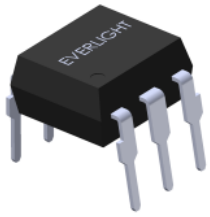
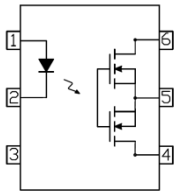
DATASHEET

GENERAL PURPOSE 1 FORM A SOLID STATE RELAY
6PIN DIP TYPE FORM A SSR





LED Anode	1
LED Cathode	2
No Connection	3
MOSFET Drain	4, 6
MOSFET Source	5

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 approved (No. E214129)
- UL 508 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

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

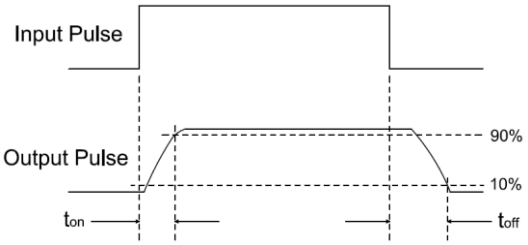
Parameter		Symbol	Rating				Unit
			EL606A	EL625A	EL640A	EL660A	
Input	Forward Current	I_F	50				mA
	Reverse Voltage	V_R	5				V
	Peak Forward Current*1	I_{FP}	1				A
	Power Dissipation	P_{in}	75				mW
Output	Break Down Voltage	V_L	60	250	400	600	V
	Continuous Load Current	I_L	550	180	120	50	mA
	Pulse 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℃)

	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*	EL606A	$R_{d(ON)}$ A	I_F = 5mA, I_L = Max. t = 1s	-	0.75	2.5	Ω
		EL625A			-	6.5	15	
		EL640A			-	20	30	
		EL660A			-	42	70	
	On Resistance*	EL606A	$R_{d(ON)}$ B	I_F = 5mA, I_L = Max. t = 1s		0.4	1	Ω
		EL625A				3	5	
		EL640A				14	20	
		EL660A				30	50	
	On Resistance*	EL606A	$R_{d(ON)}$ C	I_F = 5mA, I_L = Max. t = 1s		0.2	0.5	Ω
		EL625A				1.5	3	
		EL640A				7	15	
		EL660A				15	30	
	Output Capacitance	EL606A	C_{out}	V_L = 0V, f = 1MHz	-	85	-	pF
		EL625A			-	60	-	
		EL640A			-	45	-	
		EL660A			-	30	-	
Transfer Characteristics	LED turn on Current		$I_{F(on)}$	I_L = Max.	-	1.5	3	mA
	LED turn off current		$I_{F(off)}$	I_L = Max.	0.4	1.5	-	mA
	Turn On Time	EL606A	T_{on}	I_F = 10 mA, I_L = Max. R_L = 200Ω ,	-	1.3	3	ms
		EL625A			-	1	3	
		EL640A			-	0.35	3	
		EL660A			-	1	3	
	Turn Off Time	EL606A	T_{off}		-	0.1	0.5	ms
		EL625A				0.1	0.5	
		EL640A				0.1	0.5	
		EL660A				0.1	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

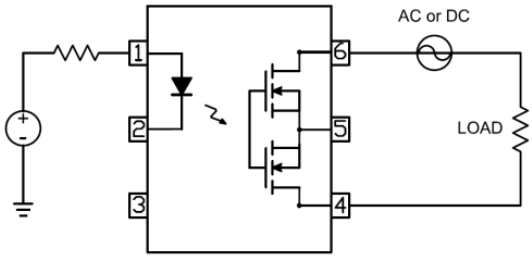
Turn on/Turn off Time



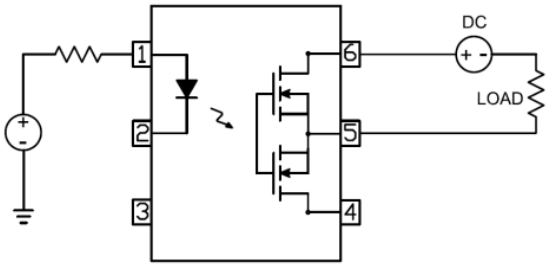
Note:

