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NC7WZ07 TinyLogic[®] UHS Dual Buffer (Open-Drain Outputs)

Features

- Ultra-High Speed: t_{PZL} 2.3 ns (Typical)
- High I_{OL} Output Drive: ±24 mA at 3 V V_{CC}
- Broad V_{CC} Operating Range: 1.65 V to 5.50 V
- Power Down High Impedance Inputs/Outputs
- Over-Voltage Tolerance Inputs Facilitate 5 V to 3 V Translation
- Proprietary Noise/EMI Reduction Circuitry
- Ultra-Small MicroPak™ Packages

Description

The NC7WZ07 is a dual buffer with open-drain outputs from Fairchild's Ultra-High Speed (UHS) series of TinyLogic®. The device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive, while maintaining low static power dissipation over a broad $V_{\rm CC}$ operating range. The device is specified to operate over a very broad $V_{\rm CC}$ operating range. The device is specified to operate over the 1.65 V to 5.5 V $V_{\rm CC}$ range. The inputs and outputs are high impedance when $V_{\rm CC}$ is 0 V. Inputs tolerate voltages up to 7 V independent of $V_{\rm CC}$ operating voltage.

Ordering Information

Part Number	Top Mark	Package	Packing Method
NC7WZ07P6X	Z07	6-Lead SC70, EIAJ SC88 1.25 mm Wide	3000 Units on Tape & Reel
NC7WZ07L6X	D3	6-Lead MicroPak™, 1.00 mm Wide	5000 Units on Tape & Reel
NC7WZ07FHX	D3	6-Lead, MicroPak2™, 1x1 mm Body, .35 mm Pitch	5000 Units on Tape & Reel

Connection Diagrams

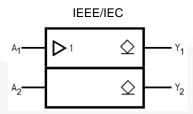


Figure 1. Logic Symbol

Pin Configurations

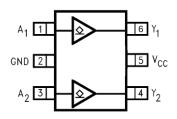


Figure 2. SC70 (Top View)

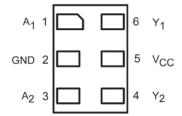


Figure 3. MicroPak™ (Top Through View)

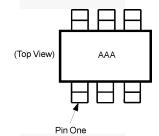


Figure 4. Pin 1 Orientation

Notes:

- 1. AAA represents product code top mark (see Ordering Information).
- 2. Orientation of top mark determines pin one location.
- 3. Reading the top mark left to right, pin one is the lower left pin.

Pin Definitions

Pin # SC70	Pin # MicroPak™	Name	Description
1	1	A ₁	Input
2	2	GND	Ground
3	3	A_2	Input
4	4	Y ₂	Output
5	5	V _{CC}	Supply Voltage
6	6	Y ₁	Output

Function Table

Y= A

Inputs	Output
A	Y
LOW Logic Level	LOW Logic Level
HIGH Logic Level	High Impedance Output State, Open Drain

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Para	ameter	Min.	Max.	Unit
V _{cc}	Supply Voltage		-0.5	7.0	V
V _{IN}	DC Input Voltage		-0.5	7.0	V
V _{OUT}	DC Output Voltage		-0.5	7.0	V
I _{IK}	DC Input Diode Current	V _{IN} < -0.5 V		-50	mA
I _{OK}	DC Output Diode Current	V _{OUT} < -0.5 V		-50	mA
I _{OUT}	DC Output Current			±50	mA
I _{CC} or I _{GND}	DC V _{CC} or Ground Current			±100	mA
T _{STG}	Storage Temperature Range		-65	+150	°C
TJ	Junction Temperature Under B	ias		+150	°C
TL	Junction Lead Temperature (So	oldering, 10 Seconds)		+260	°C
	- 7	SC70-6		150	
P_{D}	Power Dissipation at +85°C	MicroPak™-6		130	mW
		MicroPak2™-6		120	
ECD	Human Body Model, JEDEC:JE	SD22-A114		4000	\/
ESD	Charge Device Model, JEDEC:	JESD22-C101		2000	V

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameter	Conditions	Min.	Max.	Unit
.,	Supply Voltage Operating		1.65	5.50	
V_{CC}	Supply Voltage Data Retention		1.5	5.5	V
V _{IN}	Input Voltage		0	5.5	V
V _{OUT}	Output Voltage		0	5.5	V
		V _{CC} at 1.8 V, ±0.15 V, 2.5 V ± 0.2 V	0	20	ns/V
t _r , t _f Input Rise and Fa	Input Rise and Fall Times	V _{CC} at 3.3 V ±0.3 V	0	10	
		V _{CC} at 5.0 V ±0.5 V	0	5	
T _A	Operating Temperature		-40	+85	°C
		SC70-6		425	
θ_{JA}	Thermal Resistance	MicroPak™-6		500	°C/W
		MicroPak2™-6		560	1

