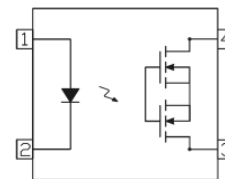


4PIN DIP TYPE FORM A SSR EL4XXA-G SERIES DATASHEET



Schematic



Features

- Compliance Halogens Free (Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)
- Compliance with EU REACH.
- The product itself will remain within RoHS compliant version
- Normally open signal pole signal throw relay
- Low operating current
- 60 to 600V output withstand voltage
- Low on resistance
- Wide operating temperature range of -40°C to 85°C
- High isolation voltage between input and output (Viso = 5000 Vrms)
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- UL 1577 + cUL approved (No. E214129)
- UL 508 + cUL approved (No. E348721)
- VDE approved (No. 40028391)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

Pin Configuration

- 1, LED Anode
- 2, LED Cathode
- 3, MOSFET

Description

The EL406A, EL425A, EL440A and EL460A 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 single channel configuration is equivalent to 1 form A EMR. They are packaged in 4 pin DIP and available in surface mount SMD option.

Applications

- Exchange equipment
- Measurement equipment
- FA/OA equipment
- Industrial controls, Security

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

	Parameter	Symbol	Rating				Unit
			EL406A	EL425A	EL440A	EL460A	
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	60	250	400	600	V
	Continuous Load Current	I_L	550	150	120	50	mA
	Pulse Load Current* ³	I_{LPeak}	1.2	0.5	0.3	0.15	A
	Power Dissipation	P_{out}		500			mW
	Total Power Dissipation	P_T		550			mW
	Isolation Voltage* ⁴	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* ⁵	T_{SOL}		260			$^{\circ}\text{C}$

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

*2. Indicate the DC and peak AC values

*3. A connection: 100 ms (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	EL406A	I _F = 10mA, I _L = Max. t = 1s	-	0.7	2.5	Ω
		EL425A		-	6.5	15	
		EL440A		-	20	30	
		EL460A		-	40	70	
	Output Capacitance	EL406A	V _L = 0V, f = 1MHz	-	85	-	pF
		EL425A		-	60	-	
		EL440A		-	45	-	
		EL460A		-	30	-	
Transfer Characteristics	LED turn on Current	EL406A	I _L = Max.	-	3	5	mA
		EL425A					
		EL440A					
		EL460A					
	LED turn off current	EL406A	I _L = Max.	0.4	3	-	mA
		EL425A					
		EL440A					
		EL460A					
	Turn On Time	EL406A	I _F = 10 mA, I _L = Max. R _L = 200Ω ,	-	1.4	3	ms
		EL425A					
		EL440A					
		EL460A					
	Turn Off Time	EL406A	T _{off}	-	0.05	0.5	ms
		EL425A					
		EL440A					
		EL460A					
	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

