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NC7SV157

TinyLogic® ULP-A 2-Input Non-Inverting Multiplexer

General Description

The NC7SV157 is a single 2-Input Non-inverting Multiplexer from Fairchild's Ultra Low Power-A (ULP-A) Series of TinyLogic®. ULP-A is ideal for applications that require extreme high speed, high drive and low power. This product is designed for a wide low voltage operating range (0.9V to 3.6V V_{CC}) and applications that require more drive and speed than the TinyLogic ULP series, but still offer best in class low power operation.

The NC7SV157 is uniquely designed for optimized power and speed, and is fabricated with an advanced CMOS technology to achieve high-speed operation while maintaining low CMOS power dissipation.

Features

- 0.9V to 3.6V V_{CC} supply operation
- 3.6V overvoltage tolerant I/O's at V_{CC} from 0.9V to 3.6V
- Extremely High Speed tpD

1.5 ns typ for 2.7V to 3.6V $V_{\rm CC}$

2.0 ns typ for 2.3V to 2.7V $\rm V_{\rm CC}$

3.0 ns typ for 1.65V to 1.95V $\ensuremath{\text{V}_{\text{CC}}}$

4.0 ns typ for 1.4V to 1.6V $\rm V_{\rm CC}$

8.0 ns typ for 1.1V to 1.3V $\rm V_{CC}$ 16.0 ns typ for 0.9V $\rm V_{CC}$

- Power-Off high impedance inputs and outputs
- High Static Drive (I_{OH}/I_{OL})

±24 mA @ 3.00V V_{CC}

±18 mA @ 2.30V V_{CC}

 ± 6 mA @ 1.65V V_{CC}

 ± 4 mA @ 1.4V V_{CC}

 ± 2 mA @ 1.1V V_{CC}

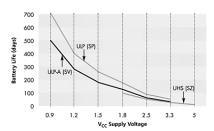
 ± 0.1 mA @ 0.9V V_{CC}

- Uses patented Quiet Series™ noise/EMI reduction circuitry
- Ultra small MicroPak™ leadfree package
- Ultra low dynamic power

Ordering Code:

Order Number	Package Number	Product Code Top Mark	Package Description	Supplied As
NC7SV157P6X	MAA06A	VF7	6-Lead SC70, EIAJ SC88, 1.25mm Wide	3k Units on Tape and Reel
NC7SV157L6X	MAC06A	H9	6-Lead MicroPak, 1.0mm Wide	5k Units on Tape and Reel

Battery Life vs. V_{CC} Supply Voltage



TinyLogic ULP and ULP-A with up to 50% less power consumption can extend your battery life significantly.

Battery Life = (V_{battery} *I_{battery}*.9)/(P_{device})/24hrs/day

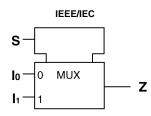
Where, ${\rm P_{device}} = ({\rm I_{CC}} \star {\rm V_{CC}}) + ({\rm C_{PD}} + {\rm C_L}) \star {\rm V_{CC}}^2 \star {\rm f}$

Assumes ideal 3.6V Lithium Ion battery with current rating of 900mAH and derated 90% and device frequency at 10MHz, with $C_L=15\,\mathrm{pF}$ load

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Logic Symbol



Pin Descriptions

Pin Names	Description		
I ₀ , I ₁	Data Inputs		
S	Control Input		
Z	Output		

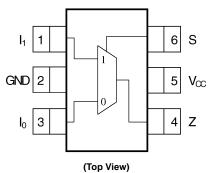
Function Table

	Inputs	Output		
S	I ₁	$Z = (I_0) \bullet (S) + (I_1) \bullet (S)$		
L	Х	L	L	
L	Χ	Н	Н	
Н	L	Х	L	
Н	Н	X	Н	

H = HIGH Logic Level L = LOW Logic Level

Connection Diagrams

Pin Assignments for SC70



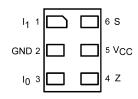
Pin One Orientation Diagram



Pin One

AAA represents 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



(Top Thru View)

±24 mA

Absolute Maximum Ratings(Note 1)

Recommended Operating Conditions (Note 3)

