

# FOD8320

## High Noise Immunity, 2.5A Output Current, Gate Drive Optocoupler in Optoplanar® Wide Body SOP 5-Pin

### Features

- Fairchild's Optoplanar® packaging technology provides reliable and high voltage insulation with greater than 10mm creepage and clearance distance, and 0.5mm internal insulation distance while still offering a compact footprint
- 2.5A output current driving capability for medium power IGBT/MOSFET
  - Use of P-Channel MOSFETs at output stage enables output voltage swing close to the supply rail
- 35kV/μs Minimum Common Mode Rejection
- Wide Supply Voltage range from 15V to 30V
- Fast Switching Speed over full operating temperature range
  - 400ns max. propagation delay
  - 100ns max. pulse width distortion
- UnderVoltage LockOut (UVLO) with hysteresis
- Extended industrial temperature range, -40 to 100°C temperature range
- Safety and regulatory approvals
  - UL1577, 5,000V<sub>RMS</sub> for 1 min.
  - DIN EN/IEC60747-5-5, 1,414V peak working insulation voltage

### Applications

- AC and brushless DC motor drives
- Industrial inverter
- Uninterruptible power supply
- Induction heating
- Isolated IGBT/Power MOSFET gate drive

### Related Resources

- FOD3120, High Noise Immunity, 2.5A Output Current, Gate Drive Optocoupler Datasheet

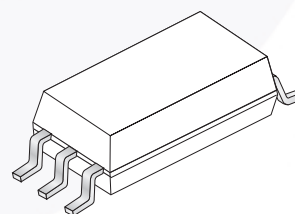
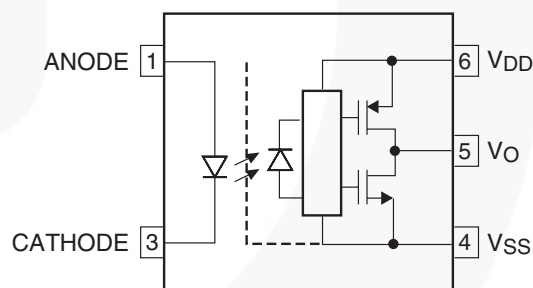
### Description

The FOD8320 is a 2.5A Output Current Gate Drive Optocoupler, capable of driving medium power IGBT/MOSFETs. It is ideally suited for fast switching driving of power IGBT and MOSFETs used in motor control inverter applications, and high performance power systems.

It utilizes Fairchild's coplanar packaging technology, Optoplanar®, and optimized IC design to achieve reliably high insulation voltage and high noise immunity.

It consists of a aluminum gallium arsenide (AlGaAs) light emitting diode optically coupled to an integrated circuit with a high-speed driver for push-pull MOSFET output stage. The device is housed in a wide body 5-pin small outline plastic package.

### Functional Schematic



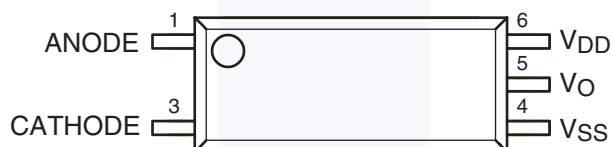
## Truth Table

| LED | $V_{DD}-V_{SS}$ “Positive Going”<br>(Turn-on) | $V_{DD}-V_{SS}$ “Positive Going”<br>(Turn-off) | $V_O$      |
|-----|-----------------------------------------------|------------------------------------------------|------------|
| Off | 0V to 30V                                     | 0V to 30V                                      | Low        |
| On  | 0V to 11.5V                                   | 0V to 10V                                      | Low        |
| On  | 11.5V to 14.5V                                | 10V to 13V                                     | Transition |
| On  | 14.5V to 30V                                  | 13V to 30V                                     | High       |

## Pin Definitions

| Pin # | Name     | Description             |
|-------|----------|-------------------------|
| 1     | Anode    | LED Anode               |
| 3     | Cathode  | LED Cathode             |
| 4     | $V_{SS}$ | Negative Supply Voltage |
| 5     | $V_O$    | Output Voltage          |
| 6     | $V_{DD}$ | Positive Supply voltage |

## Pin Configuration



## Safety and Insulation Ratings

As per DIN EN/IEC60747-5-5. This optocoupler is suitable for “safe electrical insulation” only within the safety limit data. Compliance with the safety ratings shall be ensured by means of protective circuits.

| Symbol         | Parameter                                                                                                                                    | Min.   | Typ.      | Max. | Unit       |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|------|------------|
|                | Installation Classifications per DIN VDE 0110/1.89 Table 1                                                                                   |        |           |      |            |
|                | For Rated Mains Voltage < 150Vrms                                                                                                            |        | I–IV      |      |            |
|                | For Rated Mains Voltage < 300Vrms                                                                                                            |        | I–IV      |      |            |
|                | For Rated Mains Voltage < 450Vrms                                                                                                            |        | I–III     |      |            |
|                | For Rated Mains Voltage < 600Vrms                                                                                                            |        | I–III     |      |            |
|                | Climatic Classification                                                                                                                      |        | 40/100/21 |      |            |
|                | Pollution Degree (DIN VDE 0110/1.89)                                                                                                         |        | 2         |      |            |
| CTI            | Comparative Tracking Index                                                                                                                   | 175    |           |      |            |
| $V_{PR}$       | Input to Output Test Voltage, Method b, $V_{IORM} \times 1.875 = V_{PR}$ , 100% Production Test with $t_m = 1$ sec., Partial Discharge < 5pC | 2651   |           |      |            |
|                | Input to Output Test Voltage, Method a, $V_{IORM} \times 1.5 = V_{PR}$ , Type and Sample Test with $t_m = 60$ sec., Partial Discharge < 5 pC | 2121   |           |      |            |
| $V_{IORM}$     | Max Working Insulation Voltage                                                                                                               | 1,414  |           |      | $V_{peak}$ |
| $V_{IOTM}$     | Highest Allowable Over Voltage                                                                                                               | 6000   |           |      | $V_{peak}$ |
|                | External Creepage                                                                                                                            | 10.0   |           |      | mm         |
|                | External Clearance                                                                                                                           | 10.0   |           |      | mm         |
|                | Insulation Thickness                                                                                                                         | 0.5    |           |      | mm         |
| $T_S$          | Safety Limit Values – Maximum Values Allowed in the Event of a Failure                                                                       |        |           |      |            |
|                | Case Temperature                                                                                                                             | 150    |           |      | °C         |
| $I_{S,INPUT}$  | Input Current                                                                                                                                | 200    |           |      | mA         |
| $P_{S,OUTPUT}$ | Output Power                                                                                                                                 | 600    |           |      | mW         |
| $R_{IO}$       | Insulation Resistance at $T_S$ , $V_{IO} = 500V$                                                                                             | $10^9$ |           |      | $\Omega$   |

**Absolute Maximum Ratings** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

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                                                     | Value          | Units            |
|------------------------|---------------------------------------------------------------|----------------|------------------|
| $T_{STG}$              | Storage Temperature                                           | -40 to +125    | $^\circ\text{C}$ |
| $T_{OPR}$              | Operating Temperature                                         | -40 to +100    | $^\circ\text{C}$ |
| $T_J$                  | Junction Temperature                                          | -40 to +125    | $^\circ\text{C}$ |
| $T_{SOL}$              | Lead Solder Temperature (Refer to Reflow Temperature Profile) | 260 for 10 sec | $^\circ\text{C}$ |
| $I_{F(AVG)}$           | Average Input Current                                         | 25             | mA               |
| F                      | Operating Frequency                                           | 50             | kHz              |
| $V_R$                  | Reverse Input Voltage                                         | 5.0            | V                |
| $I_{O(PEAK)}$          | Peak Output Current <sup>(1)</sup>                            | 3.0            | A                |
| $V_{DD}$               | Supply Voltage                                                | 0 to 35        | V                |
| $V_{O(PEAK)}$          | Peak Output Voltage                                           | 0 to $V_{DD}$  | V                |
| $t_{R(IN)}, t_{F(IN)}$ | Input Signal Rise and Fall Time                               | 500            | ns               |
| $PD_I$                 | Input Power Dissipation <sup>(2)(4)</sup>                     | 45             | mW               |
| $PD_O$                 | Output Power Dissipation <sup>(3)(4)</sup>                    | 500            | mW               |

**Notes:**

1. Maximum pulse width = 10 $\mu\text{s}$ , maximum duty cycle=0.2%.
2. No derating required across operating temperature range.
3. Derate linearly from 25 $^\circ\text{C}$  at a rate of 5.2mW/ $^\circ\text{C}$
4. Functional operation under these conditions is not implied. Permanent damage may occur if the device is subjected to conditions outside these ratings.

