

Small Outline Optoisolators Transistor Output (Low Input Current)

These devices consist of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon phototransistor detector, 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.

- • Convenient Plastic SOIC-8 Surface Mountable Package Style
- • Low LED Input Current Required, for Easier Logic Interfacing
- • Standard SOIC-8 Footprint, with 0.050" Lead Spacing
- · Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- • High Input–Output Isolation of 3000 Vac (rms) Guaranteed
- • UL Recognized **W** File #E90700, Volume 2

Ordering Information:

- •To obtain MOC215, 216, 217 in Tape and Reel, add R2 suffix to device numbers: R2 = 2500 units on 13" reel
- •To obtain MOC215, 216, 217 in quantities of 50 (shipped in sleeves) No Suffix

Marking Information:

- MOC215 = 215
- MOC216 = 216
- MOC217 = 217

Applications:

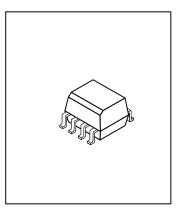
- • Low power Logic Circuits
- · Interfacing and coupling systems of different potentials and impedances
- •Telecommunications equipment
- Portable electronics

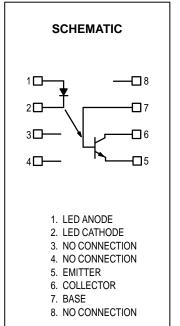
MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

| Rating | Symbol | Value | Unit |
|---|---------------------|-------------|-------------|
| INPUT LED | | | |
| Forward Current — Continuous | ١ _F | 60 | mA |
| Forward Current — Peak (PW = 100 µs, 120 pps) | I _F (pk) | 1.0 | А |
| Reverse Voltage | ٧ _R | 6.0 | V |
| LED Power Dissipation @ T _A = 25°C Derate above 25°C | PD | 90 0.8 | mW mW/°C |
| OUTPUT TRANSISTOR | | | |
| Collector–Emitter Voltage | VCEO | 30 | V |
| Collector-Base Voltage | VCBO | 70 | V |
| Emitter–Collector Voltage | V _{ECO} | 7.0 | V |
| Collector Current — Continuous | IC | 150 | mA |
| Detector Power Dissipation @ T _A = 25°C Derate above 25°C | PD | 150 1.76 | mW mW/°C |

MOC215 MOC216 MOC217

SMALL OUTLINE OPTOISOLATORS TRANSISTOR OUTPUT







MAXIMUM RATINGS — continued (T_A = 25°C unless otherwise noted)

| Rating | Symbol | Va | lue | Unit | |
|---|-----------------------|-----------------------------------|----------------------------------|----------|----------------------------|
| TOTAL DEVICE | | | | | |
| Input–Output Isolation Voltage ^(1,2) (60 Hz, 1.0 sec. duration) | | | 30 | 00 | Vac(rms) |
| Total Device Power Dissipation @ T _A = 25°C Derate above 25°C | | PD | | 50 94 | mW mW/°C |
| Ambient Operating Temperature Range ⁽³⁾ | | ТА | -45 to | o +100 | °C |
| Storage Temperature Range ⁽³⁾ | | T _{stg} | -45 to | o +125 | ٥° |
| Lead Soldering Temperature (1/16" from case, 10 sec. duration) | | — | 20 | 60 | °C |
| ELECTRICAL CHARACTERISTICS (T _A = 25°C unless other | wise noted)(4) | | - | | |
| Characteristic | Symbol | Min | Typ (4) | Max | Unit |
| INPUT LED | • | | | | |
| Forward Voltage (I _F = 1.0 mA) | VF | — | 1.05 | 1.3 | V |
| Reverse Leakage Current (V _R = 6.0 V) | IR | _ | 0.1 | 100 | μA |
| Capacitance | С | _ | 18 | — | pF |
| OUTPUT TRANSISTOR | | | | | |
| Collector–Emitter Dark Current $(V_{CE} = 5.0 \text{ V}, T_A = 25^{\circ}\text{C})$ | ICEO1 | _ | 1.0 | 50 | nA |
| (V _{CE} = 5.0 V, T _A = 100°C) | ICEO2 | _ | 1.0 | _ | μA |
| Collector–Emitter Breakdown Voltage (I _C = 100 μ A) | V _(BR) CEO | 30 | 90 | _ | V |
| Emitter–Collector Breakdown Voltage (I _E = 100 μ A) | V _{(BR)ECO} | 7.0 | 7.8 | — | V |
| Collector–Emitter Capacitance (f = 1.0 MHz, $V_{CE} = 0$) | CCE | — | 7.0 | — | pF |
| COUPLED | | | | | |
| Output Collector Current MOC215 (IF = 1.0 mA, V _{CE} = 5.0 V) MOC217 MOC217 MOC217 | 3 | 200 (20) 500 (50) 1.0 (100) | 500(50) 800 (80) 1.3 (130) | | μΑ (%) μΑ (%) mA (%) |
| Collector–Emitter Saturation Voltage (I _C = 100 μ A, I _F = 1.0 mA) | V _{CE(sat)} | — | 0.35 | 0.4 | V |
| Turn–On Time (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) | ton | _ | 7.5 | _ | μs |
| Turn–Off Time (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) | toff | _ | 5.7 | _ | μs |
| Rise Time (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) | tr | _ | 3.2 | _ | μs |
| Fall Time (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω) | tf | | 4.7 | | μs |
| Input–Output Isolation Voltage (f = 60 Hz, t = 1.0 sec.) ^(1,2) | VISO | 3000 | _ | _ | Vac(rms) |
| Isolation Resistance $(V_{I-O} = 500 V)^{(2)}$ | RISO | 10 ¹¹ | — | — | Ω |
| Isolation Capacitance ($V_{I-O} = 0$, f = 1.0 MHz) ⁽²⁾ | CISO | _ | 0.2 | _ | pF |

