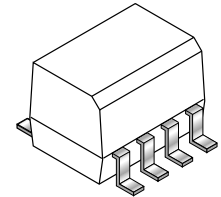


**MOCD217-M**

**DESCRIPTION**

The MOCD217-M device consists of two gallium arsenide infrared emitting diodes optically coupled to two monolithic silicon phototransistor detectors, in a surface mountable, small outline plastic package. It is ideally suited for high density applications and eliminates the need for through-the-board mounting.

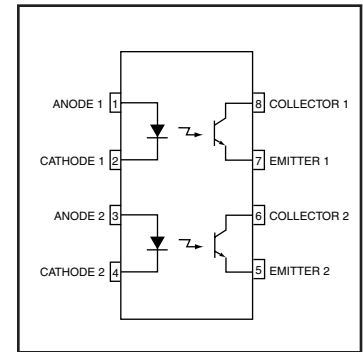


**FEATURES**

- U.L. Recognized (File #E90700, Volume 2)
- VDE Recognized (File #136616) (add option "V" for VDE approval, i.e, MOCD217V-M)
- Low Input Current (Specified @ 1 mA)
- Minimum  $BV_{CEO}$  of 30 Volts Guaranteed
- Convenient Plastic SOIC-8 Surface Mountable Package Style
- 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  $V_{AC(rms)}$  Guaranteed

**APPLICATIONS**

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



| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ 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 @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$          | $P_D$      | 90<br>0.8   | mW<br>mW/ $^\circ\text{C}$ |
| <b>DETECTOR</b>  |            |             |                            |
| Collector-Emitter Voltage  | $V_{CEO}$  | 30          | V                          |
| Emitter-Collector Voltage  | $V_{ECO}$  | 7.0         | V                          |
| Collector Current-Continuous   | $I_C$      | 150         | mA                         |
| Detector Power Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$     | $P_D$      | 150<br>1.76 | mW<br>mW/ $^\circ\text{C}$ |
| <b>TOTAL DEVICE</b>  |            |             |                            |
| Input-Output Isolation Voltage <sup>(1,2,3)</sup><br>(f = 60 Hz, 1 min. Duration)            | $V_{ISO}$  | 2500        | Vac(rms)                   |
| Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$      | 250<br>2.94 | mW<br>mW/ $^\circ\text{C}$ |
| Ambient Operating Temperature Range  | $T_A$      | -40 to +100 | $^\circ\text{C}$           |
| Storage Temperature Range  | $T_{stg}$  | -40 to +125 | $^\circ\text{C}$           |

