

MOCD206M, MOCD207M, MOCD208M Dual Channel Phototransistor Small Outline Surface Mount Optocouplers

Features

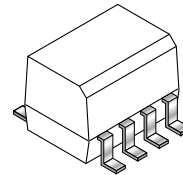
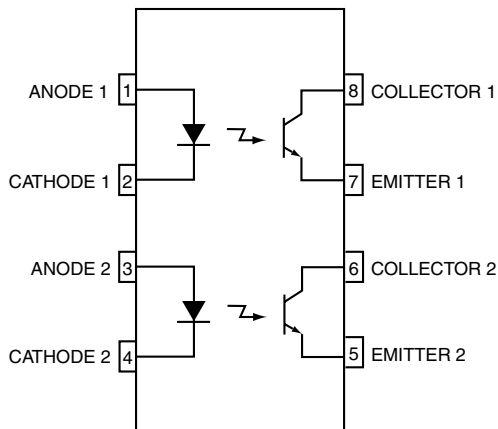
- Dual Channel Optocoupler
- Convenient Plastic SOIC-8 Surface Mountable Package Style
- Two channels in one compact surface mount package
- Closely Matched Current Transfer Ratios to Minimize Unit-to-Unit Variation
- Minimum $V_{(BR)CEO}$ of 70 Volts Guaranteed
- Standard SOIC-8 Footprint, with 0.050" 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 MOCD206M/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.



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 μs , 120 pps) | 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°C unless otherwise specified)⁽³⁾

| Symbol | Parameter | Test Conditions | Device | Min | Typ** | Max | Unit |
|----------------------|---|---|----------|------------------|-------|------|----------|
| EMITTER | | | | | | | |
| V _F | Input Forward Voltage | I _F = 30mA | All | — | 1.25 | 1.55 | V |
| I _R | Reverse Leakage Current | V _R = 6.0V | All | — | 0.001 | 100 | μA |
| C | Capacitance | | All | — | 18 | — | pF |
| DETECTOR | | | | | | | |
| I _{CEO} | Collector-Emitter Dark Current | V _{CE} = 10V, T _A = 25°C | All | — | 1.0 | 50 | nA |
| I _{CEO} | | V _{CE} = 10V, T _A = 100°C | All | — | 1.0 | — | μA |
| V _{(BR)CEO} | Collector-Emitter Breakdown Voltage | I _C = 100μA | All | 70 | 100 | — | V |
| V _{(BR)CEO} | Emitter-Collector Breakdown Voltage | I _E = 100μA | All | 7.0 | 10 | — | V |
| C _{CE} | Collector-Emitter Capacitance | f = 1.0 MHz, V _{CE} = 0V | All | — | 7.0 | — | pF |
| COUPLED | | | | | | | |
| CTR | Current Transfer Ratio, Collector to Emitter ⁽⁴⁾ | I _F = 10mA, V _{CE} = 5V | MOCD206M | 63 | — | 125 | % |
| | | | MOCD207M | 100 | — | 200 | |
| | | | MOCD208M | 40 | — | 125 | |
| | | I _F = 1mA, V _{CE} = 5V | MOCD206M | 22 | — | — | |
| | | | MOCD207M | 34 | — | — | |
| | | | MOCD208M | 13 | — | — | |
| V _{CE(sat)} | Collector-Emitter Saturation Voltage | I _C = 2.0mA, I _F = 10mA | All | — | — | 0.4 | V |
| t _{on} | Turn-On Time | I _C = 2.0mA, V _{CC} = 10V, R _L = 100 Ω | All | — | 3.0 | — | μs |
| t _{off} | Turn-Off Time | I _C = 2.0mA, V _{CC} = 10V, R _L = 100 Ω | All | — | 2.8 | — | μs |
| t _r | Rise Time | I _C = 2.0mA, V _{CC} = 10V, R _L = 100 Ω | All | — | 1.6 | — | μs |
| t _f | Fall Time | I _C = 2.0mA, V _{CC} = 10V, R _L = 100 Ω | All | — | 2.2 | — | μs |
| V _{ISO} | Isolation Surge Voltage ^(1, 2) | f = 60Hz, t = 1 min., I _{I-O} ≤ 2μA | All | 2500 | — | — | Vac(rms) |
| R _{ISO} | Isolation Resistance ⁽²⁾ | V _{I-O} = 500V | All | 10 ¹¹ | — | — | Ω |
| C _{ISO} | Isolation Capacitance ⁽²⁾ | V _{I-O} = 0V, f = 1 MHz | 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

