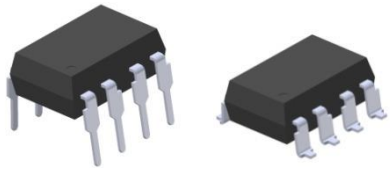
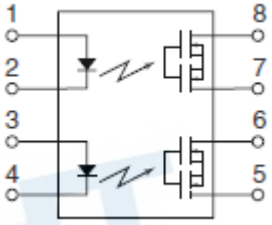
DATASHEET

GENERAL PURPOSE SOLID STATE RELAY
8PIN DIP 2-CHANNEL TYPE FORM A SSR 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)
- • SEMKO approved
- • NEMKO approved
- • DEMKO approved
- • FIMKO approved
- • CQC approved

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 °C, unless otherwise specified)

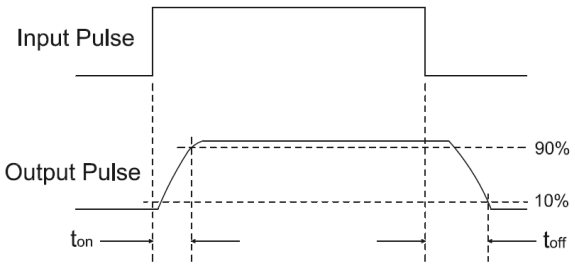
Parameter		Symbol	Rating		Unit
			EL840A	EL860A	
Input	Forward Current	I_F	50		mA
	Reverse Voltage	V_R	5		V
	Peak Forward Current*1	I_{FP}	1		A
	Power Dissipation	P_{in}	75		mW
Output	Break Down Voltage*2	V_L	400	600	V
	Continuous Load Current*2	I_L	120	50	mA
	Pulse Load Current*3	I_{LPeak}	0.3	0.15	A
	Power Dissipation	P_{out}	800		mW
Total Power Dissipation		P_T	850		mW
Isolation Voltage*4		V_{iso}	5000		Vrms
Storage Temperature		T_{STG}	-40 to 125		°C
Operating Temperature		T_{OPR}	-40 to 85		°C
Soldering Temperature*5		T_{SOL}	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_L = 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_A=25 °C)

	Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage		V_F	I_F = 10mA	-	1.18	1.5	V
	Reverse Current		I_R	V_R = 5V	-	-	1	μA
Output	Off State leakage Current		I_{leak}	I_F = 0mA, V_L = Max.	-	-	1	μA
	On Resistance	EL840A	$R_{d(ON)}$	I_F = 10mA, I_L = Max. t = 1s	-	20	30	Ω
		EL860A			-	40	70	
	Output Capacitance	EL840A	C_{out}	V_L = 0V, f = 1MHz	-	45	-	pF
		EL860A			-	30	-	
Transfer Characteristics	LED turn on Current	EL840A	$I_{F(on)}$	I_L = Max.	-	3.0	5	mA
		EL860A			-	3.0	5	
	LED turn off current	EL840A	$I_{F(off)}$	I_L = Max.	0.4	3.0	-	mA
		EL860A			0.4	3.0	-	
	Turn On Time	EL840A	T_{on}	I_F = 10 mA, I_L = Max. R_L = 200Ω ,	-	0.4	3	ms
		EL860A			-	1.4	3	
	Turn Off Time	EL840A	T_{off}			0.05	0.5	ms
		EL860A				0.05	0.5	
	Isolation Resistance		R_{I-O}	V_{I-O} = 500V DC	5×10^{10}	-	-	Ω
	Isolation Capacitance		C_{I-O}	V = 0V, f = 1MHz	1.5	-	-	pF

