Is Now Part of

ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

FAIRCHILD

SEMICONDUCTOR™

NC7SZ373
TinyLogic® UHS D-Type Latch with 3-STATE Output

General Description

The NC7SZ373 is a single positive edge-triggered D-type CMOS Latch with 3-STATE output from Fairchild's Ultra High Speed Series of TinyLogic® in the space saving SC70 6-lead package. 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 very broad V_{CC} operating range. The device is specified to operate over the 1.65V to 5.5V range. The inputs and output are high impedance when V_{CC} is 0V. Inputs tolerate voltages up to 7V independent of V_{CC} operating voltage. The latch appears transparent to the data when Latch Enable (LE) is HIGH. When LE is LOW, the data that meets the setup time is latched. The output tolerates voltages above V_{CC} in the 3-STATE condition.

Features

- Space saving SC70 6-lead package
- Ultra small MicroPak™ leadless package
- Ultra High Speed; t_{PD} 2.6 ns Typ into 50 pF at 5V V_{CC}
- High Output Drive; ±24 mA at 3V V_{CC}
- Broad V_{CC} Operating Range; 1.65V to 5.5V
- Matches the performance of LCX when operated at 3.3V V_{CC}
- Power down high impedance inputs/output
- Overvoltage tolerant inputs facilitate 5V to 3V translation
- Patented noise/EMI reduction circuitry implemented

Ordering Code:

Order Number	Package Number	Product Code Top Mark	Package Description	Supplied As
NC7SZ373P6X	MAA06A	Z73	6-Lead SC70, EIAJ SC88, 1.25mm Wide	3k Units on Tape and Reel
NC7SZ373L6X	MAC06A	D4	6-Lead MicroPak, 1.0mm Wide	5k Units on Tape and Reel

TinyLogic® is a registered trademark of Fairchild Semiconductor Corporation.

MicroPak™ is a trademark of Fairchild Semiconductor Corporation.

Logic Symbol

IEEE/IEC

OE
LE
D _____ Q

Pin Descriptions

Pin Names	Description
D	Data Input
LE	Latch Enable Input
$\overline{OE}$	Output Enable Input
Q	Latch Output

Function Table

Inputs			Output
LE	**D**	**$\overline{OE}$**	**Q**
H	L	L	L
H	H	L	H
L	X	L	Q_{n-1}
X	X	H	Z

H = HIGH Logic Level   X = Immaterial
L = LOW Logic Level   Z = HIGH Impedance
Q_{n-1} = Previous state prior to HIGH-to-LOW transition of latch enable

Connection Diagrams

Pin Assignments for SC70

LE 1
GND 2
D 3
4 Q
5 V_{CC}
6 $\overline{OE}$

LE
D Q

(Top View)
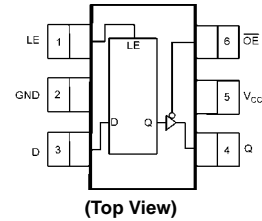
Pin One Orientation Diagram

(Top View)   AAA
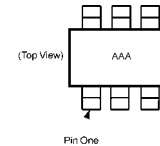
Pin One

AAA = Product Code Top Mark - see ordering code

Note: Orientation of Top Mark determines Pin One location. Read the top product code mark left to right, Pin One is the lower left pin.(see diagram).

Pad Assignments for MicroPak

LE 1   6 $\overline{OE}$
GND 2   5 V_{CC}
D 3   4 Q

(Top Thru View)
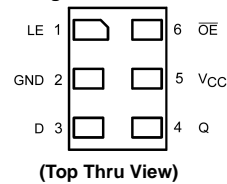
Absolute Maximum Ratings(Note 1)