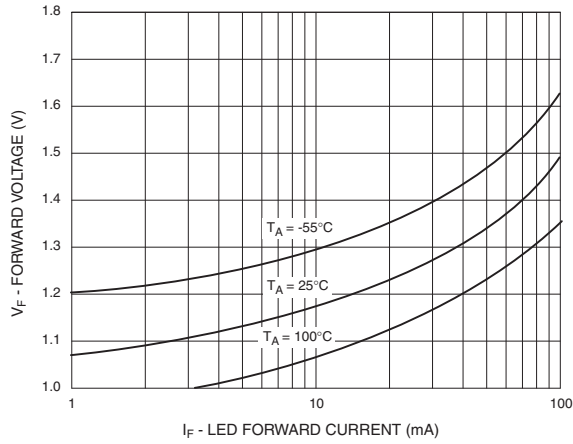


Fig. 2 Output Current vs. Input Current

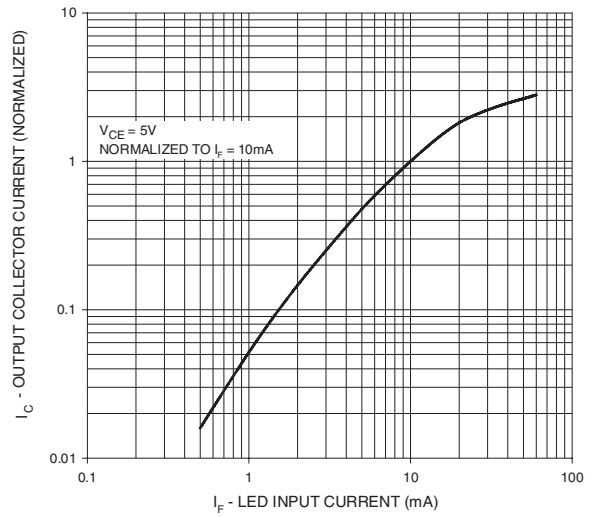


Fig. 3 Output Current vs. Ambient Temperature

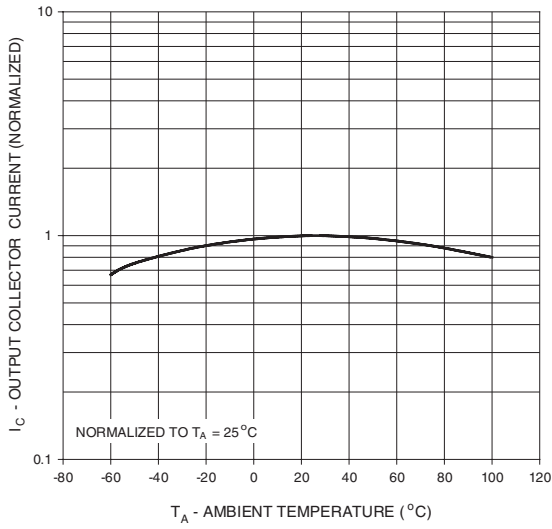


Fig. 4 Output Current vs. Collector - Emitter Voltage

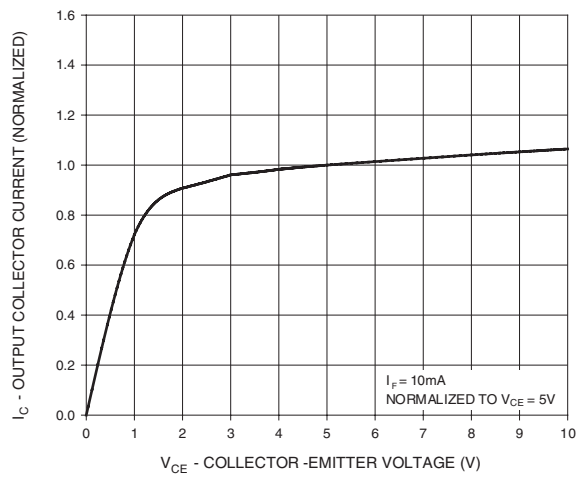
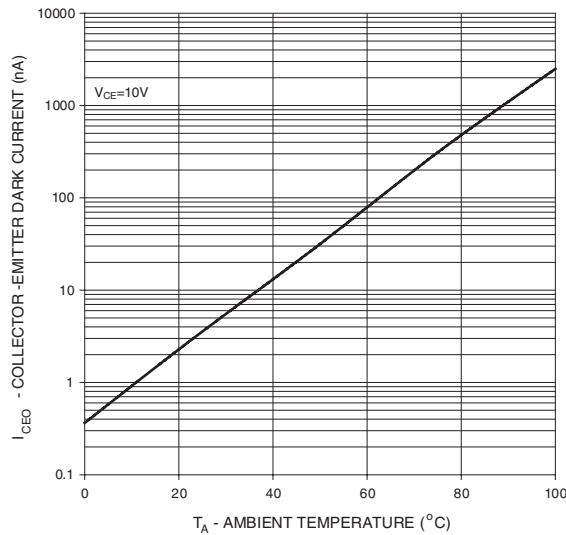
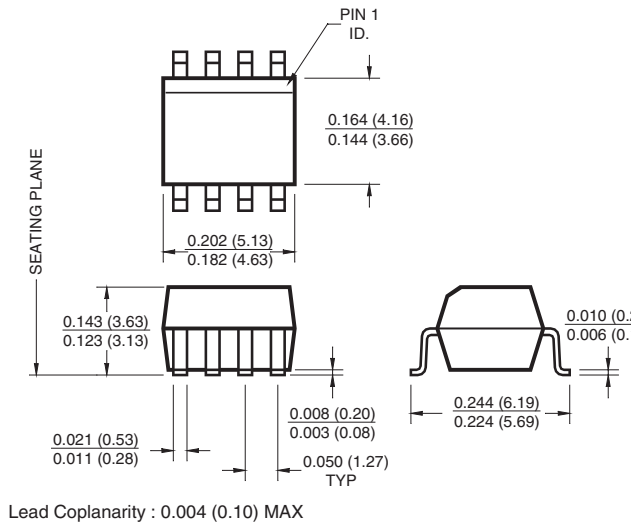


Fig. 5 Dark Current vs. Ambient Temperature

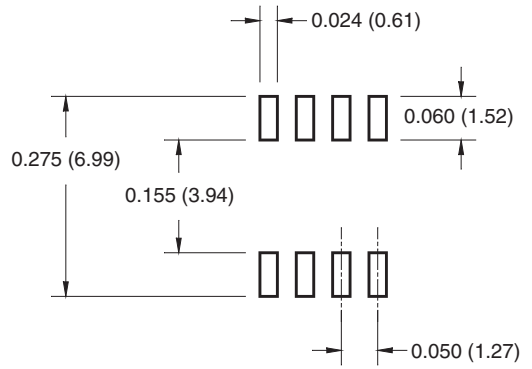


Package Dimensions

