



**Photocoupler**  
**Product Data Sheet**  
LTV-8212

Spec No. :DS70-2018-0141  
Effective Date: 11/02/2018  
Revision: -

**LITE-ON DCC**

**RELEASE**

**BNS-OD-FC001/A4**

## Photocoupler LTV-821X series

### 1. DESCRIPTION

PhotoMOS Relay are integration of an AlGaAs Light Emitting Diode, a Photo Voltage Generator and two MOSFET. These devices are ideally suited for controlling low-level signals and various types of loads, for example relays, motors, lamps and solenoids. PhotoMOS Relay provide 5,000V isolation (Viso(rms)) between input to output.

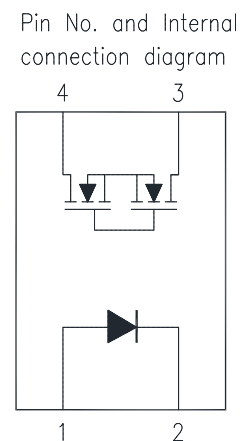
#### 1.1 Features

- Controls low-level analog signals
- Controls various types of loads such as relays, motors, lamps and solenoids
- Stable on-resistance
- Low-level off state leakage current of max 1uA
- Isolation voltage between input and output Viso : 5,000 Vrms
- Package : DIP4-pin
- Safety approval  
Pending

#### 1.2 Applications

- High-speed inspection machines
- Telephone equipment
- Data communication equipment
- Computers

#### 1.3 Functional Diagram



### 2. TYPES

Output Rating		Part number	Suffix Option			Quantity	
Load Voltage	Load Current		Lead Frame Type *1	Tape & Reel *2	IEC/EN/DIN EN 60747-5-5		Halogen free option
60V	550mA	LTV-8212	LTV-821X	-TA	-V	-G	1000 per reel
250V	180mA	LTV-8217	LTV-821XM				
400V	120mA	LTV-8214	LTV-821XS				
600V	50mA	LTV-8216	-	-TA1			65 per tube

Example :LTV-8212S-TA-G

LTV8212STA-V-G ( All "-" should be removed before "-V" )

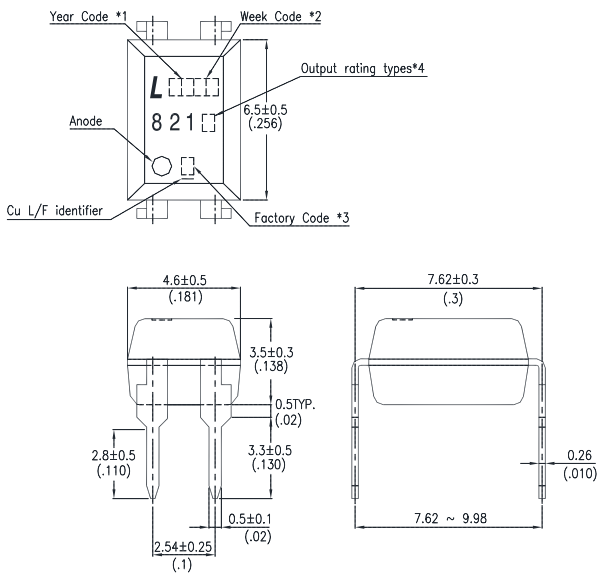
Note :

