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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®

September 2009

NC7SZ126
TinyLogic® UHS Buffer with Three-State Output

Features

- Ultra-High Speed: t_{PD} 2.6ns (Typical) into 50pF at 5V V_{CC}
- High Output Drive: ±24mA at 3V V_{CC}
- Broad V_{CC} Operating Range: 1.65V to 5.5V
- Matches Performance of LCX Operated at 3.3V V_{CC}
- Power Down High-Impedance Inputs/Outputs
- Over-Voltage Tolerance Inputs Facilitate 5V to 3V Translation
- Proprietary Noise/EMI Reduction Circuitry
- Ultra-Small MicroPak™ Packages
- Space-Saving SOT23 and SC70 Packages

Description

The NC7SZ126 is single buffer with three-State output 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_{CC} operating range. The device is specified to operate over the 1.65V to 5.5V V_{CC} operating range. The inputs and output are high impedance above ground when V_{CC} is 0V. Inputs tolerate voltages up to 6V, independent of V_{CC} operating voltage. The output tolerates voltages above V_{CC} in the 3-State condition.

Ordering Information

Part Number	Top Mark	Eco Status	Package	Packing Method
NC7SZ126M5X	7Z26	RoHS	5-Lead SOT23, JEDEC MO-178 1.6mm	3000 Units on Tape & Reel
NC7SZ126P5X	Z26	RoHS	5-Lead SC70, EIAJ SC-88a, 1.25mm Wide	3000 Units on Tape & Reel
NC7SZ126L6X	FF	RoHS	6-Lead MicroPak™, 1.00mm Wide	5000 Units on Tape & Reel
NC7SZ126FHX	FF	Green	6-Lead, MicroPak2, 1x1mm Body, .35mm Pitch	5000 Units on Tape & Reel

For Fairchild's definition of Eco Status, please visit: http://www.fairchildsemi.com/company/green/rohs_green.html.

Connection Diagrams

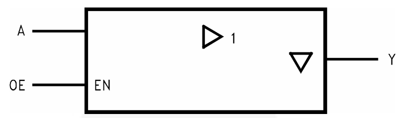


Figure 1. Logic Symbol

Pin Configurations

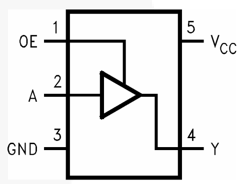


Figure 2. SC70 and SOT23 (Top View)

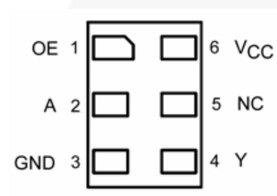


Figure 3. MicroPak (Top Through View)

Pin Definitions

Pin # SC70 / SOT23	Pin # MicroPak	Name	Description
1	1	OE	Input
2	2	A	Input
3	3	GND	Ground
4	4	Y	Output
5	6	V_{CC}	Supply Voltage
	5	NC	No Connect

Function Table

Inputs		Output
OE	**A**	**Out Y**
H	L	L
H	H	H
L	X	Z

H = HIGH Logic Level
L = LOW Logic Level
X = HIGH or LOW Logic Level
Z = HIGH Impedance State

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	Parameter		Min.	Max.	Unit
V_{CC}	Supply Voltage		-0.5	6.0	V
V_{IN}	DC Input Voltage		-0.5	6.0	V
V_{OUT}	DC Output Voltage		-0.5	6.0	V
I_{IK}	DC Input Diode Current	V_{IN} < -0.5V		-50	mA
		V_{IN} > 6.0V		+20	
I_{OK}	DC Output Diode Current	V_{OUT} < -0.5V		-50	mA
		V_{OUT} > 6V, V_{CC}=GND		+20	
I_{OUT}	DC Output Current			±50	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current			±50	mA
T_{STG}	Storage Temperature Range		-65	+150	°C
T_J	Junction Temperature Under Bias			+150	°C
T_L	Junction Lead Temperature (Soldering, 10 Seconds)			+260	°C
P_D	Power Dissipation at +85°C	SOT-23		200	mW
		SC70-5		150	
		MicroPak-6		130	
		MicroPak2-6		120	
ESD	Human Body Model, JEDEC:JESD22-A114			4000	V
	Charge Device Model, JEDEC:JESD22-C101			2000	