Surface Mount



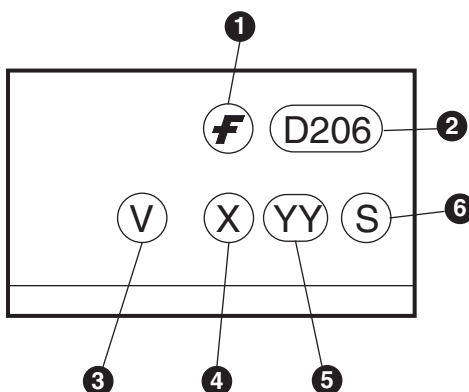
8-Pin Small Outline



Ordering Information

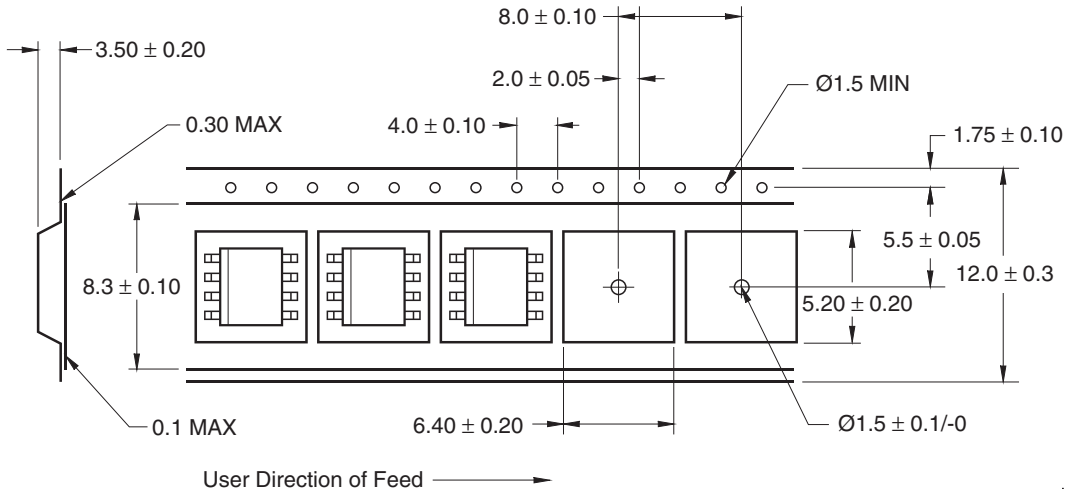
| Option | Order Entry Identifier | Description |
|--------|------------------------|--|
| V | V | VDE Approved |
| D1 | D1 | Tape & Reel (500 units per reel), 16mm width carrier tape |
| D1V | D1V | VDE Approved, Tape & Reel (500 units per reel), 16mm width carrier tape |
| D2 | D2 | Tape & Reel (2500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

