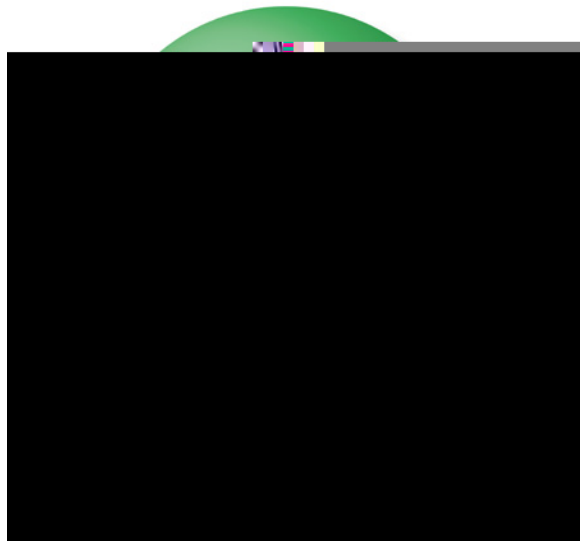




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### Truth Table

LED	Output
Off	HIGH
On	LOW

### Pin Configuration

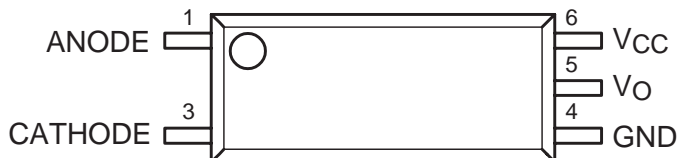


Figure 2. Pin Configuration

### Pin Definitions

Pin #	Name	Description
1	Anode	Anode
3	Cathode	Cathode
4	GND	Output Ground
5	$V_O$	Output Voltage
6	$V_{CC}$	Output Supply Voltage



## 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.  $T_A = 25^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Value	Units
$T_{\text{STG}}$	Storage Temperature	-40 to +125	$^\circ\text{C}$
$T_{\text{OPR}}$	Operating Temperature	-40 to +100	$^\circ\text{C}$
$T_{\text{J}}$	Junction Temperature	-40 to +125	$^\circ\text{C}$
$T_{\text{SOL}}$			

**Note:**

1. No derating required up to  $100^\circ\text{C}$ .

## 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.

**Note:**

2.  $0.1\ \mu\text{F}$  bypass capacitor must be connected between pins 4 and 6.

## Isolation Characteristics

Apply over all recommended conditions, typical value is measured at  $T_A = 25^\circ\text{C}$ .

### Notes:

3. Device is considered a two-terminal device: pins 1 and 3 are shorted together and pins 4, 5, and 6 are shorted together.
4. 5,000  $\text{VAC}_{\text{RMS}}$  for 1-minute duration is equivalent to 6,000  $\text{VAC}_{\text{RMS}}$  for 1-second duration.

## Electrical Characteristics

Apply over all recommended conditions;  $T_A = -40^\circ\text{C}$  to  $+100^\circ\text{C}$ ,  $3.0\text{ V} \leq V_{\text{CC}} \leq 5.5\text{ V}$ ; unless otherwise specified. Typical value is measured at  $T_A = 25^\circ\text{C}$  and  $V_{\text{CC}} = 3.3\text{ V}$  or  $V_{\text{CC}} = 5\text{ V}$ .

## Switching Characteristics

Apply over all recommended conditions;  $T_A = -40^\circ\text{C}$  to  $+100^\circ\text{C}$ ,  $V_{CC} = 3.3\text{ V}$ ,  $I_F = 6.0\text{ mA}$ ; unless otherwise specified. Typical value is measured at  $T_A = 25^\circ\text{C}$  and  $V_{CC} = 3.3\text{ V}$ .

