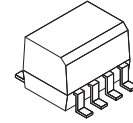


8-pin SOIC AC Input Phototransistor Output Optocoupler

MOC256M



SOIC8
 CASE 751DZ

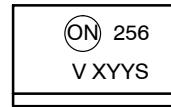
Description

The MOC256M is an AC input phototransistor opto-coupler. The device consists of two infrared emitters connected in anti-parallel and coupled to a silicon NPN phototransistor detector. It is designed for applications requiring the detection or monitoring of AC signals. The device is constructed with a standard SOIC-8 footprint.

Features

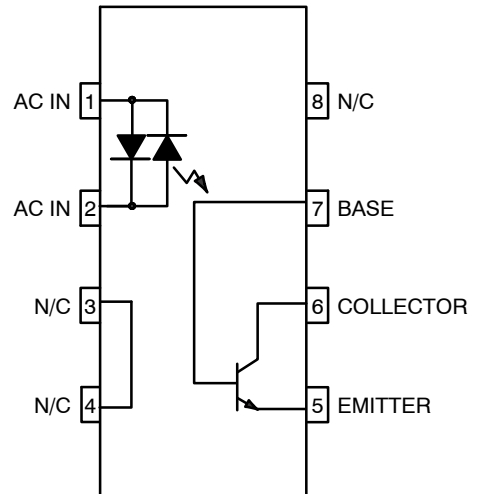
- Bidirectional AC Input
 - ◆ Protection Against Reversed DC Bias
- Guaranteed CTR Symmetry of 2:1 Maximum
- Convenient Plastic SOIC-8 Surface Mountable Package Style, with 0.050" Lead Spacing
- Safety and Regulatory Approvals:
 - ◆ UL1577, 2,500 VAC_{RMS} for 1 Minute
 - ◆ DIN-EN/IEC60747-5-5, 565 V Peak Working Insulation Voltage
- These are Pb-Free Devices

MARKING DIAGRAM



- 256 = Device Number
- V = DIN EN/IEC60747-5-5 Option (only appears on component ordered with this option)
- X = One-Digit Year Code, e.g., "4"
- YY = Digit Work Week, Ranging from "01" to "53"
- S = Assembly Package Code

SCHEMATIC



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

MOC256M

SAFETY AND INSULATION RATINGS (As per DIN EN/IEC 60747-5-5, this optocoupler is suitable for “safe electrical insulation” only within the safety limit data. Compliance with the safety ratings shall be ensured by means of protective circuits.)

| Parameter | Characteristics | |
|---|-----------------------|-------|
| Installation Classifications per DIN VDE 0110/1.89 Table 1, For Rated Mains Voltage | <150 V _{RMS} | I-IV |
| | <300 V _{RMS} | I-III |
| Climatic Classification | 55/100/21 | |
| Pollution Degree (DIN VDE 0110/1.89) | 2 | |
| Comparative Tracking Index | 175 | |

| Symbol | Parameter | Value | Unit |
|-----------------------|--|------------------|-------------------|
| V _{PR} | Input-to-Output Test Voltage, Method A, V _{IORM} × 1.6 = V _{PR} , Type and Sample Test with t _m = 10 s, Partial Discharge < 5 pC | 904 | V _{peak} |
| | Input-to-Output Test Voltage, Method B, V _{IORM} × 1.875 = V _{PR} , 100% Production Test with t _m = 1 s, Partial Discharge < 5 pC | 1060 | V _{peak} |
| V _{IORM} | Maximum Working Insulation Voltage | 565 | V _{peak} |
| V _{IOTM} | Highest Allowable Over-Voltage | 4000 | V _{peak} |
| | External Creepage | ≥4 | mm |
| | External Clearance | ≥4 | mm |
| DTI | Distance Through Insulation (Insulation Thickness) | ≥0.4 | mm |
| T _S | Case Temperature (Note 1) | 150 | °C |
| I _{S,INPUT} | Input Current (Note 1) | 200 | mA |
| P _{S,OUTPUT} | Output Power (Note 1) | 300 | mW |
| R _{IO} | Insulation Resistance at T _S , V _{IO} = 500 V (Note 1) | >10 ⁹ | Ω |

