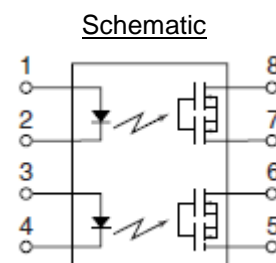
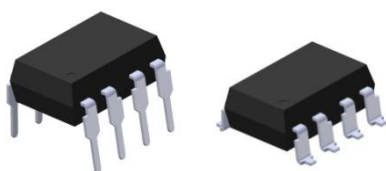


### GENERAL PURPOSE SOLID STATE RELAY 8PIN DIP 2-CHANNEL TYPE FORM A SSR



#### Features

- Compact 8-pin DIP size
- Applicable for 2 Form A use as well as two independent 1 Form A use
- Controls low-level analog signals
- High sensitivity and high speed response
- Low-level off state leakage current of max. 1uA
- Wide operating temperature range of -40°C to 85°C
- High isolation voltage between input and output (Viso = 5000 Vrms)
- UL 1577 + cUL approved (No. E214129)
- VDE approved (No. 40028391)

#### Pin Configuration

- 1, 3 LED Anode
- 2, 4 LED Cathode
- 8, 7, 6, 5 MOSFET

#### Description

The EL840A and EL860A are solid state relays containing an AlGaAs infrared LEDs on the light emitting side (input side) optically coupled to a high voltage output detector circuit. The detector consists of a photovoltaic diode array and MOSFETs on the output side. The dual channel configuration is equivalent to 1 form A EMR. They are packaged in 8 pin DIP and available in surface mount SMD option.

#### Applications

- High-speed inspection machines
- Telephones equipment
- Computer

**Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)**

	Parameter	Symbol	Rating		Unit
			EL840A	EL860A	
Input	Forward Current	$I_F$	50		mA
	Reverse Voltage	$V_R$	5		V
	Peak Forward Current* <sup>1</sup>	$I_{FP}$	1		A
	Power Dissipation	$P_{in}$	75		mW
Output	Break Down Voltage	$V_L$	400	600	V
	Continuous Load Current	$I_L$	120	50	mA
	Pulse Load Current* <sup>2</sup>	$I_{LPeak}$	0.3	0.15	A
	Power Dissipation	$P_{out}$	800		mW
	Total Power Dissipation	$P_T$	850		mW
	Isolation Voltage* <sup>3</sup>	$V_{iso}$	5000		Vrms
	Storage Temperature	$T_{STG}$	-40 to 125		$^{\circ}\text{C}$
	Operating Temperature	$T_{OPR}$	-40 to 85		$^{\circ}\text{C}$
	Soldering Temperature* <sup>4</sup>	$T_{SOL}$	260		$^{\circ}\text{C}$

Notes:

\*1.  $f=100\text{Hz}$ , Duty Cycle = 0.1%

\*2. A connection: 100ms (1 shot),  $V_L = \text{DC}$

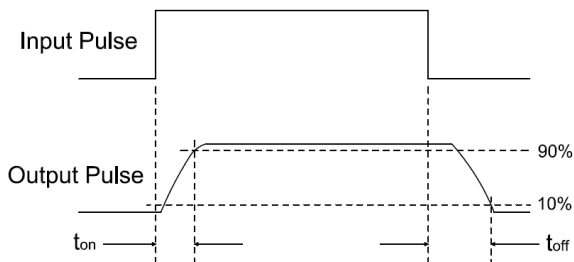
\*3. AC for 1 minute, R.H. = 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

