

**DESCRIPTION**

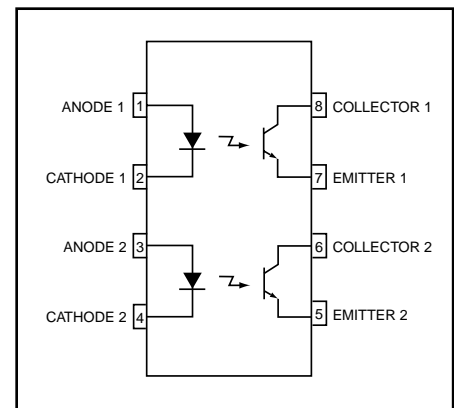
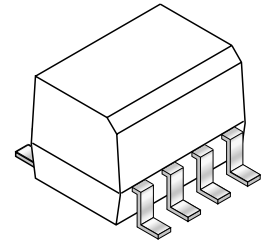
The MOCD207M/MOCD208M consist of two silicon phototransistors optically coupled to two GaAs infrared LEDs. These devices are constructed in a small outline surface mount package which conforms to the standard SOIC-8 footprint.

**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                 |
|---|------------|-------------|----------------------|
| <b>EMITTER</b>  |            |             |                      |
| Forward Current - Continuous  | $I_F$      | 60          | mA                   |
| Forward Current - Peak (PW = 100 $\mu\text{s}$ , 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 $25^\circ\text{C}$   |            | 0.8         | mW/ $^\circ\text{C}$ |
| <b>DETECTOR</b>   |            |             |                      |
| 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 $25^\circ\text{C}$   |            | 1.76        | mW/ $^\circ\text{C}$ |
| <b>TOTAL DEVICE</b>   |            |             |                      |
| Input-Output Isolation Voltage <sup>(1,2)</sup><br>(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 $25^\circ\text{C}$   |            | 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<br>(1/16" from case, 10 sec. duration)               | $T_L$      | 260         | $^\circ\text{C}$     |

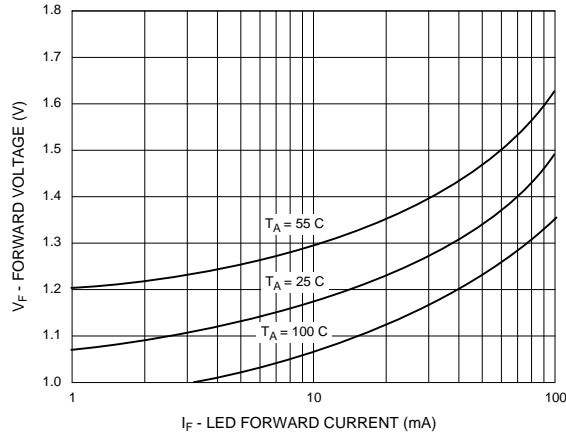
| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise specified) <sup>(3)</sup> |  |               |         |           |       |      |               |
|---|--|---------------|---------|-----------|-------|------|---------------|
| Parameter   | Test Conditions  | Symbol        | Device  | Min       | Typ** | Max  | Unit          |
| <b>EMITTER</b>  |  |               |         |           |       |      |               |
| 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  | $\mu\text{A}$ |
| Capacitance   |  | C             | All     | —         | 18    | —    | pF            |
| <b>DETECTOR</b>   |  |               |         |           |       |      |               |
| 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   | —    | $\mu\text{A}$ |
| 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            |
| <b>COUPLED</b>  |  |               |         |           |       |      |               |
| Current Transfer Ratio,<br>Collector to Emitter <sup>(4)</sup>  | $I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$                      | 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   | —    | $\mu\text{s}$ |
| Turn-Off Time   | $I_C = 2.0\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\ \Omega$ | $t_{off}$     | All     | —         | 2.8   | —    | $\mu\text{s}$ |
| Rise Time   | $I_C = 2.0\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\ \Omega$ | $t_r$         | All     | —         | 1.6   | —    | $\mu\text{s}$ |
| Fall Time   | $I_C = 2.0\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\ \Omega$ | $t_f$         | All     | —         | 2.2   | —    | $\mu\text{s}$ |
| Isolation Surge Voltage <sup>(1,2)</sup>  | $f = 60\text{ Hz}, t = 1\text{ min.}$                          | $V_{ISO}$     | All     | 2500      | —     | —    | Vac(rms)      |
| Isolation Resistance <sup>(2)</sup>   | $V_{I-O} = 500\text{ V}$                                       | $R_{ISO}$     | All     | $10^{11}$ | —     | —    | $\Omega$      |
| Isolation Capacitance <sup>(2)</sup>  | $V_{I-O} = 0\text{ V}, f = 1\text{ MHz}$                       | $C_{ISO}$     | All     | —         | 0.2   | —    | pF            |