Turn on/Turn off Time



Typical Electro-Optical Characteristics Curves

Figure 1. Load current vs Ambient temperature

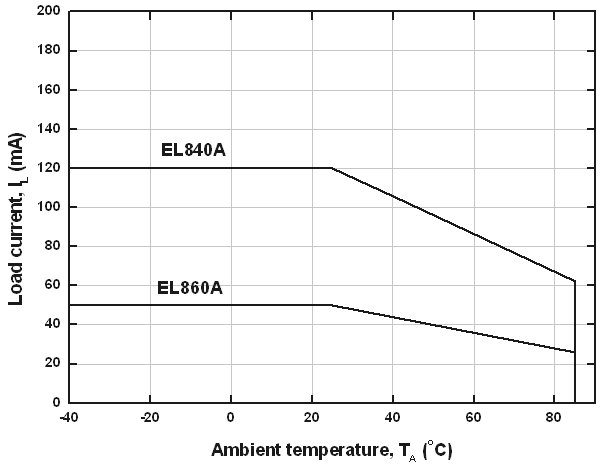


Figure 2. On Resistance vs Ambient Temperature

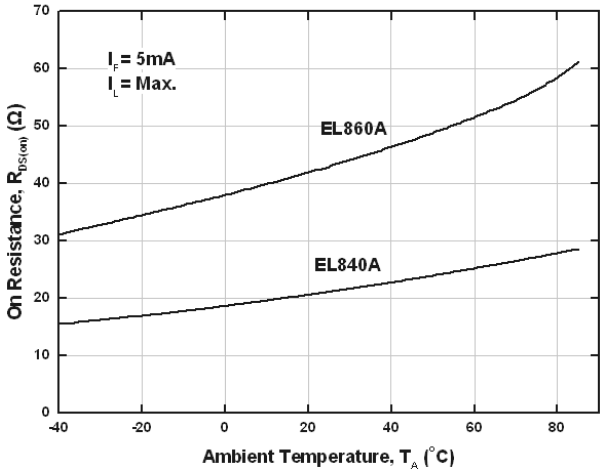


Figure 3. Switching Time vs Ambient Temperature

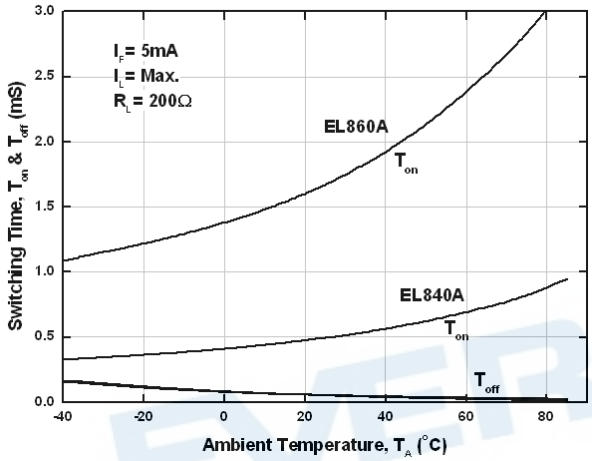


