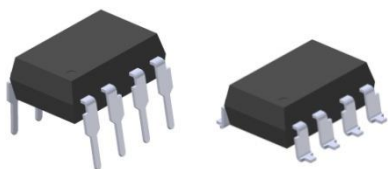
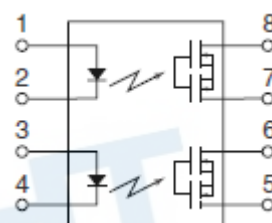


### 8PIN DIP 2-CHANNEL TYPE FORM A SOLID STATE RELAY EL840A(D)\_EL860A(D)\_Series



Schematic



Pin Configuration

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

#### Features

- Compact 8-pin DIP size
- Applicable for 2 Form A use as well as two independent 1Form 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)

#### Description

The EL840A(D) and EL860A(D) 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<sub>A</sub>=25 °C, unless otherwise specified)**

	Parameter	Symbol	Rating		Unit
			EL840A	EL860A	
Input	Forward Current	I <sub>F</sub>	50		mA
	Reverse Voltage	V <sub>R</sub>	5		V
	Peak Forward Current*1	I <sub>FP</sub>	1		A
	Power Dissipation	P <sub>in</sub>	75		mW
Output	Break Down Voltage*2	V <sub>L</sub>	400	600	V
	Continuous Load Current*2	I <sub>L</sub>	120	50	mA
	Pulse Load Current*3	I <sub>LPeak</sub>	0.3	0.15	A
	Power Dissipation	P <sub>out</sub>	800		mW
	Total Power Dissipation	P <sub>T</sub>	850		mW
	Isolation Voltage*4	V <sub>iso</sub>	5000		Vrms
	Storage Temperature	T <sub>STG</sub>	-40 to 125		°C
	Operating Temperature	T <sub>OPR</sub>	-40 to 85		°C
	Soldering Temperature*5	T <sub>SOL</sub>	260		°C

Notes:

\*1. f =100Hz, Duty Cycle = 0.1%

\*2. Indicate the peak AC and DC values

\*3.A connection: 100ms (1 shot), V<sub>L</sub> = DC or Peak AC

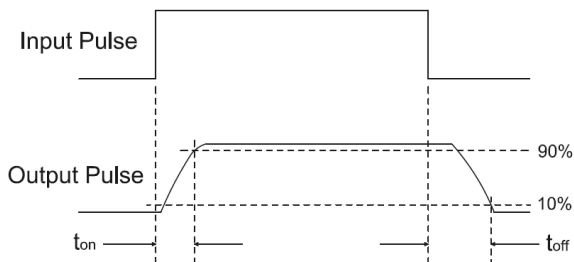
\*4.AC for 1 minute, R.H. = 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

\*5.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	<div>EL840A EL860A</div>	R <sub>d(ON)</sub>	<div>I<sub>F</sub> = 10mA, I<sub>L</sub> = Max. t = 1s</div>	<div>- -</div>	<div>20 40</div>	<div>30 70</div>	Ω
	Output Capacitance	<div>EL840A EL860A</div>	C <sub>out</sub>	V <sub>L</sub> = 0V, f = 1MHz	<div>- -</div>	<div>45 30</div>	<div>- -</div>	pF
	LED turn on Current	<div>EL840A EL860A</div>	I <sub>F(on)</sub>	I <sub>L</sub> = Max.	<div>- -</div>	<div>3.0 3.0</div>	<div>5 5</div>	mA
		LED turn off current	<div>EL840A EL860A</div>	I <sub>F(off)</sub>	I <sub>L</sub> = Max.	<div>0.4 0.4</div>	<div>3.0 3.0</div>	
Transfer Characteristics	Turn On Time	<div>EL840A EL860A</div>	T <sub>on</sub>	I <sub>F</sub> = 10 mA, I <sub>L</sub> = Max. R <sub>L</sub> = 200Ω ,	<div>- -</div>	<div>0.4 1.4</div>	<div>3 3</div>	ms
	Turn Off Time	<div>EL840A EL860A</div>	T <sub>off</sub>		<div>0.05 0.05</div>	<div>0.5 0.5</div>	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