1. Input–Output Isolation Voltage, V_{ISO} , is an internal device dielectric breakdown rating.

2. For this test, pins 1 and 2 are common, and pins 5, 6 and 7 are common.

3. Refer to Quality and Reliability Section in Opto Data Book for information on test conditions.

4. Always design to the specified minimum/maximum electrical limits (where applicable).

5. Current Transfer Ratio (CTR) = $I_C/I_F \times 100\%$.



TYPICAL CHARACTERISTICS

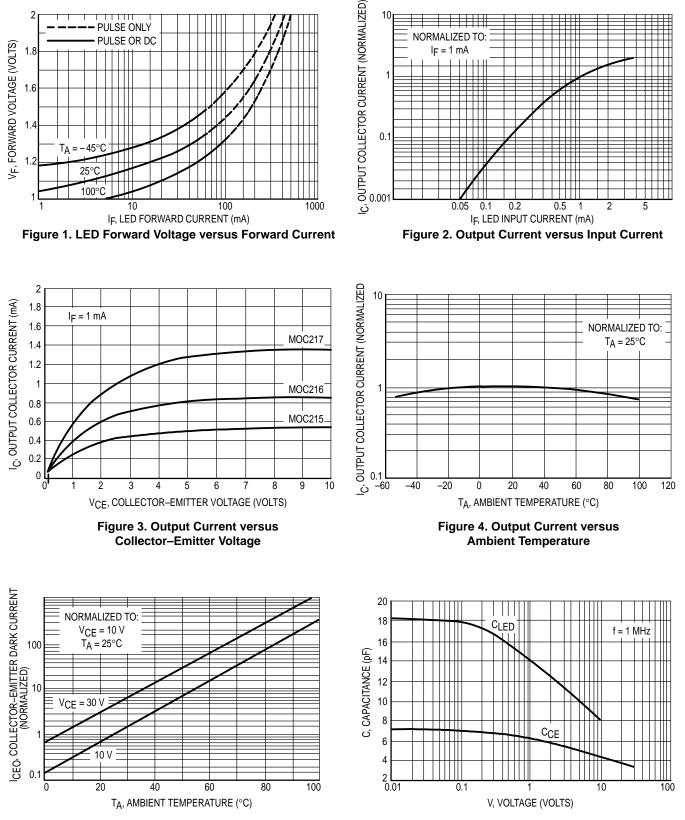


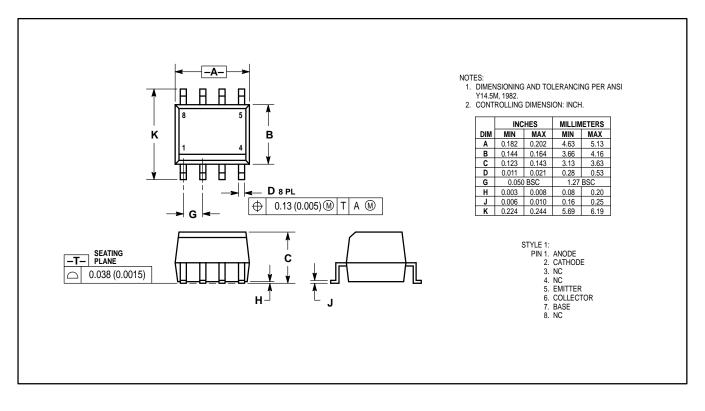
Figure 5. Dark Current versus Ambient Temperature





MOC215, MOC216, MOC217

PACKAGE DIMENSIONS





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- 2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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| technical support | Convenient plastic SOIC-8 surface mountable package style Low LED input current required, for | | |
| my Fairchild | easier logic interfacing | | |
| company | Standard SOIC-8 footprint, with a 0.050-inch lead spacing Compatible with dual wave, vapor phase and IR reflow soldering High input - Output isolation of 3000 VAC (RMS) guaranteed Underwriters Laboratory (UL) recognized - File #E90700, Volume 2 | _ | |

Applications

- Low power logic circuits
- Interfacing and coupling systems of different potentials and impedances
 Telecommunications equipment
- Portable electronics