**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                     | Min. | Max. | Unit             |
|-------------------|-------------------------------|------|------|------------------|
| $T_A$             | Ambient Operating Temperature | -40  | 100  | $^\circ\text{C}$ |
| $V_{DD} - V_{SS}$ | Supply Voltage                | 16   | 30   | V                |
| $I_{F(ON)}$       | Input Current (ON)            | 7    | 16   | mA               |
| $V_{F(OFF)}$      | Input Voltage (OFF)           | 0    | 0.8  | V                |

## Isolation Characteristics

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

| Symbol           | Parameter                      | Conditions                                                                                                                | Min.  | Typ.      | Max. | Units            |
|------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------|-----------|------|------------------|
| $V_{\text{ISO}}$ | Input-Output Isolation Voltage | $T_A = 25^\circ\text{C}$ , R.H. < 50%, $t = 1.0\text{min}$ , $I_{\text{I-O}} \leq 20\mu\text{A}$ , 50Hz <sup>(5)(6)</sup> | 5,000 |           |      | $V_{\text{RMS}}$ |
| $R_{\text{ISO}}$ | Isolation Resistance           | $V_{\text{I-O}} = 500\text{V}^{(5)}$                                                                                      |       | $10^{11}$ |      | $\Omega$         |
| $C_{\text{ISO}}$ | Isolation Capacitance          | $V_{\text{I-O}} = 0\text{V}$ , Freq = 1.0MHz <sup>(6)</sup>                                                               |       | 1         |      | pF               |

### Notes:

- Device is considered a two terminal device: Pins 1 and 3 are shorted together and Pins 4, 5 and 6 are shorted together.
- 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, typical value is measured at  $V_{\text{DD}} = 30\text{V}$ ,  $V_{\text{SS}} = \text{Ground}$ ,  $T_A = 25^\circ\text{C}$  unless otherwise specified.

| Symbol                     | Parameter                                   | Conditions                                  | Min.                   | Typ.                  | Max.                   | Units                | Figure    |
|----------------------------|---------------------------------------------|---------------------------------------------|------------------------|-----------------------|------------------------|----------------------|-----------|
| $V_F$                      | Input Forward Voltage                       | $I_F = 10\text{mA}$                         | 1.1                    | 1.5                   | 1.8                    | V                    | 16        |
| $\Delta(V_F / T_A)$        | Temperature Coefficient of Forward Voltage  |                                             |                        | -1.8                  |                        | mV/ $^\circ\text{C}$ |           |
| $BV_R$                     | Input Reverse Breakdown Voltage             | $I_R = 10\mu\text{A}$                       | 5                      |                       |                        | V                    |           |
| $C_{\text{IN}}$            | Input Capacitance                           | $f = 1\text{MHz}$ , $V_F = 0\text{V}$       |                        | 60                    |                        | pF                   |           |
| $I_{\text{OH}}$            | High Level Output Current <sup>(1)</sup>    | $V_{\text{OH}} = V_{\text{DD}} - 3\text{V}$ | 1.0                    | 2.0                   | 2.5                    | A                    | 1, 3      |
|                            |                                             | $V_{\text{OH}} = V_{\text{DD}} - 6\text{V}$ | 2.0                    |                       | 2.5                    | A                    | 1, 3, 19  |
| $I_{\text{OL}}$            | Low Level Output Current <sup>(1)</sup>     | $V_{\text{OL}} = V_{\text{SS}} + 3\text{V}$ | 1.0                    | 2.0                   | 2.5                    | A                    | 4, 6      |
|                            |                                             | $V_{\text{OL}} = V_{\text{SS}} + 6\text{V}$ | 2.0                    |                       | 2.5                    | A                    | 4, 6, 18  |
| $V_{\text{OH}}$            | High Level Output Voltage <sup>(7)(8)</sup> | $I_F = 10\text{mA}$ , $I_O = -2.5\text{A}$  | $V_{\text{DD}} - 6.25$ | $V_{\text{DD}} - 2.5$ |                        | V                    | 1         |
|                            |                                             | $I_F = 10\text{mA}$ , $I_O = -100\text{mA}$ | $V_{\text{DD}} - 0.5$  | $V_{\text{DD}} - 0.1$ |                        |                      | 1, 2, 20  |
| $V_{\text{OL}}$            | Low Level Output Voltage <sup>(7)(8)</sup>  | $I_F = 10\text{mA}$ , $I_O = 2.5\text{A}$   |                        | $V_{\text{SS}} + 2.5$ | $V_{\text{SS}} + 6.25$ | V                    | 4         |
|                            |                                             | $I_F = 0\text{mA}$ , $I_O = 100\text{mA}$   |                        | $V_{\text{SS}} + 0.1$ | $V_{\text{SS}} + 0.5$  |                      | 5, 21     |
| $I_{\text{DDH}}$           | High Level Supply Current                   | $V_O$ Open, $I_F = 7$ to $16\text{mA}$      |                        | 2.9                   | 3.8                    | mA                   | 7, 8, 22  |
| $I_{\text{DDL}}$           | Low Level Supply Current                    | $V_O$ Open, $V_F = 0$ to $0.8\text{V}$      |                        | 2.8                   | 3.8                    | mA                   | 7, 8, 23  |
| $I_{\text{FLH}}$           | Threshold Input Current Low to High         | $I_O = 0\text{mA}$ , $V_O > 5\text{V}$      |                        | 2.4                   | 5.0                    | mA                   | 9, 15, 24 |
| $V_{\text{FHL}}$           | Threshold Input Voltage High to Low         | $I_O = 0\text{mA}$ , $V_O < 5\text{V}$      | 0.8                    |                       |                        | V                    | 25        |
| $V_{\text{UVLO+}}$         | UnderVoltage Lockout Threshold              | $I_F = 10\text{mA}$ , $V_O > 5\text{V}$     | 11.5                   | 12.7                  | 14.5                   | V                    | 17, 26    |
| $V_{\text{UVLO-}}$         |                                             | $I_F = 10\text{mA}$ , $V_O < 5\text{V}$     | 10.0                   | 11.2                  | 13.0                   | V                    | 17, 26    |
| $\text{UVLO}_{\text{HYS}}$ | UnderVoltage Lockout Threshold Hysteresis   |                                             |                        | 1.5                   |                        | V                    |           |

### Notes:

- In this test,  $V_{\text{OH}}$  is measured with a dc load current of 100mA. When driving capacitive load  $V_{\text{OH}}$  will approach  $V_{\text{DD}}$  as  $I_{\text{OH}}$  approaches zero amps.
- Maximum pulse width = 1ms, maximum duty cycle = 20%.

