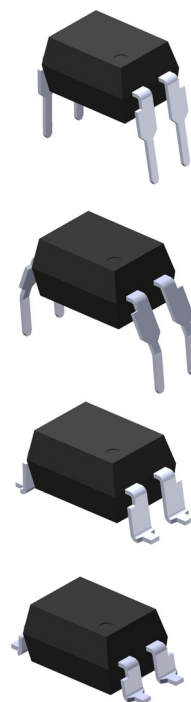


## 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

### 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
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved
- CQC approved

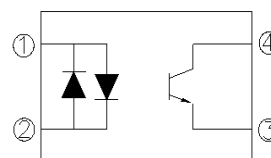


#### Description

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



#### 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



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## 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	$I_F$	$\pm 60$	mA
	Peak forward current ( $t = 10\mu\text{s}$ )	$I_{FM}$	1	A
	Power dissipation	$P_D$	100	mW
	Derating factor (above $100^{\circ}\text{C}$ )		2.9	mW/ $^{\circ}\text{C}$
Output	Power dissipation	$P_C$	150	mW
	Derating factor (above $100^{\circ}\text{C}$ )		5.8	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>		$V_{iso}$	5000	V rms
Operating temperature		$T_{opr}$	-55~+110	$^{\circ}\text{C}$
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.



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# 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)

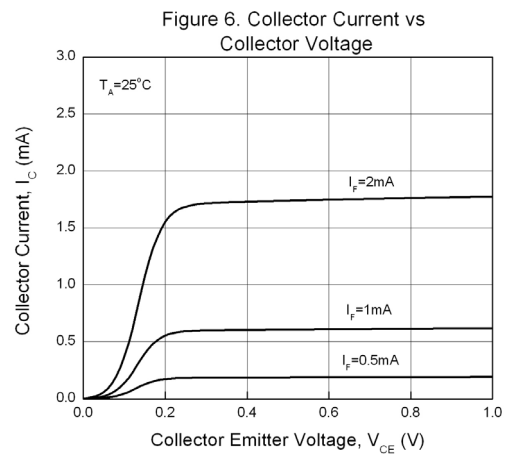
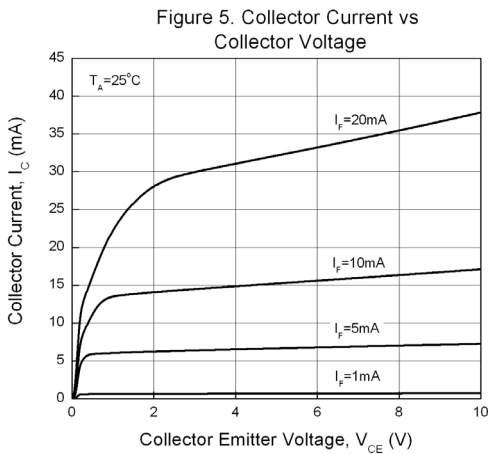
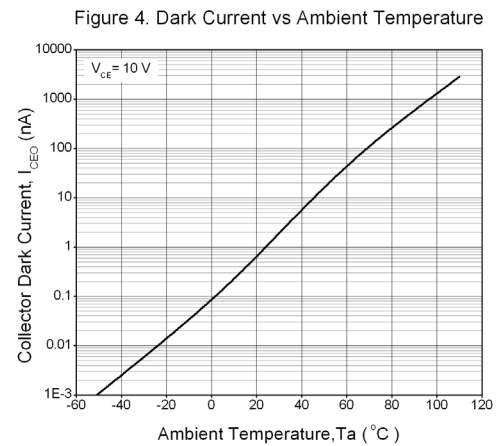
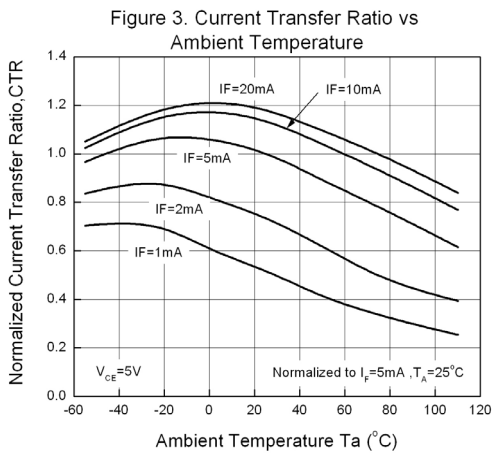
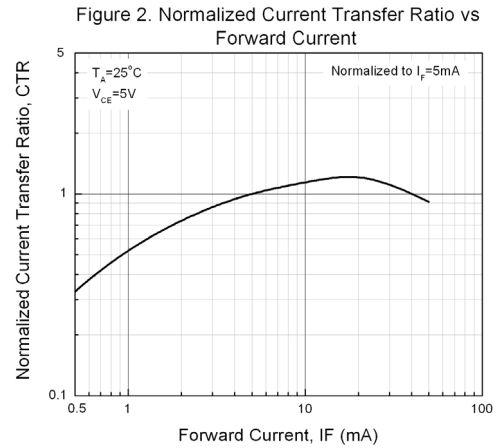
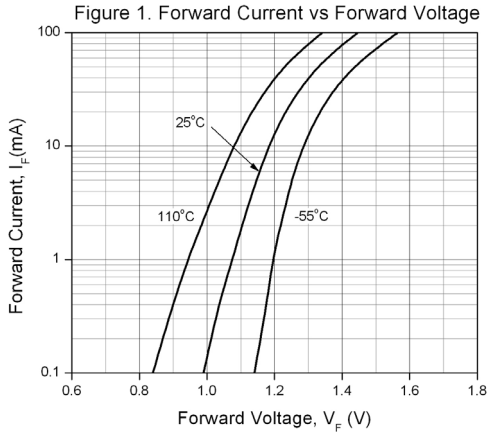
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition	
Current Transfer ratio	EL814	CTR	20	-	300	%	I <sub>F</sub> = ±1mA, V <sub>CE</sub> = 5V
	EL814A		50	-	150		
CTR Symmetry		0.7		1.3		I <sub>F</sub> = ±1mA, V <sub>CE</sub> = 5V	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	-	0.05	0.2	V	I <sub>F</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% RH	
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

