

MOCD207M, MOCD208M Dual Channel Phototransistor Small Outline Surface Mount Optocouplers

Features

- Dual Channel Optocoupler
- Convenient Plastic SOIC-8 Surface Mountable Package Style
- Two channels in one compact surface mount package
- Closely Matched Current Transfer Ratios to Minimize Unit-to-Unit Variation
- Minimum $V_{(BR)CEO}$ of 70 Volts Guaranteed
- Standard SOIC-8 Footprint, with 0.050" Lead Spacing
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- High Input-Output Isolation of 2500 Vac (rms) Guaranteed
- Meets U.L. Regulatory Requirements, File #E90700, Volume 2

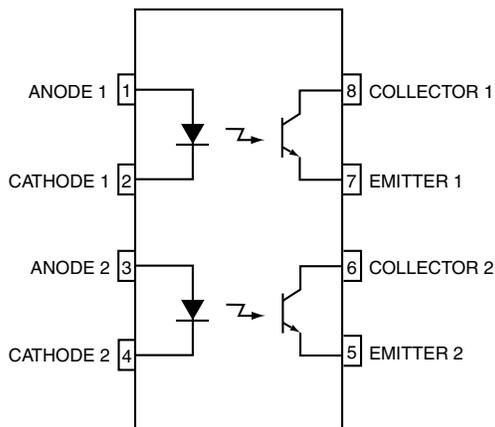
Applications

- Feedback control circuits
- Interfacing and coupling systems of different potentials and impedances
- General purpose switching circuits
- Monitor and detection circuits

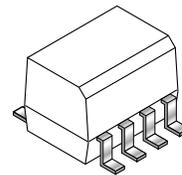
Description

The MOCD207M/MOCD208M consist of two silicon phototransistors optically coupled to two GaAs infrared LEDs. These devices are constructed in a small outline surface mount package which conforms to the standard SOIC-8 footprint.

Schematic



Package



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

Symbol	Rating	Value	Unit
EMITTER			
I_F	Forward Current – Continuous	60	mA
I_F (pk)	Forward Current – Peak (PW = 100 μ s, 120pps)	1.0	A
V_R	Reverse Voltage	6.0	V
P_D	LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	90	mW
		0.8	mW/ $^\circ\text{C}$
DETECTOR			
V_{CEO}	Collector-Emitter Voltage	70	V
V_{CBO}	Collector-Base Voltage	70	V
V_{ECO}	Emitter-Collector Voltage	7.0	V
I_C	Collector Current-Continuous	150	mA
P_D	Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	150	mW
		1.76	mW/ $^\circ\text{C}$
TOTAL DEVICE			
V_{ISO}	Input-Output Isolation Voltage ^(1, 2) (f = 60Hz, 1 min. Duration)	2500	Vac(rms)
P_D	Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	250	mW
		2.94	mW/ $^\circ\text{C}$
T_A	Ambient Operating Temperature Range	-40 to +100	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-40 to +125	$^\circ\text{C}$
T_L	Lead Soldering Temperature (1/16" from case, 10 sec. duration)	260	$^\circ\text{C}$

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise specified)⁽³⁾

Symbol	Parameter	Test Conditions	Device	Min.	Typ.*	Max.	Unit
EMITTER							
V_F	Input Forward Voltage	$I_F = 30\text{mA}$	All		1.25	1.55	V
I_R	Reverse Leakage Current	$V_R = 6.0\text{V}$	All		0.001	100	μA
C	Capacitance		All		18		pF
DETECTOR							
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 10\text{V}, T_A = 25^\circ\text{C}$	All		1.0	50	nA
I_{CEO}		$V_{CE} = 10\text{V}, T_A = 100^\circ\text{C}$	All		1.0		μA
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 100\mu\text{A}$	All	70	100		V
$V_{(BR)CEO}$	Emitter-Collector Breakdown Voltage	$I_E = 100\mu\text{A}$	All	7.0	10		V
C_{CE}	Collector-Emitter Capacitance	$f = 1.0\text{ MHz}, V_{CE} = 0\text{V}$	All		7.0		pF
COUPLED							
CTR	Current Transfer Ratio, Collector to Emitter ⁽⁴⁾	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$	MOCD207M	100		200	%
			MOCD208M	40		125	
		$I_F = 1\text{mA}, V_{CE} = 5\text{V}$	MOCD207M	34			
			MOCD208M	13			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 2.0\text{mA}, I_F = 10\text{mA}$	All			0.4	V
t_{on}	Turn-On Time	$I_C = 2.0\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$	All		3.0		μs
t_{off}	Turn-Off Time	$I_C = 2.0\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$	All		2.8		μs
t_r	Rise Time	$I_C = 2.0\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$	All		1.6		μs
t_f	Fall Time	$I_C = 2.0\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$	All		2.2		μs
V_{ISO}	Isolation Surge Voltage ^(1, 2)	$f = 60\text{Hz}, t = 1\text{ min.}, I_{I-O} \leq 2\mu\text{A}$	All	2500			Vac(rms)
R_{ISO}	Isolation Resistance ⁽²⁾	$V_{I-O} = 500\text{V}$	All	10^{11}			Ω
C_{ISO}	Isolation Capacitance ⁽²⁾	$V_{I-O} = 0\text{V}, f = 1\text{MHz}$	All		0.2		pF

