



# Photocoupler

## Product Data Sheet

### MOC3052-A SERIES

Spec No.: DS70-2007-0020

Effective Date: 04/30/2015

Revision: C

**LITE-ON DCC**

**RELEASE**

BNS-OD-FC001/A4

## Photocouplers MOC3052-A

### 1. DESCRIPTION

#### 1.1 Features

- Isolation voltage between input and output  $V_{iso} : 5,000V_{rms}$
- 5pin 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 : MOC3052-A
- Safety approval
  - UL 1577
  - VDE DIN EN60747-5-5 (VDE 0884-5)
  - CSA CA5A
  - CQC GB4943.1-2011/ GB8898-2011 (meet Altitude up to 5000m)
  - FIMKO
- RoHS Compliance
  - All materials be used in device are followed EU RoHS directive (No.2002/95/EC).
- MSL class1

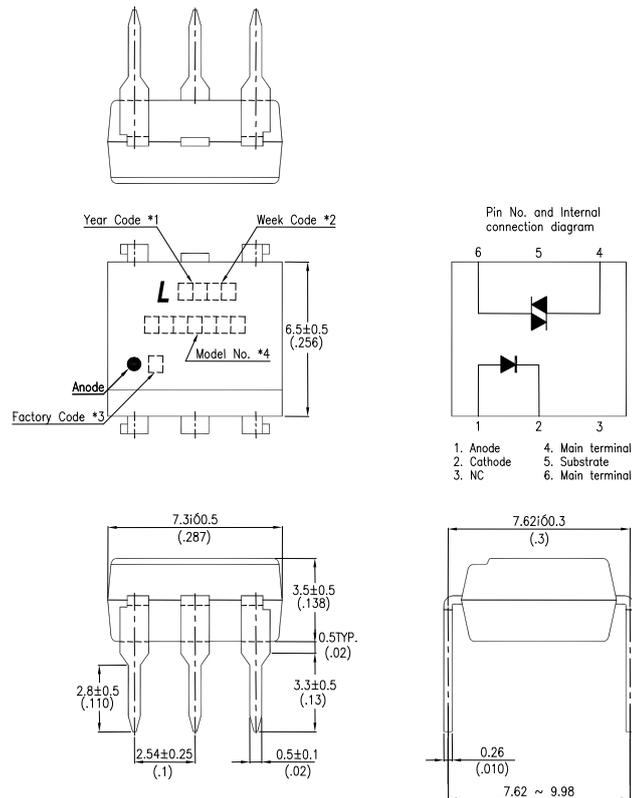
#### 1.2 Applications

- Incandescent Lamp Dimmers
- Interfacing Microprocessors to 115 and 240 Vac Peripherals
- Lamp Ballasts
- Motor Controls
- Solid State Relays
- Static AC Power Switch
- Solenoid / Valve Controls
- Temperature Controls

## Photocouplers MOC3052-A

### 2. PACKAGE DIMENSIONS

#### 2.1 MOC3052-A :



#### Notes :

1. Year date code.
2. 2-digit work week.
3. Factory identification mark shall be marked (W: China-CZ, X: China-TJ, Y: Thailand)
4. Model No.: MOC3052-A

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**3. RATING AND CHARACTERISTICS**

**3.1 Absolute Maximum Ratings at Ta=25°C**

	Parameter	Symbol	Rating	Unit
Input	Forward Current	$I_F$	50	mA
	Reverse Voltage	$V_R$	6	V
	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
	Collector Power Dissipation	$P_C$	300	mW
	Total Power Dissipation	$P_{tot}$	330	mW
1.	Isolation Voltage	$V_{iso}$	5000	$V_{rms}$
	Operating Temperature	$T_{opr}$	-50 ~ +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

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### 3.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