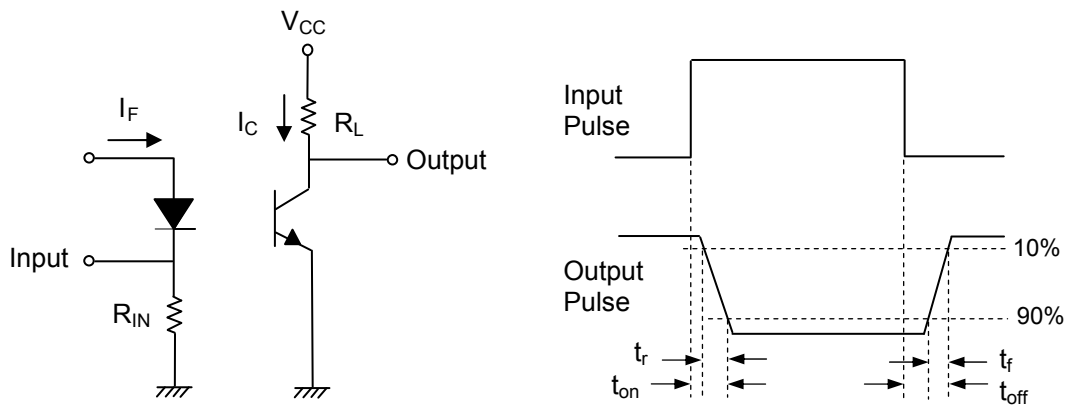
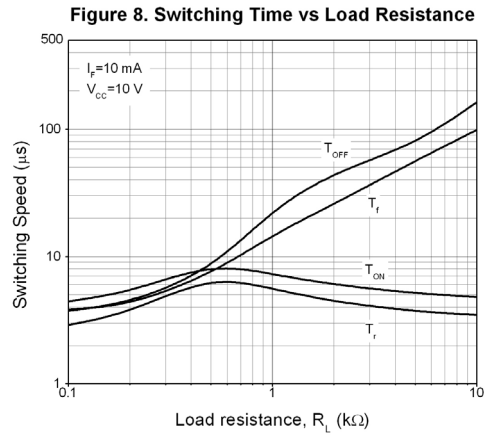
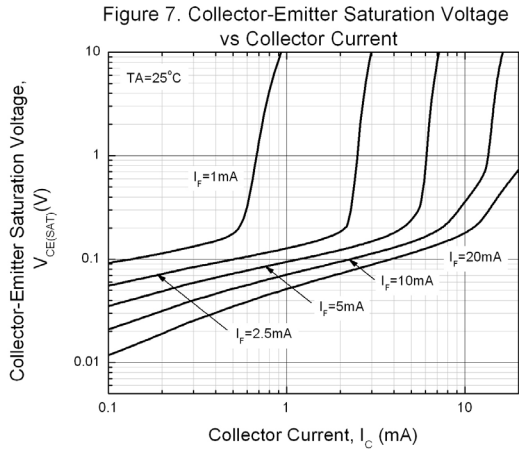
## EL814 Series

