



# Photocoupler

## Product Data Sheet

### LTV-3063

Spec No.: DS70-2014-0024

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Revision: A

**LITE-ON DCC**

**RELEASE**

BNS-OD-FC001/A4

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## Photocoupler LTV-306X series

### 1. DESCRIPTION

#### 1.1 Features

- Isolation voltage between input and output Viso : 3,750Vrms
- 4pin MFP zero-cross optoisolators triac driver output
- High repetitive peak off-state voltage  $V_{DRM}$  : Min. 600V
- High critical rate of rise of off-state voltage (  $dV/dt$  : MIN. 1000V /  $\mu s$  )
- Mini-flat package :  
2.0mm profile : LTV-3060, LTV-3061, LTV-3062, LTV-3063
- Safety approval  
UL 1577  
cUL CA5A  
VDE DIN EN60747-5-5 (VDE 0884-5)
- RoHS Compliance  
All materials be used in device are followed EU RoHS directive (No.2002/95/EC).
- ESD pass HBM 8000V / MM2000V
- MSL class1

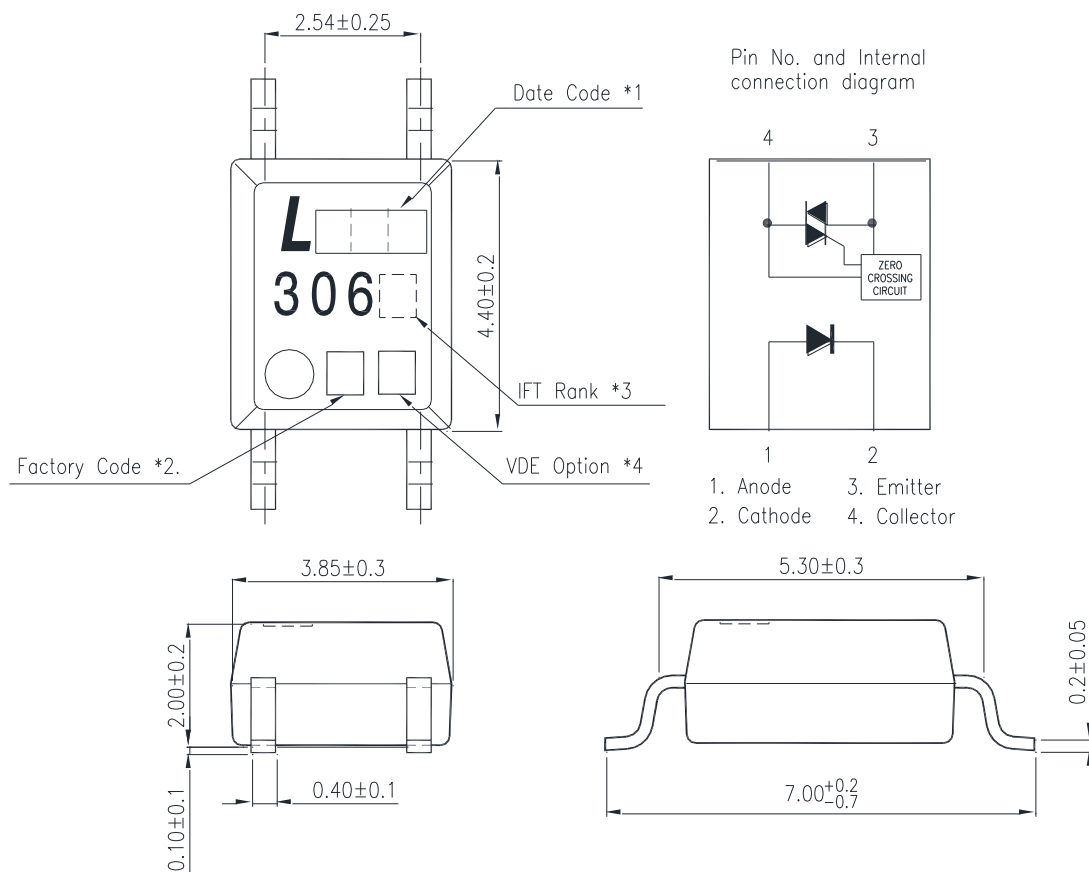
#### 1.2 Applications

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

## Photocoupler LTV-306X series

### 2. PACKAGE DIMENSIONS

#### 2.1 LTV-306X series



#### Notes :

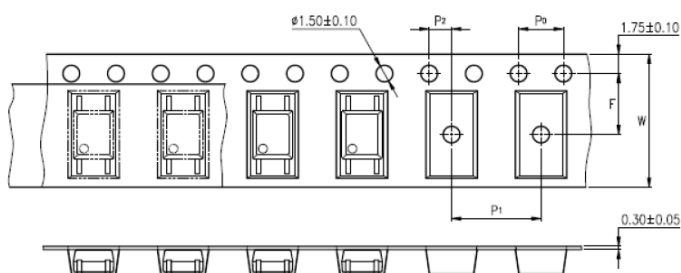
1. 1-digit Year date code, 2-digit work week.
2. Factory identification mark shall be marked (X: China -TJ)
3.  $I_{FT}$  Rank
4. "4" or "V" for VDE option.

\*All dimensions in millimeters.

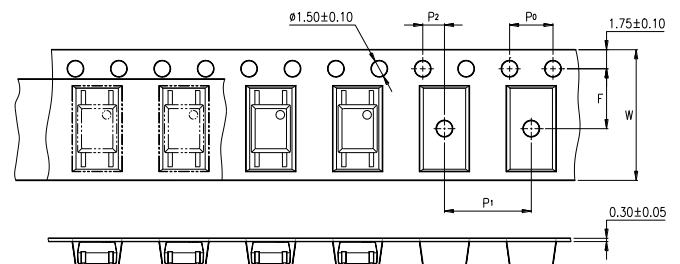
## Photocoupler LTV-306X series

### 3. TAPING DIMENSIONS

#### 3.1 LTV-306X-TP



#### 3.2 LTV-306X



| Description                            | Symbol         | Dimension in mm (inch) |
|----------------------------------------|----------------|------------------------|
| Tape wide                              | W              | 12±0.3 (0.472)         |
| Pitch of sprocket holes                | P <sub>0</sub> | 4±0.1 (0.157)          |
| Distance of compartment                | F              | 5.5±0.1 (0.217)        |
|                                        | P <sub>2</sub> | 2±0.1 (0.079)          |
| Distance of compartment to compartment | P <sub>1</sub> | 8±0.1 (0.315)          |

#### 3.3 Quantities Per Reel

| Package Type     | LTV-306X series |
|------------------|-----------------|
| Quantities (pcs) | 3000            |

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### 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         |
|        | Power Dissipation                                | $P_D$     | 70         | mW        |
|        | Junction Temperature                             | $T_J$     | 125        | °C        |
| Output | Off-State Output Terminal Voltage                | $V_{DRM}$ | 600        | V         |
|        | Peak Repetitive Surge Current ( PW=1ms, 120pps ) | $V_{TSM}$ | 1          | A         |