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
V_{CC}	Supply Voltage Operating		1.65	5.50	V
	Supply Voltage Data Retention		1.50	5.50	
V_{IN}	Input Voltage		0	5.5	V
V_{OUT}	Output Voltage	Active State	0	V_{CC}	V
		Three-State	0	5.5	
T_A	Operating Temperature		-40	+85	°C
t_r, t_f	Input Rise and Fall Times	V_{CC}=1.8V, 2.5V ± 0.2V	0	20	ns/V
		V_{CC}=3.3V ± 0.3V	0	10	
		V_{CC}=5.0V ± 0.5V	0	5	
θ_{JA}	Thermal Resistance	SOT-23		300	°C/W
		SC70-5		425	
		MicroPak-6		500	
		MicroPak2-6		560	

Note:

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

DC Electrical Characteristics

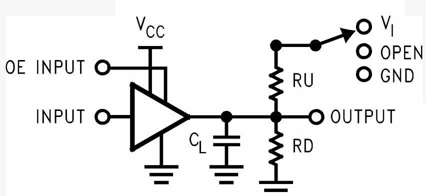
Symbol	Parameter	V_{CC}	Conditions	T_A=+25°C			T_A=-40 to +85°C		Units
				Min.	Typ.	Max.	Min.	Max.	
V_{IH}	HIGH Level Input Voltage	1.65 to 1.95		$0.75V_{CC}$			$0.75V_{CC}$		V
		2.30 to 5.50		$0.70V_{CC}$			$0.70V_{CC}$		
V_{IL}	LOW Level Input Voltage	1.65 to 1.95				$0.25V_{CC}$		$0.25V_{CC}$	V
		2.30 to 5.50				$0.30V_{CC}$		$0.30V_{CC}$	
V_{OH}	HIGH Level Output Voltage	1.65	$V_{IN}=V_{IH}$, I_{OH}=-100µA	1.55	1.65		1.55		V
		1.80		1.70	1.80		1.70		
		2.30		2.20	2.30		2.20		
		3.00		2.90	3.00		2.90		
		4.50		4.40	4.50		4.40		
		1.65	I_{OH}=-4mA	1.29	1.52		1.29		
		2.30	I_{OH}=-8mA	1.90	2.15		1.90		
		3.00	I_{OH}=-16mA	2.40	2.80		2.40		
		3.00	I_{OH}=-24mA	2.30	2.68		2.30		
		4.50	I_{OH}=-32mA	3.80	4.20		3.80		
V_{OL}	LOW Level Output Voltage	1.65	$V_{IN}=V_{IL}$, I_{OL}=100µA		0.00	0.10		0.10	V
		1.80			0.00	0.10		0.10	
		2.30			0.00	0.10		0.10	
		3.00			0.00	0.10		0.10	
		4.50			0.00	0.10		0.10	
		1.65	I_{OL}=4mA		0.80	0.24		0.24	
		2.30	I_{OL}=8mA		0.10	0.30		0.30	
		3.00	I_{OL}=16mA		0.15	0.40		0.40	
		3.00	I_{OL}=24mA		0.22	0.55		0.55	
		4.50	I_{OL}=32mA		0.22	0.55		0.55	
I_{IN}	Input Leakage Current	0 to 5.5	V_{IN}=5.5V, GND			±1		±10	µA
I_{OZ}	3-STATE Output Leakage	0 to 5.5	$V_{IN}=V_{IH}$ or V_{IL} $V_O=V_{CC}$ or GND			±1		±10	µA
I_{OFF}	Power Off Leakage Current	0	V_{IN} or V_{OUT}=5.5V			1		10	µA
I_{CC}	Quiescent Supply Current	1.65 to 5.50	V_{IN}=5.5V, GND			2		20	µA

