

Dual Channel Small Outline Optoisolators Transistor Output

These devices consist of two gallium arsenide infrared emitting diodes optically coupled to two monolithic silicon phototransistor detectors, in a surface mountable, small outline, plastic package. They are ideally suited for high density applications and eliminate the need for through-the-board mounting.

- Dual Channel Coupler
- Convenient Plastic SOIC-8 Surface Mountable Package Style
- 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
- Shipped in Tape and Reel, which Conforms to EIA Standard RS481A
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- High Input-Output Isolation of 3000 Vac (rms) Guaranteed
- Meets U.L. Regulatory Requirements, File #E54915

Ordering Information:

- To obtain MOCD207, 208 in tape and reel, add R2 suffix to device numbers as follows:
R2 = 2500 units on 13" reel
- To obtain MOCD207, 208 in quantities of 50 (shipped in sleeves) — no suffix

Marking Information:

- MOCD207 = D207
- MOCD208 = D208

Applications:

- Feedback Control Circuits
- Interfacing and Coupling Systems of Different Potentials and Impedances
- General Purpose Switching Circuits
- Monitor and Detection Circuits

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

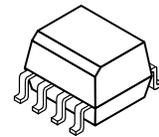
| Rating | Symbol | Value | Unit |
|--|------------------|-------------|----------------------------|
| INPUT LED | | | |
| Forward Current — Continuous | I_F | 60 | mA |
| Forward Current — Peak ($PW = 100 \mu\text{s}, 120 \text{ pps}$) | $I_F(\text{pk})$ | 1.0 | A |
| Reverse Voltage | V_R | 6.0 | V |
| LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 90 0.8 | mW mW/ $^\circ\text{C}$ |
| OUTPUT TRANSISTOR | | | |
| 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 @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 150 1.76 | mW mW/ $^\circ\text{C}$ |

Preferred devices are Motorola recommended choices for future use and best overall value.

MOCD207
[CTR = 100–200%]
MOCD208
[CTR = 40–125%]

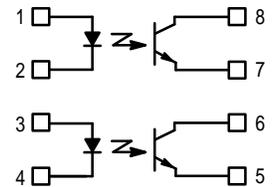
Motorola Preferred Devices

**DUAL CHANNEL
SMALL OUTLINE
OPTOISOLATORS
TRANSISTOR OUTPUT**



**CASE 846-01, STYLE 3
PLASTIC**

SCHEMATIC



1. ANODE 1
2. CATHODE 1
3. ANODE 2
4. CATHODE 2
5. EMITTER 2
6. COLLECTOR 2
7. EMITTER 1
8. COLLECTOR 1

MOCD207 MOCD208

MAXIMUM RATINGS—continued ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|--|-----------|-------------|----------------------------|
| TOTAL DEVICE | | | |
| Input–Output Isolation Voltage ^(1,2) (60 Hz, 1.0 sec. duration) | V_{ISO} | 3000 | Vac(rms) |
| Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 250 2.94 | mW 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) | — | 260 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)⁽³⁾

| Characteristic | Symbol | Min | Typ ⁽³⁾ | Max | Unit |
|--|--------|-----|--------------------|------|---------------|
| INPUT LED | | | | | |
| Forward Voltage ($I_F = 30\text{ mA}$) | V_F | — | 1.2 | 1.55 | V |
| Reverse Leakage Current ($V_R = 6.0\text{ V}$) | I_R | — | 0.1 | 100 | μA |
| Capacitance | C | — | 18 | — | pF |

OUTPUT TRANSISTOR

| | | | | | |
|---|---------------|-----|-----|----|---------------|
| Collector–Emitter Dark Current ($V_{CE} = 10\text{ V}$, $T_A = 25^\circ\text{C}$) ($V_{CE} = 10\text{ V}$, $T_A = 100^\circ\text{C}$) | I_{CEO1} | — | 1.0 | 50 | nA |
| | I_{CEO2} | — | 1.0 | — | μA |
| Collector–Emitter Breakdown Voltage ($I_C = 100\ \mu\text{A}$) | $V_{(BR)CEO}$ | 70 | 120 | — | V |
| Emitter–Collector Breakdown Voltage ($I_E = 100\ \mu\text{A}$) | $V_{(BR)ECO}$ | 7.0 | 7.8 | — | V |
| Collector–Emitter Capacitance ($f = 1.0\text{ MHz}$, $V_{CE} = 0$) | C_{CE} | — | 7.0 | — | pF |

