



Photocoupler

Product Data Sheet

MOC3052 SERIES

Spec No.: DS70-2001-025

Effective Date: 06/17/2016

Revision: E

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

Photocoupler MOC305X series

1. DESCRIPTION

1.1 Features

- Isolation voltage between input and output $V_{iso} : 5,000V_{rms}$
- 6pin DIP photocoupler, triac driver output
- High repetitive peak off-state voltage $V_{DRM} : \text{Min. } 600V$
- High critical rate of rise of off-state voltage($dV/dt : \text{MIN. } 1000V / \mu s$)
- Dual-in-line package : MOC3050, MOC3051, MOC3052, MOC3053
- Wide lead spacing package : MOC3050M, MOC3051M, MOC3052M, MOC3053M
- Surface mounting package : MOC3050S, MOC3051S, MOC3052S, MOC3053S
- Tape and reel packaging : MOC3050S-TA, MOC3051S-TA, MOC3052S-TA, MOC3053S-TA
MOC3050S-TA1, MOC3051S-TA1, MOC3052S-TA1, MOC3053S-TA1
- Safety approval
UL 1577, Cert. No.E113898
CSA CA5A, Cert. No. 1020087 (CA 91533-1)
FIMKO EN/IEC 60950-1, EN/IEC 60065; Cert. No.NCS/FI 24426 M3
VDE DIN EN60747-5-2, Cert. No. 40015248
CQC GB4943.1-2011/ GB8898-2011
- RoHS Compliance
All materials be used in device are followed EU RoHS directive (No.2002/95/EC).
- MSL class1

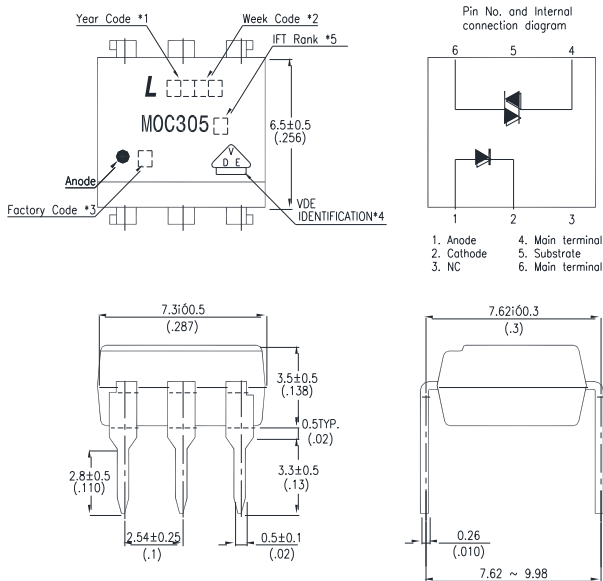
1.2 Applications

- AC Motor Drives
- AC Motor Starters
- E.M. Contactors
- Lighting Controls
- Solenoid/Valve Controls
- Solid State Relays
- Static Power Switches
- Temperature Controls