|        | Collector Power Dissipation                      | $P_C$     | 300        | mW        |
|        | Junction Temperature                             | $T_J$     | 125        | °C        |
|        | Total Power Dissipation                          | $P_{tot}$ | 330        | mW        |
| *1.    | Isolation Voltage                                | $V_{iso}$ | 3750       | $V_{rms}$ |
|        | Ambient Operating Temperature Range              | $T_A$     | -55 ~ +115 | °C        |
|        | Storage Temperature                              | $T_{stg}$ | -55 ~ +150 | °C        |
| *2.    | Soldering Temperature                            | $T_L$     | 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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### 4.2 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                                 |          | $I_{DRM}$  | —    | —    | 500  | 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 | —    | —    | V/ $\mu\text{s}$ |                                                                                  |
| COUPLED       | *3 Led Trigger Current, Current Required to Latch Output, Either Direction | LTV-3060 | $I_{FT}$   | —    | —    | 30   | mA               | Main Terminal Voltage = 3V                                                       |
|               |                                                                            | LTV-3061 |            | —    | —    | 15   |                  |                                                                                  |
|               |                                                                            | LTV-3062 |            | —    | —    | 10   |                  |                                                                                  |
|               |                                                                            | LTV-3063 |            | —    | —    | 5    |                  |                                                                                  |
|               | Holding Current, Either Direction                                          |          | $I_H$      | —    | 400  | —    | $\mu\text{A}$    |                                                                                  |
| ZERO CROSSING | Inhibit Voltage                                                            |          | $V_{INH}$  | —    | 5    | 20   | Volts            | $I_F=\text{Rated } I_{FT}$ , MT1-MT2 Voltage above which device will not trigger |
|               | Leakage in Inhibited State                                                 |          | $I_{DRM2}$ | —    | —    | 500  | $\mu\text{A}$    | $I_F = \text{Rated } I_{FT}$ , 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.