Note

4. Unused inputs must be held HIGH or LOW. They may not float.

DC Electrical Characteristics

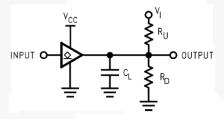
Cumbal	mbol Parameter	V	Conditions	T,	_A =+25°	C	T _A =-40	to +85°C	111014-
Symbol		V _{cc} Conditions		Min.	Тур.	Max.	Min.	Max.	Units
\/	HIGH Level Input	1.65 to 1.95		0.75V _{CC}			0.75V _{CC}		V
V_{IH}	Voltage	2.30 to 5.50		0.70V _{CC}			0.70V _{CC}		V
V	LOW Level Input	1.65 to 1.95				0.25V _{CC}		0.25V _{CC}	V
V_{IL}	Voltage	2.30 to 5.50				0.30V _{CC}		0.30V _{CC}	V
I _{LKG}	HIGH Level Output Leakage Current	1.65 to 5.50	V _{IN} =V _{IH} , V _{OUT} =V _{CC} or GND			±5		±10	μA
		1.65			0.00	0.10		0.00	
		1.80			0.00	0.10		0.10	
		2.30	$V_{IN}=V_{IL}$, $I_{OL}=100 \mu A$		0.00	0.10		0.10	
		3.00			0.00	0.10		0.10	
V	LOW Level Output	4.50			0.00	0.10		0.10	V
V_{OL}	Voltage	1.65	I _{OL} =4 mA		0.80	0.24		0.24	V
		2.30	I _{OL} =8 mA		0.10	0.30		0.30	
	5	3.00	I _{OL} =16 mA		0.16	0.40		0.40	
		3.00	I _{OL} =24 mA		0.24	0.55		0.55	
		4.50	I _{OL} =32 mA		0.25	0.55		0.55	
I _{IN}	Input Leakage Current	0 to 5.5	$0 \leq V_{IN} \leq 5.5 \ V$			±0.1	1	±1.0	μΑ
I _{OFF}	Power Off Leakage Current	0	V _{IN} or V _{OUT} =5.5 V			1		10	μΑ
I _{CC}	Quiescent Supply Current	1.65 to 5.50	V _{IN} =5.5 V, GND			1		10	μA

AC Electrical Characteristics

Symbol	Symbol Parameter		Conditions	T _A =+25°C		T _A =-40 to +85°C		Units	Figure	
		Parameter V _{CC}		Min.	Тур.	Max.	Min.	Max.		
		1.65		1.8	6.6	11.5	1.8	12.6		
		1.80	C _L =50 pF,	1.8	5.5	9.5	1.8	10.5		
		2.50 ± 0.20	RU=500 Ω, RD=500 Ω,	1.2	3.7	5.8	1.2	6.4		Figure 5
		3.30 ± 0.30	$V_{l}=2 \times V_{CC}$	0.8	2.9	4.4	0.8	4.8	ns	
	Dropogation Daloy	5.00 ± 0.50		0.5	2.3	3.5	0.5	3.9		
t_{PZL}, t_{PLZ}	Propagation Delay	1.65		1.8	5.5	11.5	1.8	12.6		Figure 6
		1.80	C_L =50 pF, RU=500 Ω, RD=500 Ω, V_I =2 x V_{CC}	1.8	4.3	9.5	1.8	10.5		-
		2.50 ± 0.20		1.2	2.8	5.8	1.2	6.4		
		3.30 ± 0.30		0.8	2.1	4.4	0.8	4.8		
		5.00 ± 0.50		0.5	1.4	3.5	0.5	3.9		
C _{IN}	Input Capacitance	0			2.5				pF	
C _{OUT}	Output Capacitance	0			4.0					
	Power Dissipation	3.30		_	3				n.E	Figure 7
C_{PD}	Capacitance ⁽⁵⁾	5.00			4				pF	rigule /

Note:

5. C_{PD} is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I_{CCD}) at no output loading and operating at 50% duty cycle. C_{PD} is related to I_{CCD} dynamic operating current by the expression: I_{CCD}=(C_{PD})(V_{CC})(f_{IN})+(I_{CC}static).



Notes:

- 6. C_L includes load and stray capacitance.
- 7. Input PRR = 1.0MHz, $t_W = 500$ ns.