Supply Voltage (V_{CC})	−0.5V to +7.0V
DC Input Voltage (V_{IN})	−0.5V to +7.0V
DC Output Voltage (V_{OUT})	−0.5V to +7.0V
DC Input Diode Current (I_{IK})	
$V_{IN} < 0V$	−50 mA
DC Output Diode Current (I_{OK})	
$V_{OUT} < 0V$	−50 mA
DC Output (I_{OUT}) Source/Sink Current	±50 mA
DC V_{CC}/GND Current (I_{CC}/I_{GND})	±50 mA
Storage Temperature Range (T_{STG})	−65°C to +150°C
Junction Temperature under Bias (T_J)	150°C
Junction Lead Temperature (T_L)	
(Soldering, 10 seconds)	260°C
Power Dissipation (P_D) @+85°C	180 mW

Recommended Operating Conditions (Note 2)

|	
Power Supply	
Operating (V_{CC})	1.65V to 5.5V
Data Retention	1.5V to 5.5V
Input Voltage (V_{IN})	0V to 5.5V
Output Voltage (V_{OUT})	
Active State	0V to V_{CC}
3-STATE	0V to 5.5V
Input Rise and Fall Time (t_r, t_f)	
$V_{CC} = 1.8V$, $2.5V \pm 0.2V$	0 to 20 ns/V
$V_{CC} = 3.3V \pm 0.3V$	0 to 10 ns/V
$V_{CC} = 5.5V \pm 0.5V$	0 to 5 ns/V
Operating Temperature (T_A)	−40°C to +85°C
Thermal Resistance (θ_{JA})	350° C/W

Note 1: The "Absolute Maximum Ratings": are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Note 2: Unused inputs must be held HIGH or LOW. They may not float.

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	$T_A = +25°C$			$T_A = -40°C$ to $+85°C$		Unit	Conditions	
			Min	Typ	Max	Min	Max			
V_{IH}	HIGH Level Control	1.65 to 1.95	0.75 V_{CC}			0.75 V_{CC}		V		
	Input Voltage	2.3 to 5.5	0.7 V_{CC}			0.7 V_{CC}				
V_{IL}	LOW Level Control	1.65 to 1.95			0.25 V_{CC}		0.25 V_{CC}	V		
	Input Voltage	2.3 to 5.5			0.3 V_{CC}		0.3 V_{CC}			
V_{OH}	HIGH Level Control	1.65	1.55	1.65		1.55		V	$V_{IN} = V_{IH}$	$I_{OH} = -100$ μA
	Output Voltage	1.8	1.7	1.8		1.7				
		2.3	2.2	2.3		2.2				
		3.0	2.9	3.0		2.9				
		4.5	4.4	4.5		4.4				
		1.65	1.24	1.52		1.29				$I_{OH} = -4$ mA
		2.3	1.9	2.15		1.9				$I_{OH} = -8$ mA
		3.0	2.4	2.8		2.4				$I_{OH} = -16$ mA
		3.0	2.3	2.68		2.3				$I_{OH} = -24$ mA
		4.5	3.8	4.2		3.8				$I_{OH} = -32$ mA
V_{OL}	LOW Level Control	1.65		0.0	0.08		0.0	V	$V_{IN} = V_{IL}$	$I_{OL} = 100$ μA
	Output Voltage	1.8		0.0	0.1		0.1			
		2.3		0.0	0.1		0.1			
		3.0		0.0	0.1		0.1			
		4.5		0.0	0.1		0.1			
		1.65		0.08	0.24		0.24			$I_{OL} = 4$ mA
		2.3		0.10	0.3		0.3			$I_{OL} = 8$ mA
		3.0		0.15	0.4		0.4			$I_{OL} = 16$ mA
		3.0		0.22	0.55		0.55			$I_{OL} = 24$ mA
		4.5		0.22	0.55		0.55			$I_{OL} = 32$ mA
I_{IN}	Input Leakage Current	0 to 5.5			±0.1		±1.0	μA	$0 \leq V_{IN} \leq 5.5V$	
I_{OZ}	3-STATE Output Leakage	1.65 to 5.5			±0.5		±5.0	μA	$V_{IN} = V_{IL}$ or V_{IH} $0 \leq V_{OUT} \leq 5.5V$	
I_{OFF}	Power-Off Leakage Current	0.0			1.0		10	μA	V_{IN} or $V_{OUT} = 5.5V$	
I_{CC}	Quiescent Supply Current	1.65 to 5.5			1.0		10	μA	$V_{IN} = 5.5V$, GND	

AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	$T_A = +25°C$			$T_A = -40°C$ to $+85°C$		Units	Conditions	Figure Number
			Min	Typ	Max	Min	Max			
t_{PLH} t_{PHL}	Propagation Delay D to Q	1.65	2.0	9.0	15.0	2.0	16.0	ns	C_L = 15 pF R_D = 1 MΩ S_1 = Open	Figures 1, 3
		1.8	2.0	6.1	10.0	2.0	10.5			
		2.5 ± 0.2	1.5	3.6	6.5	1.6	6.8			
		3.3 ± 0.3	1.0	2.7	4.6	1.2	5.0			
		5.0 ± 0.5	1.0	2.0	3.4	1.0	3.7			
		3.3 ± 0.3	1.5	3.3	5.5	1.5	6.2		C_L = 50 pF R_D = 500Ω, S_1 = Open	Figures 1, 3
		5.0 ± 0.5	1.0	2.6	4.3	1.3	4.8			
t_{PLH} t_{PHL}	Propagation Delay LE to Q	1.65	2.0	9.0	1.45	2.0	15.0	ns	C_L = 15 pF R_D = 1 MΩ S_1 = Open	Figures 1, 3
		1.8	2.0	6.0	9.6	2.0	10.0			
		2.5 ± 0.2	1.8	3.5	6.1	1.5	6.6			
		3.3 ± 0.3	1.3	2.6	4.4	1.0	4.8			
		5.0 ± 0.5	1.0	2.0	3.2	0.8	3.5			
		3.3 ± 0.3	1.5	3.3	5.3	1.5	6.2		C_L = 50 pF R_D = 500Ω, S_1 = Open	Figures 1, 4
		5.0 ± 0.5	1.3	2.6	4.2	1.2	4.6			
t_{PZL} t_{PZH}	Output Enable Time	1.65	2.0	9.0	13.5	2.0	14.6	ns	C_L = 50 pF, V_I = 2x V_{CC} R_U, R_D = 500Ω S1 = GND for t_{PZH} S1 = V_I for t_{PZL}	Figures 1, 4
		1.8	2.0	6.0	9.0	2.0	9.5			
		2.5 ± 0.2	2.0	3.7	6.0	1.8	6.6			
		3.3 ± 0.3	1.5	2.8	5.0	1.4	5.3			
		5.0 ± 0.5	1.0	2.2	3.7	1.0	3.9			
t_{PLZ} t_{PHZ}	Output Disable Time	1.65	2.0	7.7	12.0	2.0	13.0	ns	C_L = 50 pF, V_I = 2x V_{CC} R_U, R_D = 500Ω S_1 = GND for t_{PHZ} S_1 = V_I for t_{PLZ}	Figures 1, 4
		1.8	2.0	5.1	8.0	2.0	8.5			
		2.5 ± 0.2	2.0	3.5	6.0	1.8	6.3			
		3.3 ± 0.3	1.5	2.8	4.5	1.4	4.7			
		5.0 ± 0.5	1.0	2.3	3.7	1.0	3.9			
t_S	Setup Time, D to LE	2.5 ± 0.2			2.0			ns	C_L = 50 pF R_D = 500 Ω, S_1 = Open	Figures 1, 5
		3.3 ± 0.3			1.5					
		5.0 ± 0.5			1.5					
t_H	Hold Time, D to LE	2.5 ± 0.2			1.5			ns	C_L = 50 pF R_D = 500 Ω, S_1 = Open	Figures 1, 5
		3.3 ± 0.3			1.5					
		5.0 ± 0.5			1.5					
t_W	Pulse Width, LE	2.5 ± 0.2			3.0			ns	C_L = 50 pF R_D = 500 Ω, S_1 = Open	Figures 1, 5
		3.3 ± 0.3			3.0					
		5.0 ± 0.5			3.0					

