

Photocoupler MOC308X series

1. DESCRIPTION

1.1 Features

- Isolation voltage between input and output V_{iso} : 5,000V_{rms}
- 6pin DIP zero-cross photocoupler, triac driver output
- High repetitive peak off-state voltage VDRM : Min. 800V
- High critical rate of rise of off-state voltage(dV/dt : MIN. 1000V / μ s)
- Dual-in-line package : MOC3081 / MOC3082 /MOC3083
- Wide lead spacing package : MOC3081M / MOC3082M /MOC3083M
- Surface mounting package : MOC3081S / MOC3082S /MOC3083S
- Tape and reel packaging : MOC3081S-TA / MOC3082S-TA / MOC3083S-TA
MOC3081S-TA1 / MOC3082S-TA1 / MOC3083S-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
- Halogen free option

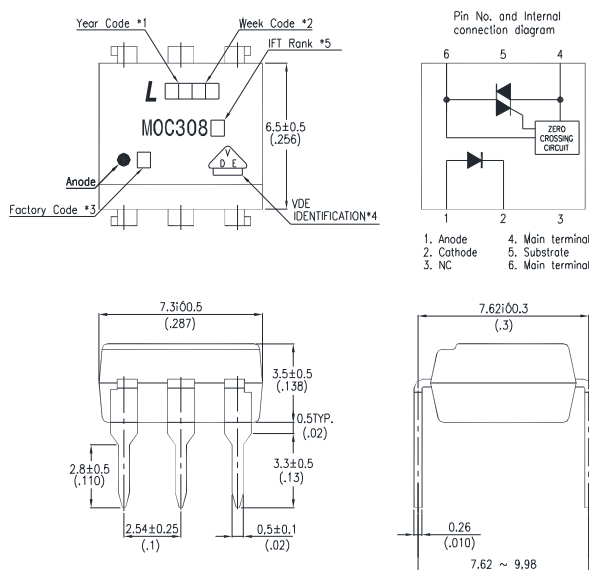
1.2 Applications

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

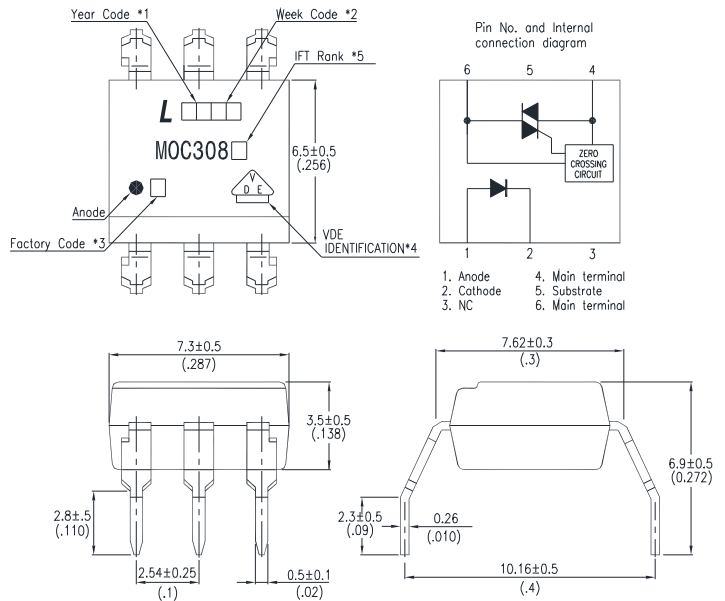
Photocoupler MOC308X series

2. PACKAGE DIMENSIONS

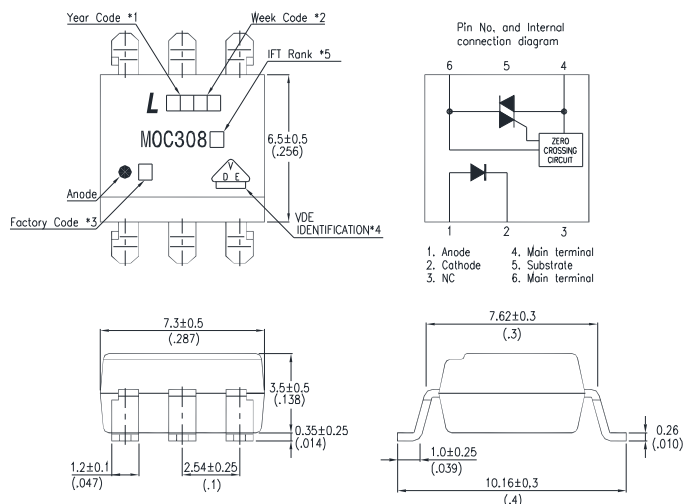
2.1 MOC308X



2.2 MOC308XM



2.3 MOC308XS



Notes :

