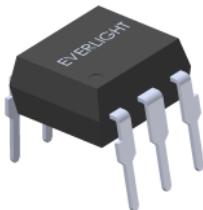


GENERAL PURPOSE SOLID STATE RELAY 6PIN DIP TYPE FORM A SSR



Features

- 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)
- 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

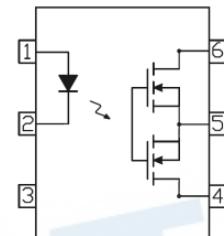
Description

The EL606A, EL625A, EL640A and EL660A 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. They can enable AC/DC and DC only output connections. The single channel configuration is equivalent to 1 form A EMR. They are packaged in 6 pin DIP and available in surface mount SMD option.

Applications

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

Schematic



Pin Configuration

- 1, LED Anode
- 2, LED Cathode
- 4, 6 MOSFET Drain
- 5, MOSFET Source

Absolute Maximum Ratings (T_A=25°C, unless otherwise specified)

Parameter	Symbol	Type of connection	Rating				Unit
			EL606A	EL625A	EL640A	EL660A	
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	V _L	60	250	400	600	V
	Continuous Load Current	I _L	A	550	150	120	50
			B	650	220	130	60
			C	800	300	150	80
	Pulse Load Current ^{*2}	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 ^{*3}	V _{Iso}		5000			Vrms
	Storage Temperature	T _{STG}		-40 to 125			°C
	Operating Temperature	T _{OPR}		-40 to 85			°C
	Soldering Temperature ^{*4}	T _{SOL}		260			°C

Notes:

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

*2. A connection: 100ms (1 shot), V_L = DC

*3. AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2, 3 are shorted together, and pins 4, 5, 6 are shorted together.

*4. For 10 seconds

Electro-Optical Characteristics ($T_A=25^\circ\text{C}$)

	Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	
Input	Forward Voltage	V_F	$I_F = 10\text{mA}$	-	1.18	1.5	V	
	Reverse Current	I_R	$V_R = 5\text{V}$	-	-	1	μA	
Output	Off State leakage Current	I_{leak}	$I_F = 0\text{mA}, V_L = \text{Max.}$	-	-	1	μA	
On Resistance*	EL606A			-	0.75	2.5		
	EL625A	$R_{d(\text{ON})}$ A	$I_F = 5\text{mA}, I_L = \text{Max.}$ $t = 1\text{s}$	-	6.5	15	Ω	
	EL640A			-	20	30		
	EL660A			-	42	70		
On Resistance*	EL606A			0.4	1			
	EL625A	$R_{d(\text{ON})}$ B	$I_F = 5\text{mA}, I_L = \text{Max.}$ $t = 1\text{s}$	3.4	5		Ω	
	EL640A			15.2	20			
	EL660A			28	50			
On Resistance*	EL606A			0.2	0.5			
	EL625A	$R_{d(\text{ON})}$ C	$I_F = 5\text{mA}, I_L = \text{Max.}$ $t = 1\text{s}$	1.7	3		Ω	
	EL640A			7.6	15			
	EL660A			14	30			
Output Capacitance	EL606A			-	85	-		
	EL625A	C_{out}	$V_L = 0\text{V}, f = 1\text{MHz}$	-	60	-	pF	
	EL640A			-	45	-		
	EL660A			-	30	-		
Transfer Characteristics	LED turn on current	EL606A		-	1.38	3		
	EL625A	$I_{F(\text{on})}$	$I_L = \text{Max.}$	-	1.28	3	mA	
	EL640A			-	1.36	3		
	EL660A			-	1.32	3		
	EL606A			0.4	1.22	-		
	LED turn off current	EL625A	$I_{F(\text{off})}$	$I_L = \text{Max.}$	0.4	1.12	-	mA
	EL640A			0.4	1.38	-		
	EL660A			0.4	1.2	-		
	EL606A			-	1.3	3		
Turn On Time	EL625A	T_{on}		-	1	3	ms	
	EL640A			-	0.35	3		
	EL660A		$I_F = 10\text{ mA}, I_L = \text{Max.}$	-	1	3		
	EL606A		$R_L = 200\Omega$	-	0.1	0.5		
Turn Off Time	EL625A	T_{off}		0.1	0.5		ms	
	EL640A			0.1	0.5			
	EL660A			0.1	0.5			
	Isolation Resistance	$R_{\text{I-O}}$	$V_{\text{I-O}} = 500\text{V DC}$	5×10^{10}	-	-	Ω	

