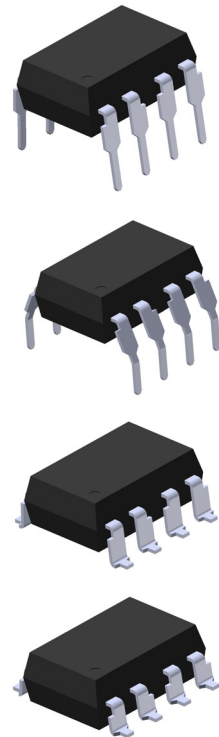


# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL825 Series

### Features:

- Current transfer ratio  
(CTR: 600~7500% at  $I_F = 1\text{mA}$ ,  $V_{CE} = 2\text{V}$ )
- High isolation voltage between input and output ( $V_{iso} = 5000\text{ V rms}$ )
- Creepage distance  $> 7.62\text{ mm}$
- Operating temperature up to  $+110^\circ\text{C}$ 
  - Compact small outline 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

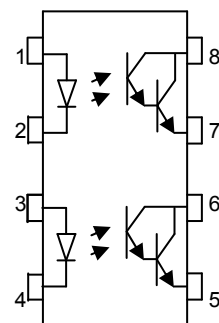
The EL825 series devices each consists of an infrared emitting diodes, optically coupled to a Darlington phototransistor detector.

These devices are packaged in an 8-pin DIP package and available in wide-lead spacing and SMD option.

### Applications

- Telephone set, telephone exchangers
- Sequence controllers
- System appliances, measuring instruments
- Signal transmission between circuits of different potentials and impedances

#### Schematic



#### Pin Configuration

- 1, 3. Anode
- 2, 4. Cathode
- 5, 7. Emitter
- 6, 8. Collector



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# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL825 Series

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

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	60	mA
	Peak forward current (1us, pulse)	$I_{FP}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation No derating required up to $T_a = 100^\circ\text{C}$	$P_D$	100	mW
Output	Power dissipation Derating factor (above $T_a = 80^\circ\text{C}$ )	$P_C$	150	mW
			5.8	mW/ $^\circ\text{C}$
	Collector current	$I_C$	80	mA
	Collector-Emitter voltage	$V_{CEO}$	40	V
	Emitter-Collector voltage	$V_{ECO}$	7	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 PHOTOCOUPLER

**EL825 Series**

### Electrical Characteristics ( $T_a=25^\circ\text{C}$ unless specified otherwise)

#### Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	$V_F$	-	1.2	1.4	V	$I_F = 20\text{mA}$
Reverse current	$I_R$	-	-	10	$\mu\text{A}$	$V_R = 4\text{V}$
Input capacitance	$C_{in}$	-	30	250	pF	$V = 0, f = 1\text{kHz}$

#### Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	$I_{CEO}$	-	-	1	$\mu\text{A}$	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	$BV_{CEO}$	40	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	$BV_{ECO}$	7	-	-	V	$I_E = 0.01\text{mA}$

### Transfer Characteristics ( $T_a=25^\circ\text{C}$ unless specified otherwise)

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	CTR	600	-	7500	%	$I_F = 1\text{mA}, V_{CE} = 2\text{V}$
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.8	1.0	V	$I_F = 20\text{mA}, I_C = 5\text{mA}$
Isolation resistance	$R_{IO}$	$5 \times 10^{10}$	-	-	$\Omega$	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$
Floating capacitance	$C_{IO}$	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$
Cut-off frequency	$f_c$	-	6	-	kHz	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$
Rise time	$t_r$	-	60	300	$\mu\text{s}$	$V_{CE} = 2\text{V}, I_C = 10\text{mA},$ $R_L = 100\Omega$
Fall time	$t_f$	-	53	250	$\mu\text{s}$	

