



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





# 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

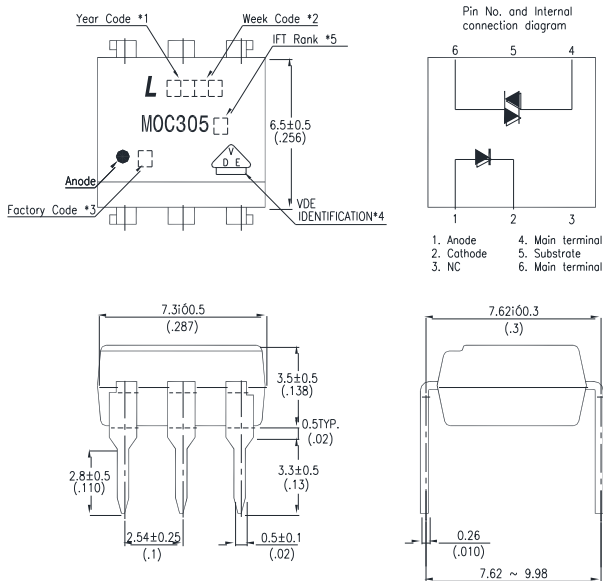
#### 1.2 Applications

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

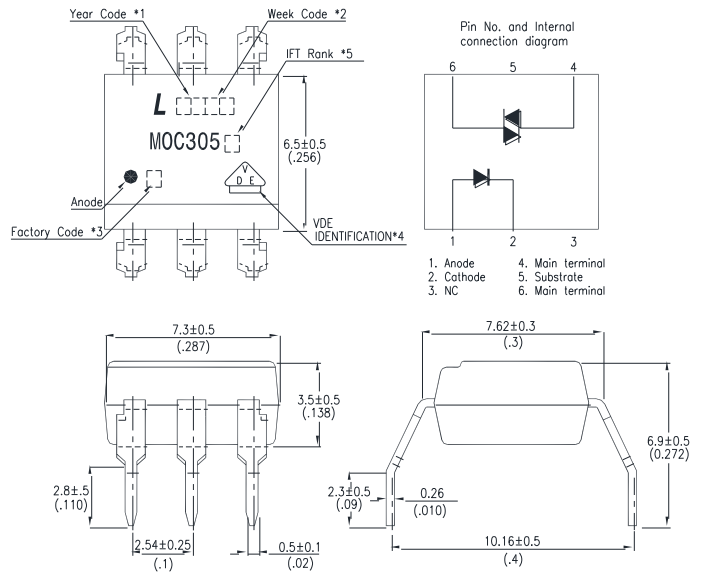
## Photocoupler MOC305X series

### 2. PACKAGE DIMENSIONS

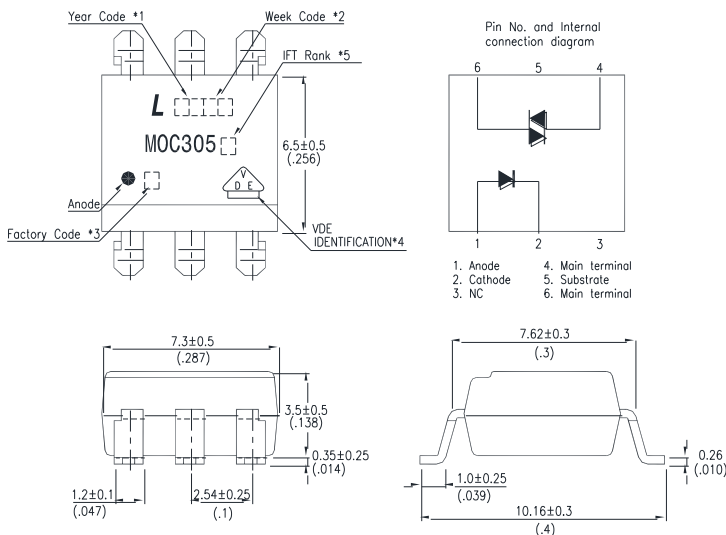
#### 2.1 MOC305X



#### 2.2 MOC305XM



#### 2.3 MOC305XS



#### Notes :

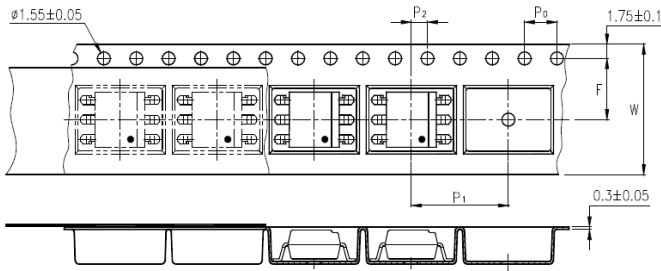
1. Year date code.
2. 2-digit work week.
3. Factory identification mark shall be marked (W: China-CZ, Y: Thailand)
4. VDE option
5. I<sub>FT</sub> rank

\* Dimensions are in Millimeters and (Inches).

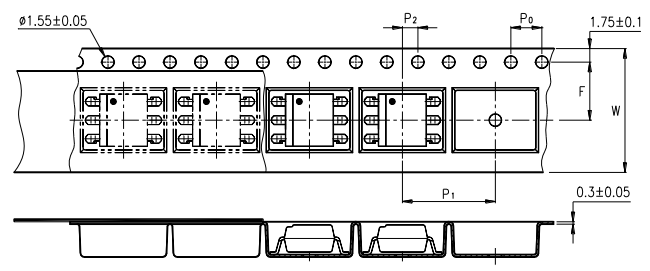
## Photocoupler MOC305X series

### 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 <sub>0</sub>	4±0.1 (0.15)
Distance of compartment	F	7.5±0.1 (0.295)
	P <sub>2</sub>	2±0.1 (0.079)
Distance of compartment to compartment	P <sub>1</sub>	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	$\mu\text{A}$	$V_R=6\text{V}$	
Output	1 Peak Blocking Current, Either Direction	$I_{\text{DRM}}$	—	10	100	nA	$V_{\text{DRM}} = 600\text{V}$	
	Peak On-State Voltage, Either Direction	$V_{\text{TM}}$	—	1.7	3.0	V	$I_{\text{TM}}=100\text{ mA Peak}$	
	2 Critical rate of Rise of Off-State Voltage	$dv/dt$	1000	—	—	$\text{V}/\mu\text{s}$	$V_{\text{in}}=240\text{Vrms}$	
Couple	3 Led Trigger Current, Current Required to Latch Output,	MOC3050	$I_{\text{FT}}$	—	—	30	mA	Main Terminal Voltage = 3V
		MOC3051		—	—	15		
		MOC3052		—	—	10		
		MOC3053		—	—	5		
	Holding Current, Either Direction	$I_H$	—	200	—	$\mu\text{A}$		

\*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 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