AC Electrical Characteristics

Symbol	Parameter	V_{CC}	Conditions	$T_A=25°C$			$T_A=-40$ to $+85°C$		Units	Figure
				Min.	Typ.	Max.	Min.	Max.		
t_{PLH}, t_{PHL}	Propagation Delay	1.65	$C_L=15pF$, $R_D=1M\Omega$, S_1=OPEN	2.0	6.4	13.2	2.0	13.8	ns	Figure 4, Figure 6
		1.80		2.0	5.3	11.0	2.0	11.5		
		2.50 ± 0.20		0.8	3.4	7.5	0.8	8.0		
		3.30 ± 0.30		0.5	2.5	5.2	0.5	5.5		
		5.00 ± 0.50		0.5	2.1	4.5	0.5	4.8		
		3.30 ± 0.30	$C_L=50pF$, $R_D=500\Omega$, S_1=OPEN	1.5	3.2	5.7	1.5	6.0		
		5.00 ± 0.50		0.8	2.6	5.0	0.8	5.3		
t_{PZL}, t_{PZH}	Output Enable Time	1.65	$C_L=50pF$, $R_D=500\Omega$, $RU=500\Omega$, S_1=GND for t_{PZH}, $S_1=V_{IN}$ for t_{PZL}, $V_{IN}=2•V_{CC}$	2.0	8.4	15.0	2.0	15.6	ns	Figure 4, Figure 6
		1.80		2.0	6.1	11.5	2.0	12.0		
		2.50 ± 0.20		1.5	3.8	8.0	1.5	8.5		
		3.30 ± 0.30		1.5	3.2	5.7	1.5	6.0		
		5.00 ± 0.50		0.8	2.3	5.0	0.8	5.3		
t_{PLZ}, t_{PHZ}	Output Disable Time	1.65	$C_L=50pF$, $R_D=500\Omega$, $RU=500\Omega$, S_1=GND for t_{PHZ}, $S_1=V_{IN}$ for t_{PLZ}, $V_{IN}=2•V_{CC}$	2.0	6.5	13.2	2.0	14.5		
		1.80		2.0	5.6	11.0	2.0	12		
		2.50 ± 0.20		1.0	4.0	8.0	1.0	8.5		
		3.30 ± 0.30		1.0	3.5	5.7	1.0	6.0		
		5.00 ± 0.50		0.5	2.5	4.7	0.5	5.0		
C_{IN}	Input Capacitance	0.00			4				pF	
C_{OUT}	Output Capacitance	0.00			8				pF	
C_{PD}	Power Dissipation Capacitance[2]	3.30			17				pF	Figure 5
		5.00			24					

Note:

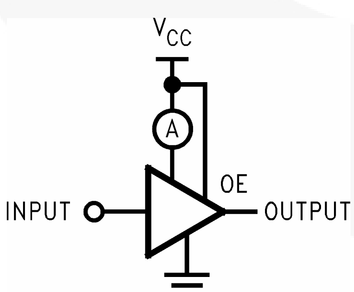
2. C_{PD} is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I_{CCD}) at no output lading and operating at 50% duty cycle. C_{PD} is related to I_{CCD} dynamic operating current by the expression: $I_{CCD}=(C_{PD})(V_{CC})(f_{IN})+(I_{CC}static)$.



Note:

3. C_L includes load and stray capacitance. Input PRR=1.0MHz, t_W=500ns

Figure 4. AC Test Circuit



Note:

4. Input=AC Waveform; $t_r=t_f$=1.8ns; PRR=10MHz; Duty Cycle=50%.

Figure 5. I_{CCD} Test Circuit

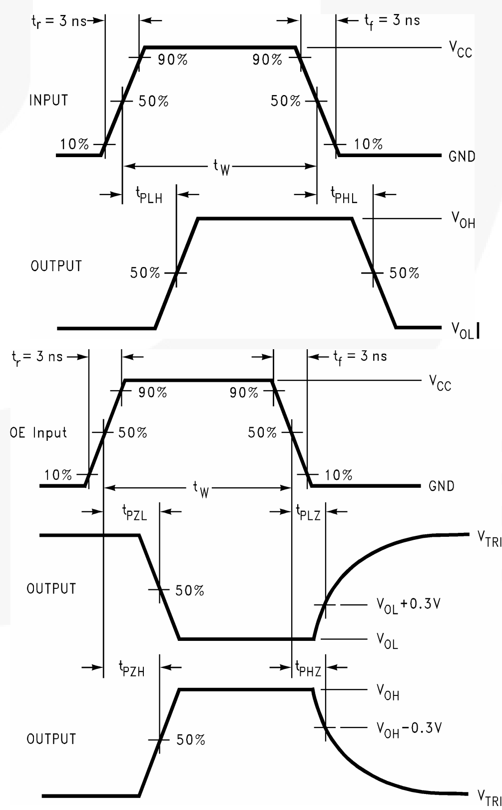


Figure 6. AC Waveforms

Physical Dimensions

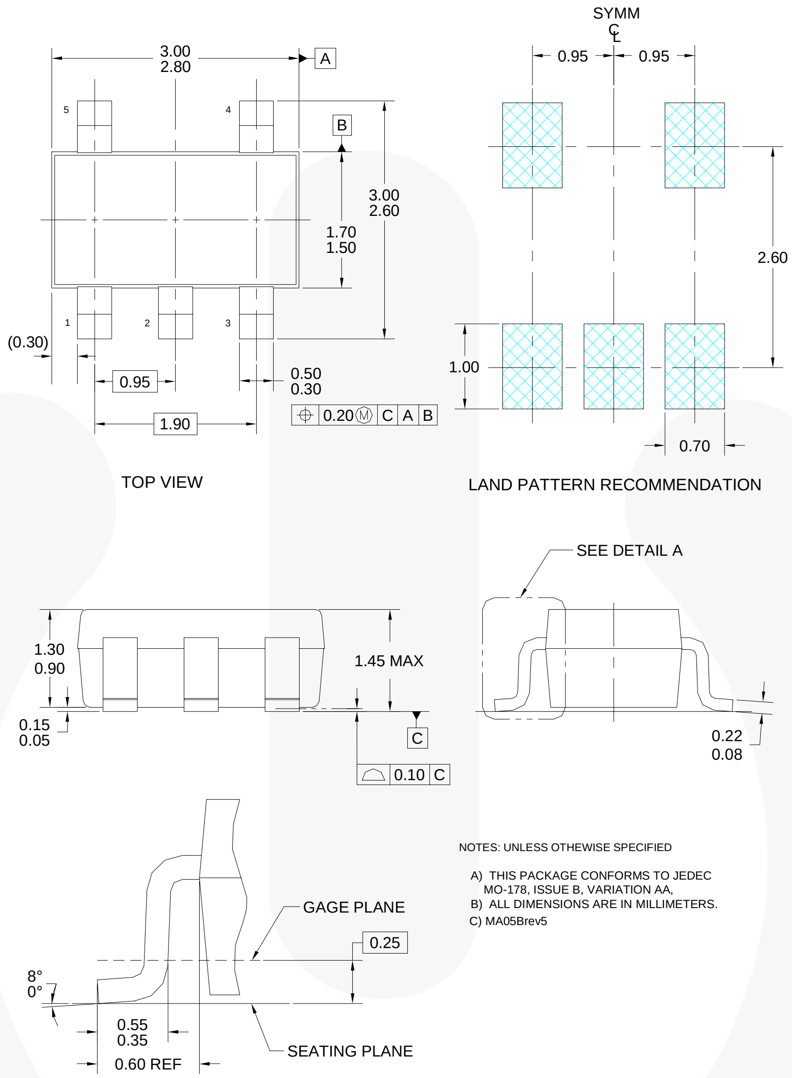


Figure 7. 5-Lead SOT23, JEDEC MO-178 1.6mm

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Tape and Reel Specifications

Please visit Fairchild Semiconductor's online packaging area for the most recent tape and reel specifications: http://www.fairchildsemi.com/packaging/SOT23-5L_tr.pdf.

Package Designator	Tape Section	Cavity Number	Cavity Status	Cover Type Status
M5X	Leader (Start End)	125 (Typical)	Empty	Sealed
	Carrier	3000	Filled	Sealed
	Trailer (Hub End)	75 (Typical)	Empty	Sealed

