

## Photocoupler LTV-802X series

### 1. DESCRIPTION

#### 1.1 Features

- Isolation voltage between input and output  $V_{iso}$  : 5,000 Vrms
- High repetitive peak off-state voltage  $V_{DRM}$  : Min. 400V
- High critical rate of rise of off-state voltage (  $dV/dt$  : MIN. 1000V /  $\mu$ s )
- Non-zero crossing functional
- Safety approval
  - UL 1577
  - VDE DIN EN60747-5-5 (VDE 0884-5)
  - cUL CA5A
  - CQC GB4943.1-2011/ GB8898-2011 (meet Altitude up to 5000m)
  - Nordic Safety ( DEMKO)

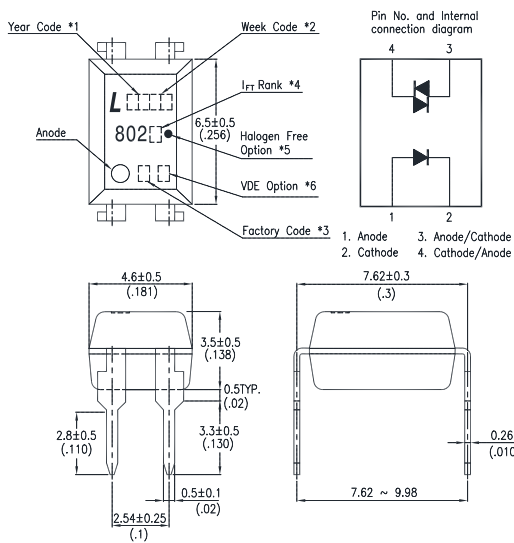
#### 1.2 Applications

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

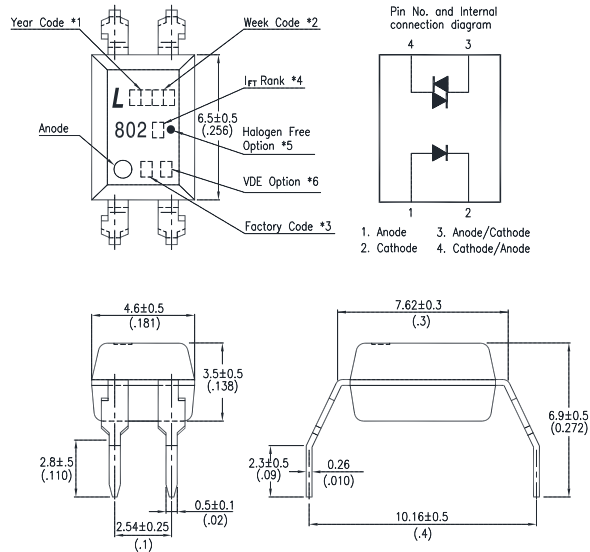
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### 2. PACKAGE DIMENSIONS

