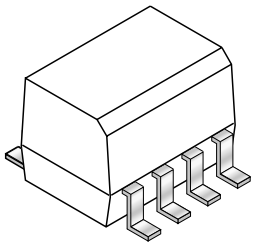
DUAL CHANNEL PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLERS

MOCD207M MOCD208M

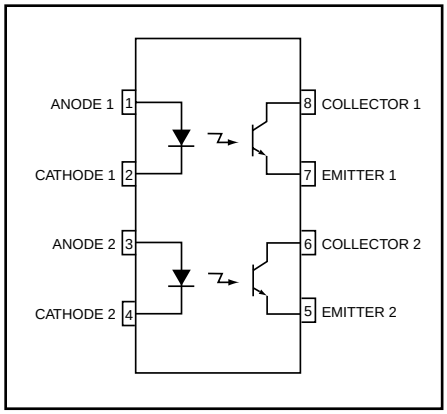
DESCRIPTION

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.



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

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise specified)

Rating	Symbol	Value	Unit
EMITTER			
Forward Current - Continuous	I_F	60	mA
Forward Current - Peak (PW = 100 µs, 120 pps)	I_F (pk)	1.0	A
Reverse Voltage	V_R	6.0	V
LED Power Dissipation @ T_A = 25°C	P_D	90	mW
Derate above 25°C		0.8	mW/°C
DETECTOR			
Collector-Emitter Voltage	V_{CEO}	70	V
Collector-Base Voltage	V_{CBO}	70	V
Emitter-Collector Voltage	V_{ECO}	7.0	V
Collector Current-Continuous	I_C	150	mA
Detector Power Dissipation @ T_A = 25°C	P_D	150	mW
Derate above 25°C		1.76	mW/°C
TOTAL DEVICE			
Input-Output Isolation Voltage [1,2] (f = 60 Hz, 1 min. Duration)	V_{ISO}	2500	Vac(rms)
Total Device Power Dissipation @ T_A = 25°C	P_D	250	mW
Derate above 25°C		2.94	mW/°C
Ambient Operating Temperature Range	T_A	-45 to +100	°C
Storage Temperature Range	T_{stg}	-45 to +125	°C
Lead Soldering Temperature (1/16” from case, 10 sec. duration)	T_L	260	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified) (3)

Parameter	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
EMITTER							
Input Forward Voltage	I_F = 30 mA	V_F	All	—	1.25	1.55	V
Reverse Leakage Current	V_R = 6.0 V	I_R	All	—	0.001	100	µA
Capacitance		C	All	—	18	—	pF
DETECTOR							
Collector-Emitter Dark Current	V_{CE} = 10 V, T_A = 25°C	I_{CEO}	All	—	1.0	50	nA
	V_{CE} = 10 V, T_A = 100°C	I_{CEO}	All	—	1.0	—	µA
Collector-Emitter Breakdown Voltage	I_C = 100 µA	$V_{(BR)CEO}$	All	70	100	—	V
Emitter-Collector Breakdown Voltage	I_E = 100 µA	$V_{(BR)ECO}$	All	7.0	10	—	V
Collector-Emitter Capacitance	f = 1.0 MHz, V_{CE} = 0 V	C_{CE}	All	—	7.0	—	pF
COUPLED							
Current Transfer Ratio, Collector to Emitter (4)	I_F = 10 mA, V_{CE} = 5 V	CTR	MOCD207	100	150	200	%
			MOCD208	40	—	125	
	I_F = 1 mA, V_{CE} = 5 V		MOCD207	34	—	—	
			MOCD208	13	—	—	
Collector-Emitter Saturation Voltage	I_C = 2.0 mA, I_F = 10 mA	$V_{CE\ (sat)}$	All	—	—	0.4	V
Turn-On Time	I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω	t_{on}	All	—	3.0	—	µs
Turn-Off Time	I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω	t_{off}	All	—	2.8	—	µs
Rise Time	I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω	t_r	All	—	1.6	—	µs
Fall Time	I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω	t_f	All	—	2.2	—	µs
Isolation Surge Voltage (1,2)	f = 60 Hz, t = 1 min.	V_{ISO}	All	2500	—	—	Vac(rms)
Isolation Resistance (2)	V_{I-O} = 500 V	R_{ISO}	All	10^{11}	—	—	Ω
Isolation Capacitance (2)	V_{I-O} = 0 V, f = 1 MHz	C_{ISO}	All	—	0.2	—	pF