Figure 4. Turn On Time vs LED Forward Current

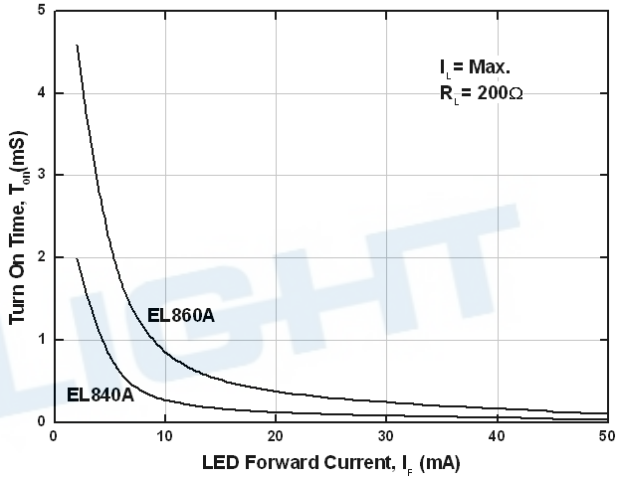


Figure 5. Turn Off Time vs LED Forward Current

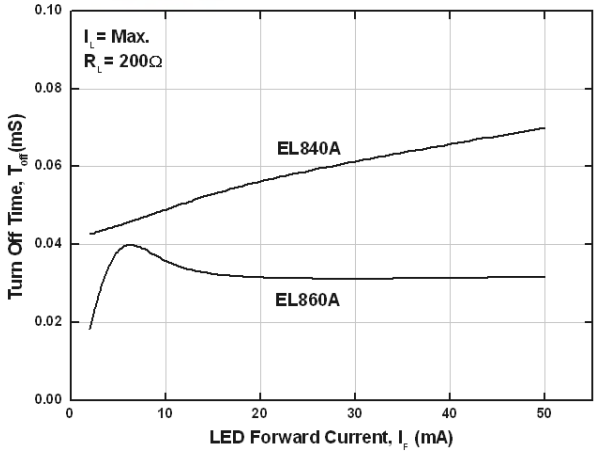


Figure 6. LED Operate on Current vs Ambient Temperature

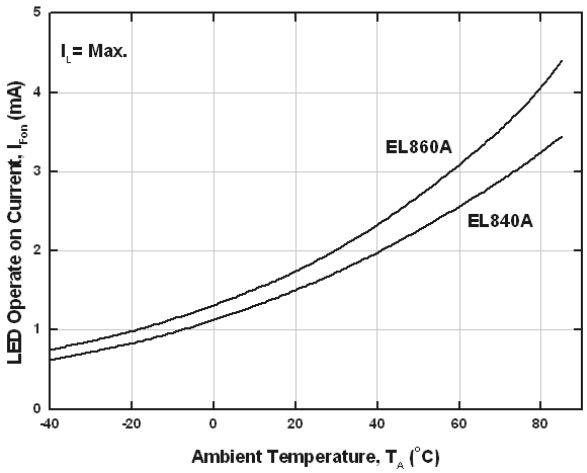


Figure 7. LED Turn off Current vs Ambient Temperature

