



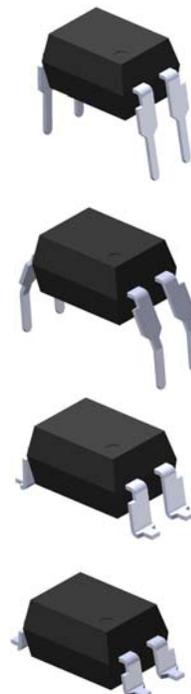
LIGHTING FOREVER

# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## EL814 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 ( $V_{iso} = 5000\text{ V rms}$ )
- Wide Operating temperature range  
-55~110°C
- High collector-emitter voltage  $V_{CEO} = 80\text{V}$
- Compact dual-in-line 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. 1143601)

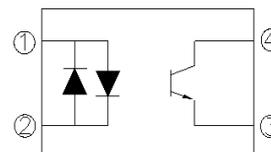


### Description

The EL814 series of devices each consist of two infrared emitting diodes, connected in inverse parallel, optically coupled to a phototransistor detector.

They are packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.

### Schematic



### Applications

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

### Pin Configuration

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



LIGHTING FOREVER

# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## EL814 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	$P_D$	70	mW
	Derating factor (above 100 °C)		2.9	mW/°C
Output	Power dissipation	$P_C$	150	mW
	Derating factor (above 100 °C)		5.8	mW/°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>		$V_{iso}$	5000	V rms
Operating temperature		$T_{opr}$	-55~+110	°C
Storage temperature		$T_{stg}$	-55~+125	°C
Soldering temperature <sup>*2</sup>		$T_{sol}$	260	°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 DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## EL814 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
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> = 0.1mA

