

Features

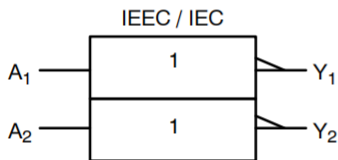
- Operation voltage range: 1.65~5.5V
- Inputs Accept Voltages To 5.5V
- High noise immunity
- Low Power Dissipation
- Max t_{PD} Of 3.2 ns At 5V
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 1000-V Charged-Device Model (C101)
- SOT363 Package Available

General Description

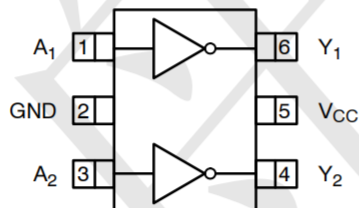
The NC7WZ04 is a dual inverter gate and it provides the Boolean function $Y = \overline{A}$ in positive logic.

This device has power-down protective circuit to prevent the device from destruction when it is powered down.

Logic Diagram



Pin Configuration



Marking: Z04Y

Function Table

INPUT(nA)	OUTPUT(nY)
H	L
L	H

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

- ## Applications
- Voltage Level Shifting
 - General Purpose Logic
 - Power Down Signal Isolation
 - Wide array of products such as:
 - PCs, Networking, Notebooks, Netbooks, PDAs
 - Tablet Computers, E-readers
 - Computer Peripherals, Hard Drives, CD/DVD ROM
 - TV, DVD, DVR, Set-Top Box
 - Cell Phones, Personal Navigation / GPS
 - MP3 Players, Cameras, Video Recorders

Absolute Maximum Ratings

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5 ~ +6.5	V
Input Voltage		V_{IN}	-0.5 ~ +6.5	V
Output Voltage	Active Mode	V_{OUT}	-0.5 ~ $V_{CC} + 0.5$	V
	Power-Down Mode		-0.5 ~ +6.5	V
V_{CC} or GND Current		I_{CC}	±100	mA
Continuous Output Current ($V_{OUT}=0$ to V_{CC})		I_{OUT}	±50	mA
Input Clamp Current ($V_{IN}<0$)		I_{IK}	-50	mA
Output Clamp Current ($V_{OUT}>V_{CC}$ or $V_{OUT}<0$)		I_{OK}	-50	mA
Power Dissipation ($T_A=-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$)		P_D	300	mW
Operating Junction Temperature		T_J	-40 ~ +125	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

- 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.

Recommended Operating Conditions

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage		V_{CC}	1.65		5.5	V
Input Voltage		V_{IN}	0		5.5	V
Output Voltage	Active Mode	V_{OUT}	0		V_{CC}	V
	Power-Down Mode		0		5.5	V
Input Transition Rise or Fall Rate	$V_{CC}=1.65\text{V to }2.7\text{V}$	t_R / t_F	0		20	ns/V
	$V_{CC}=2.7\text{V to }5.5\text{V}$		0		10	ns/V

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

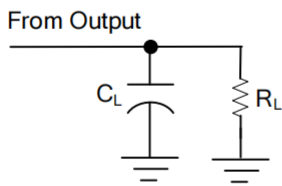
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	V_{IH}	$V_{CC}=1.65\text{V} \sim 1.95\text{V}$	$0.65 \times V_{CC}$			V
		$V_{CC}=2.3\text{V} \sim 2.7\text{V}$	1.7			V
		$V_{CC}=2.7\text{V} \sim 3.6\text{V}$	2			V
		$V_{CC}=4.5\text{V} \sim 5.5\text{V}$	$0.7 \times V_{CC}$			V
Low-level Input Voltage	V_{IL}	$V_{CC}=1.65\text{V} \sim 1.95\text{V}$			$0.35 \times V_{CC}$	V
		$V_{CC}=2.3\text{V} \sim 2.7\text{V}$			0.7	V
		$V_{CC}=2.7\text{V} \sim 3.6\text{V}$			0.8	V
		$V_{CC}=4.5\text{V} \sim 5.5\text{V}$			$0.3 \times V_{CC}$	V
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65 \sim 5.5\text{V}$, $I_{OH}=-100\mu\text{A}$	$V_{CC}-0.1$			V
		$V_{CC}=1.65\text{V}$, $I_{OH}=-4\text{mA}$	1.2			V
		$V_{CC}=2.3\text{V}$, $I_{OH}=-8\text{mA}$	1.9			V
		$V_{CC}=2.7\text{V}$, $I_{OH}=-12\text{mA}$	2.2			V
		$V_{CC}=3.0\text{V}$, $I_{OH}=-24\text{mA}$	2.3			V
		$V_{CC}=4.5\text{V}$, $I_{OH}=-32\text{mA}$	3.8			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65 \sim 5.5\text{V}$, $I_{OL}=100\mu\text{A}$			0.1	V
		$V_{CC}=1.65\text{V}$, $I_{OL}=4\text{mA}$			0.45	V
		$V_{CC}=2.3\text{V}$, $I_{OL}=8\text{mA}$			0.3	V
		$V_{CC}=2.7\text{V}$, $I_{OL}=12\text{mA}$			0.4	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	$I_{I(LEAK)}$	$V_{CC}=5.5\text{V}$, $V_{IN}=5.5\text{V}$ or GND		± 0.1	± 5	μA
Power OFF Leakage Current	I_{OFF}	$V_{CC}=0\text{V}$, V_{IN} or $V_{OUT}=5.5\text{V}$		± 0.1	± 10	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5\text{V}$, $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$		0.1	10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	$V_{CC}=2.3 \sim 5.5\text{V}$, One input at $V_{CC}-0.6\text{V}$, Other inputs at V_{CC} or GND		5	500	μA

