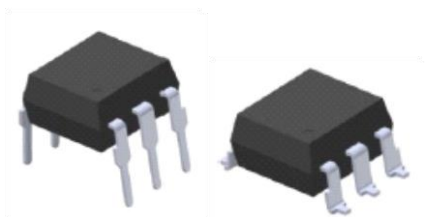


6 PIN DIP TYPE FORM A SOLID STATE RELAY EL606A(D)-G_EL625A(D)-G_EL640A(D)-G_EL660A(D)-G Series Datasheet



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)
- 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

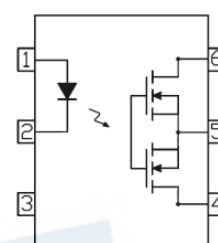
Description

The EL606A(D)-G_EL625A(D)-G_EL640A(D)-G_EL660A(D)-G Series 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. 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* ²	V _L		60	250	400	600	V
			A	550	150	120	50	mA
			B	650	220	130	60	mA
	Current	I _L	C	800	300	150	80	mA
			Pulse Load Current* ³	I _{LPeak}	1.2	0.5	0.3	0.15
	Power Dissipation	P _{out}			500			mW
Total Power Dissipation	P _T			550			mW	
Isolation Voltage* ⁴	V _{iso}			5000			V _{rms}	
Storage Temperature	T _{STG}			-40 to 125			°C	
Operating Temperature	T _{OPR}			-40 to 85			°C	
Soldering Temperature* ⁵	T _{SOL}			260			°C	

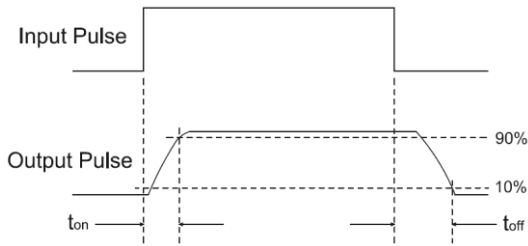
Notes:

- *1. f =100Hz, Duty Cycle = 0.1%
- *2. Indicate the 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*	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			-	3.4	5	
		EL640A			-	15.2	20	
		EL660A			-	28	50	
	On Resistance*	EL606A	R _{d(ON) C}	I _F = 5mA, I _L = Max. t = 1s	-	0.2	0.5	Ω
		EL625A			-	1.7	3	
		EL640A			-	7.6	15	
		EL660A			-	14	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	EL606A	I _{F(on)}	I _L = Max.	-	1.38	3	mA
		EL625A			-	1.28	3	
		EL640A			-	1.36	3	
		EL660A			-	1.32	3	
	LED turn off current	EL606A	I _{F(off)}	I _L = Max.	0.4	1.22	-	mA
		EL625A			0.4	1.12	-	
		EL640A			0.4	1.38	-	
		EL660A			0.4	1.2	-	
	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}	I _F = 10 mA, I _L = Max. R _L = 200Ω	-	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	

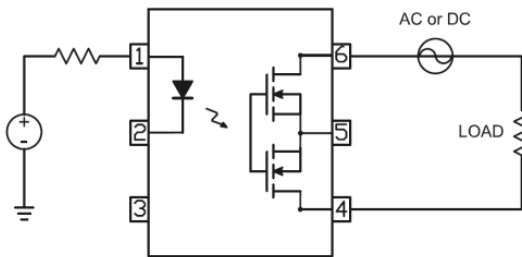
Turn on/Turn off Time



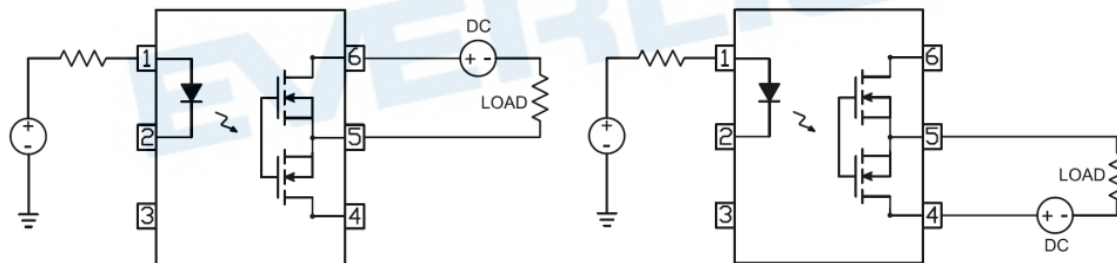
Note:

* On resistance test

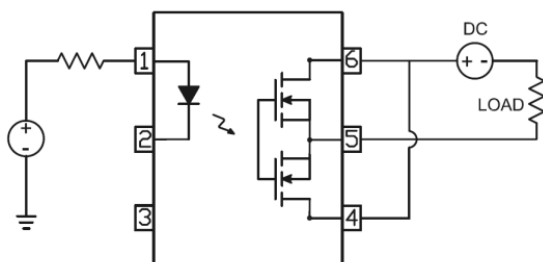
Connection A



Connection B



Connection C



Typical Electro-Optical Characteristics Curves

Figure 1-1. Load current vs Ambient temperature

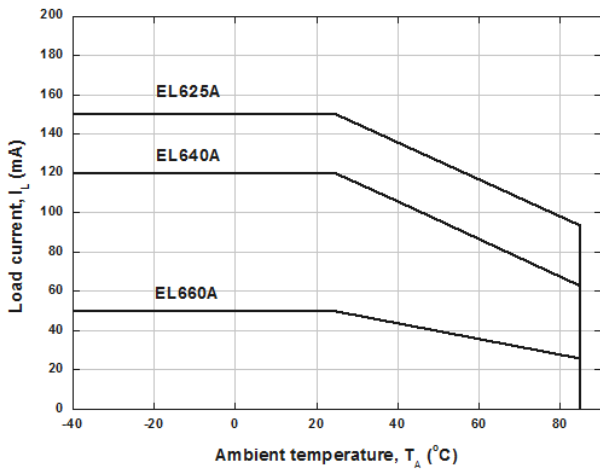


Figure 1-2. Load current vs Ambient temperature

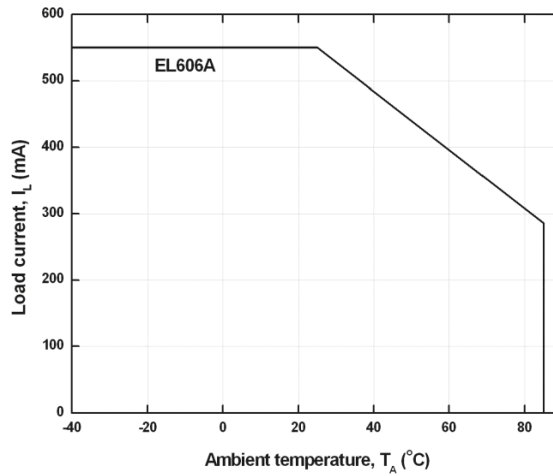


Figure 2-1. On Resistance vs Ambient Temperature