\*3 All devices are guaranteed to trigger at an  $I_F$  value less than or equal to max  $I_{FT}$ .

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### 5. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

Fig.1 Forward Current vs.  
Ambient Temperature

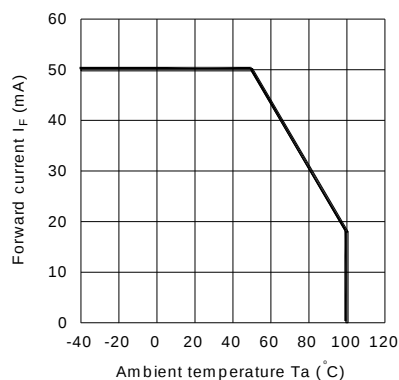


Fig.2 On-state Current vs. Ambient  
Temperature

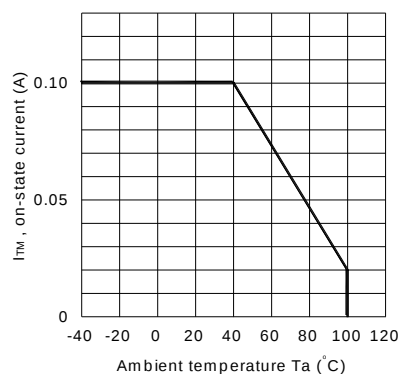


Fig.3 Minimum Trigger Current  
vs. Ambient Temperature

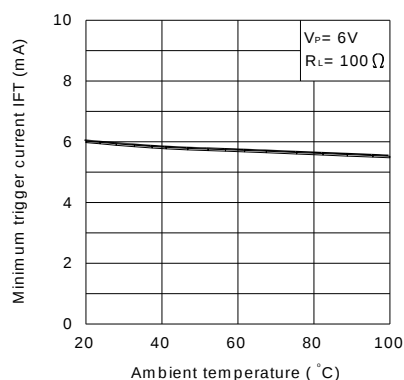


Fig.4 Forward Current vs. Forward  
Voltage

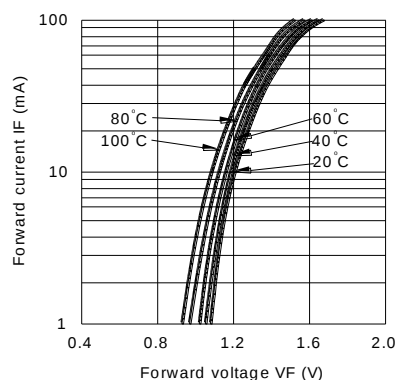


Fig.5 On-state Voltage vs. Ambient  
Temperature

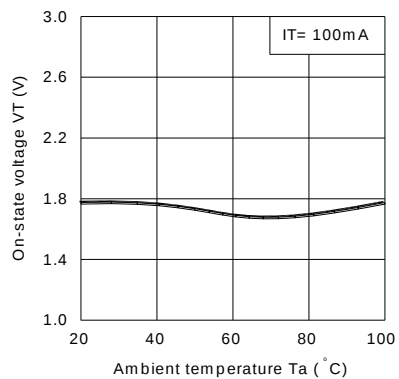
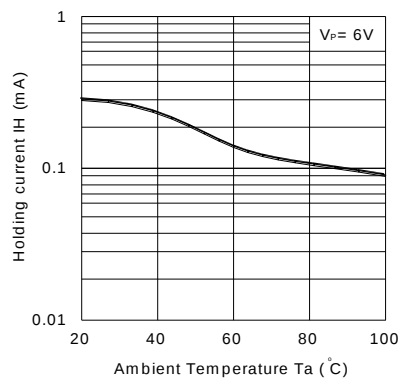