Typical Electro-Optical Characteristics Curves

Figure 1-1. Load current vs Ambient temperature

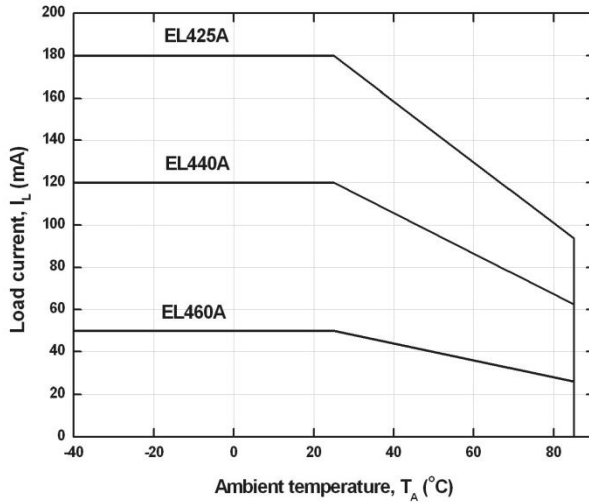


Figure 1-2. Load current vs Ambient temperature

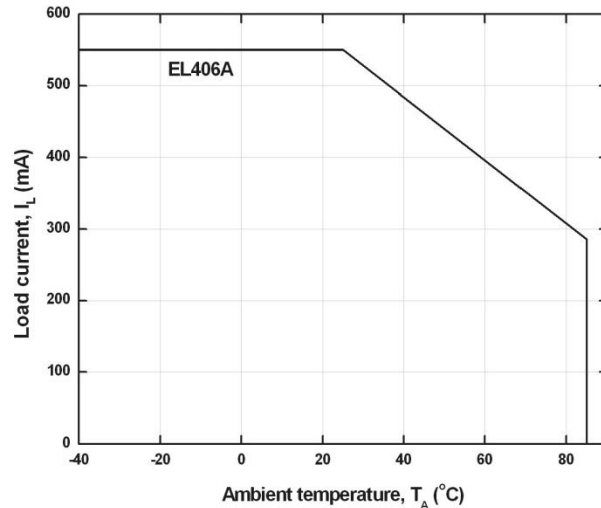


Figure 2-1. On Resistance vs Ambient Temperature

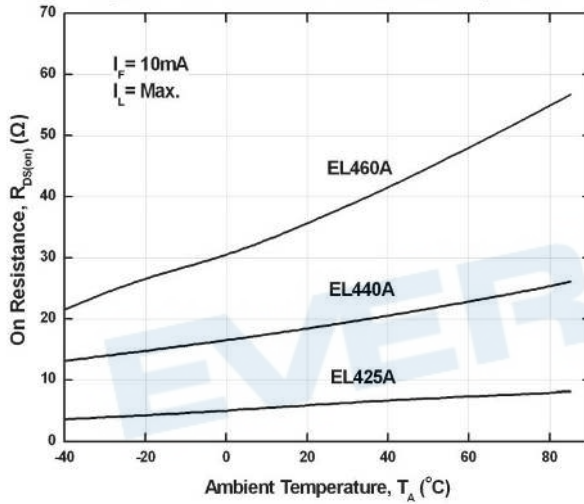


Figure 2-2. On Resistance vs Ambient Temperature

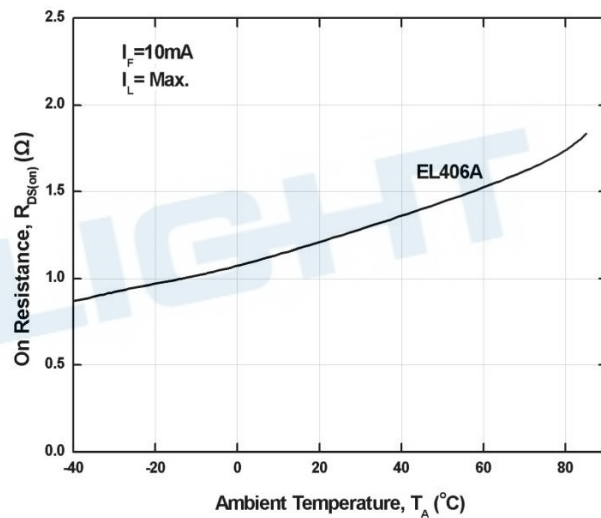