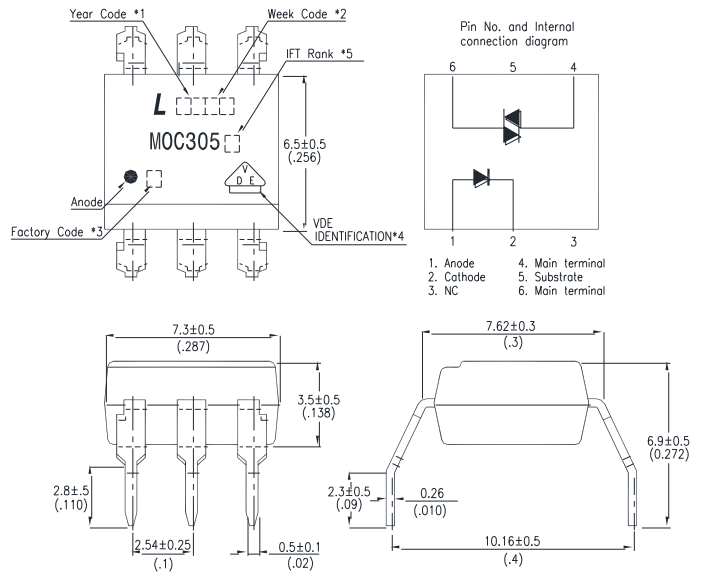
Photocoupler MOC305X series

2. PACKAGE DIMENSIONS

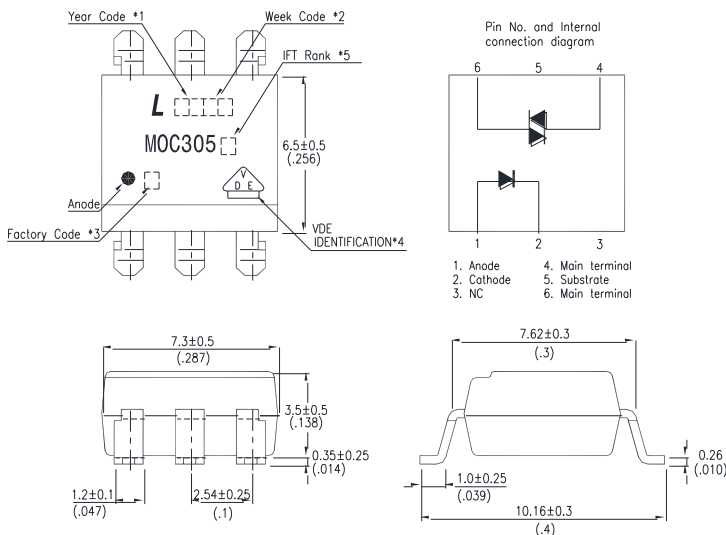
2.1 MOC305X



2.2 MOC305XM



2.3 MOC305XS



Notes :

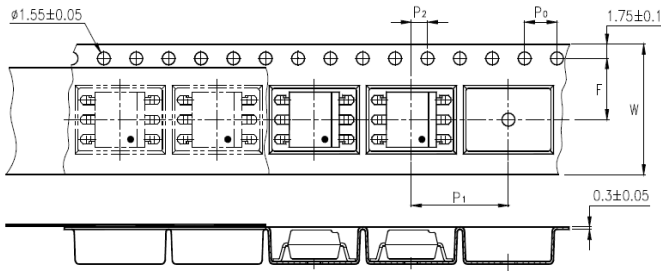
1. Year date code.
2. 2-digit work week.
3. Factory identification mark shall be marked (W: China-CZ, Y: Thailand)
4. VDE option
5. I_{FT} rank

* Dimensions are in Millimeters and (Inches).

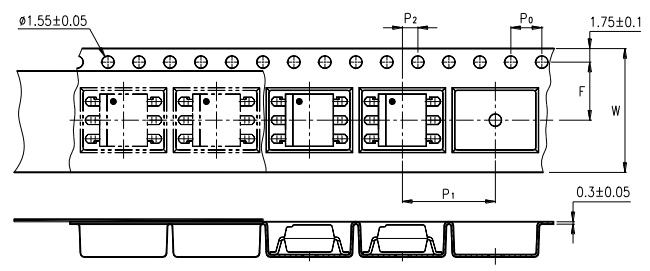
Photocoupler MOC305X series

3. TAPING DIMENSIONS

3.1 MOC305XS-TA



3.2 MOC305XS-TA1



| Description | Symbol | Dimension in mm (inch) |
|--|----------------|------------------------|
| Tape wide | W | 16±0.3 (0.63) |
| Pitch of sprocket holes | P ₀ | 4±0.1 (0.15) |
| Distance of compartment | F | 7.5±0.1 (0.295) |
| | P ₂ | 2±0.1 (0.079) |
| Distance of compartment to compartment | P ₁ | 12±0.1 (0.472) |