Isolation Capacitance

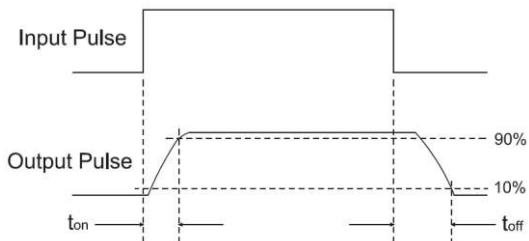
C_{I-O}

V = 0V, f = 1MHz

- 1.5 -

pF

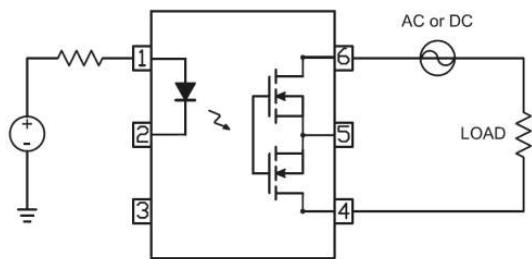
Turn on/Turn off Time



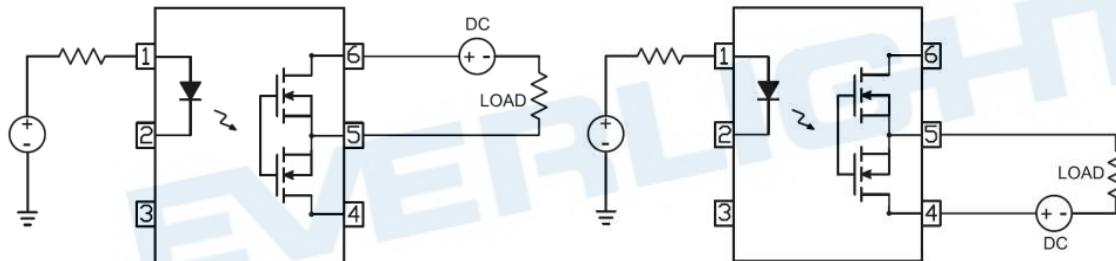
Note:

* On resistance test

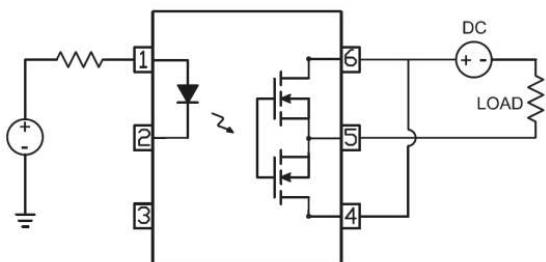
Connection A



Connection B



Connection C



Typical Electro-Optical Characteristics Curves

Figure 1-1. Load current vs Ambient temperature

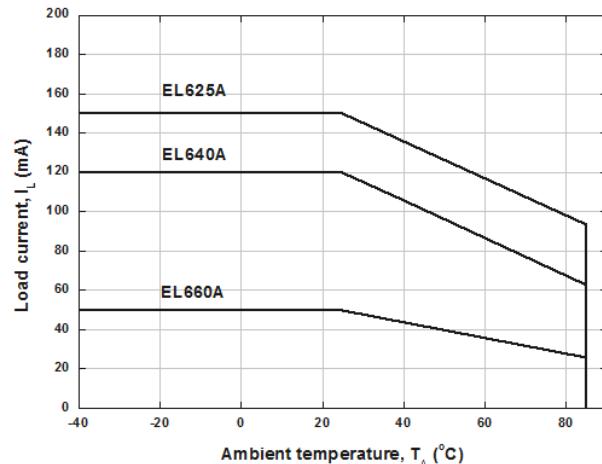


Figure 1-2. Load current vs Ambient temperature

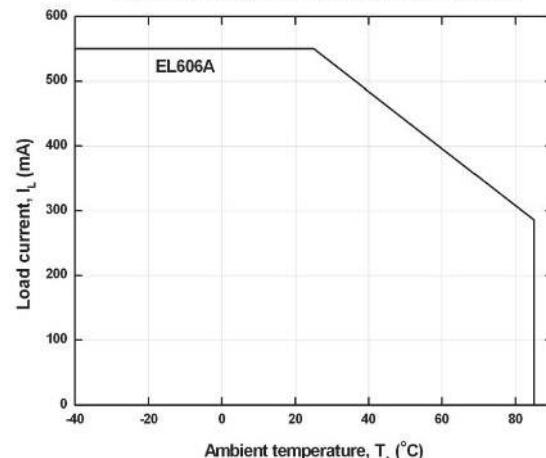


Figure 2-1. On Resistance vs Ambient Temperature

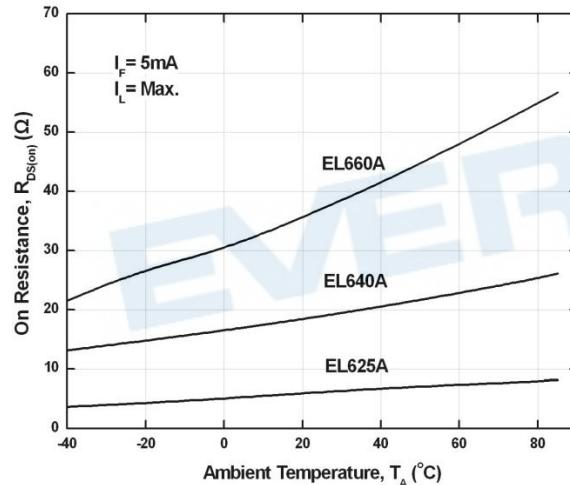


Figure 2-2. On Resistance vs Ambient Temperature

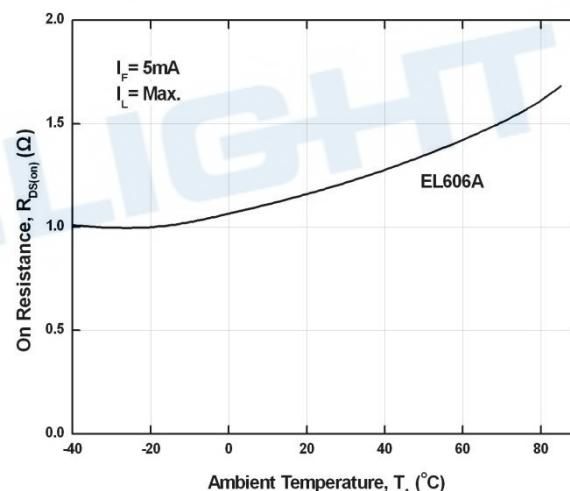