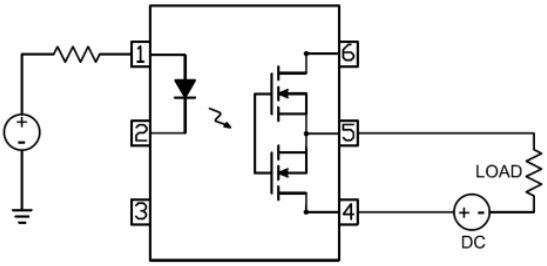
* On resistance test

Connection A

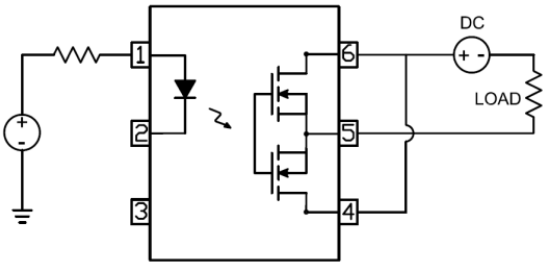


Connection B





Connection C



Typical Electro-Optical Characteristics Curves

Figure 1-1. Load current vs Ambient temperature

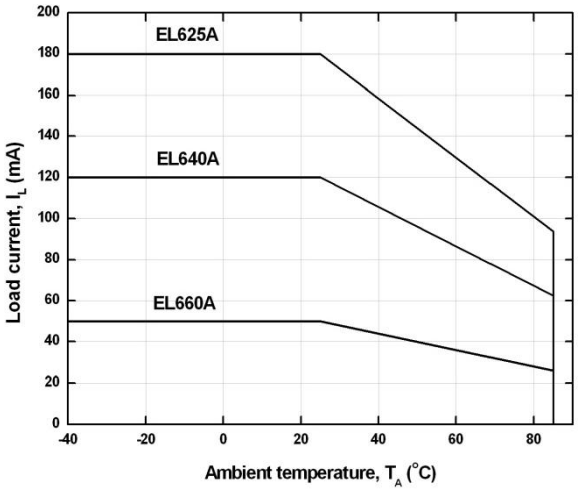


Figure 1-2. Load current vs Ambient temperature