## Switching Characteristics

Apply over all recommended conditions, typical value is measured at  $V_{DD} = 30V$ ,  $V_{SS} = \text{Ground}$ ,  $T_A = 25^\circ\text{C}$  unless otherwise specified.

| Symbol          | Parameter                                                          | Conditions                                                                                                          | Min. | Typ. | Max. | Units                   | Figure                 |
|-----------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------|------|------|-------------------------|------------------------|
| $t_{PHL}$       | Propagation Delay Time to Logic Low Output <sup>(9)</sup>          | $I_F = 7\text{mA to } 16\text{mA}$ , $R_g = 10\Omega$ , $C_g = 10\text{nF}$ , $f = 10\text{kHz}$ , Duty Cycle = 50% | 150  | 285  | 400  | ns                      | 10, 11, 12, 13, 14, 27 |
| $t_{PLH}$       | Propagation Delay Time to Logic High Output <sup>(10)</sup>        |                                                                                                                     | 150  | 260  | 400  | ns                      | 10, 11, 12, 13, 14, 27 |
| PWD             | Pulse Width Distortion <sup>(11)</sup><br>$ t_{PHL} - t_{PLH} $    |                                                                                                                     |      | 25   | 100  | ns                      |                        |
| PDD (Skew)      | Propagation Delay Difference Between Any Two Parts <sup>(12)</sup> |                                                                                                                     | -250 |      | 250  |                         |                        |
| $t_R$           | Output Rise Time (10% to 90%)                                      |                                                                                                                     |      | 60   |      | ns                      | 27                     |
| $t_F$           | Output Fall Time (90% to 10%)                                      |                                                                                                                     |      | 60   |      | ns                      | 27                     |
| $t_{ULVO\ ON}$  | ULVO Turn On Delay                                                 | $I_F = 10\text{mA}$ , $V_O > 5V$                                                                                    |      | 0.8  |      | $\mu\text{s}$           |                        |
| $t_{ULVO\ OFF}$ | ULVO Turn Off Delay                                                | $I_F = 10\text{mA}$ , $V_O < 5V$                                                                                    |      | 0.4  |      | $\mu\text{s}$           |                        |
| $ CM_H $        | Common Mode Transient Immunity at Output High                      | $T_A = 25^\circ\text{C}$ , $V_{DD} = 30V$ , $I_F = 7 \text{ to } 16\text{mA}$ , $V_{CM} = 2000V^{(13)}$             | 35   | 50   |      | $\text{kV}/\mu\text{s}$ | 28                     |
| $ CM_L $        | Common Mode Transient Immunity at Output Low                       | $T_A = 25^\circ\text{C}$ , $V_{DD} = 30V$ , $V_F = 0V$ , $V_{CM} = 2000V^{(14)}$                                    | 35   | 50   |      | $\text{kV}/\mu\text{s}$ | 28                     |

### Notes:

9.  $t_{PHL}$  propagation delay is measured from the 50% level on the falling edge of the input pulse to the 50% level of the falling edge of the  $V_O$  signal.
10.  $t_{PLH}$  propagation delay is measured from the 50% level on the rising edge of the input pulse to the 50% level of the rising edge of the  $V_O$  signal.
11. PWD is defined as  $|t_{PHL} - t_{PLH}|$  for any given device.
12. The difference between  $t_{PHL}$  and  $t_{PLH}$  between any two FOD8320 parts under same operating conditions, with equal loads.
13. Common mode transient immunity at output high is the maximum tolerable negative  $dV_{cm}/dt$  on the trailing edge of the common mode impulse signal,  $V_{cm}$ , to assure that the output will remain high (i.e.  $V_O > 15.0V$ ).
14. Common mode transient immunity at output low is the maximum tolerable positive  $dV_{cm}/dt$  on the leading edge of the common pulse signal,  $V_{cm}$ , to assure that the output will remain low (i.e.  $V_O < 1.0V$ ).

## Typical Performance Characteristics

Figure 1. Output High Voltage Drop vs. Output High Current

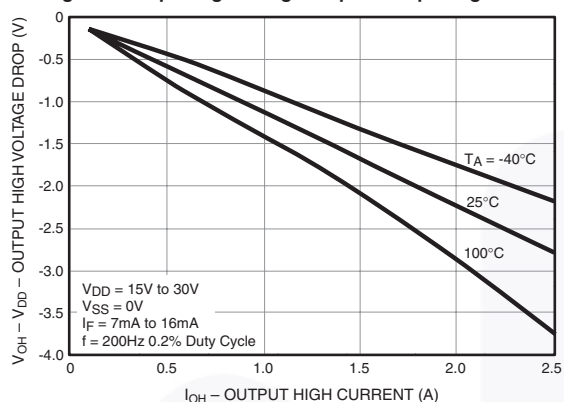


Figure 2. Output High Voltage Drop vs. Ambient Temperature

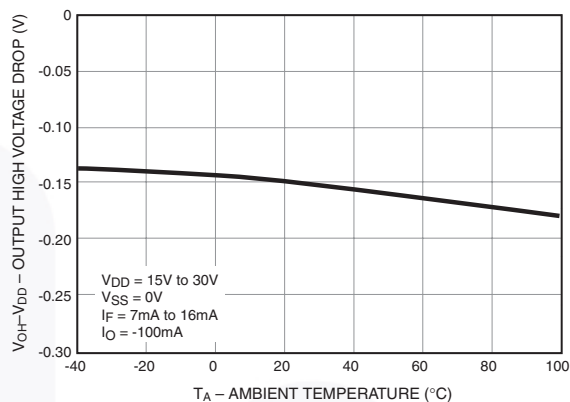


Figure 3. Output High Current vs. Ambient Temperature

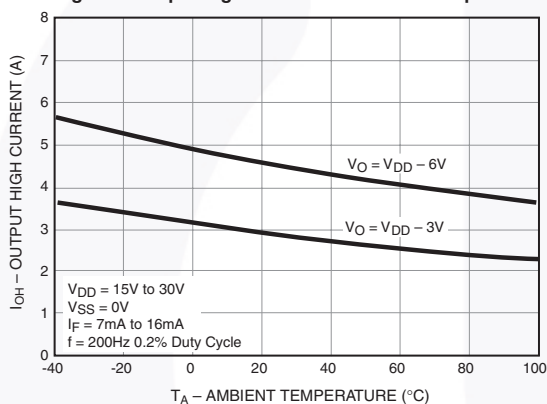


Figure 4. Output Low Voltage vs. Output Low Current

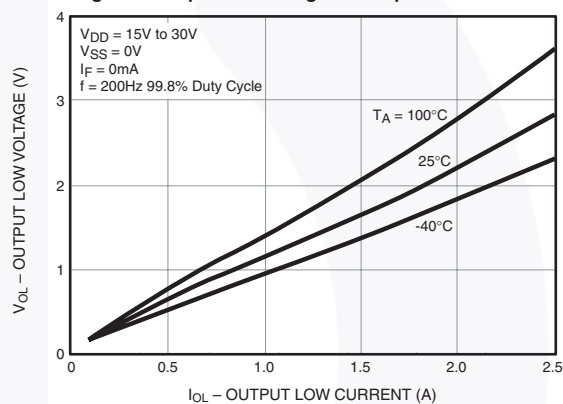


Figure 5. Output Low Voltage vs. Ambient Temperature

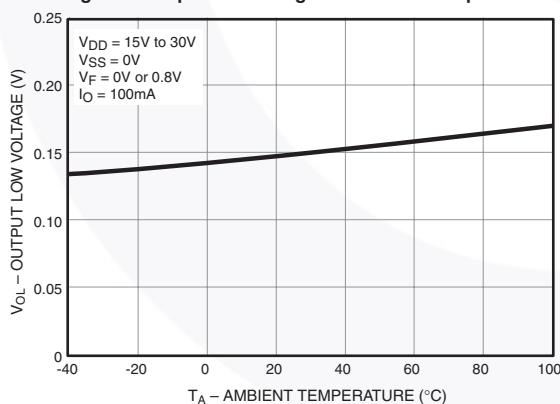
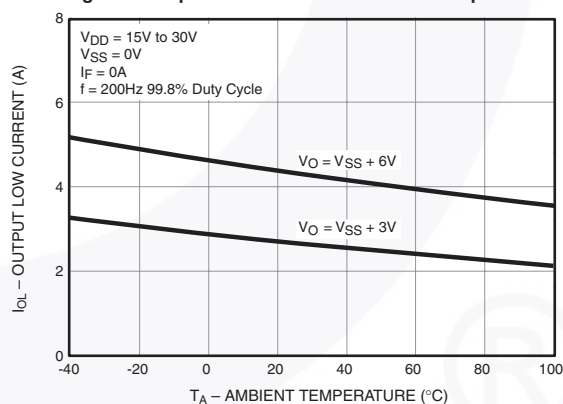


