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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.

March 2016

FOD8314, FOD8314T
1.0 A Output Current, Gate Drive Optocoupler in Stretched Body SOP 6-Pin

Features

- FOD8314T - 8 mm Creepage and Clearance Distance, and 0.4 mm Insulation Distance to Achieve Reliable and High-Voltage Insulation
- 1.0 A Output Current Driving Capability for Medium-Power IGBT/MOSFET
  - Use of P-Channel MOSFETs at Output Stage

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.

Parameter		Characteristics	
		FOD8314	FOD8314T
Installation Classifications per DIN VDE 0110/1.89 Table 1, For Rated Mains Voltage	< 150 V_{RMS}	I–IV	I–IV
	< 300 V_{RMS}	I–IV	I–IV
	< 450 V_{RMS}	I–III	I–IV
	< 600 V_{RMS}	I–III	I–III
Climatic Classification		40/100/21	40/100/21
Pollution Degree (DIN VDE 0110/1.89)		2	2
Comparative Tracking Index		175	175

Symbol	Parameter	Value		Unit
		FOD8314	FOD8314T	
V_{PR}	Input-to-Output Test Voltage, Method B, V_{IORM} x 1.875 = V_{PR}, 100% Production Test with t_m = 1 s, Partial Discharge < 5 pC	1,671	2,137	V_{peak}
	Input-to-Output Test Voltage, Method A, V_{IORM} x 1.6 = V_{PR}, Type and Sample Test with t_m = 10 s, Partial Discharge < 5 pC	1,426	1,824	V_{peak}
V_{IORM}	Maximum Working Insulation Voltage	891	1,140	V_{peak}
V_{IOTM}	Highest Allowable Over-Voltage	6,000	8,000	V_{peak}
	External Creepage	8.0	8.0	mm
	External Clearance	7.0	8.0	mm
DTI	Distance Through Insulation (Insulation Thickness)	0.4	0.4	mm
	Safety Limit Values – Maximum Values Allowed in the Event of a Failure,			
T_S	Case Temperature	150	150	°C
$I_{S,INPUT}$	Input Current	200	200	mA
$P_{S,OUTPUT}$	Output Power	600	600	mW
R_{IO}	Insulation Resistance at T_S, V_{IO} = 500 V	10^9	10^9	

Switching Characteristics

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t_{PHL}	Propagation Delay Time to Logic Low Output(9)	I_F = 7 mA to 16 mA, R_g = 10 , C_g = 10 nF, f = 10 kHz, Duty Cycle = 50%	100	270	500	ns
t_{PLH}	Propagation Delay Time to Logic High Output(10)		100	260	500	ns
PWD	Pulse Width Distortion(11) $\lvert t_{PHL} - t_{PLH} \rvert$			25	300	ns
PDD (Skew)	Propagation Delay Difference Between Any Two Parts(12)		-350		350	
t_R	Output Rise Time (10% to 90%)			60		ns
t_F	Output Fall Time (90% to 10%)			40		ns
$t_{ULVO\ ON}$	ULVO Turn On Delay	I_F = 10 mA, V_O > 5 V		0.8		s
$t_{ULVO\ OFF}$	ULVO Turn Off Delay	I_F = 10 mA, V_O < 5 V		0.2		s
$\lvert CM_H \rvert$	Common Mode Transient Immunity at Output High	V_{DD} = 30 V, I_F = 10 mA to 16 mA, V_{CM} = 2000 V, T_A = 25°C(13)	20	50		kV/ s
$\lvert CM_L \rvert$	Common Mode Transient Immunity at Output Low	V_{DD} = 30 V, V_F = 0 V, V_{CM} = 2000 V, T_A = 25°C(14)	20	50		kV/ s

Notes:

9. Propagation delay t_{PHL} 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. Propagation delay t_{PLH} 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 $\lvert t_{PHL} - t_{PLH} \rvert$ for any given device.
12. The difference between t_{PHL} and t_{PLH} between any two FOD8314 parts under the same operating conditions, with equal loads.
13. Common mode transient immunity at output high is the maximum tolerable negative dVcm/dt on the trailing edge of the common mode impulse signal, V_{CM}, to ensure that the output remains high (i.e., V_O > 15.0 V).
14. Common mode transient immunity at output low is the maximum tolerable positive dVcm/dt on the leading edge of the common pulse signal, V_{CM}, to ensure that the output remains low (i.e., V_O < 1.0 V).