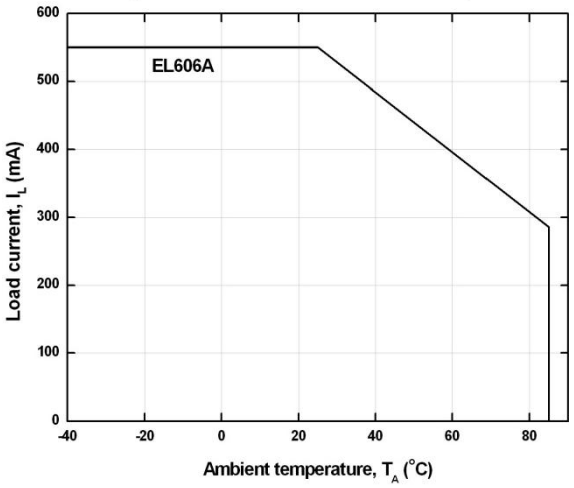


Figure 2-1. On Resistance vs Ambient Temperature

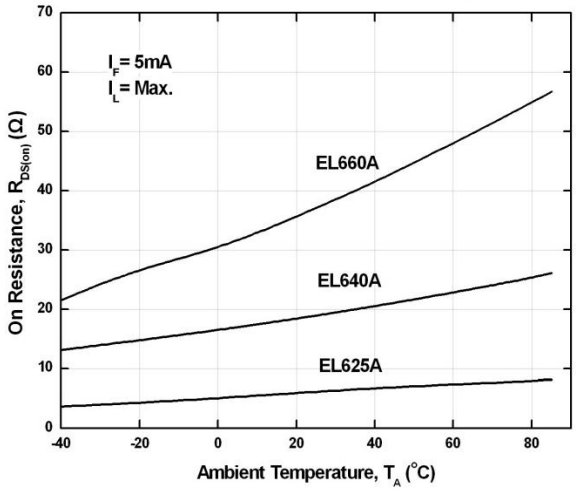


Figure 2-2. On Resistance vs Ambient Temperature

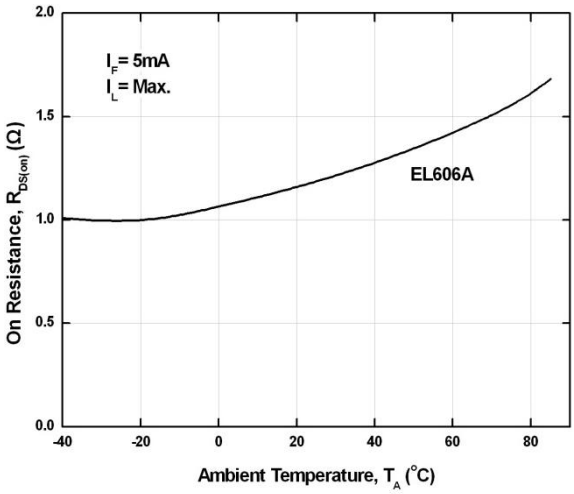


Figure 3. Switching Time vs Ambient Temperature

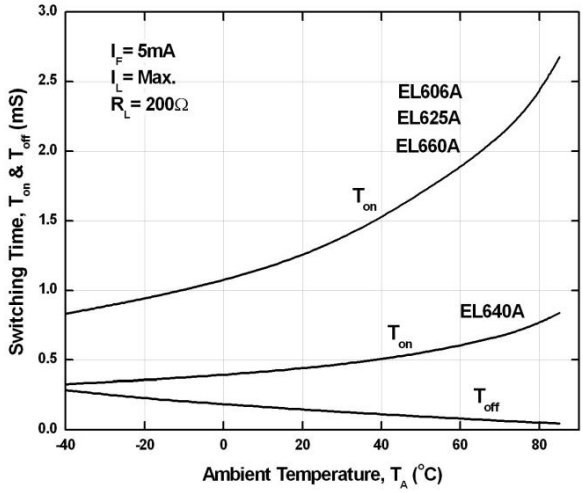


Figure 4. Turn On Time vs LED Forward Current