Figure 6. Output Low Current vs. Ambient Temperature



## Typical Performance Characteristics (Continued)

Figure 7. Supply Current vs. Ambient Temperature

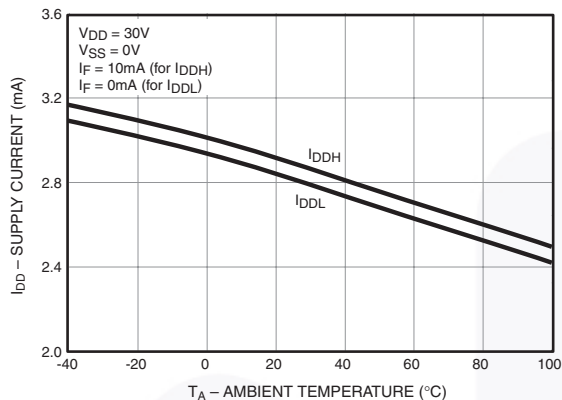


Figure 8. Supply Current vs. Supply Voltage

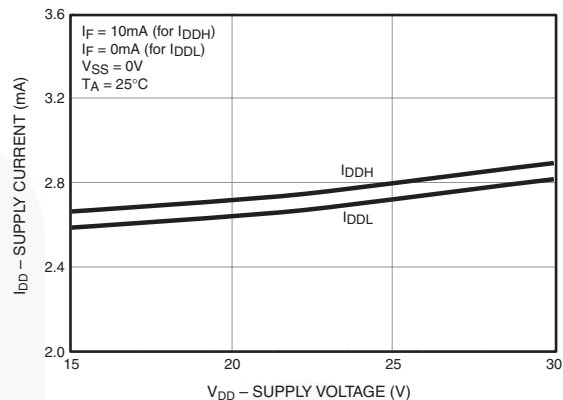


Figure 9. Low to High Input Current Threshold vs. Ambient Temperature

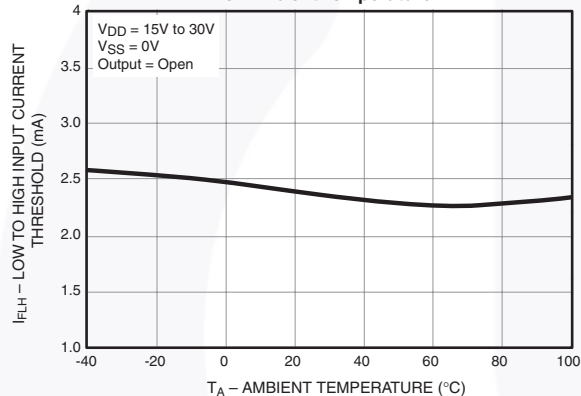


Figure 10. Propagation Delay vs. Supply Voltage

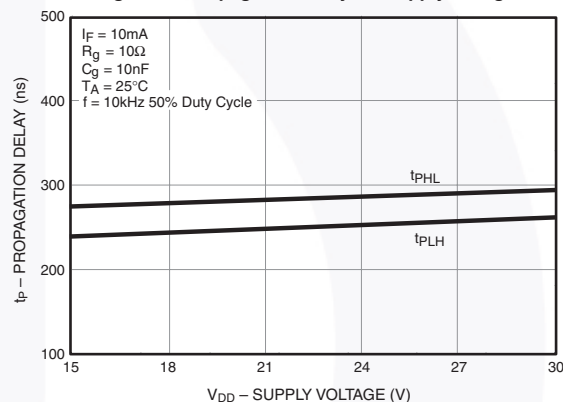


Figure 11. Propagation Delay vs. LED Forward Current

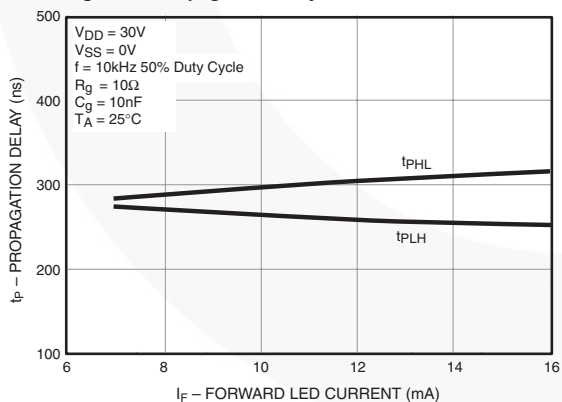
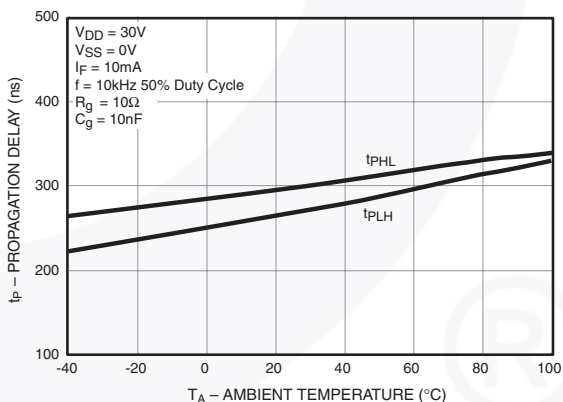


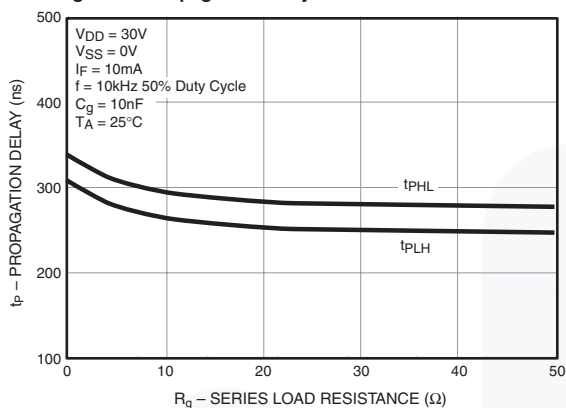
Figure 12. Propagation Delay vs. Ambient Temperature



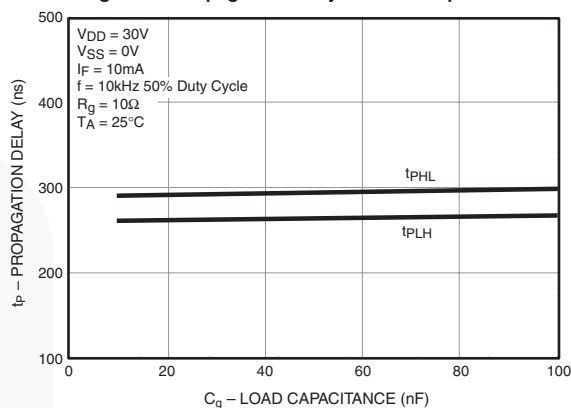


## Typical Performance Characteristics (Continued)

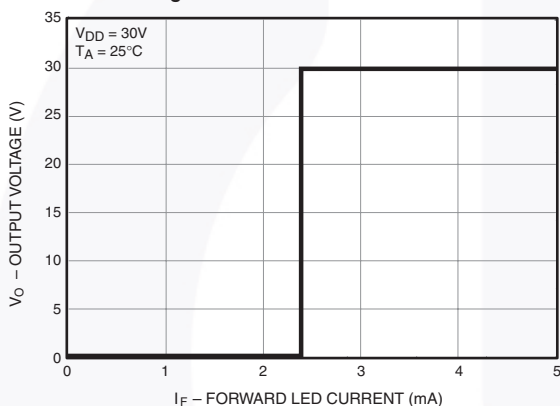
**Figure 13. Propagation Delay vs. Series Load Resistance**



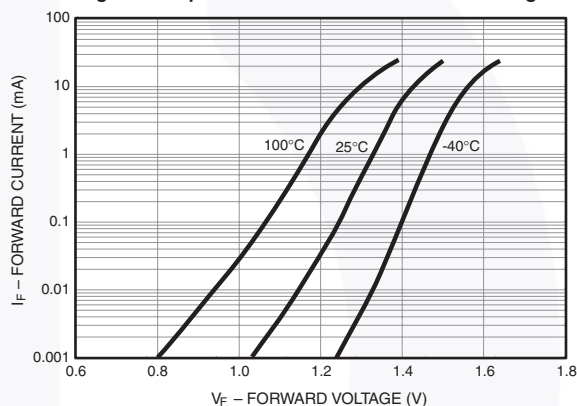
**Figure 14. Propagation Delay vs. Load Capacitance**