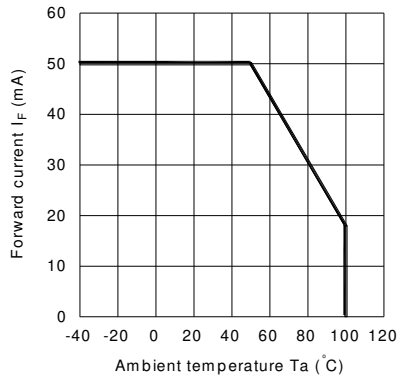


Fig.2 On-state Current vs. Ambient Temperature

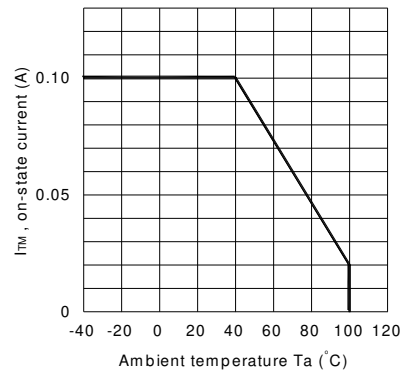


Fig.3 Minimum Trigger Current vs. Ambient Temperature

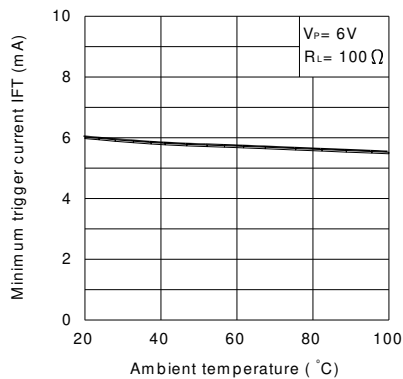


Fig.4 Forward Current vs. Forward Voltage

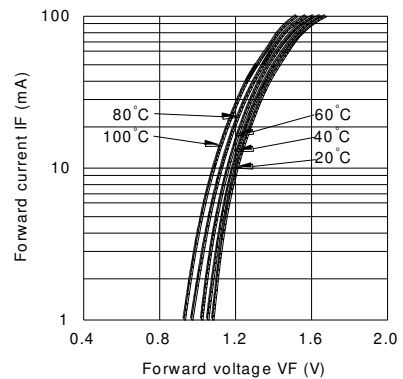


Fig.5 On-state Voltage vs. Ambient Temperature

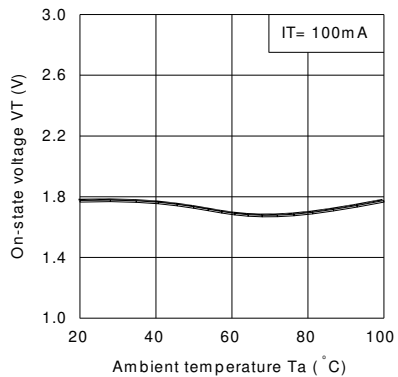
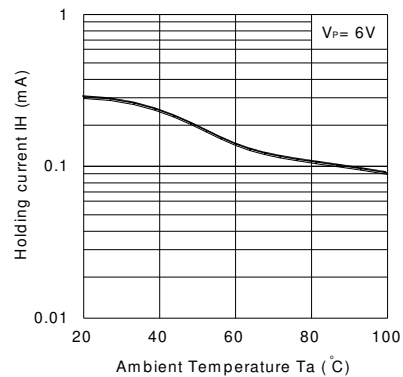


Fig.6 Holding Current vs. Ambient Temperature





## Photocoupler MOC305X series

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

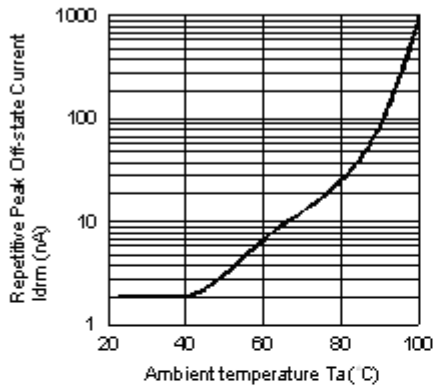
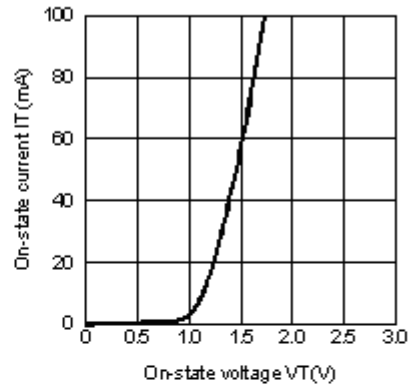
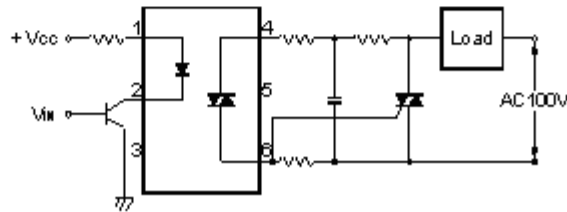