\*4. For 10 seconds

## Electro-Optical Characteristics (T<sub>A</sub>=25 °C)

	Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	
Input	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10mA	-	1.18	1.5	V	
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5V	-	-	1	μA	
Output	Off State leakage Current	I <sub>leak</sub>	I <sub>F</sub> = 0mA, V <sub>L</sub> = Max.	-	-	1	μA	
	On Resistance	R <sub>d(ON)</sub>	I <sub>F</sub> = 10mA, I <sub>L</sub> = Max. t = 1s	-	20	30	Ω	
	EL840A EL860A			-	40	70		
	Output Capacitance	C <sub>out</sub>	V <sub>L</sub> = 0V, f = 1MHz	-	45	-	pF	
	EL840A EL860A			-	30	-		
Transfer Characteristics	LED turn on Current	I <sub>F(on)</sub>	I <sub>L</sub> = Max.	-	3.0	5	mA	
	EL840A EL860A			-	3.0	5		
	LED turn off current	I <sub>F(off)</sub>	I <sub>L</sub> = Max.	0.4	3.0	-	mA	
	EL840A EL860A			0.4	3.0	-		
	Turn On Time	T <sub>on</sub>	I <sub>F</sub> = 10 mA, I <sub>L</sub> = Max. R <sub>L</sub> = 200Ω ,	-	0.4	3	ms	
	EL840A EL860A			-	1.4	3		
	Turn Off Time	T <sub>off</sub>		EL840A EL860A		0.05 0.05	0.5 0.5	ms
	Isolation Resistance	R <sub>I-O</sub>	V <sub>I-O</sub> = 500V DC	5×10 <sup>10</sup>	-	-	Ω	
	Isolation Capacitance	C <sub>I-O</sub>	V = 0V, f = 1MHz	1.5	-	-	pF	