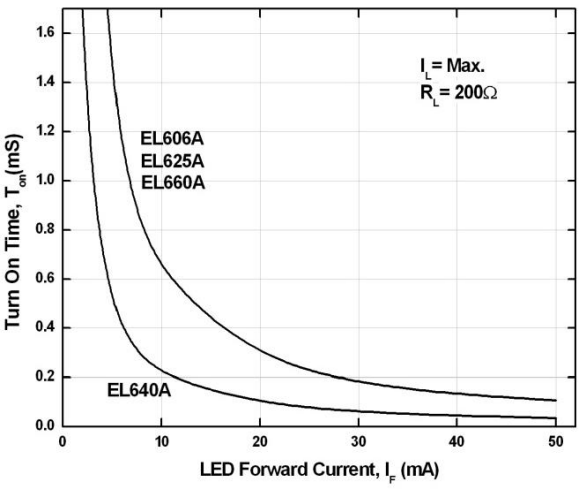


Figure 5. Turn Off Time vs LED Forward Current

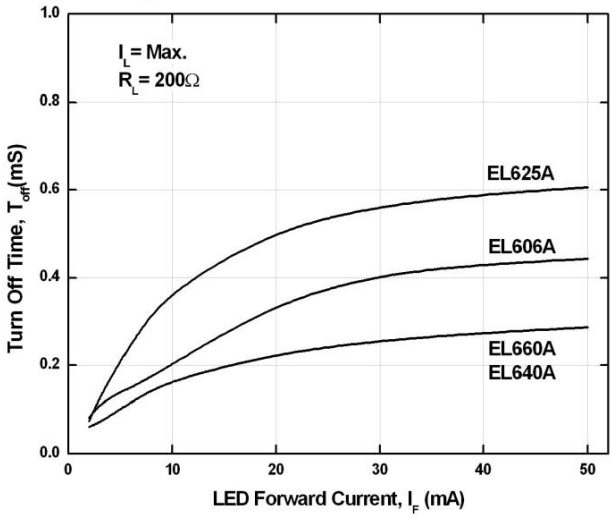


Figure 6. LED Operate on Current vs Ambient Temperature

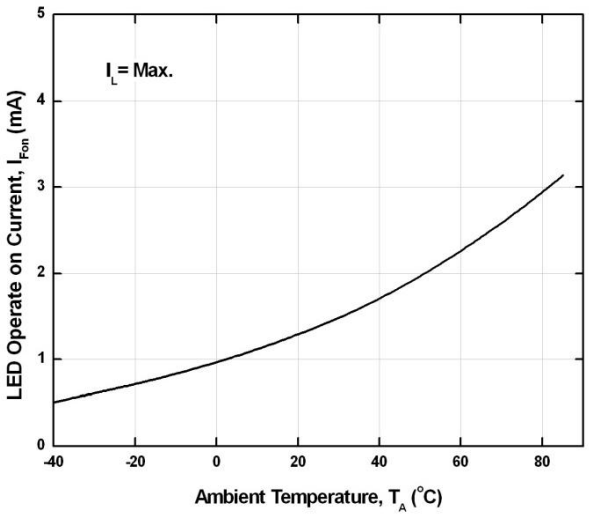


Figure 7. LED Turn off Current vs Ambient Temperature

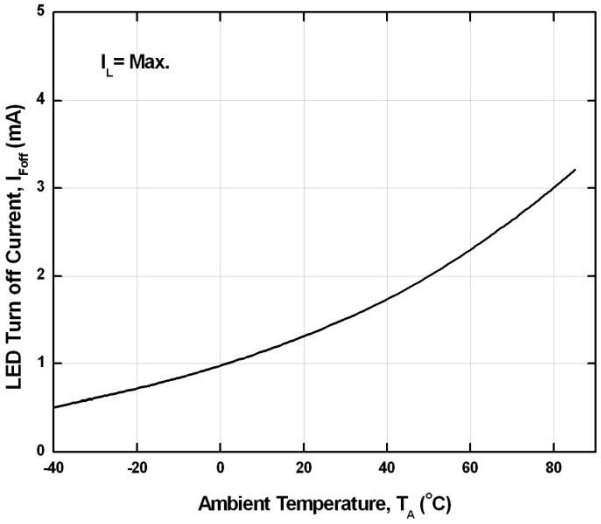


Figure 8. LED Dropout Voltage vs Ambient Temperature

