LITEON®
OPTOELECTRONICS

Photocoupler
Product Data Sheet
LTV-305X

Spec No. :DS70-2014-0079
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Revision: C

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

LITE-ON Technology Corp. / Optoelectronics
No.90,Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.
Tel: 886-2-2222-6181 Fax: 886-2-2221-1948 / 886-2-2221-0660

Photocoupler
LTV-305X series

1. DESCRIPTION

1.1 Features

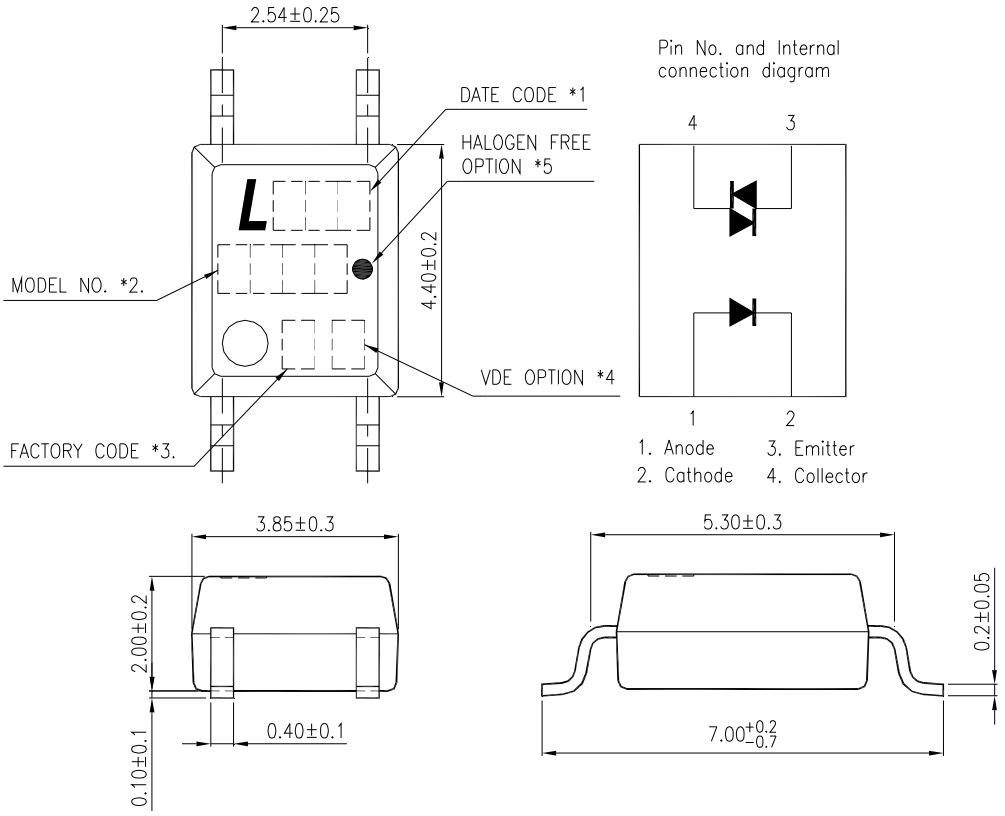
- Isolation voltage between input and output Viso : 3,750Vrms
- 4pin MFP non zero-cross optoisolators triac driver output
- High repetitive peak off-state voltage V_{DRM} : Min. 600V
- High critical rate of rise of off-state voltage (dV/dt : MIN. 1000V / μs)
- Mini-flat package :
  2.0mm profile : LTV-3051 / LTV-3052 / LTV-3053
- 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
- Halogen free option

1.2 Applications

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

2. PACKAGE DIMENSIONS

2.1 LTV-305X series



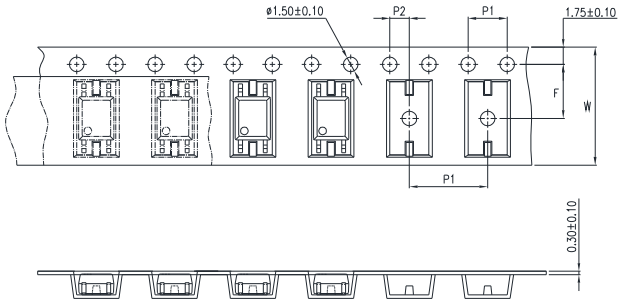
Notes :

1. 1-digit year code, Example : 2010 = A
   2-digit work week ranging from '01' to '53'
2. Model No. : 3051 / 3052 / 3053
3. Factory identification mark (X: China-TJ)
4. "4"or"V" for VDE option.
5. "●" for halogen free option.