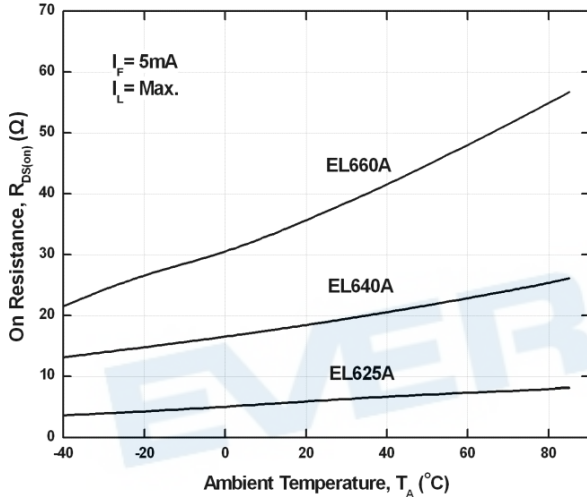


Figure 2-2. On Resistance vs Ambient Temperature

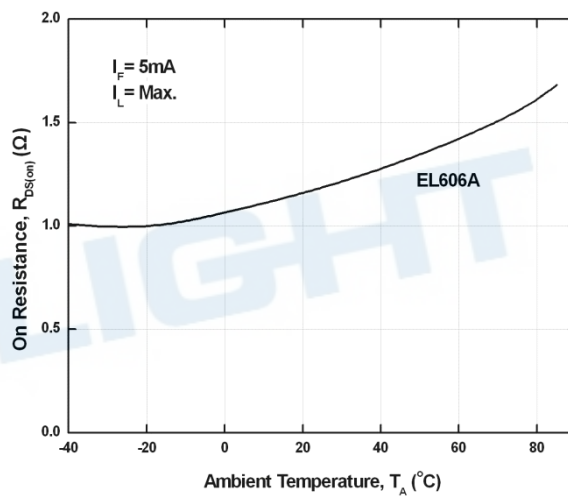


Figure 3. Switching Time vs Ambient Temperature

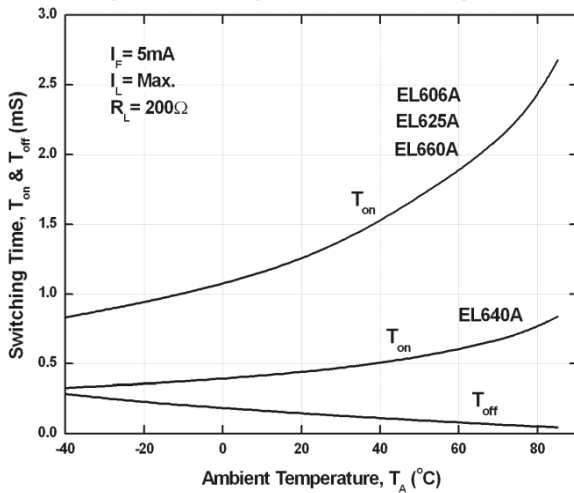


Figure 4. Turn On Time vs LED Forward Current

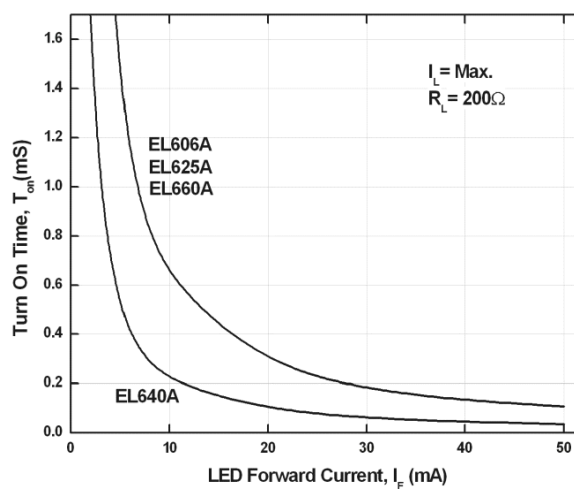


Figure 5. Turn Off Time vs LED Forward Current