** Typical values at T_A = 25°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 x 100%.

Fig. 1 LED Forward Voltage vs. Forward Current

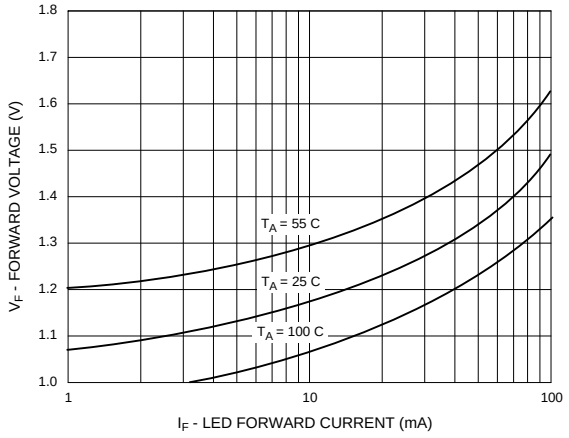


Fig. 2 Output Curent vs. Input Current

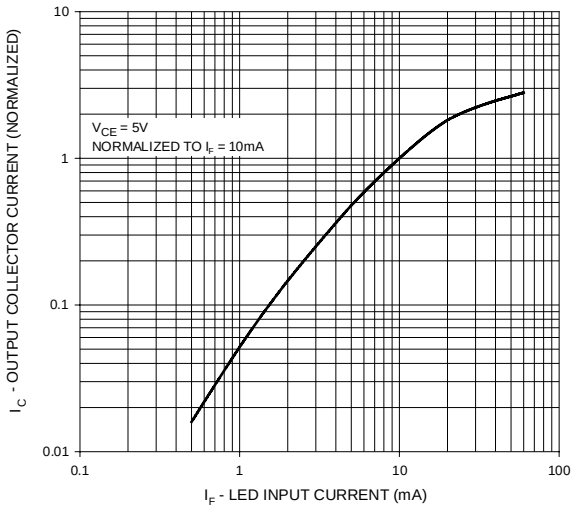


Fig. 3 Output Current vs. Ambient Temperature

