



Gate Drive Optocoupler, High Noise Immunity, 1.0 A Output Current

FOD3150

Description

The FOD3150 is a 1.0 A Output Current Gate Drive Optocoupler, capable of driving most 800 V / 20 A IGBT / MOSFET. It is ideally suited for fast switching driving of power IGBT and MOSFETs used

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Table 1. TRUTH TABLE

LED	$V_{DD} - V_{SS}$ "Positive Going" (Turn-on)	$V_{DD} - V_{SS}$ "Negative Going" (Turn-off)	V_O
Off	0 V to 30 V	0 V to 30 V	Low
On	0 V to 11 V	0 V to 9.7 V	Low
On	11 V to 14 V	9.7 V to 12.7 V	Transition
On	14 V to 30 V	12.7 V to 30 V	High

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Table 4. ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified.)

Symbol	Parameter	Value	Units
T_{STG}	Storage Temperature	-55 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 Wave Solder Temperature (refer to page 12 for reflow solder profile)	260 for 10 sec	$^\circ\text{C}$
$I_{F(AVG)}$	Average Input Current	25	mA
V_R	Reverse Input Voltage	5	V
$I_{O(PEAK)}$	Peak Output Current ⁽¹⁾	1.5	A
$V_{DD} - V_{SS}$	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 ^{(2) (4)}	45	mW
PD_O	Output Power Dissipation ^{(3) (4)}	250	mW

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Maximum pulse width = 10 μs , maximum duty cycle = 0.2 %.
2. Derate linearly above 87 $^\circ\text{C}$, free air temperature at a rate of 0.77 mW/ $^\circ\text{C}$.
3. No derating required across temperature range.
4. Functional operation under these conditions is not implied. Permanent damage may occur if the device is subjected to conditions outside these ratings.

Table 5. RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Units
T_A	Ambient Operating Temperature	-40 to +100	$^\circ\text{C}$
$V_{DD} - V_{SS}$	Power Supply	15 to 30	V
$I_{F(ON)}$	Input Current (ON)	7 to 16	mA
$V_{F(OFF)}$	Input Voltage (OFF)	0 to 0.8	V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

Table 6. 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_{ISO}	Input-Output Isolation Voltage	$T_A = 25^\circ\text{C}$, R.H. < 50 %, $t = 1.0$ minute, $I_{I-O} \leq 10 \mu\text{A}$, 50 Hz ^{(5) (6)}	5000			V_{RMS}
R_{ISO}	Isolation Resistance	$V_{I-O} = 500 \text{ V}$ ⁽⁵⁾		10^{11}		Ω
C_{ISO}	Isolation Capacitance	$V_{I-O} = 0 \text{ V}$, Frequency = 1.0 MHz ⁽⁵⁾		1		pF

5. Device is considered a two terminal device: pins 2 and 3 are shorted together and pins 5, 6, 7 and 8 are shorted together.
6. 5,000 V_{RMS} for 1 minute duration is equivalent to 6,000 V_{ACRMS} for 1 second duration.

Table 7. ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_F	Input Forward Voltage	$I_F = 10 \text{ mA}$	1.2	1.5	1.8	V
$\Delta(V_F / T_A)$	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_{IN}	Input Capacitance	$f = 1 \text{ MHz}$, $V_F = 0 \text{ V}$		60		pF

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Typical Performance Curves

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TYPICAL PERFORMANCE CURVES (continued)

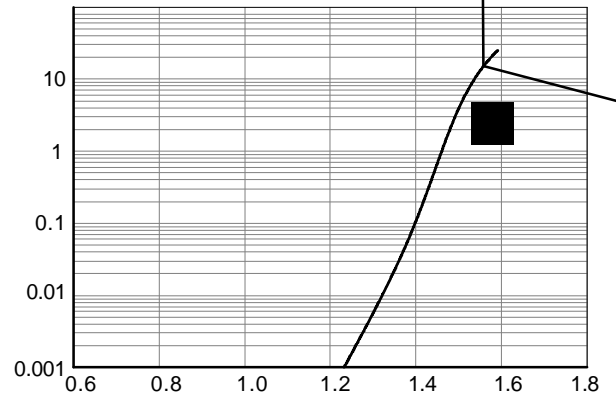
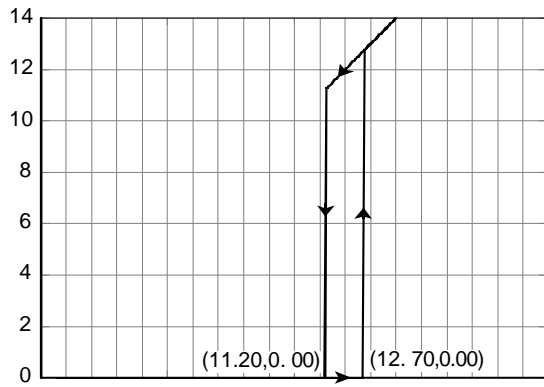