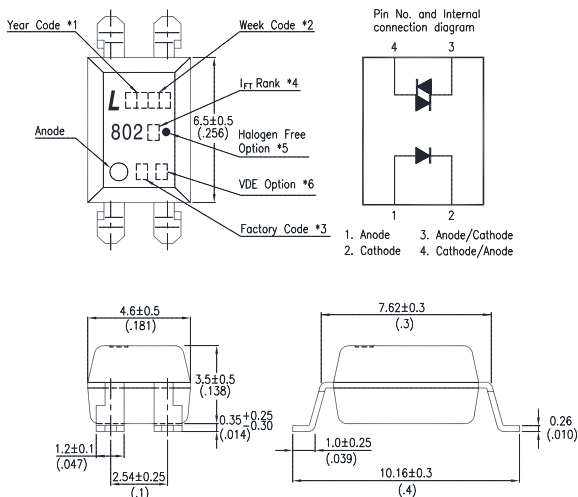
#### 2.1 LTV-802X



#### 2.2 LTV-802XM



#### 2.3 LTV-802XS



#### Notes :

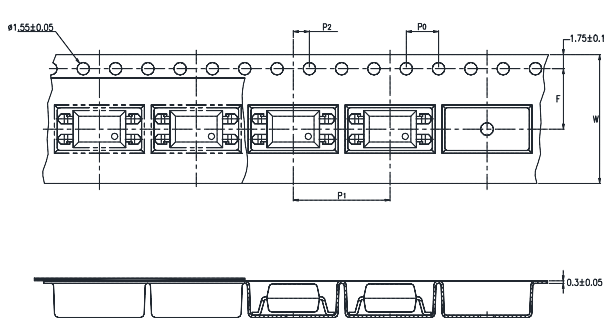
1. 2-digit year code, example : 2016 = 16
2. 2-digit work week ranging from '01' to '53'
3. Factory identification mark shall be marked (W: China-CZ, Y: Thailand)
4. I<sub>FT</sub> Rank
5. "●" for halogen free option.
6. "4" or "V" for VDE option.

\*Dimensions in millimeters (inches).

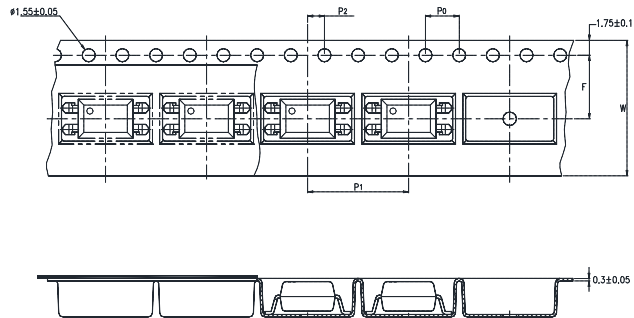
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### 3. TAPING DIMENSIONS

#### 3.1 LTV-802XS-TA



#### 3.2 LTV-802XS-TA1



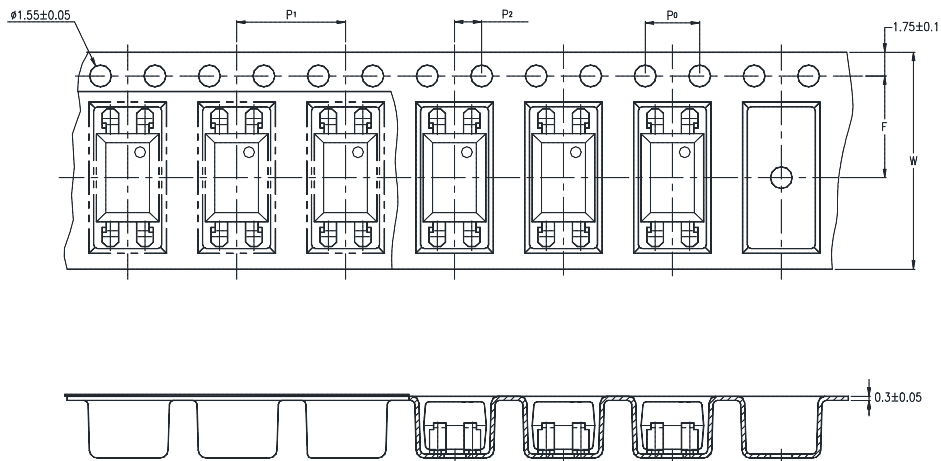
Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (0.63)
Pitch of sprocket holes	P <sub>0</sub>	4±0.1 (0.15)
Distance of compartment	F	7.5±0.1 (0.295)
	P <sub>2</sub>	2±0.1 (0.079)
Distance of compartment to compartment	P <sub>1</sub>	12±0.1 (0.472)

#### 3.3 Quantities Per Reel

Package Type	TA/TA1
Quantities (pcs)	1000

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### 3.4 LTV-802XS-TP



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>	8±0.1 (0.472)