1. Safety limit values – maximum values allowed in the event of a failure.

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

| Symbol | Parameter | Value | Unit |
|---------------------|--|--------------------|-------|
| TOTAL DEVICE | | | |
| T _{STG} | Storage Temperature | -40 to +125 | °C |
| T _A | Ambient Operating Temperature | -40 to +100 | °C |
| T _J | Junction Temperature Range | -40 to +125 | °C |
| T _{SOL} | Lead Solder Temperature | 260 for 10 seconds | °C |
| P _D | Total Device Power Dissipation @ T _A = 25°C | 240 | mW |
| | Derate Above 25°C | 2.94 | mW/°C |

EMITTER

| | | | |
|---------------------|---|-----|-------|
| I _F | Continuous Forward Current | 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°C | 90 | mW |
| | Derate Above 25°C | 0.8 | mW/°C |

DETECTOR

| | | | |
|------------------|--|------|-------|
| I _C | Continuous Collector Current | 150 | mA |
| V _{CEO} | Collector-Emitter Voltage | 30 | V |
| V _{CBO} | Collector-Base Voltage | 70 | V |
| V _{ECO} | Emitter-Collector Voltage | 7 | V |
| P _D | Detector Power Dissipation @ T _A = 25°C | 150 | mW |
| | Derate Above 25°C | 1.76 | mW/°C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

MOC256M

ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise noted)

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--------|-----------|-----------------|-----|-----|-----|------|
|--------|-----------|-----------------|-----|-----|-----|------|

EMITTER

| | | | | | | |
|-----------------|-----------------------|-------------------------|---|-----|-----|----|
| V _F | Input Forward Voltage | I _F = ±10 mA | – | 1.2 | 1.5 | V |
| C _{IN} | Input Capacitance | V = 0 V, f = 1 MHz | – | 20 | – | pF |

DETECTOR

| | | | | | | |
|-------------------|-------------------------------------|--|----|-----|-----|----|
| I _{CEO1} | Collector–Emitter Dark Current | V _{CE} = 10 V, T _A = 25°C | – | 1.0 | 100 | nA |
| I _{CEO2} | | V _{CE} = 10 V, T _A = 100°C | – | 1.0 | – | μA |
| I _{CBO} | Collector–Base Dark Current | V _{CB} = 10 V | – | 0.2 | – | nA |
| BV _{CEO} | Collector–Emitter Breakdown Voltage | I _C = 10 mA | 30 | 100 | – | V |
| BV _{CBO} | Collector–Base Breakdown Voltage | I _C = 100 μA | 70 | 120 | – | V |
| BV _{ECO} | Emitter–Collector Breakdown Voltage | I _E = 100 μA | 5 | 10 | – | V |
| C _{CE} | Collector–Emitter Capacitance | f = 1.0 MHz, V _{CE} = 0 | – | 7 | – | pF |
| C _{CB} | Collector–Base Capacitance | f = 1.0 MHz, V _{CB} = 0 | – | 20 | – | pF |
| C _{EB} | Emitter–Base Capacitance | f = 1.0 MHz, V _{EB} = 0 | – | 10 | – | pF |

COUPLED

| | | | | | | |
|-----------------------|--------------------------------------|--|-----|-----|-----|---|
| CTR | Current Transfer Ratio | I _F = ±10 mA, V _{CE} = 10 V | 20 | 150 | – | % |
| | Output–Collector Current Symmetry | $\left(\frac{I_C @ I_F = +10 \text{ mA}, V_{CE} = 10 \text{ V}}{I_C @ I_F = -10 \text{ mA}, V_{CE} = 10 \text{ V}} \right)$ | 0.5 | – | 2.0 | |
| V _{CE (SAT)} | Collector–Emitter Saturation Voltage | I _C = 0.5 mA, I _F = ±10 mA | – | 0.1 | 0.4 | V |

ISOLATION CHARACTERISTICS

| | | | | | | |
|------------------|--------------------------------|--|------------------|-----|---|--------------------|
| V _{ISO} | Input–Output Isolation Voltage | t = 1 Minute | 2500 | – | – | V _{ACRMS} |
| C _{ISO} | Isolation Capacitance | V _{I-O} = 0 V, f = 1 MHz | – | 0.2 | – | pF |
| R _{ISO} | Isolation Resistance | V _{I-O} = ±500 VDC, T _A = 25°C | 10 ¹¹ | – | – | Ω |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