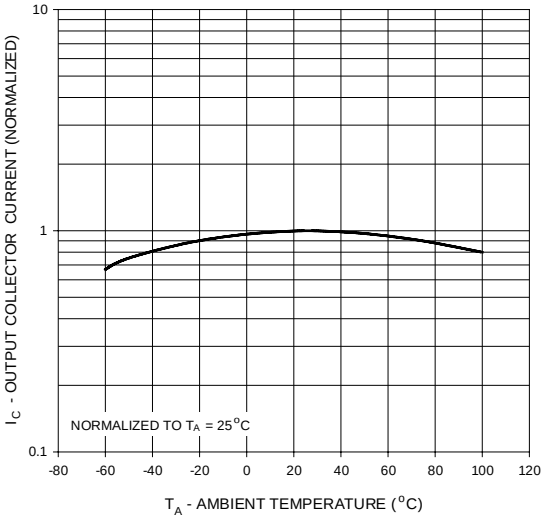


Fig. 4 Output Current vs. Collector - Emitter Voltage

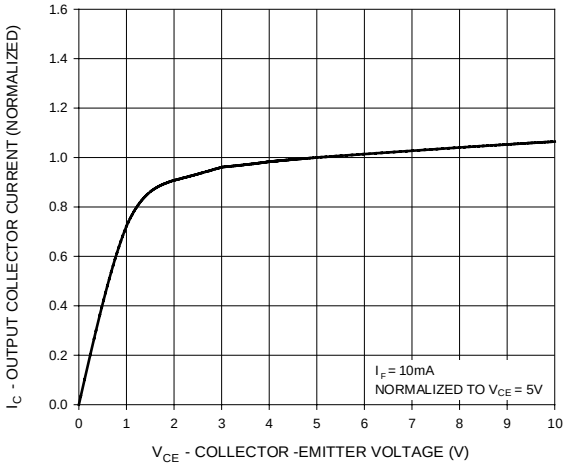
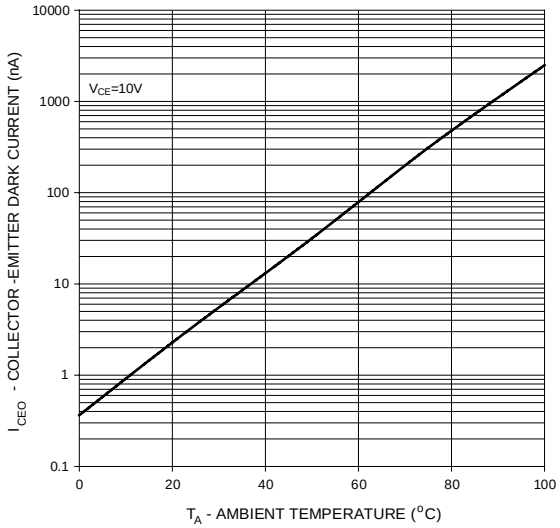
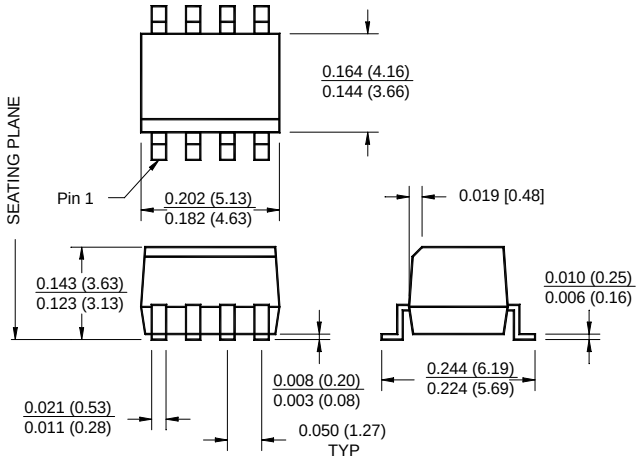


Fig. 5 Dark Current vs. Ambient Temperature



Package Dimensions (Surface Mount)