Figure 13. Transfer Characteristics



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TEST CIRCUIT

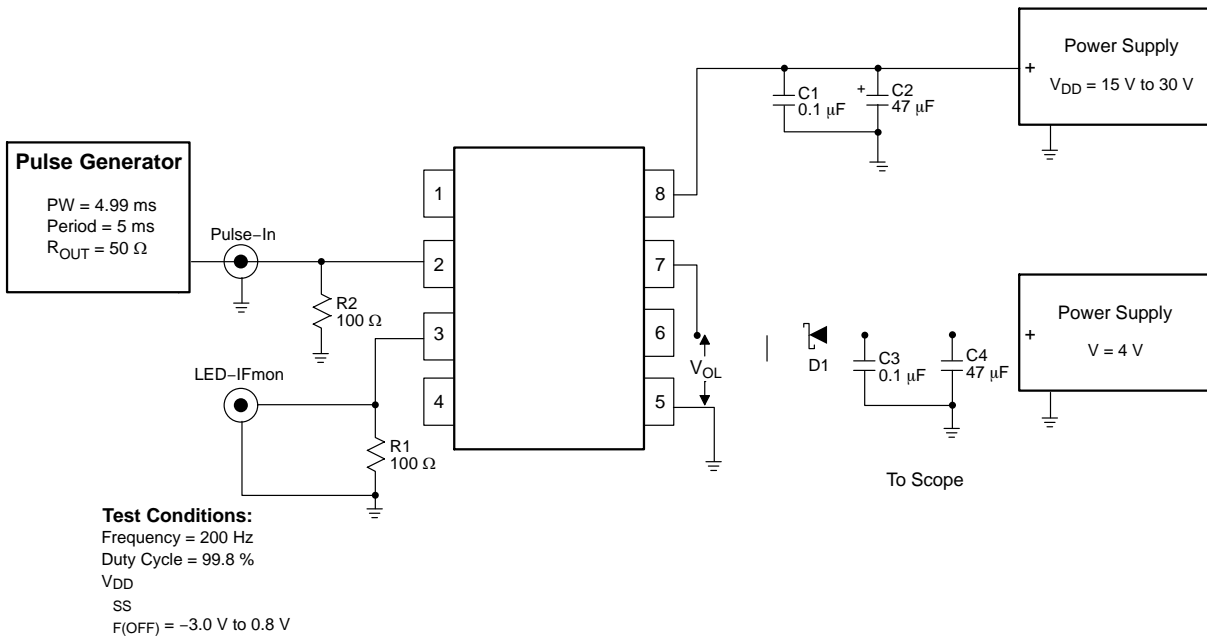


Figure 16. I_{OL} Test Circuit

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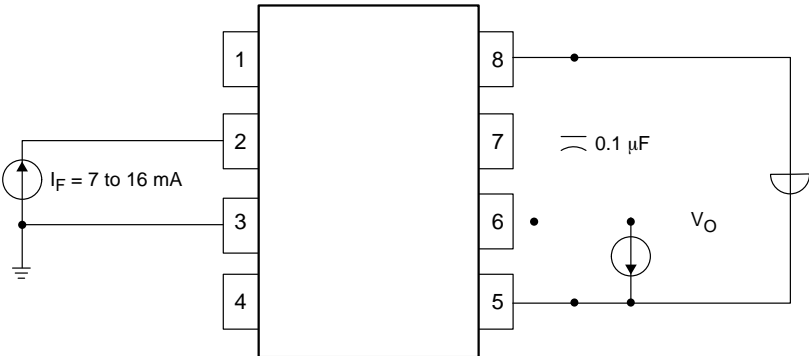


