



**THE DATASHEET OF  
MOCD207R1VM**



# 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

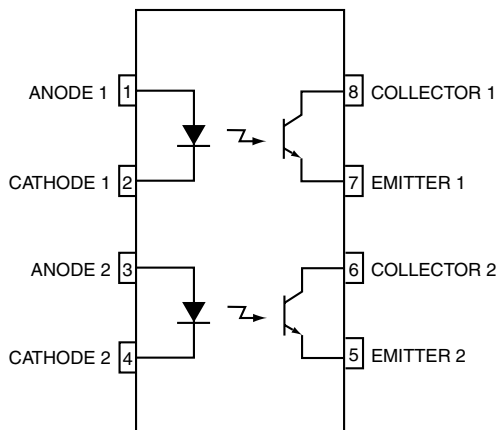
## Applications

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

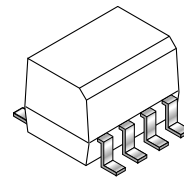
## Description

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
<b>EMITTER</b>			
$I_F$	Forward Current – Continuous	60	mA
$I_F$ (pk)	Forward Current – Peak (PW = 100 $\mu$ 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 $25^\circ\text{C}$	90	mW
		0.8	mW/ $^\circ\text{C}$
<b>DETECTOR</b>			
$V_{CEO}$	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 $25^\circ\text{C}$	150	mW
		1.76	mW/ $^\circ\text{C}$
<b>TOTAL DEVICE</b>			
$V_{ISO}$	Input-Output Isolation Voltage <sup>(1, 2)</sup> (f = 60Hz, 1 min. Duration)	2500	Vac(rms)
$P_D$	Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	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)<sup>(3)</sup>

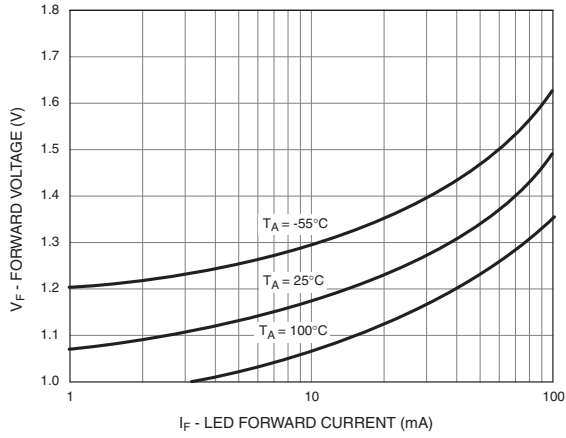
Symbol	Parameter	Test Conditions	Device	Min.	Typ.*	Max.	Unit
<b>EMITTER</b>							
$V_F$	Input Forward Voltage	$I_F = 30\text{mA}$	All		1.25	1.55	V
$I_R$	Reverse Leakage Current	$V_R = 6.0\text{V}$	All		0.001	100	$\mu\text{A}$
C	Capacitance		All		18		pF
<b>DETECTOR</b>							
$I_{CEO}$	Collector-Emitter 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		$\mu\text{A}$
$V_{(BR)CEO}$	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
<b>COUPLED</b>							
CTR	Current Transfer Ratio, Collector to Emitter <sup>(4)</sup>	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$	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		$\mu\text{s}$
$t_{off}$	Turn-Off Time	$I_C = 2.0\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$	All		2.8		$\mu\text{s}$
$t_r$	Rise Time	$I_C = 2.0\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$	All		1.6		$\mu\text{s}$
$t_f$	Fall Time	$I_C = 2.0\text{mA}, V_{CC} = 10\text{V}, R_L = 100\Omega$	All		2.2		$\mu\text{s}$
$V_{ISO}$	Isolation Surge Voltage <sup>(1, 2)</sup>	$f = 60\text{Hz}, t = 1\text{ min.}, I_{I-O} \leq 2\mu\text{A}$	All	2500			Vac(rms)
$R_{ISO}$	Isolation Resistance <sup>(2)</sup>	$V_{I-O} = 500\text{V}$	All	$10^{11}$			$\Omega$
$C_{ISO}$	Isolation Capacitance <sup>(2)</sup>	$V_{I-O} = 0\text{V}, f = 1\text{MHz}$	All		0.2		pF

