Absolute Maximum Ratings (Note 1)

Supply Voltage (V_{CC})	−0.5V to +6V
DC Input Voltage (V_{IN})	−0.5V to +6V
DC Output Voltage (V_{OUT})	−0.5V to +6V
DC Input Diode Current (I_{IK})	
@$V_{IN} < −0.5V$	−50 mA
@ $V_{IN} > 6V$	+20 mA
DC Output Diode Current (I_{OK})	
@$V_{OUT} < −0.5V$	−50 mA
@ $V_{OUT} > 6V$, V_{CC} = GND	+20 mA
DC Output Current (I_{OUT})	± 50 mA
DC V_{CC}/GND Current (I_{CC}/I_{GND})	± 50 mA
Storage Temperature (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	
SOT23-5	200 mW
SC70-5	150 mW

Recommended Operating Conditions (Note 2)

Supply Voltage Operating (V_{CC})	1.65V to 5.5V
Supply Voltage Data Retention (V_{CC})	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
Operating Temperature (T_A)	−40°C to +85°C
Input Rise and Fall Time (t_r, t_f)	
V_{CC} = 1.8V, 2.5V ± 0.2V	0 ns/V to 20 ns/V
V_{CC} = 3.3V ± 0.3V	0 ns/V to 10 ns/V
V_{CC} = 5.0V ± 0.5V	0 ns/V to 5 ns/V
Thermal Resistance (θ_{JA})	
SOT23-5	300°C/W
SC70-5	425°C/W

Note 1: Absolute maximum ratings are DC values beyond which the device may be damaged or have its useful life impaired. The datasheet specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. Fairchild does not recommend operation outside datasheet specifications.

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

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	$T_A = +25°C$ Min	Typ	Max	$T_A = −40°C$ to $+85°C$ Min	Max	Units	Conditions
V_{IH}	HIGH Level Input Voltage	1.65 to 1.95	0.75 V_{CC}			0.75 V_{CC}		V	
		2.3 to 5.5	0.7 V_{CC}			0.7 V_{CC}			
V_{IL}	LOW Level Input Voltage	1.65 to 1.95			0.25 V_{CC}		0.25 V_{CC}	V	
		2.3 to 5.5			0.3 V_{CC}		0.3 V_{CC}		
V_{OH}	HIGH Level Output Voltage	1.65	1.55	1.65		1.55			$V_{IN} = V_{IH}$ $I_{OH} = −100$ µA
		1.8	1.7	1.8		1.7		V	
		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	1.29	1.52		1.29			$I_{OH} = −4$ mA
		2.3	1.9	2.15		1.9			$I_{OH} = −8$ mA
		3.0	2.4	2.80		2.4		V	$I_{OH} = −16$ mA
		3.0	2.3	2.68		2.3			$I_{OH} = −24$ mA
		4.5	3.8	4.20		3.8			$I_{OH} = −32$ mA
V_{OL}	LOW Level Output Voltage	1.65		0.0	0.1		0.0		$V_{IN} = V_{IL}$ $I_{OL} = 100$ µA
		1.8		0.0	0.1		0.1		
		2.3		0.0	0.1		0.1	V	
		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	V	$I_{OL} = 16$ 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			±1		±10	µA	$0 \leq V_{IN} \leq 5.5V$
I_{OZ}	3-STATE Output Leakage	1.65 to 5.5			±1		±10	µA	$V_{IN} = V_{IH}$ or V_{IL} $0 \leq V_O \leq 5.5V$
I_{OFF}	Power Off Leakage Current	0.0			1		10	µA	V_{IN} or V_{OUT} = 5.5V
I_{CC}	Quiescent Supply Current	1.65 to 5.5			2.0		20	µA	V_{IN} = 5.5V, GND

AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	$T_A = +25°C$ Min	Typ	Max	$T_A = -40°C$ to $+85°C$ Min	Max	Units	Conditions	Fig. No.
t_{PLH} t_{PHL}	Propagation Delay	1.65	2.0	6.4	13.2	2.0	13.8	ns	$C_L = 15$ pF, $R_D = 1$ MΩ, $S_1 = $OPEN	Figures 1, 3
		1.8	2.0	5.3	11.0	2.0	11.5			
		2.5 ± 0.2	0.8	3.4	7.5	0.8	8.0			
		3.3 ± 0.3	0.5	2.5	5.2	0.5	5.5			
		5.0 ± 0.5	0.5	2.1	4.5	0.5	4.8			
t_{PLH} t_{PHL}	Propagation Delay	3.3 ± 0.3	1.5	3.2	5.7	1.5	6.0	ns	$C_L = 50$ pF, $R_D = 500$Ω, $S_1 = $OPEN	Figures 1, 3
		5.0 ± 0.5	0.8	2.6	5.0	0.8	5.3			
t_{PZL} t_{PZH}	Output Enable Time	1.65	2.0	8.4	15.0	2.0	15.6	ns	$C_L = 50$ pF, $RD = 500$Ω $RU = 500$Ω $S_1 = $GND for t_{PZH} $S_1 = V_{IN}$ for t_{PZL} $V_{IN} = 2 \times V_{CC}$	Figures 1, 3
		1.8	2.0	7.0	12.5	2.0	13			
		2.5 ± 0.2	1.5	4.6	8.5	1.5	9			
		3.3 ± 0.3	1.5	3.5	6.2	1.5	6.5			
		5.0 ± 0.5	0.8	2.8	5.5	0.8	5.8			
t_{PLZ} t_{PHZ}	Output Disable Time	1.65	2.0	6.5	13.2	2.0	14.5	ns	$C_L = 50$ pF, $RD = 500$Ω $RU = 500$Ω $S_1 = $GND for t_{PHZ} $S_1 = V_{IN}$ for t_{PLZ} $V_{IN} = 2 \times V_{CC}$	Figures 1, 3
		1.8	2.0	5.4	11	2.0	12			
		2.5 ± 0.2	1.5	3.5	8	1.5	8.5			
		3.3 ± 0.3	1.0	2.8	5.7	1.0	6			
		5.0 ± 0.5	0.5	2.1	4.7	0.5	5.0			
C_{IN}	Input Capacitance	0		4				pF		
C_{OUT}	Output Capacitance	0		8						
C_{PD}	Power Dissipation Capacitance	3.3		17				pF	(Note 3)	Figure 2
		5.0		24						

Note 3: 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:
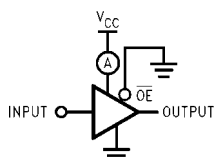$I_{CCD} = (C_{PD})(V_{CC})(f_{IN}) + (I_{CC}$static$)$.

AC Loading and Waveforms
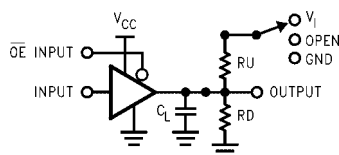
C_L includes load and stray capacitance
Input PRR = 1.0 MHz; t_W = 500 ns

FIGURE 1. AC Test Circuit

Input = AC Waveform; $t_r = t_f$ = 1.8 ns;
PRR = 10 MHz; Duty Cycle = 50%
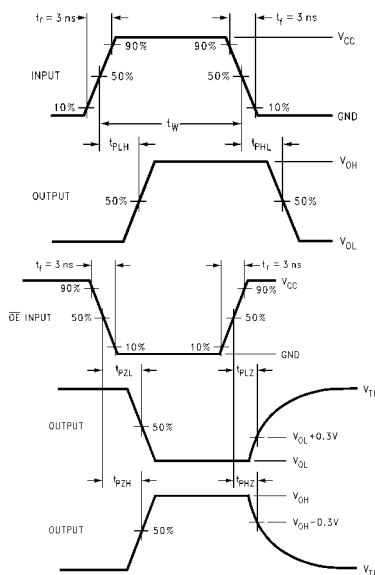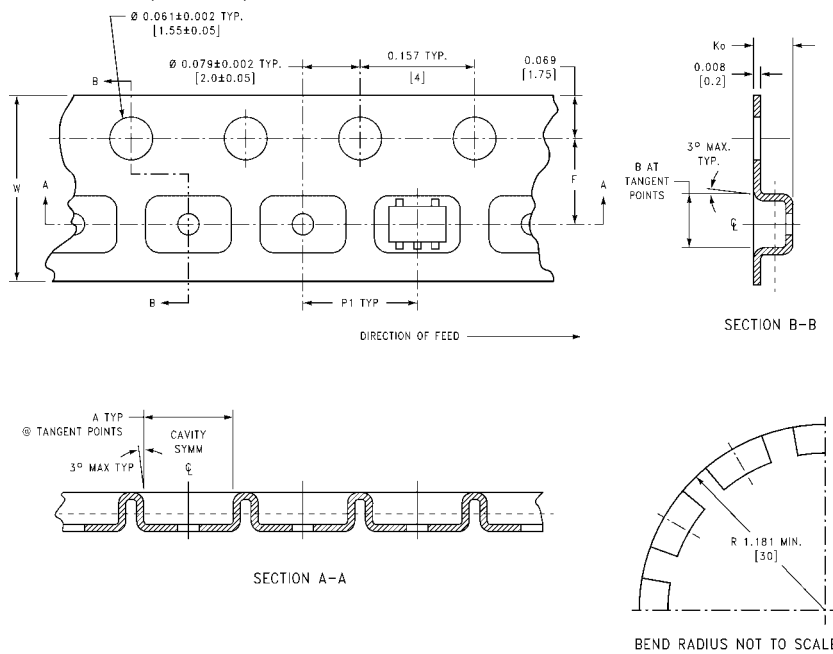
FIGURE 2. I_{CCD} Test Circuit