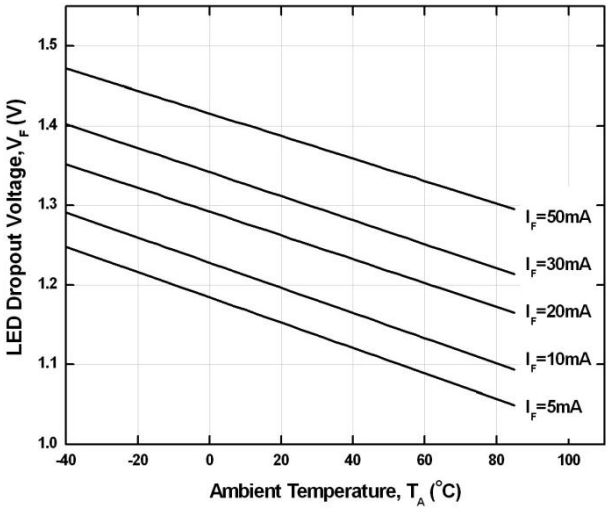


Figure 9-1. Load Voltage vs Load Current

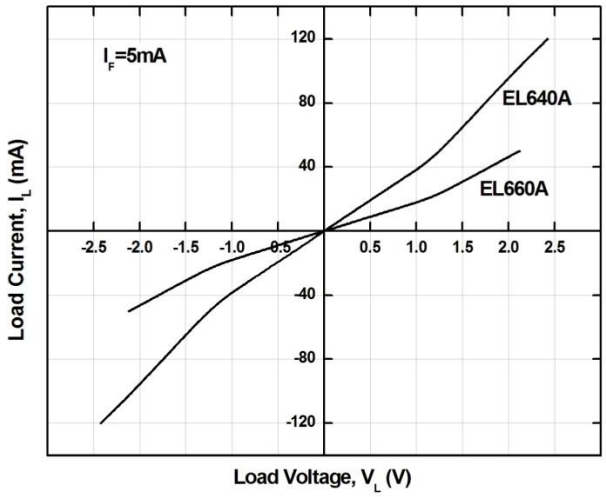


Figure 9-2. Load Voltage vs Load Current

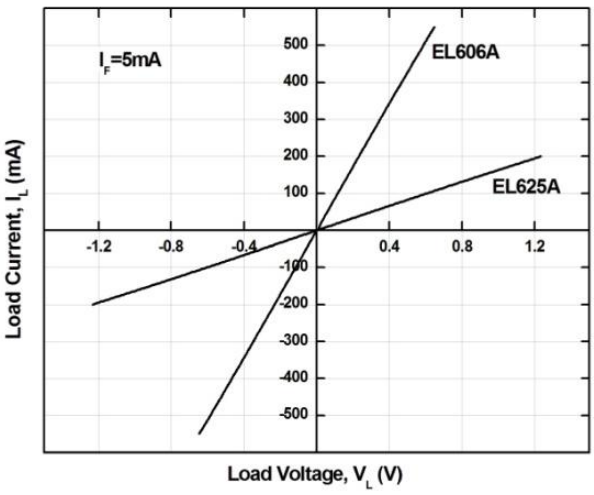


Figure 10. Off State Leakage Current vs Load Voltage

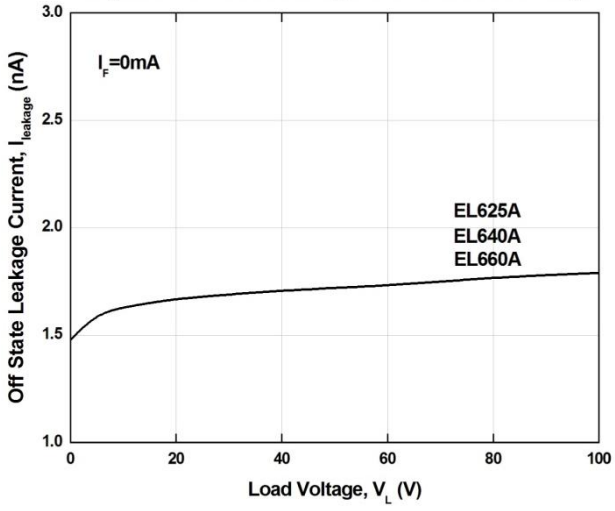
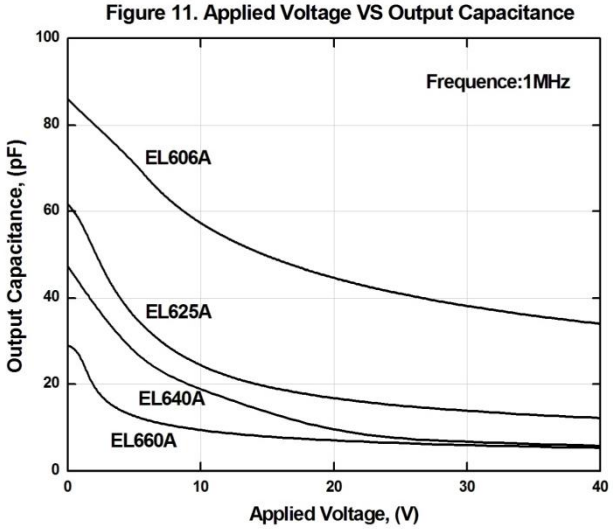