Capacitance (Note 3)

Symbol	Parameter	Typ	Max	Units	Conditions
C_{IN}	Input Capacitance	3		pF	V_{CC} = Open, V_{IN} = 0V or V_{CC}
C_{OUT}	Output Capacitance	4		pF	V_{CC} = 3.3V, V_{IN} = 0V or V_{CC}
C_{PD}	Power Dissipation Capacitance (Note 4)	14		pF	V_{CC} = 3.3V
		17			V_{CC} = 5.0V

**Note 3:** T_A = +25C, f = 1 MHz.

Note 4: 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. (See Figure 2) C_{PD} is related to I_{CCD} dynamic operating current by the expression:
$I_{CCD} = (C_{PD})(V_{CC})(f_{IN}) + (I_{CC}static)$.

AC Loading and Waveforms
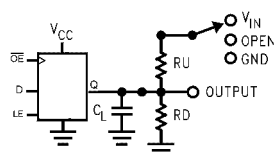
C_L includes load and stray capacitance

Input PRR = 1.0 MHz, t_w = 500 ns

FIGURE 1. AC Test Circuit
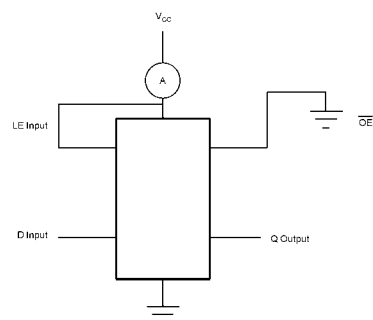
D Input = AC Waveform; $t_r = t_f$ = 1.8 ns;

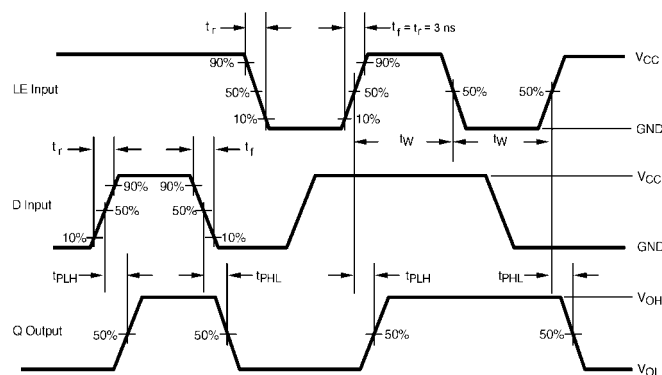D Input PRR = 10 MHz; Duty Cycle = 50%

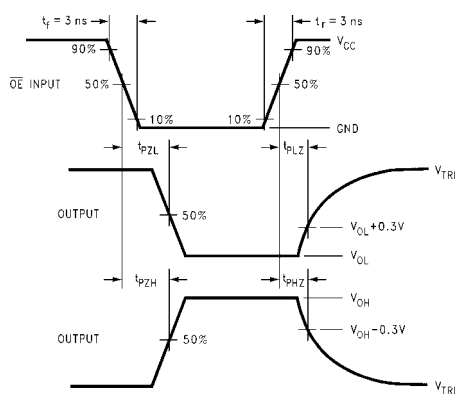**FIGURE 2. I_{CCD} Test Circuit**
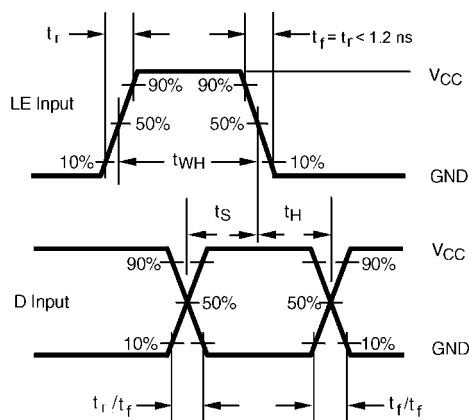