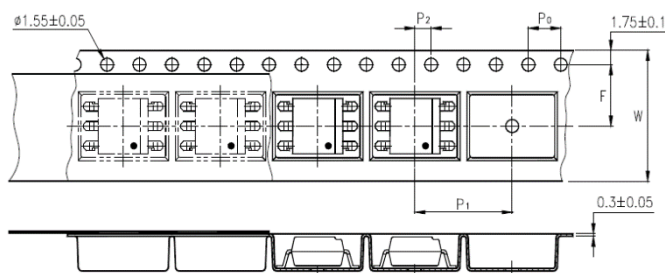
1. 2-digit year code, example : 2016 = 16
2. 2-digit work week ranging from '01' to '53'
3. Factory identification mark shall be marked (W: China-CZ, Y: Thailand)
4. VDE option
5. I_{FT} rank

* Dimensions are in Millimeters and (Inches).

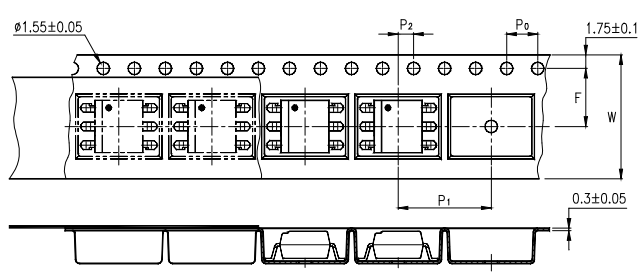
Photocoupler MOC308X series

3. TAPING DIMENSIONS

3.1 MOC308XS-TA



3.2 MOC308XS-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 | MOC308XS series |
|------------------|-----------------|
| Quantities (pcs) | 1000 |

Photocoupler MOC308X 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 | 120 | mW |
| Output | Off-State Output Terminal Voltage | V_{DRM} | 800 | V |
| | On-State RMS Current | $I_{D(RMS)}$ | 100 | mA |
| | Peak Repetitive Surge Current (PW=1ms, 120pps) | I_{TSM} | 1 | A |
| | Junction Temperature | T_J | 125 | °C |
| | Output Power Dissipation | P_O | 300 | mW |
| | Total Power Dissipation | P_{tot} | 330 | mW |
| 1. | Isolation Voltage | V_{iso} | 5000 | V_{rms} |
| | Operating Temperature | T_{opr} | -40 ~ +110 | °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 MOC308X series

4.2 Recommended Operating Conditions (Note)

| Characteristics | | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------|---------|-----------|------|------|------|------|
| Supply Voltage | | V_{AC} | - | - | 480 | Vac |
| Forward Current | MOC3081 | I_F | 22.5 | 25 | 30 | mA |
| | MOC3082 | | 15 | 20 | 30 | mA |
| | MOC3083 | | 7.5 | 10 | 30 | mA |
| Operating Temperature | | T_{opr} | -25 | - | 85 | °C |

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device.

Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

Photocoupler MOC308X series

4.3 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

| Parameter | | | Symb | Min. | Typ. | Max. | Unit | Test Condition |
|---------------|---|--|-------------------|------|------|------|------------------|--|
| Input | Forward Voltage | | V_F | — | 1.2 | 1.4 | 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} | — | — | 500 | nA | $V_{\text{DRM}} = 800\text{V}$ |
| | | Peak On-State Voltage, Either Direction | V_{TM} | — | — | 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 | Led Trigger Current, Current Required to Latch Output, Either Direction | MOC3081 | I_{FT} | — | — | 15 | mA | Main Terminal Voltage = 3V |
| | | MOC3082 | | — | — | 10 | | |
| | | MOC3083 | | — | — | 5 | | |
| | Holding Current, Either Direction | | I_H | — | 200 | — | μA | |
| ZERO CROSSING | Inhibit Voltage | | V_{INH} | — | 5 | 20 | Volts | $I_F=\text{Rated } I_{\text{FT}}$, MT1-MT2 Voltage above which device will not trigger. |
| | Leakage in Inhibited State | | I_{DRM2} | — | — | 500 | μA | $I_F = \text{Rated } I_{\text{FT}}$, Rated V_{DRM} , Off State |

*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.