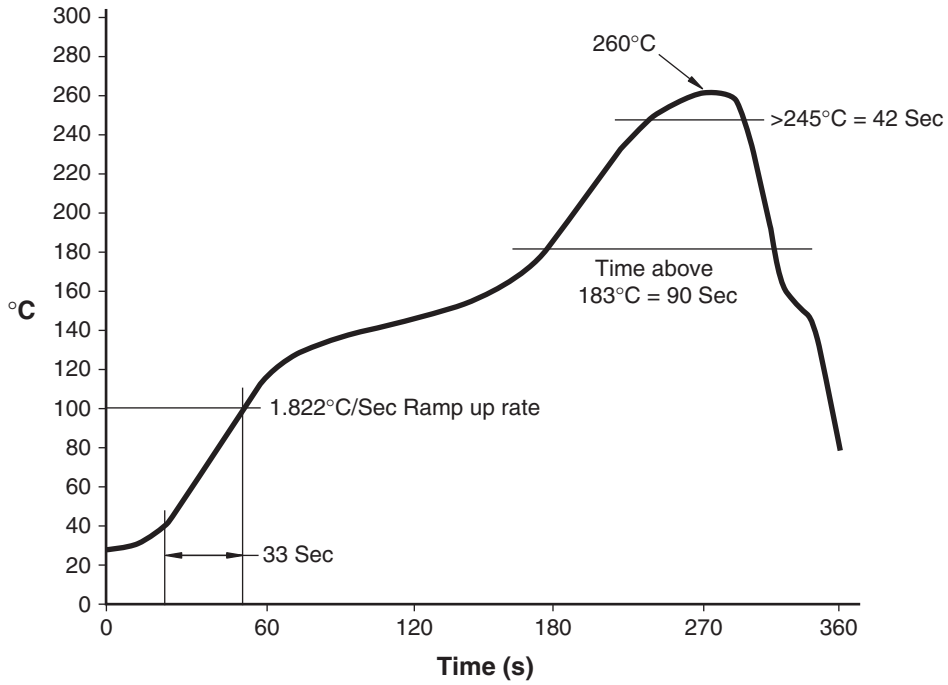


| Definitions | |
|-------------|--|
| 1 | Fairchild logo |
| 2 | Device number |
| 3 | VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table) |
| 4 | One digit year code, e.g., '3' |
| 5 | Two digit work week ranging from '01' to '53' |
| 6 | Assembly package code |

Carrier Tape Specifications



Reflow Profile



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| ActiveArray™ | GlobalOptoisolator™ | OCXPro™ | SMART START™ | UltraFET® |
| Bottomless™ | GTO™ | OPTOLOGIC® | SPM™ | VCX™ |
| Build it Now™ | HiSeC™ | OPTOPLANAR™ | Stealth™ | Wire™ |
| CoolFET™ | I ² C™ | PACMAN™ | SuperFET™ | |
| CROSSVOLT™ | i-Lo™ | POP™ | SuperSOT™-3 | |
| DOMET™ | ImpliedDisconnect™ | Power247™ | SuperSOT™-6 | |
| EcoSPARK™ | IntelliMAX™ | PowerEdge™ | SuperSOT™-8 | |
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| EnSigna™ | LittleFET™ | PowerTrench® | TCM™ | |
| FACT™ | MICROCOUPLER™ | QFET® | TinyBoost™ | |
| FAST® | MicroFET™ | QS™ | TinyBuck™ | |
| FASTr™ | MicroPak™ | QT Optoelectronics™ | TinyPWM™ | |
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| FRFET™ | MSX™ | RapidConfigure™ | TinyLogic® | |
| | MSXPro™ | RapidConnect™ | TINYOPTO™ | |
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| The Power Franchise® | | ScalarPump™ | UHC™ | |
| Programmable Active Droop™ | | | | |

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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. |
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