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

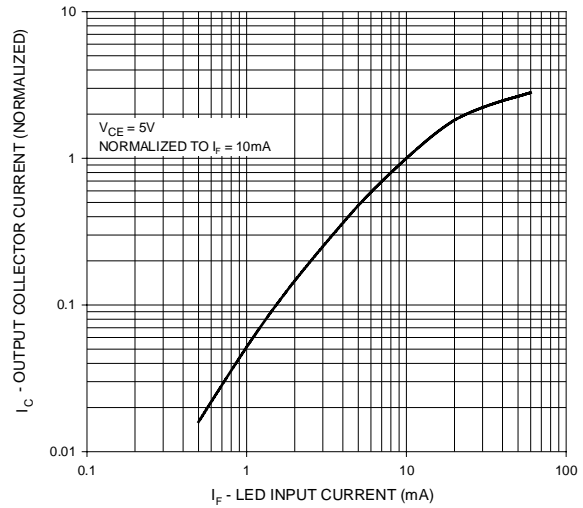
**NOTE:**

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) =  $I_C/I_F \times 100\%$ .

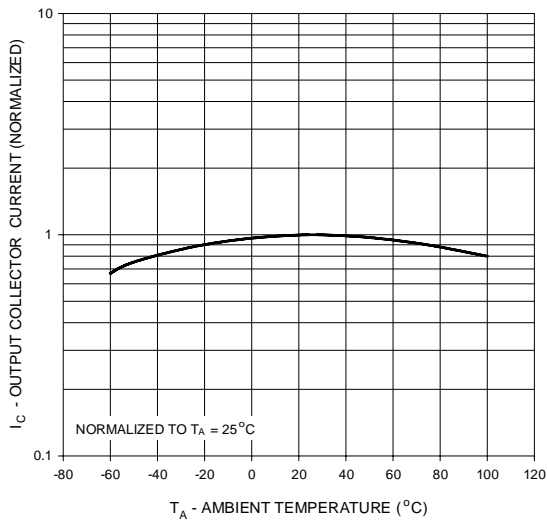
**Fig. 1 LED Forward Voltage vs. Forward Current**



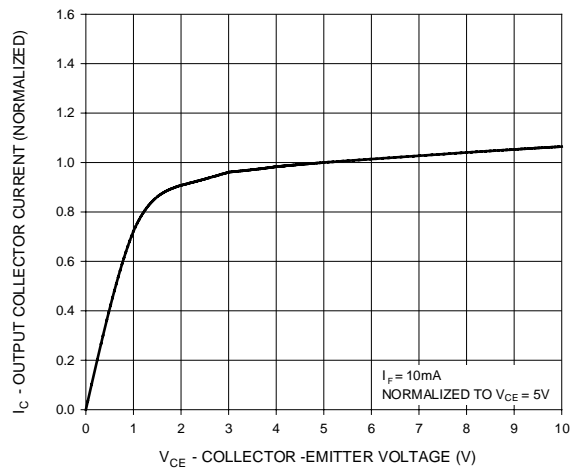
**Fig. 2 Output Current vs. Input Current**