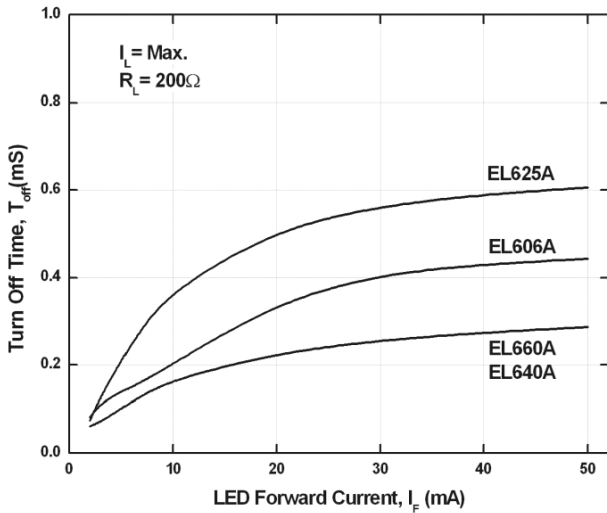


Figure 6. LED Operate on Current vs Ambient Temperature

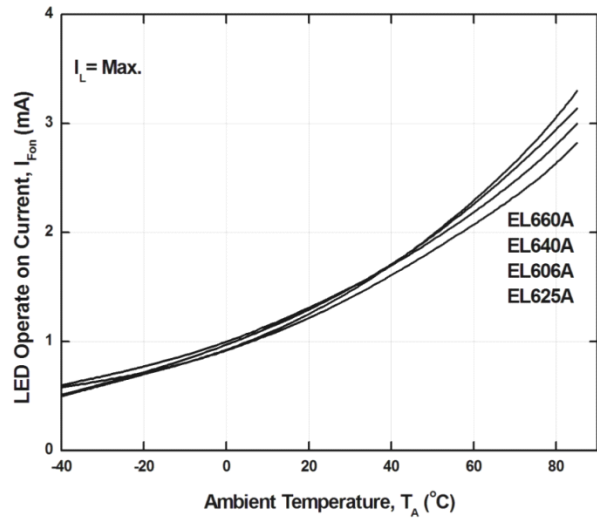


Figure 7. LED Turn off Current vs Ambient Temperature

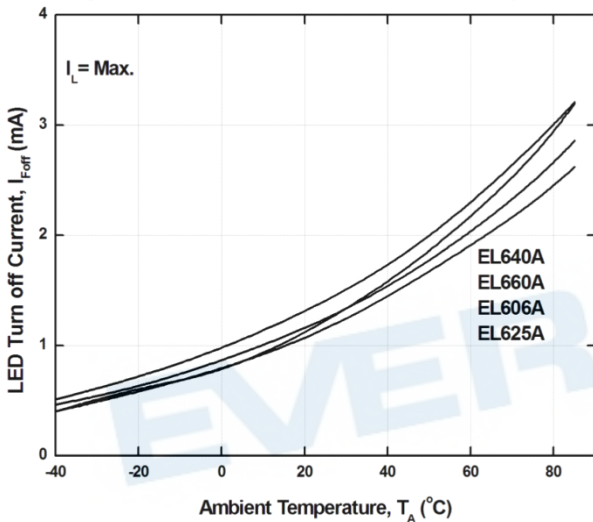


Figure 8. LED Dropout Voltage vs Ambient Temperature

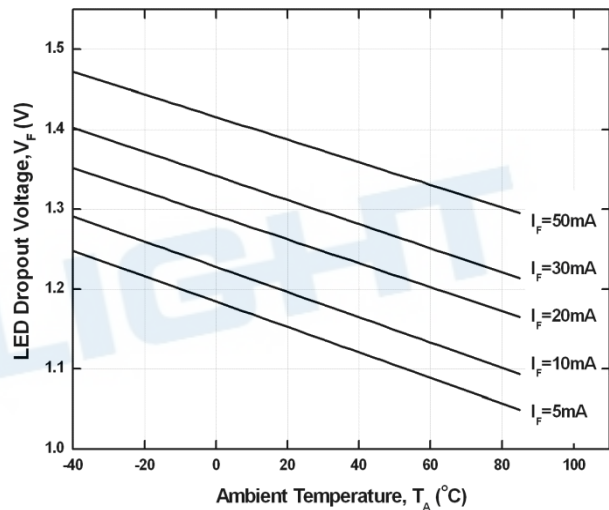


Figure 9-1. Load Voltage vs Load Current