Fig.6 Holding Current vs.  
Ambient Temperature



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

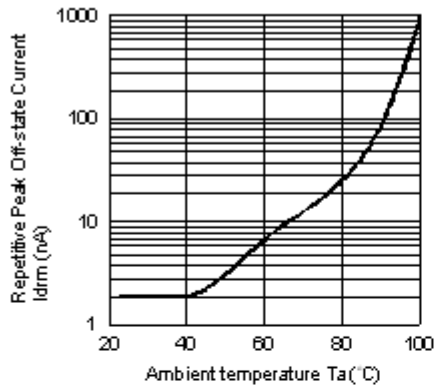
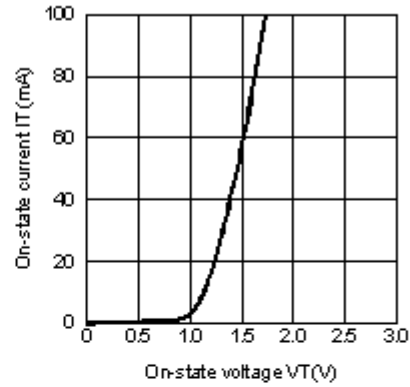
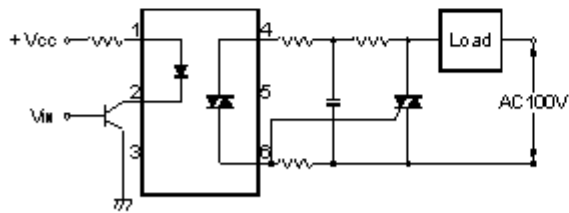


Fig.8 On-state Current vs. On-state Voltage



Basic Operation Circuit

Medium/High Power Triac Drive Circuit



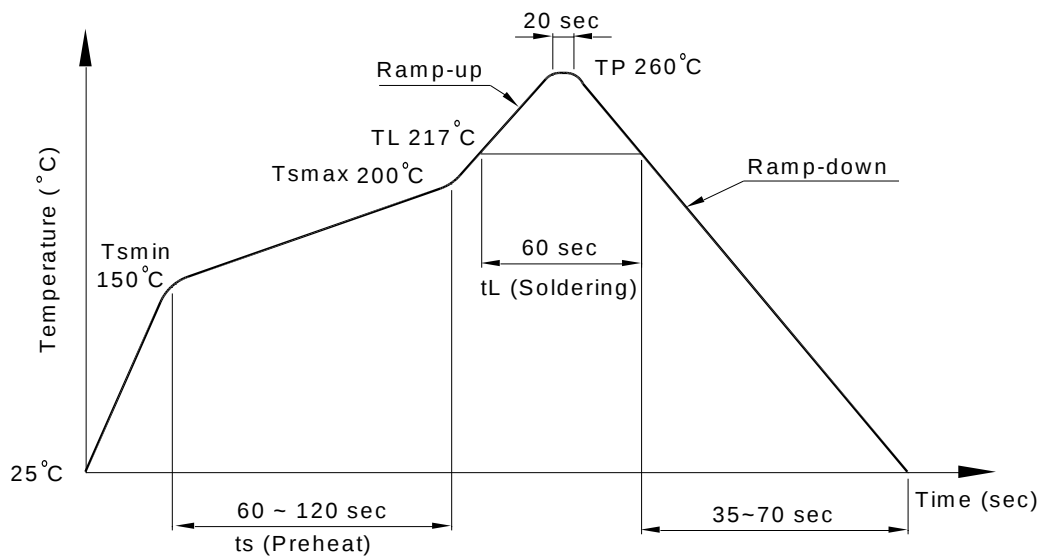
## Photocoupler LTV-306X series

### 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) ( $t_s$ )    | 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    |