Figure 18. V_{OH} Test Circuit

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REFLOW PROFILE

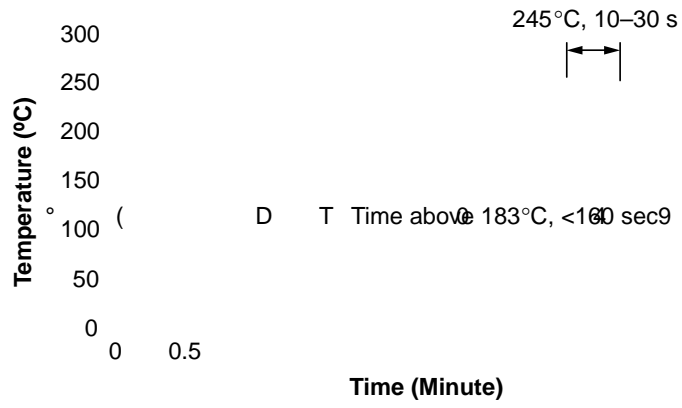


Figure 27. Reflow Profile

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CARRIER TAPE SPECIFICATIONS

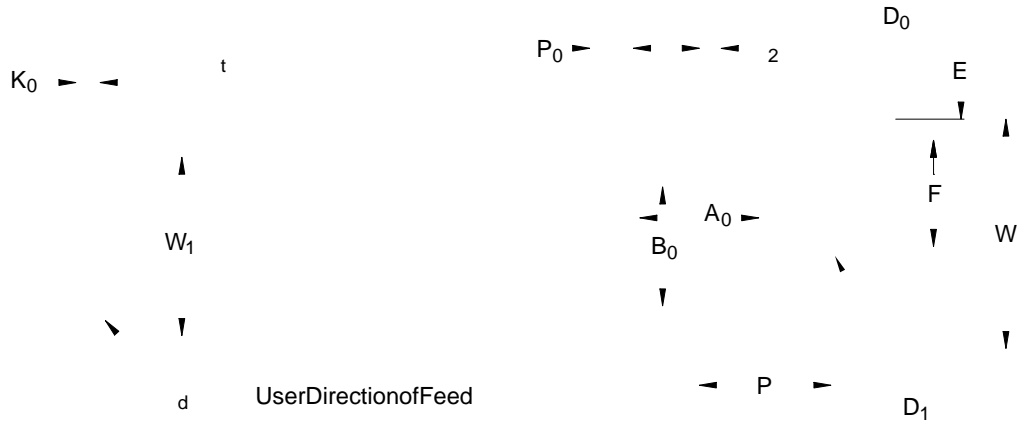
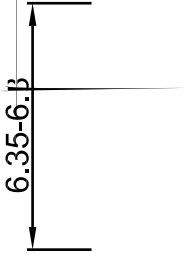


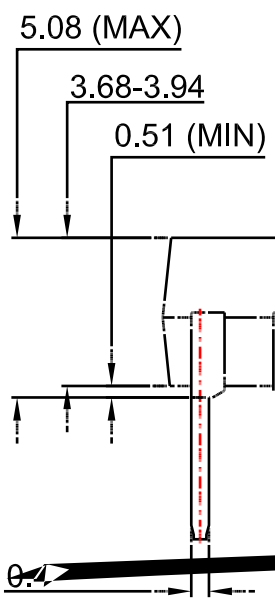
Figure 29. Carrier Tape Specifications

PDIP8 6.6x3.81, 2.54P

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PDIP8 9.655x6.6, 2.54P



PDIP8 GW
CASE 709AC
ISSUE 0

LANE

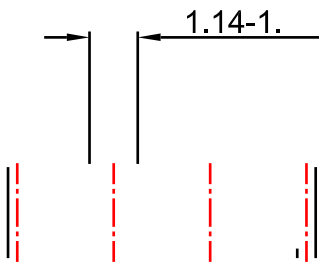
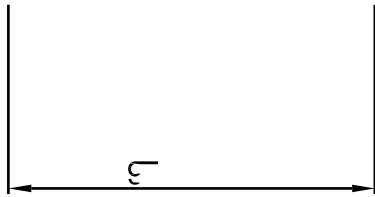
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NOTES:
A) NO STA C

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