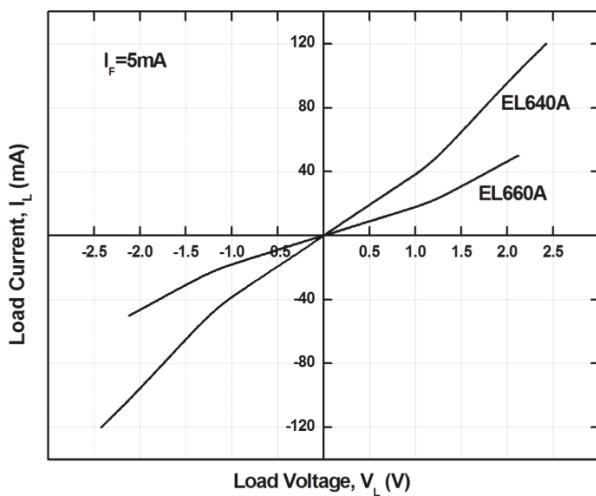


Figure 9-2. Load Voltage vs Load Current

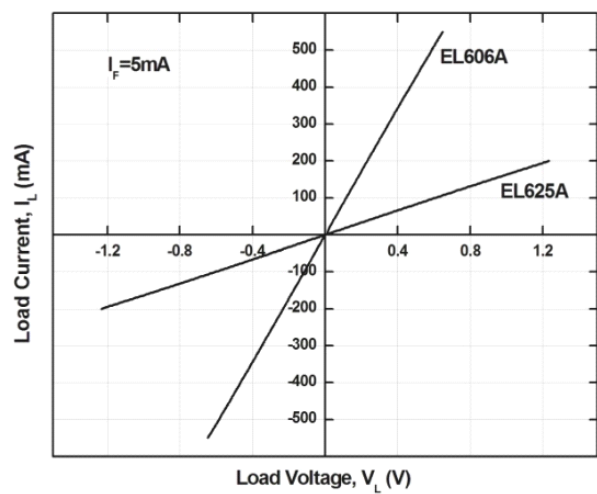


Figure 10. Off State Leakage Current vs Load Voltage

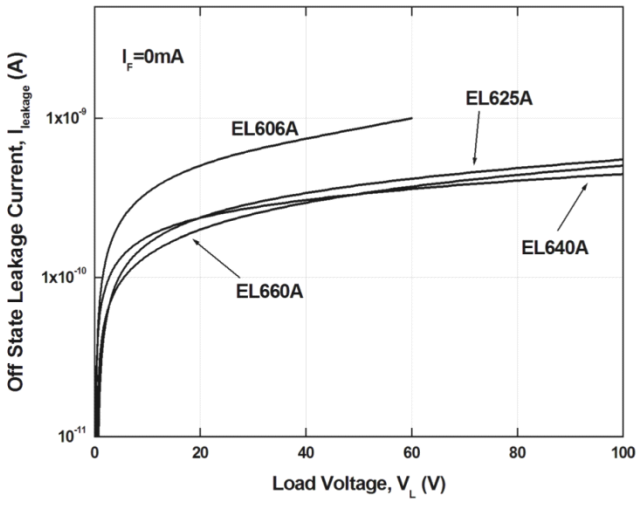
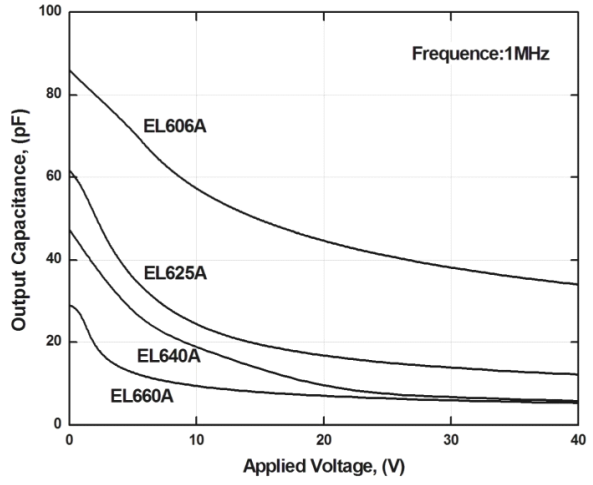


Figure 11. Applied Voltage VS Output Capacitance



EVERLIGHT

Order Information

Part Number

EL6XXA(Y)(Z)(D)-VG

Note:

XX = Part No. (06, 25, 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

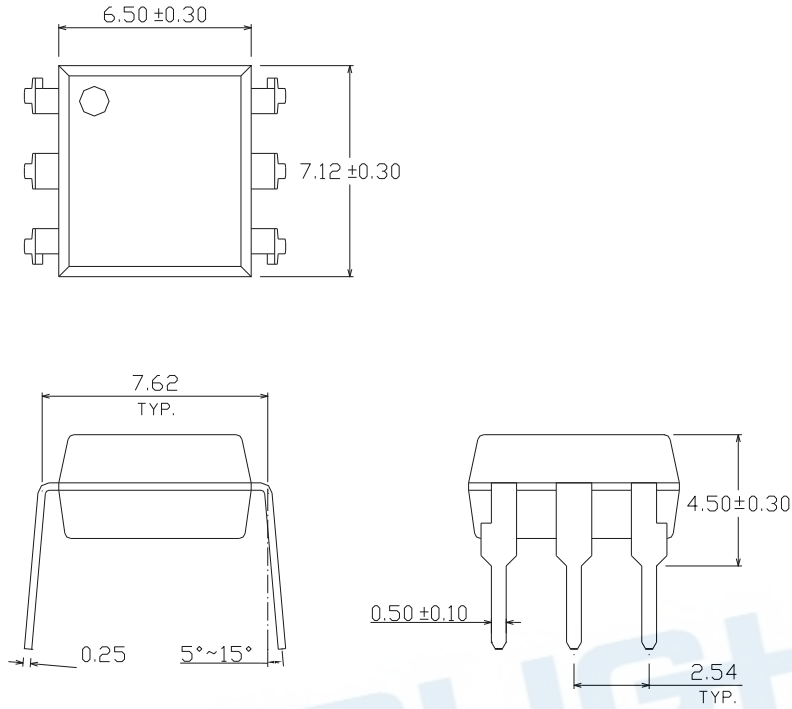
G = Halogens free

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

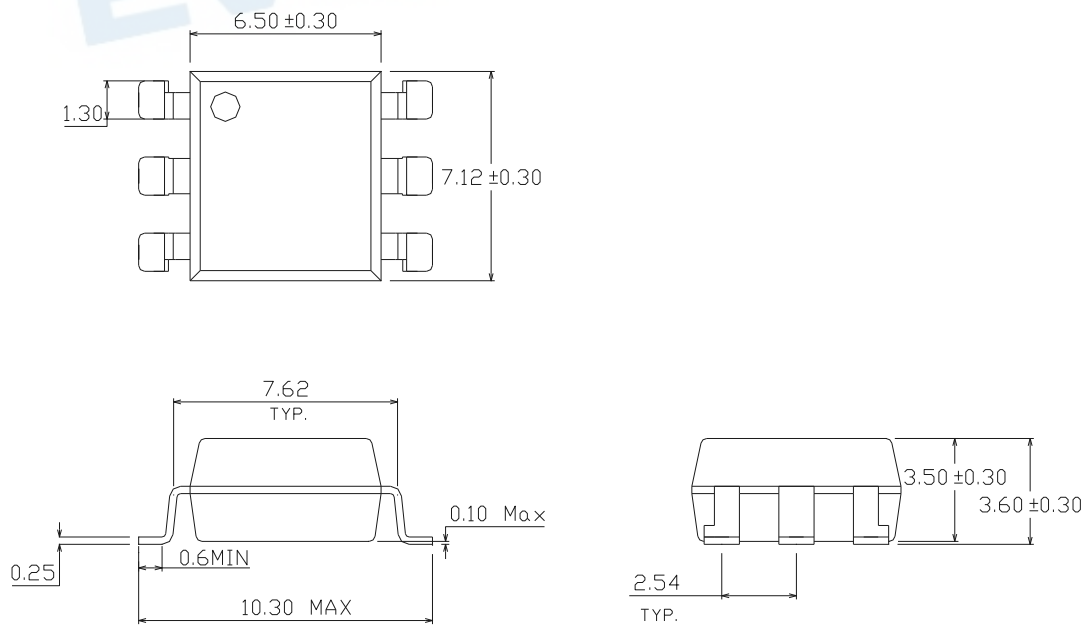
EVERLIGHT

Package Dimension

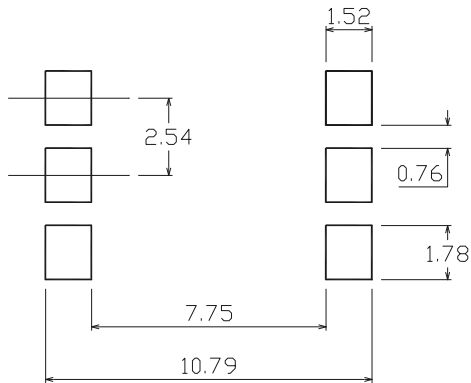
Standard DIP Type



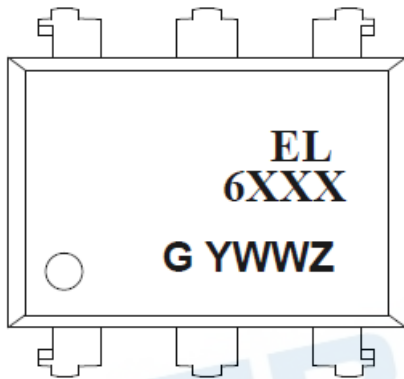
Option S1 Type



Recommended pad layout for surface mount leadform



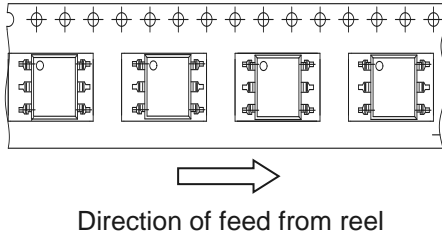
Device MarkingNotes



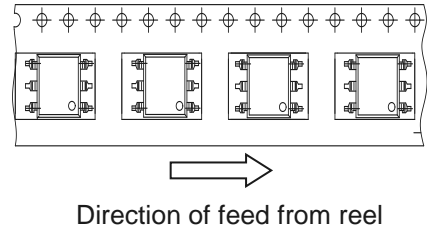
- EL denotes Everlight
- XXX denotes Type Number 06A, 25A, 40A, 60A
- G denotes Green Part