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units	Figure
Data Rate		$R_L = 350\ \Omega$			10	Mbit/sec	
$t_{PHL}$	Propagation Delay to Logic Low Output	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		40	80	ns	10, 11, 15
$t_{PLH}$	Propagation Delay to Logic High Output	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		50	90	ns	10, 11, 15
PWD	Pulse Width Distortion, $ t_{PHL} - t_{PLH} $	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		10	35	ns	12, 13, 15
$t_{PSK}$	Propagation Delay Skew	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$ <sup>(5)</sup>			40	ns	
$t_R$	Output Rise Time (10% to 90%)	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		20		ns	14, 15
$t_F$	Output Fall Time (90% to 10%)	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		10		ns	14, 15
$ CM_H $	Common-Mode Transient Immunity at Output High	$I_F = 0\text{ mA}$ , $V_O > 2\text{ V}$ , $V_{CM} = 1,000\text{ V}$ <sup>(6)</sup>	20	40		kV/ $\mu\text{s}$	16
$ CM_L $	Common-Mode Transient Immunity at Output Low	$I_F = 6.0\text{ mA}$ , $V_O < 0.8\text{ V}$ , $V_{CM} = 1,000\text{ V}$ <sup>(6)</sup>	20	40		kV/ $\mu\text{s}$	16

Apply over all recommended conditions;  $T_A = -40^\circ\text{C}$  to  $+100^\circ\text{C}$ ,  $V_{CC} = 5\text{ V}$ ,  $I_F = 6.0\text{ mA}$ ; unless otherwise specified. Typical value is measured at  $T_A = 25^\circ\text{C}$  and  $V_{CC} = 5\text{ V}$ .

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units	Figure
Data Rate		$R_L = 350\ \Omega$			10	Mbit/sec	
$t_{PHL}$	Propagation Delay to Logic Low Output	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		37	80	ns	10, 11, 15
$t_{PLH}$	Propagation Delay to Logic High Output	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		41	90	ns	10, 11, 15
PWD	Pulse Width Distortion, $ t_{PHL} - t_{PLH} $	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		4	25	ns	12, 13, 15
$t_{PSK}$	Propagation Delay Skew	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$ <sup>(5)</sup>			40	ns	
$t_R$	Output Rise Time (10% to 90%)	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		22		ns	14, 15
$t_F$	Output Fall Time (90% to 10%)	$R_L = 350\ \Omega$ , $C_L = 15\text{ pF}$		9		ns	14, 15
$ CM_H $	Common-Mode Transient Immunity at Output High	$I_F = 0\text{ mA}$ , $V_O > 2\text{ V}$ , $V_{CM} = 1,000\text{ V}$ <sup>(6)</sup>	20	40		kV/ $\mu\text{s}$	16
$ CM_L $	Common-Mode Transient Immunity at Output Low	$I_F = 6.0\text{ mA}$ , $V_O < 0.8\text{ V}$ , $V_{CM} = 1,000\text{ V}$ <sup>(6)</sup>	20	40		kV/ $\mu\text{s}$	16

**Notes:**

5.  $t_{PSK}$  is equal to the magnitude of the worst-case difference in  $t_{PHL}$  and/or  $t_{PLH}$  between any two units from the same manufacturing date code that are operated at same case temperature ( $\pm 5^{\circ}\text{C}$ ), at same operating conditions, with equal loads ( $R_L = 350 \Omega$ ,  $C_L = 15 \text{ pF}$ ), and with an input rise time less than 5 ns.
6. Common-mode transient immunity at output HIGH is the maximum tolerable positive  $dV_{CM}/dt$  on the leading edge of the common-mode impulse signal,  $V_{CM}$ , to assure that the output remains HIGH. Common-mode transient immunity at output LOW is the maximum tolerable negative  $dV_{CM}/dt$  on the trailing edge of the common pulse signal,  $V_{CM}$ , to assure that the output remains LOW.



## Typical Performance Characteristics



Typical Performance Characteristics (Continued)



-40 -20 0 20 40 60 80 100  
T<sub>A</sub> – AMBIENT TEMPERATURE (

Figure 14. Rise Time (t<sub>R</sub>) and Fall Time (t<sub>F</sub>) vs. Ambient Temperature