## Turn on/Turn off Time



## Typical Electro-Optical Characteristics Curves

Figure 1. Load current vs Ambient temperature

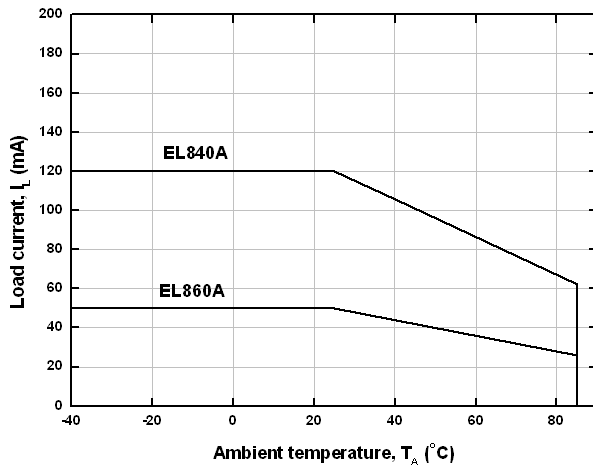


Figure 2. On Resistance vs Ambient Temperature

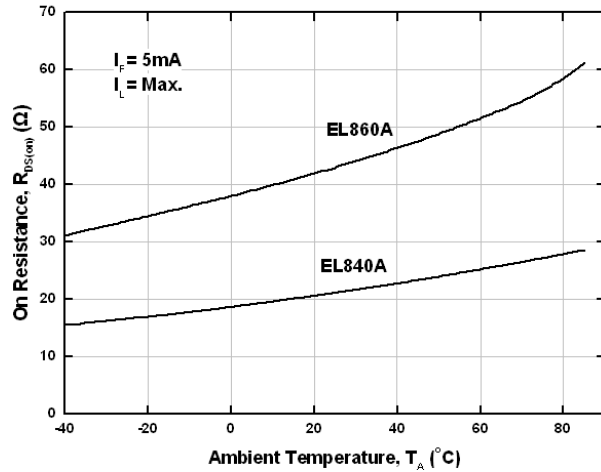


Figure 3. Switching Time vs Ambient Temperature

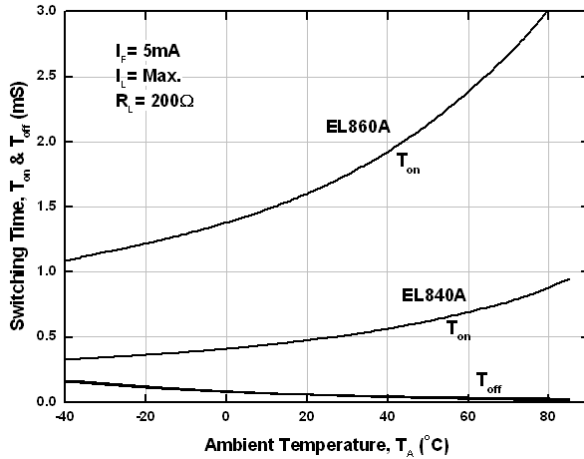


Figure 4. Turn On Time vs LED Forward Current

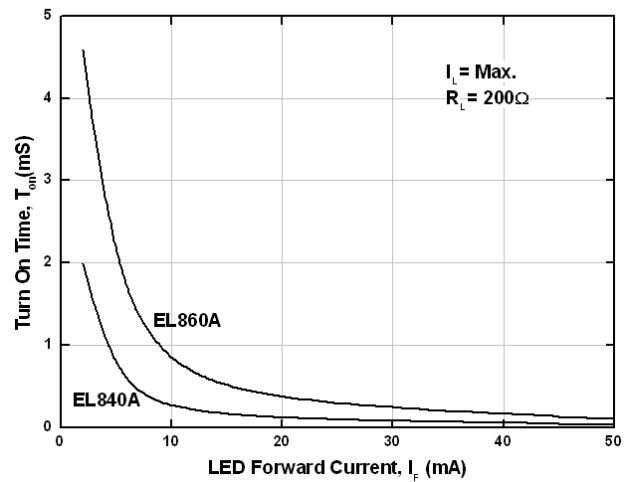


Figure 5. Turn Off Time vs LED Forward Current

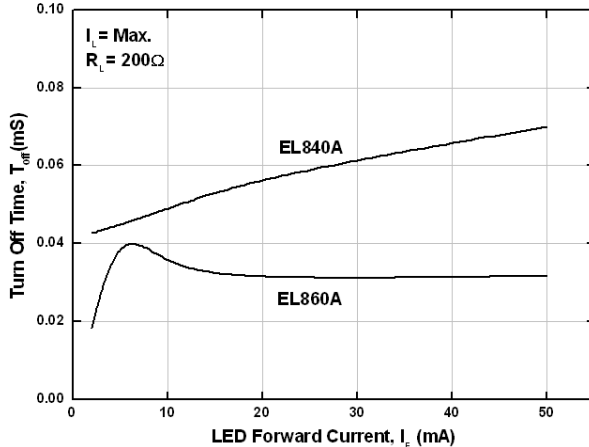