Fig.8 On-state Current vs. On-state Voltage



Basic Operation Circuit  
Medium/High Power Triac Drive Circuit



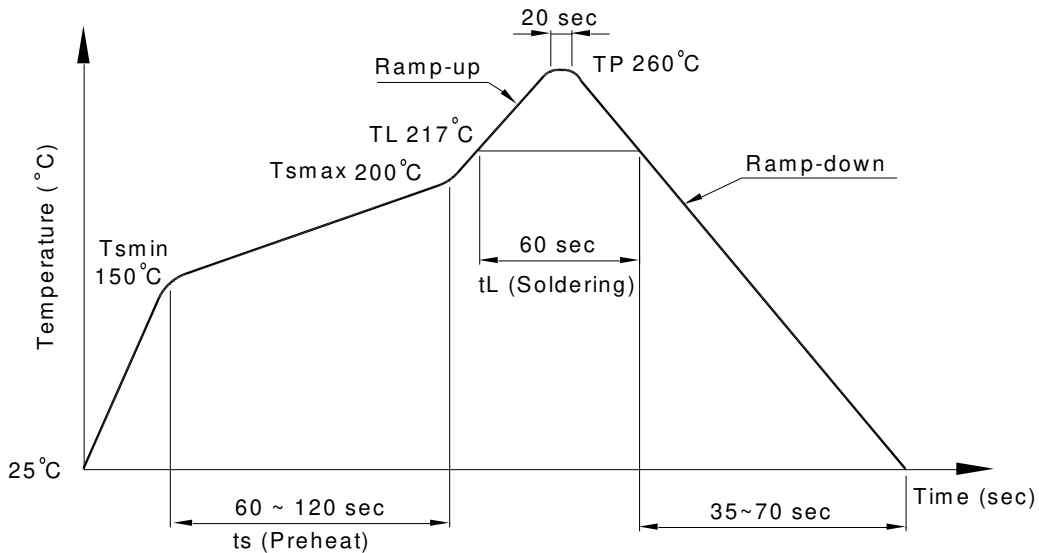
# Photocoupler MOC305X series

## 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)**

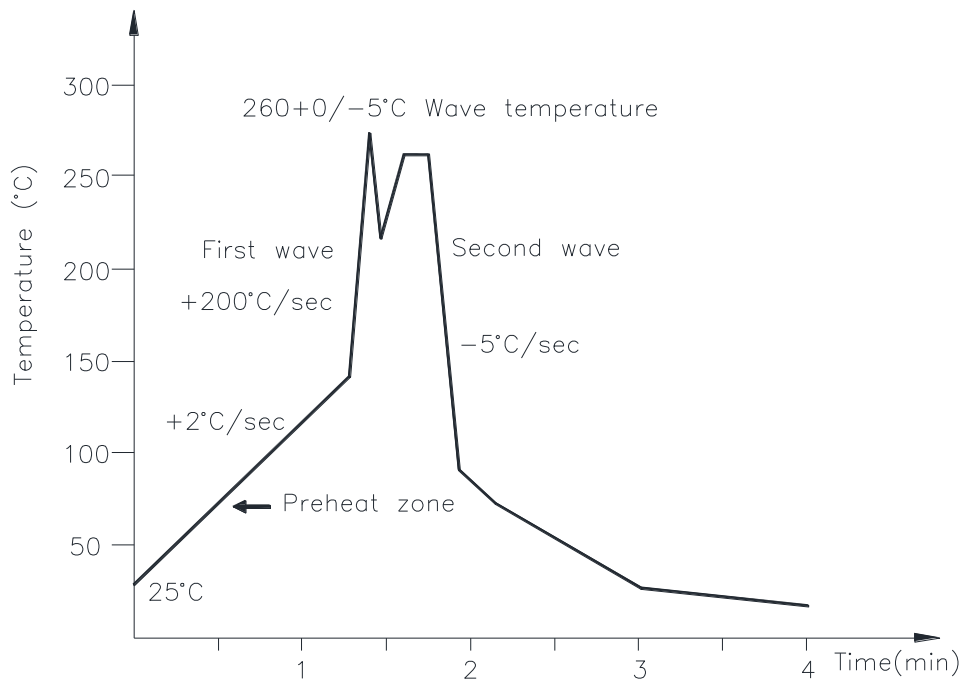
One time soldering is recommended within the condition of temperature.

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

Time: 10 sec.

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

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.

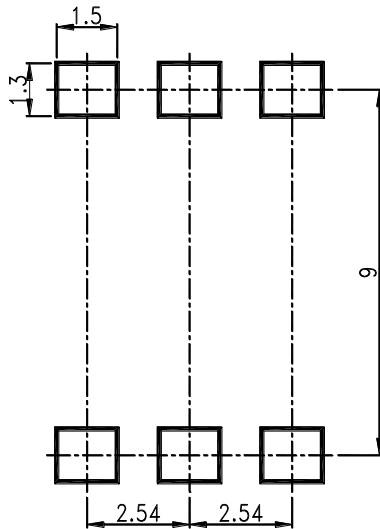
Temperature:  $380 \pm 0 / -5^{\circ}\text{C}$

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.