

FAIRCHILD
SEMICONDUCTOR®

**DUAL CHANNEL PHOTOTRANSISTOR
SMALL OUTLINE SURFACE MOUNT
OPTOCOUPLEDERS**

MOCD207M

MOCD208M

DESCRIPTION

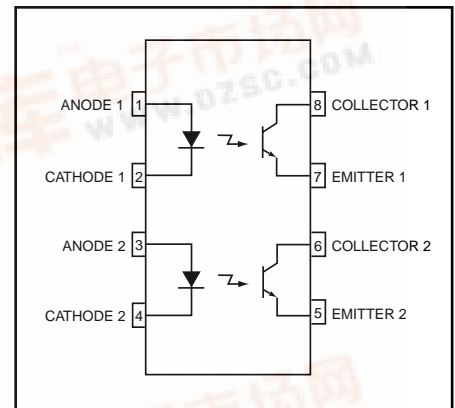
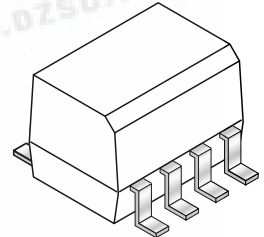
The MOCD207M/MOCD208M consist of two silicon phototransistors optically coupled to two GaAs infrared LEDs. These devices are constructed in a small outline surface mount package which conforms to the standard SOIC-8 footprint.

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

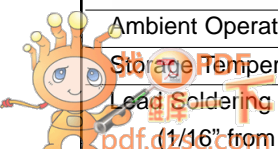
APPLICATIONS

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



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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 @ $T_A = 25^\circ\text{C}$	P_D	90	mW
Derate above 25°C		0.8	mW/ $^\circ\text{C}$
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 @ $T_A = 25^\circ\text{C}$	P_D	150	mW
Derate above 25°C		1.76	mW/ $^\circ\text{C}$
TOTAL DEVICE			
Input-Output Isolation Voltage ^(1,2) (f = 60 Hz, 1 min. Duration)	V_{ISO}	2500	Vac(rms)
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	250	mW
Derate above 25°C		2.94	mW/ $^\circ\text{C}$
Ambient Operating Temperature Range	T_A	-45 to +100	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-45 to +125	$^\circ\text{C}$
Lead Soldering Temperature (1/16" from case, 10 sec. duration)	T_L	260	$^\circ\text{C}$



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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified) ⁽³⁾							
Parameter	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
EMITTER							
Input Forward Voltage	$I_F = 30\text{ mA}$	V_F	All	—	1.25	1.55	V
Reverse Leakage Current	$V_R = 6.0\text{ V}$	I_R	All	—	0.001	100	μA
Capacitance		C	All	—	18	—	pF
DETECTOR							
Collector-Emitter Dark Current	$V_{CE} = 10\text{ V}, T_A = 25^\circ\text{C}$	I_{CEO}	All	—	1.0	50	nA
	$V_{CE} = 10\text{ V}, T_A = 100^\circ\text{C}$	I_{CEO}	All	—	1.0	—	μA
Collector-Emitter Breakdown Voltage	$I_C = 100\ \mu\text{A}$	$V_{(BR)CEO}$	All	70	100	—	V
Emitter-Collector Breakdown Voltage	$I_E = 100\ \mu\text{A}$	$V_{(BR)ECO}$	All	7.0	10	—	V
Collector-Emitter Capacitance	$f = 1.0\text{ MHz}, V_{CE} = 0\text{ V}$	C_{CE}	All	—	7.0	—	pF
COUPLED							
Current Transfer Ratio, Collector to Emitter ⁽⁴⁾	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	CTR	MOCD207	100	150	200	%
			MOCD208	40	—	125	
	MOCD207		34	—	—		
	MOCD208		13	—	—		
Collector-Emitter Saturation Voltage	$I_C = 2.0\text{ mA}, I_F = 10\text{ mA}$	$V_{CE(sat)}$	All	—	—	0.4	V
Turn-On Time	$I_C = 2.0\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\ \Omega$	t_{on}	All	—	3.0	—	μs
Turn-Off Time	$I_C = 2.0\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\ \Omega$	t_{off}	All	—	2.8	—	μs
Rise Time	$I_C = 2.0\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\ \Omega$	t_r	All	—	1.6	—	μs
Fall Time	$I_C = 2.0\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\ \Omega$	t_f	All	—	2.2	—	μs
Isolation Surge Voltage ^(1,2)	$f = 60\text{ Hz}, t = 1\text{ min.}$	V_{ISO}	All	2500	—	—	Vac(rms)
Isolation Resistance ⁽²⁾	$V_{I-O} = 500\text{ V}$	R_{ISO}	All	10^{11}	—	—	Ω
Isolation Capacitance ⁽²⁾	$V_{I-O} = 0\text{ V}, f = 1\text{ MHz}$	C_{ISO}	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) = $I_C/I_F \times 100\%$.