Figure 6. LED Operate on Current vs Ambient Temperature

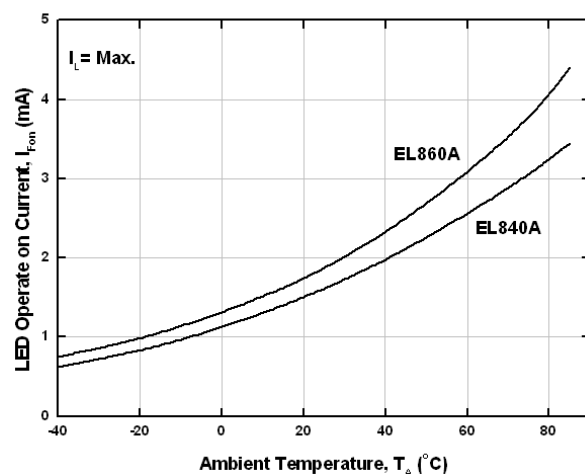


Figure 7. LED Turn off Current vs Ambient Temperature

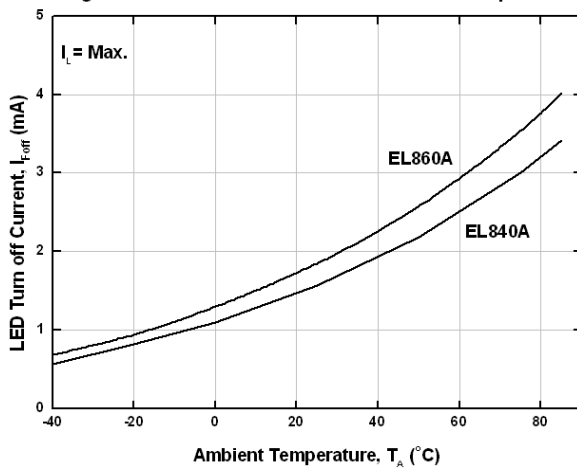


Figure 8. LED Dropout Voltage vs Ambient Temperature

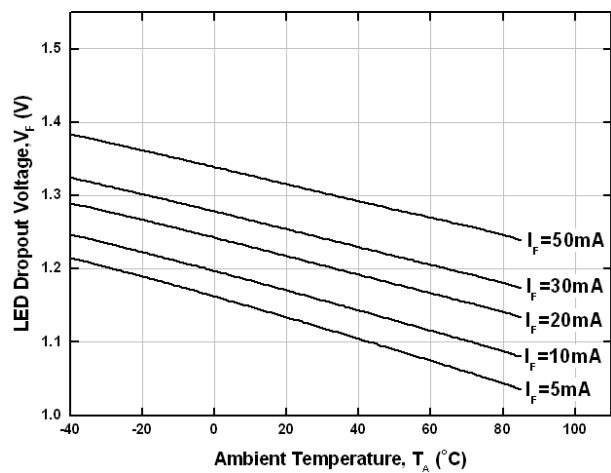


Figure 9. Load Voltage vs Load Current

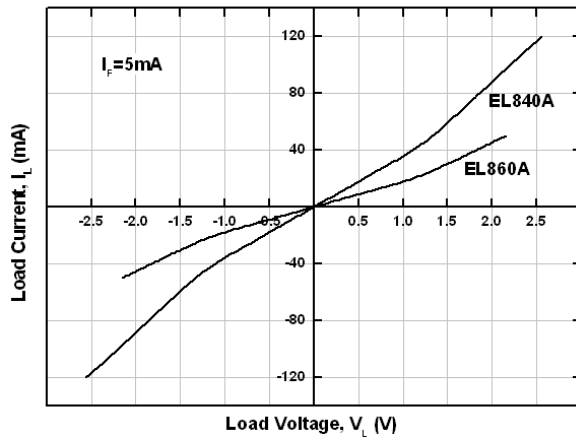


Figure 10. Off State Leakage Current vs Load Voltage

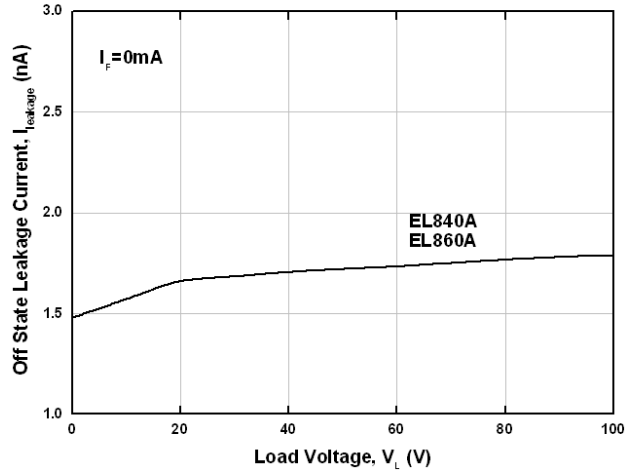
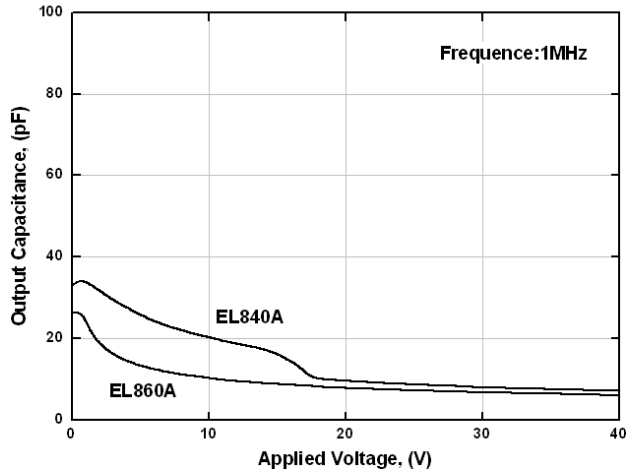