1. Referring to Page.2
2. The orientation of Pin1 on tape : "-TA" represents lower right ; "-TA1" represents upper left.

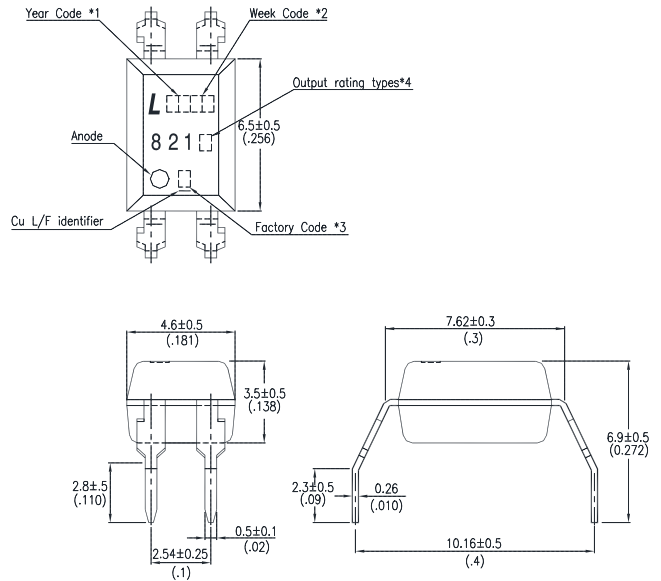
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### 3. PACKAGE DIMENSIONS

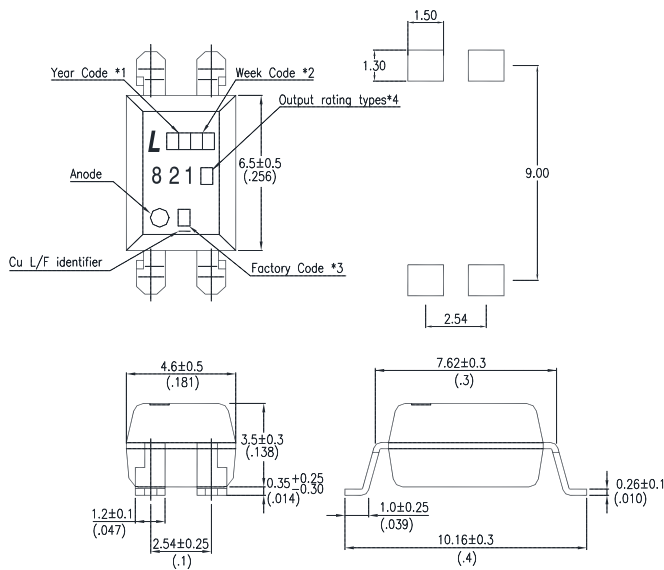
#### 3.1 LTV-821X



#### 3.2 LTV-821XM



#### 3.3 LTV-821XS



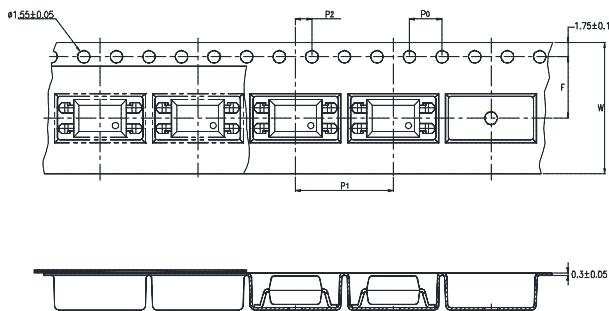
#### Notes:

1. 2-digit year code, example : 2017 = 17
  2. 2-digit work week ranging from '01' to '52'
  3. Factory identification mark shall be marked (W: China-CZ, Y: Thailand)
  4. VDE option.
  5. Output rating Option
- Dimensions in millimeters (inches).

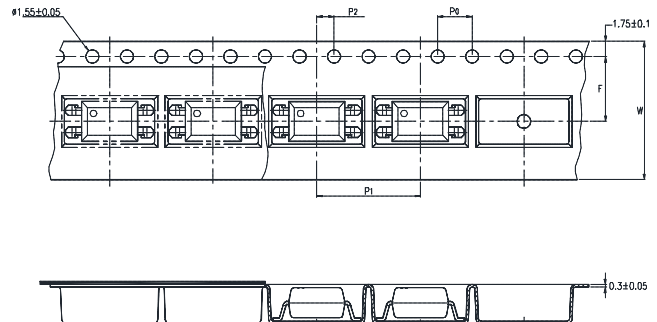
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### 4. TAPING DIMENSIONS