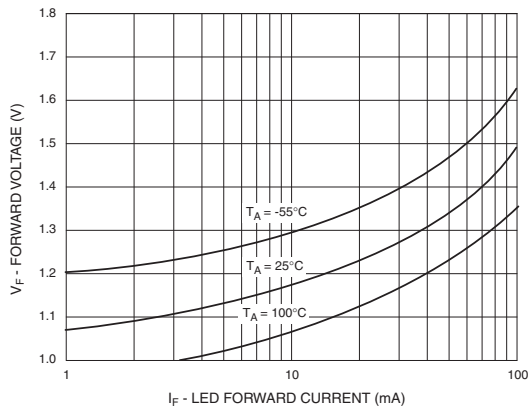
| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise specified) |  |               |           |       |     |               |
|--|--|---------------|-----------|-------|-----|---------------|
| Parameter  | Test Conditions  | Symbol        | Min       | Typ** | Max | Unit          |
| <b>EMITTER</b>   |  |               |           |       |     |               |
| Input Forward Voltage  | $I_F = 1.0 \text{ mA}$   | $V_F$         | —         | 1.05  | 1.3 | V             |
| Reverse Leakage Current  | $V_R = 6.0 \text{ V}$  | $I_R$         | —         | 0.1   | 100 | $\mu\text{A}$ |
| Capacitance  |  | C             | —         | 18    | —   | pF            |
| <b>DETECTOR</b>  |  |               |           |       |     |               |
| Collector-Emitter Dark Current   | $V_{CE} = 10 \text{ V}, T_A = 25^\circ\text{C}$                          | $I_{CEO1}$    | —         | 1.0   | 50  | nA            |
|  | $V_{CE} = 10 \text{ V}, T_A = 100^\circ\text{C}$                         | $I_{CEO2}$    | —         | 1.0   | —   | $\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage  | $I_C = 100 \mu\text{A}$  | $BV_{CEO}$    | 30        | 90    | —   | V             |
| Emitter-Collector Breakdown Voltage  | $I_E = 100 \mu\text{A}$  | $BV_{ECO}$    | 7.0       | 7.8   | —   | V             |
| Collector-Emitter Capacitance  | $f = 1.0 \text{ MHz}, V_{CE} = 0 \text{ V}$                              | $C_{CE}$      | —         | 7.0   | —   | pF            |
| <b>COUPLED</b>   |  |               |           |       |     |               |
| Output Collector Current <sup>(4)</sup>  | $I_F = 1.0 \text{ mA}, V_{CE} = 5 \text{ V}$                             | CTR           | 100       | 130   | —   | %             |
| Collector-Emitter Saturation Voltage   | $I_C = 100 \mu\text{A}, I_F = 1.0 \text{ mA}$                            | $V_{CE(sat)}$ | —         | 0.35  | 0.4 | V             |
| Turn-On Time   | $I_C = 2.0 \text{ mA}, V_{CC} = 10 \text{ V}, R_L = 100 \Omega$ (fig 6.) | $t_{on}$      | —         | 7.5   | —   | $\mu\text{s}$ |
| Turn-Off Time  | $I_C = 2.0 \text{ mA}, V_{CC} = 10 \text{ V}, R_L = 100 \Omega$ (fig 6.) | $t_{off}$     | —         | 5.7   | —   | $\mu\text{s}$ |
| Rise Time  | $I_C = 2.0 \text{ mA}, V_{CC} = 10 \text{ V}, R_L = 100 \Omega$ (fig 6.) | $t_r$         | —         | 3.2   | —   | $\mu\text{s}$ |
| Fall Time  | $I_C = 2.0 \text{ mA}, V_{CC} = 10 \text{ V}, R_L = 100 \Omega$ (fig 6.) | $t_f$         | —         | 4.7   | —   | $\mu\text{s}$ |
| Isolation Surge Voltage <sup>(1,2,3)</sup>   | $f = 60 \text{ Hz}, t = 1 \text{ min.}$                                  | $V_{ISO}$     | 2500      | —     | —   | Vac(rms)      |
| Isolation Resistance <sup>(2)</sup>  | $V_{I-O} = 500 \text{ V}$  | $R_{ISO}$     | $10^{11}$ | —     | —   | $\Omega$      |
| Isolation Capacitance <sup>(2)</sup>   | $V_{I-O} = 0 \text{ V}, f = 1 \text{ MHz}$                               | $C_{ISO}$     | —         | 0.2   | —   | pF            |

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

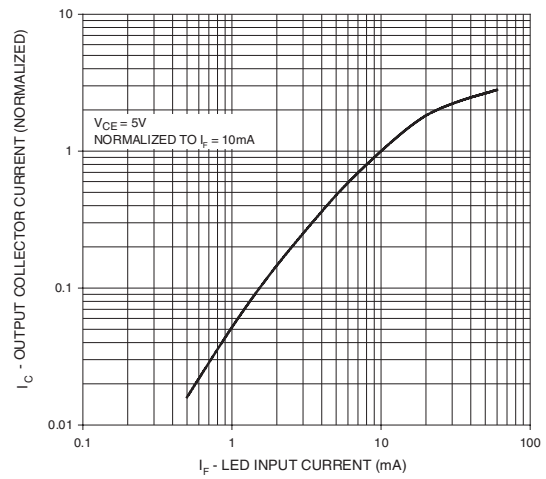
**NOTE:**

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.  $V_{ISO}$  rating of 2500 V<sub>AC(rms)</sub> for  $t = 1 \text{ min.}$  is equivalent to a rating of 3,000 V<sub>AC(rms)</sub> for  $t = 1 \text{ sec.}$
4. Current Transfer Ratio (CTR) =  $I_C/I_F \times 100\%$ .