3.3 Quantities Per Reel

| Package Type | MOC305XS series |
|------------------|-----------------|
| Quantities (pcs) | 1000 |

**Photocoupler
MOC305X series**

4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25°C

| | Parameter | Symbol | Rating | Unit |
|--------|---|-----------|------------|-----------|
| Input | Forward Current | I_F | 50 | mA |
| | Reverse Voltage | V_R | 6 | V |
| | Junction Temperature | T_J | 125 | °C |
| | Power Dissipation | P | 100 | mW |
| Output | Off-State Output Terminal Voltage | V_{DRM} | 600 | V |
| | Peak Repetitive Surge Current (PW=1ms, 120pps) | I_{TSM} | 1 | A |
| | Junction Temperature | T_J | 125 | °C |
| | Collector Power Dissipation | P_C | 300 | mW |
| | Total Power Dissipation | P_{tot} | 330 | mW |
| 1. | Isolation Voltage | V_{iso} | 5000 | V_{rms} |
| | Operating Temperature | T_{opr} | -40 ~ +100 | °C |
| | Storage Temperature | T_{stg} | -55 ~ +150 | °C |
| 2. | Soldering Temperature | T_{sol} | 260 | °C |

1. AC For 1 Minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

- (1) Short between anode and cathode on the primary side and between collector and emitter on the secondary side.
- (2) The isolation voltage tester with zero-cross circuit shall be used.
- (3) The waveform of applied voltage shall be a sine wave.

2. For 10 Seconds

Photocoupler MOC305X series

4.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Test Condition | |
|-----------|--|------------------|-----------------|------|------|------------------|------------------------------------|----------------------------|
| Input | Forward Voltage | V_F | — | 1.15 | 1.5 | V | $I_F=20\text{mA}$ | |
| | Reverse Current | I_R | — | 0.05 | 10 | μA | $V_R=6\text{V}$ | |
| Output | 1 Peak Blocking Current, Either Direction | I_{DRM} | — | 10 | 100 | nA | $V_{\text{DRM}} = 600\text{V}$ | |
| | Peak On-State Voltage, Either Direction | V_{TM} | — | 1.7 | 3.0 | V | $I_{\text{TM}}=100\text{ mA Peak}$ | |
| | 2 Critical rate of Rise of Off-State Voltage | dv/dt | 1000 | — | — | V/ μs | $V_{\text{in}}=240\text{Vrms}$ | |
| Couple | 3 Led Trigger Current, Current Required to Latch Output, | MOC3050 | I_{FT} | — | — | 30 | mA | Main Terminal Voltage = 3V |
| | | MOC3051 | | — | — | 15 | | |
| | | MOC3052 | | — | — | 10 | | |
| | | MOC3053 | | — | — | 5 | | |
| | Holding Current, Either Direction | I_H | — | 200 | — | μA | | |

*1. Test voltage must be applied within dv/dt rating.

*2. This is static dv/dt . Commutating dv/dt is a function of the load-driving thyristor(s) only.

*3. All devices are guaranteed to trigger at an I_F value less than or equal to max I_{FT} . Therefore, recommended operating I_F lies between max I_{FT} , 30 mA for MOC3050, 15 mA for MOC3051, 10 mA for MOC3052, 5 mA for MOC3053, and absolute max I_F (50mA)