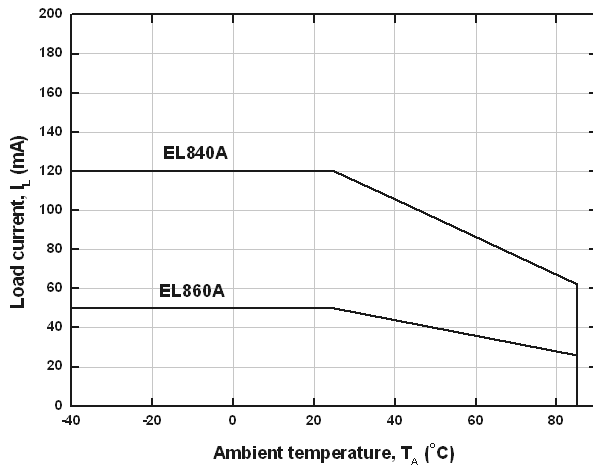


Figure 2. On Resistance vs Ambient Temperature

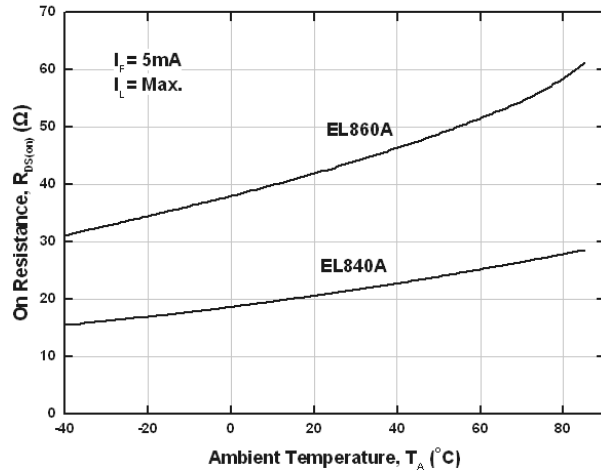


Figure 3. Switching Time vs Ambient Temperature

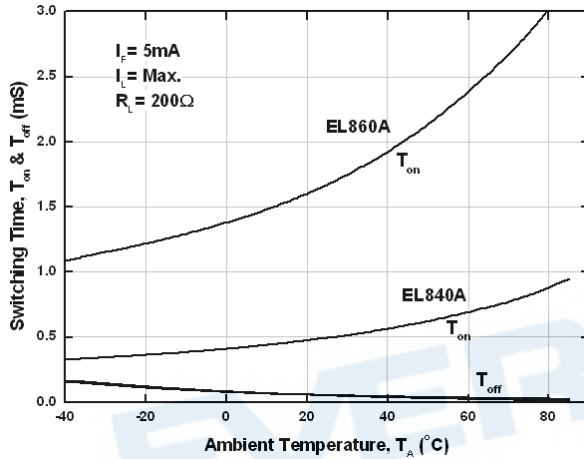


Figure 4. Turn On Time vs LED Forward Current

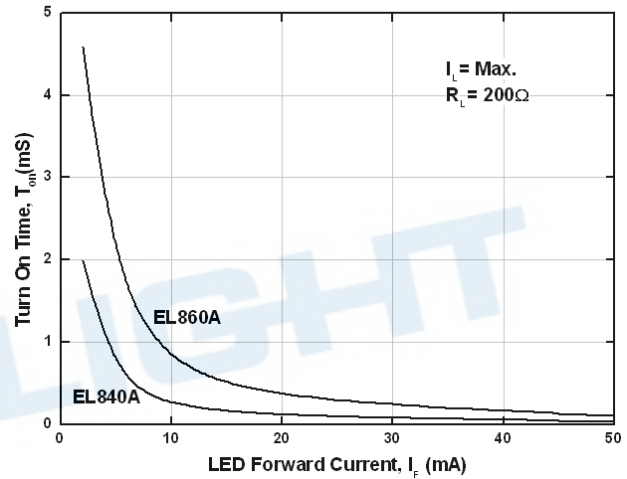


Figure 5. Turn Off Time vs LED Forward Current

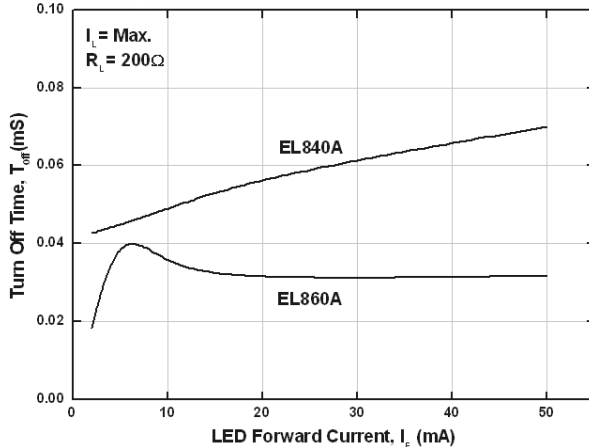