Figure 3. Switching Time vs Ambient Temperature

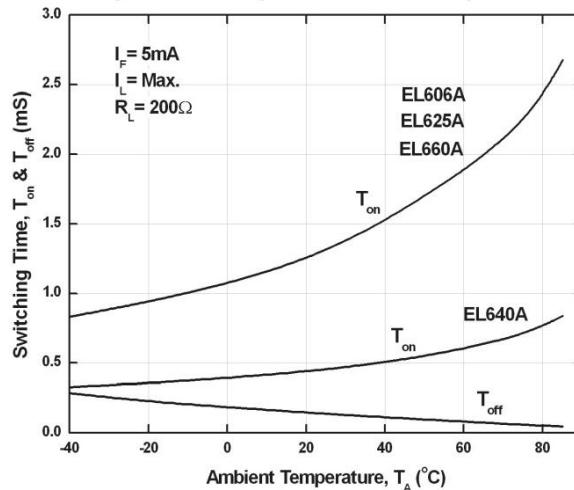


Figure 4. Turn On Time vs LED Forward Current

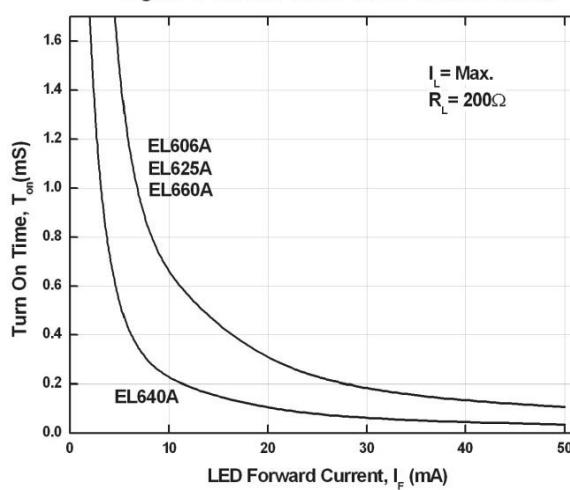


Figure 5. Turn Off Time vs LED Forward Current

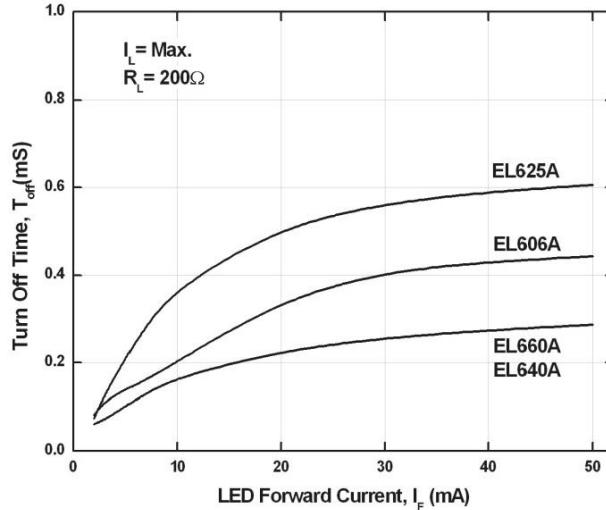


Figure 7. LED Turn off Current vs Ambient Temperature

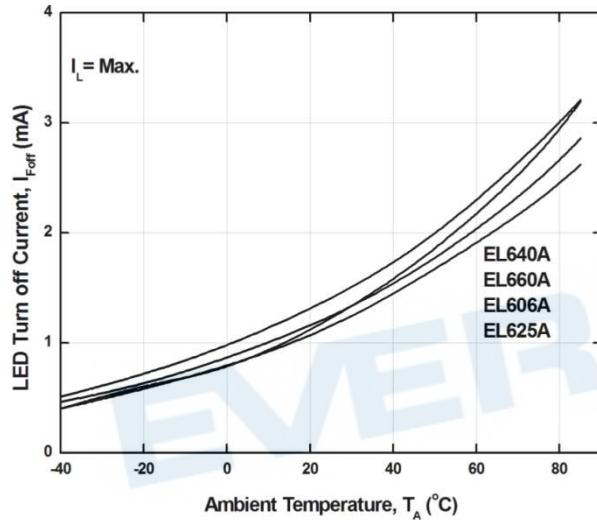


Figure 9-1. Load Voltage vs Load Current

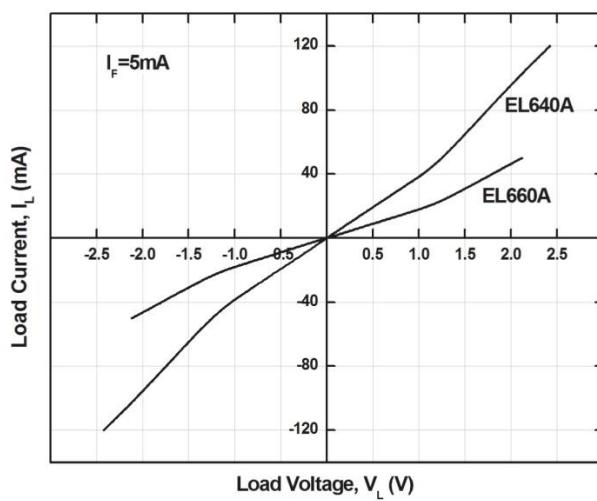


Figure 6. LED Operate on Current vs Ambient Temperature

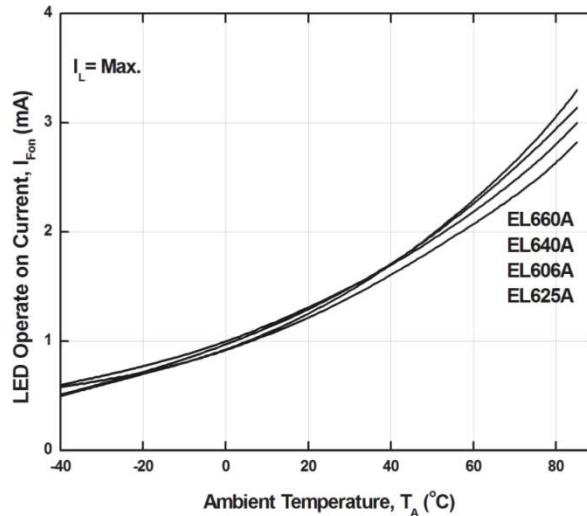