Photocoupler MOC305X series

5. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

Fig.1 Forward Current vs. Ambient Temperature

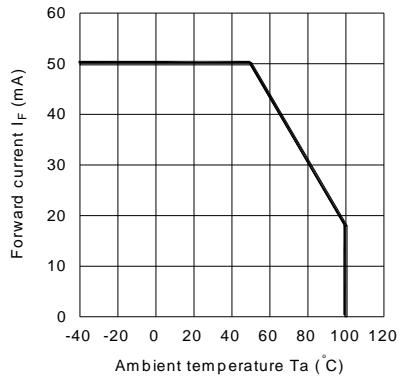


Fig.2 On-state Current vs. Ambient Temperature

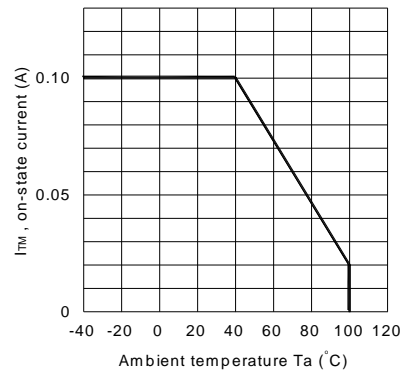


Fig.3 Minimum Trigger Current vs. Ambient Temperature

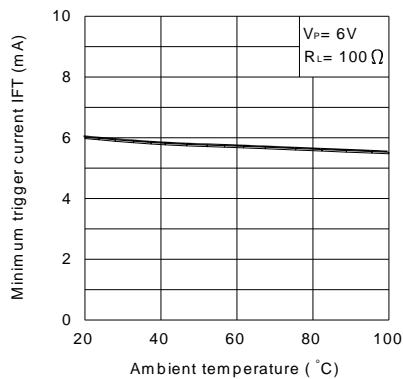


Fig.4 Forward Current vs. Forward Voltage

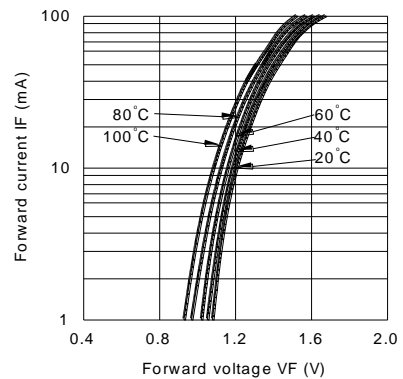


Fig.5 On-state Voltage vs. Ambient Temperature

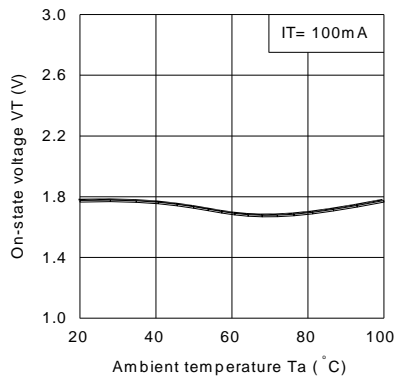
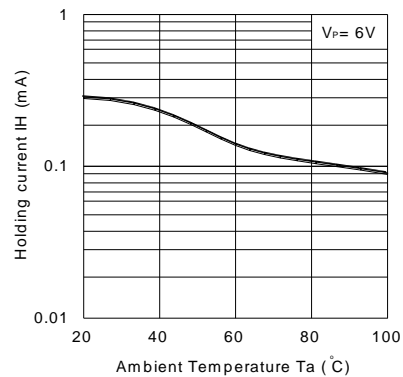


Fig.6 Holding Current vs. Ambient Temperature



Photocoupler MOC305X series

Fig.7 Repetitive Peak Off-state Current vs. Temperature

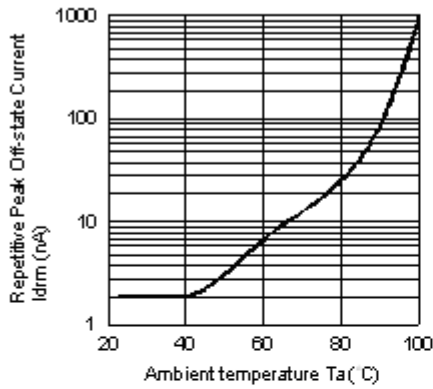
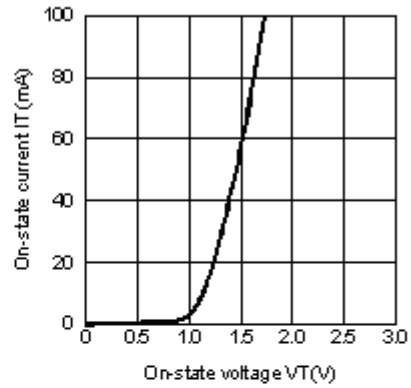
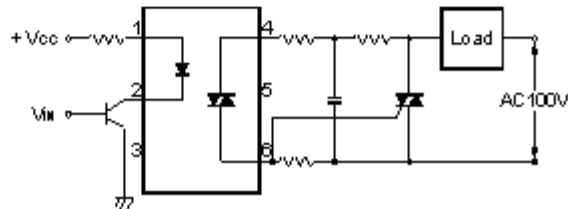