Figure 11. Applied Voltage VS Output Capacitance



Order Information

Part Number

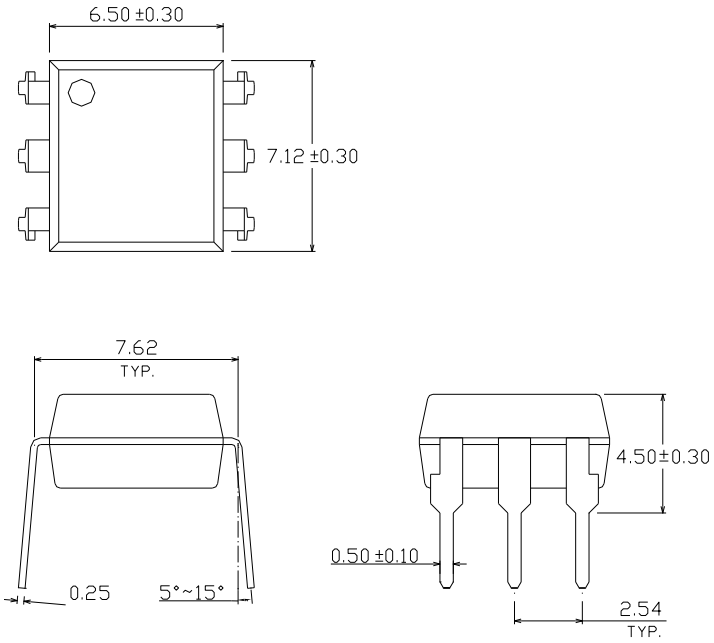
EL6XXA(Y)(Z)-V

Note:
XX = Part No. (06, 25, 40 or 60)
Y = Lead form option (S, S1, M or none)
Z = Tape and reel option (TA, TB, TU, TD or none).
V = VDE safety approved option

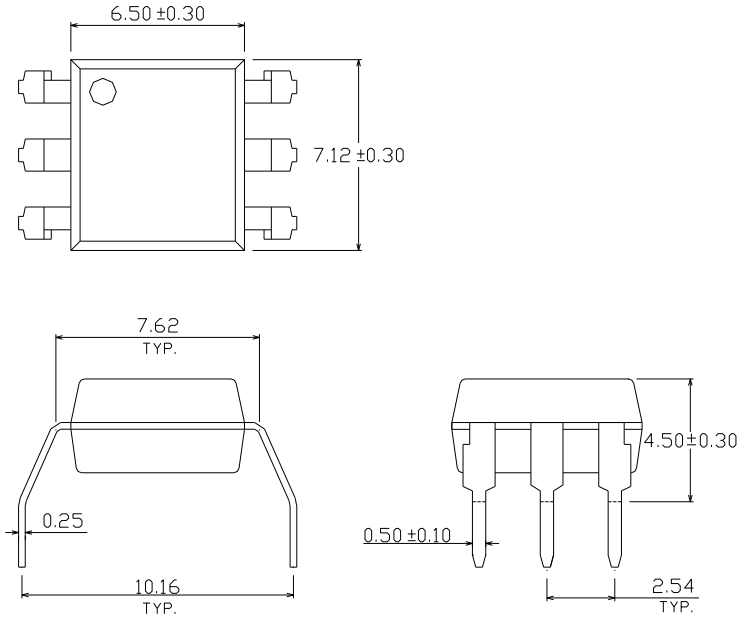
Option	Description	Packing quantity
None	Standard DIP-6	65 units per tube
M	Wide lead bend (0.4 inch spacing)	65 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead 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