Figure 6. LED Operate on Current vs Ambient Temperature

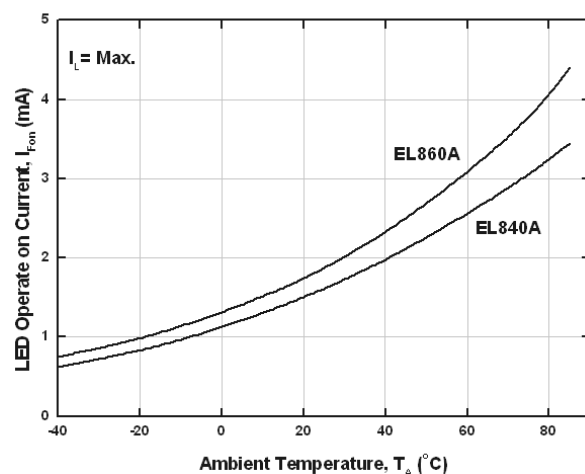


Figure 7. LED Turn off Current vs Ambient Temperature

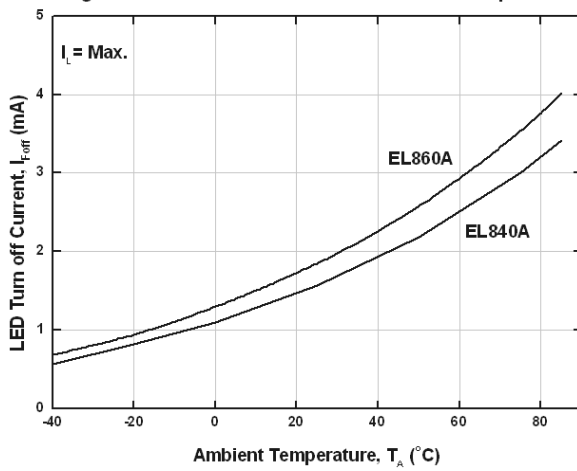


Figure 8. LED Dropout Voltage vs Ambient Temperature

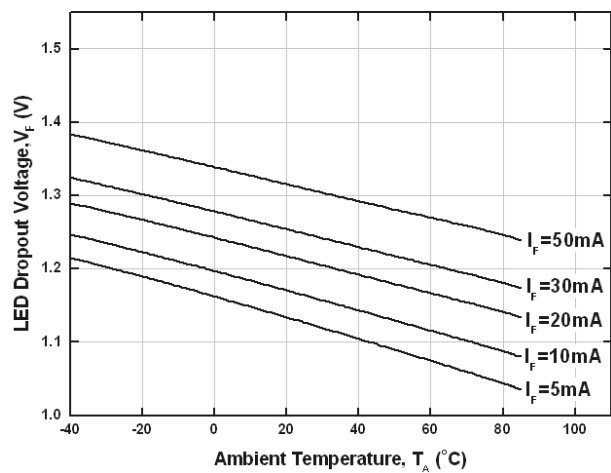


Figure 9. Load Voltage vs Load Current

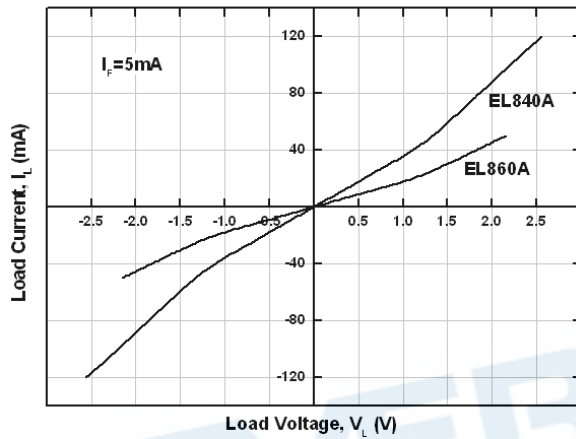