Figure 5. AC Test Circuit

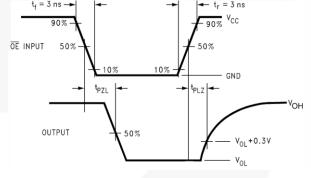
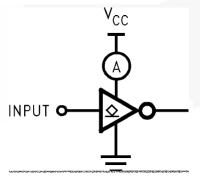


Figure 6. AC Waveforms



Note:

- 8. Input=AC Waveform; $t_r=t_f=1.8$ ns.
- 9. PRR=Variable; Duty Cycle=50%.

Figure 7. I_{CCD} Test Circuit

Physical Dimensions

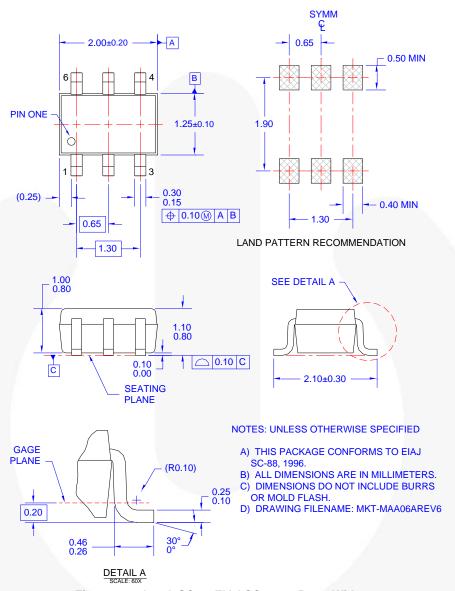


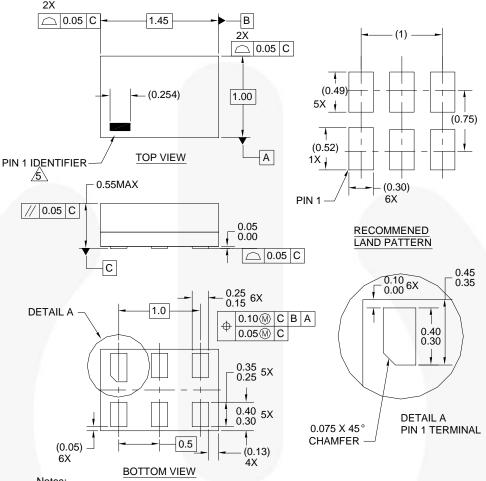
Figure 8. 6-Lead, SC70, EIAJ SC88, 1.25 mm Wide

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Package Designator	Tape Section	Cavity Number	Cavity Status	Cover Type Status
	Leader (Start End)	125 (Typical)	Empty	Sealed
P6X	Carrier	3000	Filled	Sealed
	Trailer (Hub End)	75 (Typical)	Empty	Sealed

Physical Dimensions



- 1. CONFORMS TO JEDEC STANDARD M0-252 VARIATION UAAD
- 2. DIMENSIONS ARE IN MILLIMETERS
- 3. DRAWING CONFORMS TO ASME Y14.5M-1994
- 4. FILENAME AND REVISION: MAC06AREV4
- 5 PIN ONE IDENTIFIER IS 2X LENGTH OF ANY

OTHER LINE IN THE MARK CODE LAYOUT.

Figure 9. 6-Lead, MicroPak™, 1.0 mm Wide

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	Leader (Start End)	125 (Typical)	Empty	Sealed
L6X	Carrier	5000	Filled	Sealed
	Trailer (Hub End)	75 (Typical)	Empty	Sealed

Physical Dimensions

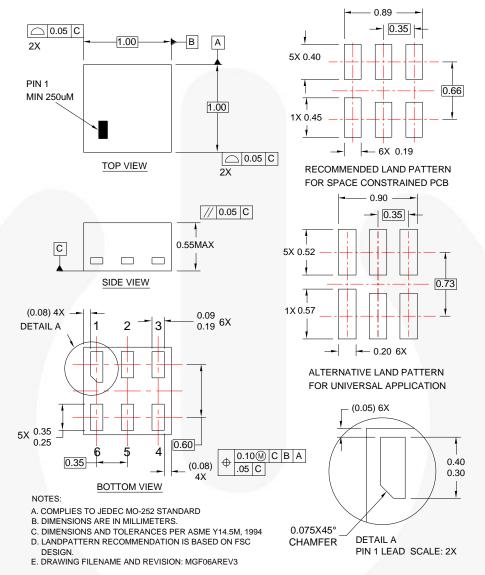


Figure 10. 6-Lead, MicroPak2™, 1x1 mm Body, .35 mm Pitch

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FHX	Carrier	5000	Filled	Sealed
	Trailer (Hub End)	75 (Typical)	Empty	Sealed





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