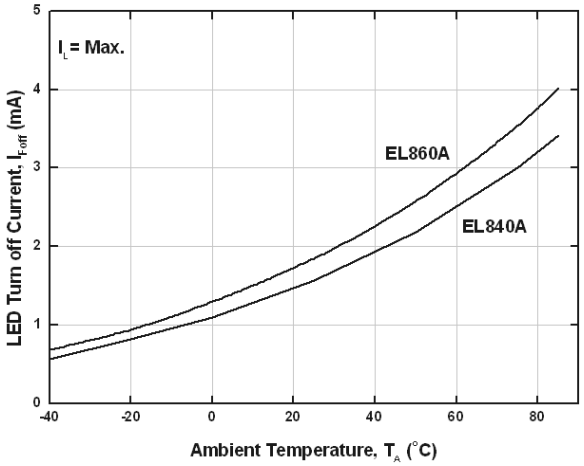


Figure 8. LED Dropout Voltage vs Ambient Temperature

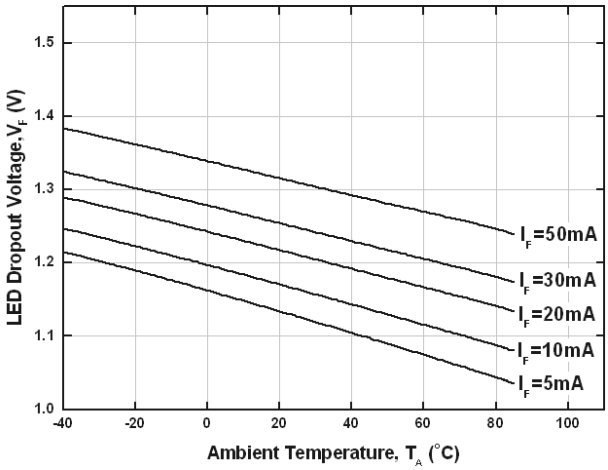


Figure 9. Load Voltage vs Load Current

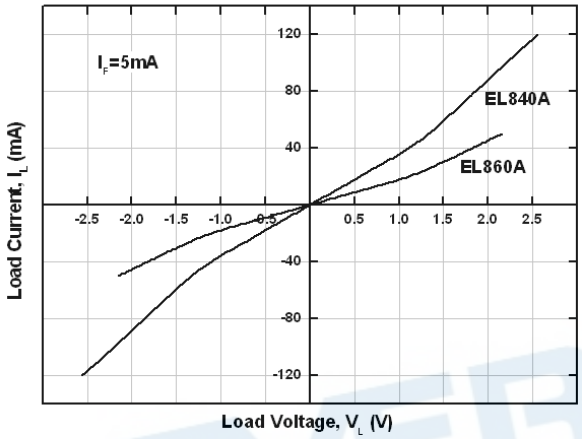


Figure 10. Off State Leakage Current vs Load Voltage

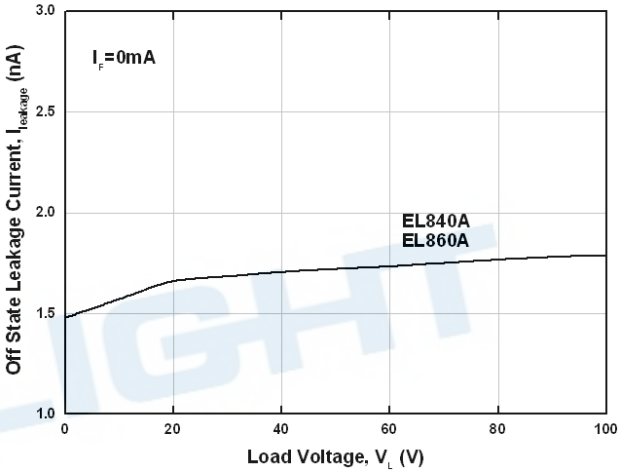
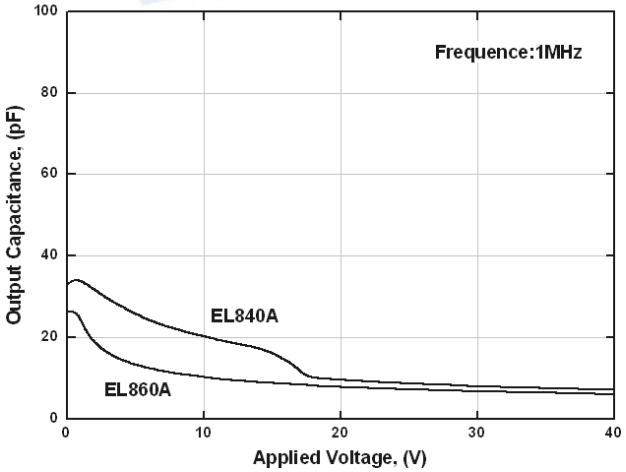


