

High Noise Immunity, 3.3V/5V, 10 Mbit/sec Logic Gate Opto Coupler (Open Collector) Optocoupler

FODM8061

Description

The FODM8061 is a 3.3 V/5 V high-speed logic gate output (open collector) optocoupler, which supports isolated communications allowing digital signals to communicate between systems without conducting ground loops or hazardous voltages. It utilizes onsemi's patented coplanar packaging technology, OPTOPLANAR[®], and optimized IC design to achieve high noise immunity, characterized by high common mode transient immunity specifications.

This optocoupler consists of an AlGaAs LED at the input, optically coupled to a high speed integrated photo-detector logic gate. The output of the detector IC is an open collector schottky-clamped transistor. The coupled parameters are guaranteed over the wide temperature range of -40°C to +110°C. A maximum input signal of 5mA will provide a minimum output sink current of 13 mA (fan out of 8).

Features

- High Noise Immunity Characterized by Common Mode Transient Immunity (CMTI)
 - ◆ 20 kV/μs Minimum CMTI
- High Speed
 - ◆ 10 Mbit/sec Data Rate (NRZ)
 - ◆ 80 ns Max. Propagation Delay
 - ◆ 25 ns Max. Pulse Width Distortion
 - ◆

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PIN DEFINITIONS

Number	Name	Function Description
1	ANODE	Anode
3	CATHODE	Cathode
4	GND	Output Ground
5	V_O	Output Voltage
6	V_{CC}	Output Supply Voltage

SAFETY AND INSULATION RATINGS FOR MINI-FLAT PACKAGE (SO5 PIN)

(As per 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 Main Voltage <150 Vrms	-	I-IV	-	
	For Rated Main Voltage <300 Vrms	-	I-III	-	
	Climatic Classification	-	40/110/21	-	
	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 $t_m = 1$ s, Partial Discharge <5 pC	1060	-	-	
V_{PR}	Input to Output Test Voltage, Method a, $V_{IORM} \times 1.5 = V_{PR}$, Type and Sample Test with $t_m = 60$ s, Partial Discharge <5 pC	848	-	-	
V_{IORM}	Max Working Insulation Voltage	565	-	-	V_{peak}
V_{IOTM}	Highest Allowable Over Voltage	4000	-	-	

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MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
T _{STG}	Storage Temperature	-40 to +125	°C
T _{OPR}	Operating Temperature	-40 to +110	°C
T _J	Junction Temperature	-40 to +125	°C
T _{SOL}	Lead Solder Temperature (Refer to Reflow Temperature Profile)	260 for 10 s	°C
I _F	Forward Current	50	mA
V _R	Reverse Voltage	5.0	V
V _{CC}	Supply Voltage	0 to 7.0	V
V _O	Output Voltage	-0.5 to V _{CC} +0.5	V
I _O	Average Output Current	50	mA
PD _I	Input Power Dissipation (Note 1), (Note 2)	100	mW
PD _O	Output Power Dissipation (Note 1), (Note 2)		