FIGURE 3. AC Waveforms

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Tape and Reel Specification

TAPE FORMAT

Package Designator	Tape Section	Number Cavities	Cavity Status	Cover Tape Status
M5, P5	Leader (Start End)	125 (typ)	Empty	Sealed
	Carrier	250	Filled	Sealed
	Trailer (Hub End)	75 (typ)	Empty	Sealed
M5X, P5X	Leader (Start End)	125 (typ)	Empty	Sealed
	Carrier	3000	Filled	Sealed
	Trailer (Hub End)	75 (typ)	Empty	Sealed

TAPE DIMENSIONS inches (millimeters)

Ø 0.061±0.002 TYP. [1.55±0.05]

Ø 0.079±0.002 TYP. [2.0±0.05]

0.157 TYP. [4]

0.069 [1.75]

K_o

0.008 [0.2]

B AT TANGENT POINTS

3° MAX. TYP.

SECTION B-B

P1 TYP

DIRECTION OF FEED

A TYP @ TANGENT POINTS

CAVITY SYMM

3° MAX TYP

SECTION A-A

R 1.181 MIN. [30]

BEND RADIUS NOT TO SCALE

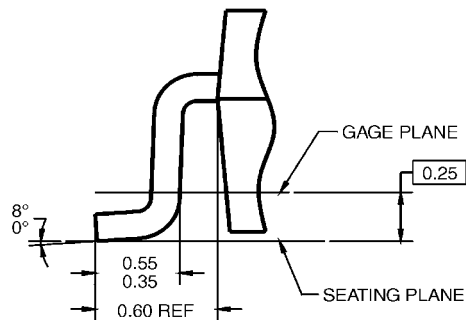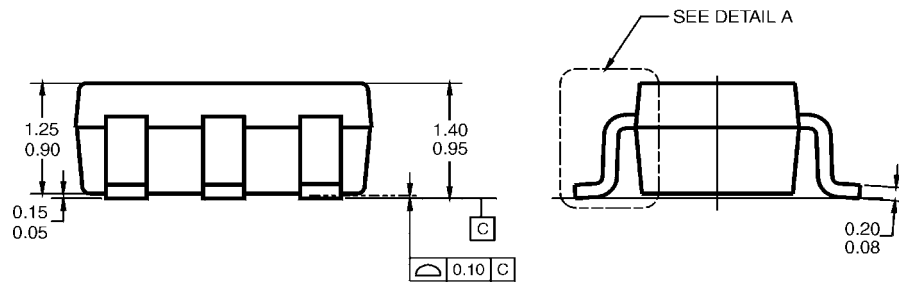| Package	Tape Size	DIM A	DIM B	DIM F	DIM K_o	DIM P1	DIM W
SC70-5	8 mm	0.093 (2.35)	0.096 (2.45)	0.138 ± 0.004 (3.5 ± 0.10)	0.053 ± 0.004 (1.35 ± 0.10)	0.157 (4)	0.315 ± 0.004 (8 ± 0.1)
SOT23-5	8 mm	0.130 (3.3)	0.130 (3.3)	0.138 ± 0.002 (3.5 ± 0.05)	0.055 ± 0.004 (1.4 ± 0.11)	0.157 (4)	0.315 ± 0.012 (8 ± 0.3)