Parameter		Symbol	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	$\mu\text{A}$	$V_R=6\text{V}$
Output	1 Peak Blocking Current, Either Direction	$I_{DRM}$	—	—	100	nA	$V_{DRM} = 600\text{V}$
	Peak On-State Voltage, Either Direction	$V_{TM}$	—	—	3.0	V	$I_{TM}=100\text{ mA Peak}$
	2 Critical rate of Rise of Off-State Voltage	$dv/dt$	1000	—	—	$\text{V}/\mu\text{s}$	$V_{in}=240\text{Vrms}$ , $T_a=85^\circ\text{C}$
Couple	3 Led Trigger Current, Current Required to Latch Output, Either Direction	$I_{FT}$	—	—	10	mA	Main Terminal Voltage = 3V
	Holding Current, Either Direction	$I_H$	—	400	—	$\mu\text{A}$	
	Isolation Resistance	$R_{ISO}$	$5 \times 10^{10}$	$1 \times 10^{11}$	—	$\Omega$	DC500V, 40 ~ 60% R.H.

\*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  $I_{FT}$  10 mA for MOC3052 and absolute max  $I_F$  (50mA)

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## 4. CHARACTERISTICS CURVES

Fig.1 Forward Current vs. Ambient Temperature

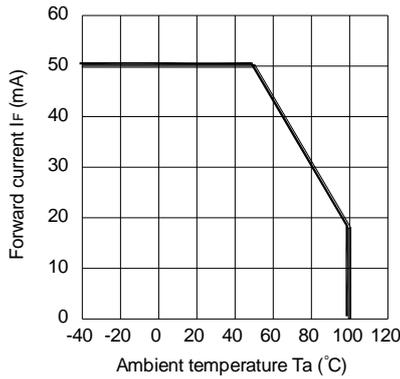


Fig.2 On-state Current vs. Ambient Temperature

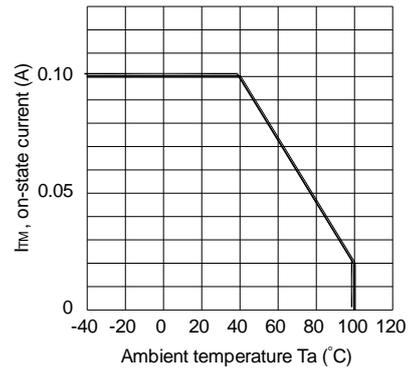


Fig.3 Minimum Trigger Current vs. Ambient Temperature

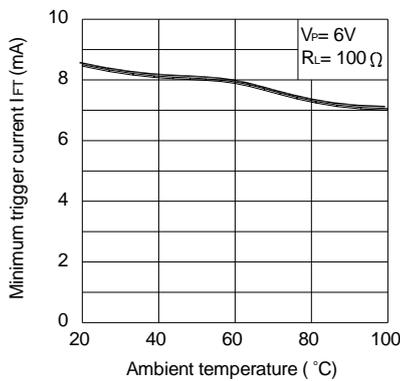


Fig.4 Forward Current vs. Forward Voltage

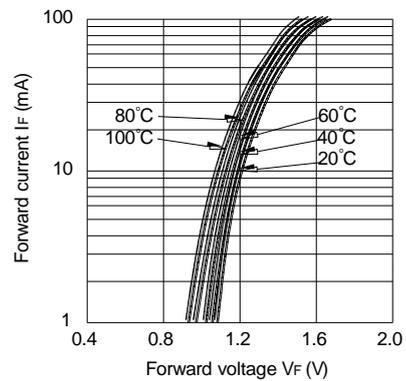


Fig.5 On-state Voltage vs. Ambient Temperature

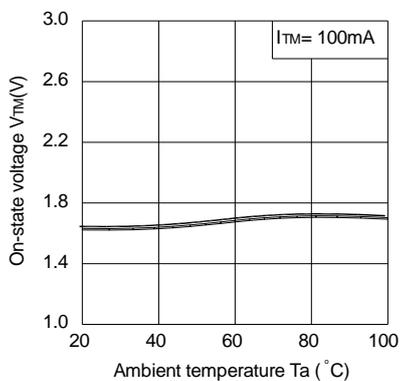
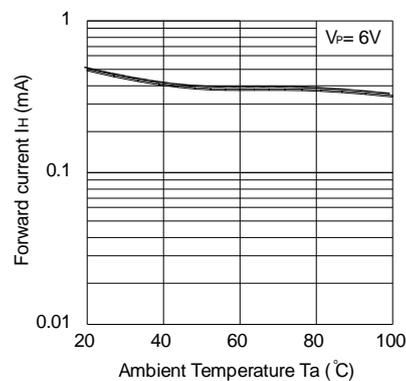