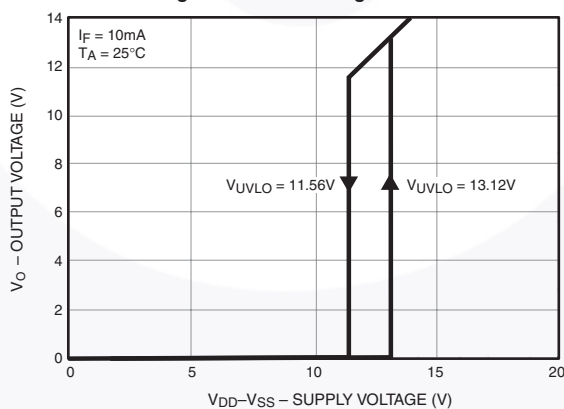
**Figure 15. Transfer Characteristics**



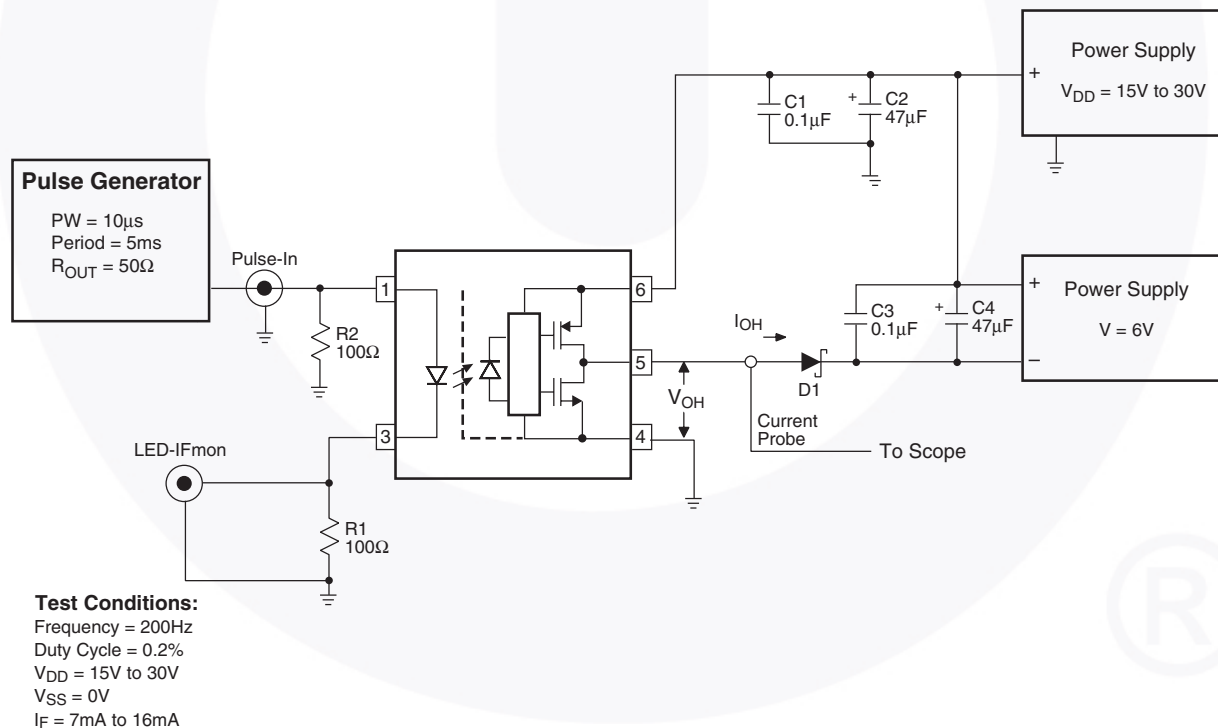
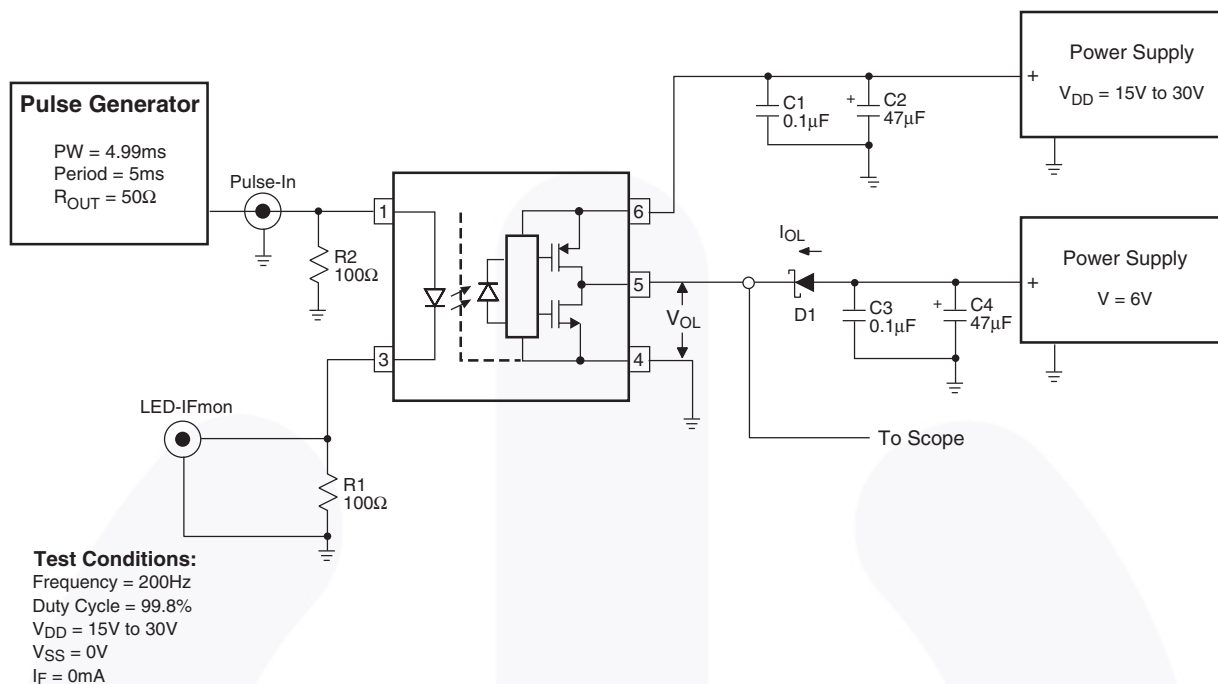
**Figure 16. Input Forward Current vs. Forward Voltage**



