



LIGHTING FOREVER

# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

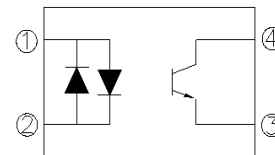
## EL354 Series

### Features:

- AC input response
- Current transfer ratio  
(CTR: Min. 20% at  $I_F = \pm 1\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
- High isolation voltage between input and output ( $V_{iso} = 3750\text{ V rms}$ )
- Compact small outline package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved (No. 716108)
- NEMKO approved (No. P06206474)
- DEMKO approved (No. 313924)
- FIMKO approved (No. FI 22807)
- CSA approved (No. 1408633)



### Schematic



### Description

The EL354 series of devices each consist of two infrared emitting diode, connected in inverse parallel, optically coupled to a phototransistor detector.

They are packaged in a 4-pin small outline package.

### Pin Configuration

1. Anode / Cathode
2. Cathode / Anode
3. Emitter
4. Collector

### Applications

- AC line monitor
- Programmable controllers
- Telephone line interface
- Unknown polarity DC sensor



LIGHTING FOREVER

## 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

### EL354 Series

#### Absolute Maximum Ratings ( $T_a=25^{\circ}\text{C}$ )

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	$\pm 50$	mA
	Peak forward current ( $t = 10\mu\text{s}$ )	$I_{FM}$	1	A
	Power dissipation No derating required up to $T_a = 100^{\circ}\text{C}$	$P_D$	70	mW
Output	Power dissipation Derating factor (above $T_a = 80^{\circ}\text{C}$ )	$P_C$	150	mW
			3.7	mW/ $^{\circ}\text{C}$
	Collector-Emitter voltage	$V_{CEO}$	80	V
	Emitter-Collector voltage	$V_{ECO}$	6	V
Total power dissipation		$P_{tot}$	200	mW
Isolation voltage <sup>*1</sup>		$V_{iso}$	3750	V rms
Operating temperature		$T_{opr}$	-55~+100	$^{\circ}\text{C}$
Storage temperature		$T_{stg}$	-55~+125	$^{\circ}\text{C}$
Soldering temperature <sup>*2</sup>		$T_{sol}$	260	$^{\circ}\text{C}$

#### Notes

\*1 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.

\*2 For 10 seconds.



LIGHTING FOREVER

# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## EL354 Series

### Electrical Characteristics (T<sub>a</sub>=25°C unless specified otherwise)

#### Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V <sub>F</sub>	-	1.2	1.4	V	I <sub>F</sub> = ± 20mA
Reverse current	I <sub>R</sub>	-	-	10	μA	V <sub>R</sub> = 4V
Input capacitance	C <sub>in</sub>	-	50	250	pF	V = 0, f = 1KHz

#### Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I <sub>CEO</sub>	-	-	100	nA	V <sub>CE</sub> = 20V, I <sub>F</sub> =0mA
Collector-Emitter breakdown voltage	BV <sub>CEO</sub>	80	-	-	V	I <sub>C</sub> =0.1mA
Emitter-Collector breakdown voltage	BV <sub>ECO</sub>	6	-	-	V	I <sub>E</sub> =0.01mA