COUPLED

| | | | | | | |
|---|--------------------|----------------------------|----------------------|---------------|------------------------|---------------|
| Output Collector Current ($I_F = 10\text{ mA}$, $V_{CE} = 5\text{ V}$) | MOCD207 MOCD208 | I_C (CTR) ⁽⁴⁾ | 10 (100) 4.0 (40) | 15 (150) — | 20 (200) 12.5 (125) | mA (%) |
| Output Collector Current ($I_F = 1\text{ mA}$, $V_{CE} = 5\text{ V}$) | MOCD207 MOCD208 | I_C | 3.4 1.3 | 7.0 3.0 | — — | mA |
| Collector–Emitter Saturation Voltage ($I_C = 2.0\text{ mA}$, $I_F = 10\text{ mA}$) | | $V_{CE(sat)}$ | — | 0.15 | 0.4 | V |
| Turn–On Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\ \Omega$) | | t_{on} | — | 3.0 | — | μs |
| Turn–Off Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\ \Omega$) | | t_{off} | — | 2.8 | — | μs |
| Rise Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\ \Omega$) | | t_r | — | 1.6 | — | μs |
| Fall Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\ \Omega$) | | t_f | — | 2.2 | — | μs |
| Input–Output Isolation Voltage ($f = 60\text{ Hz}$, $t = 1.0\text{ sec}$) ^(1,2) | | V_{ISO} | 3000 | — | — | Vac(rms) |
| Isolation Resistance ($V_{I-O} = 500\text{ V}$) ⁽²⁾ | | R_{ISO} | 10^{11} | — | — | Ω |
| Isolation Capacitance ($V_{I-O} = 0$, $f = 1.0\text{ MHz}$) ⁽²⁾ | | C_{ISO} | — | 0.2 | — | pF |

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 and 7 are common.
3. Always design to the specified minimum/maximum electrical limits (where applicable).
4. Current Transfer Ratio (CTR) = $I_C/I_F \times 100\%$.