**FIGURE 3. AC Waveforms**

FIGURE 4. AC Waveforms

FIGURE 5. AC Waveforms

Tape and Reel Specification

TAPE FORMAT for SC70

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

TAPE DIMENSIONS inches (millimeters)

SECTION B-B

SECTION A-A

BEND RADIUS NOT TO SCALE
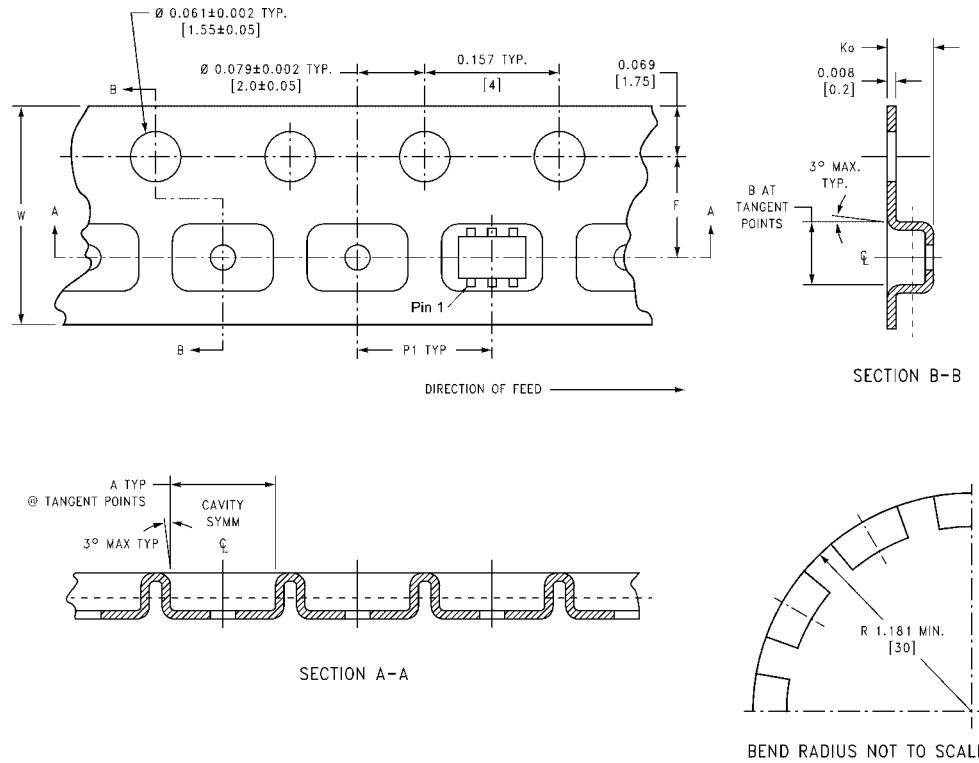
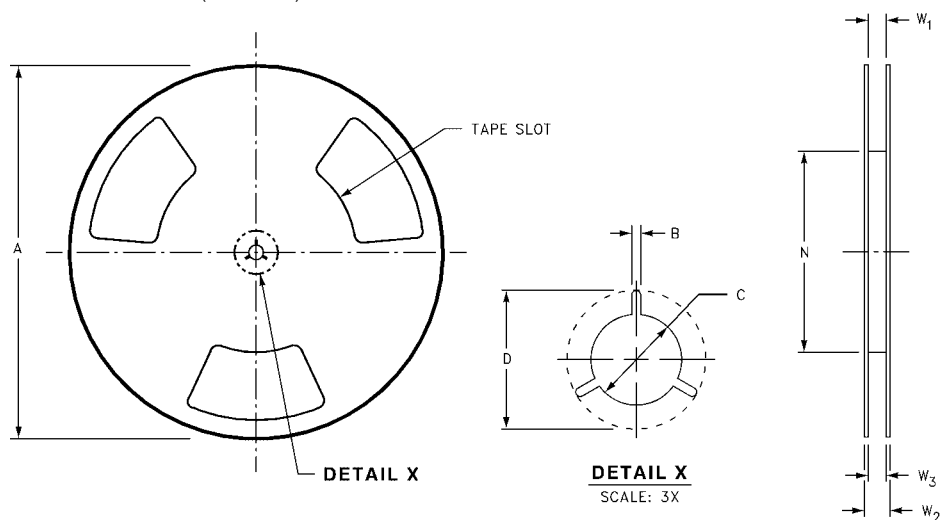| Package	Tape Size	DIM A	DIM B	DIM F	DIM K$_o$	DIM P1	DIM W
SC70-6	8 mm	0.093 (2.35)	0.096 (2.45)	0.138 ± 0.004 (3.5 ± 0.10)	0.053 ± 0.004 (1.35 ± 0.10)	0.157 (4)	0.315 ± 0.004 (8 ± 0.1)