#### 4.1 LTV-821XS-TA



#### 4.2 LTV-821XS-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 (0.47)

#### 4.3 Quantities Per Reel

Package Type	TA/TA1
Quantities (pcs)	1000

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### 5. RATING AND CHARACTERISTICS

#### 5.1 Absolute Maximum Ratings at Ta=25°C

Parameter		Symbol	LTV-8212	LTV-8217	LTV-8214	LTV-8216
Input	Forward Current	$I_F$	50mA			
	Reverse Voltage	$V_R$	5V			
	Power Dissipation	$P_{in}$	65 mw			
Output	Load Voltage (peak AC & DC)	$V_L$	60V	250V	400V	600V
	Continuous load current	$I_L$	550mA	180mA	120mA	50mA
	Power dissipation	$P_{out}$	500mW			
	Total Power Dissipation	$P_{tot}$	550mW			
1.	Isolation Voltage	$V_{iso}$	5000V			
	Operating Temperature	$T_{opr}$	-40 ~ +85 °C			
	Storage Temperature	$T_{stg}$	-55 ~ +125 °C			
	Soldering Temperature	$T_{sol}$	260 °C (For 10 seconds)			

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.

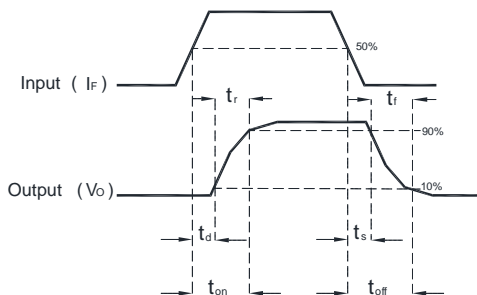
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## 5.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

Parameter		Symbol	Range	LTV-8212	LTV-8217	LTV-8214	LTV-8216	Test Condition
Input	LED Operating Current	$I_{Fon}$	Typ.	0.8mA				$I_L=Max.$
			Max.	3mA				
	LED Turn off Current	$I_{Foff}$	Min.	0.4mA				$I_L=Max.$
			Typ.	0.6mA				
Dropout Voltage	$V_F$	Typ.	1.3V				$I_F=50mA$	
		Max.	1.5V					
Output	On Resistance	$R_{on}$	Typ.	1.16 $\Omega$	8.5 $\Omega$	16.4 $\Omega$	46 $\Omega$	$I_F=5mA$
			Max.	2.5 $\Omega$	15 $\Omega$	35 $\Omega$	120 $\Omega$	$I_L=Max.$
	Off state leakage current	$I_{leak}$	Max.	1 $\mu A$				$I_F=0mA,$ $V_L=Max.$
Transfer characteristics	Turn on time	$T_{on}$	Typ.	0.65 ms	0.58 ms	0.61 ms	0.37 ms	$I_F=5mA$
			Max.	4 ms	2 ms			$I_L=Max.$
	Turn off time	$T_{off}$	Typ.	0.22 ms	0.18 ms	0.18 ms	0.2 ms	$I_F=5mA$
			Max.	1 ms				$I_L=Max.$
Isolation Resistance	$R_{iso}$	Min.	$5 \times 10^{10} \Omega$				DC500V, 40 ~ 60% R.H.	

Note :

1. Turn on / turn off time



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## 6. CHARACTERISTICS CURVES