Figure 3. Switching Time vs Ambient Temperature

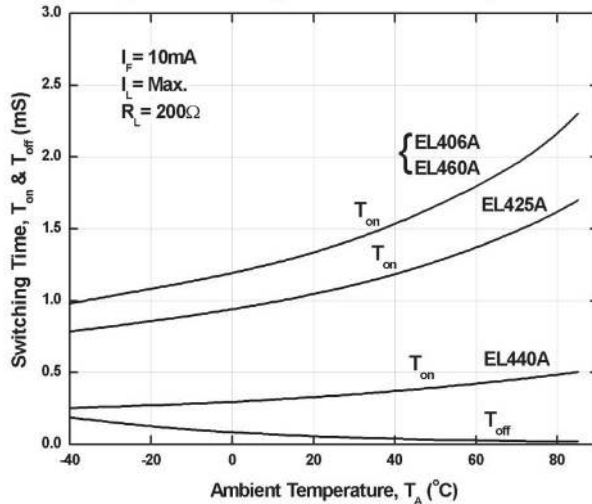


Figure 4-1. Turn On Time vs LED Forward Current

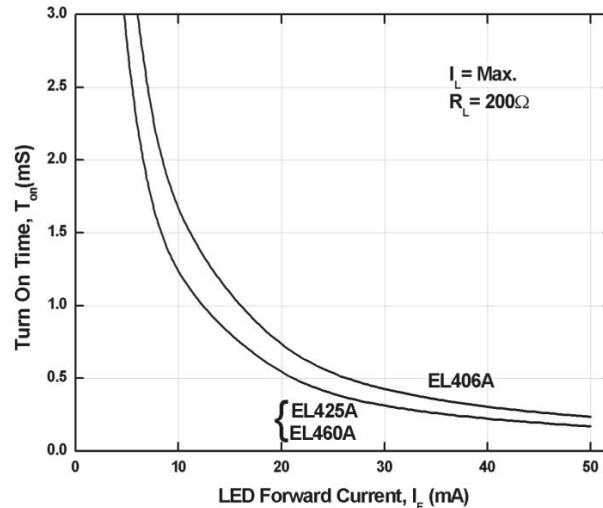


Figure 4-2. Turn On Time vs LED Forward Current

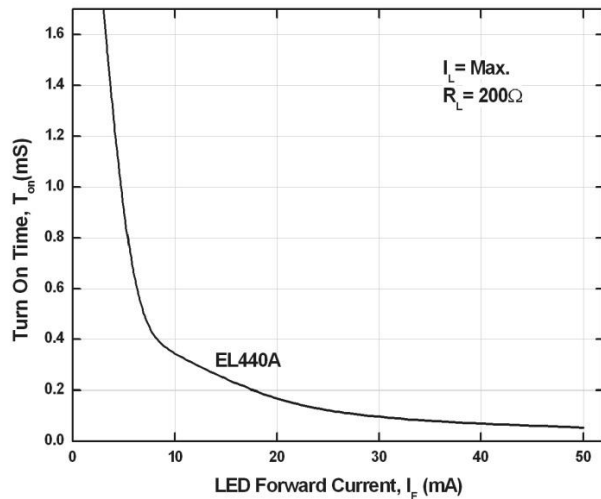


Figure 5. Turn Off Time vs LED Forward Current

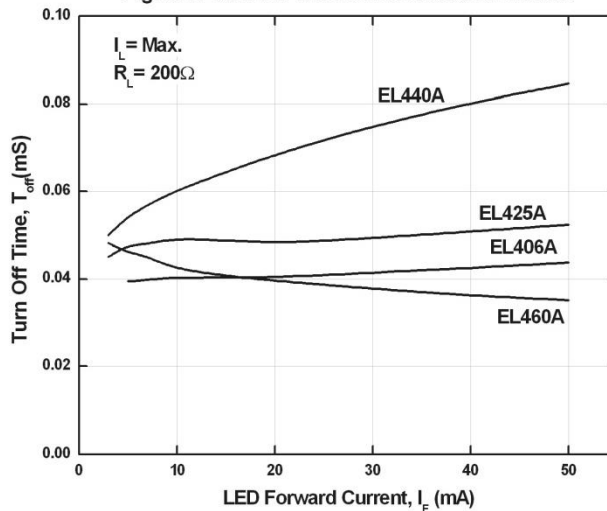


