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
  \[ \frac{dV}{dt} : \text{MIN. 100V / } \mu \text{s} \]
* 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
* Safety approval
  UL / CSA / FIMKO / VDE* approved
* Required “V” ordering option

APPLICATIONS

* 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, X : China-TJ, W : China-CZ)
*4. Model No.: MOC3020 ; MOC3021 ; MOC3022 ; MOC3023

Part No. : MOC3020 thru MOC3023 SERIES
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, X : China-TJ, W : China-CZ)
*4. Model No.: MOC3020 ; MOC3021 ; MOC3022 ; MOC3023

Part No. : MOC3020 thru MOC3023 SERIES  Page : 3 of 9
BNS-OD-C131/A4
TAPING DIMENSIONS

Tape and reel package (TYPE II):
MOC3020S-TA1, MOC3021S-TA1, MOC3022S-TA1, MOC3023S-TA1

<table>
<thead>
<tr>
<th>Description</th>
<th>Symbol</th>
<th>Dimensions in mm (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape wide</td>
<td>W</td>
<td>16 ± 0.3 (.63)</td>
</tr>
<tr>
<td>Pitch of sprocket holes</td>
<td>P₀</td>
<td>4 ± 0.1 (.15)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td>F</td>
<td>7.5 ± 0.1 (.295)</td>
</tr>
<tr>
<td>Distance of compartment to compartment</td>
<td>P₁</td>
<td>12 ± 0.1 (.472)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td>P₂</td>
<td>2 ± 0.1 (.079)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td></td>
<td>1.75 ± 0.1</td>
</tr>
<tr>
<td>Tape wide</td>
<td></td>
<td>16 ± 0.3 (.63)</td>
</tr>
<tr>
<td>Pitch of sprocket holes</td>
<td></td>
<td>4 ± 0.1 (.15)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td></td>
<td>7.5 ± 0.1 (.295)</td>
</tr>
<tr>
<td>Distance of compartment to compartment</td>
<td></td>
<td>12 ± 0.1 (.472)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td></td>
<td>2 ± 0.1 (.079)</td>
</tr>
<tr>
<td>Distance of compartment</td>
<td></td>
<td>1.75 ± 0.1</td>
</tr>
</tbody>
</table>

Part No.: MOC3020 thru MOC3023 SERIES
Page: 4 of 9
### ABSOLUTE MAXIMUM RATING

(\( Ta = 25^\circ C \) )

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>RATING</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Current</td>
<td>( I_F )</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>( V_R )</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>( P_D )</td>
<td>70</td>
<td>mW</td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off-State Output Terminal Voltage</td>
<td>( V_{DRM} )</td>
<td>400</td>
<td>V</td>
</tr>
<tr>
<td>Peak Repetitive Surge Current (^{\text{1}})</td>
<td>( V_{TSM} )</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>Collector Power Dissipation</td>
<td>( P_C )</td>
<td>300</td>
<td>mW</td>
</tr>
<tr>
<td>Total Power Dissipation</td>
<td>( P_{tot} )</td>
<td>330</td>
<td>mW</td>
</tr>
<tr>
<td><strong>(^{\text{1}}) Isolation Voltage</strong></td>
<td>( V_{iso} )</td>
<td>5,000</td>
<td>Vrms</td>
</tr>
<tr>
<td>Ambient Operating Temperature Range</td>
<td>( T_A )</td>
<td>-40 ~ +100</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>( T_{stg} )</td>
<td>-55 ~ +150</td>
<td>°C</td>
</tr>
<tr>
<td><strong>(^{\text{2}}) Soldering Temperature</strong></td>
<td>( T_L )</td>
<td>260</td>
<td>°C</td>
</tr>
</tbody>
</table>

\(^{\text{1}}\) 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.

\(^{\text{2}}\) For 10 Seconds
### ELECTRICAL - OPTICAL CHARACTERISTICS

( $T_a = 25^\circ C$ )

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
<th>CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>$V_F$</td>
<td>—</td>
<td>1.15</td>
<td>1.5</td>
<td>V</td>
<td>$I_F=20mA$</td>
</tr>
<tr>
<td>Reverse Current</td>
<td>$I_R$</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>$\mu A$</td>
<td>$V_R=6V$</td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*1 Peak Blocking Current, Either Direction</td>
<td>$I_{DRM}$</td>
<td>—</td>
<td>10</td>
<td>100</td>
<td>$nA$</td>
<td>$V_{DRM} = 400V$</td>
</tr>
<tr>
<td>Peak On-State Voltage, Either Direction</td>
<td>$V_{TM}$</td>
<td>—</td>
<td>1.7</td>
<td>3</td>
<td>V</td>
<td>$I_{TM}=100mA$ Peak</td>
</tr>
<tr>
<td>*2 Critical rate of Rise of Off-State Voltage</td>
<td>$dv/dt$</td>
<td>100</td>
<td>—</td>
<td>—</td>
<td>V/$\mu s$</td>
<td></td>
</tr>
<tr>
<td><strong>COUPLED</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*3 Led Trigger Current, Current Required to Latch Output, Either Direction</td>
<td>MOC3020</td>
<td>—</td>
<td>15</td>
<td>30</td>
<td>mA</td>
<td>Main Terminal Voltage = 3V</td>
</tr>
<tr>
<td></td>
<td>MOC3021</td>
<td>—</td>
<td>8</td>
<td>15</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOC3022</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOC3023</td>
<td>—</td>
<td>—</td>
<td>5</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>Holding Current, Either Direction</td>
<td>$I_H$</td>
<td>250</td>
<td>—</td>
<td>—</td>
<td>$\mu A$</td>
<td></td>
</tr>
</tbody>
</table>

*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 MOC3020, 15 mA for MOC3021, 10 mA for MOC3022, 5 mA for MOC3023, 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

Ambient temperature Ta (°C)

Forward current I_F (mA)

On-state current I_{on} (A)

Forward current I_F (mA)

On-state voltage V_T (V)

Minimum trigger current I_{FT} (mA)

Forward voltage V_F (V)

Holding current I_H (mA)

Part No. : MOC3020 thru MOC3023 SERIES
CHARACTERISTICS CURVES

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

RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm
Notes:

- Lite-On is continually improving the quality, reliability, function or design and Lite-On 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.
Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Lite-On:
- MOC3023S
- MOC3021S
- MOC3022S
- MOC3020S
- MOC3021
- MOC3020
- MOC3022
- MOC3023
- MOC3020S-TA
- MOC3020S-TA1
- MOC3021S-TA
- MOC3021S-TA1
- MOC3022S-TA
- MOC3022S-TA1
- MOC3023S-TA
- MOC3023S-TA1
- MOC3020M
- MOC3021M
- MOC3022M
- MOC3023M