Fig.8 On-state Current vs. On-state Voltage



Basic Operation Circuit
Medium/High Power Triac Drive Circuit



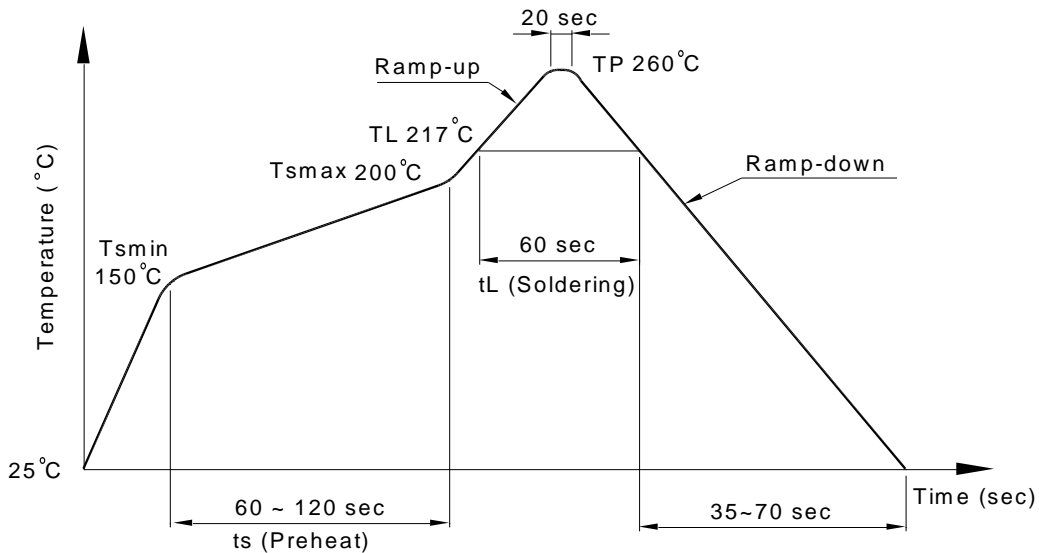
Photocoupler MOC305X series

6. TEMPERATURE PROFILE OF SOLDERING

6.1 IR Reflow soldering (JEDEC-STD-020C compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

| Profile item | Conditions |
|----------------------------------|----------------|
| Preheat | |
| - Temperature Min (T_{Smin}) | 150°C |
| - Temperature Max (T_{Smax}) | 200°C |
| - Time (min to max) (ts) | 90±30 sec |
| Soldering zone | |
| - Temperature (T_L) | 217°C |
| - Time (t_L) | 60 sec |
| Peak Temperature (T_P) | 260°C |
| Ramp-up rate | 3°C / sec max. |
| Ramp-down rate | 3~6°C / sec |



