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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



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

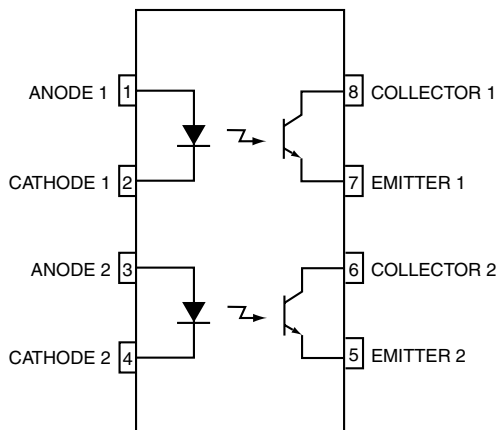
Applications

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

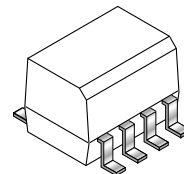
Description

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

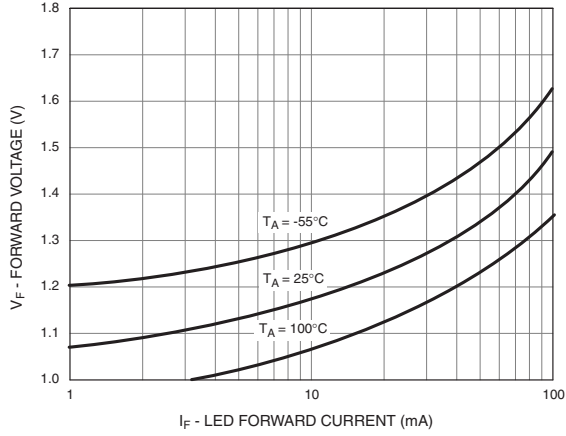


Fig. 2 Output Current vs. Input Current

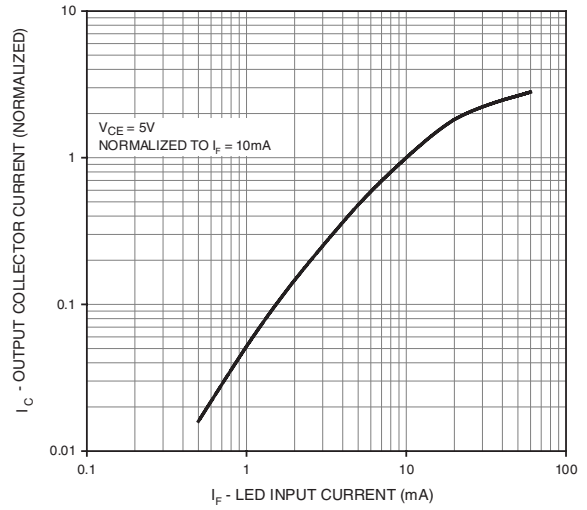


Fig. 3 Output Current vs. Ambient Temperature

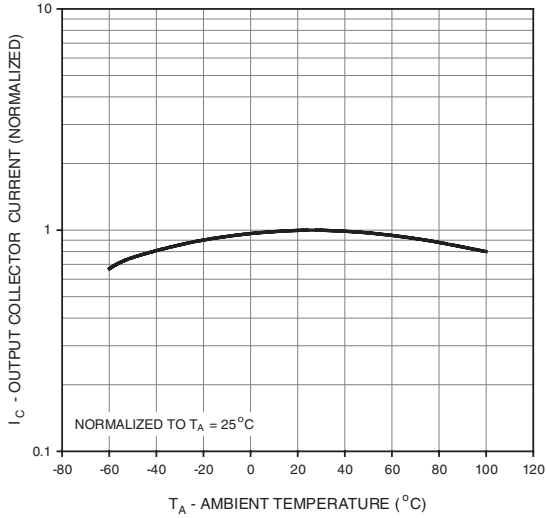


Fig. 4 Output Current vs. Collector - Emitter Voltage

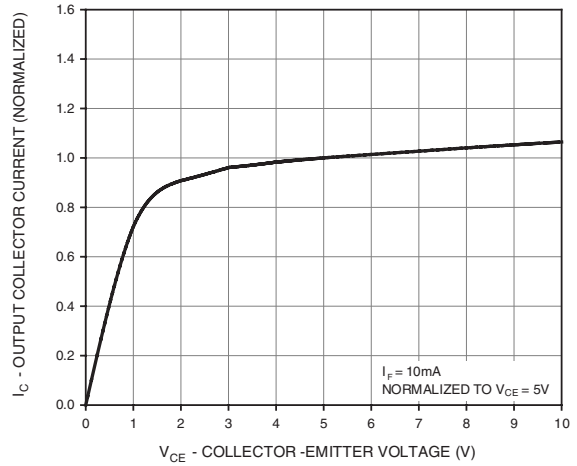
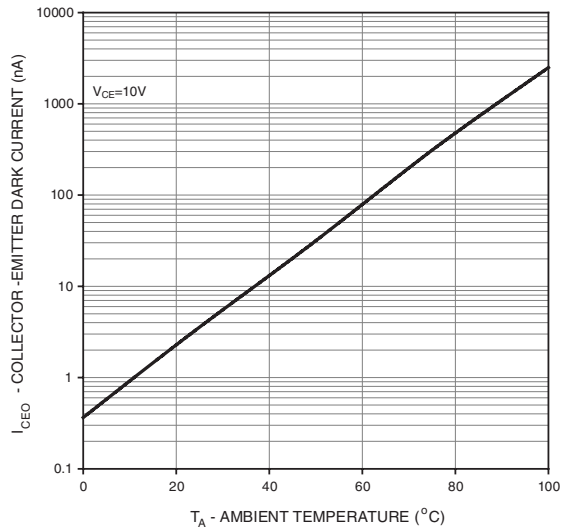
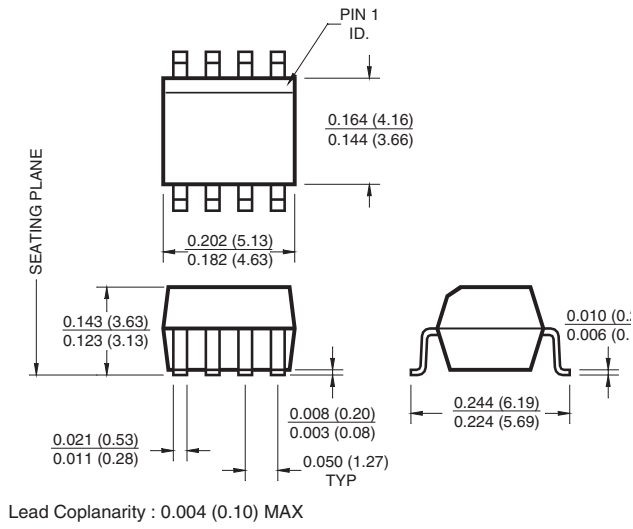