Tape and Reel Specification (Continued)

REEL DIMENSIONS inches (millimeters)

DETAIL X

DETAIL X
SCALE: 3X
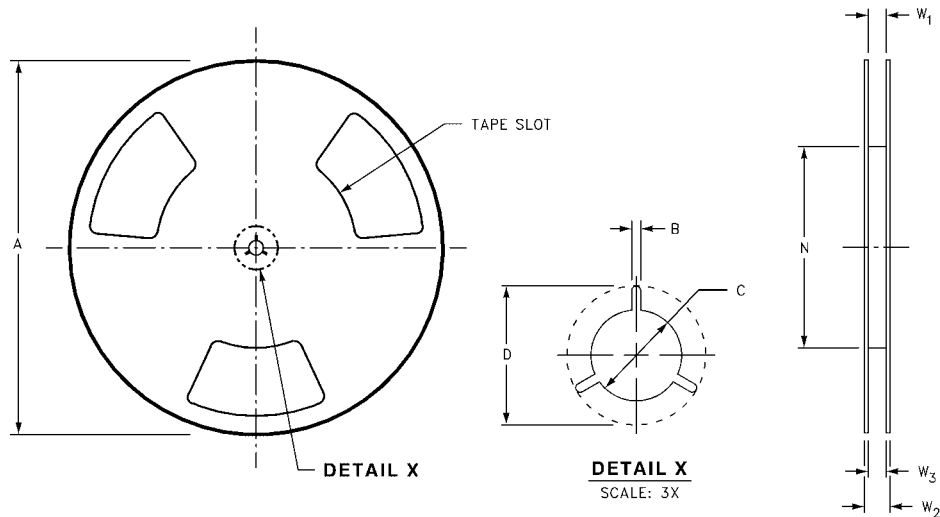
Tape Size	A	B	C	D	N	W1	W2	W3
8 mm	7.0 (177.8)	0.059 (1.50)	0.512 (13.00)	0.795 (20.20)	2.165 (55.00)	0.331 + 0.059/–0.000 (8.40 + 1.50/–0.00)	0.567 (14.40)	W1 + 0.078/–0.039 (W1 + 2.00/–1.00)