Supply Voltage (V _{CC})	-0.5V to +4.6V	Cona
DC Input Voltage (V _{IN})	-0.5V to +4.6V	Supply \
DC Output Voltage (V _{OUT})		Input Vo
HIGH or LOW State (Note 2)	–0.5V to V_{CC} +0.5V	Output \
$V_{CC} = 0V$	-0.5V to $+4.6V$	$V_{CC} =$
DC Input Diode Current (I_{IK}) $V_{IN} < 0V$	±50 mA	HIGH
DC Output Diode Current (I _{OK})		Output C
$V_{OUT} < 0V$	−50 mA	$V_{CC} =$
V _{OUT} > V _{CC}	+50 mA	$V_{CC} =$
DC Output Source/Sink Current (I_{OH}/I_{OL})	\pm 50 mA	$V_{CC} =$
DC V _{CC} or Ground Current per		$V_{CC} =$
Supply Pin (I _{CC} or Ground)	\pm 50 mA	$V_{CC} =$

-65°C to +150°C

Supply Voltage 0.9V to 3.6V Input Voltage (V_{IN}) 0V to 3.6V

Output Voltage (V_{OUT})

Output Current in I_{OH}/I_{OL} $V_{CC} = 3.0V$ to 3.6V

 $\begin{array}{c} V_{CC} = 2.3 V \text{ to } 2.7 V & \pm 18 \text{ mA} \\ V_{CC} = 1.65 V \text{ to } 1.95 V & \pm 6 \text{ mA} \\ V_{CC} = 1.4 V \text{ to } 1.6 V & \pm 4 \text{ mA} \\ V_{CC} = 1.1 V \text{ to } 1.3 V & \pm 2 \text{ mA} \\ V_{CC} = 0.9 V & \pm 0.1 \text{ mA} \end{array}$

 V_{CC} = 0.9V ± 0.1 mA Free Air Operating Temperature (T_A) -40° C to $+85^{\circ}$ C

Minimum Input Edge Rate (Δt/ΔV)

 $V_{IN} = 0.8V$ to 2.0V, $V_{CC} = 3.0V$ 10 ns/V

Note 1: 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: I_O Absolute Maximum Rating must be observed.

Note 3: Unused inputs must be held HIGH or LOW. They may not float.

DC Electrical Characteristics

Storage Temperature Range (T_{STG})

Symbol	Parameter	V _{CC}	T _A = +25°C		T _A = -40°C to +85°C		Units	Conditions
Symbol	Farameter	(V)	Min	Max	Min	Max	Units	Conditions
V_{IH}	HIGH Level	0.90	0.65 x V _{CC}		0.65 x V _{CC}			
	Input Voltage	$1.10 \le V_{CC} \le 1.30$	0.65 x V _{CC}		0.65 x V _{CC}			
		$1.40 \le V_{CC} \le 1.60$	0.65 x V _{CC}		0.65 x V _{CC}		V	
		$1.65 \leq V_{CC} \leq 1.95$	0.65 x V _{CC}		0.65 x V _{CC}		· ·	
		$2.30 \leq V_{CC} < 2.70$	1.6		1.6			
		$2.70 \leq V_{CC} \leq 3.60$	2.0		2.0			
V_{IL}	LOW Level	0.90		0.35 x V _{CC}		0.35 x V _{CC}		
	Input Voltage	$1.10 \le V_{CC} \le 1.30$		$0.35 \times V_{\rm CC}$		$0.35 \times V_{\rm CC}$		
		$1.40 \le V_{CC} \le 1.60$		$0.35 \times V_{\rm CC}$		$0.35 \times V_{\rm CC}$	V	
		$1.65 \le V_{CC} \le 1.95$		$0.35 \times V_{\rm CC}$		$0.35 \times V_{\rm CC}$	·	
		$2.30 \leq V_{CC} < 2.70$		0.7		0.7		
		$2.70 \leq V_{CC} \leq 3.60$		0.8		8.0		
V _{OH}	HIGH Level	0.90	V _{CC} - 0.1		V _{CC} - 0.1			
	Output Voltage	$1.10 \le V_{CC} \le 1.30$	V _{CC} - 0.1		V _{CC} - 0.1			
		$1.40 \le V_{CC} \le 1.60$	V _{CC} – 0.2		V _{CC} - 0.2			I _{OH} = -100 μA
		$1.65 \le V_{CC} \le 1.95$	V _{CC} - 0.2		V _{CC} - 0.2			ΙΟΗ = -100 μΑ
		$2.30 \le V_{CC} < 2.70$	V _{CC} – 0.2		V _{CC} - 0.2			
		$2.70 \leq V_{CC} \leq 3.60$	V _{CC} – 0.2		V _{CC} - 0.2			
		$1.10 \le V_{CC} \le 1.30$	0.75 x V _{CC}		0.75 x V _{CC}			$I_{OH} = -2 \text{ mA}$
		$1.40 \le V_{CC} \le 1.60$	0.75 x V _{CC}		0.75 x V _{CC}		V	$I_{OH} = -4 \text{ mA}$
		$1.65 \le V_{CC} \le 1.95$	1.25		1.25			I _{OH} = -6 mA
		$2.30 \le V_{CC} < 2.70$	2.0		2.0			IOH - O IIIV
		$2.30 \le V_{CC} < 2.70$	1.8		1.8			I _{OH} = -12 mA
		$2.70 \leq V_{CC} \leq 3.60$	2.2		2.2			OH - 12 11/1
		$2.30 \le V_{CC} < 2.70$	1.7		1.7			I _{OH} = -18 mA
		$2.70 \leq V_{CC} \leq 3.60$	2.4		2.4			
		$2.70 \le V_{CC} \le 3.60$	2.2		2.2			I _{OH} = -24 mA