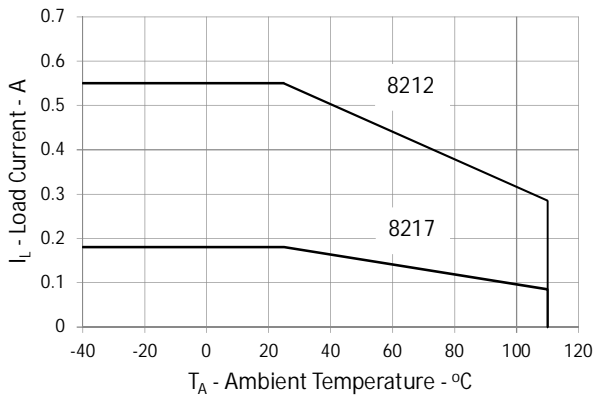


Fig. 1-(1) Load Current vs. Ambient Temperature

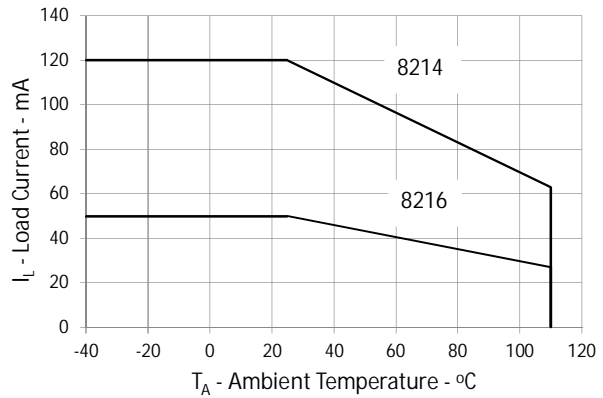


Fig. 1-(2) Load Current vs. Ambient Temperature

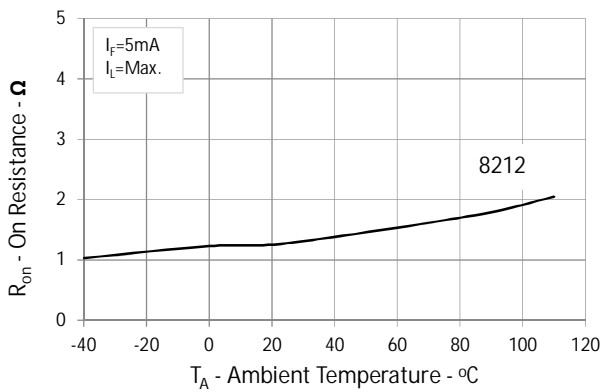


Fig. 2-(1) On Resistance vs. Ambient Temperature

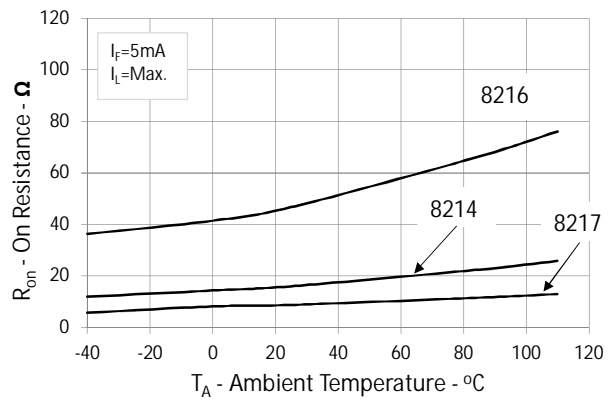