Fig. 1 LED Forward Voltage vs. Forward Current

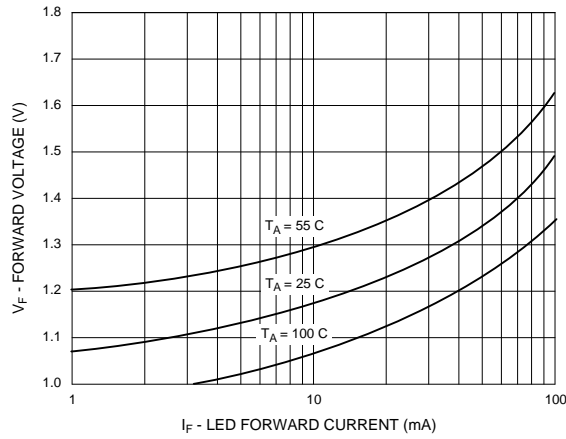


Fig. 2 Output Current vs. Input Current

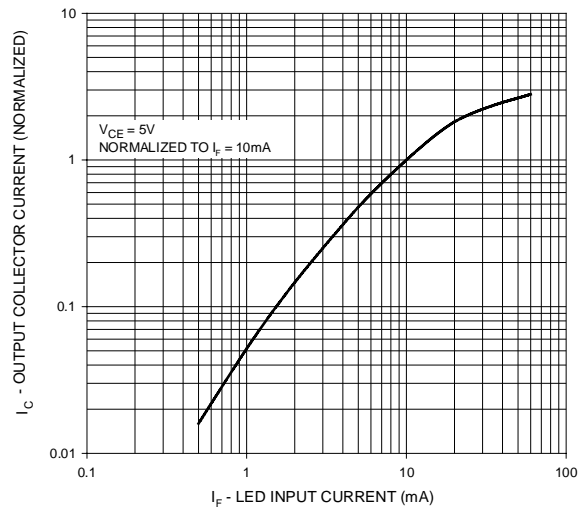


Fig. 3 Output Current vs. Ambient Temperature

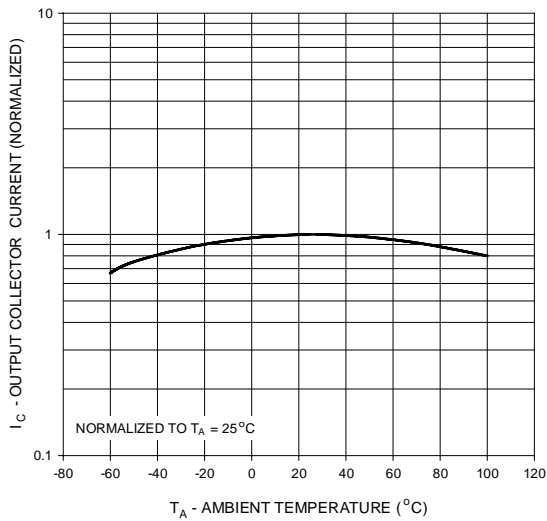


Fig. 4 Output Current vs. Collector - Emitter Voltage

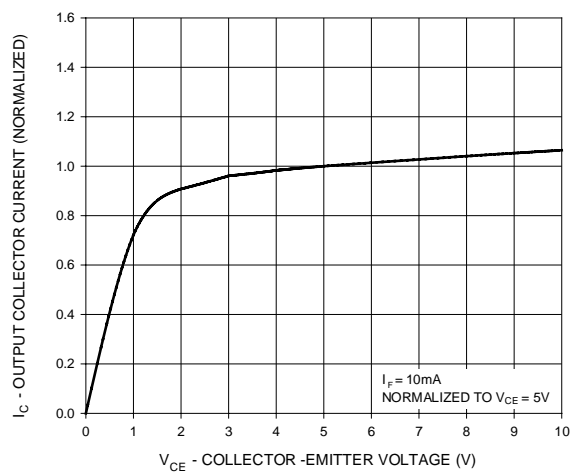
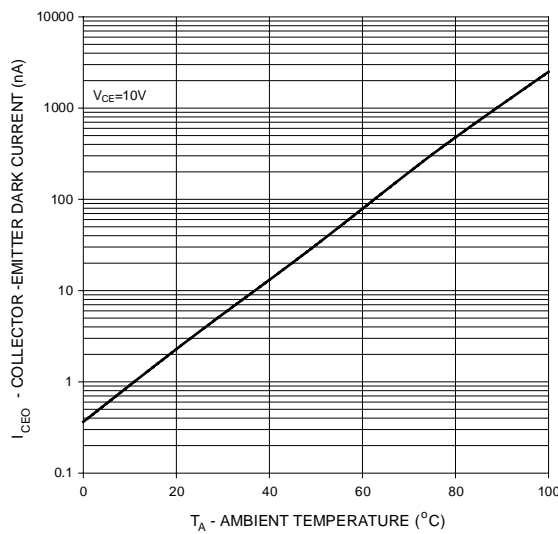
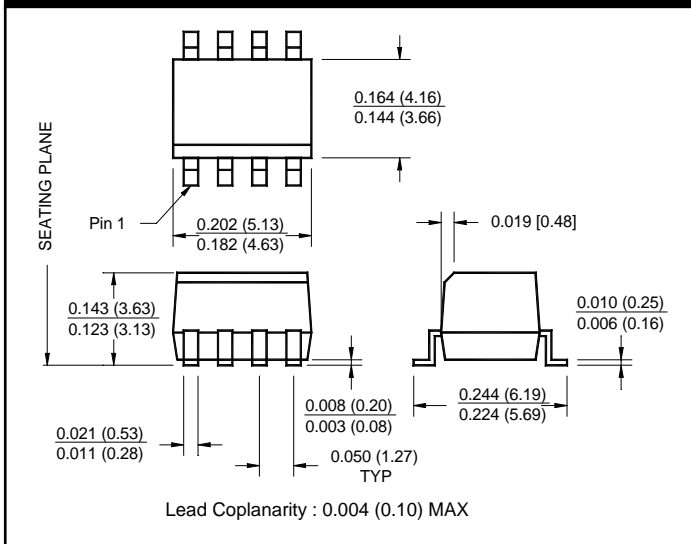