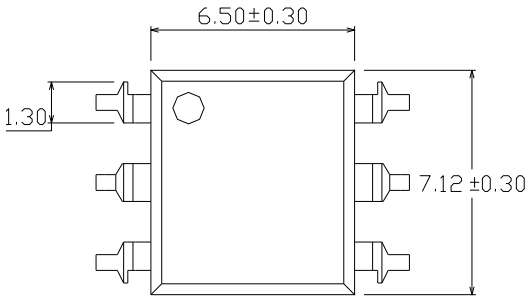
Standard DIP Type

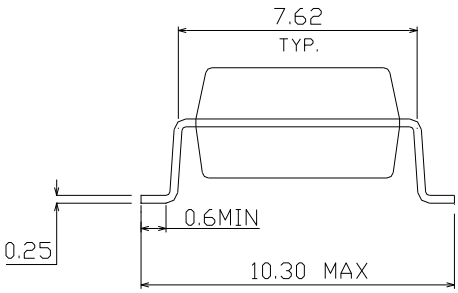


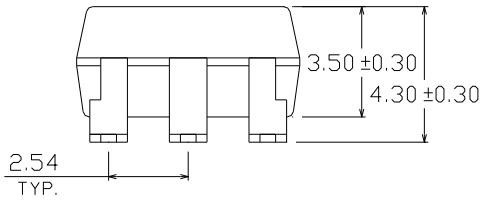
Option M Type



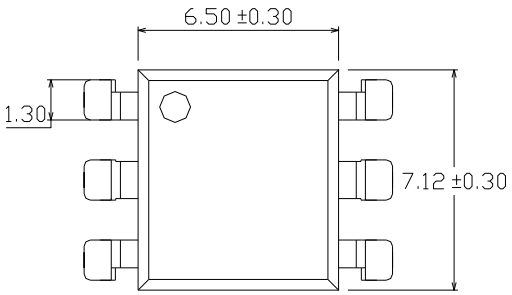
Option S Type

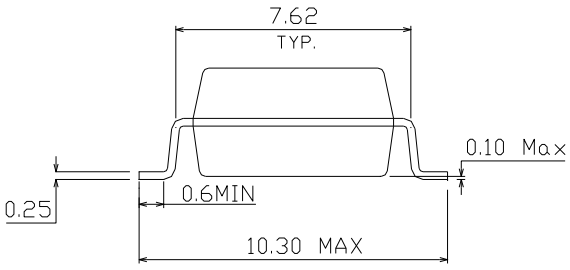


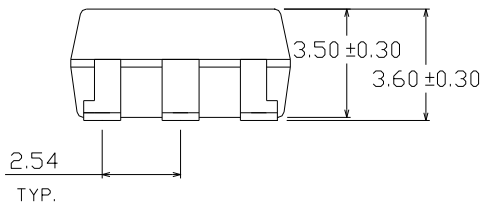




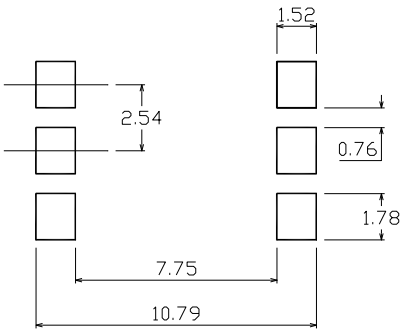
Option S1 Type



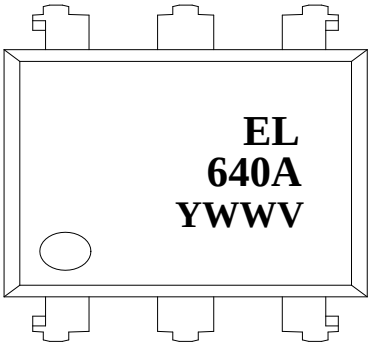




Recommended pad layout for surface mount leadform



Device Marking

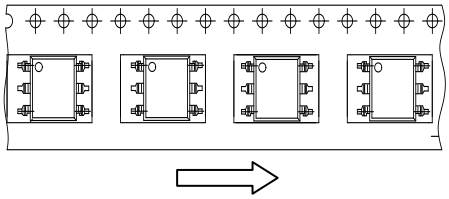


Notes

EL	denotes Everlight
640A	denotes Part Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE option