Fig. 2-(2) On Resistance vs. Ambient Temperature

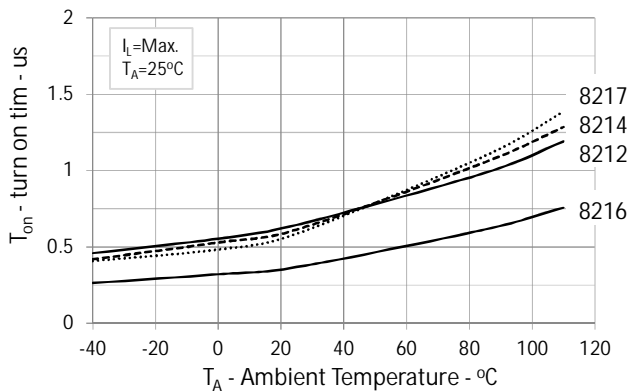


Fig. 3 Turn on time vs. Ambient Temperature

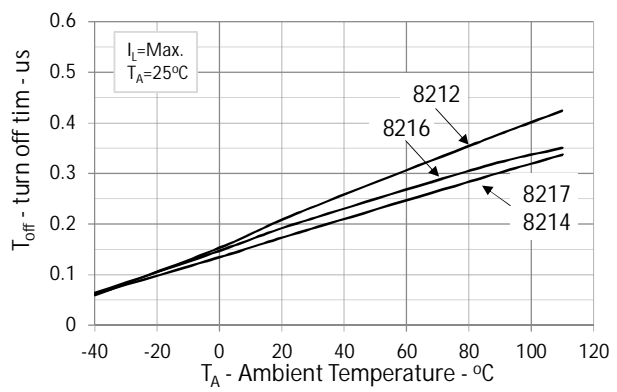


Fig. 4 Turn off time vs. Ambient Temperature

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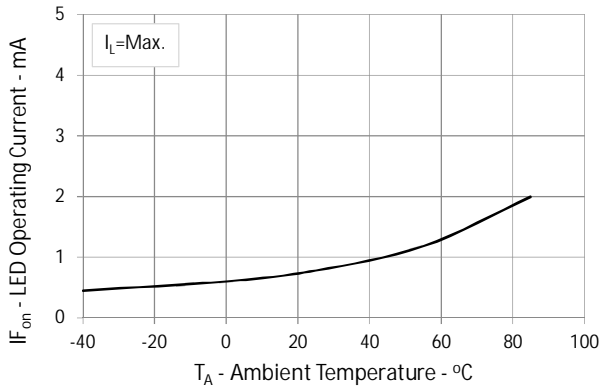