TYPICAL CHARACTERISTICS

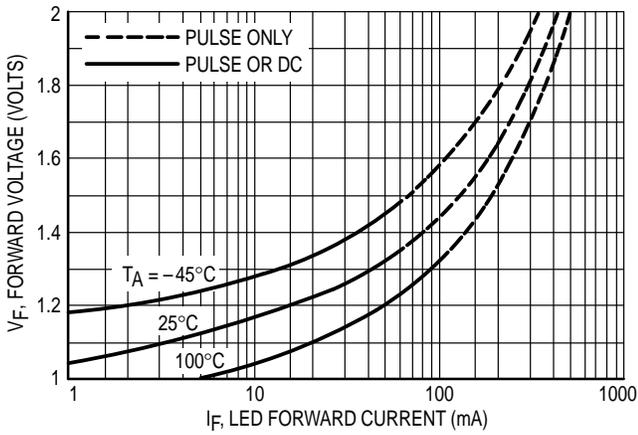


Figure 1. LED Forward Voltage versus Forward Current

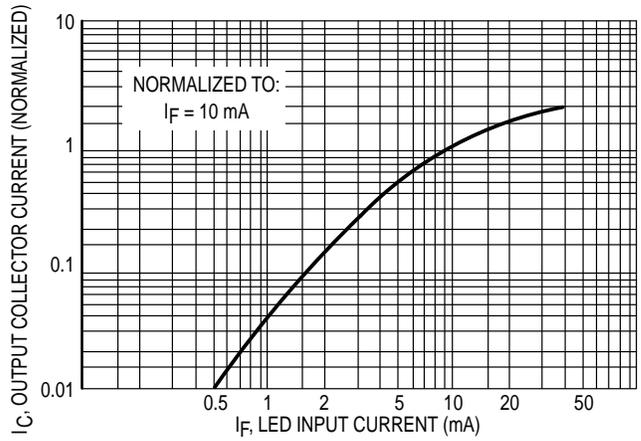


Figure 2. Output Current versus Input Current

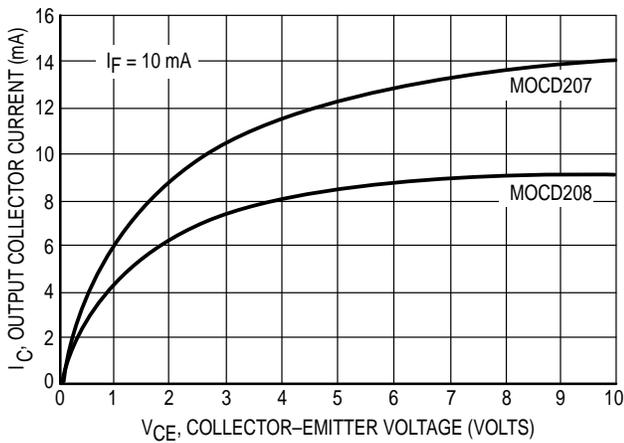


Figure 3. Output Current versus Collector-Emitter Voltage

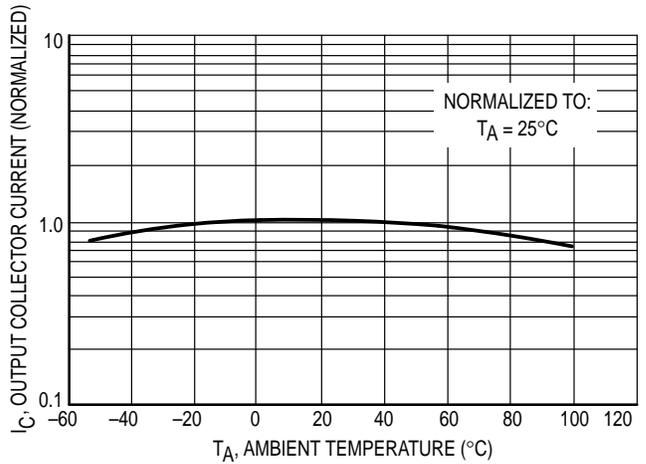