Tape and Reel Specification (Continued)

TAPE FORMAT for MicroPak

Package Designator	Tape Section	Number Cavities	Cavity Status	Cover Tape Status
	Leader (Start End)	125 (typ)	Empty	Sealed
L6X	Carrier	3000	Filled	Sealed
	Trailer (Hub End)	75 (typ)	Empty	Sealed

DIRECTION OF FEED

SECTION B-B
SCALE:10X

SECTION A-A
SCALE:10X
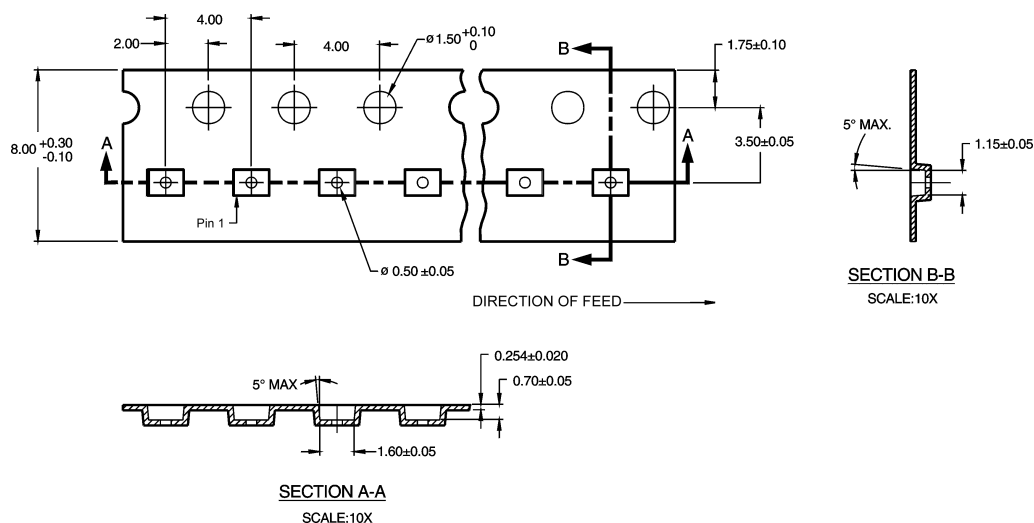
REEL DIMENSIONS inches (millimeters)

TAPE SLOT

DETAIL X

DETAIL X
SCALE: 3X

Tape Size	A	B	C	D	N	W1	W2	W3
8 mm	7.0 (177.8)	0.059 (1.50)	0.512 (13.00)	0.795 (20.20)	2.165 (55.00)	0.331 + 0.059/−0.000 (8.40 + 1.50/−0.00)	0.567 (14.40)	W1 + 0.078/−0.039 (W1 + 2.00/−1.00)