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation delay from input (A) to output(Y)	t_{PLH} t_{PHL}	$C_L=30\text{pF}$	$V_{CC}=1.8 \pm 0.15\text{V}$, $R_L=1\text{K}\Omega$	1.0	3.5	8.0	ns
			$V_{CC}=2.5 \pm 0.2\text{V}$, $R_L=500\Omega$	1.0	2.2	4.4	ns
		$C_L=50\text{pF}$	$V_{CC}=2.7\text{V}$, $R_L=500\Omega$	1.0	2.7	5.2	ns
			$V_{CC}=3.3 \pm 0.3\text{V}$, $R_L=500\Omega$	0.5	2.7	4.1	ns
			$V_{CC}=5 \pm 0.5\text{V}$, $R_L=500\Omega$	1.0	1.9	3.2	ns

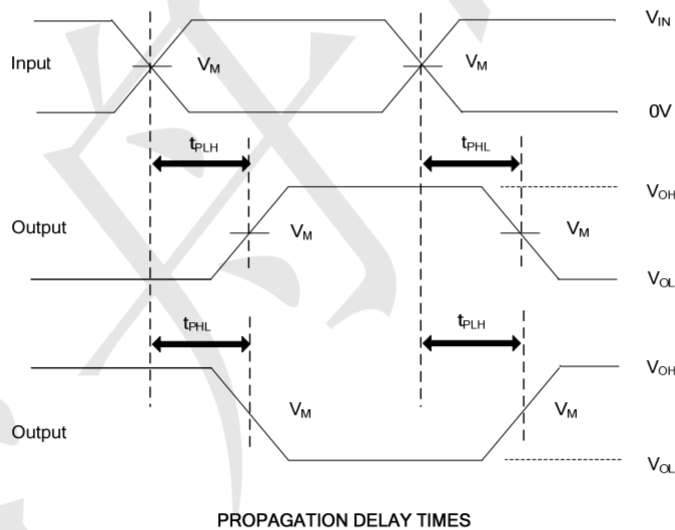


TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	Inputs		V_M	C_L	R_L
	V_{IN}	t_R, t_F			
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	1K Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	30pF	500 Ω
2.7V	2.7V	$\leq 2.5ns$	1.5V	50pF	500 Ω
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V	50pF	500 Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	50pF	500 Ω



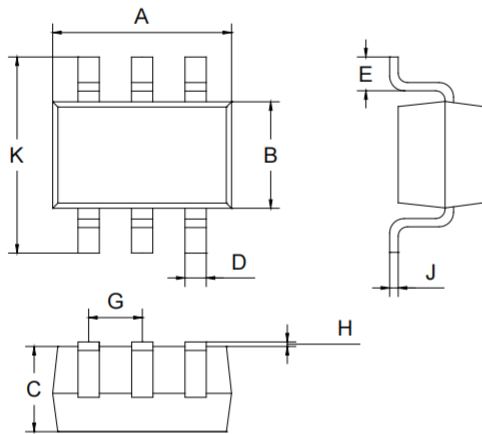
Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_0=50\Omega$.



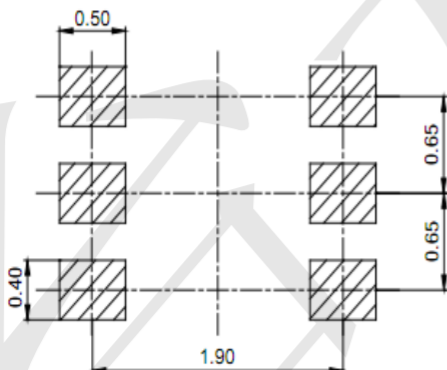
Package Outline Dimensions (Unit: mm)

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)



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