Physical Dimensions

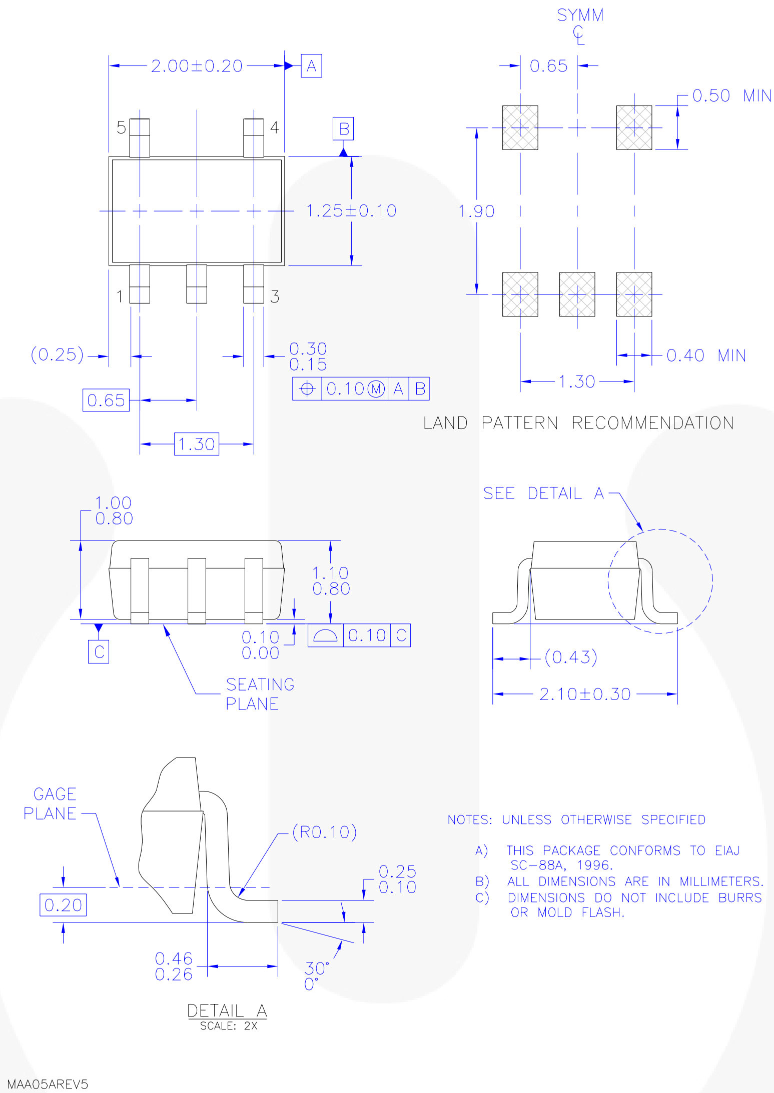

Figure 8. 5-Lead, SC70, EIAJ SC-88a, 1.25mm Wide

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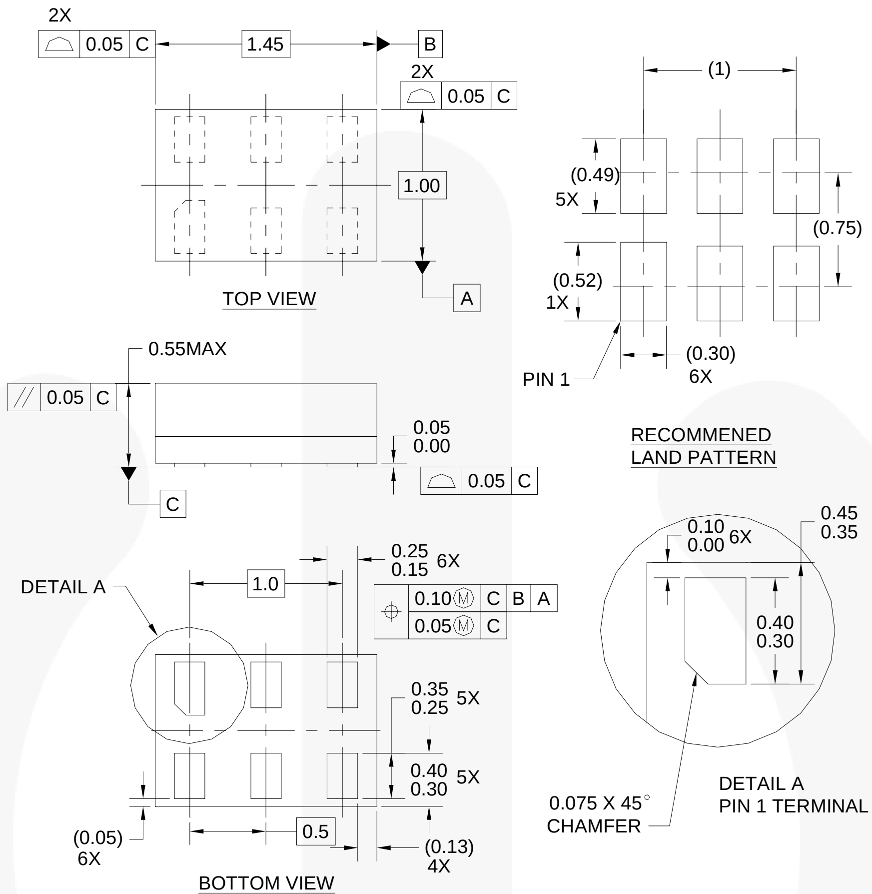
Tape and Reel Specifications

Please visit Fairchild Semiconductor's online packaging area for the most recent tape and reel specifications: http://www.fairchildsemi.com/products/analog/pdf/sc70-5_tr.pdf.