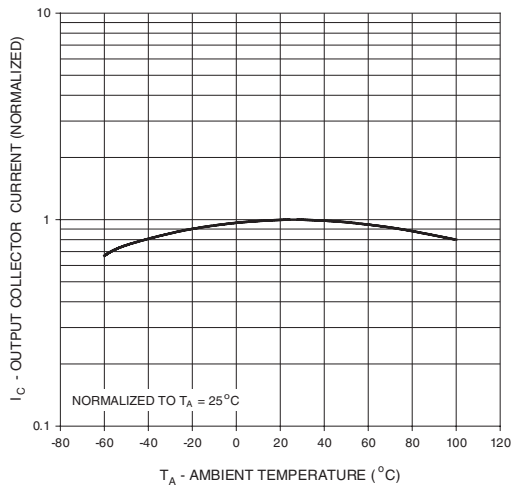
**Fig. 1 LED Forward Voltage vs. Forward Current**



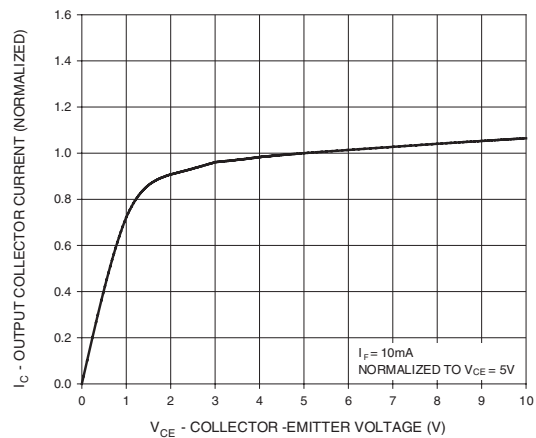
**Fig. 2 Output Current vs. Input Current**



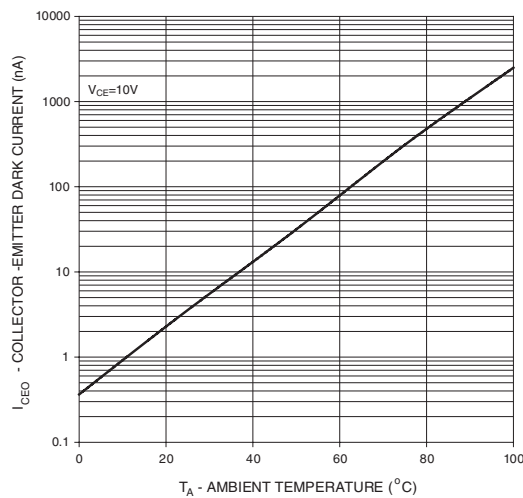
**Fig. 3 Output Current vs. Ambient Temperature**