Photocoupler MOC308X series

5. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

Fig.1 Forward Current vs. Ambient Temperature

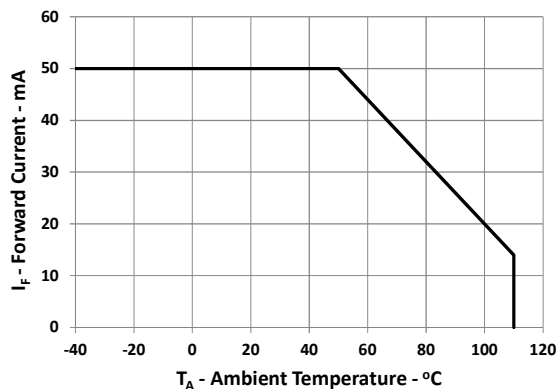


Fig.2 On-state Current vs. Ambient Temperature

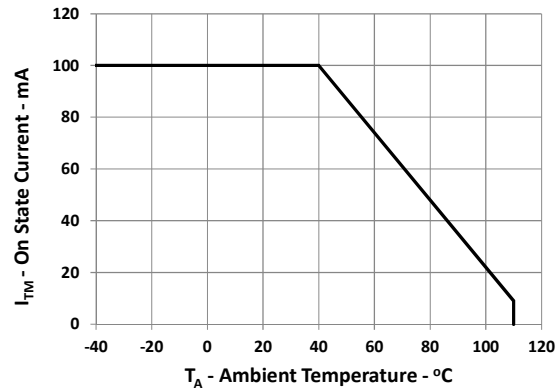


Fig.3 Normalized Trigger Current vs Ambient Temperature

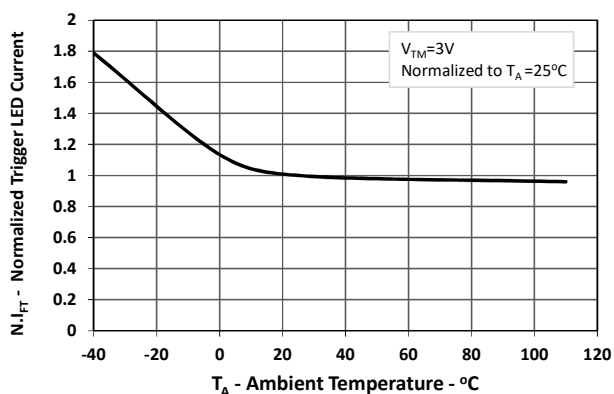


Fig.4 Forward Current vs. Forward Voltage

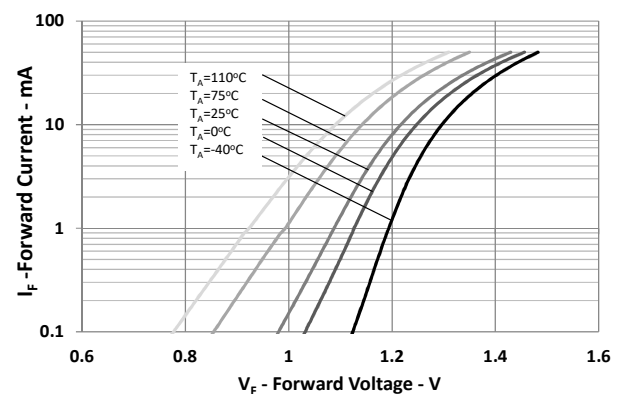


Fig.5 Normalized On-state Voltage vs Ambient Temperature

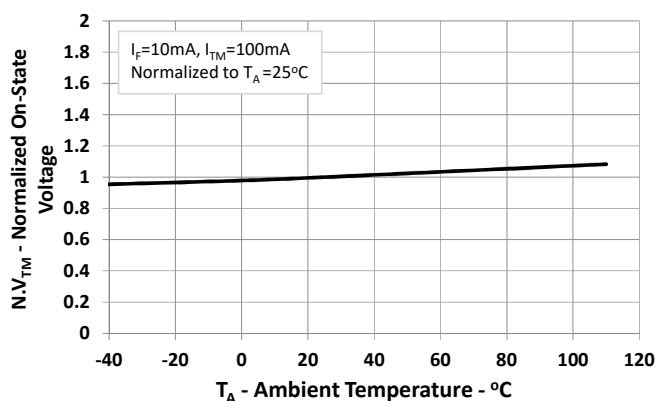
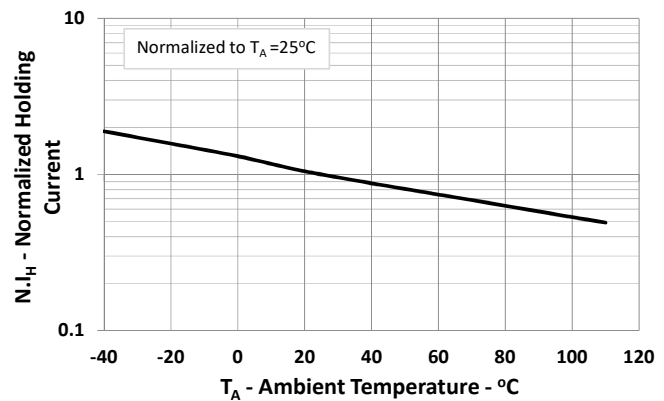


