC}=2.3\text{V}$ , $I_{OH}=-8\text{mA}$	1.90			V
		$V_{CC}=3.0\text{V}$ , $I_{OH}=-16\text{mA}$	2.40			V
		$V_{CC}=3.0\text{V}$ , $I_{OH}=-24\text{mA}$	2.30			V
		$V_{CC}=4.5\text{V}$ , $I_{OH}=-32\text{mA}$	3.80			V
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=1.65\sim 5.5\text{V}$ , $I_{OL}=100\mu\text{A}$			0.10	V
		$V_{CC}=1.65\text{V}$ , $I_{OL}=4\text{mA}$			0.45	V
		$V_{CC}=2.3\text{V}$ , $I_{OL}=8\text{mA}$			0.30	V
		$V_{CC}=3.0\text{V}$ , $I_{OL}=16\text{mA}$			0.40	V
		$V_{CC}=3.0\text{V}$ , $I_{OL}=24\text{mA}$			0.55	V
		$V_{CC}=4.5\text{V}$ , $I_{OL}=32\text{mA}$			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{IN}=0$ to $5.5\text{V}$ , $V_{CC}=0\sim 5.5\text{V}$			$\pm 5$	$\mu\text{A}$
Power OFF Leakage Current	$I_{OFF}$	$V_{IN}$ or $V_{OUT}=5.5\text{V}$ , $V_{CC}=0$			$\pm 10$	$\mu\text{A}$
Quiescent Supply Current	$I_{CC}$	$V_{IN}=V_{CC}$ or $\text{GND}$ , $I_{OUT}=0$ $V_{CC}=1.65\sim 5.5\text{V}$			10	$\mu\text{A}$
Additional Quiescent Supply Current	$\Delta I_{CC}$	One input at $V_{CC}-0.6\text{V}$ Other inputs at $V_{CC}$ or $\text{GND}$ , $I_{OUT}=0$ , $V_{CC}=3\sim 5.5\text{V}$			500	$\mu\text{A}$
Input Capacitance	$C_I$	$V_{IN}=V_{CC}$ or $\text{GND}$ , $V_{CC}=3.3\text{V}$		4		pF

**Switching Characteristics** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

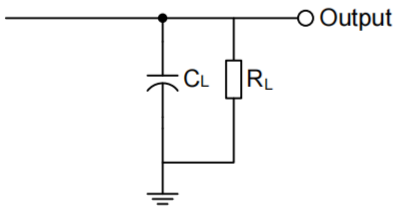
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay nA to nY	$t_{PLH}$ $t_{PHL}$	$V_{CC}=1.8\text{V}\pm 0.15\text{V}$ , $C_L=30\text{pF}$ , $R_L=1\text{K}\Omega$	3.9		9.3	ns
		$V_{CC}=2.5\text{V}\pm 0.2\text{V}$ , $C_L=30\text{pF}$ , $R_L=500\Omega$	1.9		5.7	ns
		$V_{CC}=3.3\text{V}\pm 0.3\text{V}$ , $C_L=50\text{pF}$ , $R_L=500\Omega$	2.2		5.4	ns
		$V_{CC}=5\text{V}\pm 0.5\text{V}$ , $C_L=50\text{pF}$ , $R_L=500\Omega$	1.5		4.3	ns

**Operating Characteristics** (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	$V_{CC}=5\text{V}$ , $f=10\text{MHz}$		21		pF



**TEST CIRCUIT AND WAVEFORMS**

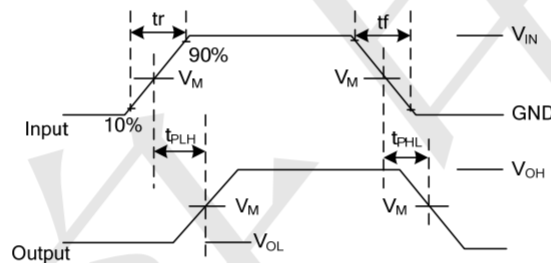


$V_{CC}$	$V_{IN}$	$t_R, t_F$	$V_M$	$C_L$	$R_L$
1.65V~1.95V	$V_{CC}$	$\leq 2\text{ns}$	$V_{CC}/2$	30pF	1k $\Omega$
2.3V~2.7V	$V_{CC}$	$\leq 2\text{ns}$	$V_{CC}/2$	30pF	500 $\Omega$
3.0V~3.6V	3V	$\leq 2.5\text{ns}$	1.5V	50pF	500 $\Omega$
4.5V~5.5V	$V_{CC}$	$\leq 2.5\text{ns}$	$V_{CC}/2$	50pF	500 $\Omega$

Definitions for test circuit:

$R_L$  = Load resistance.

$C_L$  = Load capacitance including jig and probe capacitance.



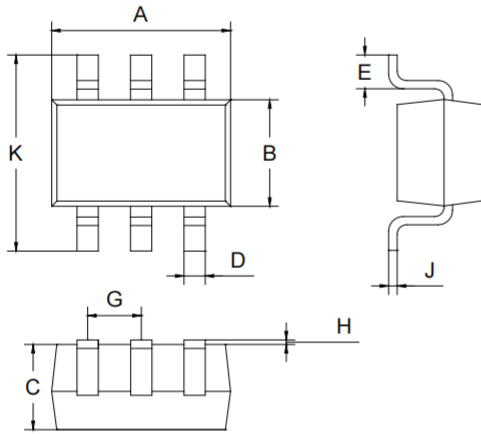
Notes: 1.  $V_{OL}$  and  $V_{OH}$  are typical output drop that occur with the output load.

2.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .



**Package Outline Dimensions** (Unit: mm)

SOT363



Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

**Mounting Pad Layout** (Unit: mm)