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

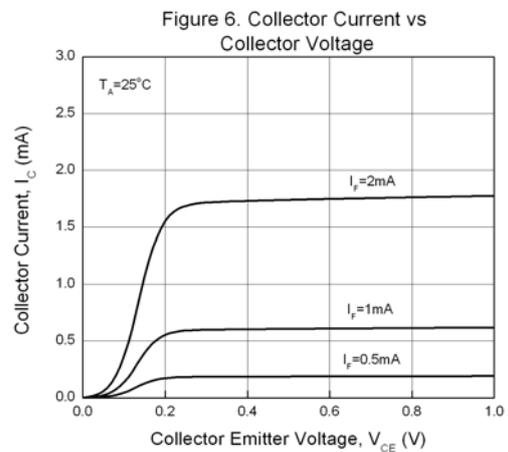
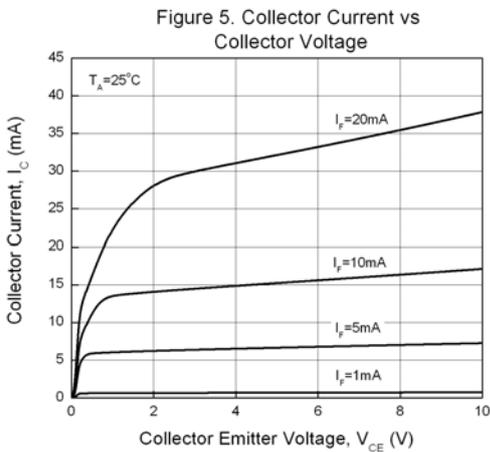
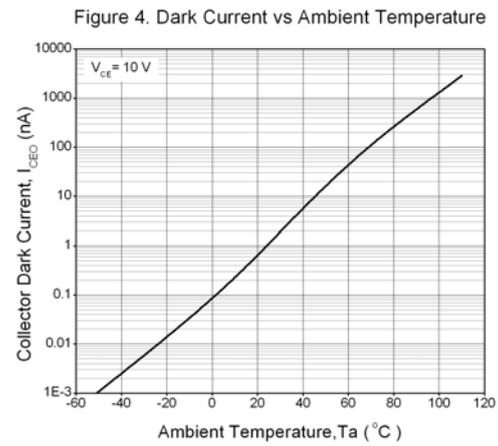
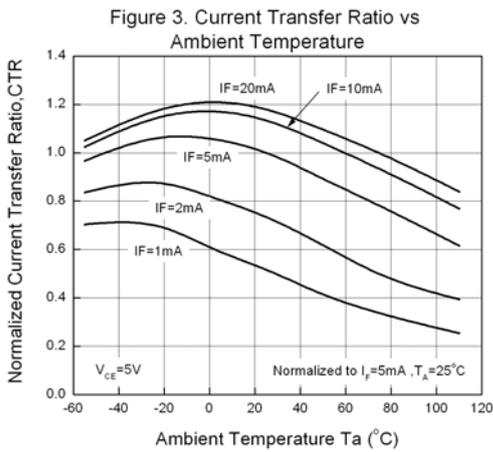
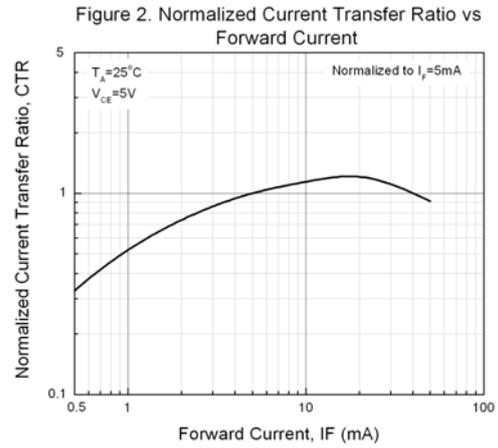
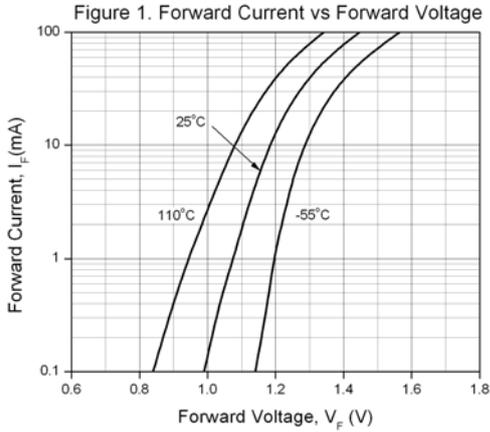
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition	
Current Transfer ratio	EL814	CTR	20	-	300	%	I <sub>F</sub> = ±1mA, V <sub>CE</sub> = 5V
	EL814A		50	-	150		
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	-	0.05	0.2	V	I <sub>F</sub> = ±20mA, I <sub>C</sub> = 1mA	
Isolation resistance	R <sub>IO</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>	-	7	18	μs	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω	
Fall time	T <sub>f</sub>	-	11	18	μs		