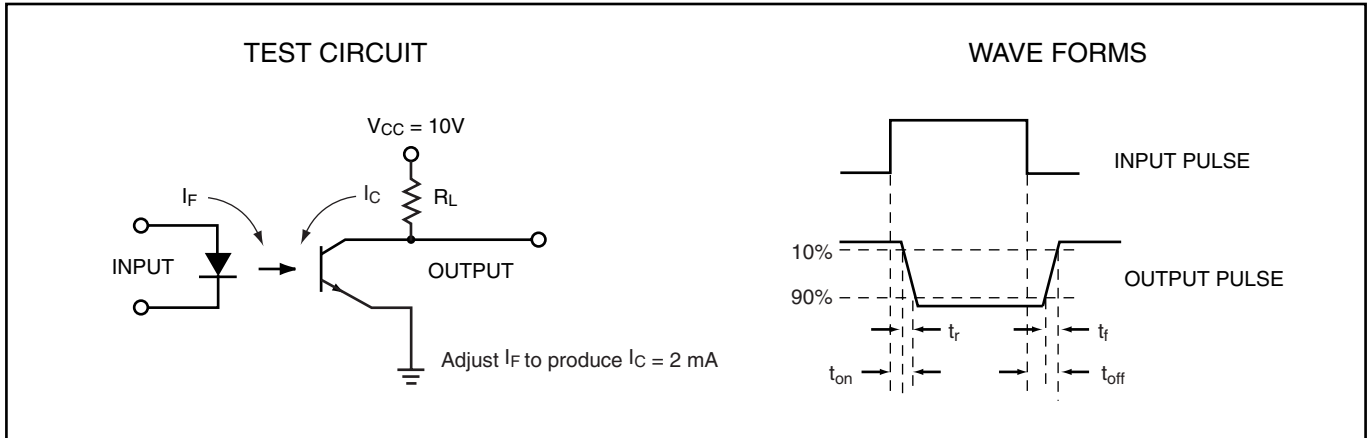


**Fig. 4 Output Current vs. Collector - Emitter Voltage**



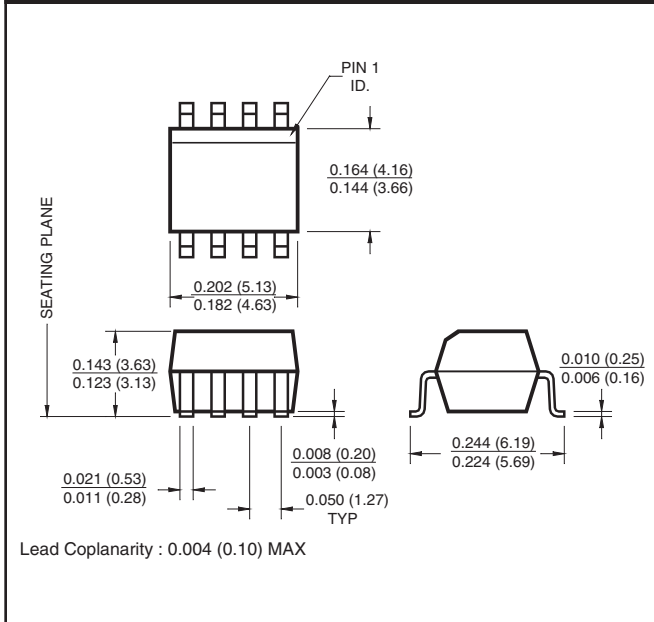
**Fig. 5 Dark Current vs. Ambient Temperature**



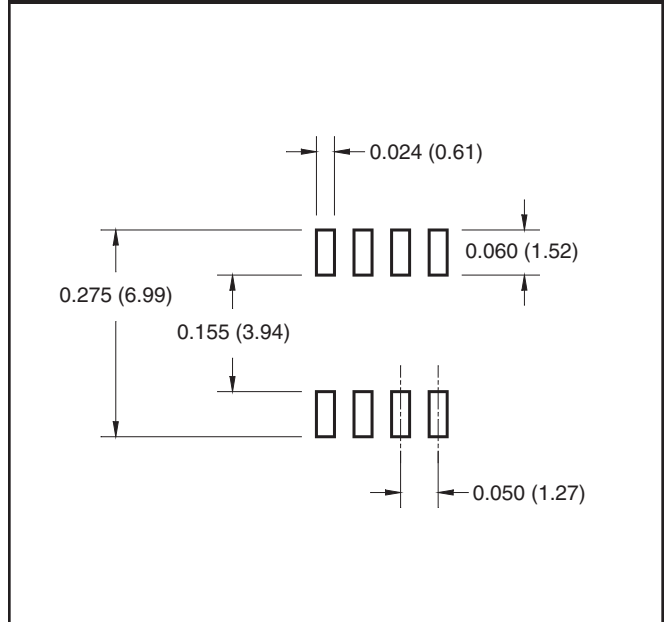


**Figure 6. Switching Time Test Circuit and Waveforms**

**Package Dimensions (Surface Mount)**



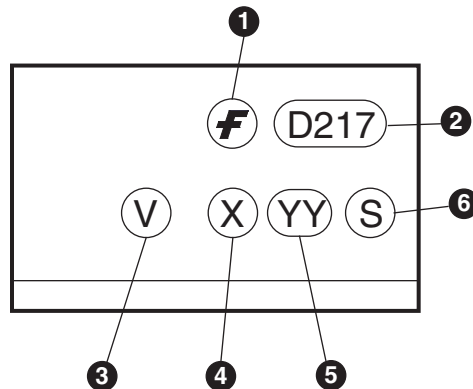
**8-Pin Small Outline**



**ORDERING INFORMATION**

| Option | Order Entry Identifier | Description                                   |
|--------|------------------------|---|
| V      | V                      | VDE 0884                                      |
| R1     | R1                     | Tape and reel (500 units per reel)            |
| R1V    | R1V                    | VDE 0884, Tape and reel (500 units per reel)  |
| R2     | R2                     | Tape and reel (2500 units per reel)           |
| R2V    | R2V                    | VDE 0884, Tape and reel (2500 units per reel) |