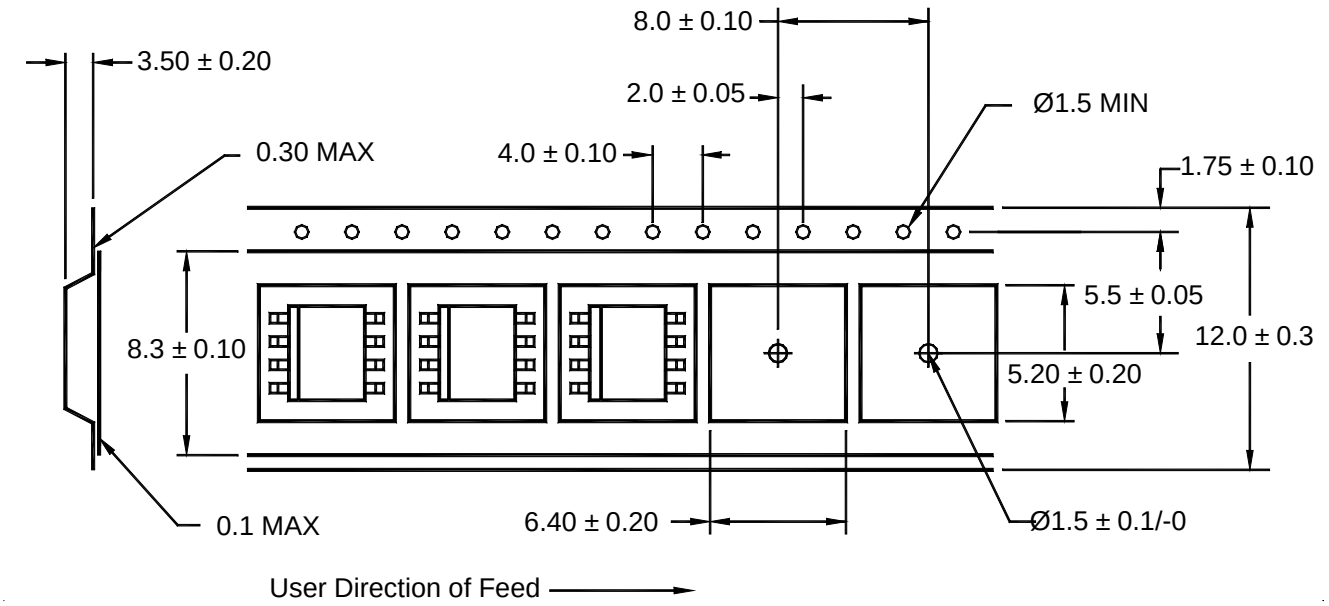


Lead Coplanarity : 0.004 (0.10) MAX

ORDERING INFORMATION

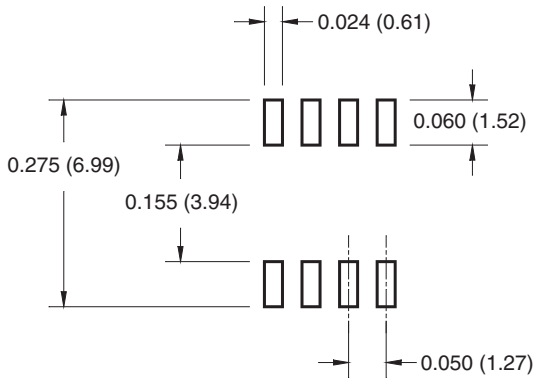
Option	Order Entry Identifier	Description
R1	R1	Tape and reel (500 units per reel)
R2	R2	Tape and reel (2500 units per reel)

QT Carrier Tape Specifications ("D" Taping Orientation)



FAIRCHILD
SEMICONDUCTOR®

8-Pin Small Outline



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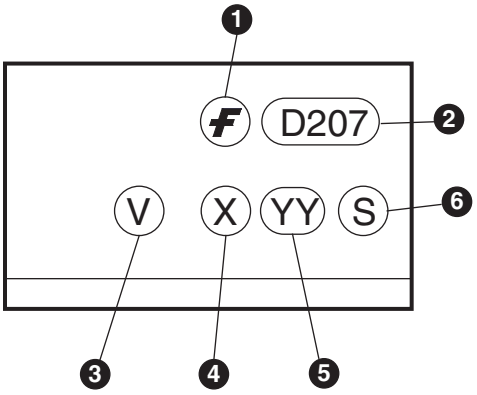
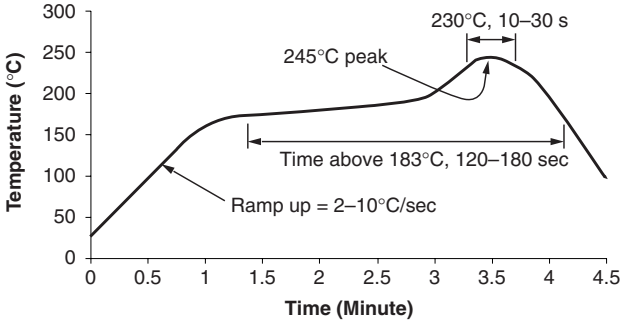
MARKING INFORMATION



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

Reflow Profile



- Peak reflow temperature: 245°C (package surface temperature)
- Time of temperature higher than 183°C for 120–180 seconds
- One time soldering reflow is recommended

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CoolFET™	FRFET™	MicroFET™	PowerTrench®	SuperSOT™-6
CROSSVOLT™	GlobalOptoisolator™	MicroPak™	QFET®	SuperSOT™-8
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PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
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 in order 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 in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.