### 3.5 Quantities Per Reel

Package Type	TP
Quantities (pcs)	2000

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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	$P_D$	120	mW
	Junction Temperature	$T_J$	125	°C
Output	Off-State Output Terminal Voltage	$V_{DRM}$	400	V
	Peak Repetitive Surge Current ( PW=100μs, 120pps )	$V_{TSM}$	1	A
	Collector Power Dissipation	$P_C$	150	mW
	Junction Temperature	$T_J$	125	°C
	Total Power Dissipation	$P_{tot}$	250	mW
*1.	Isolation Voltage	$V_{iso}$	5000	$V_{rms}$
	Ambient Operating Temperature Range	$T_A$	-55 ~ +110	°C
	Storage Temperature	$T_{stg}$	-55 ~ +125	°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		$V_{AC}$	-	-	120	Vac
Forward Current	LTV-8020	$I_F$	35	-	50	mA
	LTV-8021		22.5	25	30	mA
	LTV-8022		15	20	30	mA
	LTV-8023		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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### 4.2 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	$I_R$	—	—	10	$\mu\text{A}$	$V_R=3\text{V}$
Output	*1 Peak Blocking Current, Either Direction	$I_{DRM}$	—	—	1	$\mu\text{A}$	$V_{DRM}=400\text{V}$
	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	Led Trigger Current, Current Required to Latch Output, Either Direction	LTV-8020	—	—	30	mA	Main Terminal Voltage = 3V
		LTV-8021	—	—	15		
		LTV-8022	—	—	10		
		LTV-8023	—	—	5		
	Holding Current, Either Direction	$I_H$	—	250	—	$\mu\text{A}$	