MOC256M

TYPICAL PERFORMANCE CURVES

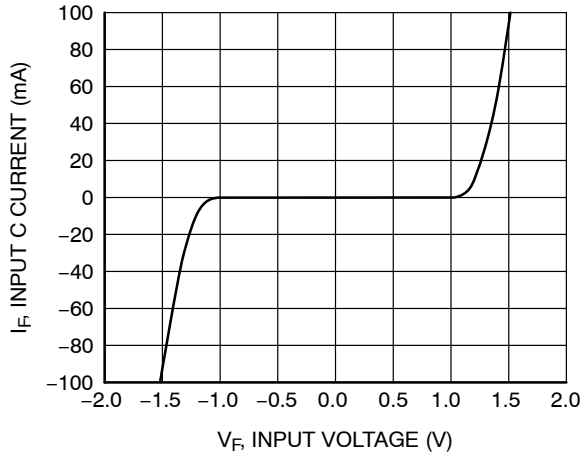


Figure 1. Input Current vs. Input Voltage

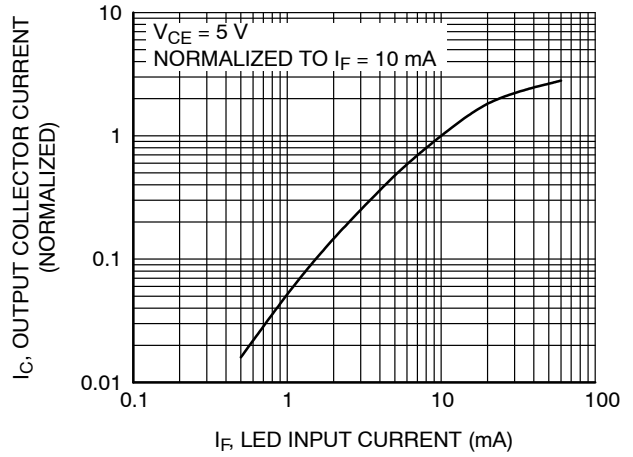


Figure 2. Output Current vs. Input Current

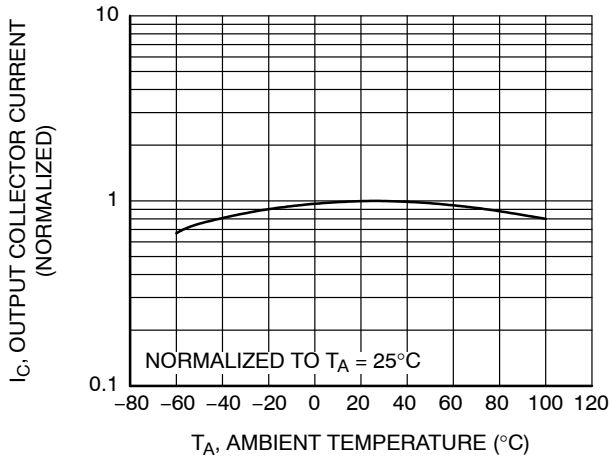


Figure 3. Output Current vs. Ambient Temperature

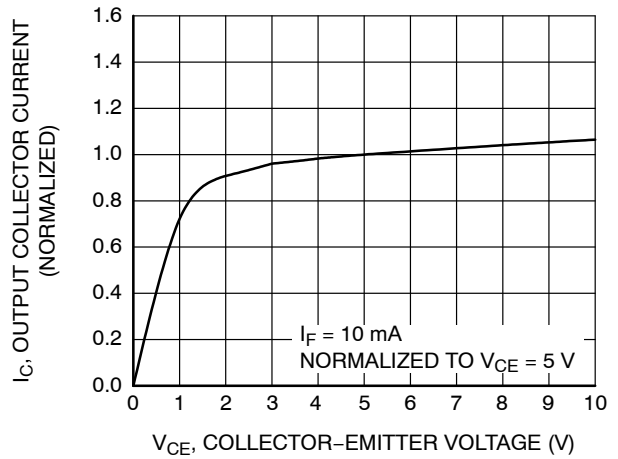


Figure 4. Output Current vs. Collector-Emitter Voltage

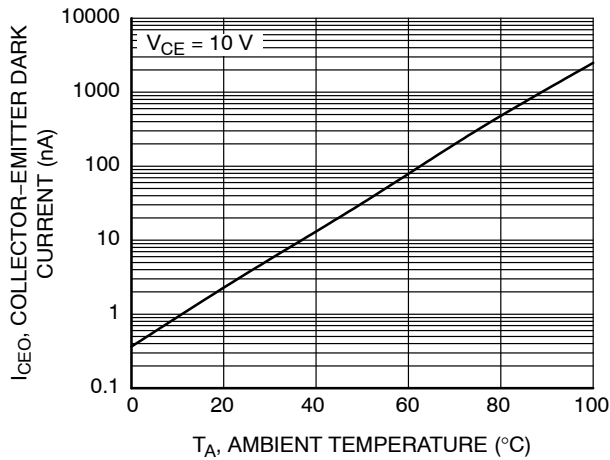


Figure 5. Dark Current vs. Ambient Temperature

MOC256M

REFLOW PROFILE

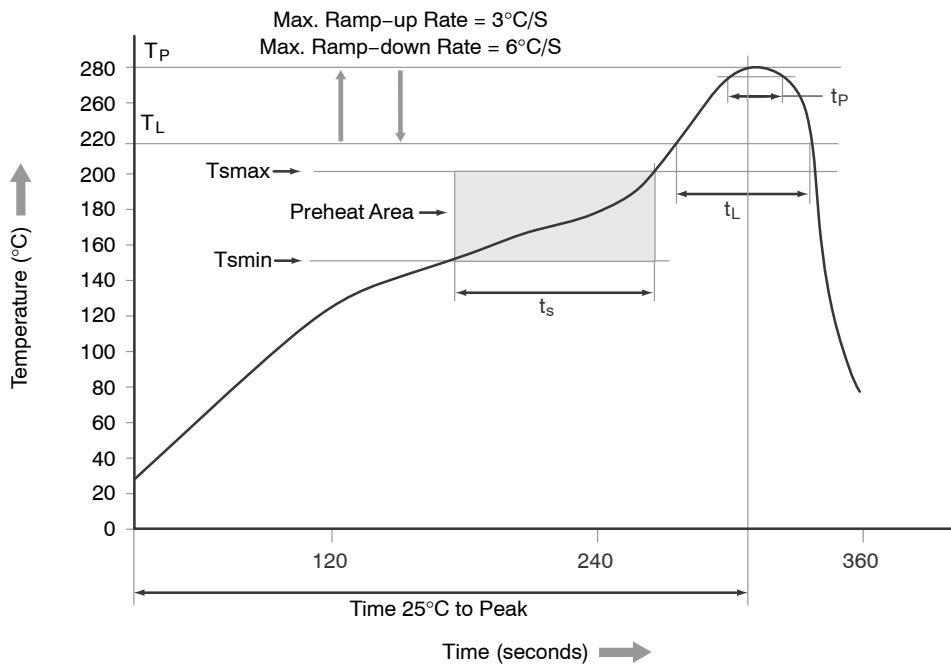


Figure 6. Reflow Profile

Table 1.

| Profile Feature | Pb-Free Assembly Profile |
|--|--------------------------|
| Temperature Minimum (T_{smin}) | 150°C |
| Temperature Maximum (T_{smax}) | 200°C |
| Time (t_s) from (T_{smin} to T_{smax}) | 60–120 seconds |
| Ramp-up Rate (t_L to t_p) | 3°C/second maximum |
| Liquidous Temperature (T_L) | 217°C |
| Time (t_L) Maintained Above (T_L) | 60–150 seconds |
| Peak Body Package Temperature | 260°C +0°C / -5°C |
| Time (t_p) within 5°C of 260°C | 30 seconds |
| Ramp-down Rate (T_P to T_L) | 6°C/second maximum |
| Time 25°C to Peak Temperature | 8 minutes maximum |