Fig.6 Holding Current vs. Ambient Temperature



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

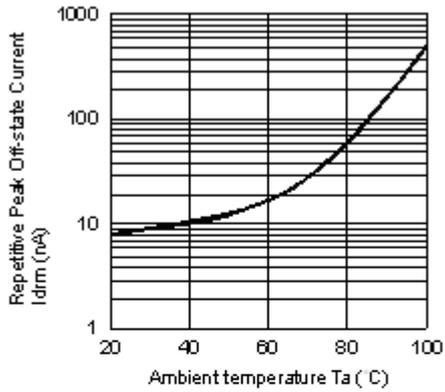
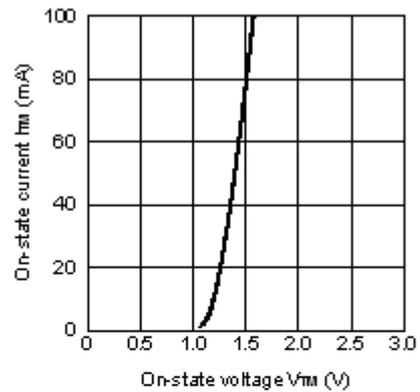
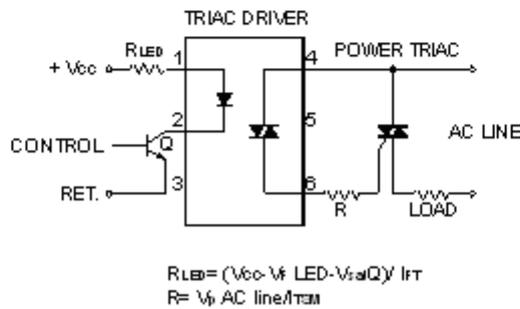


Fig. 8 On-state Current vs. On-state Voltage



### Basic Driver Circuit



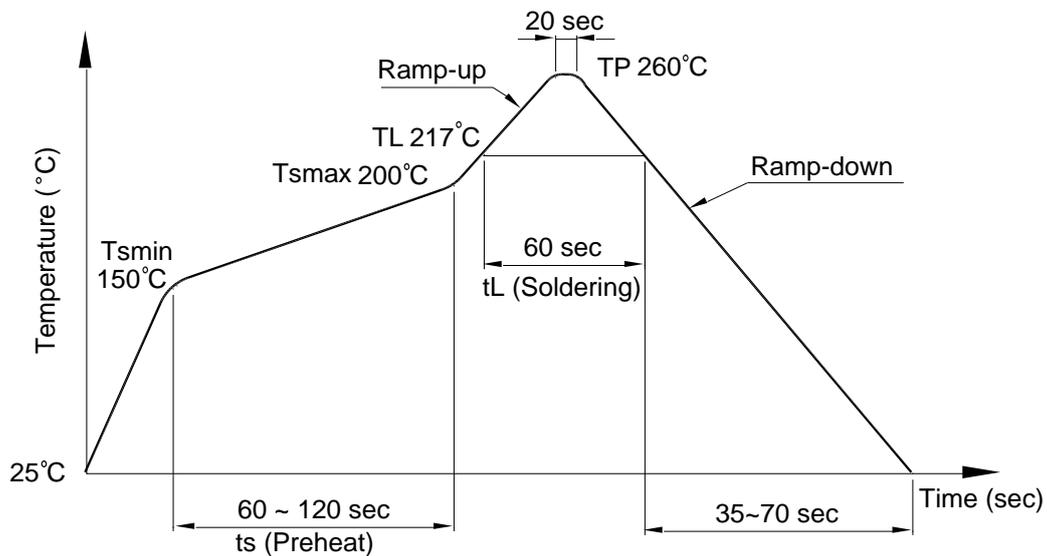
# Photocouplers MOC3052-A

## 5. TEMPERATURE PROFILE OF SOLDERING

### 5.1 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



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**5.2 Wave soldering (JEDEC22A111 compliant)**