\*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. Ambient Temperature

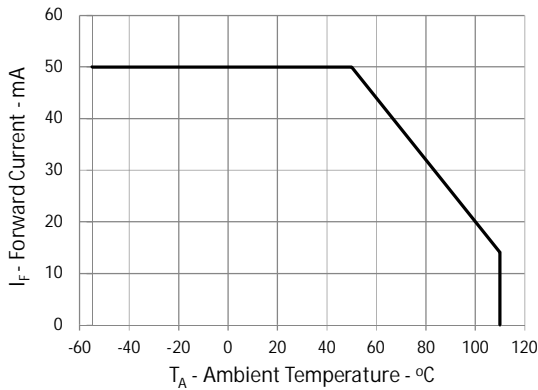


Fig.2 On-state Current vs. Ambient Temperature

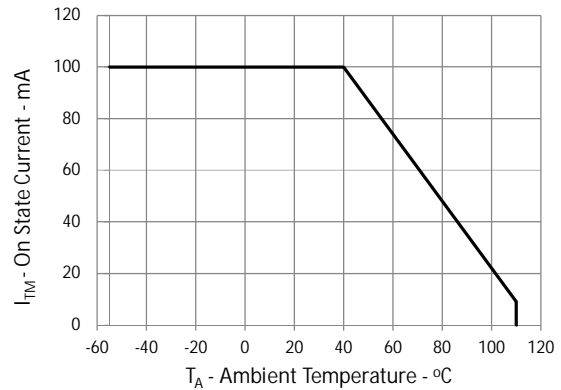


Fig.3 Normalized Trigger Current vs Ambient Temperature

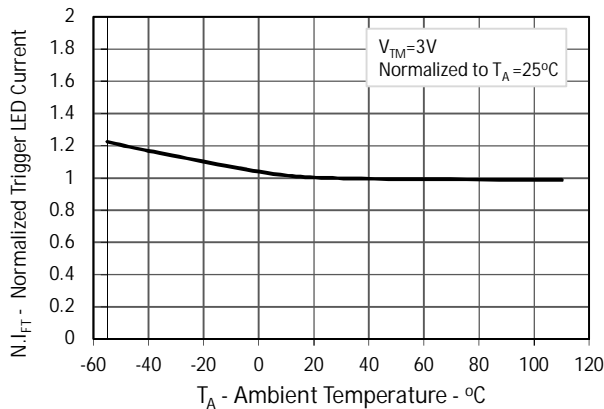


Fig.4 Forward Current vs. Forward Voltage

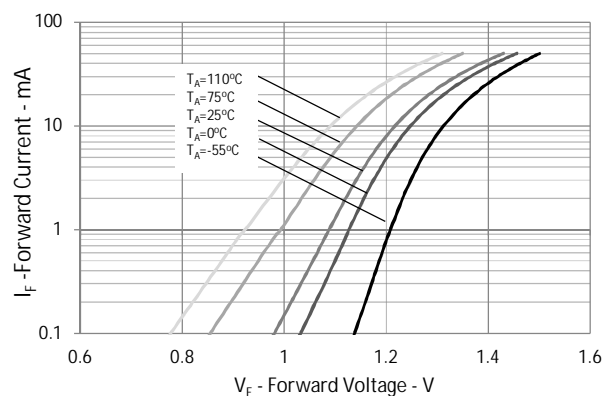


Fig.5 Normalized On-state Voltage vs Ambient Temperature

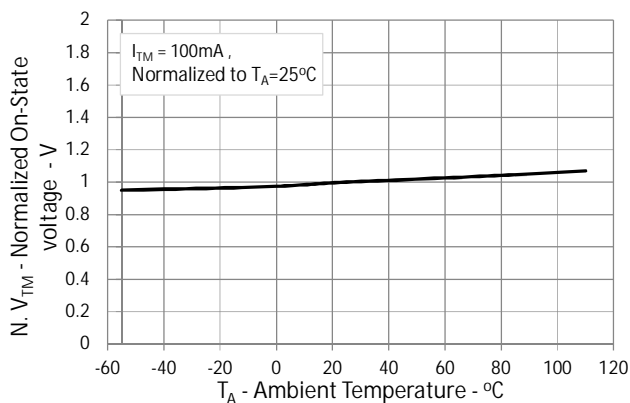
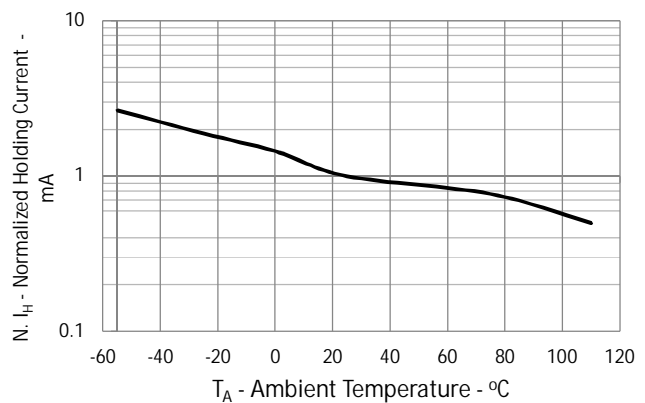


Fig.6 Normalized Holding Current vs Ambient Temperature





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Fig.7 Off-state Current vs Ambient Temperature

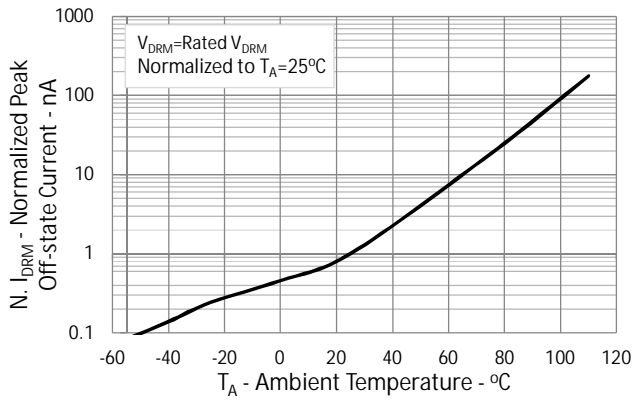
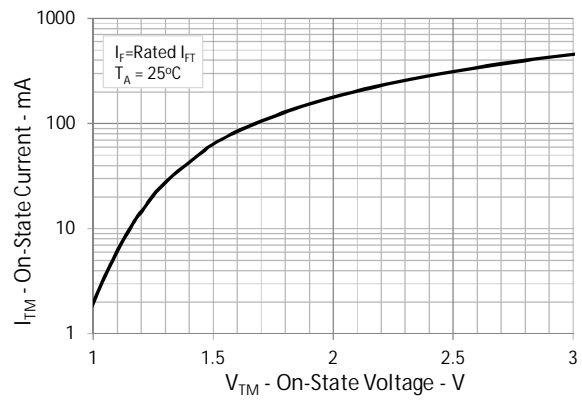
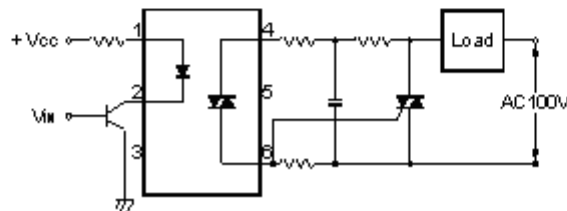