Figure 8. LED Dropout Voltage vs Ambient Temperature

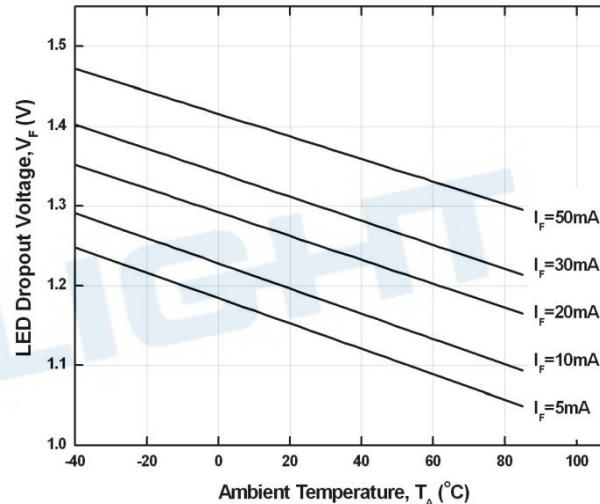


Figure 9-2. Load Voltage vs Load Current

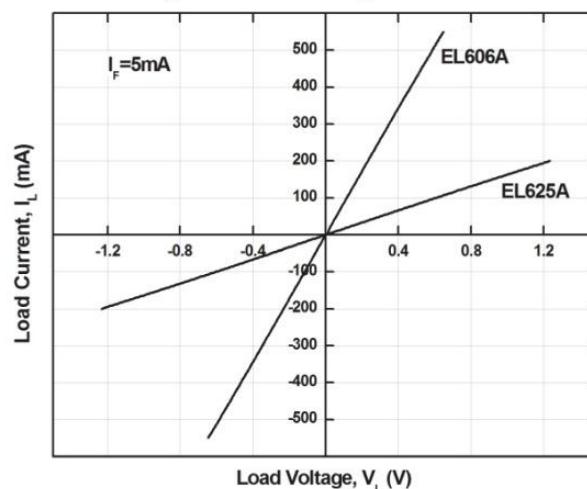


Figure 10. Off State Leakage Current vs Load Voltage

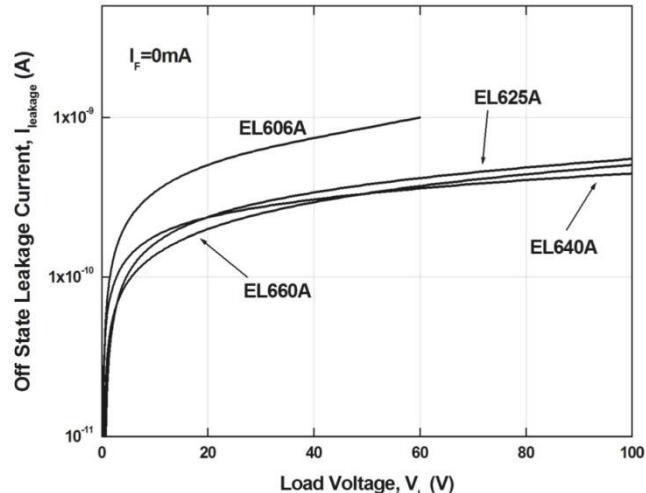
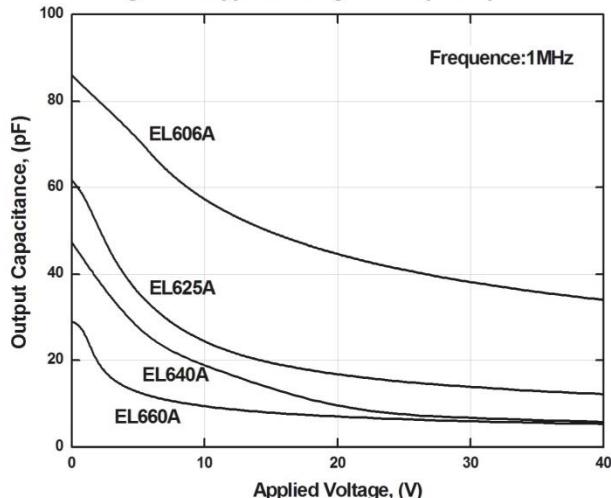


Figure 11. Applied Voltage VS Output Capacitance



Order Information

Part Number

EL6XXA(Y)(Z)-V

Note:

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

Y = Lead form option (S1, or none)