Fig. 5 LED Operating Current vs. Ambient Temperature

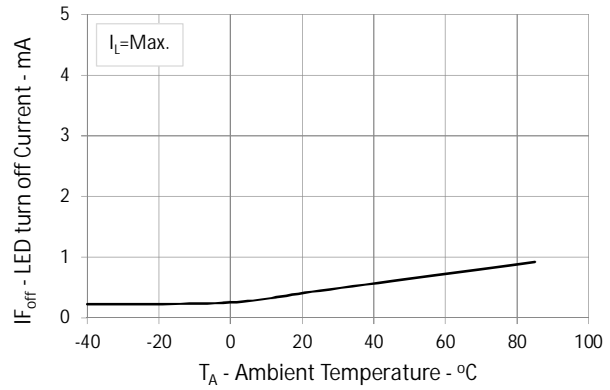


Fig. 6 Turn Off Time vs. Ambient Temperature

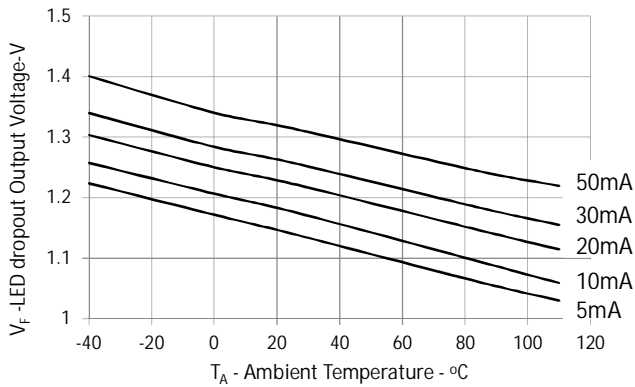


Fig. 7 LED dropout voltage vs. Ambient Temperature

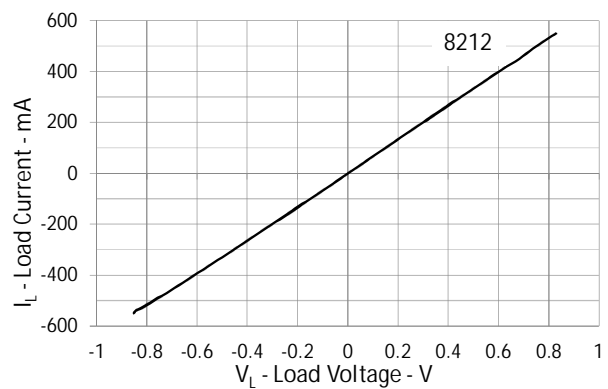


Fig. 8-(1). Load Current vs. Load Voltage

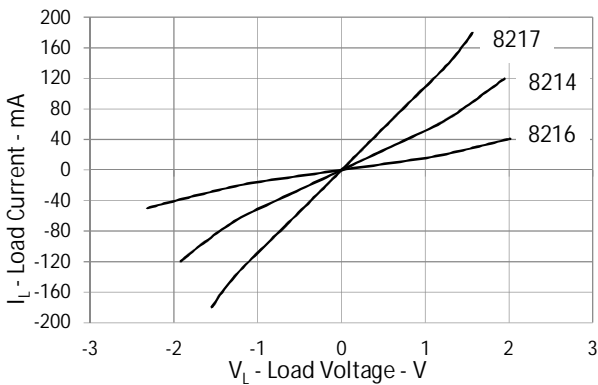


Fig. 8-(2). Load Current vs. Load Voltage

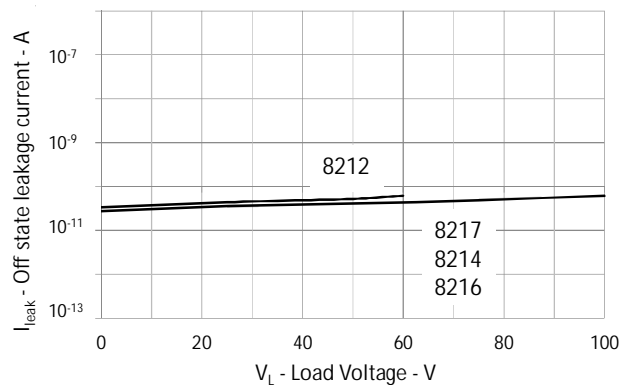


Fig. 9. Off State Leakage Current vs. Load Voltage



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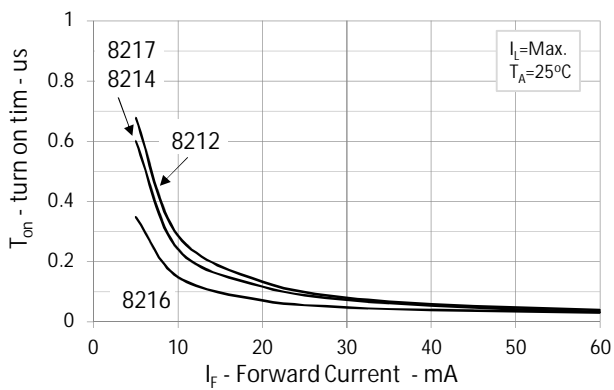