**Figure 17. Under Voltage Lockout**



## Test Circuit



# Test Circuit (Continued)

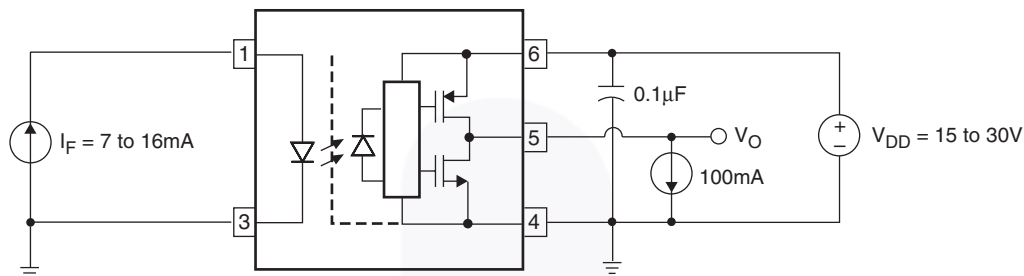


Figure 20.  $V_{OH}$  Test Circuit

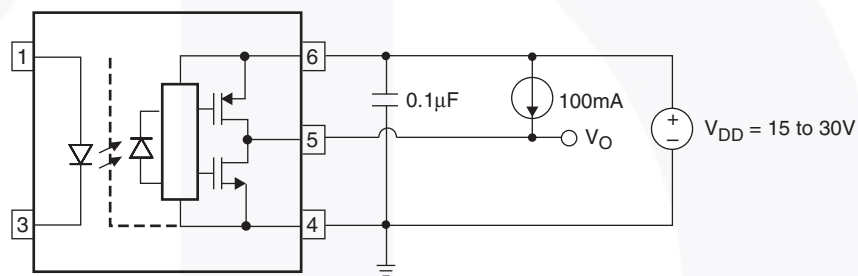


Figure 21.  $V_{OL}$  Test Circuit

# Test Circuit (Continued)

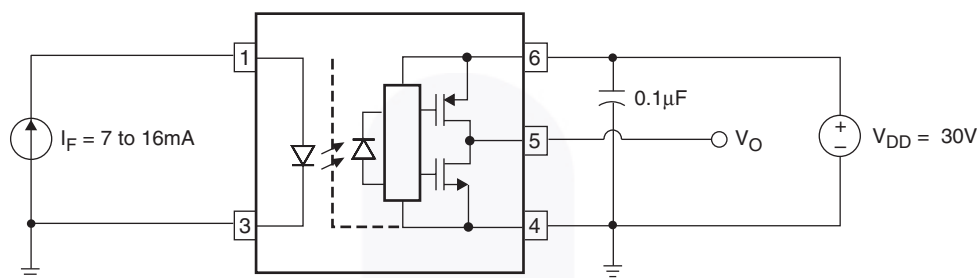


Figure 22.  $I_{DDH}$  Test Circuit

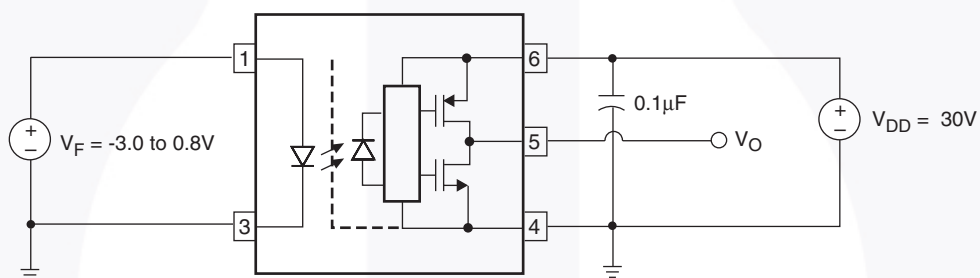


Figure 23.  $I_{DDL}$  Test Circuit

## Test Circuit (Continued)

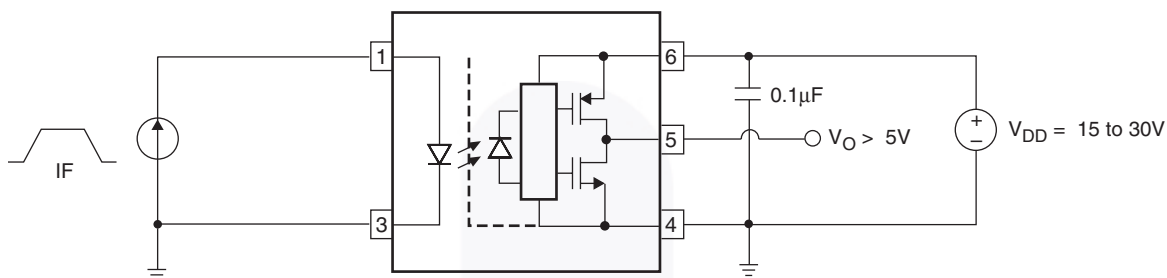


Figure 24.  $I_{FLH}$  Test Circuit

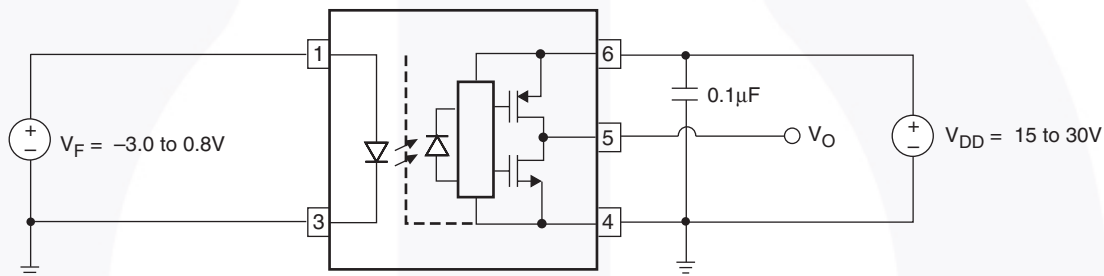


Figure 25.  $V_{FHL}$  Test Circuit

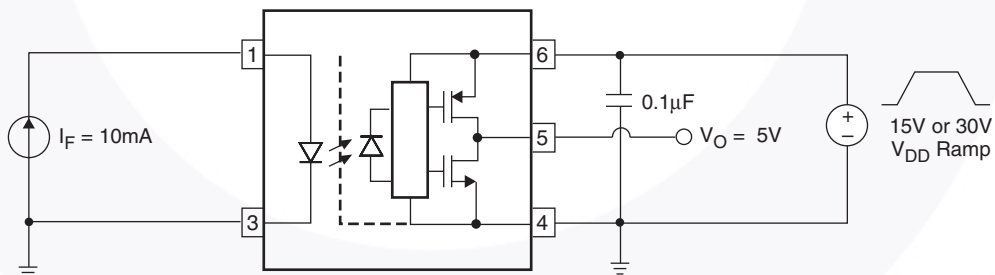
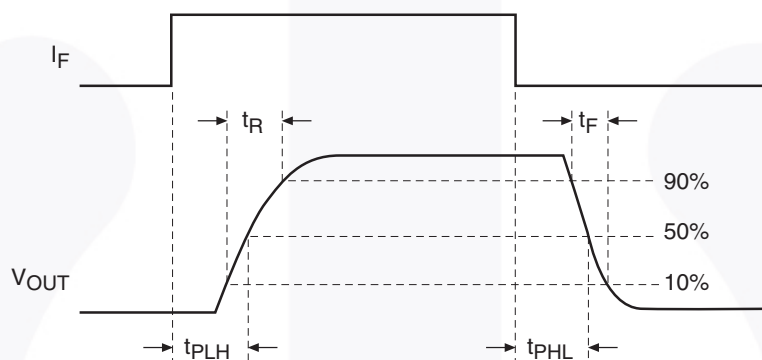
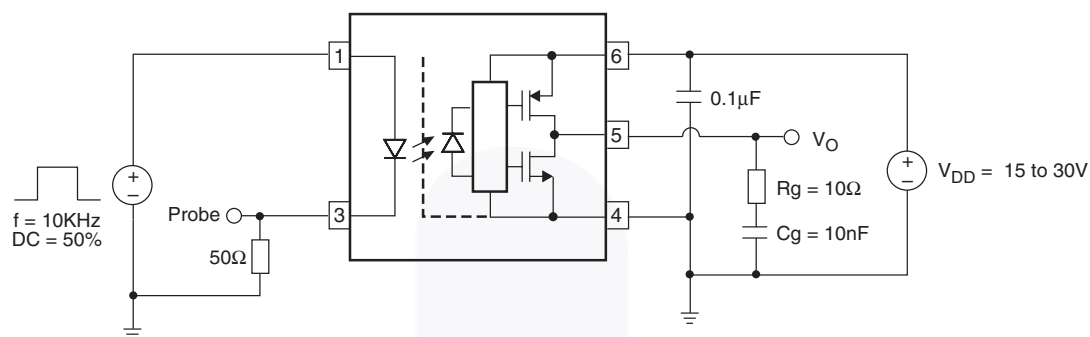
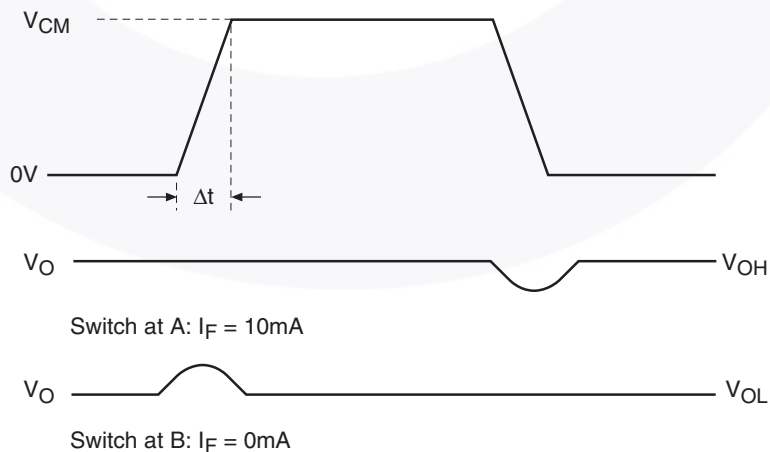
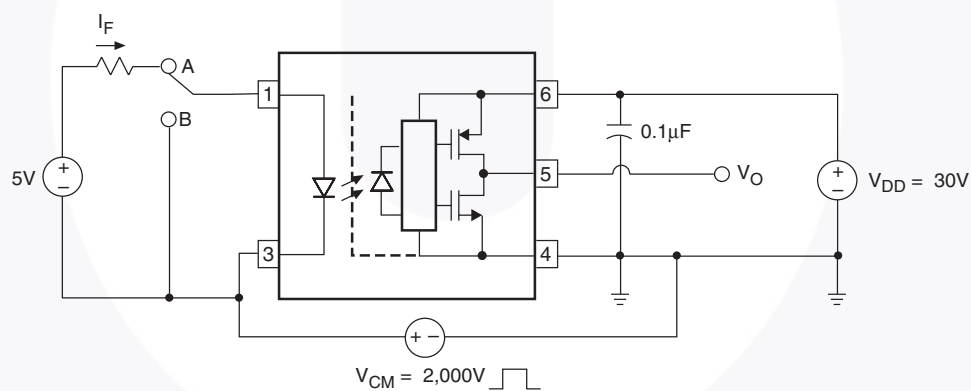