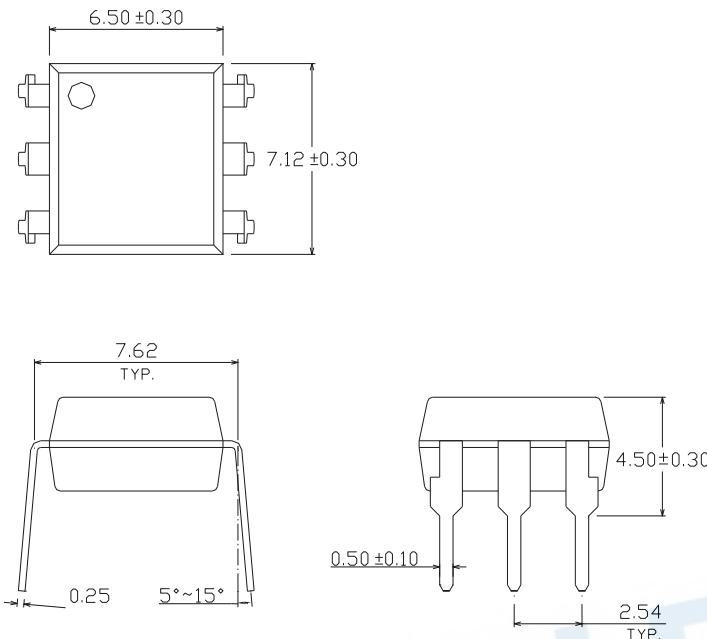
Z = Tape and reel option (TA, TB, TU, TD or none).

V = VDE safety approved option

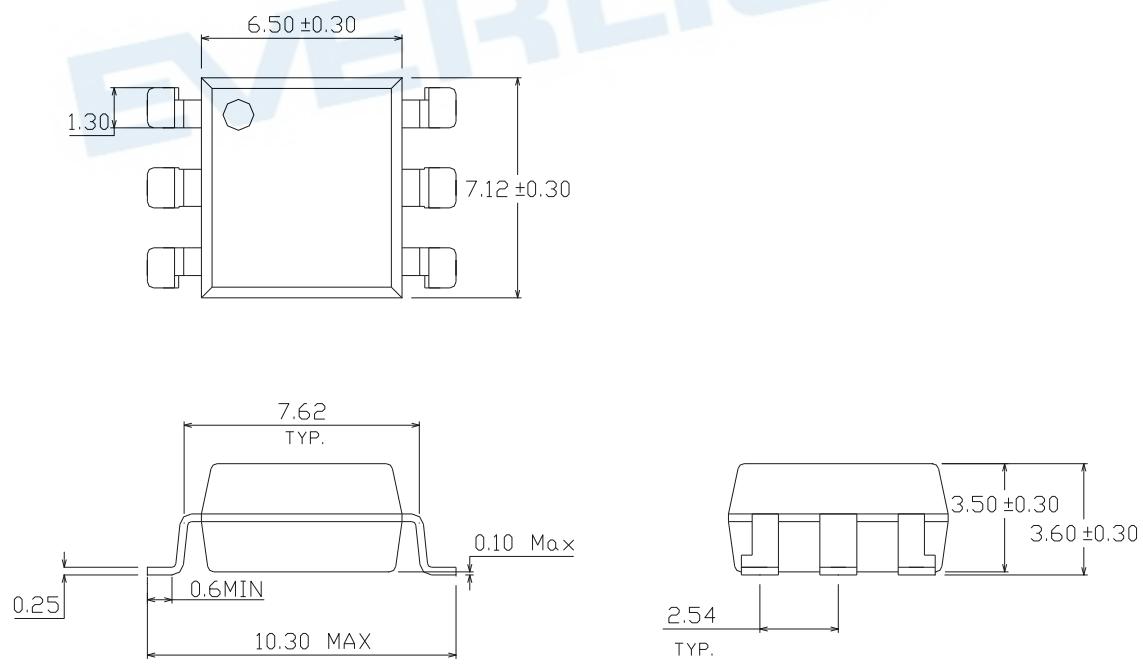
Option	Description	Packing quantity
None	Standard DIP-6	65 units per tube
S1 (TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 (TB)	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel

Package Dimension

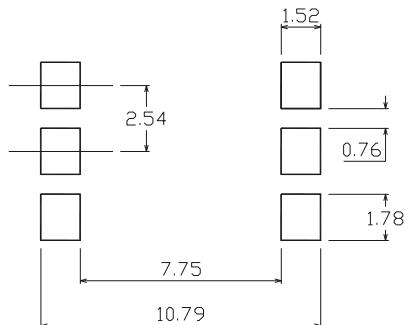
Standard DIP Type



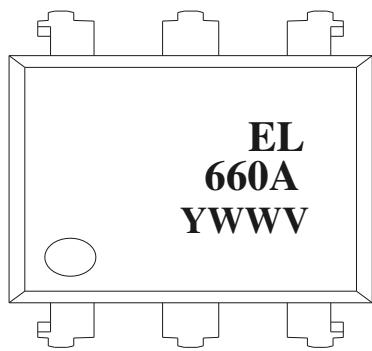
Option S1 Type



Recommended pad layout for surface mount leadform



Device Marking

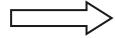
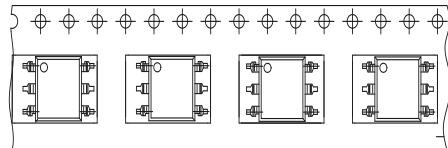


Notes

EL	denotes Everlight
660A	denotes Part Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE option

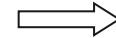
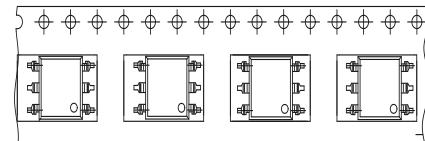
Tape & Reel Packing Specifications

Option TA



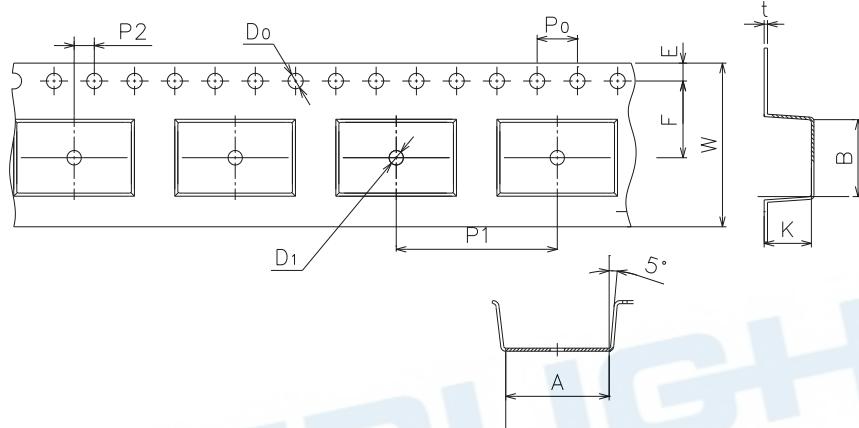
Direction of feed from reel

Option TB



Direction of feed from reel

Tape Dimensions



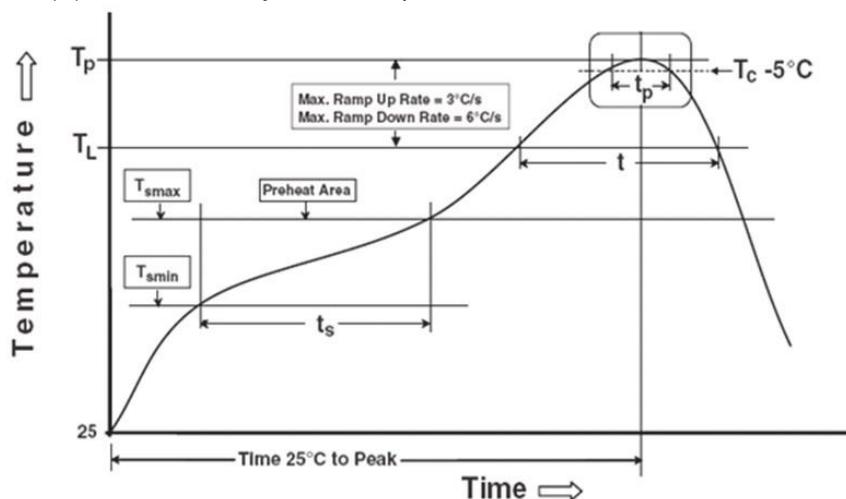
Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.8±0.1	7.5±0.1	1.5±0.1	1.5±0.1	1.75±0.1	7.5±0.1

Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.15	12±0.1	2.0±0.1	0.35±0.03	16.0±0.2	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

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2. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
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