Figure 6. Normalized LED Operate on Current vs Ambient Temperature

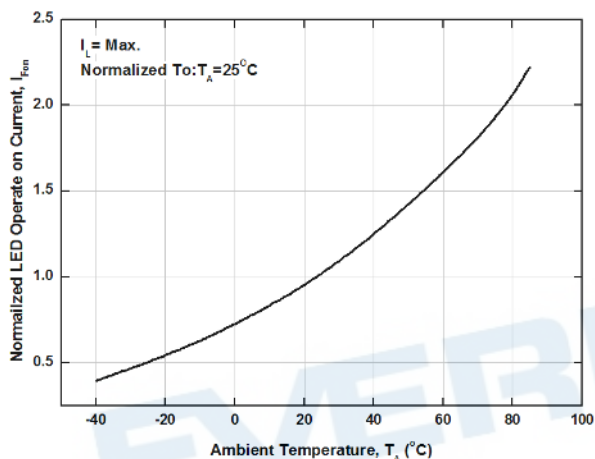


Figure 7. Normalized LED Turn off Current vs Ambient Temperature

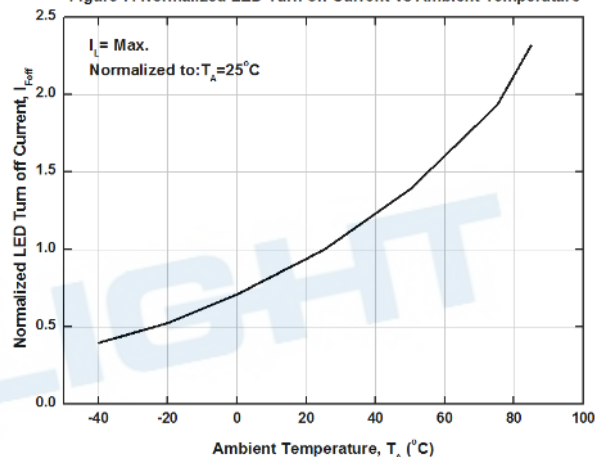


Figure 8. LED Dropout Voltage vs Ambient Temperature

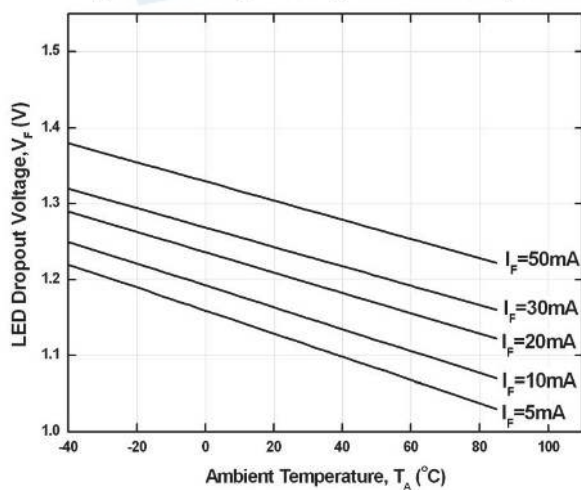


Figure 9-1. Load Voltage vs Load Current

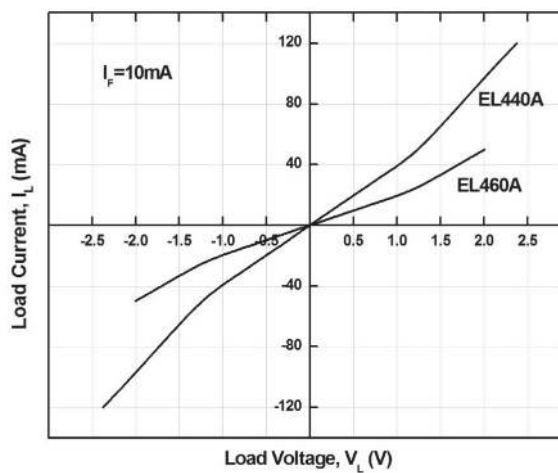