Figure 11. Applied Voltage VS Output Capacitance



## Order Information

### Part Number

**EL8XXA(Y)(Z)-V**

#### Note:

XX = Part No. ( 40 or 60)

Y = Lead form option (S1, or none)

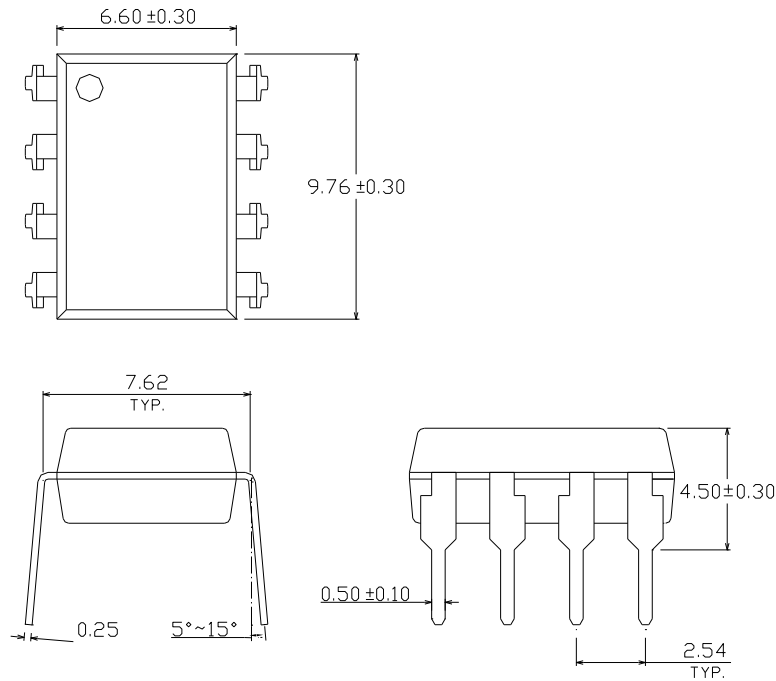
Z = Tape and reel option (TA, TB, TU, TD or none).