*Typical values at $T_A = 25^\circ\text{C}$ **Note:**

1. Input-Output Isolation Voltage, V_{ISO} , is an internal device dielectric breakdown rating.
2. For this test, Pins 1, 2, 3 and 4 are common and Pins 5, 6, 7 and 8 are common.
3. Always design to the specified minimum/maximum electrical limits (where applicable).
4. Current Transfer Ratio (CTR) = $I_C/I_F \times 100\%$.

Typical Performance Curves

Fig. 1 LED Forward Voltage vs. Forward Current

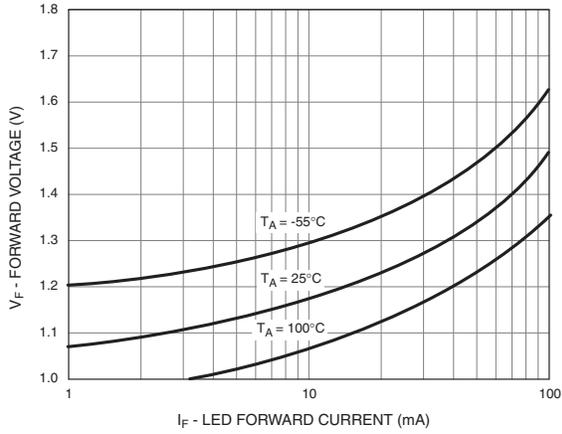


Fig. 2 Output Current vs. Input Current

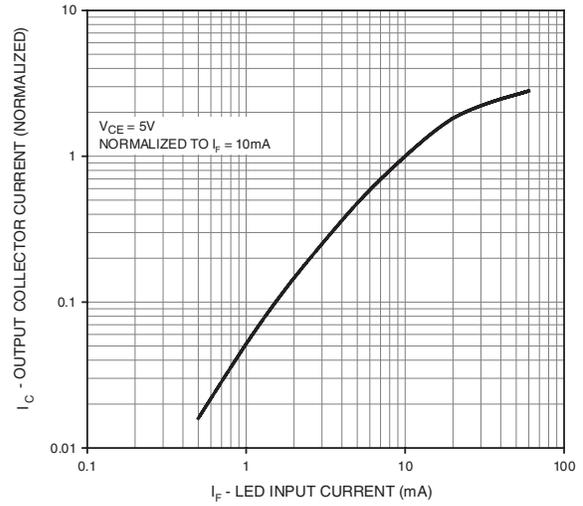


Fig. 3 Output Current vs. Ambient Temperature

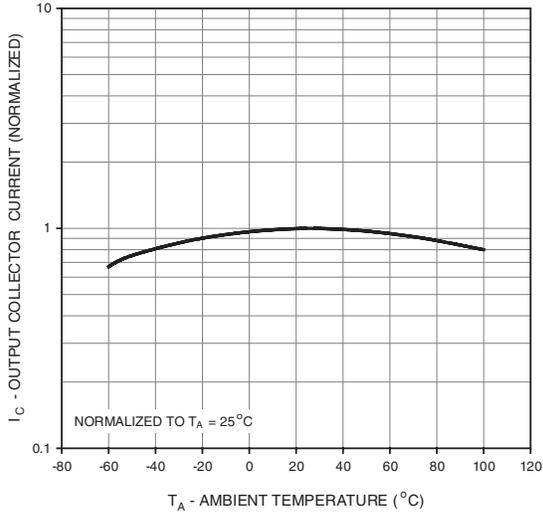


Fig. 4 Output Current vs. Collector - Emitter Voltage

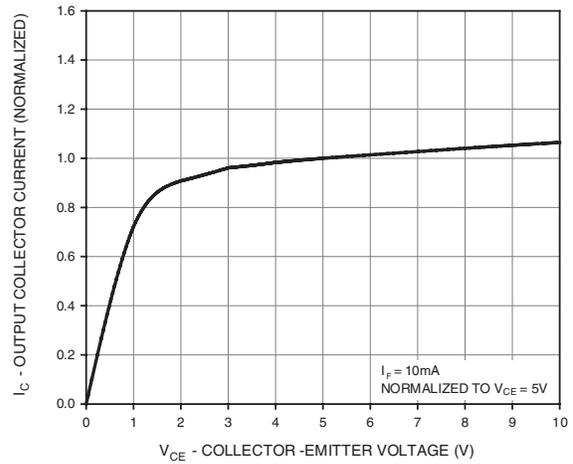
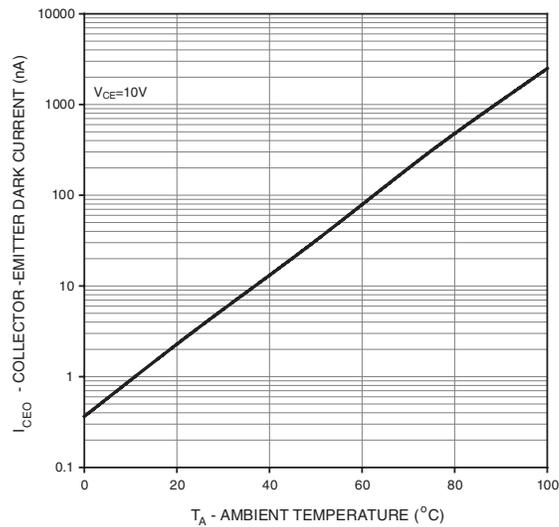
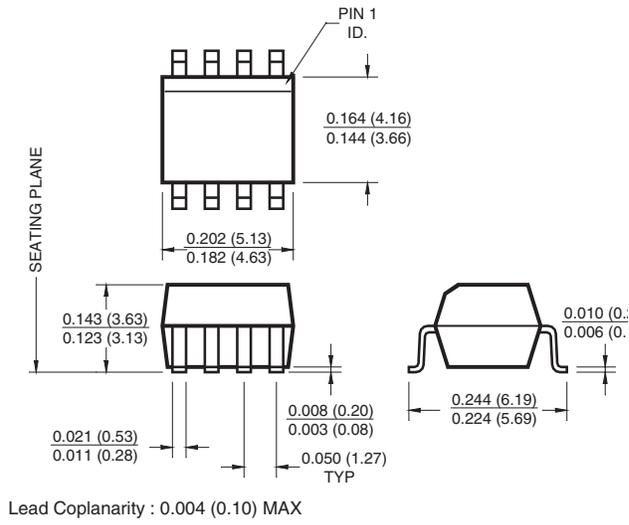