Figure 9-2. Load Voltage vs Load Current

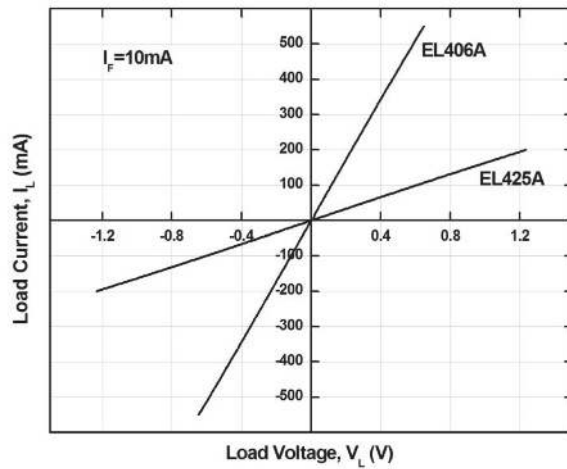


Figure 10. Off State Leakage Current vs Load Voltage

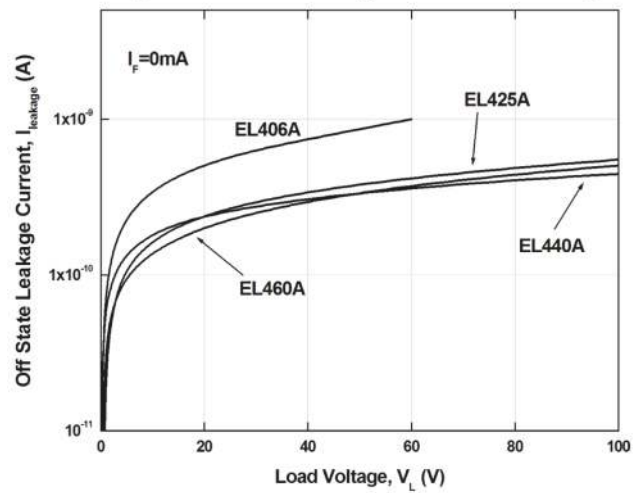
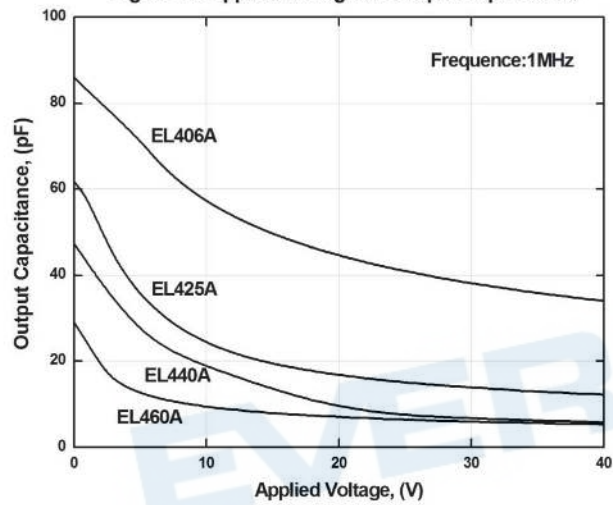


Figure 11. Applied Voltage VS Output Capacitance



Order Information

Part Number

EL4XXA(Y)(Z)-VG

Note:

XX = Part No. (06, 25, 40 or 60)

Y = Lead form option (S1, or none)

