

## **FEATURES**

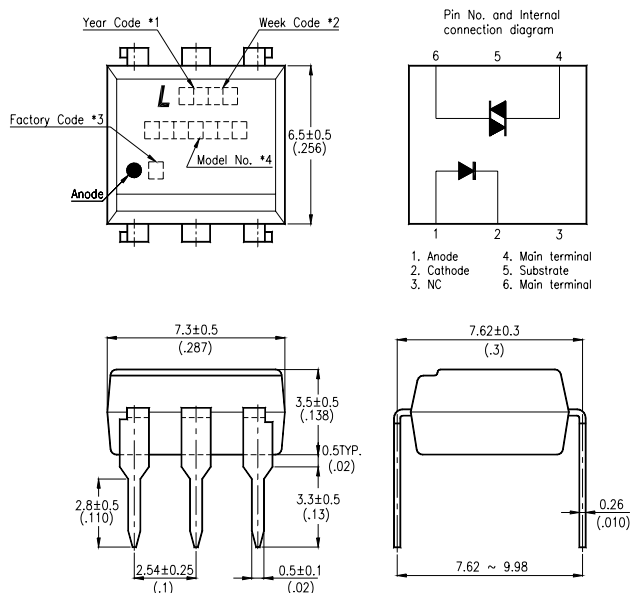
- \* Isolation voltage between input and output  $V_{iso} : 5,000V_{rms}$
- \* 6pin DIP photocoupler, triac driver output
- \* High repetitive peak off-state voltage  $V_{DRM} : \text{Min. } 400V$
- \* High critical rate of rise of off-state voltage  
(  $dV/dt : \text{MIN. } 100V / \mu s$  )
- \* Dual-in-line package :  
MOC3020, MOC3021, MOC3022, MOC3023
- \* Wide lead spacing package :  
MOC3020M, MOC3021M, MOC3022M, MOC3023M
- \* Surface mounting package :  
MOC3020S, MOC3021S, MOC3022S, MOC3023S
- \* Tape and reel packaging :  
MOC3020S-TA1, MOC3021S-TA1, MOC3022S-TA1, MOC3023S-TA1
- \* UL approved ( No. E113898 )
- \* CSA approved ( No. CA91533-1 )
- \* FIMKO approved ( No. 209049 )
- \* NEMKO approved ( No. P99102464 )
- \* DEMKO approved ( No. 99-04182 )
- \* SEMKO approved ( No. 9943380 / 01-20 )
- \* VDE approved (No. 094722 )

## **FEATURES**

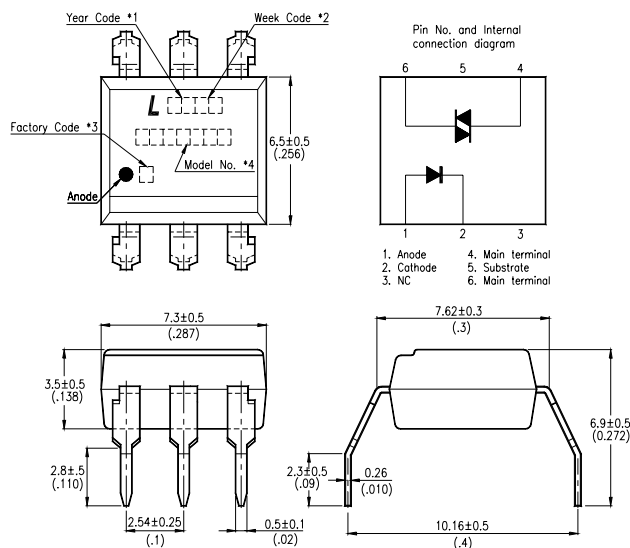
- \* Motor Controls
- \* Solid state relays
- \* For triggering high power thyristor and triac
- \* Household use equipment