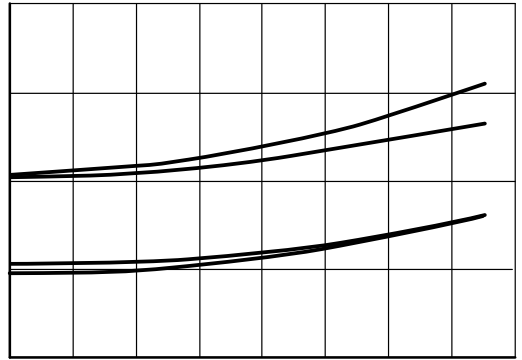
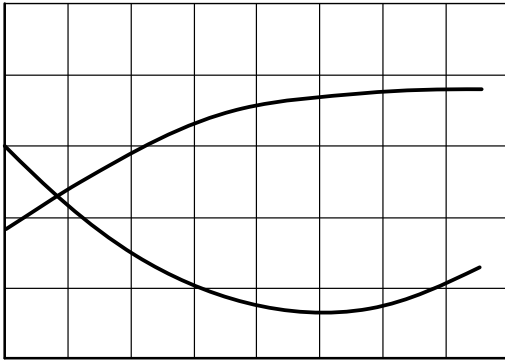
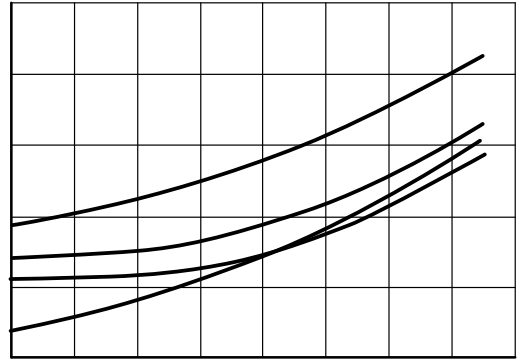
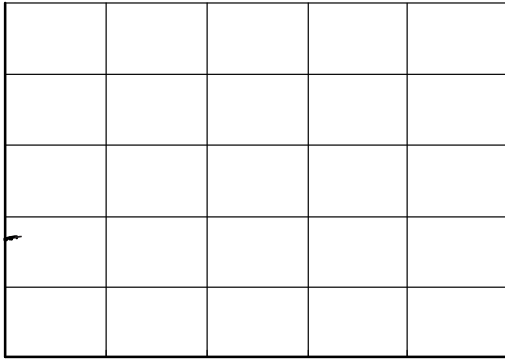
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ELECTRICAL CHARACTERISTICS (Apply over all recommended conditions)

($T_A = -40^{\circ}\text{C}$ to $+110^{\circ}\text{C}$, $3.0\text{ V} \leq V_{CC} \leq 5.5\text{ V}$, unless otherwise noted)

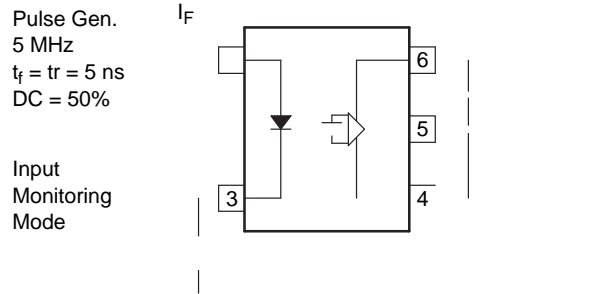
Symbol	Parameter	Test Condition	Min	Typ*	Max	Unit	
INPUT CHARACTERISTICS							
V_F	Forward Voltage	$I_F = 10\text{ mA}$ (Figure 1)	1.05	1.45	1.8	V	
BV_R	Input Reverse Breakdown Voltage	$I_R = 10\text{ }\mu\text{A}$	5.0	–	–	V	
I_{FHL}	Threshold Input Current	$V_O = 0.6\text{ V}$, $I_{OL}(\text{sinking}) = 13\text{ mA}$	$T_A < 85^{\circ}\text{C}$, (Figure 2)	–	3.4	5.0	mA
			$T_A = 85^{\circ}\text{C}$ to 110°C	–	4.2	7.5	
OUTPUT CHARACTERISTICS							
V_{OL}	Logic LOW Output Voltage	$I_F = \text{rated } I_{FHL}$, $I_{OL}(\text{sinking}) = 13\text{ mA}$ (Figure 3)	–	0.4	0.6	V	
I_{OH}	Logic HIGH Output Current	$I_F = 250\text{ }\mu\text{A}$, $V_O = 3.3\text{ V}$, (Figure 4)	–	8.0	50.0	μA	

TYPICAL PERFORMANCE CURVES (CONTINUED)