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

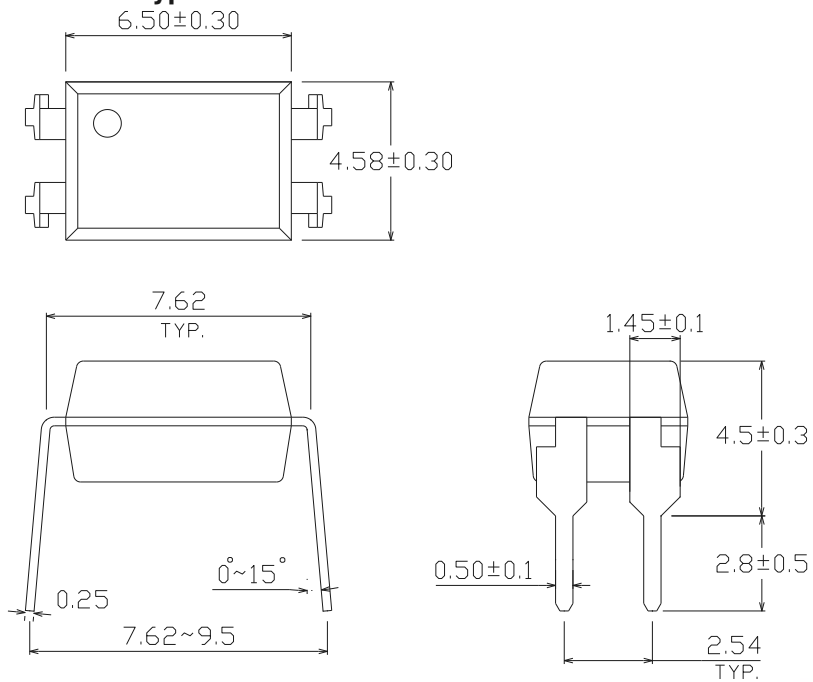
V = VDE safety approved option

G = Halogens free

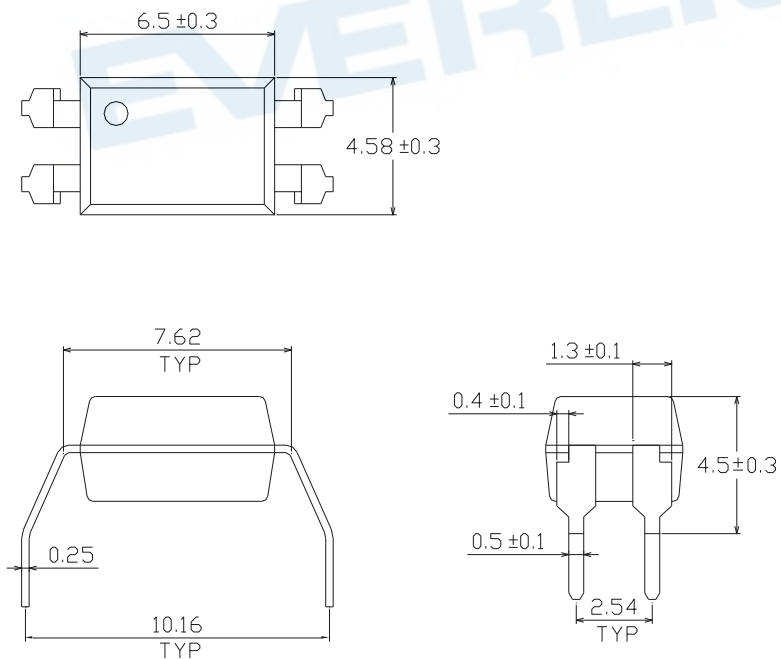
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S1 (TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 (TB)	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel
S1 (TU)	Surface mount lead form (low profile) + TU tape & reel option	1500 units per reel
S1 (TD)	Surface mount lead form (low profile) + TD tape & reel option	1500 units per reel

Package Dimension (Dimensions in mm)