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

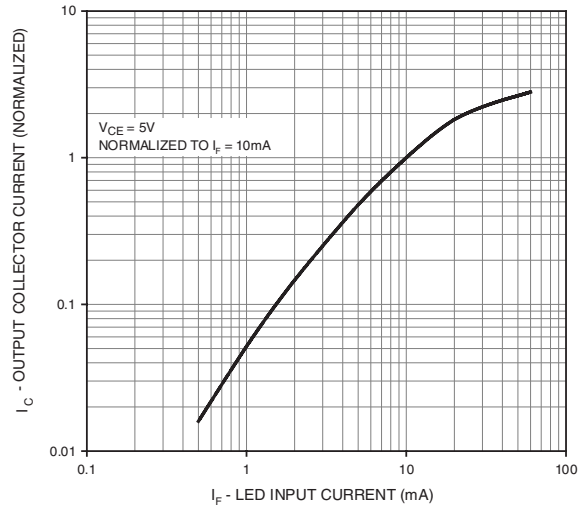
1. Input-Output Isolation Voltage,  $V_{ISO}$ , is an internal device dielectric breakdown rating.
2. For this test, Pins 1, 2, 3 and 4 are common and Pins 5, 6, 7 and 8 are common.
3. Always design to the specified minimum/maximum electrical limits (where applicable).
4. Current Transfer Ratio (CTR)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

## Typical Performance Curves

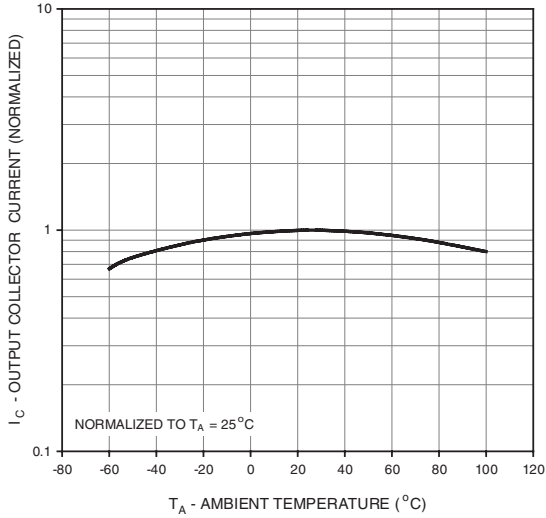
**Fig. 1 LED Forward Voltage vs. Forward Current**



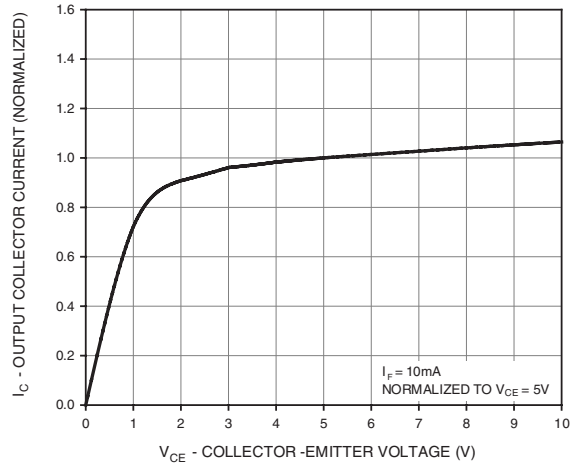
**Fig. 2 Output Current vs. Input Current**