## OUTLINE DIMENSIONS

### Dual-in-line package :



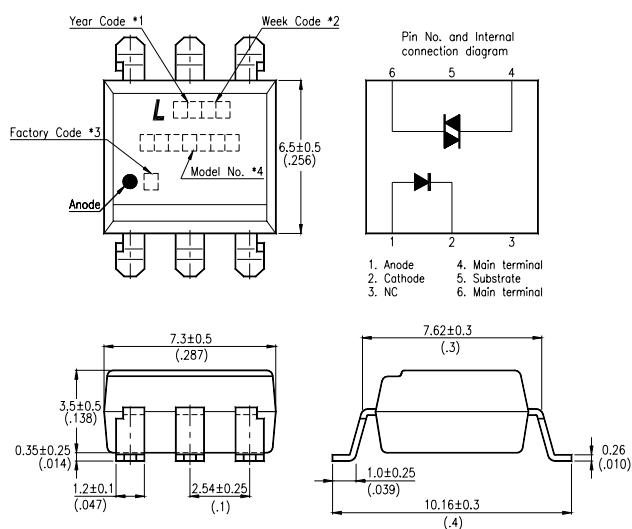
### Wide lead spacing package:



- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked (Z : Taiwan, Y : Thailand).
- \*4. Model No.: MOC3020, MOC3021, MOC3022, MOC3023

## OUTLINE DIMENSIONS

Surface mounting package :

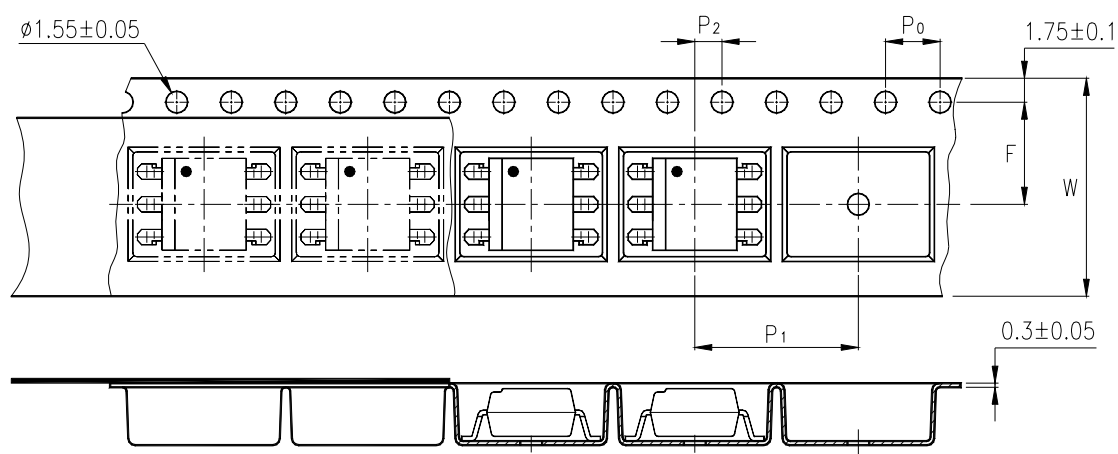


- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked (Z : Taiwan, Y : Thailand).
- \*4. Model No.: MOC3020, MOC3021, MOC3022, MOC3023

## TAPING DIMENSIONS

**Tape and reel package ( TYPE II ):**

**MOC3020S-TA1, MOC3021S-TA1, MOC3022S-TA1, MOC3023S-TA1**



| Description                            | Symbol | Dimensions in mm ( inches ) |
|----------------------------------------|--------|-----------------------------|
| Tape wide                              | W      | $16 \pm 0.3$ ( .63 )        |
| Pitch of sprocket holes                | $P_0$  | $4 \pm 0.1$ ( .15 )         |
| Distance of compartment                | F      | $7.5 \pm 0.1$ ( .295 )      |
| Distance of compartment to compartment | $P_1$  | $12 \pm 0.1$ ( .472 )       |

**ABSOLUTE MAXIMUM RATING**

( Ta = 25°C )

| PARAMETER                           |                                                     | SYMBOL           | RATING     | UNIT             |
|-------------------------------------|-----------------------------------------------------|------------------|------------|------------------|
| INPUT                               | Forward Current                                     | I <sub>F</sub>   | 50         | mA               |
|                                     | Reverse Voltage                                     | V <sub>R</sub>   | 6          | V                |
|                                     | Power Dissipation                                   | P <sub>D</sub>   | 70         | mW               |
| OUTPUT                              | Off-State Output Terminal Voltage                   | V <sub>DRM</sub> | 400        | V                |
|                                     | Peak Repetitive Surge Current<br>( PW=1ms, 120pps ) | V <sub>TSM</sub> | 1          | A                |
|                                     | Collector Power Dissipation                         | P <sub>C</sub>   | 300        | mW               |
| Total Power Dissipation             |                                                     | P <sub>tot</sub> | 330        | mW               |
| *1 Isolation Voltage                |                                                     | V <sub>iso</sub> | 5,000      | V <sub>rms</sub> |
| Ambient Operating Temperature Range |                                                     | T <sub>A</sub>   | -40 ~ +100 | °C               |
| Storage Temperature Range           |                                                     | T <sub>stg</sub> | -55 ~ +150 | °C               |
| *2 Soldering Temperature            |                                                     | T <sub>L</sub>   | 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, 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