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- Z denotes VDE option Code V

Tape & Reel Packing Specifications

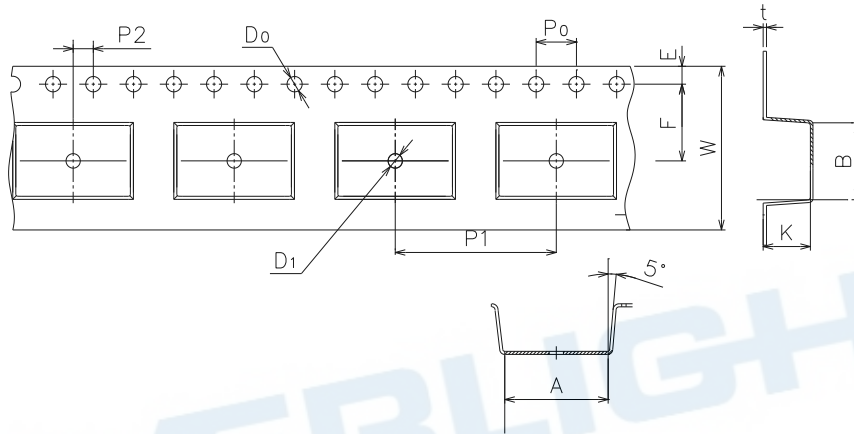
Option TA



Option TB



Tape Dimensions

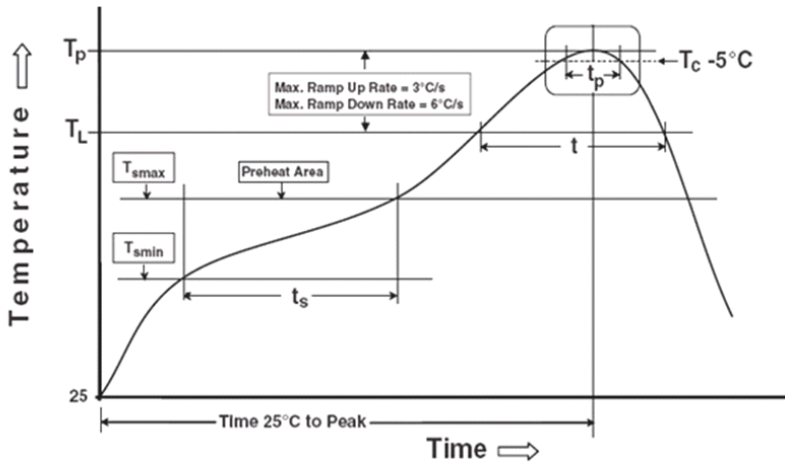


Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.8±0.1	7.5±0.1	1.5±0.1	1.5±0.1	1.75±0.1	7.5±0.1

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

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: $T_P - 5^\circ C$	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

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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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