ORDERING INFORMATION

| Part Number | Package | Shipping† |
|-------------|--|--------------------------|
| MOC256M | Small Outline 8-Pin, SOIC8 (Pb-Free) | 50 Units / Tube |
| MOC256R2M | Small Outline 8-Pin, SOIC8 (Pb-Free) | 2500 Units / Tape & Reel |
| MOC256VM | Small Outline 8-Pin, SOIC8, DIN EN/IEC60747-5-5 Option (Pb-Free) | 50 Units / Tube |
| MOC256R2VM | Small Outline 8-Pin, SOIC8, DIN EN/IEC60747-5-5 Option (Pb-Free) | 2500 Units / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

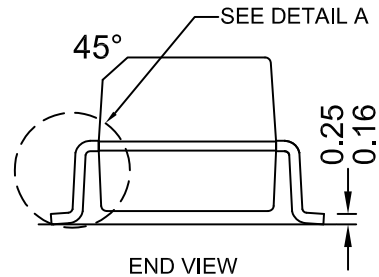
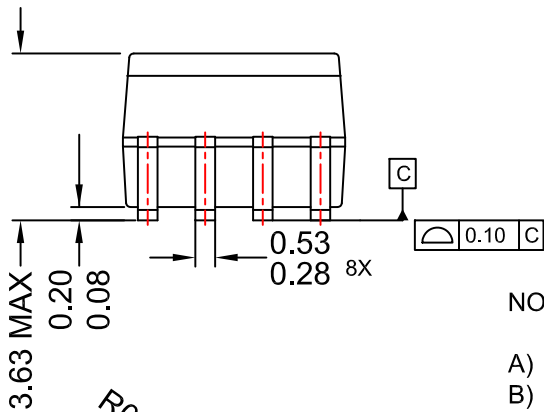
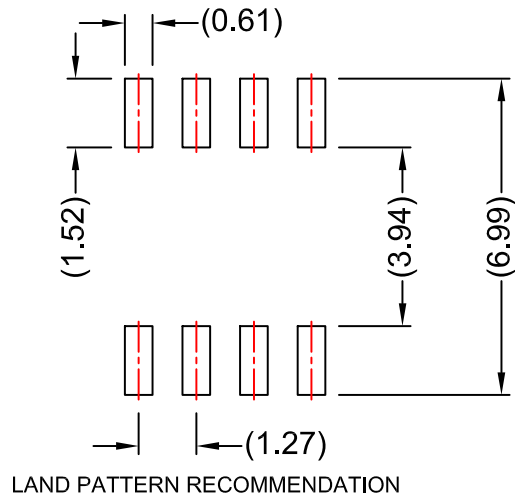
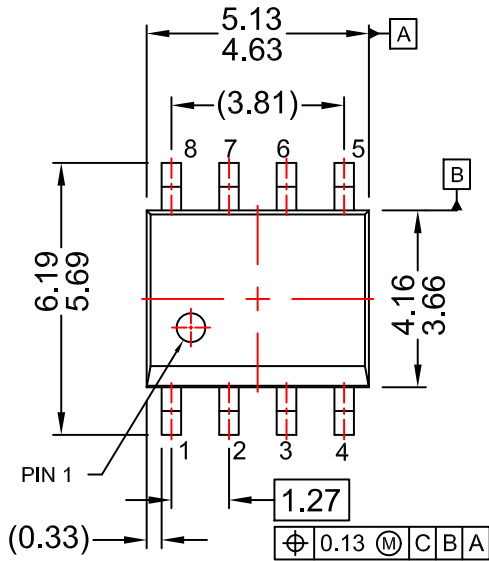
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®



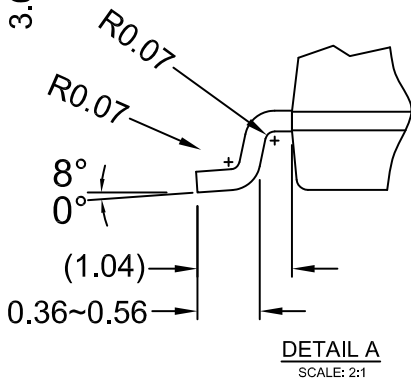
SOIC8
CASE 751DZ
ISSUE O

DATE 30 SEP 2016



NOTES:

- A) NO STANDARD APPLIES TO THIS PACKAGE
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS.
- D) LANDPATTERN STANDARD: SOIC127P600X175-8M.



| | | |
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