Figure 26. UVLO Test Circuit

## Test Circuit (Continued)



**Figure 27.  $t_{PHL}$ ,  $t_{PLH}$ ,  $t_R$  and  $t_F$  Test Circuit and Waveforms**



**Figure 28. CMR Test Circuit and Waveforms**

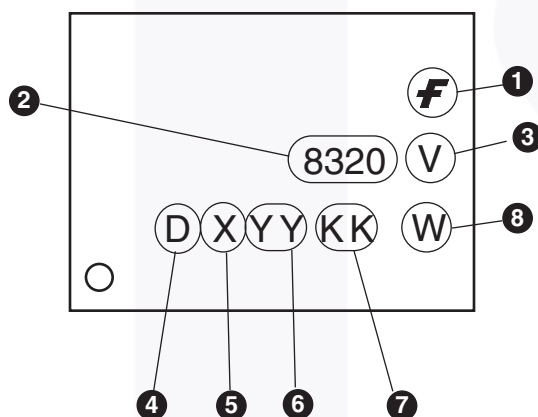
## Ordering Information

| Part Number | Package                                          | Packing Method                       |
|-------------|--------------------------------------------------|--------------------------------------|
| FOD8320     | Wide Body SOP 5-Pin                              | Tube (100 units per tube)            |
| FOD8320R2   | Wide Body SOP 5-Pin                              | Tape and Reel (1,000 units per reel) |
| FOD8320V    | Wide Body SOP 5-Pin, DIN EN/IEC60747-5-5 Option  | Tube (100 units per tube)            |
| FOD8320R2V  | Wide Body SOP 5-Pin, DIN EN/ IEC60747-5-5 Option | Tape and Reel (1,000 units per reel) |



All packages are lead free per JEDEC: J-STD-020B standard.

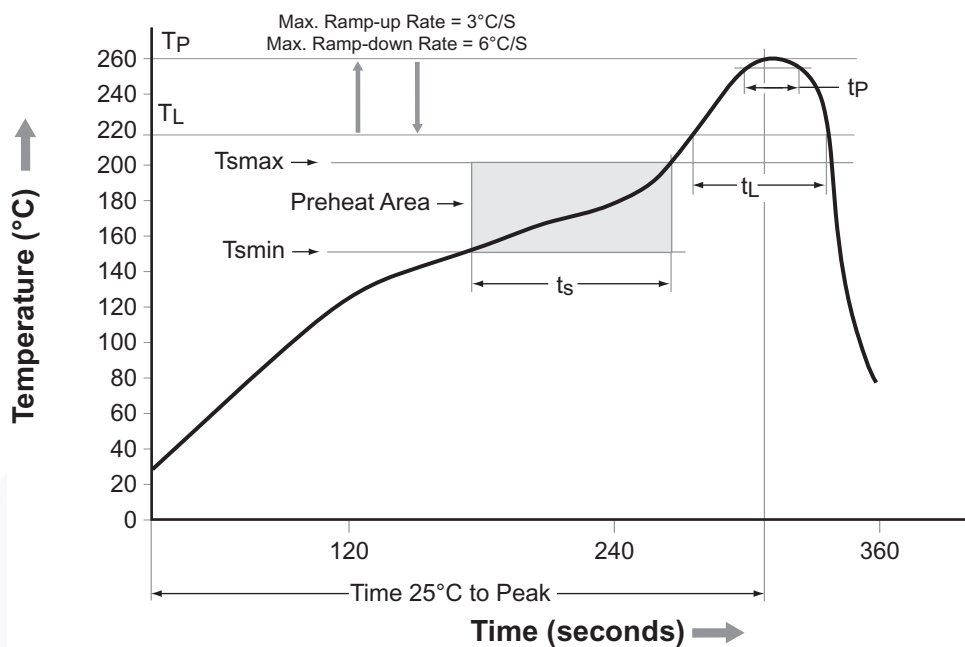
## Marking Information



### Definitions

|   |                                                                                 |
|---|---------------------------------------------------------------------------------|
| 1 | Fairchild logo                                                                  |
| 2 | Device number, e.g., '8320' for FOD8320                                         |
| 3 | DIN EN/IEC60747-5-5 Option (only appears on component ordered with this option) |
| 4 | Plant code, e.g., 'D'                                                           |
| 5 | Last digit year code, e.g., 'C' for 2012                                        |
| 6 | Two digit work week ranging from '01' to '53'                                   |
| 7 | Lot traceability code                                                           |
| 8 | Package assembly code, W                                                        |

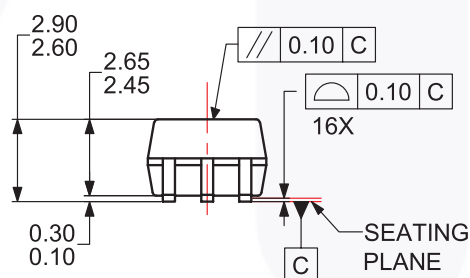
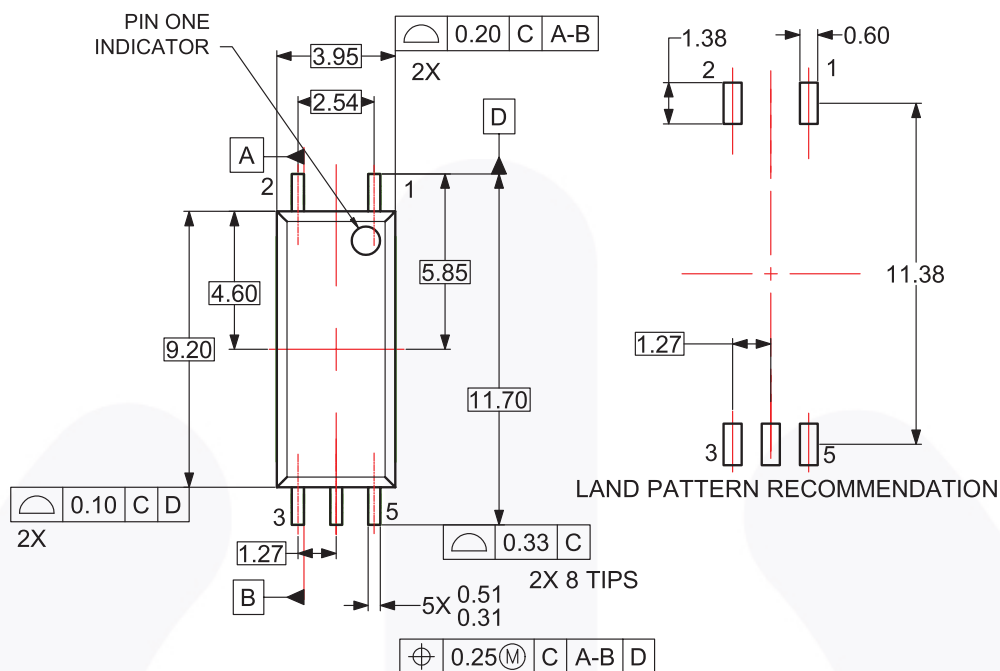
## Reflow Profile



| Profile Feature                                                       | Pb-Free Assembly Profile |
|-----------------------------------------------------------------------|--------------------------|
| Temperature Min. (T <sub>smin</sub> )                                 | 150°C                    |
| Temperature Max. (T <sub>smax</sub> )                                 | 200°C                    |
| Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> ) | 60–120 seconds           |
| Ramp-up Rate (t <sub>L</sub> to t <sub>P</sub> )                      | 3°C/second max.          |
| Liquidous Temperature (T <sub>L</sub> )                               | 217°C                    |
| Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )             | 60–150 seconds           |
| Peak Body Package Temperature                                         | 260°C +0°C / –5°C        |
| Time (t <sub>P</sub> ) within 5°C of 260°C                            | 30 seconds               |
| Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )                    | 6°C/second max.          |
| Time 25°C to Peak Temperature                                         | 8 minutes max.           |