Figure 10. Off State Leakage Current vs Load Voltage

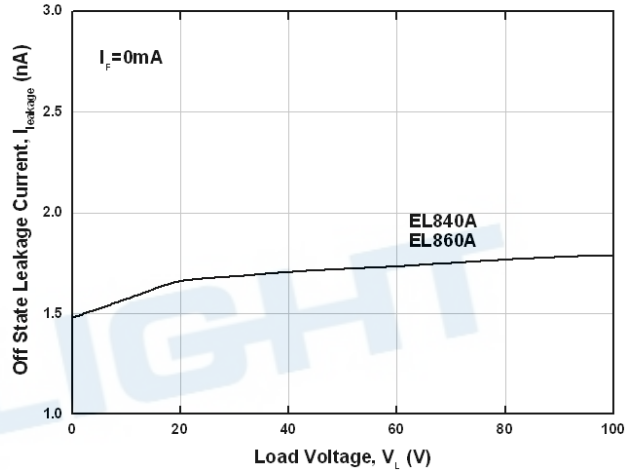
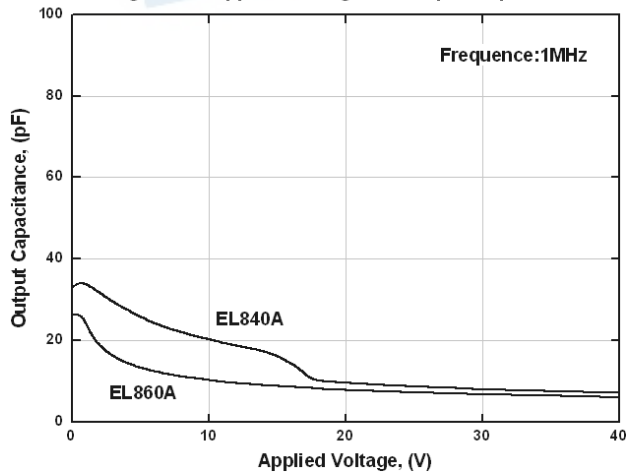


Figure 11. Applied Voltage VS Output Capacitance



\*Please be aware that all data in the graph are just for reference and not for guarantee.

## Order Information

### Part Number

**EL8XXAY(Z)(D)-V**

#### Note:

XX = Part No. ( 40 or 60)

Y = Lead form option (S1, or none)

