

## Photocoupler LTV-305X-SN series

### 1. DESCRIPTION

#### 1.1 Features

- Isolation voltage between input and output  $V_{iso}$  : 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 /  $\mu s$  )
- Mini-flat package :  
2.0mm profile : LTV-3051-SN / LTV-3052-SN / LTV-3053-SN
- 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 class 1
- Halogen free option

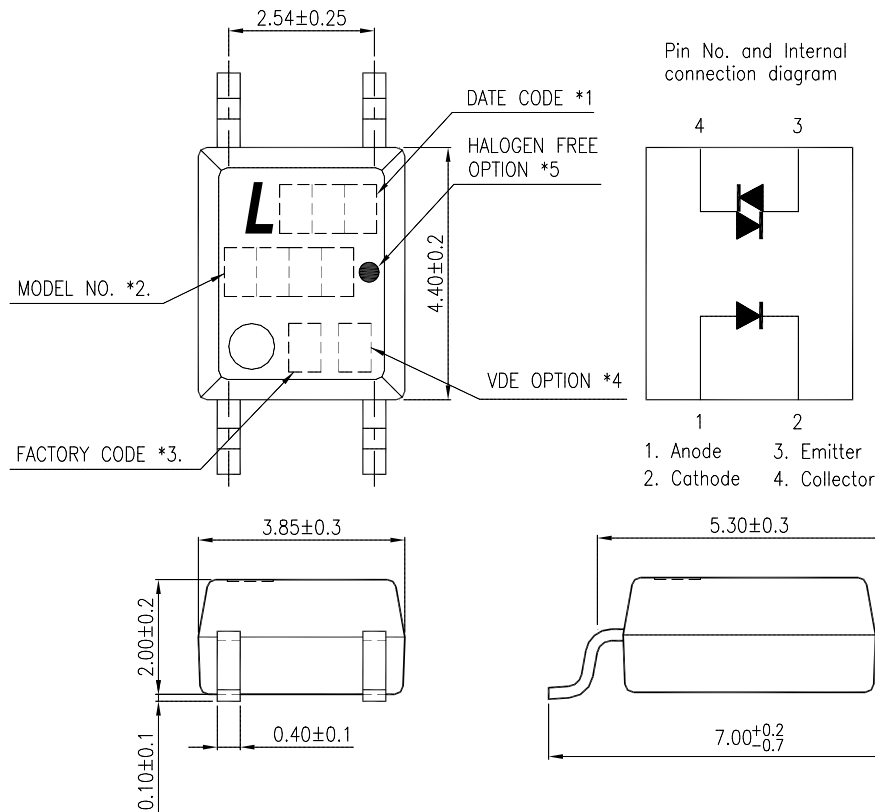
#### 1.2 Applications

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

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### 2. PACKAGE DIMENSIONS

#### 2.1 LTV-305X-SN series



#### Notes :

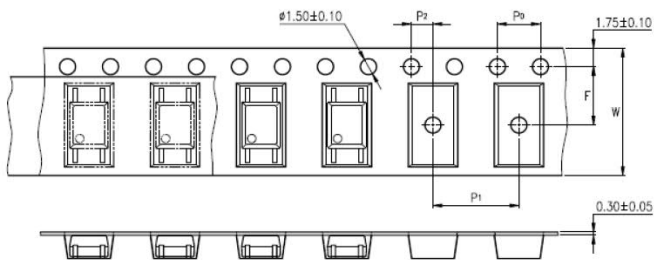
1. 1-digit year code, Example : 2010 = A  
2-digit work week ranging from '01' to '53'
2. Model No. : 3051 / 3052 / 3053
3. Factory identification mark (X: China-TJ)
4. "4" or "V" for VDE option.
5. "●" for halogen free option.

\*All dimensions in millimeters.