Fig. 5 Dark Current vs. Ambient Temperature

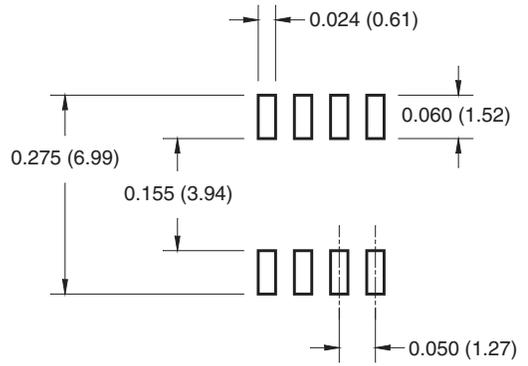


Package Dimensions

Surface Mount



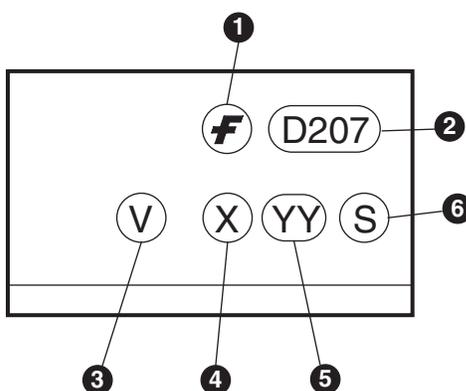
8-Pin Small Outline



Ordering Information

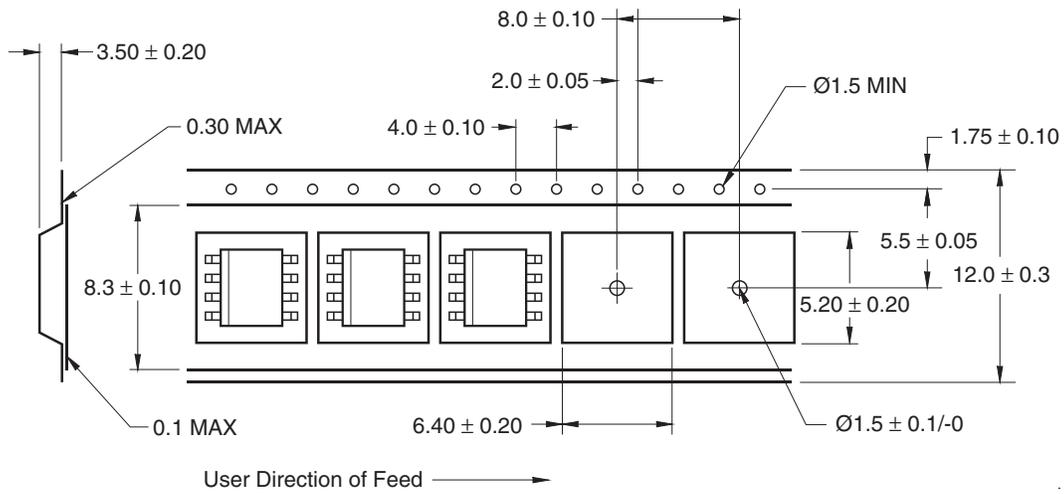
Option	Order Entry Identifier	Description
V	V	VDE Approved
D1	D1	Tape & Reel (500 units per reel), 16mm width carrier tape
D1V	D1V	VDE Approved, Tape & Reel (500 units per reel), 16mm width carrier tape
D2	D2	Tape & Reel (2500 units per reel), 16mm width carrier tape
D2V	D2V	VDE Approved, Tape & Reel (2500 units per reel), 16mm width carrier tape
R1	R1	Tape & Reel (500 units per reel), 12mm width carrier tape
R1V	R1V	VDE Approved, Tape & Reel (500 units per reel), 12mm width carrier tape
R2	R2	Tape & Reel (2500 units per reel), 12mm width carrier tape