Physical Dimensions inches (millimeters) unless otherwise noted

3.00
2.80

A

5   4

B

3.00
2.60

1.70
1.50

1   2   3

0.95

0.50
0.30

1.90

⊕ | 0.20 Ⓜ | C | A | B

SYMM
℄

0.95   0.95

2.60

1.00

0.70

LAND PATTERN RECOMMENDATION

1.25
0.90

1.40
0.95

0.15
0.05

C

◁ | 0.10 | C

SEE DETAIL A

0.20
0.08

GAGE PLANE

0.25

8°
0°

0.55
0.35

0.60 REF

SEATING PLANE

DETAIL A
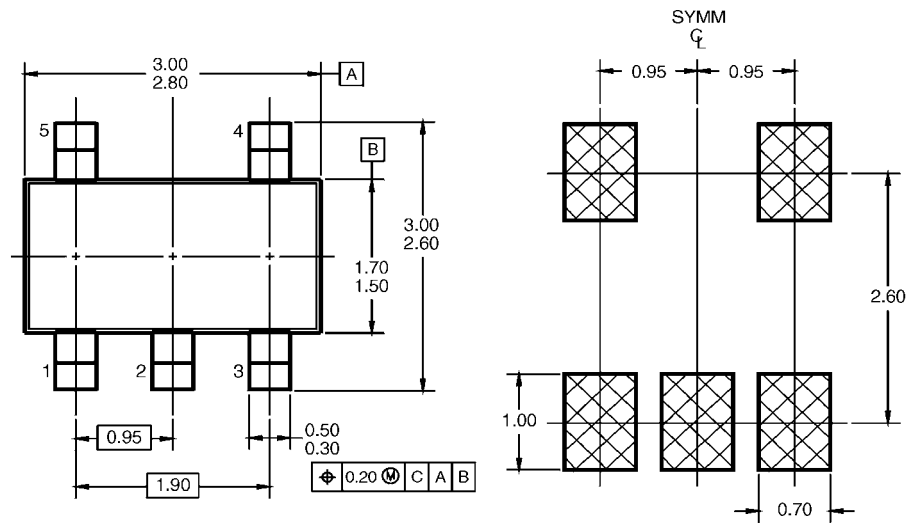
NOTES: UNLESS OTHERWISE SPECIFIED
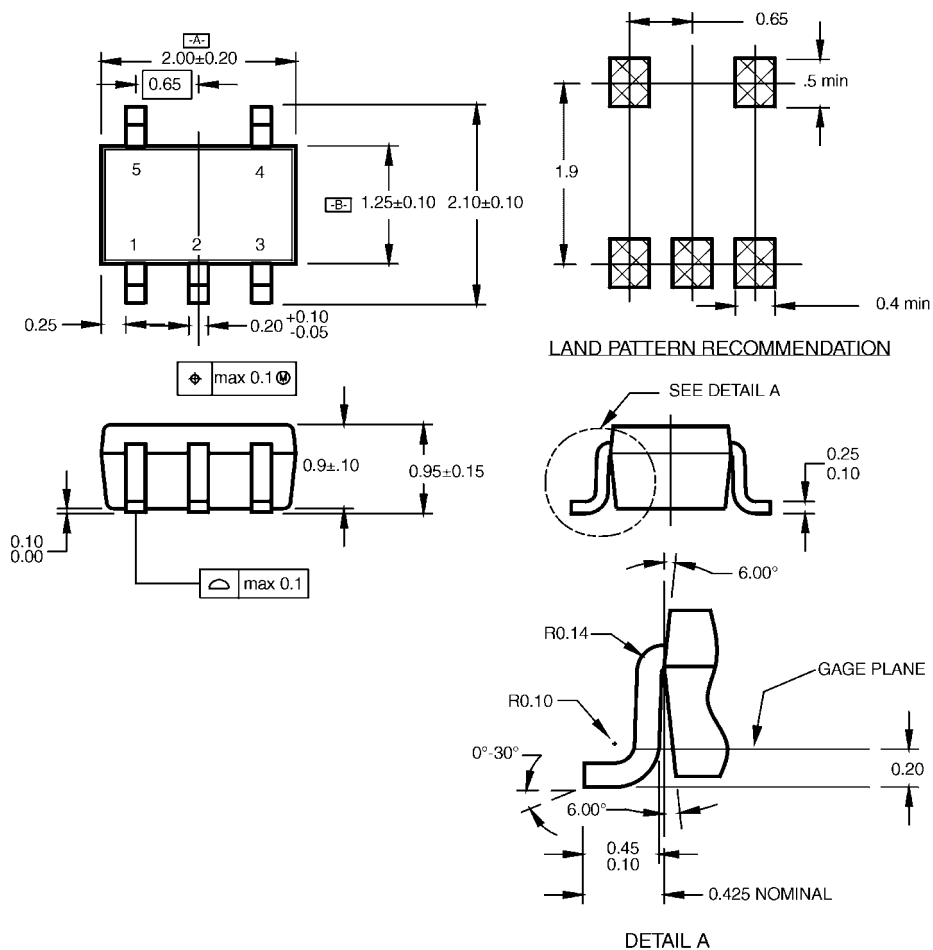   A) THIS PACKAGE CONFORMS TO JEDEC
        MO-178, ISSUE B, VARIATION AA,
        DATED JANUARY 1999.
    B) ALL DIMENSIONS ARE IN MILLIMETERS.

MA05BRevC

5-Lead SOT23, JEDEC MO-178, 1.6mm
Package Number MA05B

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

LAND PATTERN RECOMMENDATION

DETAIL A

MAA05ARevC

NOTES:
   A. CONFORMS TO EIAJ REGISTERED OUTLINE DRAWING SC88A.
   B. DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH.
   C. DIMENSIONS ARE IN MILLIMETERS.

5-Lead SC70, EIAJ SC-88a, 1.25mm Wide
Package Number MAA05A

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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.

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