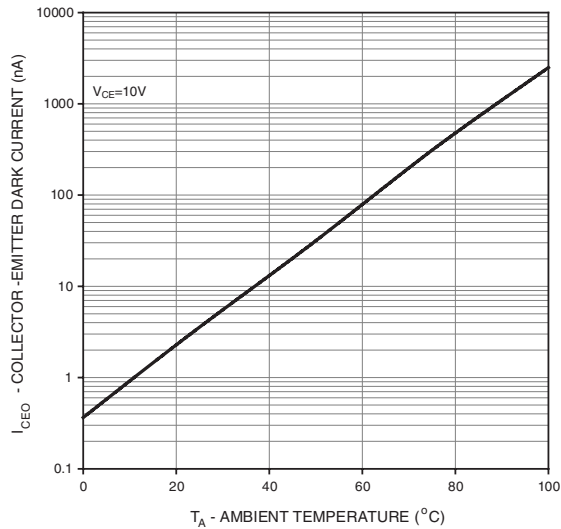
**Fig. 3 Output Current vs. Ambient Temperature**



**Fig. 4 Output Current vs. Collector - Emitter Voltage**

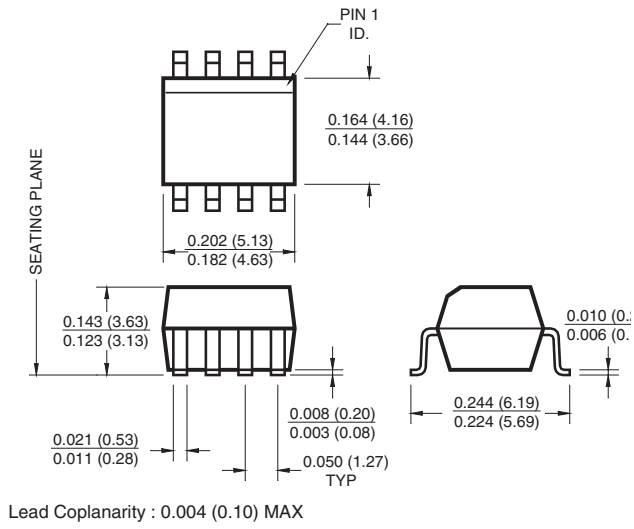


**Fig. 5 Dark Current vs. Ambient Temperature**

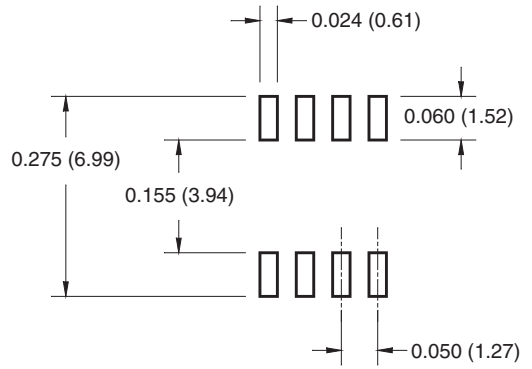


## Package Dimensions

### Surface Mount



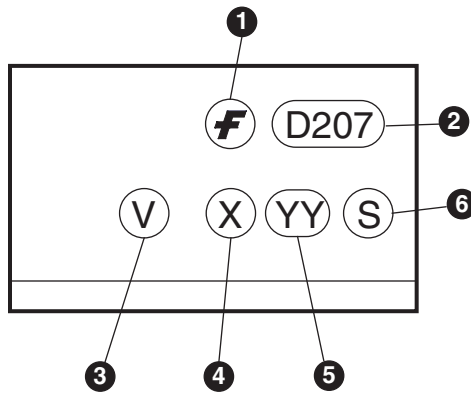
### 8-Pin Small Outline



### Ordering Information

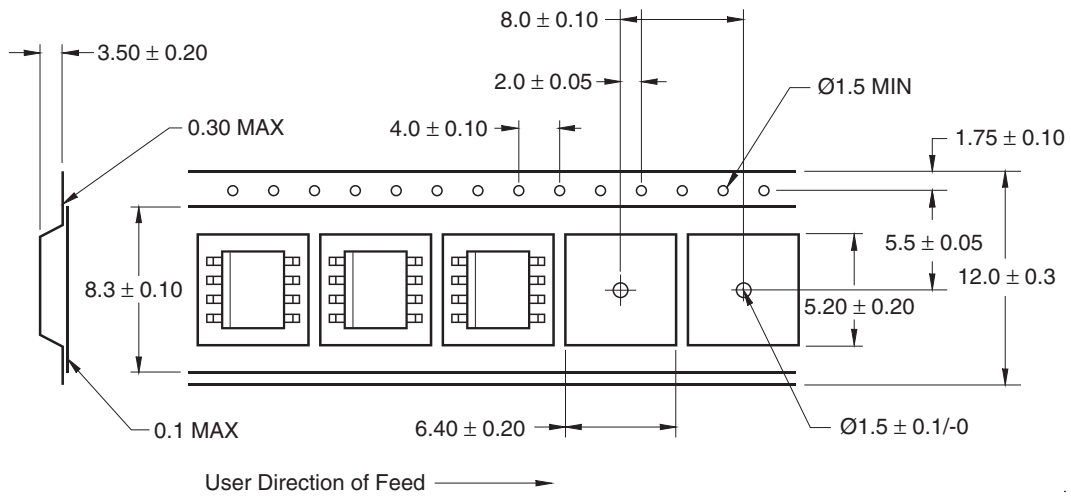
Option	Order Entry Identifier	Description
V	V	VDE Approved