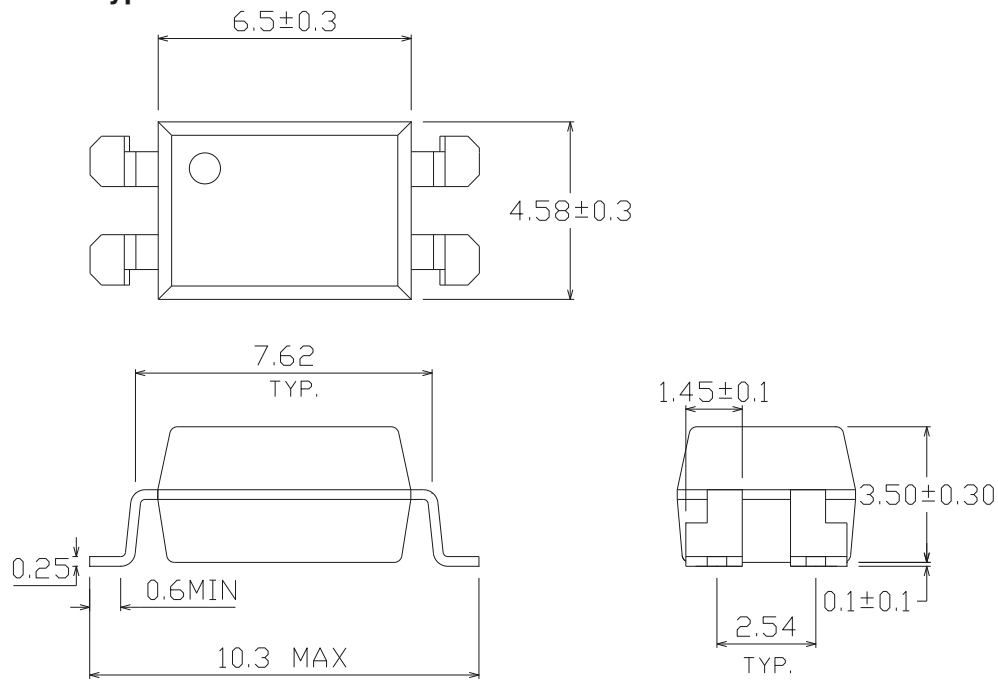
Standard DIP Type



Option M Type



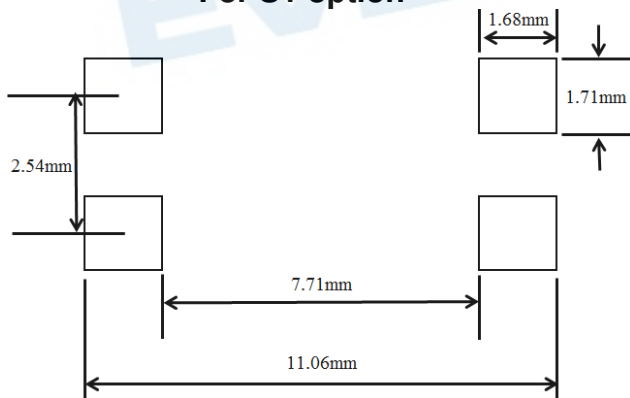
Option S1 Type



Recommended Pad Layout for Surface Mount Leadform

4Pin SMD

For S1 option



Device Marking

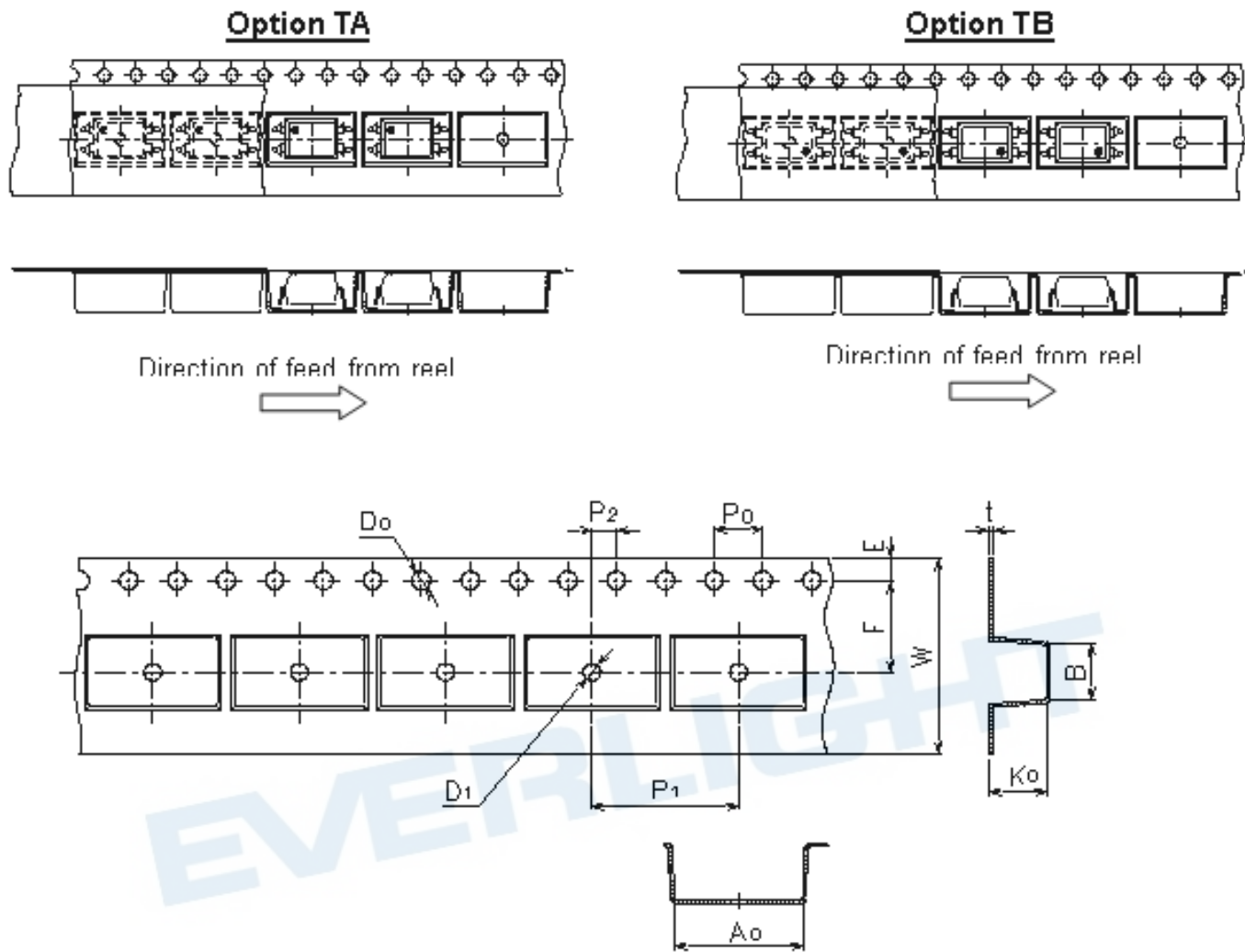


Notes

EL	denotes Everlight
460A	denotes Part Number
G	denotes Green Part
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE option