Fig.8 On-state Current vs On-state Voltage



Basic Operation Circuit  
Medium/High Power Triac Drive Circuit



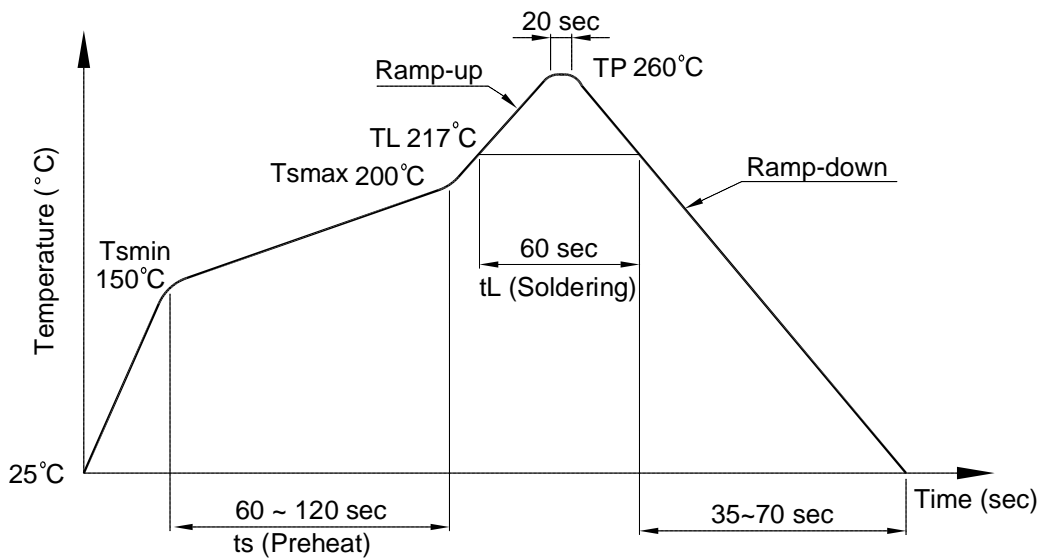
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### 6. TEMPERATURE PROFILE OF SOLDERING

#### 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)**

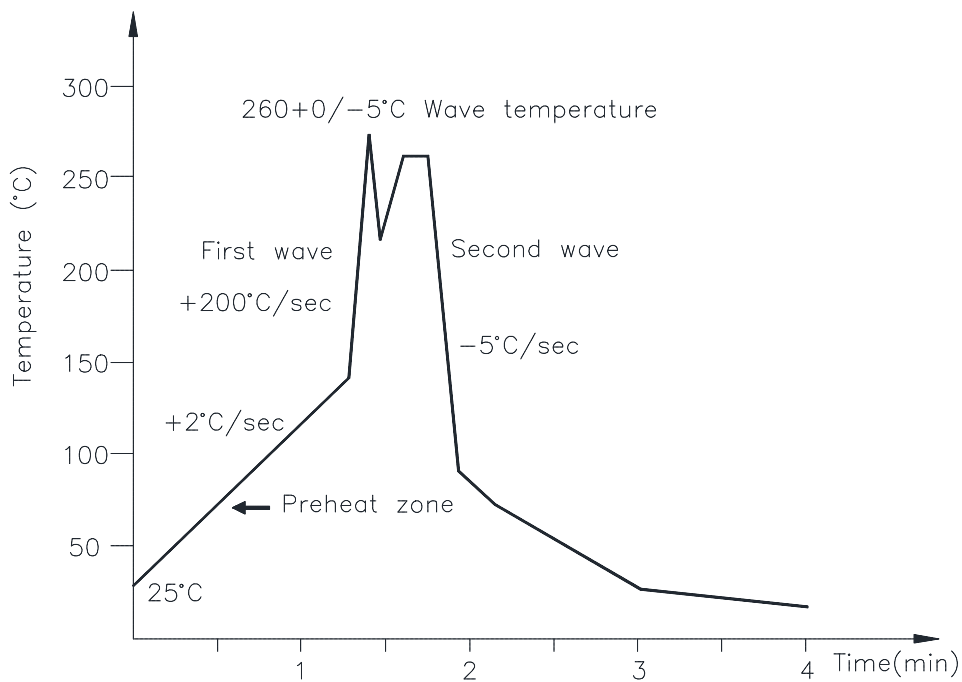
One time soldering is recommended within the condition of temperature.