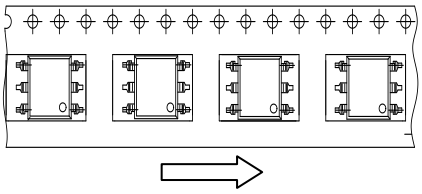
Tape & Reel Packing Specifications

Option TA



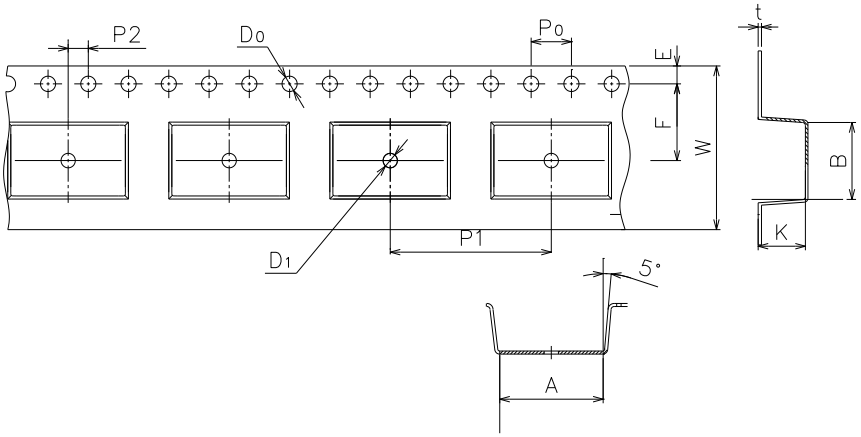
Direction of feed from reel

Option TB



Direction of feed from reel

Tape Dimensions



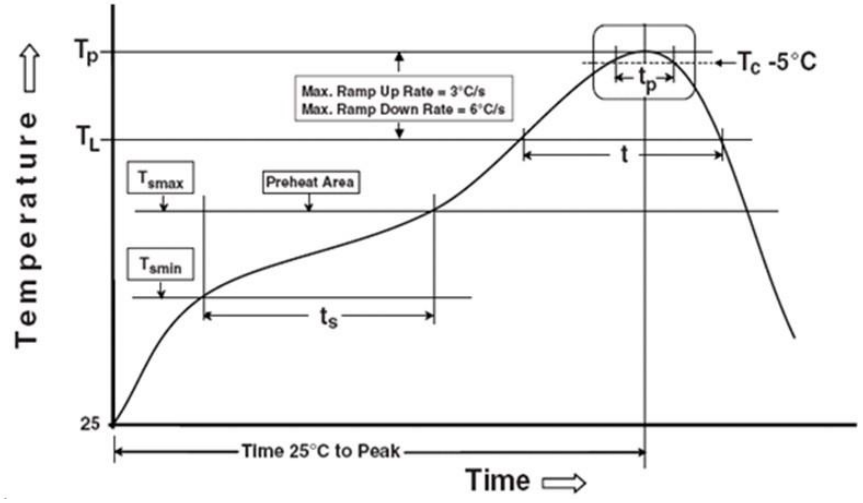
Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.5±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1

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°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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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.