Typical Performance Characteristics

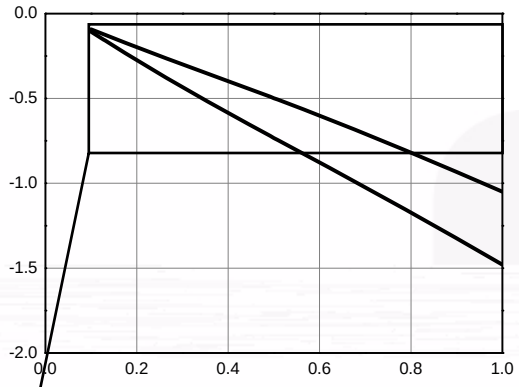


Figure 4. Output High Voltage Drop vs. Output High Current

Figure 5. Output High Voltage Drop vs. Ambient Temperature

Figure 6. Output High Current vs. Ambient Temperature

Figure 7. Output Low Voltage vs. Output Low Current

Figure 8. Output Low Voltage vs. Ambient Temperature

Figure 9. Output Low Current vs. Ambient Temperature

Test Circuit (Continued)

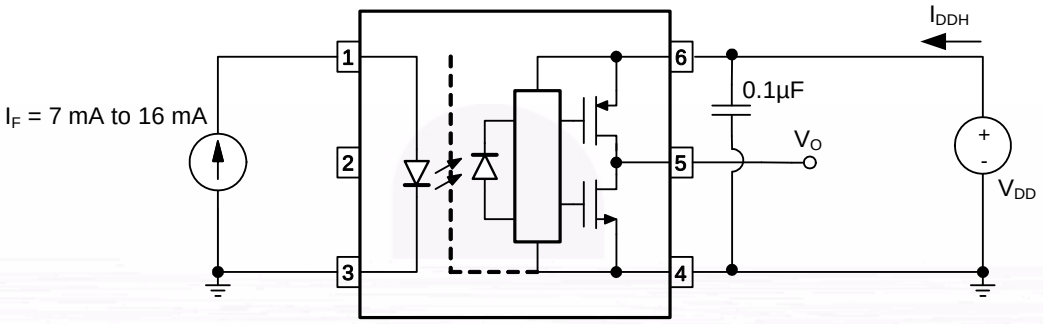


Figure 25. I_{DDH} Test Circuit

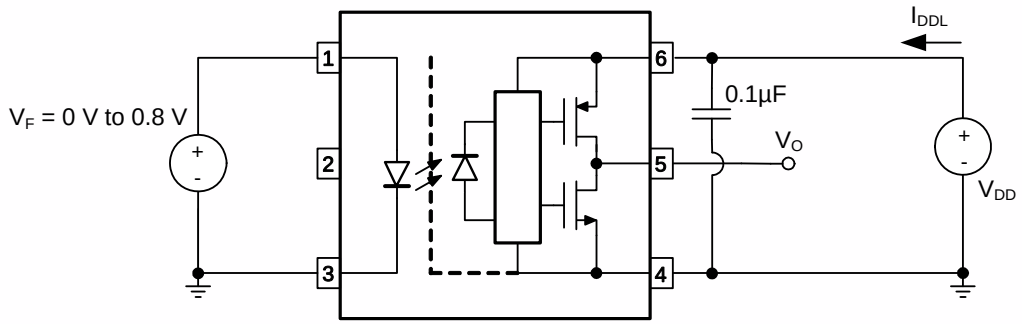
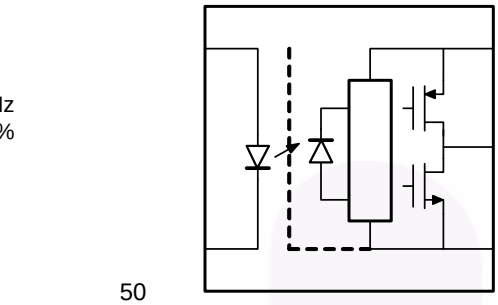


Figure 26. I_{DDL} Test Circuit

Test Circuit (Continued)