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### 6.2 Wave soldering (JEDEC22A111 compliant)

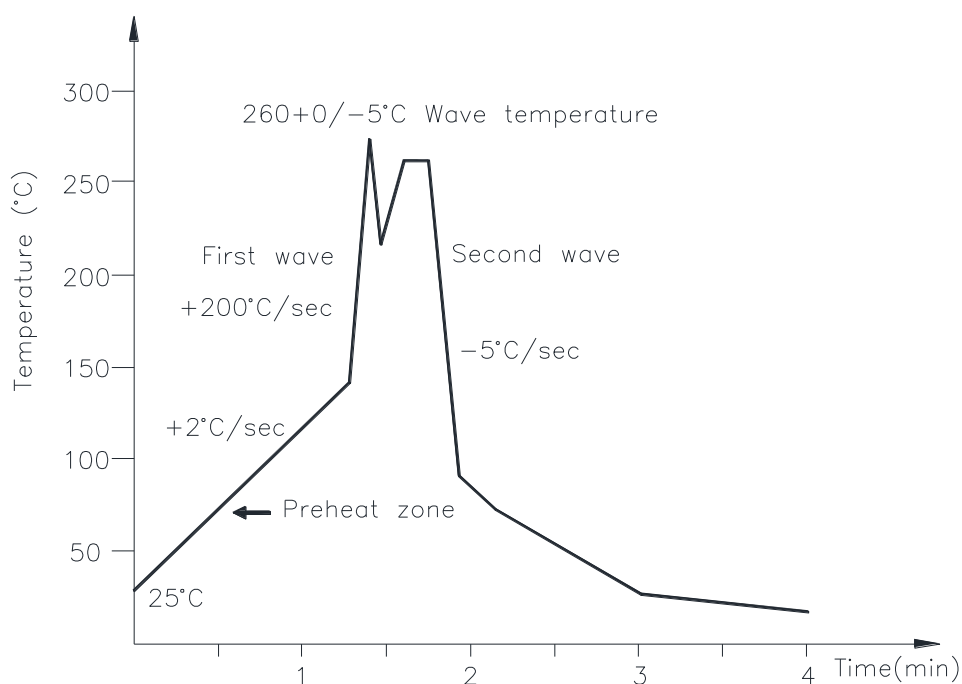
One time soldering is recommended within the condition of temperature.

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.

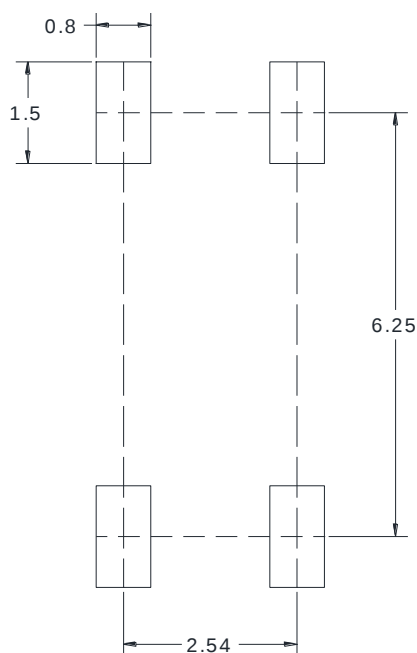
Temperature:  $380 \pm 0/-5^{\circ}\text{C}$

Time: 3 sec max.

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**7. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)**

Unit: mm



## Photocoupler LTV-306X series

### 8. NAMING RULE

# LTV-306(X)(1)

DEVICE PART NUMBER ————↑  
Please refer to Electrical Optical  
Characteristics Table on Page P5

(1) TAPING TYPE (TPor no suffix) ————↑

Example : LTV-3061-TP1

# LTV306(X)(1)-V

DEVICE PART NUMBER ————↑  
Please refer to Electrical Optical  
Characteristics Table on Page P5

(1) TAPING TYPE (TPor no suffix) ————↑

(2) VDE option ————↑

Example : LTV3061TP1-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.