## ELECTRICAL - OPTICAL CHARACTERISTICS

( Ta = 25°C )

| PARAMETER |                                                                            |         | SYMBOL           | MIN. | TYP. | MAX. | UNIT | CONDITIONS                                          |
|-----------|----------------------------------------------------------------------------|---------|------------------|------|------|------|------|-----------------------------------------------------|
| INPUT     | Forward Voltage                                                            |         | V <sub>F</sub>   | —    | 1.15 | 1.5  | V    | I <sub>F</sub> =20mA                                |
|           | Reverse Current                                                            |         | I <sub>R</sub>   | —    | —    | 10   | μA   | V <sub>R</sub> =6V                                  |
| OUTPUT    | *1 Peak Blocking Current, Either Direction                                 |         | I <sub>DRM</sub> | —    | 10   | 100  | nA   | V <sub>DRM</sub> = 400V                             |
|           | Peak On-State Voltage, Either Direction                                    |         | V <sub>TM</sub>  | —    | 1.7  | 3    | V    | I <sub>TM</sub> =100 mA Peak                        |
|           | *2 Critical rate of Rise of Off-State Voltage                              |         | dv/dt            | 100  | —    | —    | V/μs |                                                     |
| COUPLED   | *3 Led Trigger Current, Current Required to Latch Output, Either Direction | MOC3020 | I <sub>FT</sub>  | —    | 15   | 30   | mA   | Main Terminal Voltage = 3V                          |
|           |                                                                            | MOC3021 |                  | —    | 8    | 15   |      |                                                     |
|           |                                                                            | MOC3022 |                  | —    | —    | 10   |      |                                                     |
|           |                                                                            | MOC3023 |                  | —    | —    | 5    |      |                                                     |
|           | Holding Current, Either Direction                                          |         | I <sub>H</sub>   | 100  | —    | —    | μA   |                                                     |
|           | Turn-On time                                                               |         | t <sub>on</sub>  | —    | 8    | 20   | μs   | V <sub>D</sub> =9V, I <sub>F</sub> =20mA<br>RL=100Ω |

\*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  $I_{\text{FT}}$ . Therefore, recommended operating  $I_F$  lies between max  $I_{\text{FT}}$  30 mA and absolute max  $I_F$  (50mA)