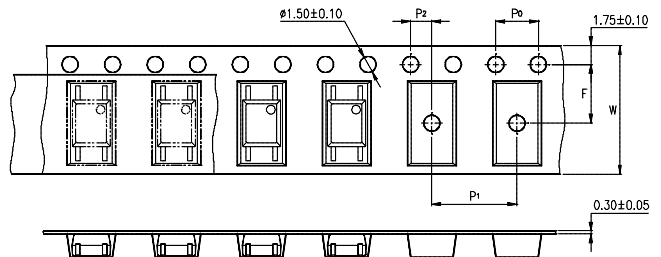
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### 3. TAPING DIMENSIONS

#### 3.1 LTV-305X-TP-SN



#### 3.2 LTV-305X-SN



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-305X-SN 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
	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

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### 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.

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### 4.3 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	$I_R$	—	—	10	$\mu\text{A}$	$V_R=6\text{V}$	
Output	*1 Peak Blocking Current, Either Direction	$I_{DRM}$	—	10	100	nA	$V_{DRM}=600\text{V}$	
	Peak On-State Voltage, Either Direction	$V_{TM}$	—	1.7	3	V	$I_{TM}=100\text{ mA Peak}$	
	*2 Critical Rate of Rise of Off-State Voltage	$dv/dt$	1000	—	—	V/ $\mu\text{s}$		
COUPLED	Led Trigger Current, Current Required to Latch Output, Either Direction	LTV-3051 LTV-3052 LTV-3053	$I_{FT}$	—	—	15	mA	Main Terminal Voltage = 3V
				—	—	10		
				—	—	5		
	Holding Current, Either Direction	$I_H$	—	300	—	$\mu\text{A}$		

\*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.

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5. CHARACTERISTICS CURVES (TYPICAL PERFORMANCE)