### Transfer Characteristics (T<sub>a</sub>=25°C unless specified otherwise)

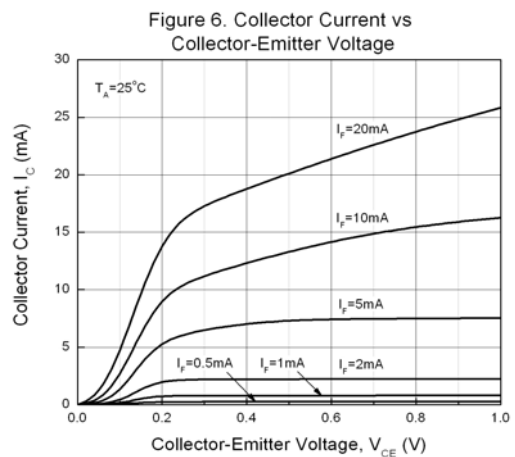
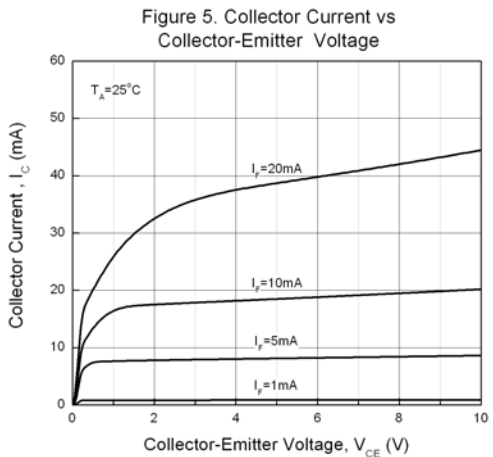
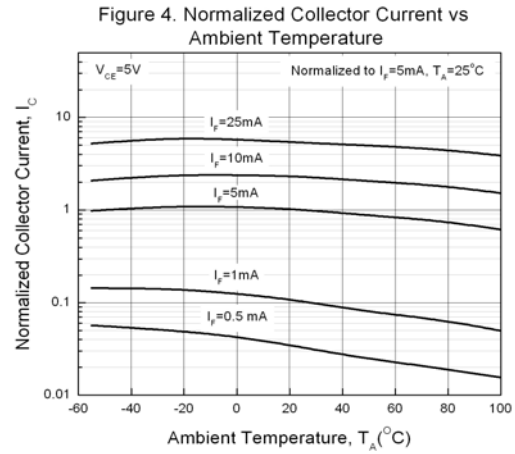
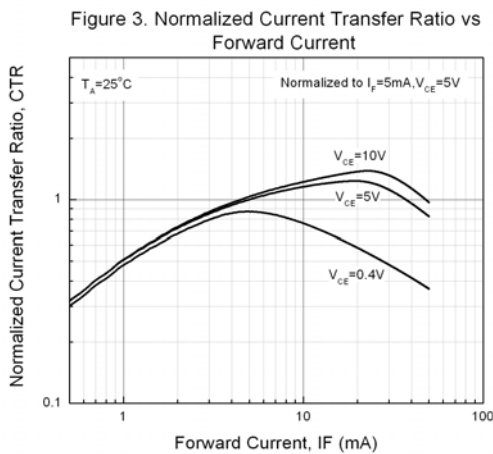
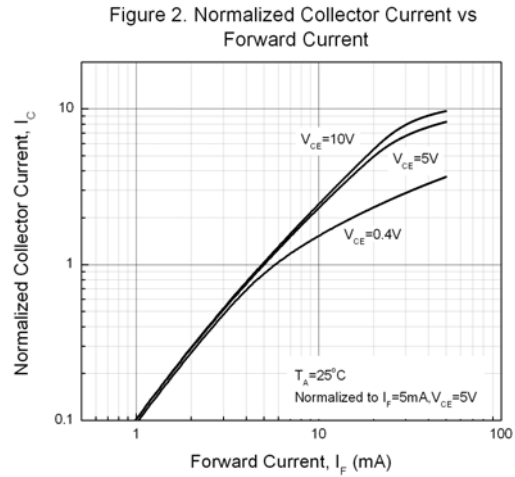
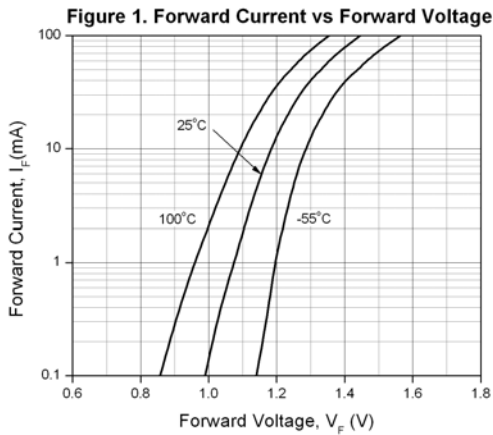
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL354	20	-	300	%	I <sub>F</sub> = ±1mA, V <sub>CE</sub> = 5V
	EL354A	50	-	150		
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	-	0.1	0.2	V	I <sub>F</sub> = ±20mA, I <sub>C</sub> = 1mA
Isolation resistance	R <sub>IO</sub>	5×10 <sup>10</sup>	10 <sup>11</sup>	-	Ω	V <sub>IO</sub> = 500Vdc, 40~60%R.H
Cut-off frequency	f <sub>c</sub>	-	80	-	kHz	V <sub>CE</sub> =5V, I <sub>C</sub> =2 mA, R <sub>L</sub> =100Ω, -3dB
Floating capacitance	C <sub>IO</sub>	-	0.6	1.0	pF	V <sub>IO</sub> = 0, f = 1MHz
Rise time	T <sub>r</sub>	-	6	18	μs	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω
Fall time	T <sub>f</sub>	-	8	18	μs	