Fig. 10. Turn on time vs. LED Forward Current

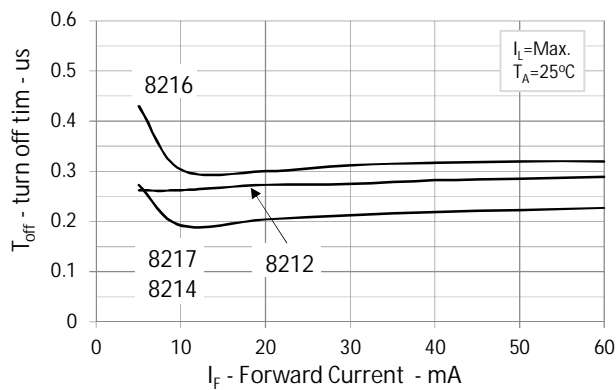


Fig. 11. Turn off time vs. LED Forward Current

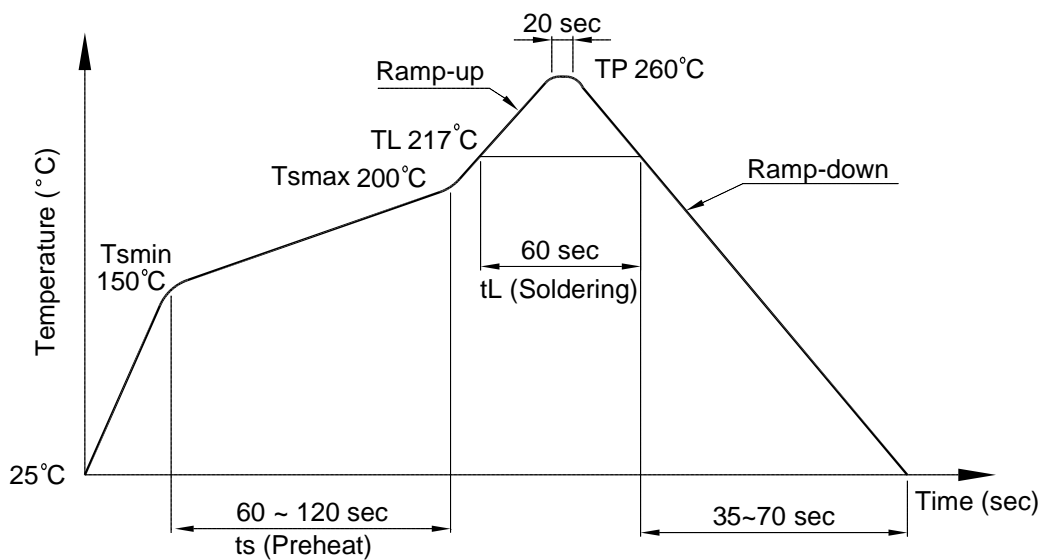
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## 7. TEMPERATURE PROFILE OF SOLDERING

### 7.1 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 twice

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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### 7.2 Wave soldering (JEDEC22A111 compliant)

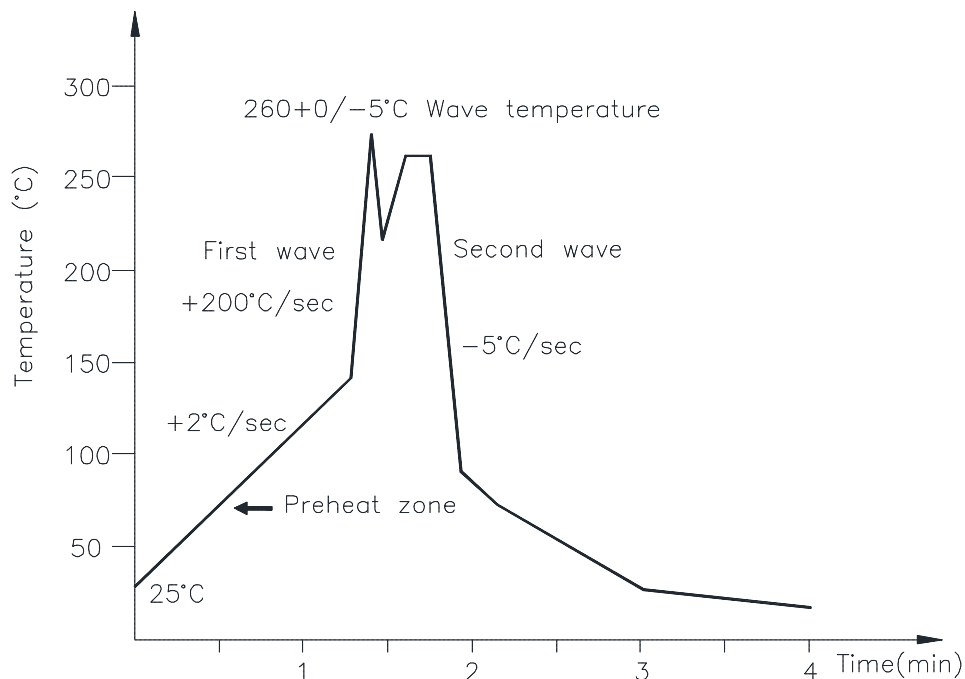
One time soldering is recommended within the condition of temperature.

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.



### 7.3 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.

## 8. 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.