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

# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

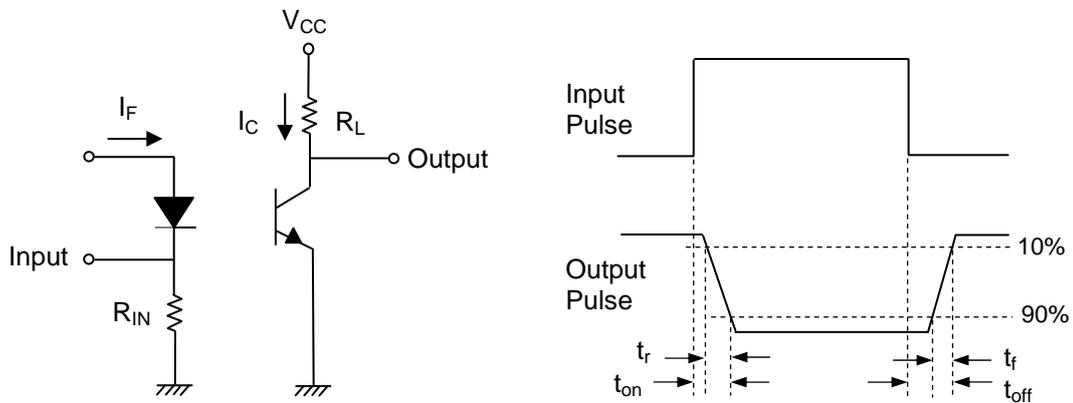
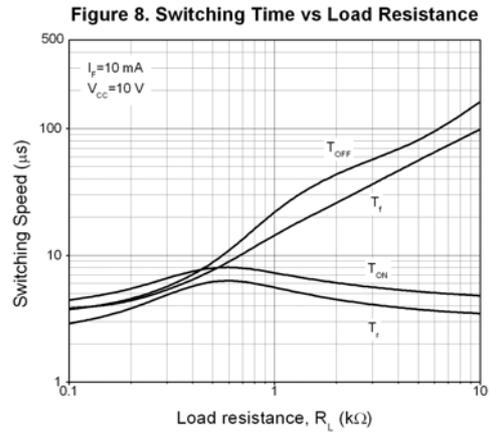
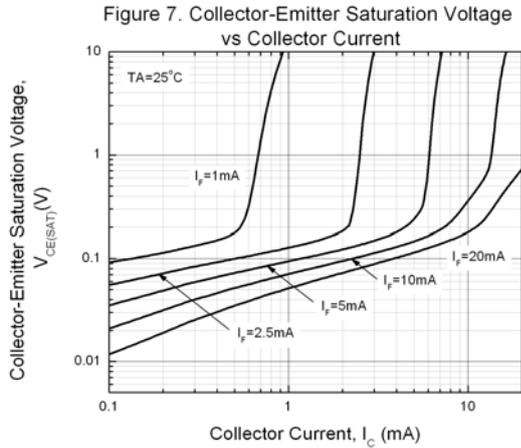
## EL814 Series

### Typical Performance Curves



# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**



**Figure 9. Switching Time Test Circuit & Waveforms**



LIGHTING FOREVER

## 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

### EL814 Series

#### Order Information

#### Part Number

# EL814X(Y)(Z)

#### Note

- X = Lead form option (S, S1, M or none)
- Y = CTR Rank option (A or none)
- Z = Tape and reel option (TA, TB, TU, TD or none).

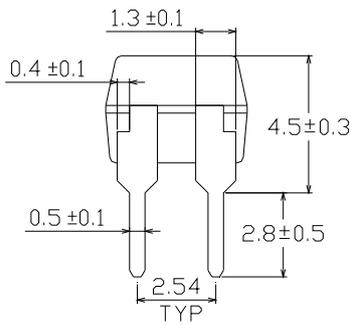
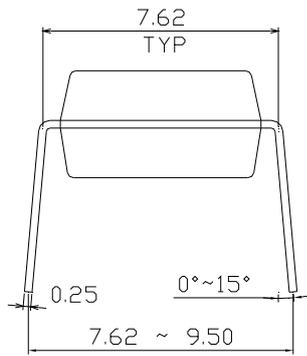
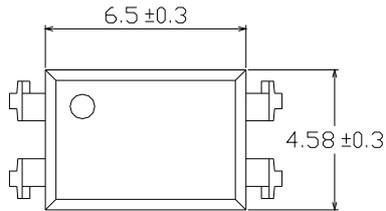
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount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

# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

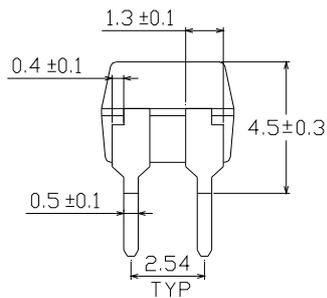
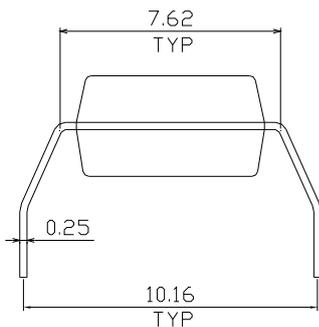
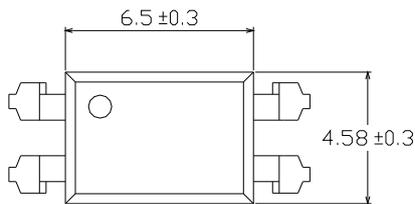
**EL814 Series**