Figure 11. Applied Voltage VS Output Capacitance



Order Information

Part Number

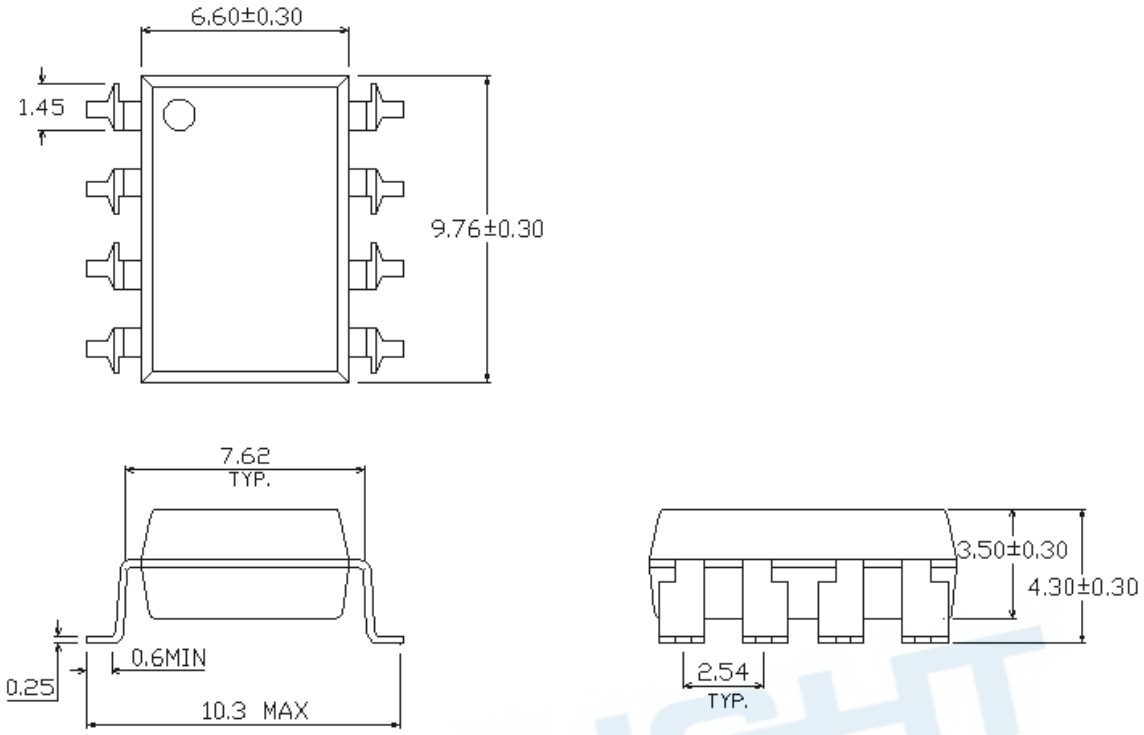
EL8XXA(Y)(Z)-V

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

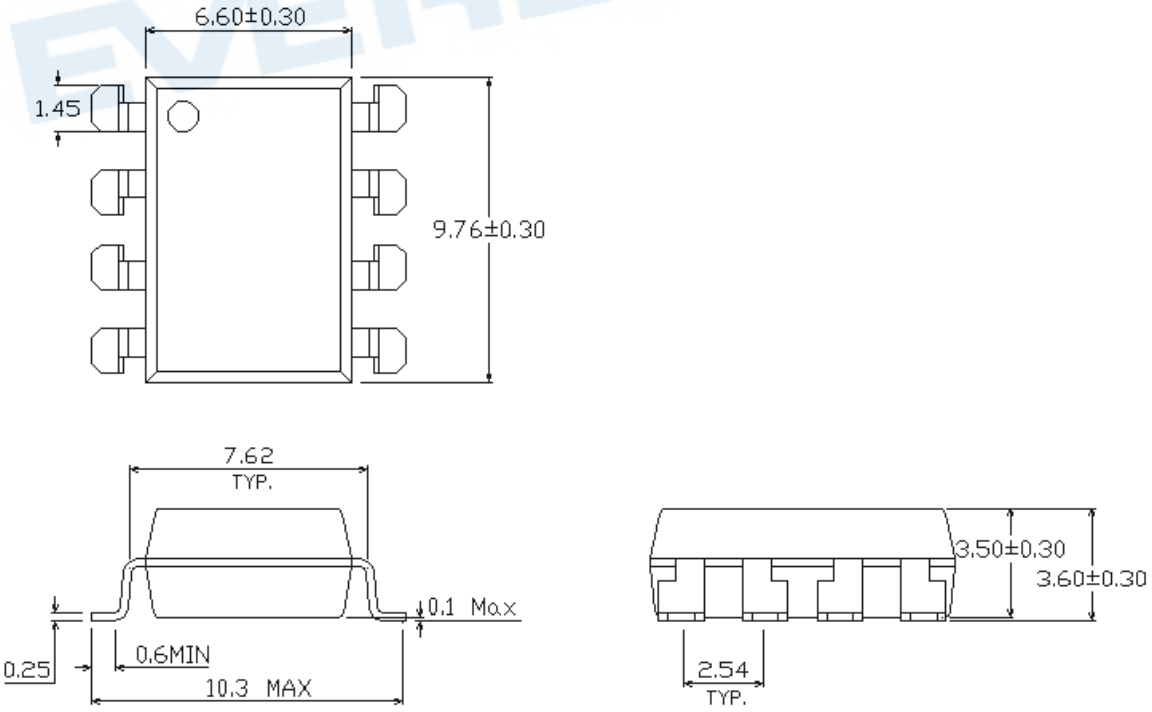
Option	Description	Packing quantity
None	Standard DIP-8	45 units per tube
S1 (TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 (TB)	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel

Package Dimension
(Dimensions in mm)