Fig. 5 Dark Current vs. Ambient Temperature



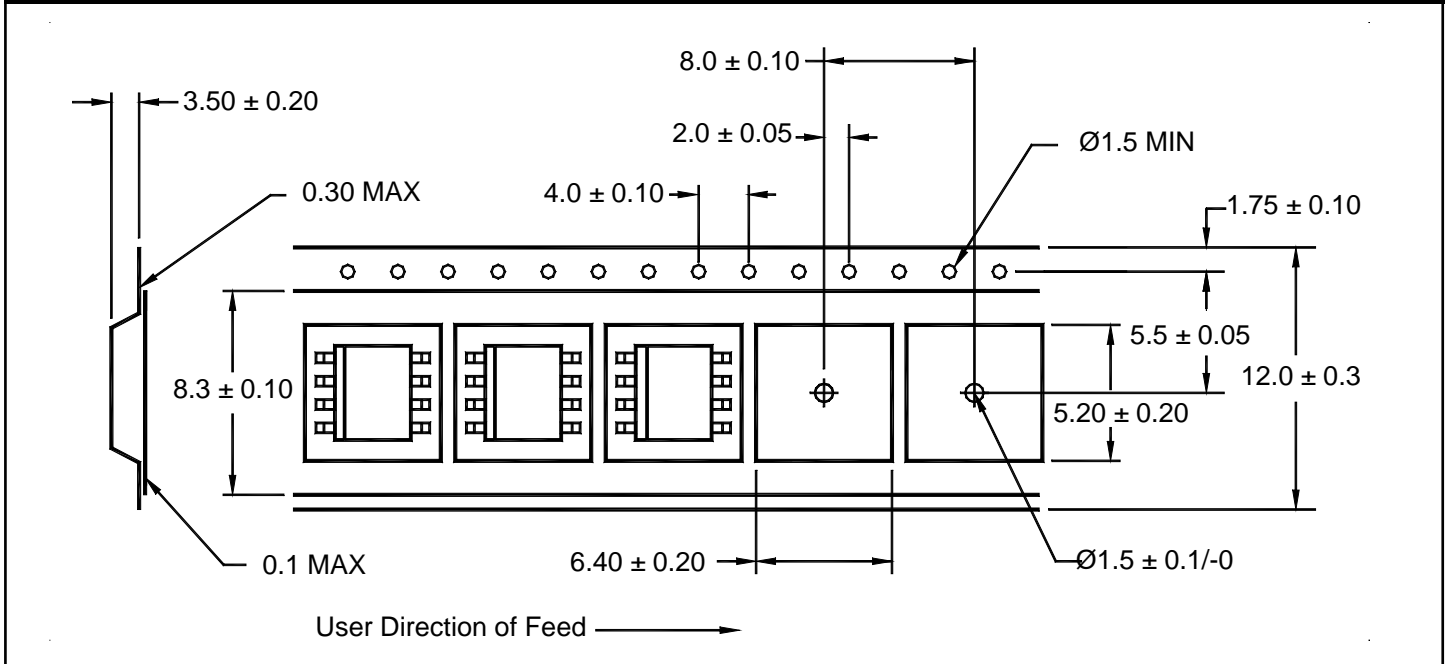
Package Dimensions (Surface Mount)



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)





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