## Package Drawings (Dimensions in mm)

### Standard DIP Type



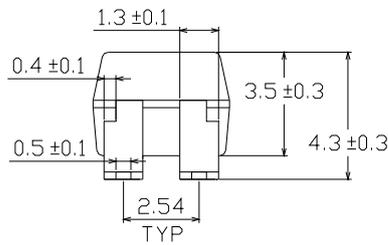
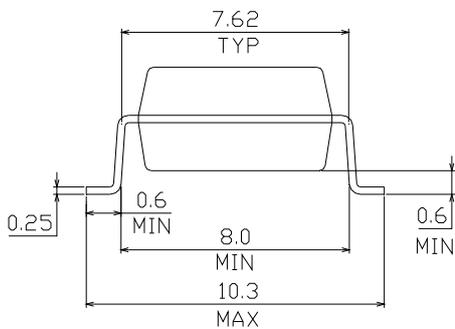
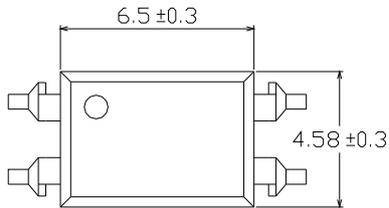
### Option M Type



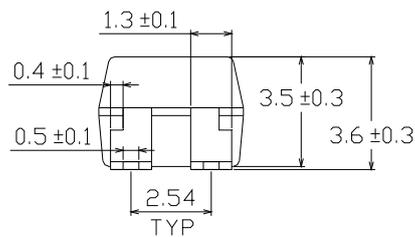
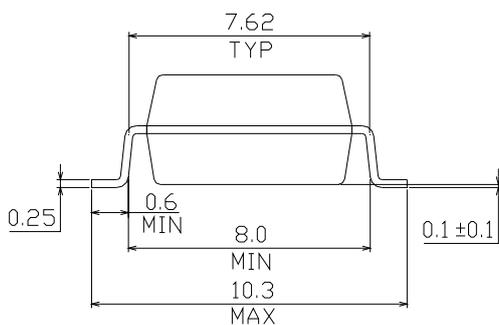
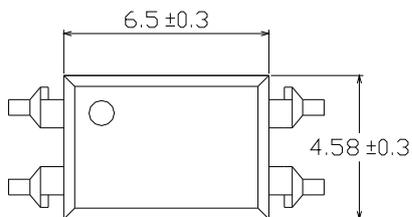
# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**