Package Designator	Tape Section	Cavity Number	Cavity Status	Cover Type Status
P5X	Leader (Start End)	125 (Typical)	Empty	Sealed
	Carrier	3000	Filled	Sealed
	Trailer (Hub End)	75 (Typical)	Empty	Sealed

Physical Dimensions



Notes:

1. CONFORMS TO JEDEC STANDARD M0-252 VARIATION UAAD
2. DIMENSIONS ARE IN MILLIMETERS
3. DRAWING CONFORMS TO ASME Y14.5M-1994

MAC06AREVC

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

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Tape and Reel Specifications

Please visit Fairchild Semiconductor's online packaging area for the most recent tape and reel specifications:
http://www.fairchildsemi.com/products/logic/pdf/micropak_tr.pdf.

Package Designator	Tape Section	Cavity Number	Cavity Status	Cover Type Status
L6X	Leader (Start End)	125 (Typical)	Empty	Sealed
	Carrier	5000	Filled	Sealed
	Trailer (Hub End)	75 (Typical)	Empty	Sealed

Physical Dimensions

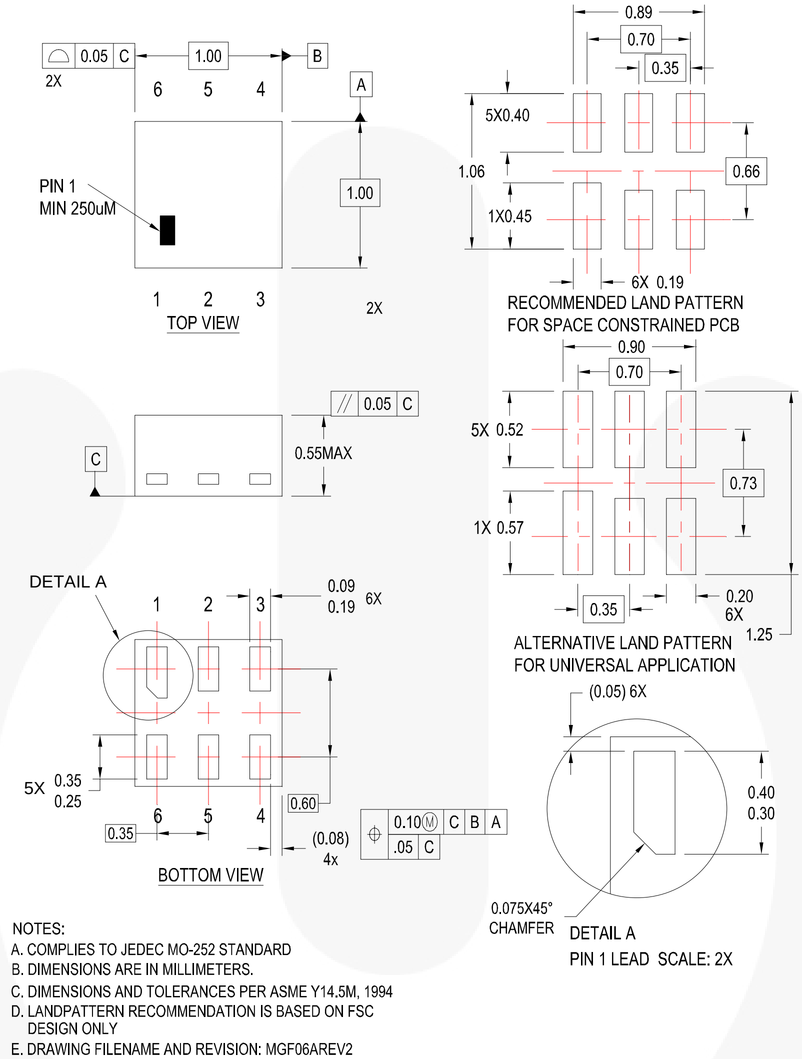

Figure 10.6-Lead, MicroPak2, 1x1mm Body, .35mm Pitch

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Tape and Reel Specifications

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http://www.fairchildsemi.com/packaging/MicroPAK2_6L_tr.pdf.

Package Designator	Tape Section	Cavity Number	Cavity Status	Cover Type Status
FHX	Leader (Start End)	125 (Typical)	Empty	Sealed
	Carrier	5000	Filled	Sealed
	Trailer (Hub End)	75 (Typical)	Empty	Sealed

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Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

Rev. I43

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- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.