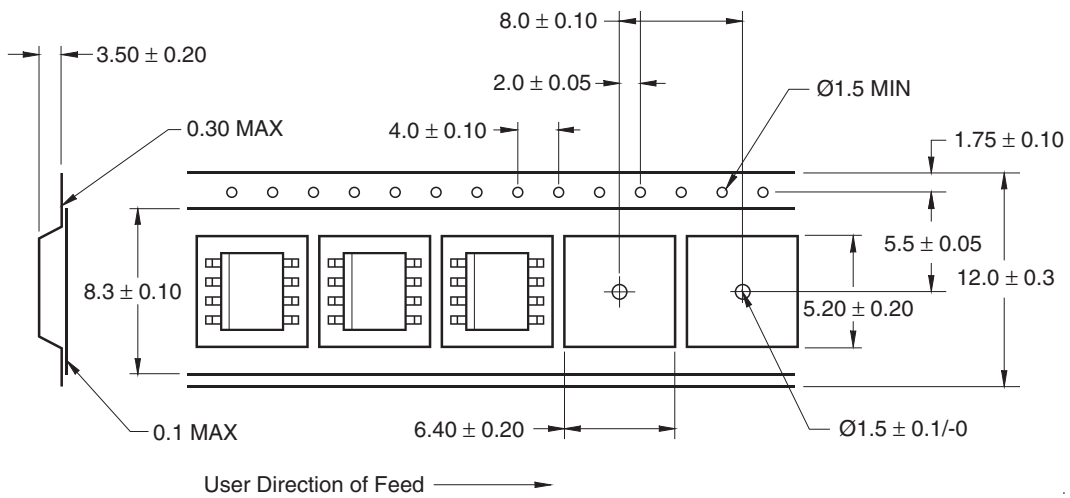
**MARKING INFORMATION**



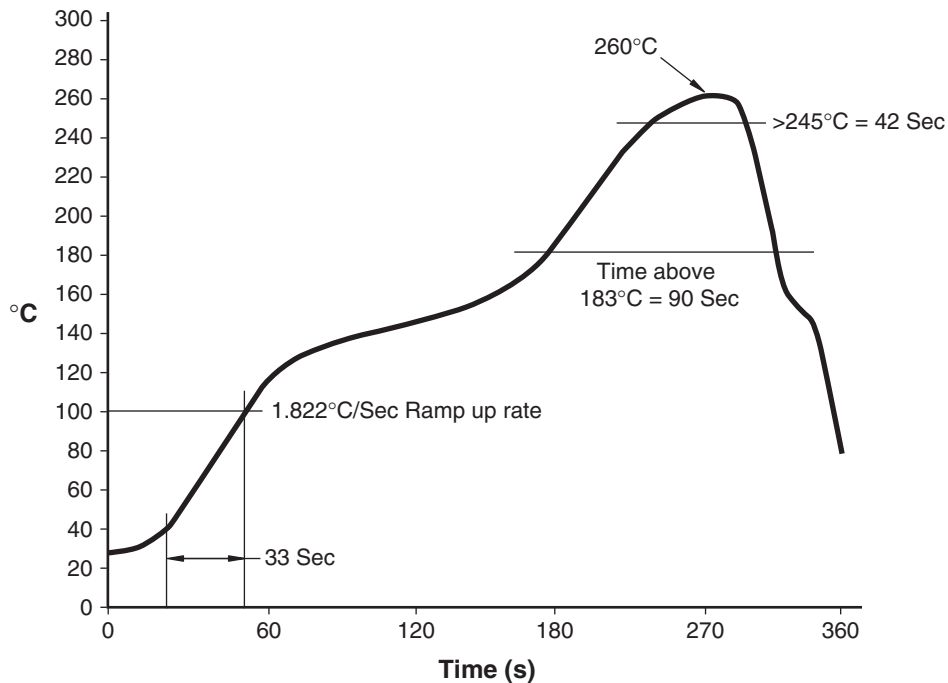
| Definitions |  |
|-------------|--|
| 1           | Fairchild logo   |
| 2           | Device number  |
| 3           | VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table) |
| 4           | One digit year code, e.g., '3'   |
| 5           | Two digit work week ranging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

**MOCD217-M**

**Carrier Tape Specifications**



**Reflow Profile**



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