Figure 4. Output Current versus Ambient Temperature

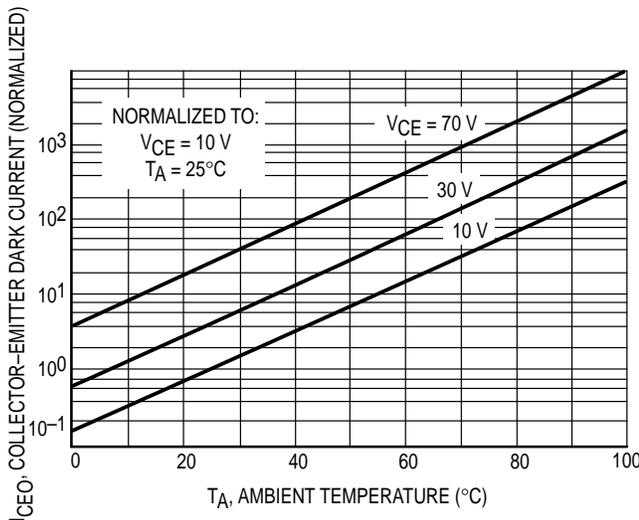


Figure 5. Dark Current versus Ambient Temperature

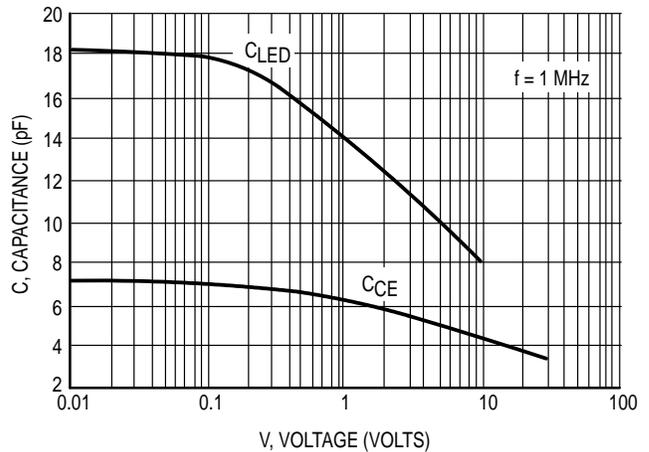
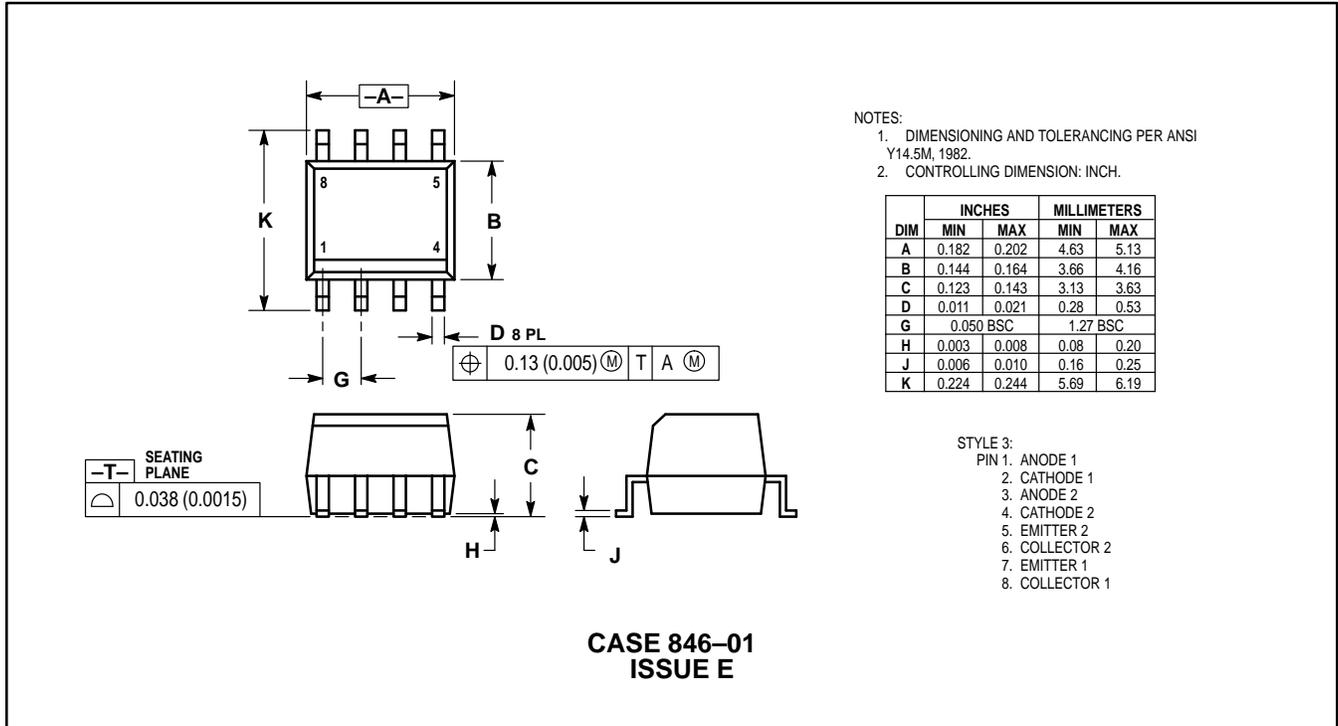


Figure 6. Capacitance versus Voltage

PACKAGE DIMENSIONS



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