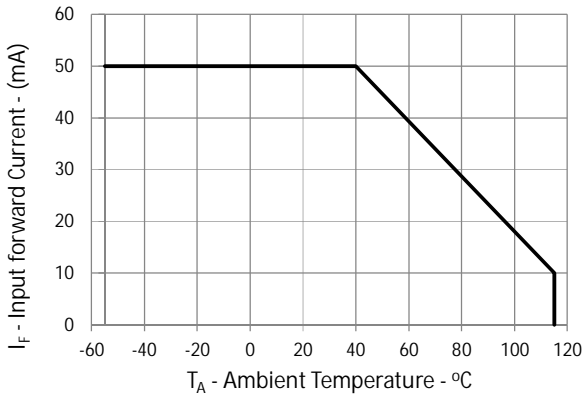


Fig.1 Forward current vs.  $T_A$

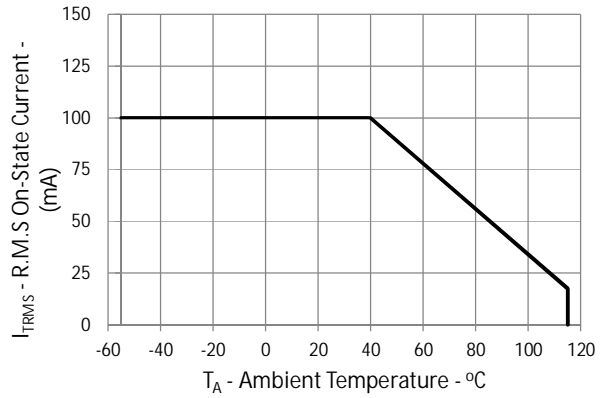


Fig 2 On-state current vs.  $T_A$

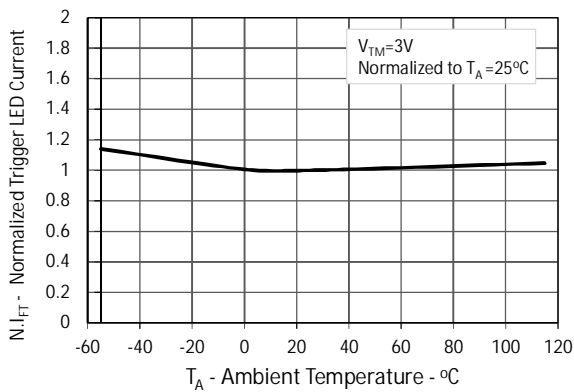


Fig 3. Normalized  $I_{FT}$  vs.  $T_A$

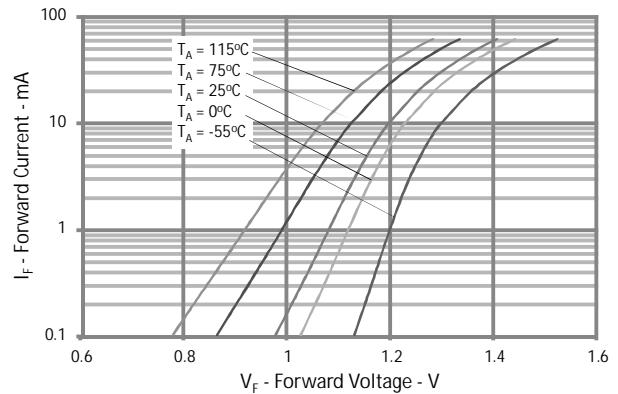


Fig 4.  $I_F$  vs.  $V_F$

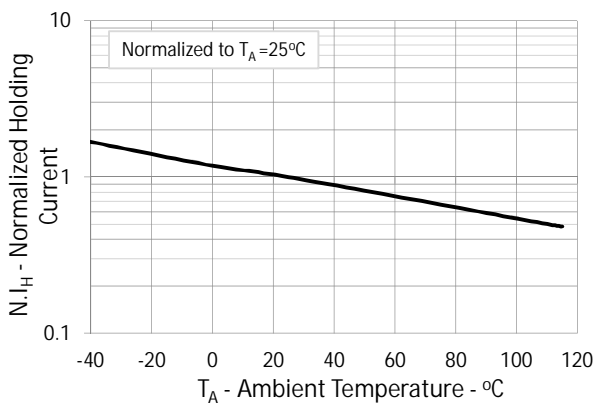


Fig 5. Normalized  $I_H$  vs.  $T_A$

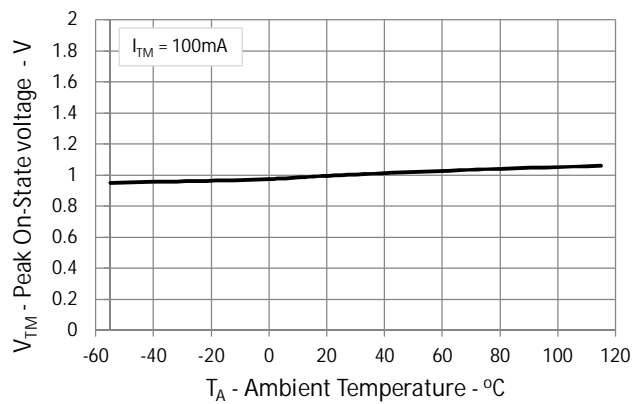


Fig 6. Normalized  $V_{TM}$  vs.  $T_A$

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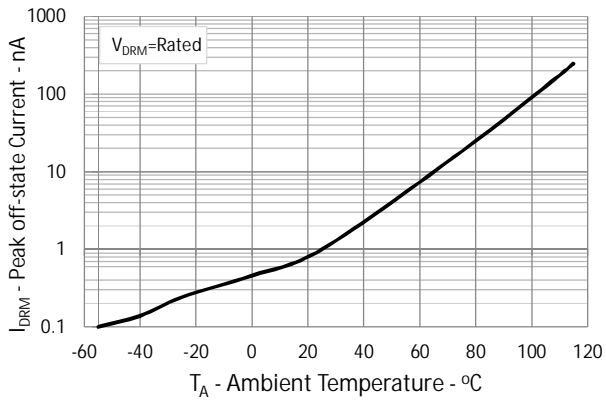