D1	D1	Tape & Reel (500 units per reel), 16mm width carrier tape
D1V	D1V	VDE Approved, Tape & Reel (500 units per reel), 16mm width carrier tape
D2	D2	Tape & Reel (2500 units per reel), 16mm width carrier tape
D2V	D2V	VDE Approved, Tape & Reel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

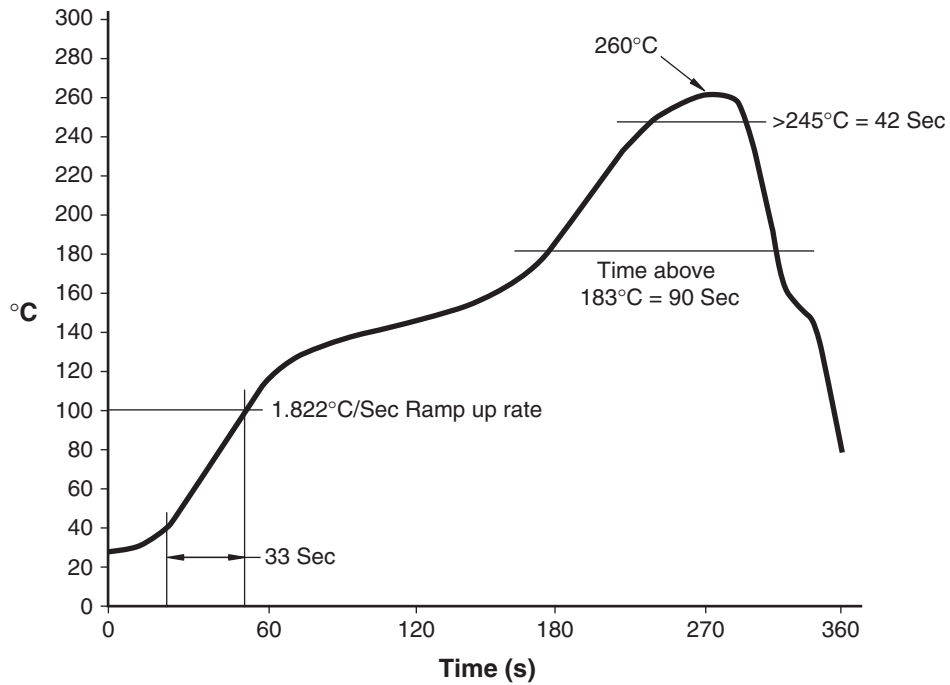


Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code, e.g., '3'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

### Carrier Tape Specifications



### Reflow Profile



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