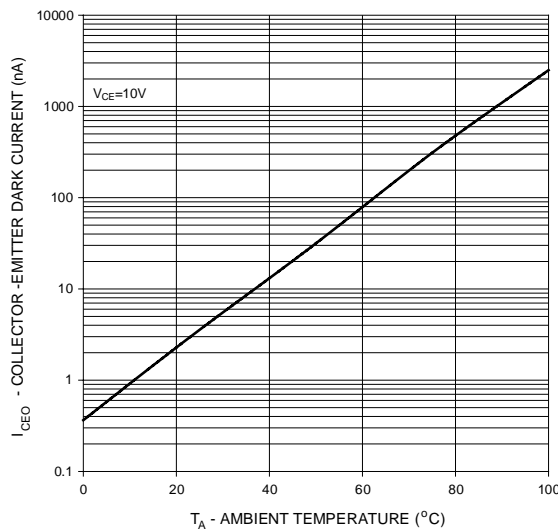
**Fig. 3 Output Current vs. Ambient Temperature**



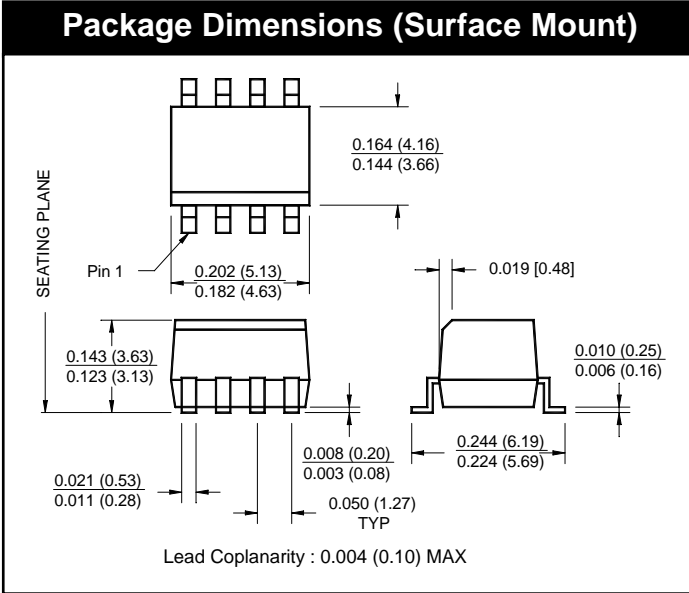
**Fig. 4 Output Current vs. Collector - Emitter Voltage**