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.

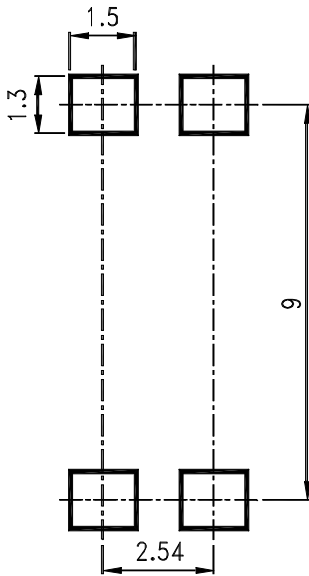
Temperature:  $380 \pm 0 / -5^{\circ}\text{C}$

Time: 3 sec max.

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

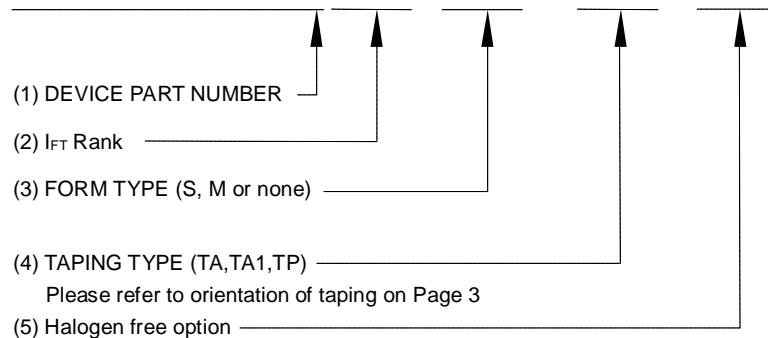
Unit: mm



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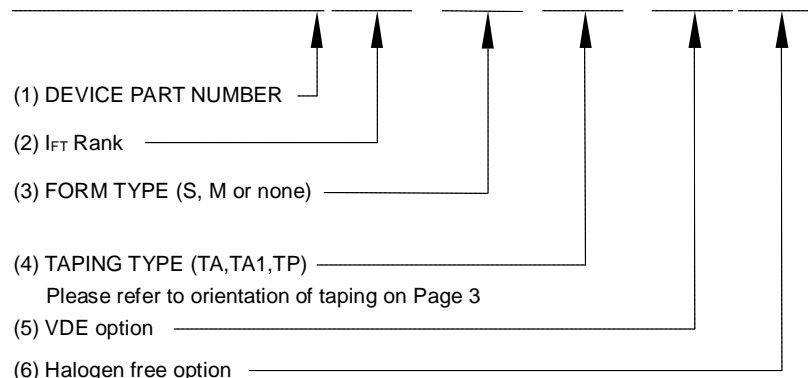
**8. NAMING RULE**

**LTV-802(X)(X)-(X)-G**



Example : LTV-8021S-TA-G

**LTV 802(X)(X)(X)-V-G**



Example : LTV8021STA-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.