\* Typical values at T<sub>a</sub> = 25°C

# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL354 Series**

## Typical Performance Curves



# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL354 Series**

Figure 7. Collector Dark Current vs Ambient Temperature

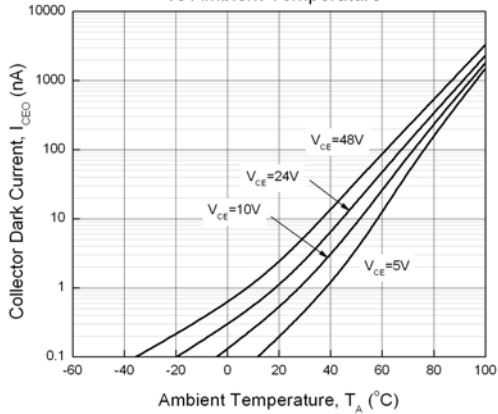


Figure 8. Switching Time vs Load Resistance

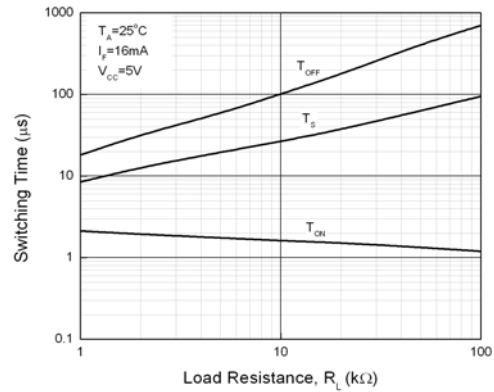


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

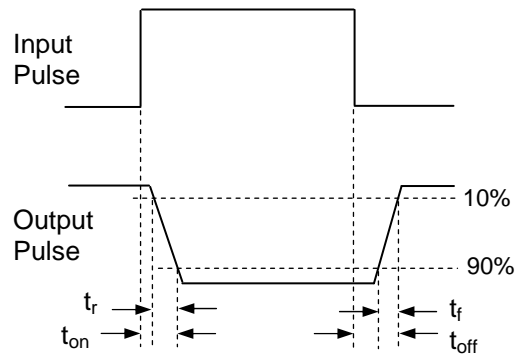
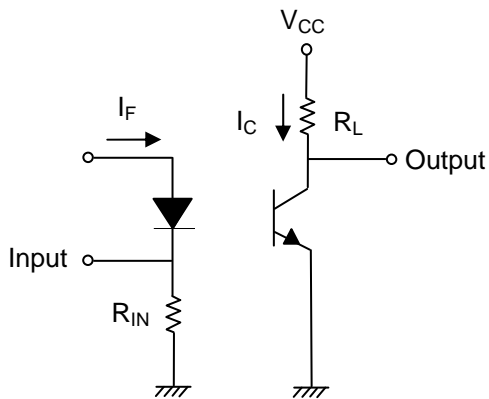
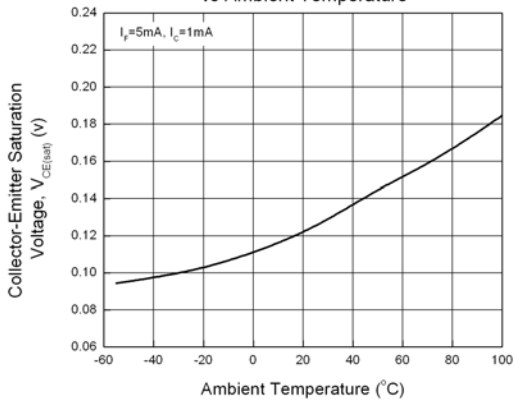