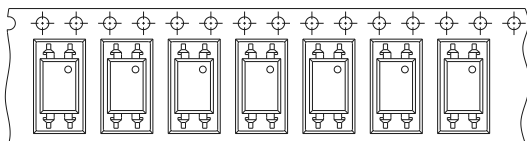
EVERLIGHT

Tape & Reel Packing Specifications



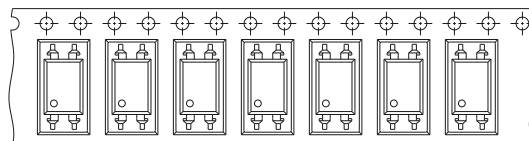
Dimension No.	A0	B	Do	D1	E	F
Dimension (mm) S1	10.7±0.1	4.65±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K0
Dimension (mm) S1	4.0±0.1	12.0±0.1	2.0±0.1	0.4±0.1	16.0±0.3	3.90±0.1

Option TU



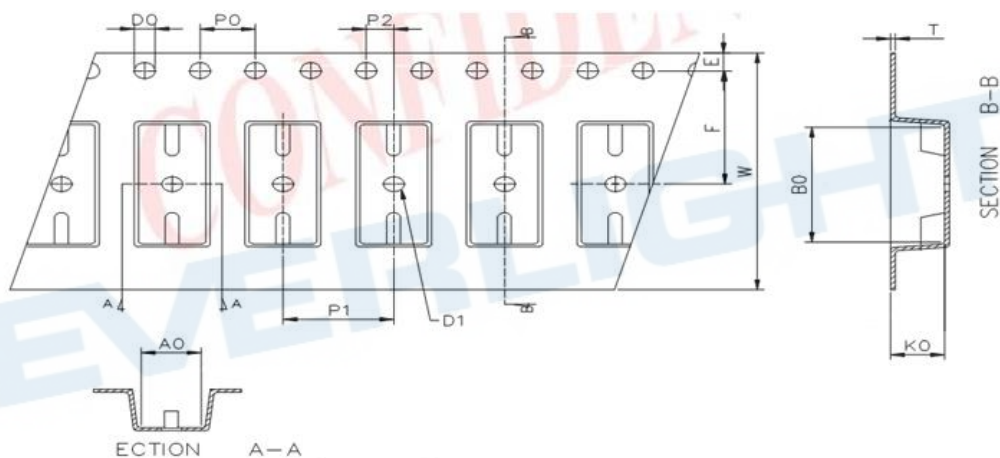
Direction of feed from reel

Option TD



Direction of feed from reel

Tape Dimensions

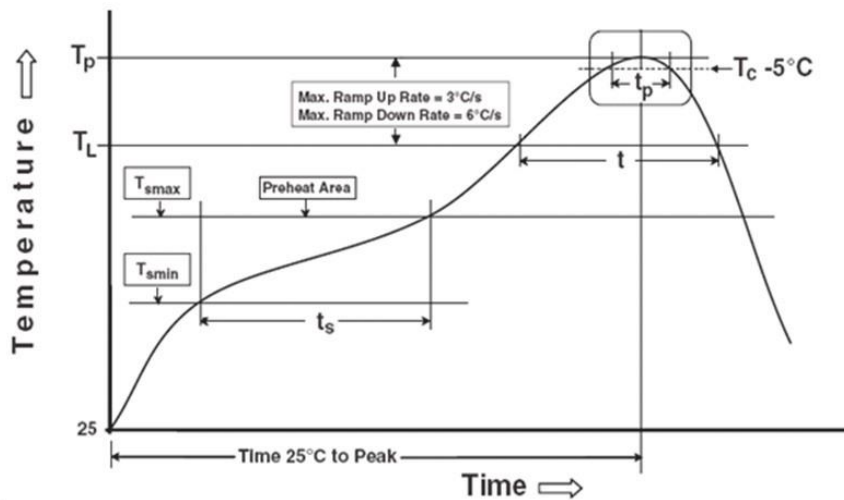


Dimension No.	Ao	Bo	Do	D1	E	F
Dimension(mm) S1	4.90±0.1	10.40±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.50±0.1
Dimension No.	Po	P1	P2	t	W	Ko
Dimension(mm) S1	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	16.00±0.3	4.60±0.1

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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