### Typical Performance Curves



# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**



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



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## 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## EL814 Series

### Order Information

#### Part Number

# EL814X(Y)(Z)-V

#### 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)
- V = VDE safety (optional).

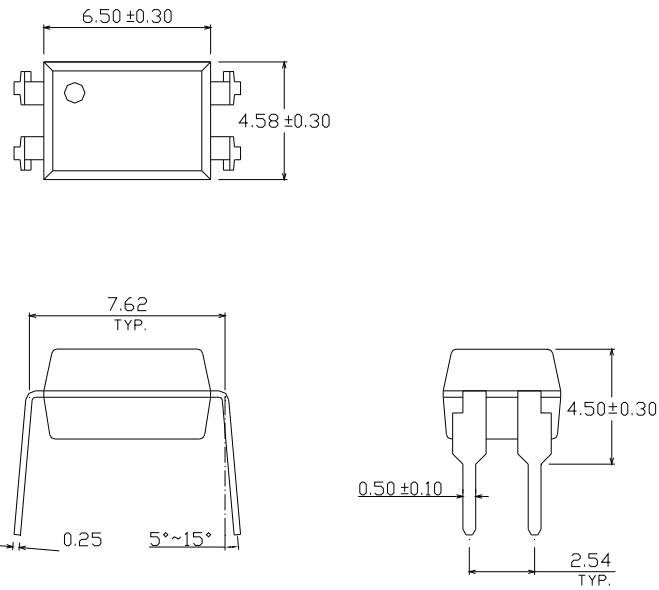
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount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