Test Circuit

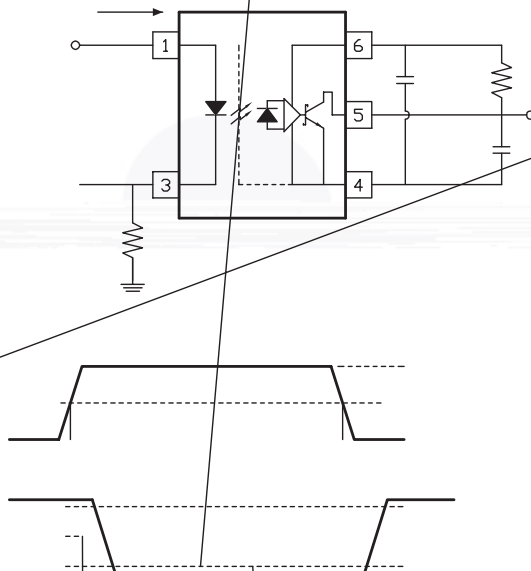


Figure 15. Test Circuit for Propagation Delay, Rise Time, and Fall Time

Figure 16. Test Circuit for Instantaneous Common-Mode Rejection Voltage

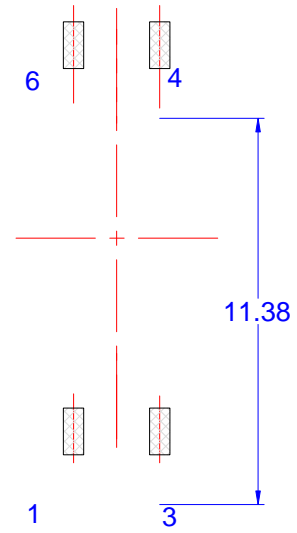
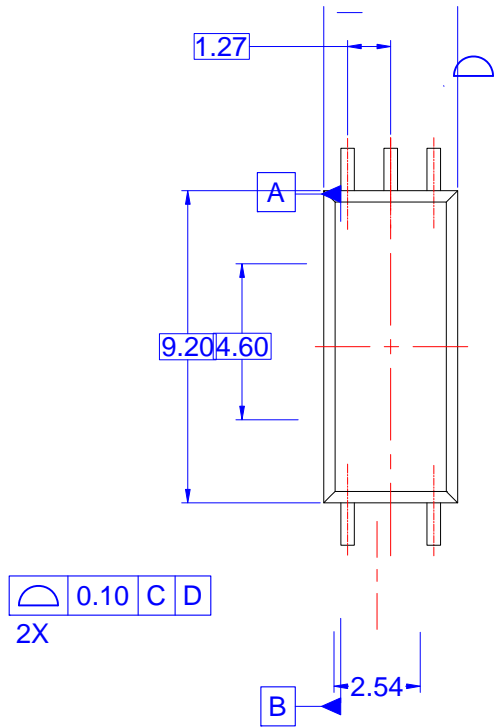


## Reflow Profile

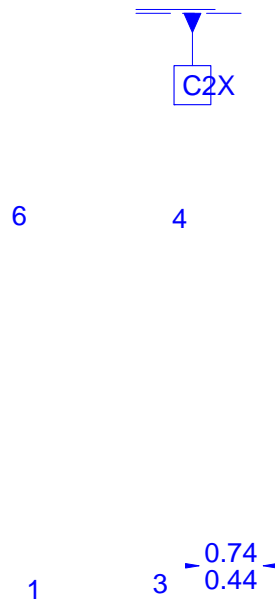


Figure 17. Reflow Profile

<b>Profile Feature</b>	<b>Pb-Free Assembly Profile</b>
Temperature Minimum ( $T_{smin}$ )	150°C
Temperature Maximum ( $T_{smax}$ )	200°C
Time ( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	60 to 120 seconds
Ramp-Up Rate ( $t_L$ to $t_P$ )	3°C/second maximum
Liquidous Temperature ( $T_L$ )	217°C
Time ( $t_L$ ) Maintained Above ( $T_L$ )	60 to 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time ( $t_P$ ) within 5°C of 260°C	30 seconds
Ramp-Down Rate ( $T_P$ to $T_L$ )	6°C/second maximum
Time 25°C to Peak Temperature	



LAND PATTERN  
RECOMMENDATION



**DETAIL A**  
SCALE: 3.2:1

NOTES: UNLESS OTHERWISE SPECIFIED

- A) THIS PACKAGE DOES NOT CONFORM TO ANY STANDARD.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS
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