V = VDE safety approved option

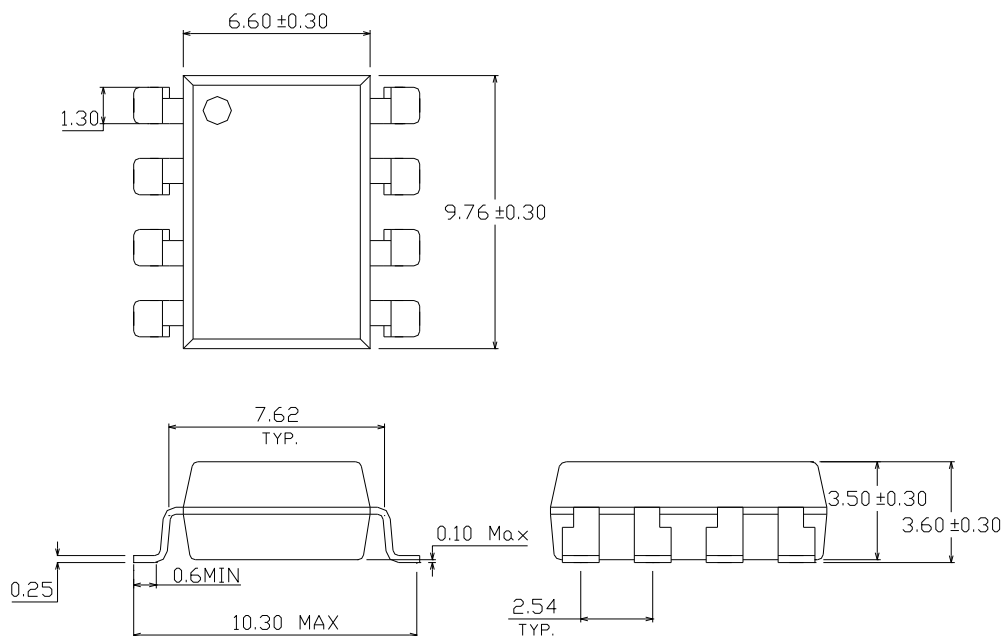
Option	Description	Packing quantity
None	Standard DIP-8	45 units per tube
S1 (TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 (TB)	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel

**Package Dimension**  
(Dimensions in mm)

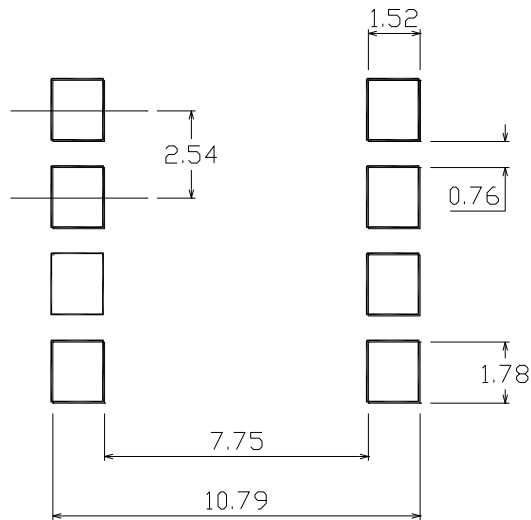
**Standard DIP Type**



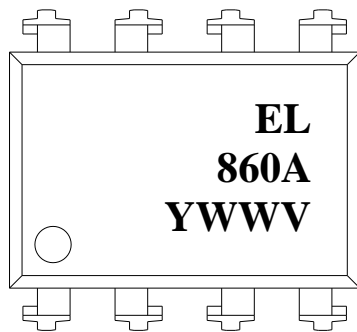
**Option S1 Type**



### Recommended Pad Layout for Surface Mount Leadform



### Device Marking



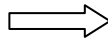
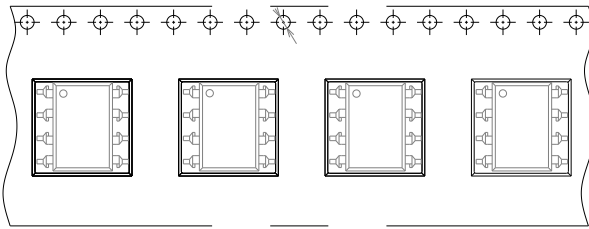
### Notes

EL	denotes Everlight
860A	denotes Part Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE option



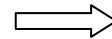
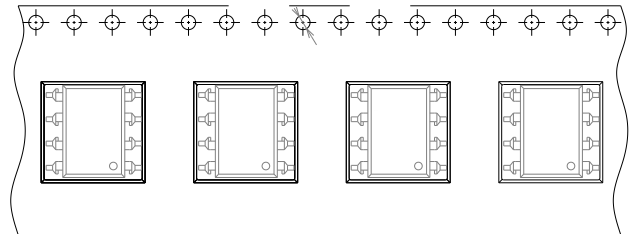
## Tape & Reel Packing Specifications