Fig.7 Normalized  $I_{DRM}$  vs.  $T_A$

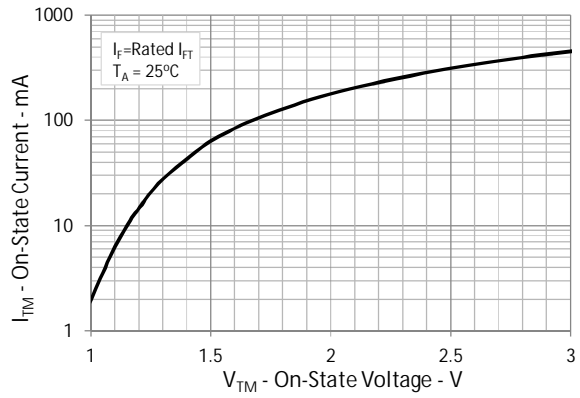


Fig.8 Normalized  $I_{TM}$  vs.  $V_{TM}$



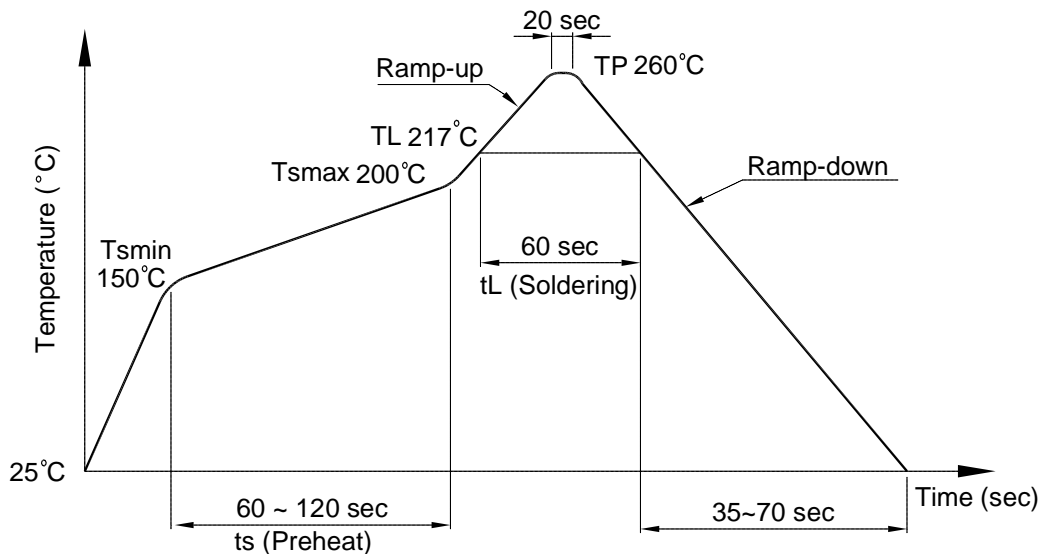
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6. TEMPERATURE PROFILE OF SOLDERING

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



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**6.2 Wave soldering (JEDEC22A111 compliant)**

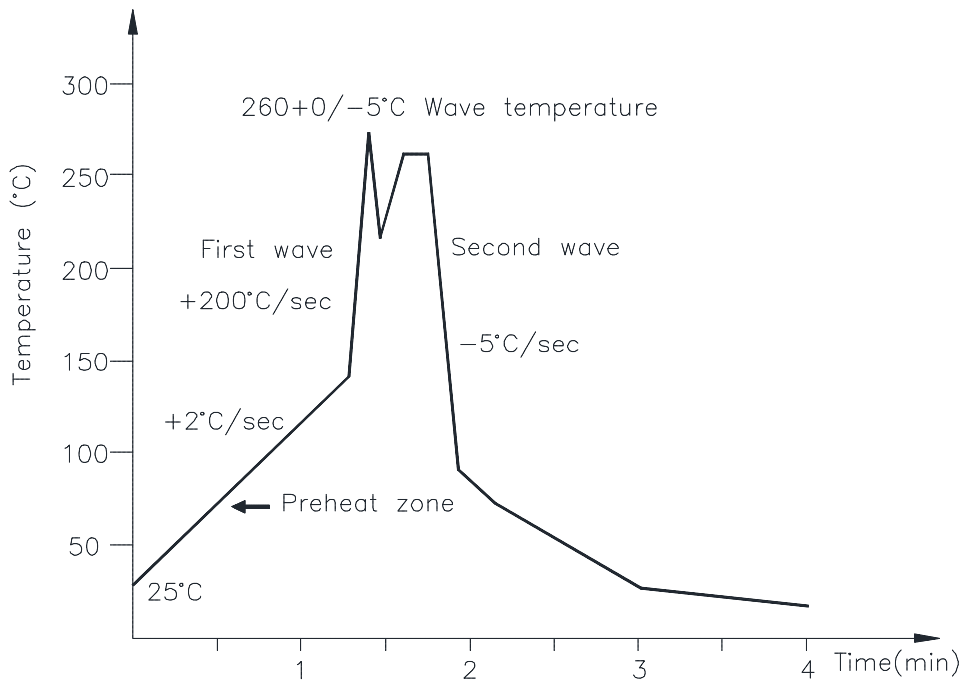
One time soldering is recommended within the condition of temperature.