Fig. 5 Dark Current vs. Ambient Temperature

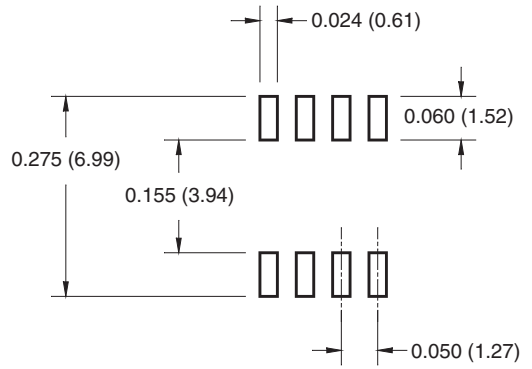


Package Dimensions

Surface Mount



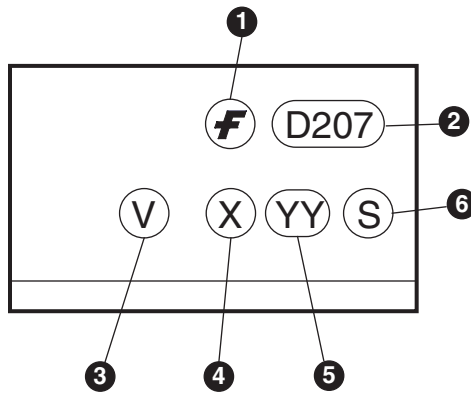
8-Pin Small Outline



Ordering Information

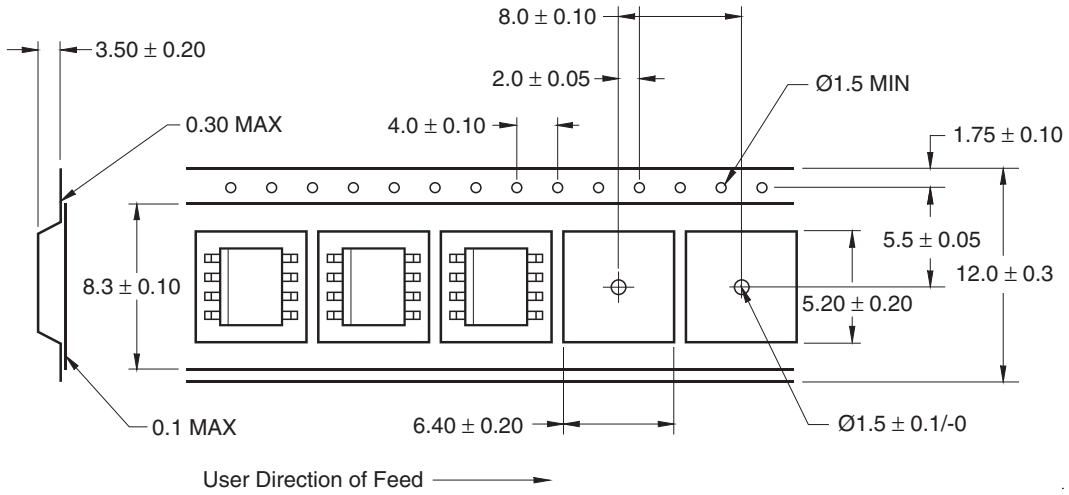
Option	Order Entry Identifier	Description
V	V	VDE Approved
D1	D1	Tape & Reel (500 units per reel), 16mm width carrier tape
D1V	D1V	VDE Approved, Tape & Reel (500 units per reel), 16mm width carrier tape
D2	D2	Tape & Reel (2500 units per reel), 16mm width carrier tape
D2V	D2V	VDE Approved, Tape & Reel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

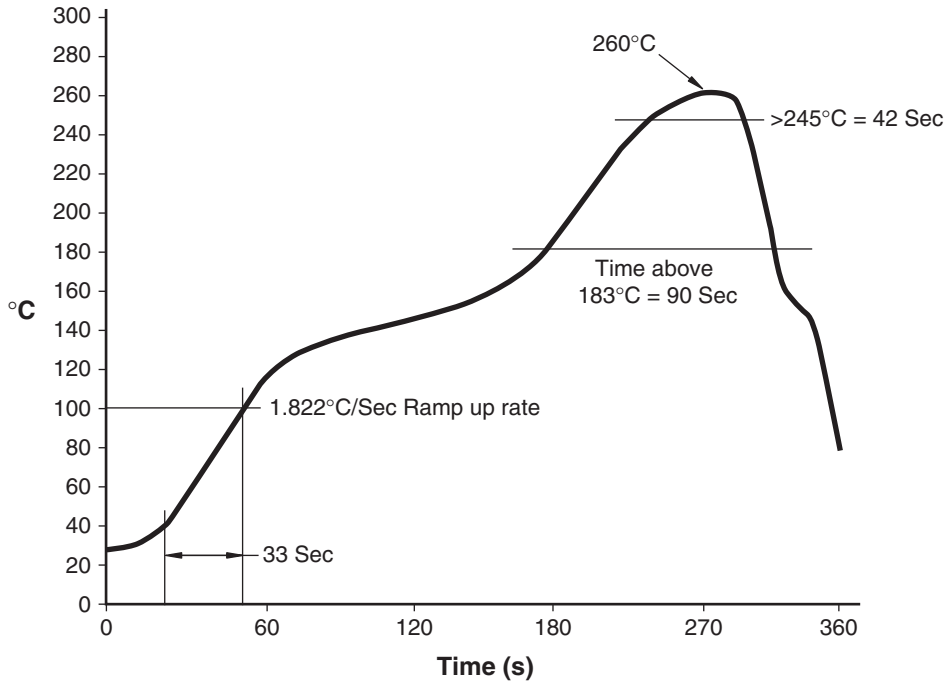


Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code, e.g., '3'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

Carrier Tape Specifications



Reflow Profile



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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™	
FPS™	MICROWIRE™	Quiet Series™	TinyPower™	
FRFET™	MSX™	RapidConfigure™	TinyLogic®	
	MSXPro™	RapidConnect™	TINYOPTO™	
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Programmable Active Droop™				

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PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
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Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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