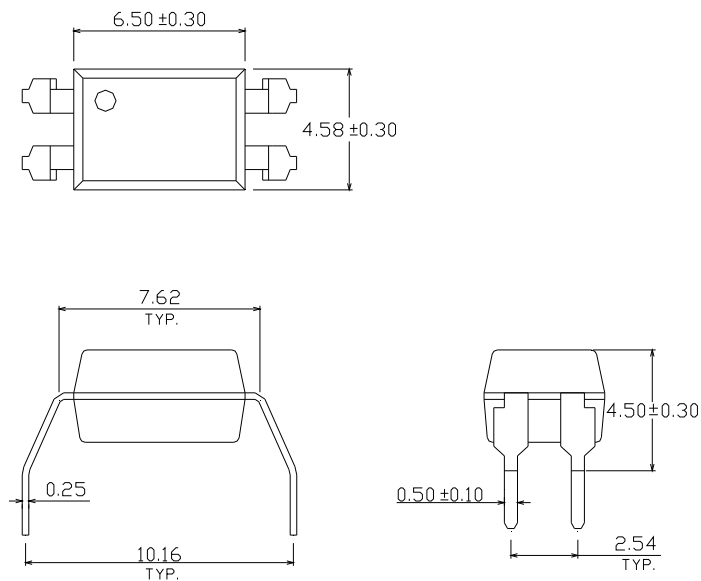
**EL814 Series**

## Package Drawings (Dimensions in mm)

### Standard DIP Type



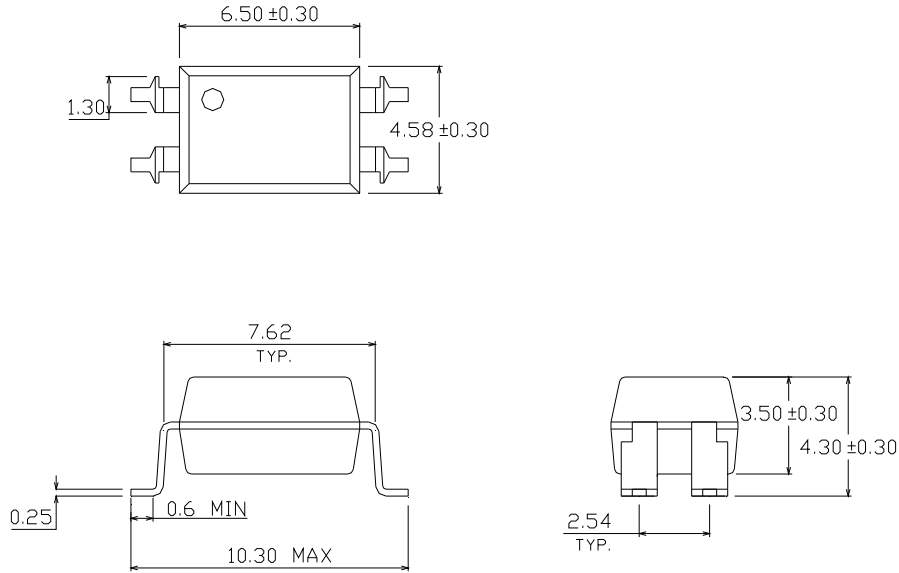
### Option M Type



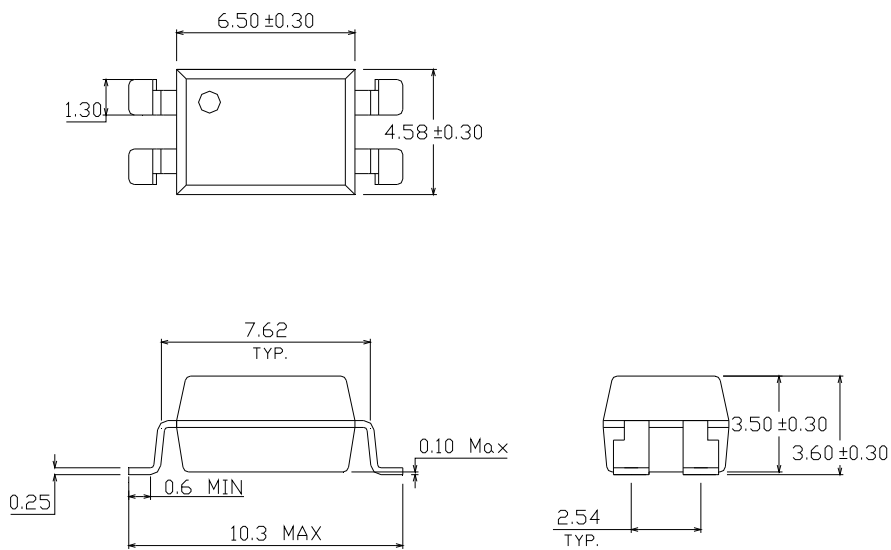
# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**

## Option S Type



## Option S1 Type





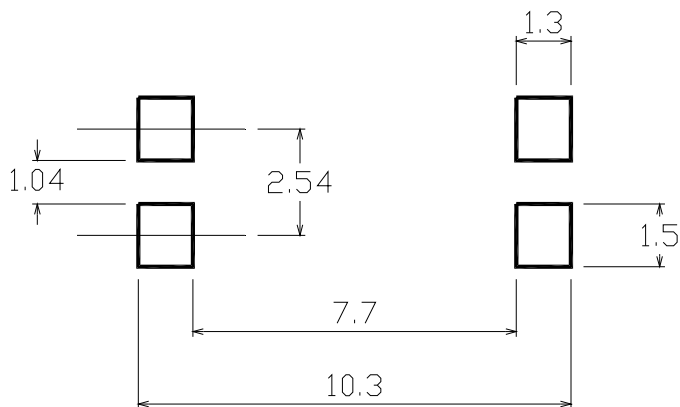


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## 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