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

D= Customer code

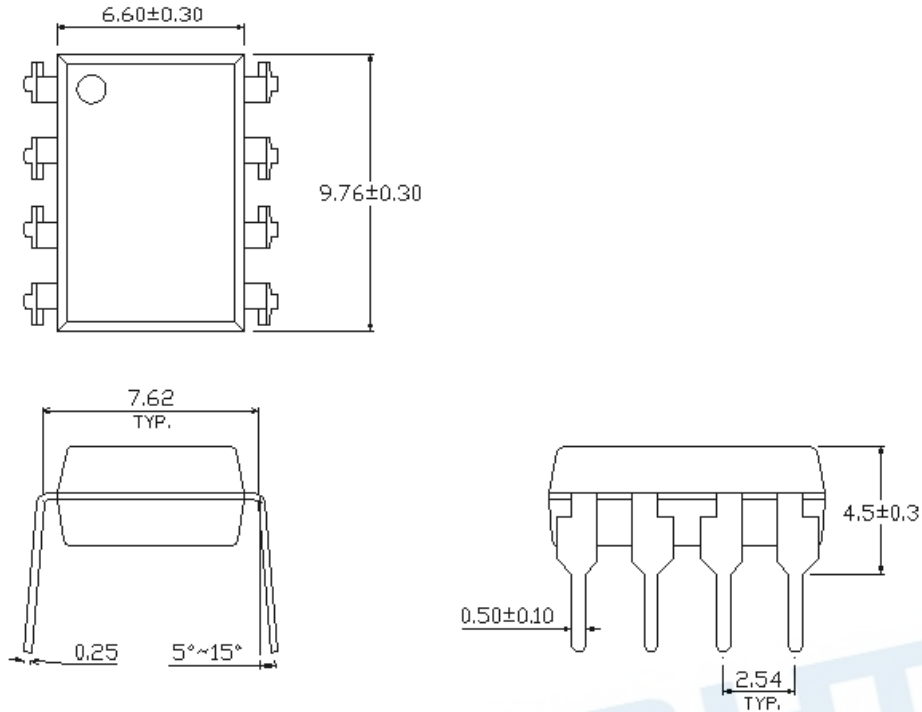
V = VDE safety approved option

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

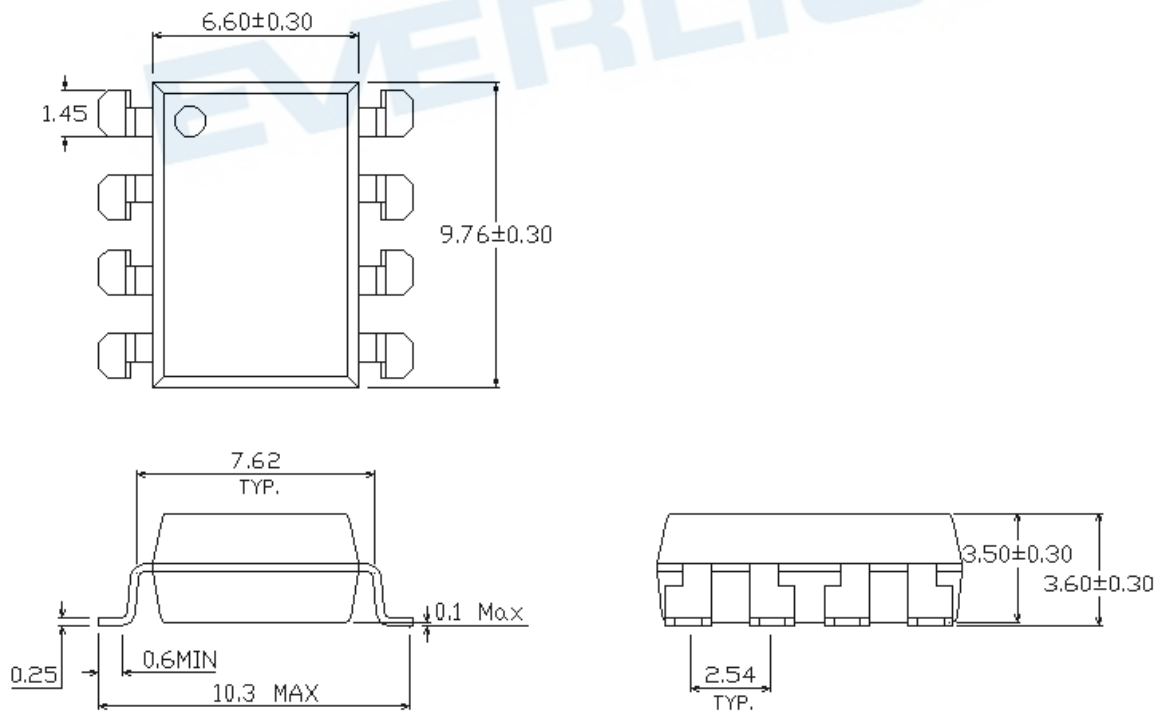
EVERLIGHT

**Package Dimension**  
(Dimensions in mm)

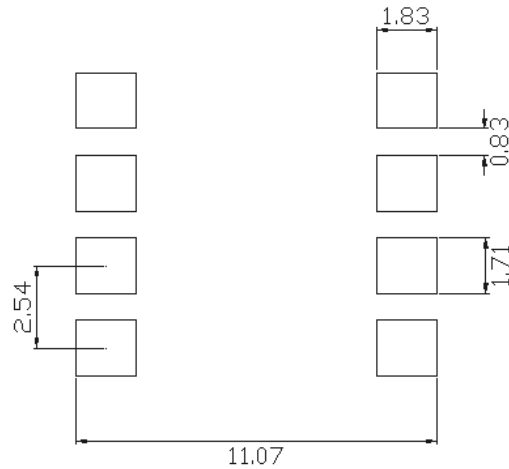
**Standard DIP Type**



**Option S1 Type**

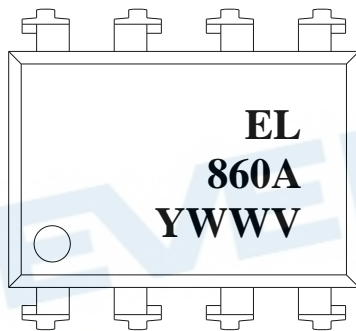


### Recommended Pad Layout for Surface Mount Leadform



Notes.  
Suggested pad dimension is just for reference only.  
Please modify the pad dimension based on individual need.