## Option S Type



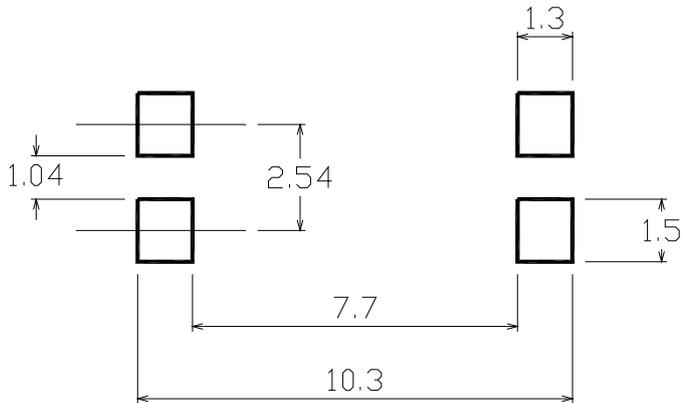
## Option S1 Type



## 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

EL814 Series

### Recommended pad layout for surface mount leadform



### Device Marking



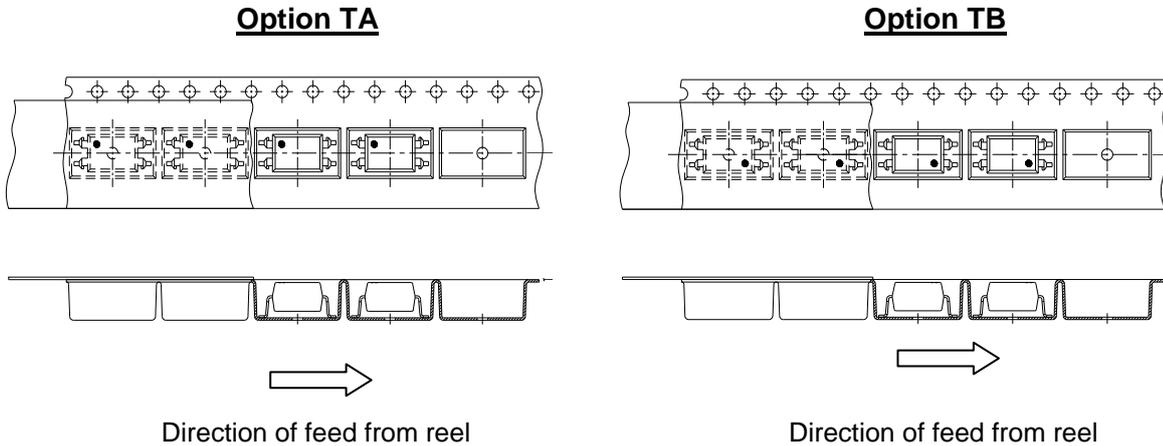
### Notes

- EL814 denotes Device Number
- F denotes Factory Code (C: China, T: Taiwan)
- R denotes CTR Rank (A or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code

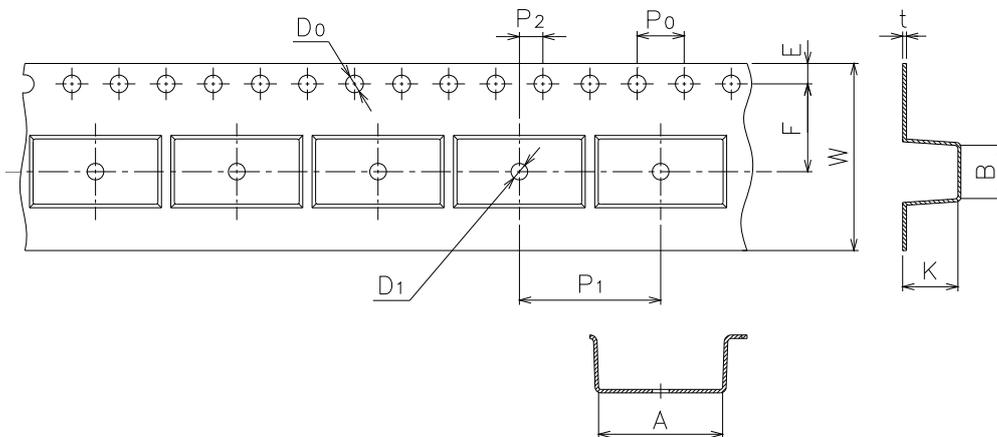
# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**

## Tape & Reel Packing Specifications



## Tape dimensions

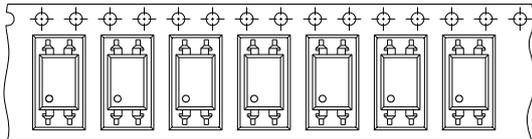


Dimension No.	<b>A</b>	<b>B</b>	<b>Do</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K</b>
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

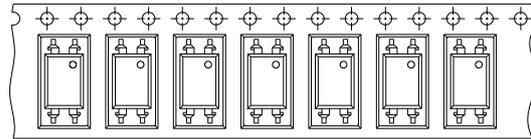
# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**