EL814 Series

### Recommended pad layout for surface mount leadform



### Device Marking



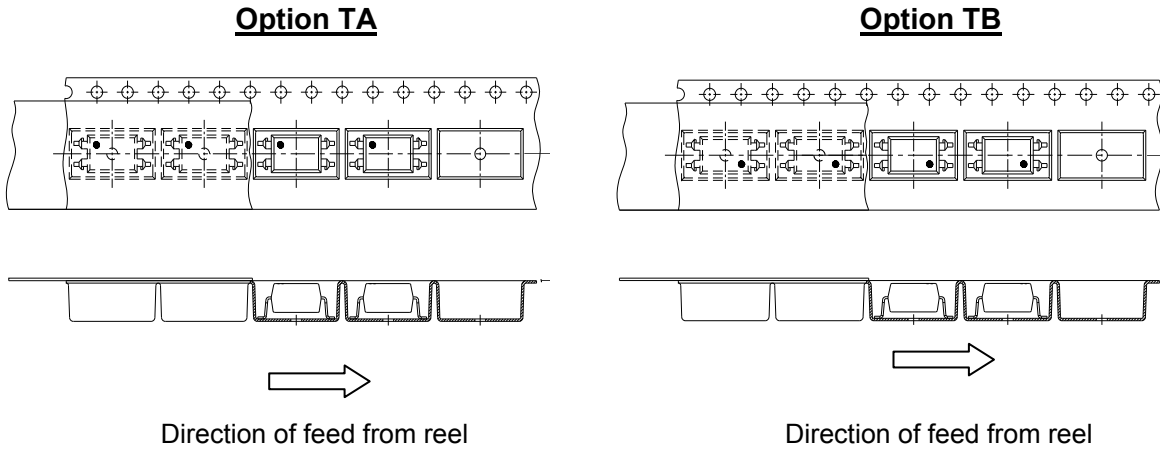
### Notes

- EL denotes EVERLIGHT
- 814 denotes Device Number
- F denotes Factory Code (None: China, T: Taiwan)
- R denotes CTR Rank (A or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE (optional)

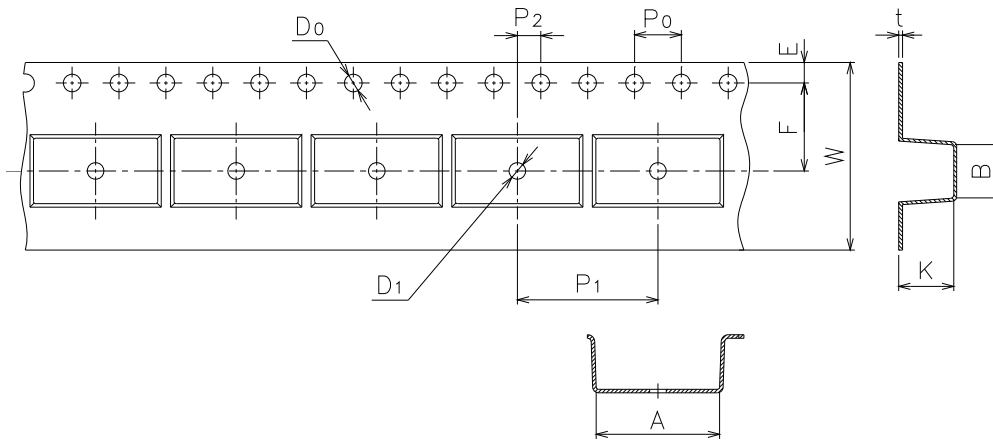
# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

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## Tape & Reel Packing Specifications



## Tape dimensions

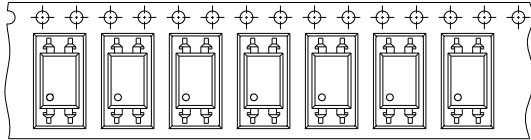


Dimension No.	<b>A</b>	<b>B</b>	<b>Do</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K</b>
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

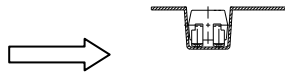
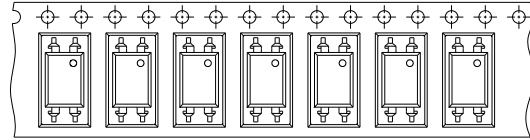
**4 PIN DIP PHOTOTRANSISTOR  
AC INPUT PHOTOCOUPLER**