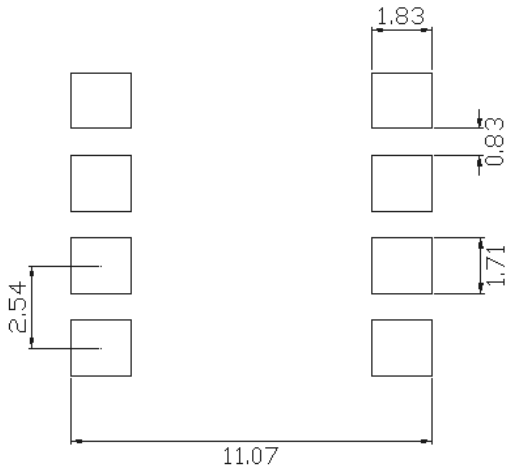
Standard DIP Type



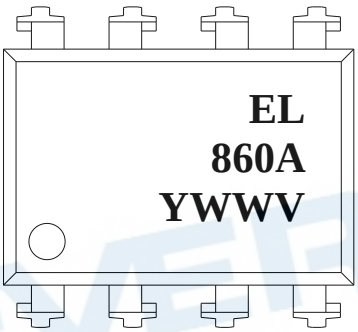
Option S1 Type



Recommended Pad Layout for Surface Mount Leadform



Device Marking

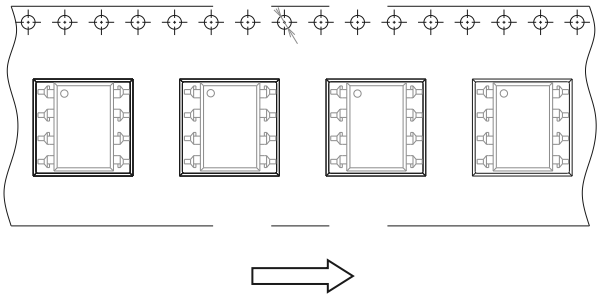


Notes

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

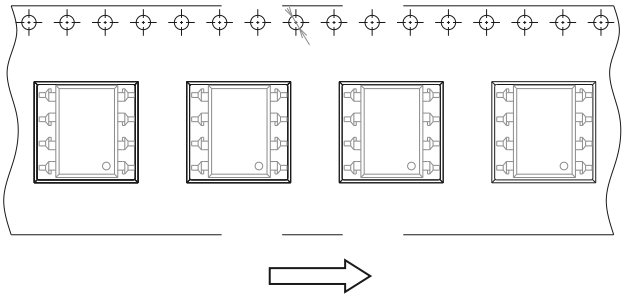
Tape & Reel Packing Specifications

Option TA



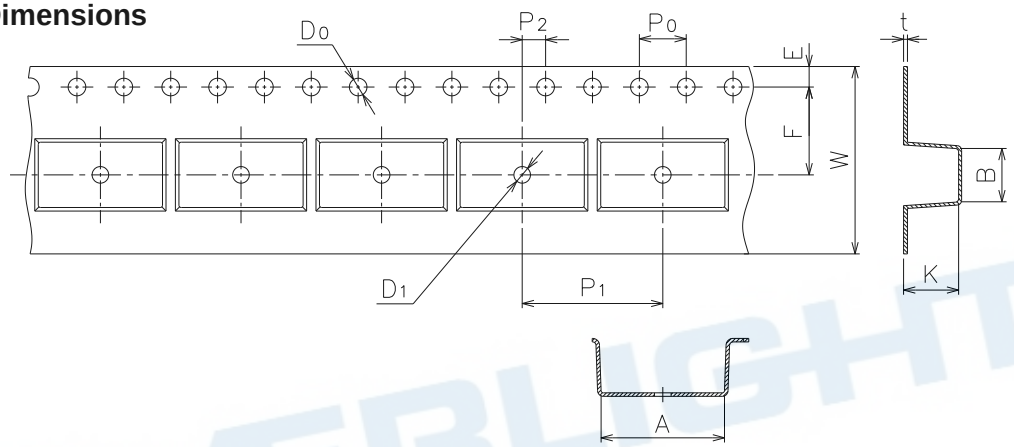
Direction of feed from reel

Option TB



Direction of feed from reel

Tape Dimensions

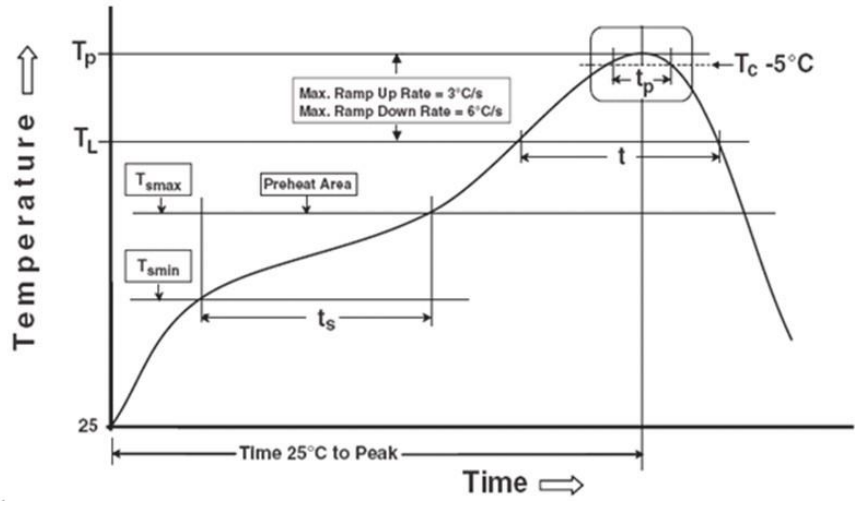


Dimension No.	A	B	Do	D1	E	F
Dimension(mm)	10.4±0.1	10.0±0.1	1.5+0.1/-0	1.5±0.25/-0	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.05	0.4±0.05	16.0±0.3/	4.5±0.1

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°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

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