Figure 10. Switching Time Test Circuit & Waveforms



LIGHTING FOREVER

# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## EL354 Series

### Order Information

#### Part Number

# EL354(X)(Y)-V

#### Note

- X = CTR Rank option (A or none)
- Y = Tape and reel option (TA, TB, or none).
- V = VDE safety option

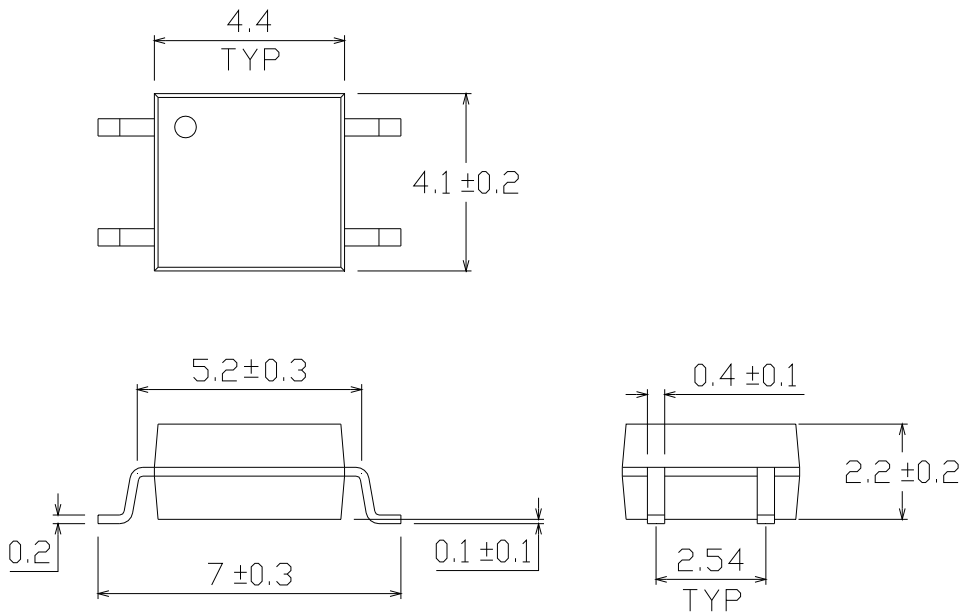
Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	3000 units per reel
(TB)	TB Tape & reel option	3000 units per reel
(TA)-V	TA Tape & reel option + VDE	3000 units per reel
(TB)-V	TB Tape & reel option + VDE	3000 units per reel

# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

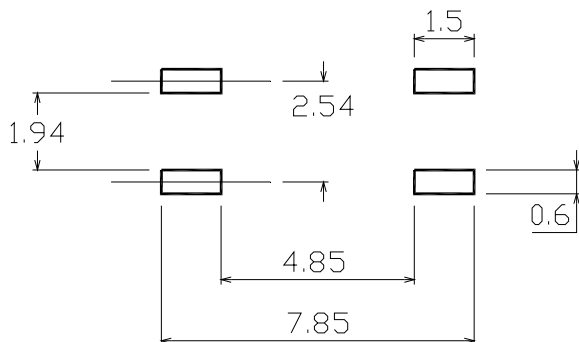
**EL354 Series**

## Package Drawings (Dimensions in mm)

### Package Drawing (Dimensions in mm)



### Recommended pad layout for surface mount leadform



## 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL354 Series**

---

### Device Marking



### Notes

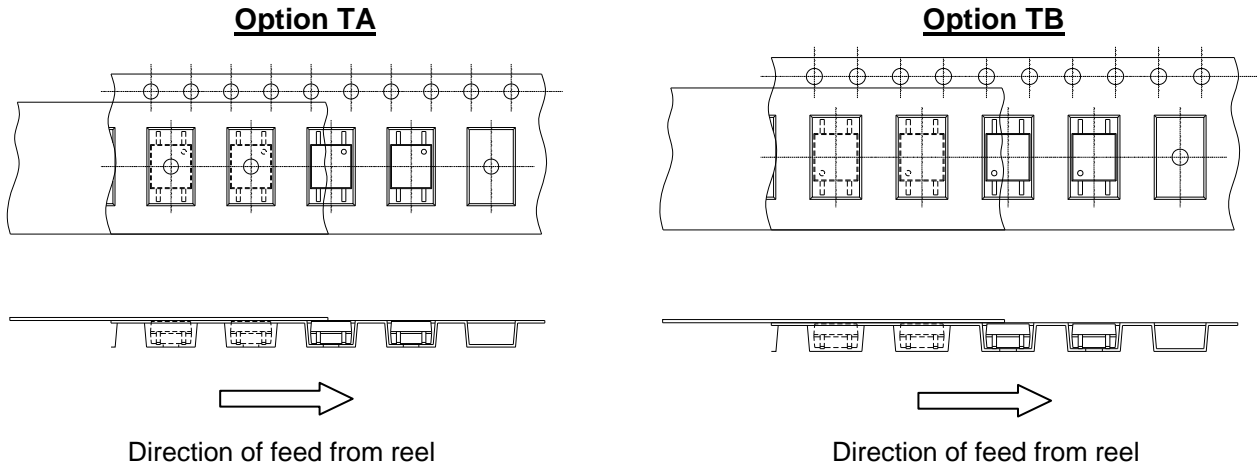
EL	denotes Everlight
354	denotes Device Number
R	denotes CTR Rank (A or none)
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE approved (optional)



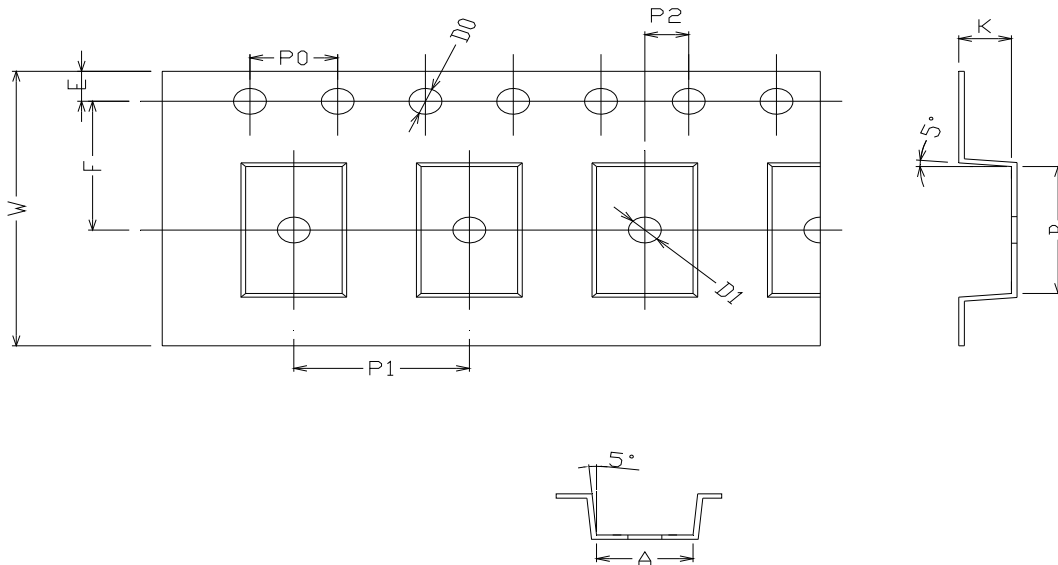
# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL354 Series**