**Photocoupler
MOC305X series**

6.2 Wave soldering (JEDEC22A111 compliant)

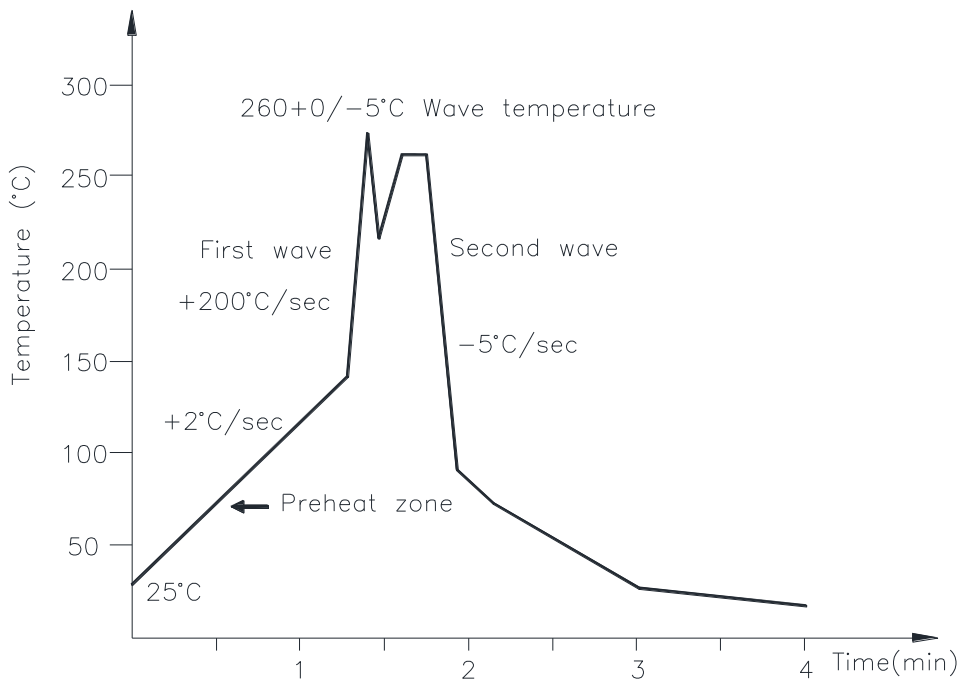
One time soldering is recommended within the condition of temperature.

Temperature: $260 \pm 0 / -5^{\circ}\text{C}$

Time: 10 sec.

Preheat temperature: 25 to 140°C

Preheat time: 30 to 80 sec.



6.3 Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

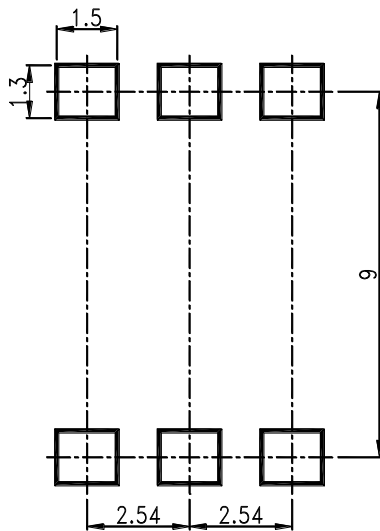
Temperature: $380 \pm 0 / -5^{\circ}\text{C}$

Time: 3 sec max.

**Photocoupler
MOC305X series**

7. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



**Photocoupler
MOC305X series**

8. NAMING RULE

MOC305(X)(1)-(2)

DEVICE PART NUMBER (MOC305X)

Please refer to Electrical Optical Characteristics Table on Page P5

(1) FORM TYPE (S, M or none)

(2) TAPING TYPE (TA, TA1)

Example : MOC3051S-TA1

MOC305(X)(1)(2)-V

DEVICE PART NUMBER (MOC305X)

Please refer to Electrical Optical Characteristics Table on Page P5

(1) FORM TYPE (S, M or none)

(2) TAPING TYPE (TA, TA1)

(3) VDE option

Example : MOC3051STA1-V

9. NOTES

- LiteOn is continually improving the quality, reliability, function or design and LiteOn reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- When requiring a device for any "specific" application, please contact our sales in advice.
- If there are any questions about the contents of this publication, please contact us at your convenience.
- The contents described herein are subject to change without prior notice.
- Immerge unit's body in solder paste is not recommended.

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