### Device Marking



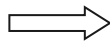
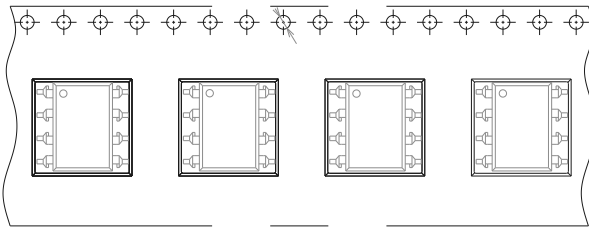
### Notes

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



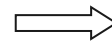
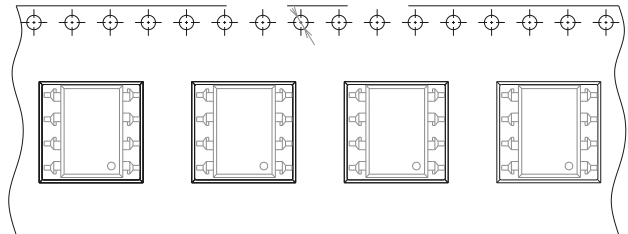
## Tape & Reel Packing Specifications

### Option TA



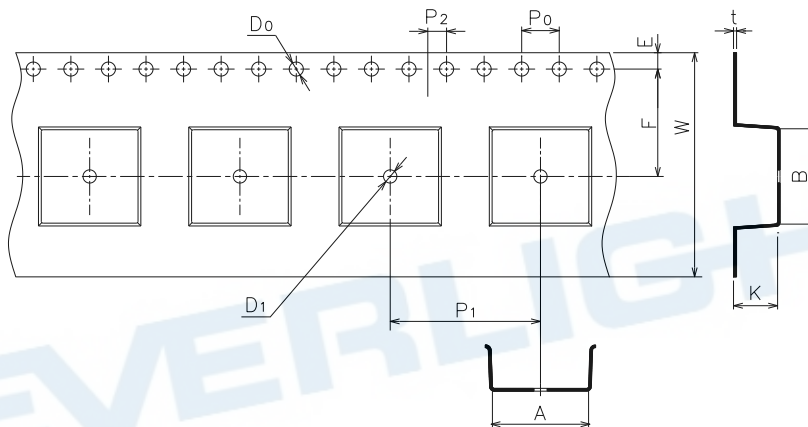
Direction of feed from reel

### Option TB



Direction of feed from reel

## Tape Dimensions

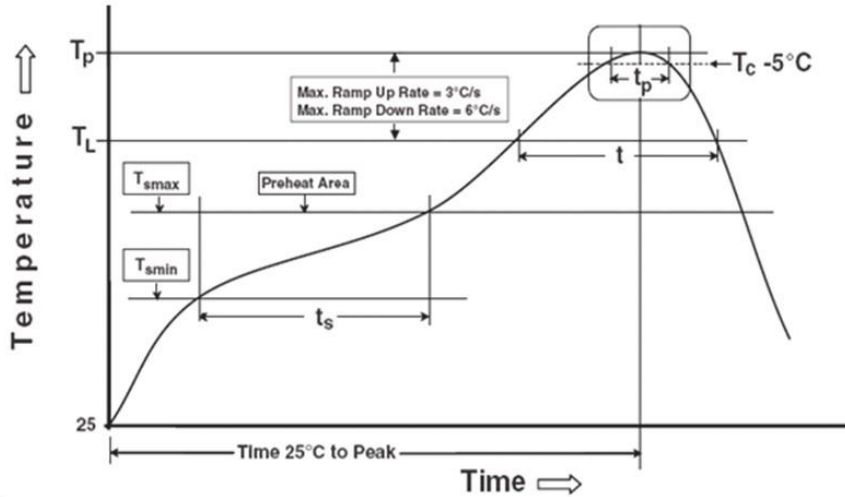


Dimension No.	A	B	Do	D1	E	F
Dimension(mm)	10.4±0.1	10.0±0.1	1.5±0.1	1.5±0.25	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.05	0.4±0.05	16.0±0.3	4.5±0.1

## 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

## DISCLAIMER

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
3. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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