**EL814 Series**

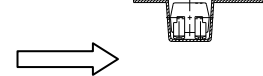
**Option TD**



**Option TU**

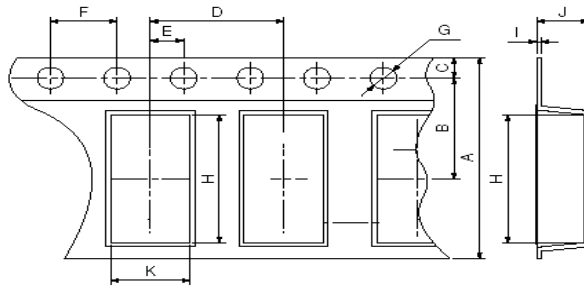


Direction of feed from reel



Direction of feed from reel

**Tape dimensions**

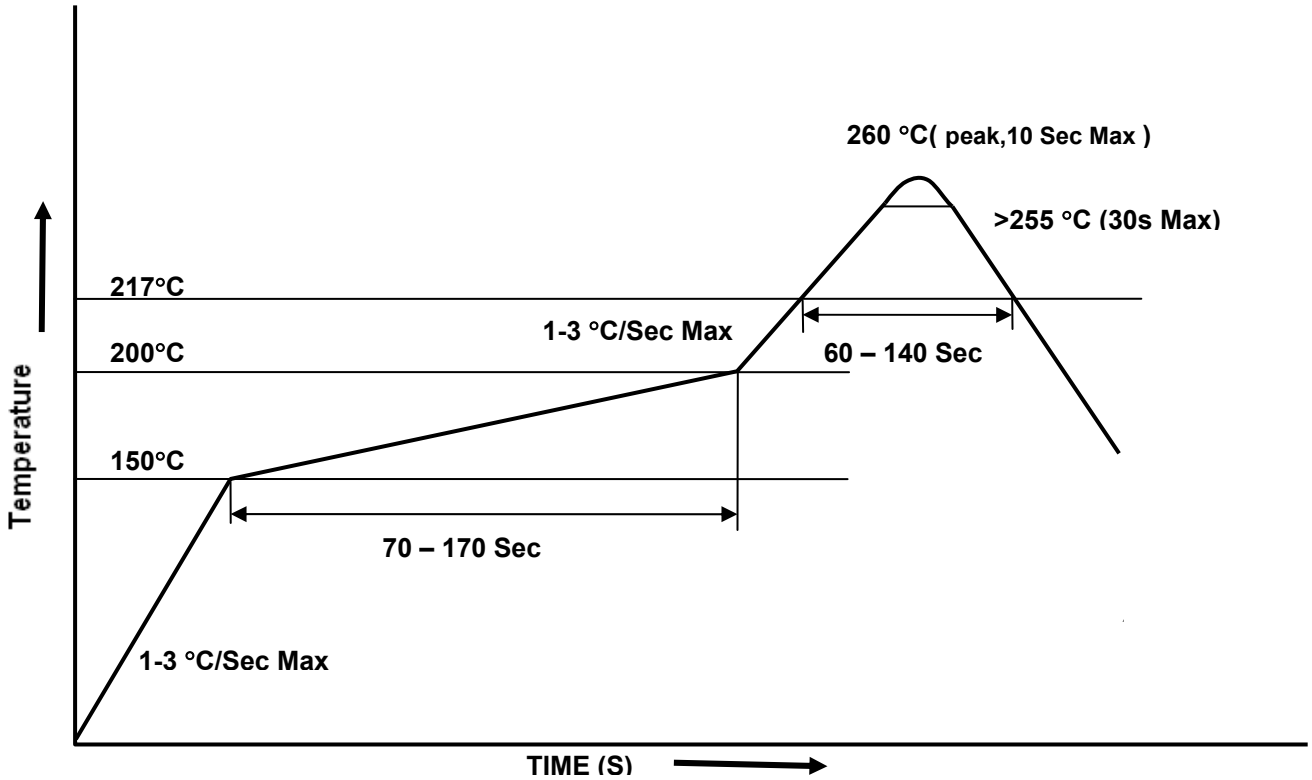


Dimension No.	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
Dimension(mm)	16.00±0.3	7.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1
Dimension No.	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	
Dimension(mm)	1.5+0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	

# 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**

## Solder Reflow Temperature Profile





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## 4 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**EL814 Series**

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