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.

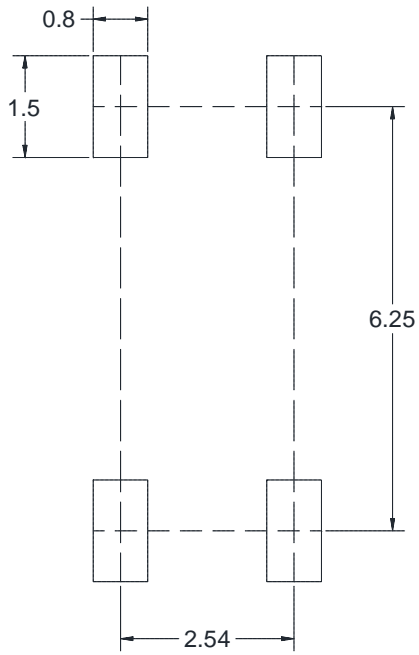
Temperature:  $380 \pm 0 / -5^{\circ}\text{C}$

Time: 3 sec max.

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7. RRECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

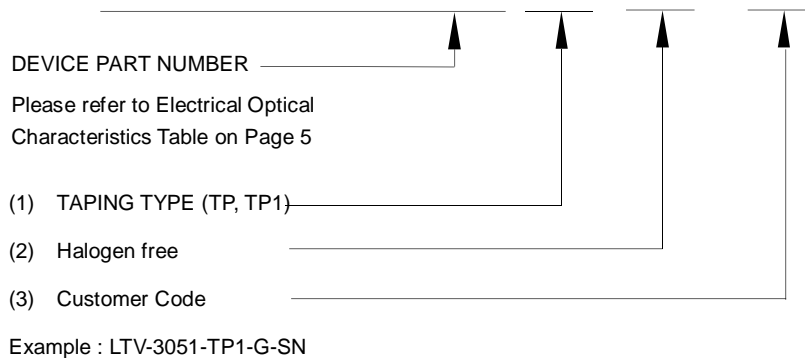
Unit: mm



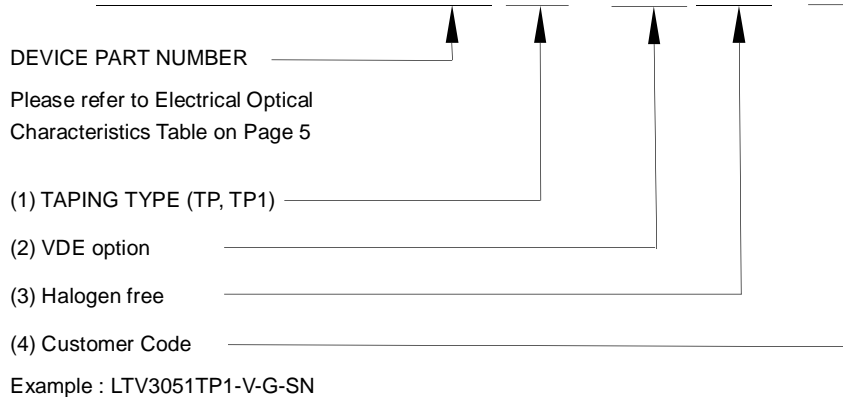
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**8. NAMING RULE**

**LTV-305(X)(1)-G-SN**



**LTV305(X)(1)-V-G-SN**



**9. NOTES**

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- 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.
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- 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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