## CHARACTERISTICS CURVES

Fig.1 Forward Current vs. Ambient Temperature

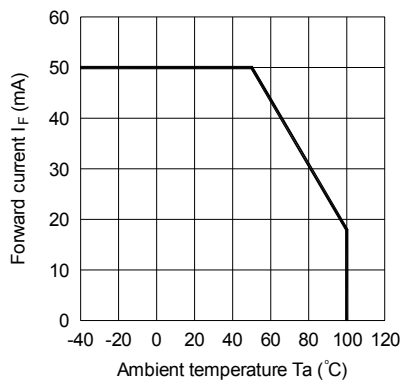


Fig.2 On-state Current vs. Ambient Temperature

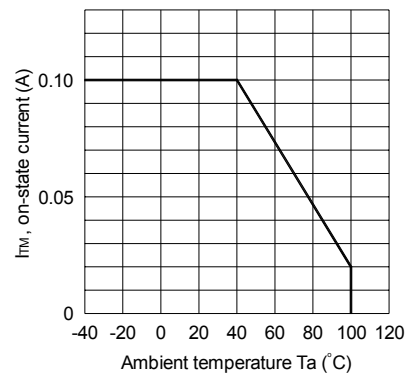


Fig.3 Minimum Trigger Current vs. Ambient Temperature

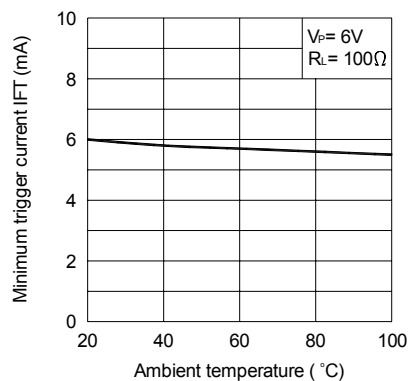


Fig.4 Forward Current vs. Forward Voltage

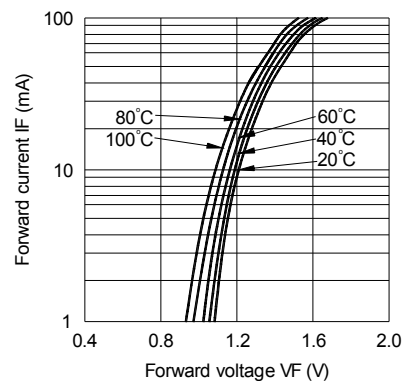


Fig.5 On-state Voltage vs. Ambient Temperature

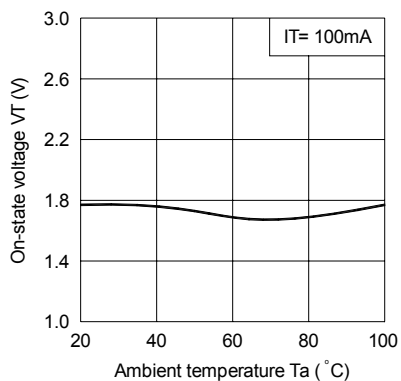
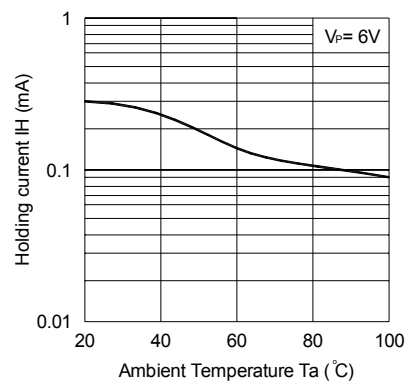


Fig.6 Holding Current vs. Ambient Temperature



## CHARACTERISTICS CURVES

Fig.7 Turn-on Time vs. Forward Current

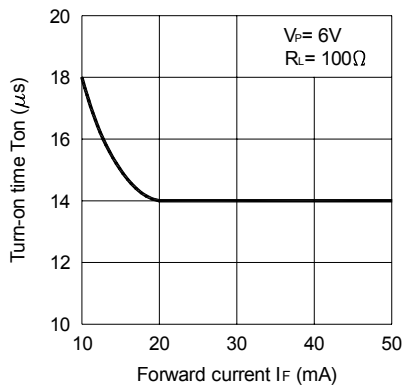


Fig.8 Repetitive Peak Off-state Current vs. Temperature

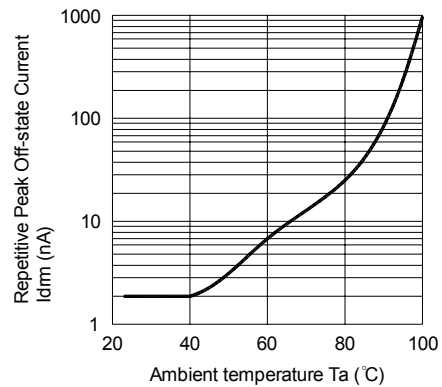
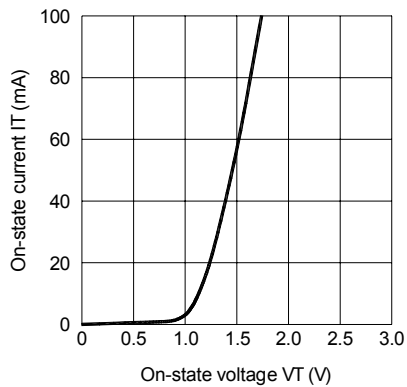
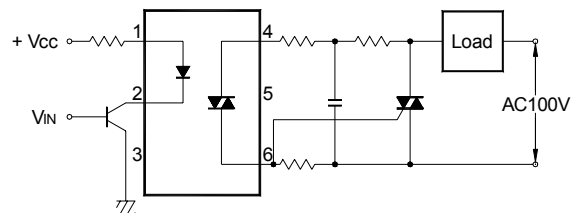


Fig.9 On-state Current vs. On-state Voltage



Basic Operation Circuit  
Medium/High Power Triac Drive Circuit



## RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