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



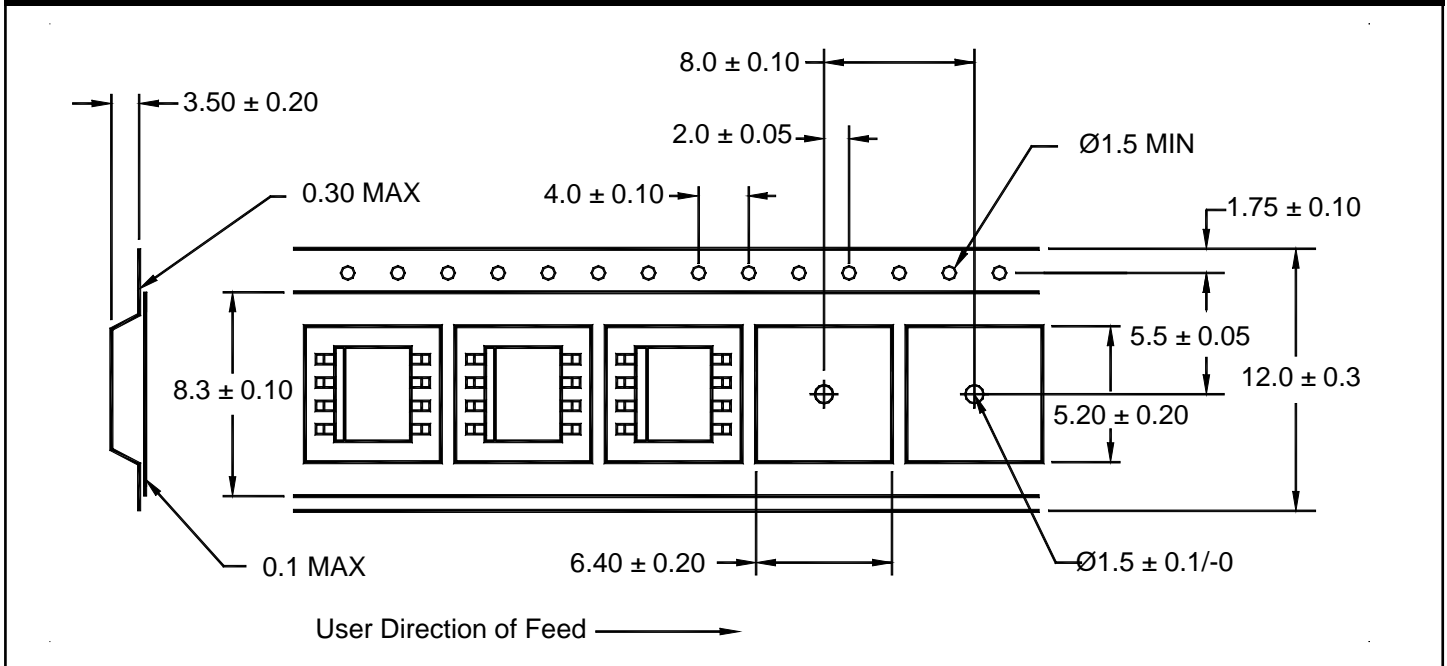
**Package Dimensions (Surface Mount)**



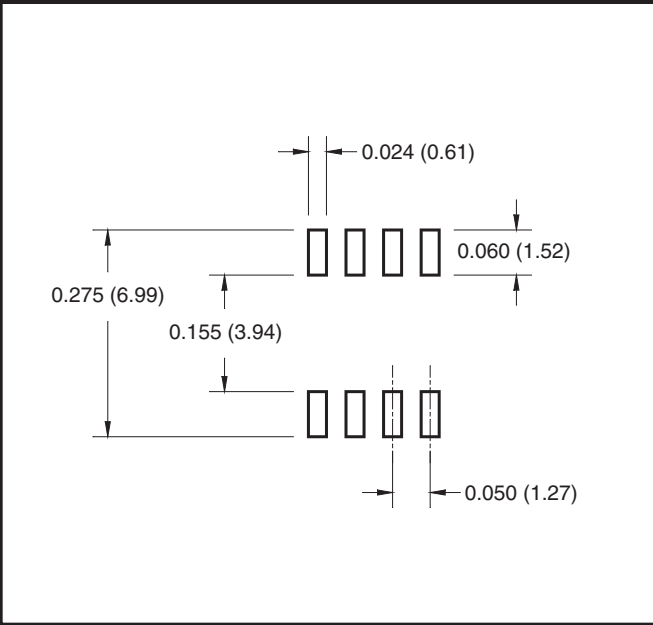
**ORDERING INFORMATION**

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

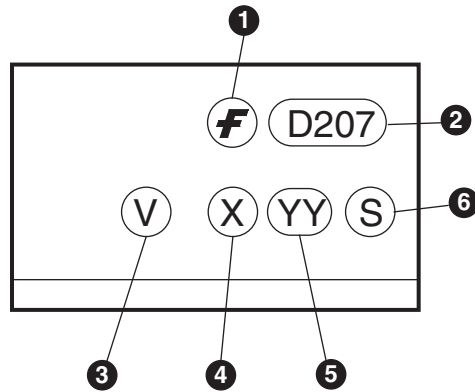
**QT Carrier Tape Specifications ("D" Taping Orientation)**



**8-Pin Small Outline**

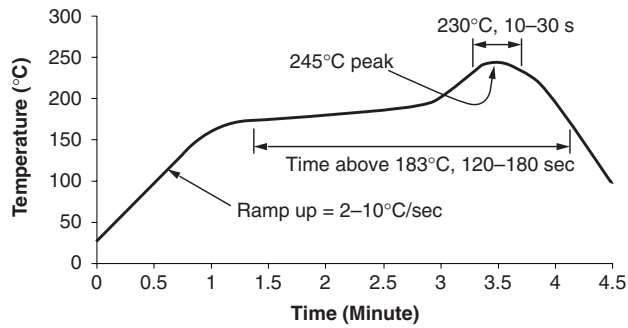


**MARKING INFORMATION**



| 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     |
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| EcoSPARK™                            | HiSeC™              | MSX™          | QT Optoelectronics™ | TinyLogic®      |
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|--------------------------|------------------------|---|
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