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SCHEMATICS



Output

Figure 11. Test Circuit for Propagation Delay Time, Rise Time and Fall Time

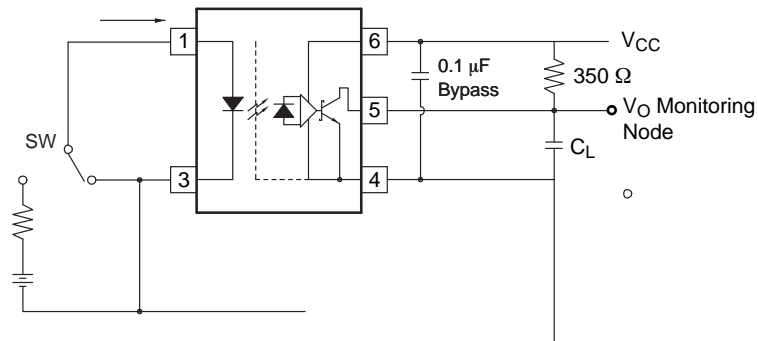


Figure 12. Test Circuit for Instantaneous Common Mode Rejection Voltage

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REFLOW PROFILE

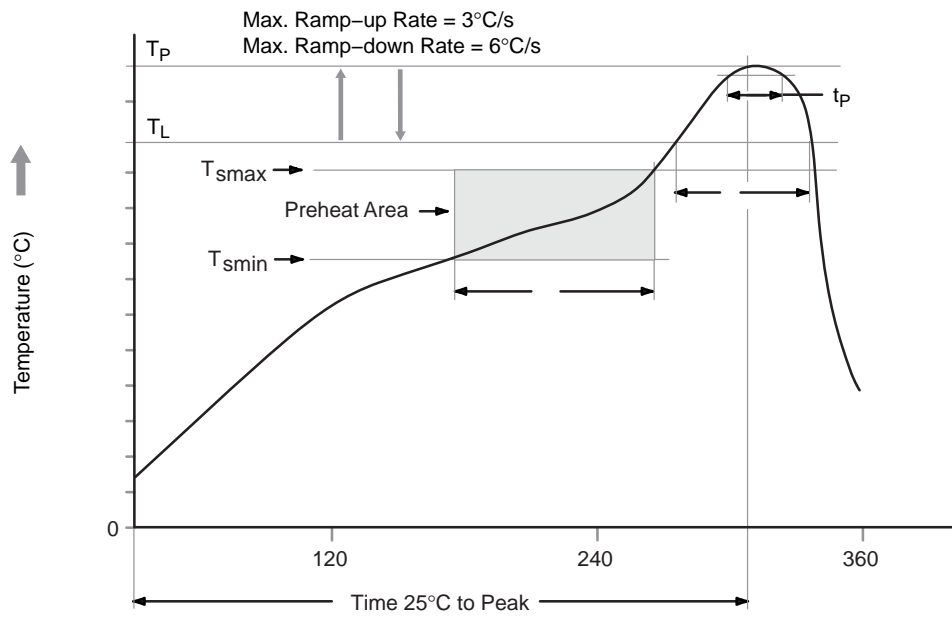


Figure 13. Reflow Profile

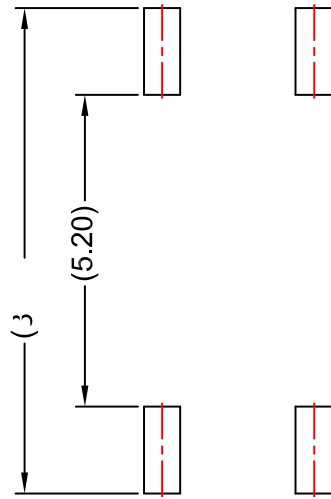
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ORDERING INFORMATION

Part Number	Package	Shipping†
FODM8061	MFP5 4.1X4.4, 2.54P (Pb-Free)	100 Units / Tube
FODM8061R2	MFP5 4.1X4.4, 2.54P (Pb-Free)	2500 / Tape & Reel
FODM8061V	MFP5 4.1X4.4, 2.54P IEC60747-5-5 (Pb-Free)	100 Units / Tube
FODM8061R2V	MFP5 4.1X4.4, 2.54P IEC60747-5-5 (Pb-Free)	2500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging

MFP5 4.1X4.4, 2.54P



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