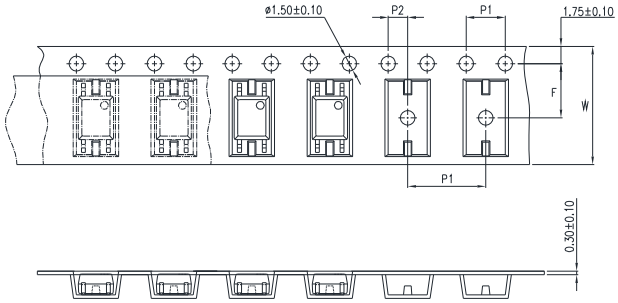
*All dimensions in millimeters.

3. TAPING DIMENSIONS

3.1 LTV-305X-TP



3.2 LTV-305X(no suffix)



Description	Symbol	Dimension in mm (inch)
Tape wide	W	12±0.3 (0.472)
Pitch of sprocket holes	P_0	4±0.1 (0.157)
Distance of compartment	F	5.5±0.1 (0.217)
	P_2	2±0.1 (0.079)
Distance of compartment to compartment	P_1	8±0.1 (0.315)

3.3 Quantities Per Reel

Package Type	LTV-305X series
Quantities (pcs)	3000

4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25℃

	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
	R.M.S. on-state current	$I_{T(RMS)}$	100	mA
	Peak Repetitive Surge Current (PW=1ms, 120pps)	I_{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

4.2 Recommended Operating Conditions (Note)

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Supply Voltage		V_{AC}	-	-	240	Vac
Forward Current	LTV-3051	I_F	22.5	25	30	mA
	LTV-3052		15	20	30	mA
	LTV-3053		7.5	10	30	mA
Operating Temperature		T_{opr}	-25	-	85	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

4.3 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25℃

Parameter			Symbol	Min.	Typ.	Max.	Unit	Test Condition
Input	Forward Voltage		V_F	—	1.15	1.5	V	I_F=20mA
	Reverse Current		I_R	—	—	10	μA	V_R=6V
Output	*1 Peak Blocking Current, Either Direction		I_{DRM}	—	10	100	nA	V_{DRM}=600V
	Peak On-State Voltage, Either Direction		V_{TM}	—	1.7	3	V	I_{TM}=100 mA Peak
	*2 Critical Rate of Rise of Off-State Voltage		dv/dt	1000	—	—	V/μs	
COUPLED	Led Trigger Current, Current Required to Latch Output, Either Direction	LTV-3051	I_{FT}	—	—	15	mA	Main Terminal Voltage = 3V
		LTV-3052		—	—	10		
		LTV-3053		—	—	5		
	Holding Current, Either Direction		I_H	—	300	—	μA	

*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.

5. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

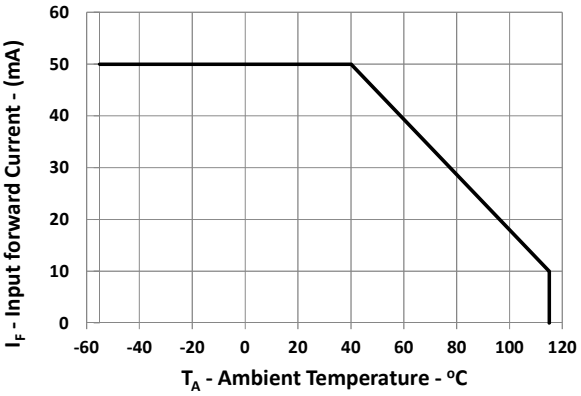


Fig.1 Forward current vs. T_A

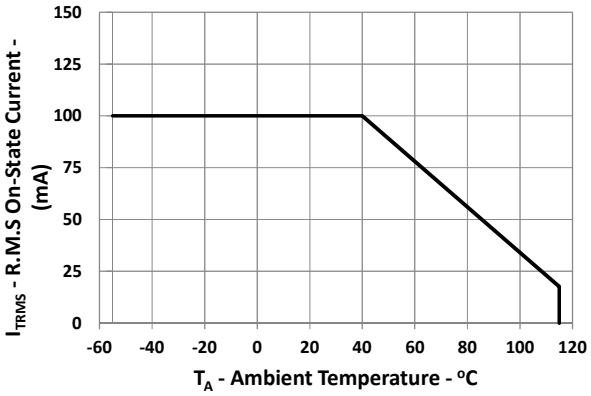


Fig 2 On-state current vs. T_A

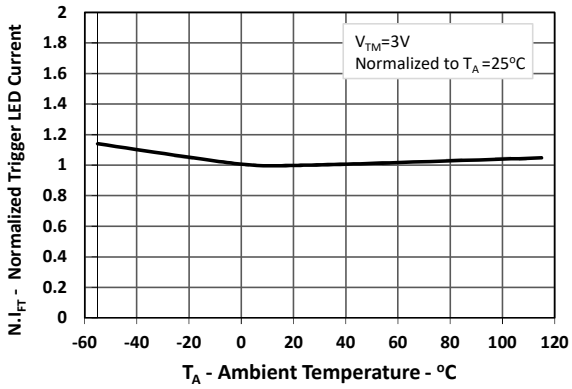


Fig 3. Normalized I_{FT} vs. T_A

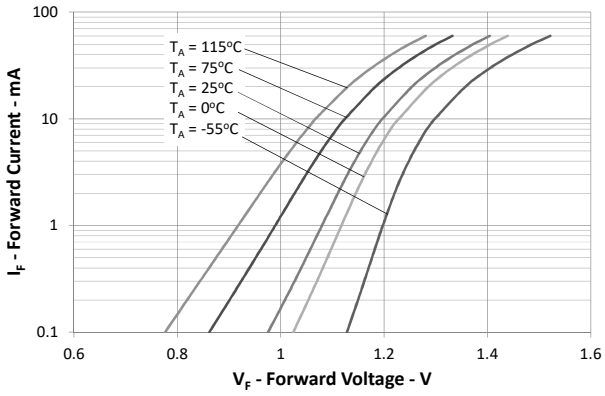


Fig 4. I_F vs. V_F

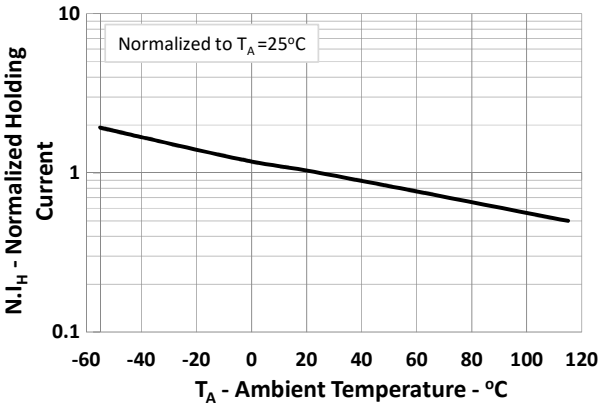


Fig 5. Normalized I_H vs. T_A

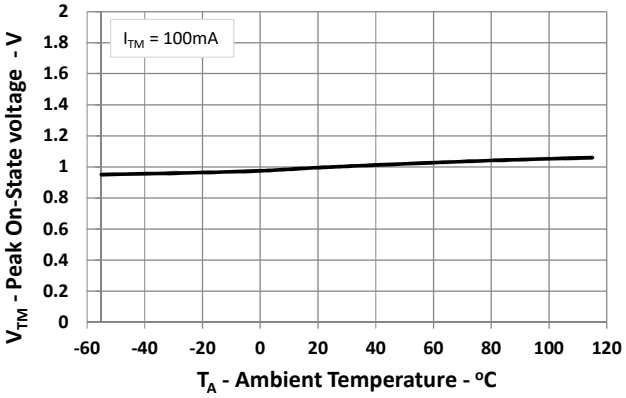


Fig 6. Normalized V_{TM} vs. T_A

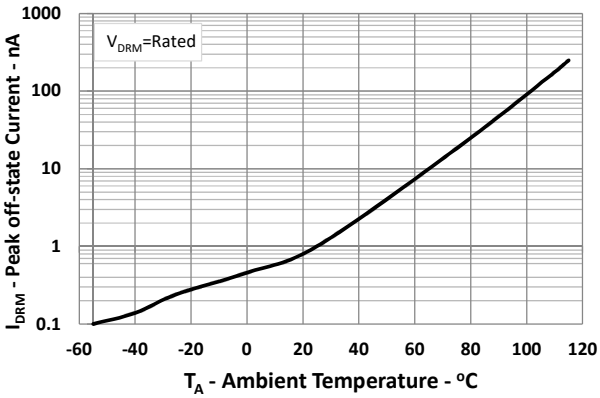


Fig.7 Normalized I_{DRM} vs. T_A

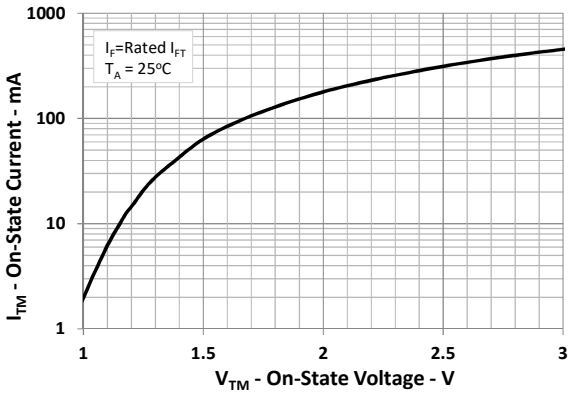