\* Typical values at  $T_a = 25^\circ\text{C}$

# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL825 Series

### Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

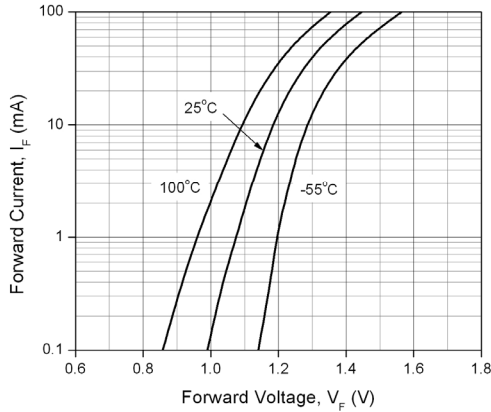


Figure 2. Current Transfer Ratio vs. Ambient Temperature

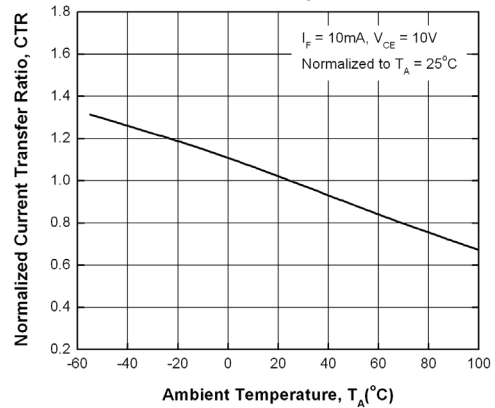


Figure 3. Normalized Current Transfer Ratio vs Forward Current

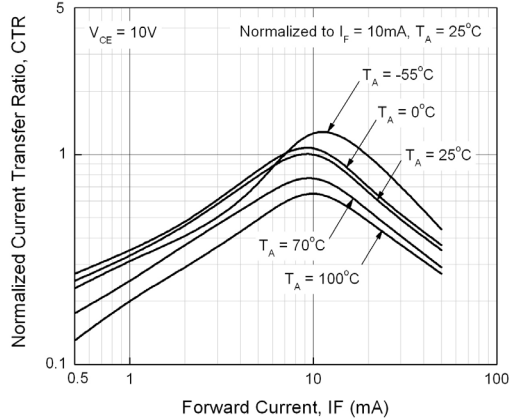


Figure 4. Collector Dark Current vs Ambient Temperature

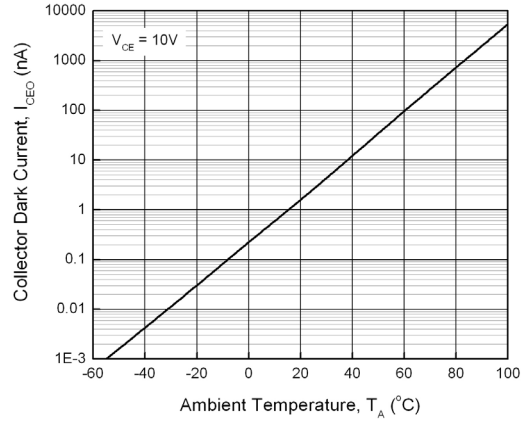


Figure 5. Turn-on Time vs Forward Current

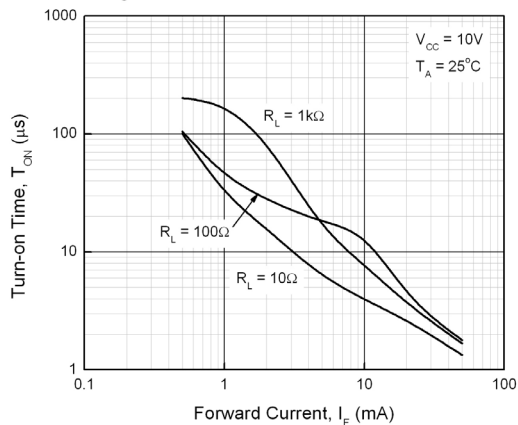
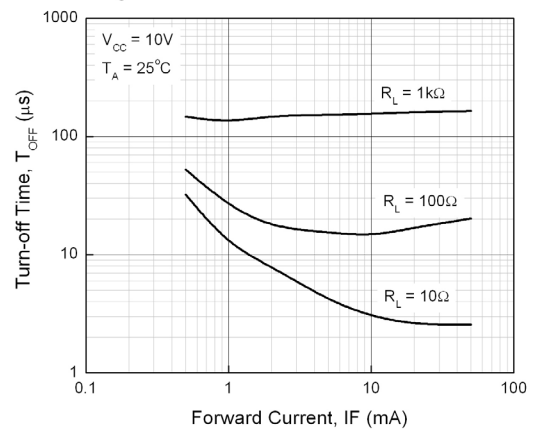
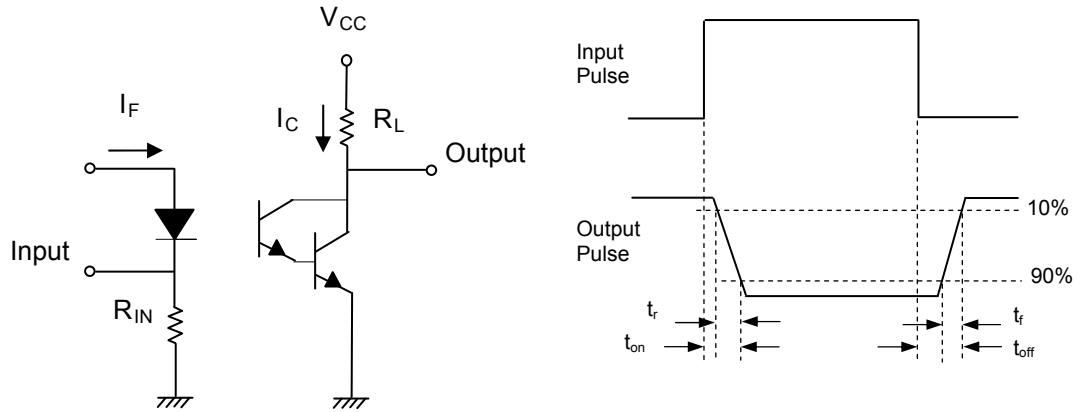


Figure 6. Turn-off Time vs Forward Current



# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL825 Series**



**Figure 7. Switching Time Test Circuit & Waveforms**



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# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL825 Series

### Order Information

#### Part Number

# EL825(X)(Z)-V

#### Note

- X = Lead form option (S, S1, M or none)
- Z = Tape and reel option (TA, TB or none).
- V = VDE safety (optional).

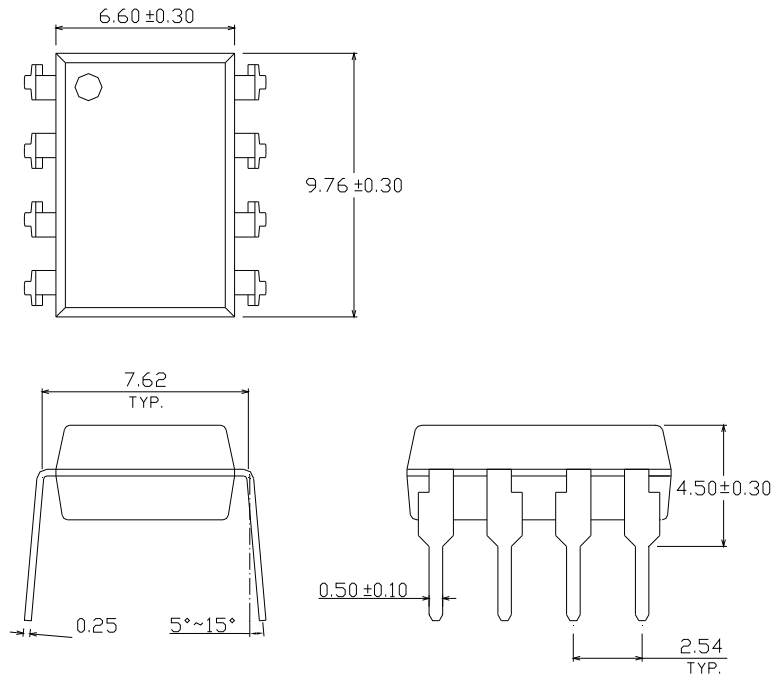
Option	Description	Packing quantity
None	Standard DIP-4	45 units per tube
M	Wide lead bend (0.4 inch spacing)	45 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead 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

# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

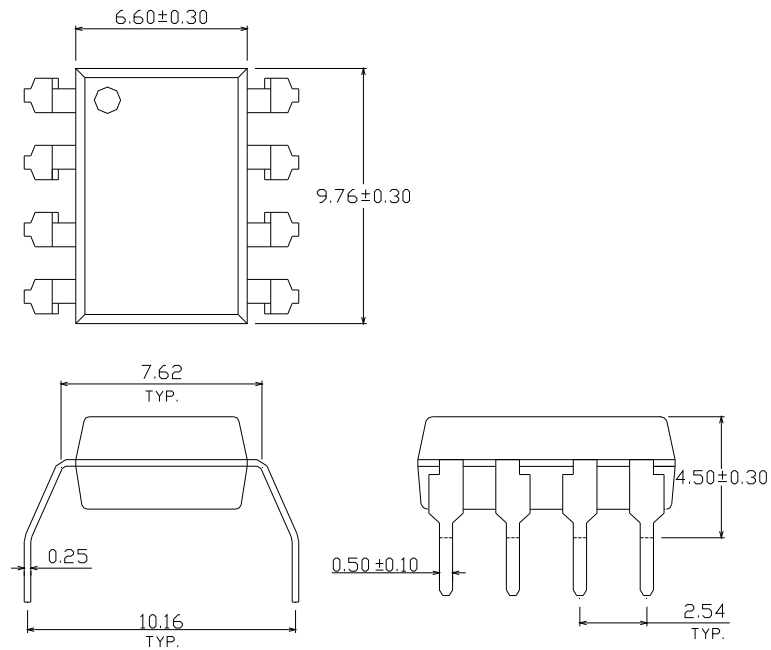
**EL825 Series**

## Package Drawing (Dimensions in mm)

### Standard DIP Type



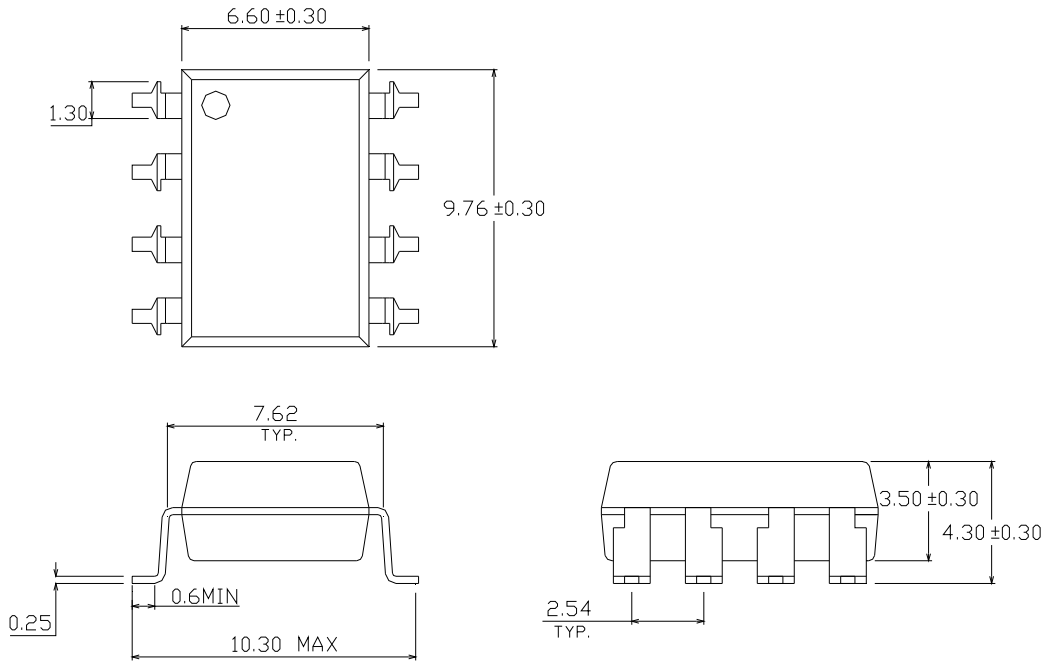
### Option M Type



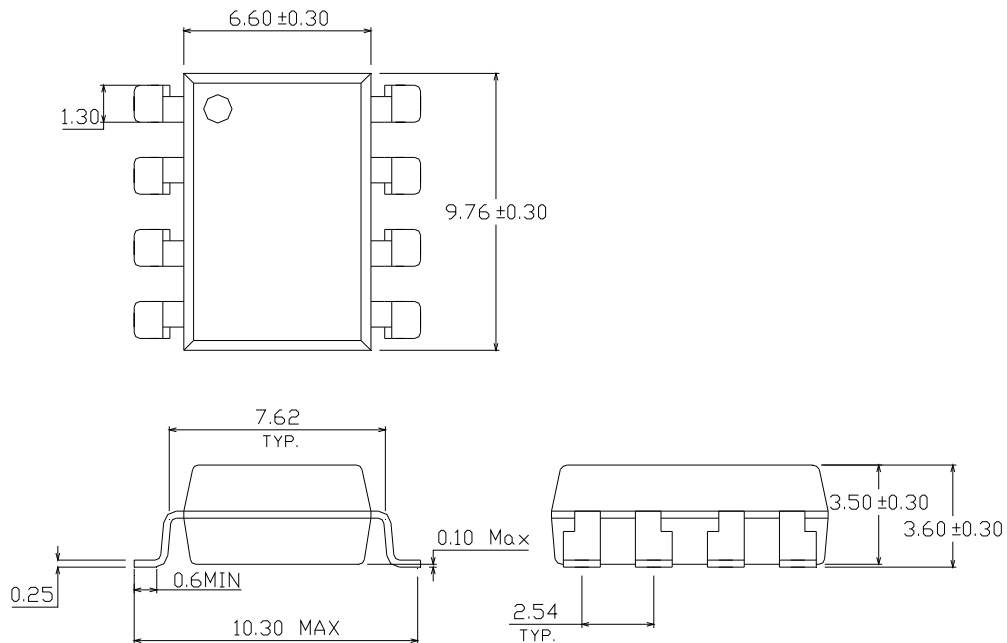
# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL825 Series**

## Option S Type



## Option S1 Type

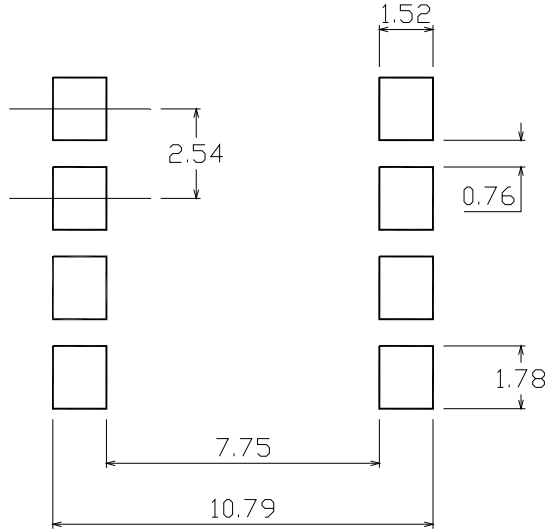




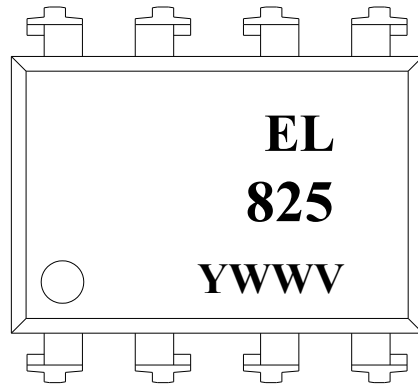
# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL825 Series**