Ordering information

The following options can be ordered with this part:

| Option | Order Entry Identifier | Description |
|--------|---------------------------|---|
| R1 | R1 | Surface-Mount Lead Bend Tape and Reel (500-pc reel) |
| R2 | R2 | Surface-Mount Lead Bend Tape and Reel (2500-pc reel) |

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Product status/pricing/packaging

| Product | Product status | Pricing* | Package type | Leads | Packing method |
|------------|-----------------|----------|--------------|-------|----------------|
| MOC215-M | Full Production | \$0.264 | SOIC | 8 | RAIL |
| MOC215R1-M | Full Production | \$0.273 | SOIC | 8 | TAPE REEL |
| MOC215R2-M | Full Production | \$0.273 | SOIC | 8 | TAPE REEL |

* 1,000 piece Budgetary Pricing

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Safety agency certificates

| Cetificate | | Agency | | |
|------------------------|-----|--------------------------------------|--|--|
| 8460,8461 (171 K) | BSI | British Standards Institution | | |
| 136616 (161 K) | VDE | VDE Pruf-und Zertifizierungsinstitut | | |
| E90700, Vol. 2 (254 K) | UL | Underwriters Laboratories Inc. | | |

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Product status/pricing/packaging

| Product | Product status | Pricing* | Package type | Leads | Packing method |
|------------|-----------------|----------|--------------|-------|----------------|
| MOC216-M | Full Production | \$0.281 | SOIC | 8 | RAIL |
| MOC216R1-M | Full Production | \$0.291 | SOIC | 8 | TAPE REEL |
| MOC216R2-M | Full Production | \$0.291 | SOIC | 8 | TAPE REEL |

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| <u>Cross-reference</u> <u>search</u> | 4N29A-M replaced by <u>4N29</u> | 4N30-M replaced by <u>4N30</u> | 4N31-M replaced by <u>4N31</u> | |
| technical information buy products | 4N32-M replaced by 4N32 | 4N33-M replaced by <u>4N33</u> | 4N35-M | |
| technical support | 4N36-M | 4N37-M | 4N38-M replaced by <u>4N38</u> | |
| my Fairchild company | 4N38A-M replaced by 4N38 | | | |
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Datasheets for products beginning with CNY

| <u> CN</u> | <u>Y17-1-M</u> | <u>CNY17-2-M</u> | <u>CNY17-3-M</u> |
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| H11A1-M | H11AA1-M replaced by H11AA1 | H11AA2-M replaced by H11AA2 |
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| | | |

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| H11AA3-M replaced by H11AA3 | H11AA4-M replaced by H11AA4 | H11AV1-M |
|---|---|------------------------------|
| H11AV1A-M | <u>H11AV2-M</u> | H11AV2A-M |
| H11B1 <mark>-M</mark> replaced by <u>H11B1</u> | H11B3-M replaced by H11B3 | H11D1-M replaced by H11D1 |
| H11D2- <mark>M</mark> replaced by <u>H11D2</u> | H11G1- <mark>M</mark> replaced by <u>H11G1</u> | H11G2-M replaced by H11G2 |
| H11G3- <mark>M</mark> replaced by <u>H11G3</u> | <u>H11L1-M</u> | H11L2-M |
| H11L3-M | | |

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Datasheets for products beginning with MCT

| MCT2-M MCT2E-M | |
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Datasheets for products beginning with MOC

| <u>MOC205-M</u> | MOC206-M | <u>MOC207-M</u> |
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| <u>MOC208-M</u> | <u>MOC211-M</u> | <u>MOC212-M</u> |
| <u>MOC213-M</u> | <u>MOC215-M</u> | MOC216-M |
| <u>MOC217-M</u> | <u>MOC223-M</u> | <u>MOC256-M</u> |
| <u>MOC3010-M</u> | <u>MOC3011-M</u> | <u>MOC3012-M</u> |
| <u>MOC3020-M</u> | <u>MOC3021-M</u> | <u>MOC3022-M</u> |
| <u>MOC3023-M</u> | <u>MOC3031-M</u> | <u>MOC3032-M</u> |
| <u>MOC3033-M</u> | <u>MOC3041-M</u> | <u>MOC3042-M</u> |
| <u>MOC3043-M</u> | <u>MOC3051-M</u> | <u>MOC3052-M</u> |
| <u>MOC3061-M</u> | <u>MOC3062-M</u> | <u>MOC3063-M</u> |
| <u>MOC3081-M</u> | <u>MOC3081-M</u> | <u>MOC3083-M</u> |
| <u>MOC3162-M</u> | <u>MOC3163-M</u> | <u>MOC5007-M</u> |
| <u>MOC5008-M</u> | <u>MOC5009-M</u> | MOC8030-M replaced by <u>MOC8030</u> |

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| MOC8050-M replaced by MOC8050 | MOC8080-M replaced by <u>MOC8080</u> | MOC8100-M |
|-------------------------------------|--|-----------|
| MOC8204-M replaced by MOC8204 | MOCD207-M | MOCD208-M |
| MOCD211-M | MOCD213-M | MOCD217-M |
| MOCD223-M | | |

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