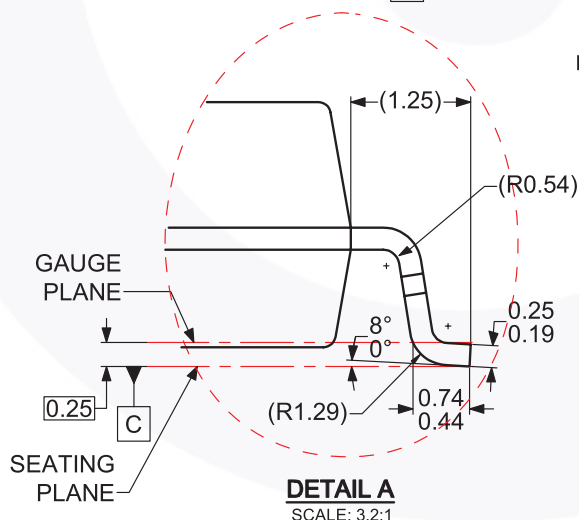


## Package Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

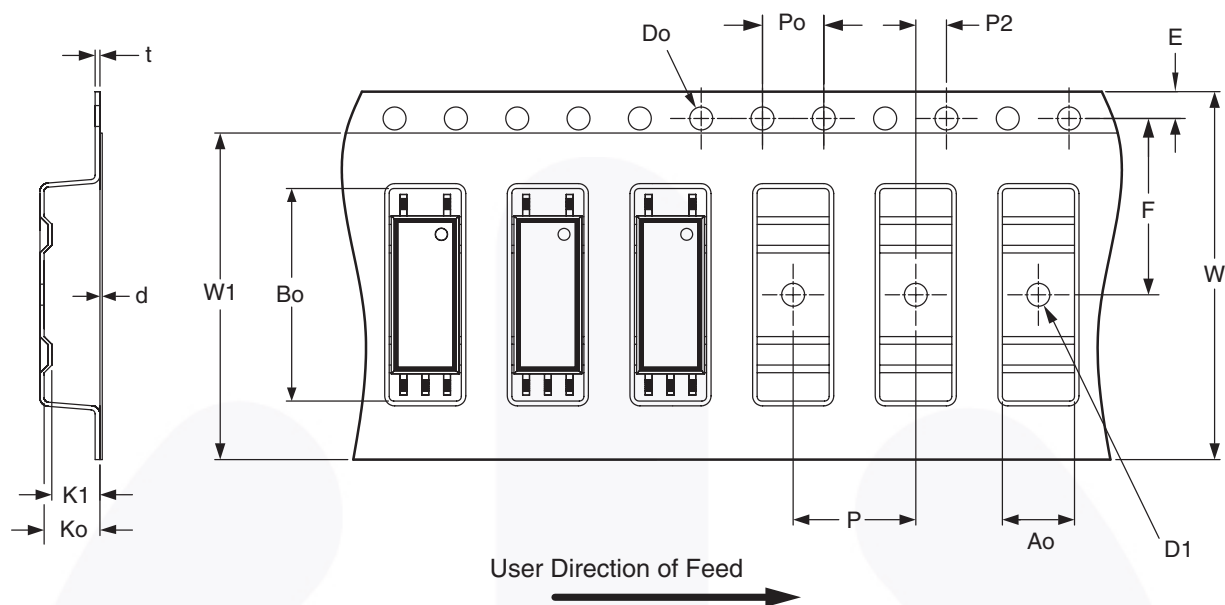
- A) THIS PACKAGE DOES NOT CONFORM TO ANY STANDARD.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS
- D) DRAWING CONFORMS TO ASME Y14.5M-1994
- E) DRAWING FILE NAME: MKT-M05AREV1



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Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>

**Carrier Tape Specification** (SOIC-5L OPTO R2 & R2V Option)

| Symbol | Description                    | Dimension in mm      |
|--------|--------------------------------|----------------------|
| W      | Tape Width                     | 24.00 + 0.20 / -0.10 |
| t      | Tape Thickness                 | 0.30 ± 0.05          |
| Po     | Sprocket Hole Pitch            | 4.00 ± 0.20          |
| Do     | Sprocket Hole Diameter         | 1.50 + 0.10 / -0.00  |
| D1     | Pocket Hole Diameter           | 1.50 + 0.25 / -0.00  |
| E      | Sprocket Hole Location         | 1.75 ± 0.10          |
| F      | Pocket Location                | 11.50 ± 0.10         |
| P2     | Pocket Pitch                   | 2.00 ± 0.10          |
| P      | Pocket Pitch                   | 8.00 ± 0.10          |
| Ao     | Pocket Dimension               | 4.50 ± 0.10          |
| Bo     | Pocket Dimension               | 12.00 ± 0.10         |
| Ko     | Pocket Dimension               | 3.35 ± 0.10          |
| K1     | Pocket Dimension               | 2.85 ± 0.10          |
| W1     | Cover Tape Width               | 21.30 ± 0.10         |
| d      | Cover Tape Thickness           | 0.05 ± 0.01          |
|        | Max Component Rotation or Tilt | 10°                  |



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| 2Cool™                                                                            | F-PFS™                                         | PowerTrench®                                                                      | The Power Franchise®                                                                |
| AccuPower™                                                                        | FRFET®                                         | PowerXS™                                                                          | the power franchise                                                                 |
| AX-CAP™*                                                                          | Global Power Resource™                         | Programmable Active Droop™                                                        | TinyBoost™                                                                          |
| BitSiC™                                                                           | GreenBridge™                                   | QFET®                                                                             | TinyBuck™                                                                           |
| Build it Now™                                                                     | Green FPS™                                     | QS™                                                                               | TinyCalc™                                                                           |
| CorePLUS™                                                                         | Green FPS™ e-Series™                           | Quiet Series™                                                                     | TinyLogic®                                                                          |
| CorePOWER™                                                                        | Gmax™                                          | RapidConfigure™                                                                   | TINYOPTO™                                                                           |
| CROSSVOLT™                                                                        | GTO™                                           |  | TinyPower™                                                                          |
| CTL™                                                                              | IntelliMAX™                                    | Saving our world, 1mW/W/kW at a time™                                             | TinyPWM™                                                                            |
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| EcoSPARK®                                                                         | MICROCOUPLER™                                  | Solutions for Your Success™                                                       | TRUECURRENT®*                                                                       |
| EfficientMax™                                                                     | MicroFET™                                      | SPM®                                                                              | µSerDes™                                                                            |
| ESBC™                                                                             | MicroPak™                                      | STEALTH™                                                                          |  |
|  | MicroPak2™                                     | SuperFET®                                                                         | UHC®                                                                                |
| Fairchild®                                                                        | MillerDrive™                                   | SuperSOT™-3                                                                       | Ultra FRFET™                                                                        |
| Fairchild Semiconductor®                                                          | MotionMax™                                     | SuperSOT™-6                                                                       | UnifET™                                                                             |
| FACT Quiet Series™                                                                | mWSaver™                                       | SuperSOT™-8                                                                       | VCX™                                                                                |
| FACT®                                                                             | OptoHiT™                                       | SupreMOS®                                                                         | VisualMax™                                                                          |
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| FastvCore™                                                                        | OPTOPLANAR®                                    | Sync-Lock™                                                                        | XS™                                                                                 |
| FETBench™                                                                         |                                                |  |                                                                                     |
| FlashWriter®*                                                                     |                                                |                                                                                   |                                                                                     |
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Rev. 162



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