Physical Dimensions inches (millimeters) unless otherwise noted

-A-
2.00±0.20

0.65

6   5   4

-B- 1.25±0.10   2.10±0.10

1   2   3

0.25   0.20 +0.10 -0.05

⊕ max 0.1 ⓦ

0.9±.10   0.95±0.15

0.10 0.00

⌂ max 0.1

0.65

.5 min

1.9

0.4 min

LAND PATTERN RECOMMENDATION

SEE DETAIL A

0.25 0.10

6.00°

R0.14

GAGE PLANE

R0.10

0°-30°

0.20

6.00°

0.45 0.10

0.425 NOMINAL

DETAIL A
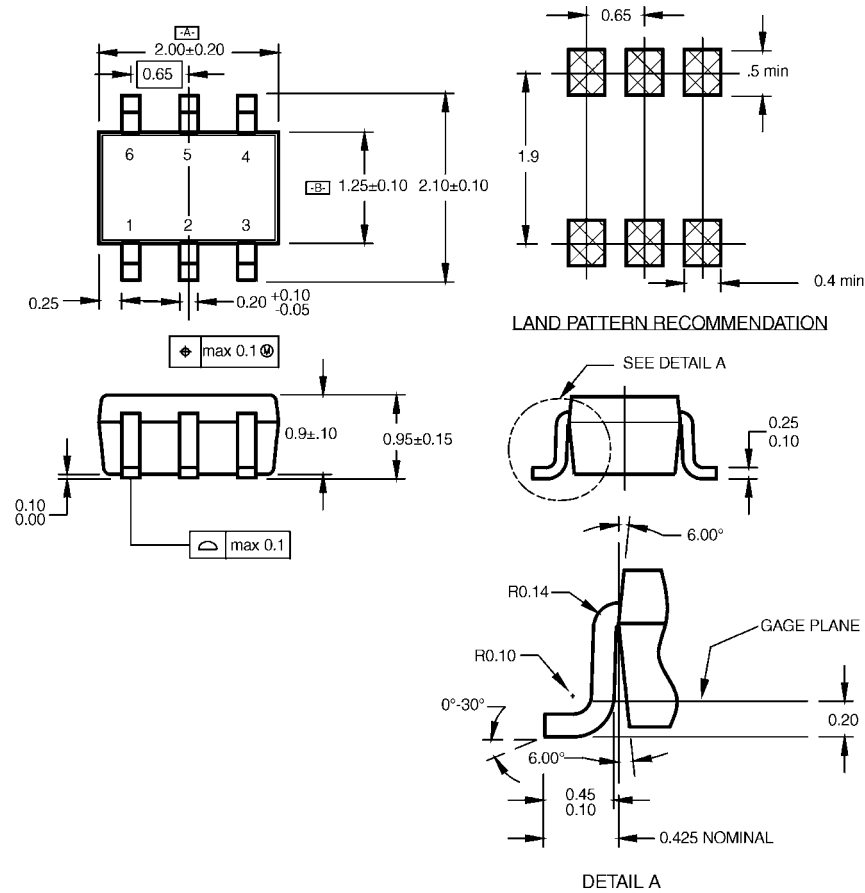
NOTES:

A. CONFORMS TO EIAJ REGISTERED OUTLINE DRAWING SC88.
B. DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH.
C. DIMENSIONS ARE IN MILLIMETERS.

MAA06ARevC

6-Lead SC70, EIAJ SC88, 1.25mm Wide
Package Number MAA06A

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

TOP VIEW

RECOMMENDED
LAND PATTERN

Detail A

BOTTOM VIEW

DETAIL A
PIN 1 LEAD

0.075 X 45°
CHAMFER

Notes:
1. JEDEC PACKAGE REGISTRATION IS ANTICIPATED
2. DIMENSIONS ARE IN MILLIMETERS
3. DRAWING CONFORMS TO ASME Y14.5M-1994

MAC06ARevB

**6-Lead MicroPak, 1.0mm Wide
Package Number MAC06A**

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.

2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

www.fairchildsemi.com

PUBLICATION ORDERING INFORMATION

© Semiconductor Components Industries, LLC

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ON Semiconductor](#):
  [NC7SZ373P6](#) [NC7SZ373P6X](#) [NC7SZ373L6X](#)

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru	moschip.ru_6
moschip.ru_4	moschip.ru_9