**Option TA**



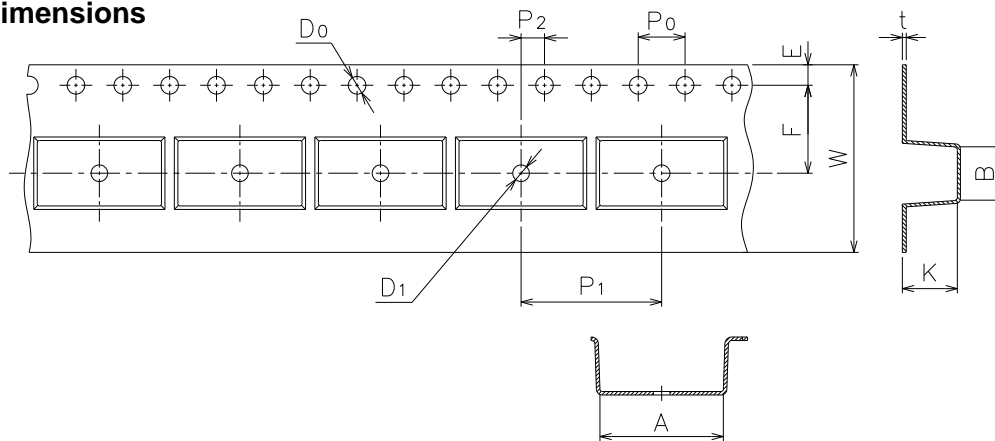
Direction of feed from reel

**Option TB**



Direction of feed from reel

## Tape Dimensions

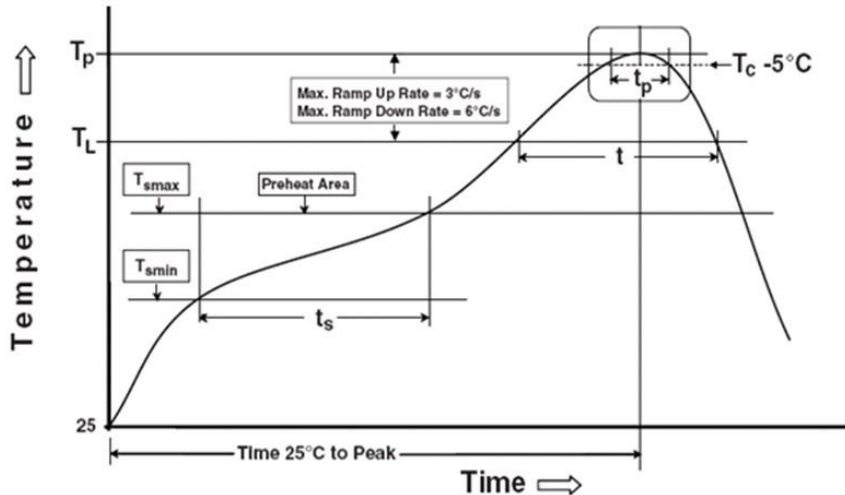


Dimension No.	A	B	Do	D1	E	F
Dimension(mm)	10.4±0.1	10.0±0.1	1.5+0.1/-0	1.5±0.25/-0	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.05	0.4±0.05	16.0±0.3/	4.5±0.1

## Precautions for Use

### 1. Soldering Condition

#### 1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Reference: IPC/JEDEC J-STD-020D

#### Preheat

Temperature min ( $T_{smin}$ )	150 °C
Temperature max ( $T_{smax}$ )	200°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3 °C/second max

#### Other

Liquidus Temperature ( $T_L$ )	217 °C
Time above Liquidus Temperature ( $t_L$ )	60-100 sec
Peak Temperature ( $T_p$ )	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times

## **Application Restrictions**

High reliability applications such as military/aerospace, automotive safety/security systems, and medical equipment may require different product. If you have any concerns, please contact Everlight before using this product in your application. This specification guarantees the quality and performance of the product as an individual component. Do not use this product beyond the specification described in this document.