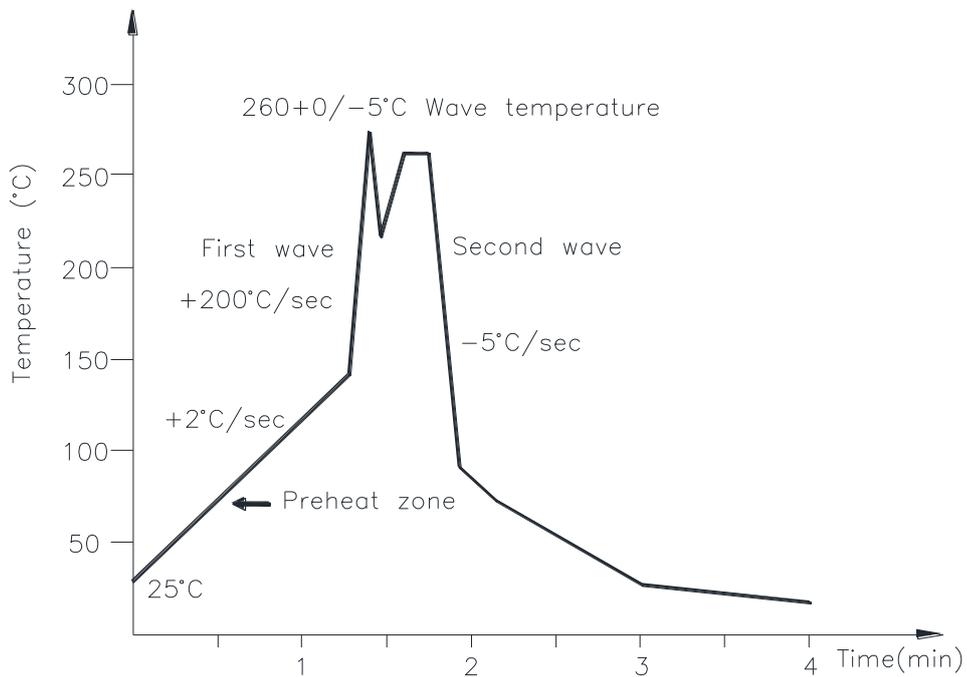
One time soldering is recommended within the condition of temperature.

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

Time: 10 sec.

Preheat temperature: 25 to  $140^\circ\text{C}$

Preheat time: 30 to 80 sec.



**5.3 Hand soldering by soldering iron**

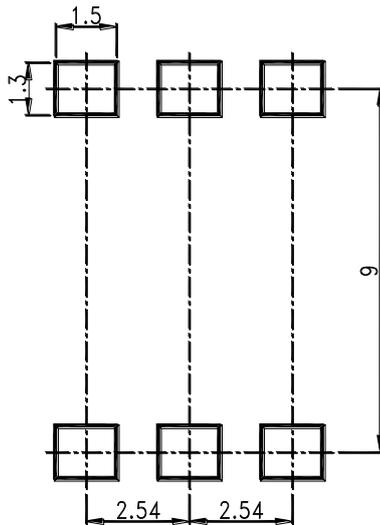
Allow single lead soldering in every single process. One time soldering is recommended.

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

Time: 3 sec max.

## 6. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



## 7. Notes:

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- When requiring a device for any "specific" application, please contact our sales in advice.
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- Immerge unit's body in solder paste is not recommended.

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