Fig.6 Normalized Holding Current vs Ambient Temperature



Photocoupler MOC308X series

Fig.7 Off-state Current vs
Ambient Temperature

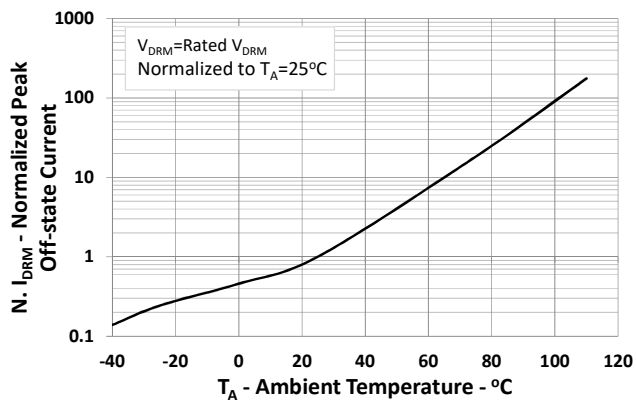


Fig.8 On-state Current vs
On-state Voltage

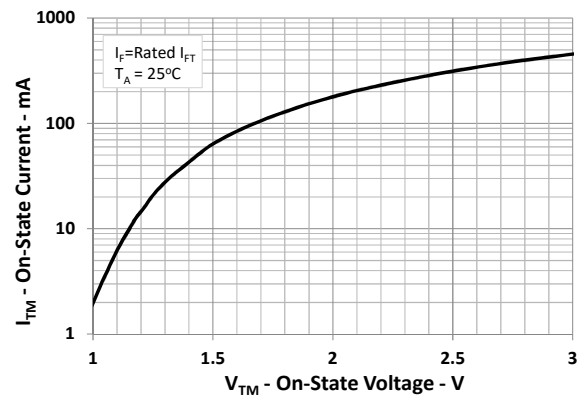
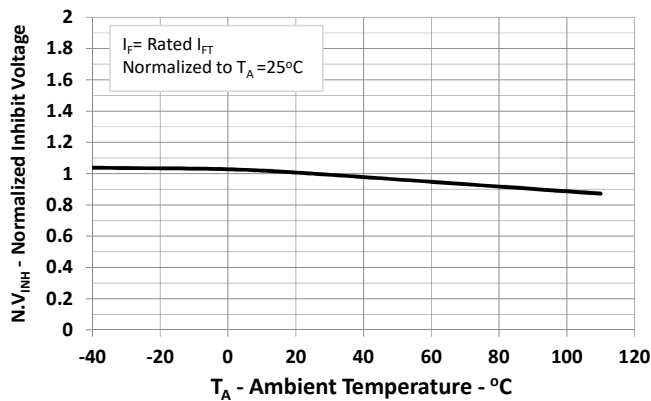