R2V	R2V	VDE Approved, Tape & Reel (2500 units per reel), 12mm width carrier tape

Marking Information

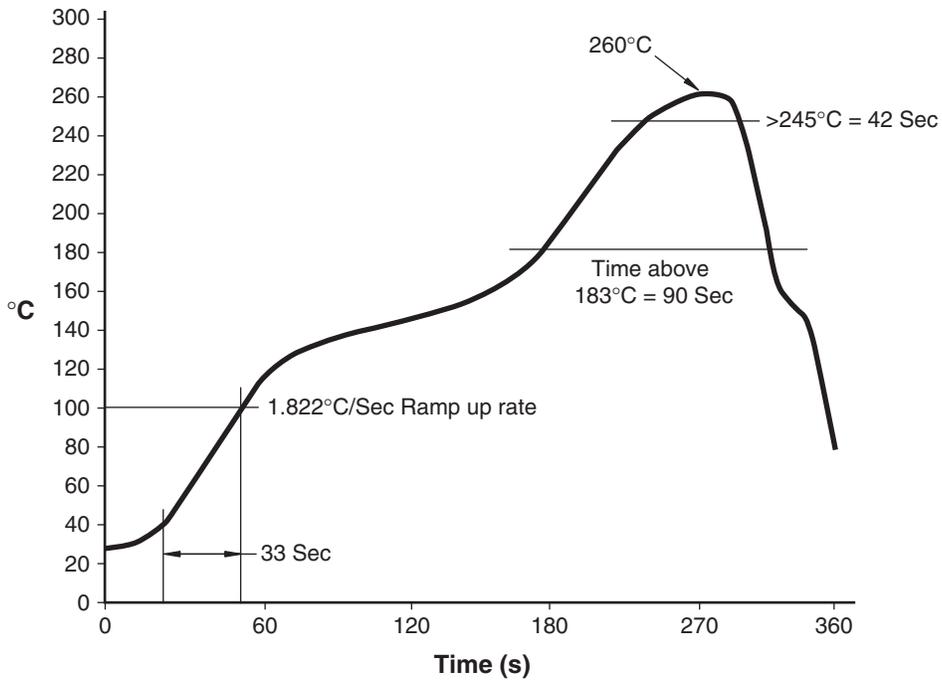


Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code, e.g., '3'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

Carrier Tape Specifications



Reflow Profile



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CoolFET™	I ² C™	PACMAN™	SuperFET™	
CROSSVOLT™	i-Lo™	POP™	SuperSOT™-3	
DOME™	ImpliedDisconnect™	Power247™	SuperSOT™-6	
EcoSPARK™	IntelliMAX™	PowerEdge™	SuperSOT™-8	
E ² C MOS™	ISOPLANAR™	PowerSaver™	SyncFET™	
EnSigna™	LittleFET™	PowerTrench®	TCM™	
FACT®	MICROCOUPLER™	QFET®	TinyBoost™	
FAST®	MicroFET™	QS™	TinyBuck™	
FASTr™	MicroPak™	QT Optoelectronics™	TinyPWM™	
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