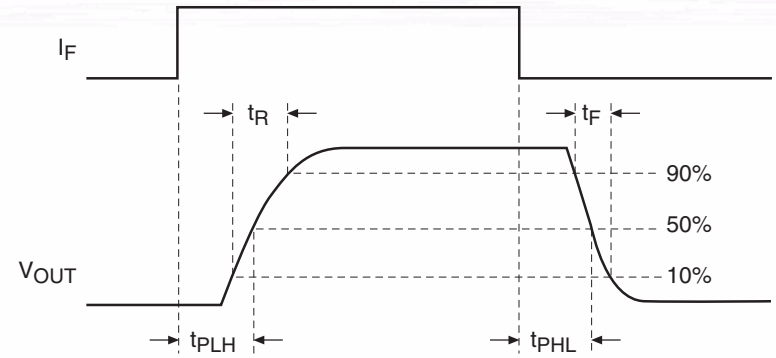


Figure 30. t_{PHL}, t_{PLH}, t_R and t_F Test Circuit and Waveforms

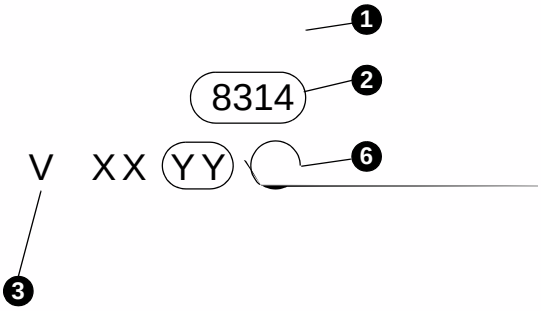
Figure 31. CMR Test Circuit and Waveforms

Ordering Information

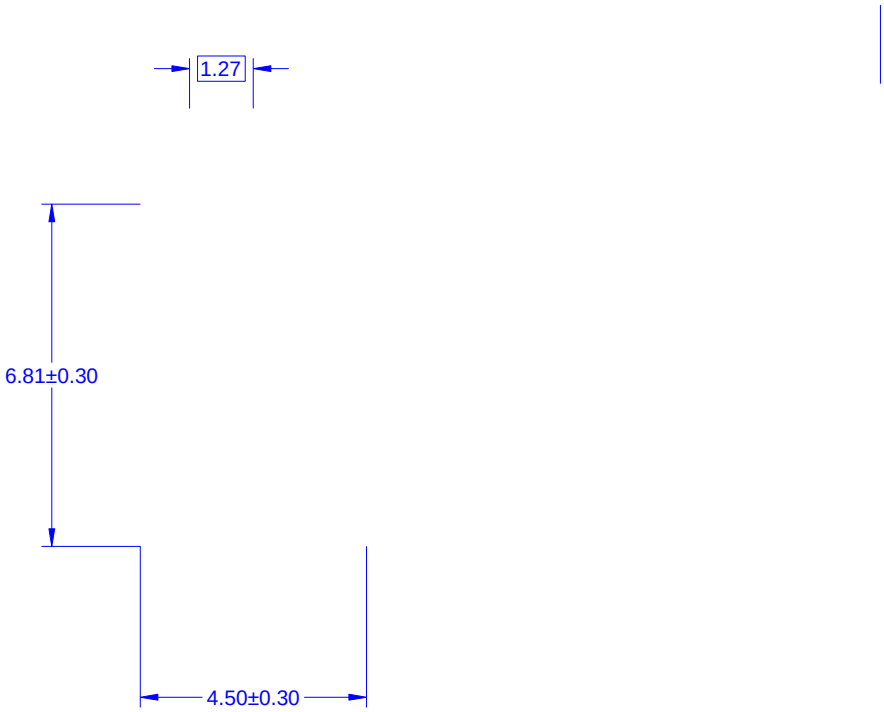
Part Number	Package	Packing Method
FOD8314	Stretched Body SOP 6-Pin	Tube (100 units per tube)
FOD8314R2	Stretched Body SOP 6-Pin	Tape and Reel (1,000 units per reel)
FOD8314V	Stretched Body SOP 6-Pin, DIN EN/IEC60747-5-5 Option	Tube (100 units per tube)
FOD8314R2V	Stretched Body SOP 6-Pin, DIN EN/IEC60747-5-5 Option	Tape and Reel (1,000 units per reel)
FOD8314T	Stretched Body SOP 6-Pin, Wide Lead	Tube (100 units per tube)
FOD8314TR2	Stretched Body SOP 6-Pin, Wide Lead	Tape and Reel (1,000 units per reel)
FOD8314TV	Stretched Body SOP 6-Pin, Wide Lead, DIN EN/IEC60747-5-5 Option	Tube (100 units per tube)
FOD8314TR2V	Stretched Body SOP 6-Pin, Wide Lead, 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. 8314
3	DIN EN/IEC60747-5-5 Option (only appears on component ordered with this option)
4	Last Digit Year Code, e.g. ‘5’
5	Two Digit Work Week Ranging from ‘01’ to ‘53’
6	Assembly Package Code



NOTES: UNLESS OTHERWISE SPECIFIED

A) NO STANDARD APPLIES TO THIS PACKAGE
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH, AND TIE BAR EXTRUSION.
D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
E) DRAWING FILE NAME: MKT-M06BREV1

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D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.

E) DRAWING FILE NAME: MKT-M06CREV1