**Option TD**



**Option TU**

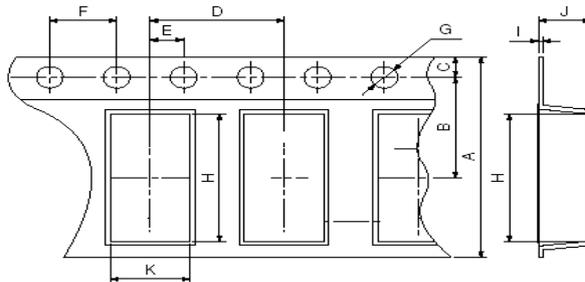


Direction of feed from reel



Direction of feed from reel

**Tape dimensions**

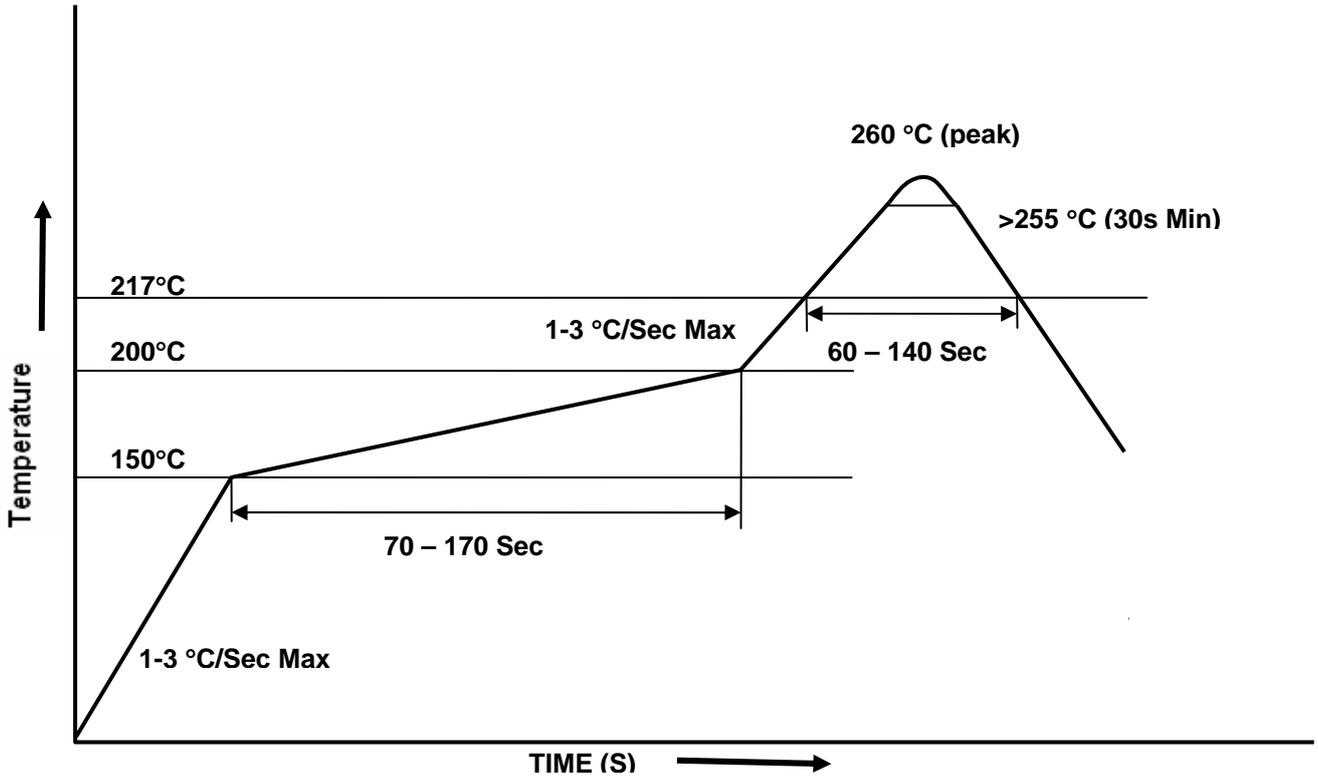


Dimension No.	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
Dimension(mm)	16.00±0.3	7.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1
Dimension No.	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	
Dimension(mm)	1.5+0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	

# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**

## Solder Reflow Temperature Profile





LIGHTING FOREVER

## 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 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.