DC Electrical Characteristics (Continued)

Symbol	Parameter	V _{CC}	T _A =	$= +25$ °C $T_A = -40$		= -40°C to +85°C		Conditions
Syllibol	r ai ailletei	(V)	Min	Max	Min	Max	Units	Conditions
V _{OL}	LOW Level	0.90		0.1		0.1		
	Output Voltage	$1.10 \leq V_{CC} \leq 1.30$		0.1		0.1		
		$1.40 \le V_{CC} \le 1.60$		0.2		0.2		1 - 1004
		$1.65 \leq V_{CC} \leq 1.95$		0.2		0.2		I _{OL} = 100 μA
		$2.30 \le V_{CC} < 2.70$		0.2		0.2		
		$2.70 \leq V_{CC} \leq 3.60$		0.2		0.2		Ì
		$1.10 \le V_{CC} \le 1.30$		0.25 x V _{CC}		0.25 x V _{CC}	V	I _{OL} = 2 mA
		$1.40 \le V_{CC} \le 1.60$		0.25 x V _{CC}		0.25 x V _{CC}	v	I _{OL} = 4 mA
		$1.65 \le V_{CC} \le 1.95$		0.3		0.3		I _{OL} = 6 mA
		$2.30 \le V_{CC} < 2.70$		0.4		0.4		I _{OL} = 12 mA
		$2.70 \leq V_{CC} \leq 3.60$		0.4		0.4		10L - 12 IIIA
		$2.30 \le V_{CC} < 2.70$		0.6		0.6		I _{OL} = 18 mA
		$2.70 \leq V_{CC} \leq 3.60$		0.4		0.4		IOL - IOIIIX
		$2.70 \leq V_{CC} \leq 3.60$		0.55		0.55		I _{OL} = 24 mA
I _{IN}	Input Leakage Current	0.90 to 3.60		±0.1		±0.5	μΑ	$0 \le V_I \le 3.6V$
I _{OFF}	Power Off Leakage Current	0		0.5		0.5	μΑ	$0 \le (V_I, V_O) \le 3.6V$
I _{CC}	Quiescent Supply Current	0.90 to 3.60		0.9		0.9	μА	$V_I = V_{CC}$ or GND
		0.90 to 3.60				±0.9	μΛ	$V_{CC} \le V_I \le 3.6V$

AC Electrical Characteristics

Symbol	Parameter	v _{cc}	$T_A = +25^{\circ}C$		$T_A = -40^{\circ}C \text{ to } +85^{\circ}C$		Units	Conditions	Figure	
Symbol	Farameter	(V)	Min	Тур	Max	Min	Max	Units	Conditions	Number
t _{PHL}	Propagation Delay	0.90		16					$C_L = 15 \text{ pF}, R_L = 1 \text{ M}\Omega$	
t _{PLH}	S to Z	$1.10 \le V_{CC} \le 1.30$	3.0	8	15.5	2.2	18.8		C = 15 pE B = 2 kO	
		$1.40 \leq V_{CC} \leq 1.60$	2.0	4	8.5	1.0	9.5	ns	$C_L = 15 \text{ pF}, R_L = 2 \text{ k}\Omega$	Figures
		$1.65 \le V_{CC} \le 1.95$	1.0	3	6.7	1.2	7.5	115		1, 2
		$2.30 \leq V_{CC} < 2.70$	1.0	2	4.1	0.8	4.4		$C_L=30$ pF, $R_L=500\Omega$	
		$2.70 \leq V_{CC} \leq 3.60$	8.0	1.5	3.4	0.7	3.6			
C _{IN}	Input Capacitance	0		2.0				pF		
C _{OUT}	Output Capacitance	0		4.5				pF		
C _{PD}	Power Dissipation	0.90 to 3.60		10				pF	$V_I = 0V \text{ or } V_{CC}$	
	Capacitance	0.90 to 3.60	10					þΕ	f = 10 MHz	