## Tape & Reel Packing Specifications



## Tape dimensions

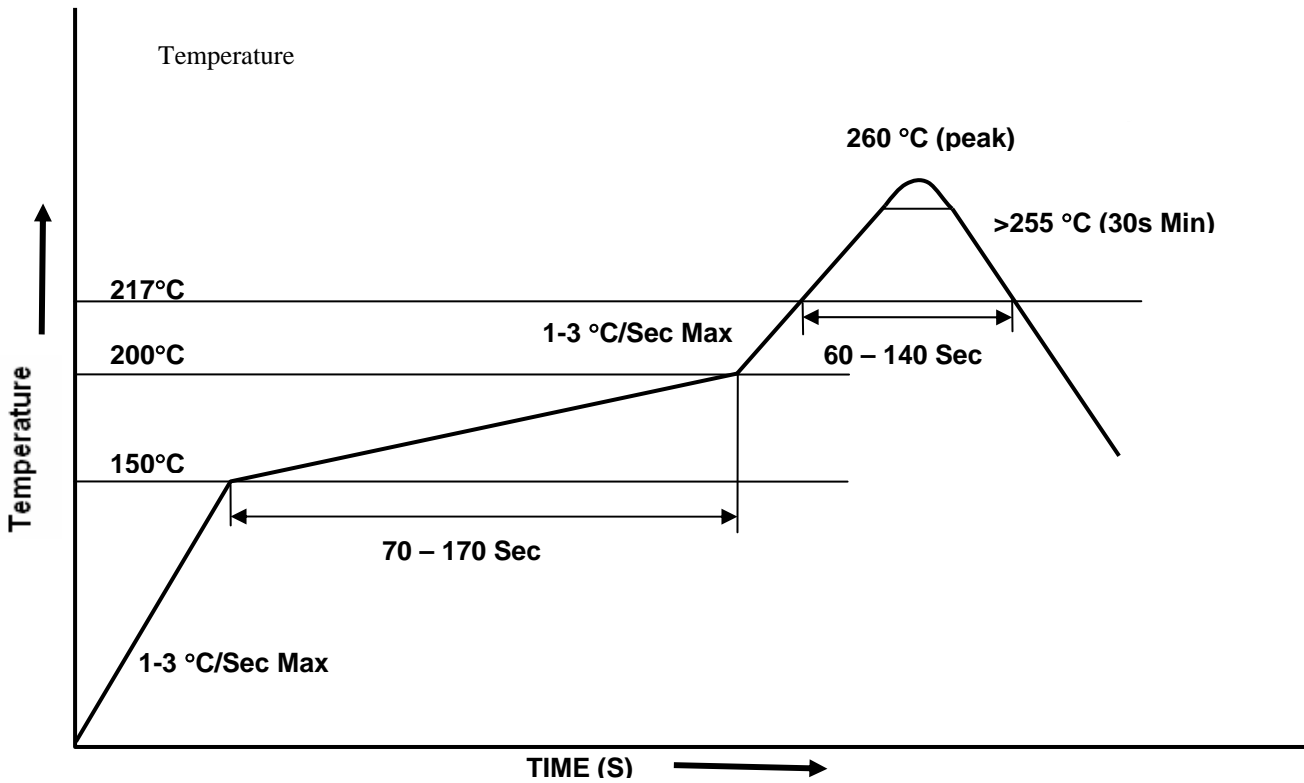


Dimension No.	<b>A</b>	<b>B</b>	<b>Do</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension (mm)	4.4 ± 0.1	7.4 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K</b>
Dimension (mm)	4.0 ± 0.15	8.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	16.0 ± 0.2	2.4 ± 0.1

# 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL354 Series**

## Solder Reflow Temperature Profile





LIGHTING FOREVER

## 4 PIN SOP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL354 Series**

---

### DISCLAIMER

1. The specifications in this datasheet may be changed without notice. EVERLIGHT reserves the authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for use as outlined in this datasheet. 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 this datasheet.
3. These specification sheets include materials protected under copyright of EVERLIGHT. Reproduction in any form is prohibited without the specific consent of EVERLIGHT.