Fig.9 Inhibit Voltage vs
Ambient Temperature



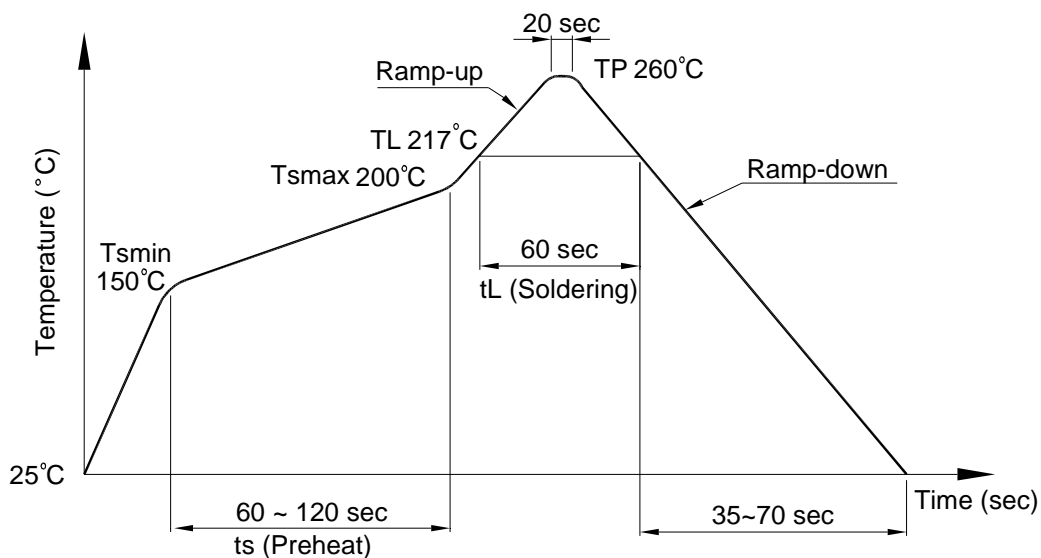
Photocoupler MOC308X series

6. TEMPERATURE PROFILE OF SOLDERING

6.1 IR Reflow soldering (JEDEC-STD-020E 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) (t_s) | 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 MOC308X series

6.2 Wave soldering (JEDEC22A111 compliant)

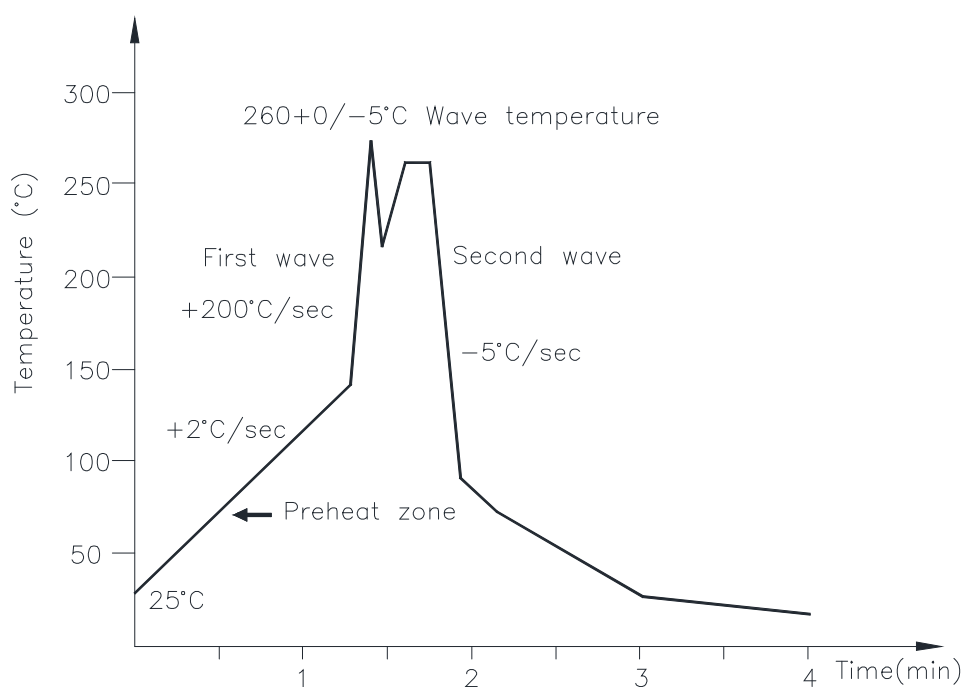
One time soldering is recommended within the condition of temperature.

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.

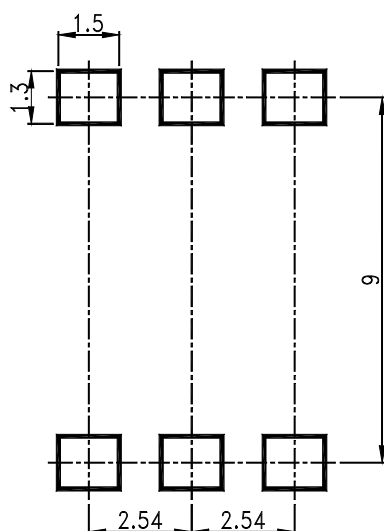
Temperature: $380 \pm 0/-5^{\circ}\text{C}$

Time: 3 sec max.

Photocoupler MOC308X series

7. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



Photocoupler MOC308X series

8. NAMING RULE

MOC308(X)(1)-(2)-G

DEVICE PART NUMBER (MOC308X)

Please refer to Electrical Optical
Characteristics Table on Page 6

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

(2) TAPING TYPE (TA, TA1)

(3) Halogen free

Example : MOC3061S-TA1-G

MOC308(X)(1)(2)-V-G

DEVICE PART NUMBER (MOC308X)

Please refer to Electrical Optical
Characteristics Table on Page 6

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

(2) TAPING TYPE (TA, TA1)

(3) VDE option

(4) Halogen free

Example : MOC3061STA1-V-G

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.