AC Loading and Waveforms

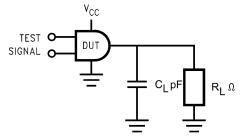


FIGURE 1. AC Test Circuit

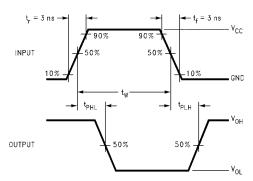


FIGURE 2. AC Waveforms

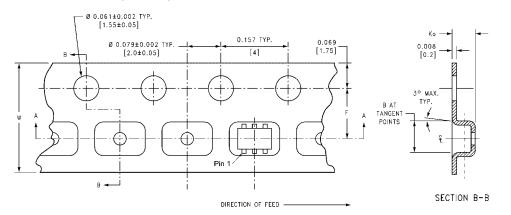
Symbol		V _{cc}								
	$3.3V \pm 0.3V$	$\textbf{2.5V} \pm \textbf{0.2V}$	$1.8V \pm 0.15V$	1.5V ± 0.10V	1.2V ± 0.10V	0.9V				
V _{mi}	1.5V	V _{CC} /2	V _{CC} /2	V _{CC} /2	V _{CC} /2	V _{CC} /2				
V _{mo}	1.5V	V _{CC} /2	V _{CC} /2	V _{CC} /2	V _{CC} /2	V _{CC} /2				

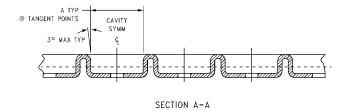
Tape and Reel Specification

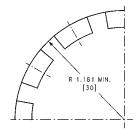
TAPE FORMAT for SC70

1741 = 1 014111741 101 0	THE ET CHAINAT TO COTO								
Package	Таре	Number	Cavity	Cover Tape					
Designator	Section	Cavities	Status	Status					
	Leader (Start End)	125 (typ)	Empty	Sealed					
P6X	Carrier	3000	Filled	Sealed					
	Trailer (Hub End)	75 (typ)	Empty	Sealed					

TAPE DIMENSIONS inches (millimeters)







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	0.096	0.138 ± 0.004	0.053 ± 0.004	0.157	0.315 ± 0.004
		(2.35)	(2.45)	(3.5 ± 0.10)	(1.35 ± 0.10)	(4)	(8 ± 0.1)

Tape and Reel Specification (Continued) TAPE FORMAT for MicroPak Package Tape Number Cavity Cover Tape Status Designator Section Cavities Status Leader (Start End) Sealed 125 (typ) Empty L6X Carrier 5000 Filled Sealed Trailer (Hub End) 75 (typ) **Empty** Sealed TAPE DIMENSIONS inches (millimeters) 1.75±0.10 3.50±0.05 8.00 +0.30 -0.10 1.15±0.05 -ø 0.50 ±0.05 SECTION B-B SCALE:10X DIRECTION OF FEED-0.254±0.020 ┌ 0.70±0.05 5° MAX 1.60±0.05 SECTION A-A **REEL DIMENSIONS** inches (millimeters) TAPE SLOT DETAIL X **DETAIL X** SCALE: 3X W1 W2 W3 Tape В С D N 7.0 0.059 0.512 0.795 2.165 0.331 + 0.059/-0.000 0.567 W1 + 0.078/-0.039 8 mm (177.8)(1.50)(13.00)(20.20)(55.00)(8.40 + 1.50 / -0.00)(14.40)(W1 + 2.00/-1.00)

Physical Dimensions inches (millimeters) unless otherwise noted 0.65 B 1.25±0.10 2.10±0.10 0.20 +0.10 LAND PATTERN RECOMMENDATION ◆ max 0.1 **②** SEE DETAIL A 0.9±.10 0.95±0.15 max 0.1 R0.14 GAGE PLANE R0.10 0.20 -- 0.425 NOMINAL DETAIL A

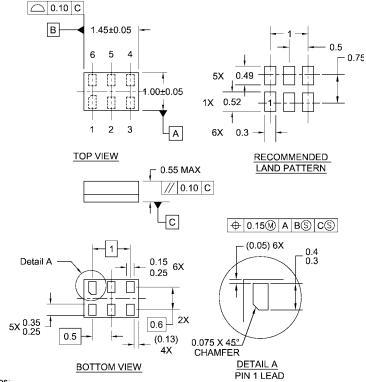
NOTES:

- 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)



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

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ПОСТАВКА ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

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http://moschip.ru/get-element

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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

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