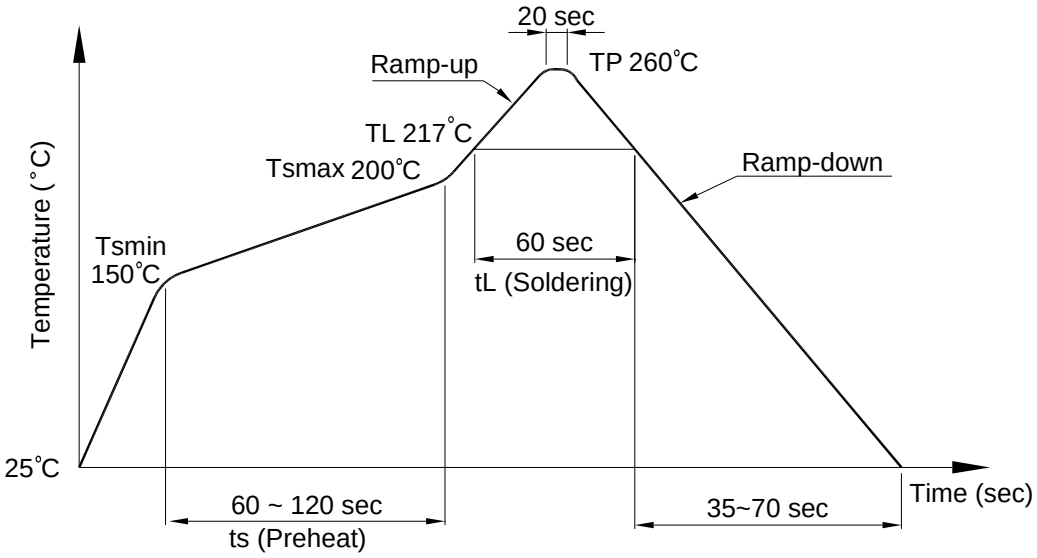
Fig.8 Normalized I_{TM} vs. V_{TM}

6. TEMPERATURE PROFILE OF SOLDERING

6.1 IR Reflow soldering (JEDEC-STD-020E 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



6.2 Wave soldering (JEDEC22A111 compliant)

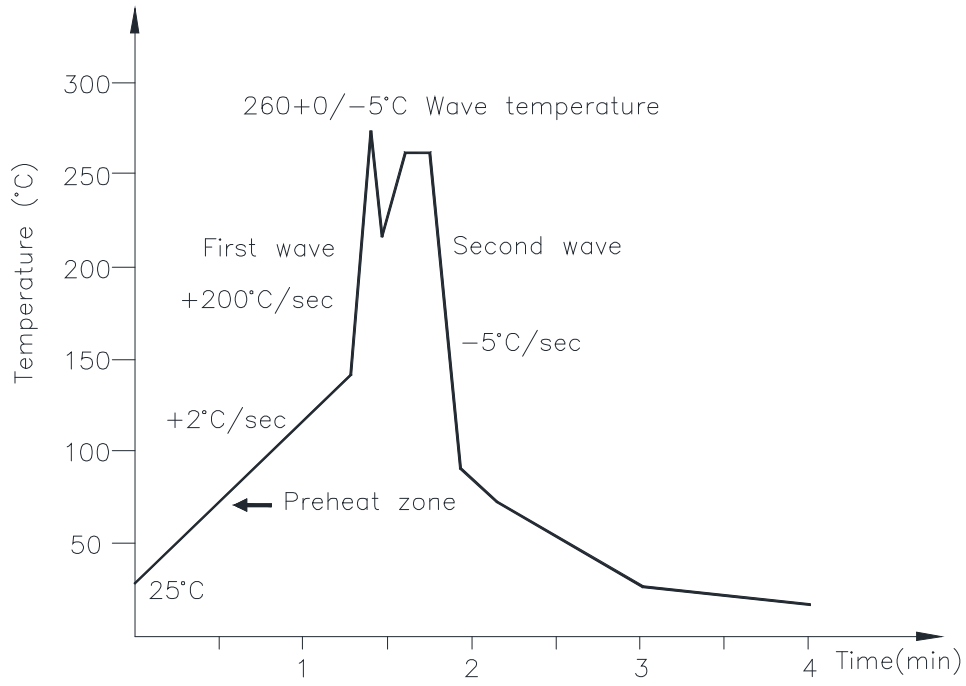
One time soldering is recommended within the condition of temperature.

Temperature: 260+0/-5˚C

Time: 10 sec.

Preheat temperature:25 to 140˚C

Preheat time: 30 to 80 sec.



6.3 Hand soldering by soldering iron

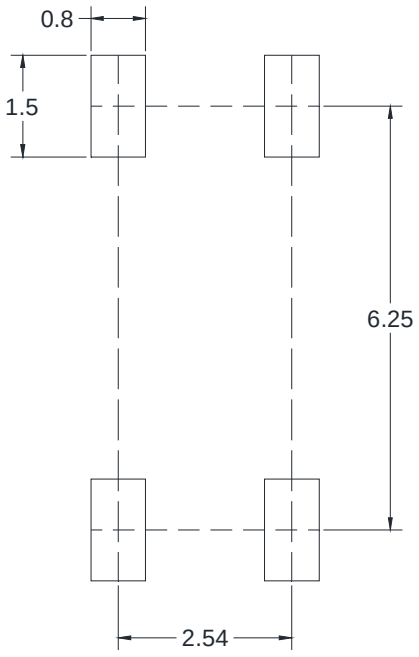
Allow single lead soldering in every single process. One time soldering is recommended.

Temperature: 380+0/-5˚C

Time: 3 sec max.

7. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

Unit: mm



8. NAMING RULE

LTV-305(X)(1)-G

DEVICE PART NUMBER

Please refer to Electrical Optical Characteristics Table on Page 5

(1) TAPING TYPE (TP, no suffix)

(2) Halogen free

Example : LTV-3051-TP1-G

LTV305(X)(1)-V-G

DEVICE PART NUMBER

Please refer to Electrical Optical Characteristics Table on Page 5

(1) TAPING TYPE (TP, no suffix)

(2) VDE option

(3) Halogen free

Example : LTV3051TP1-V-G

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.

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