## Recommended pad layout for surface mount leadform



## Device Marking



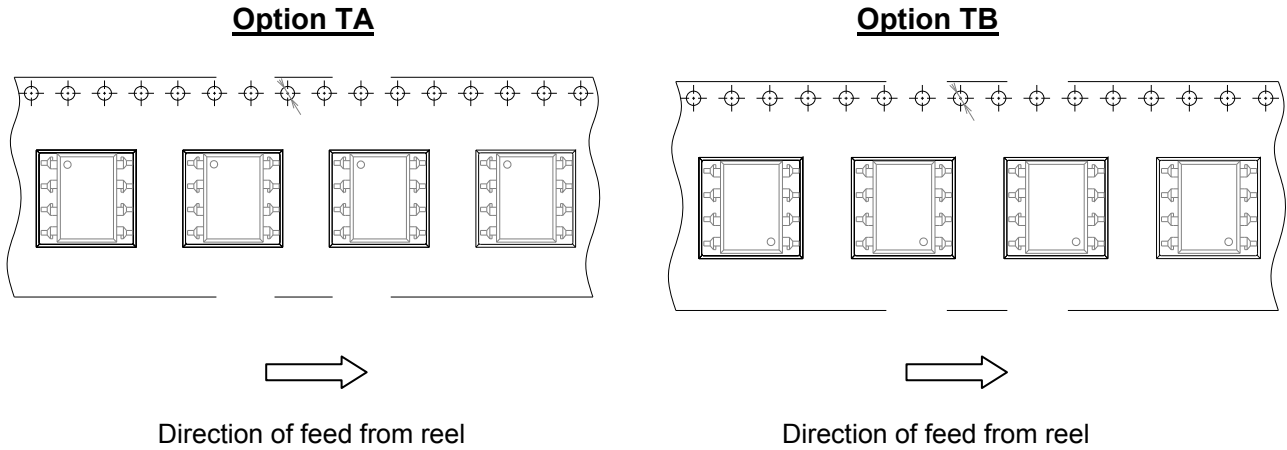
## Notes

- EL denotes EVERLIGHT
- 825 denotes Device Number
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE optional

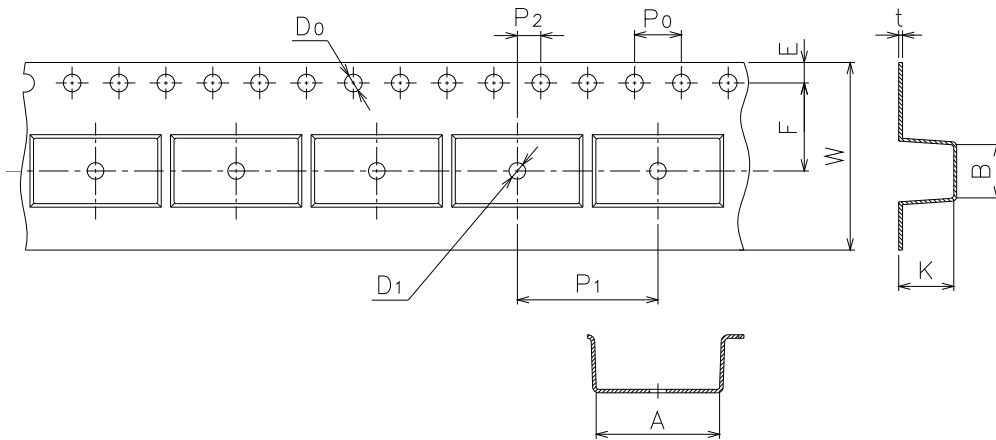
# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL825 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	10.0±0.1	1.5±0.1	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±0.1	12.0±0.1	2.0±0.1	0.4±0.1	16.0+0.3/ -0.1	4.5±0.1

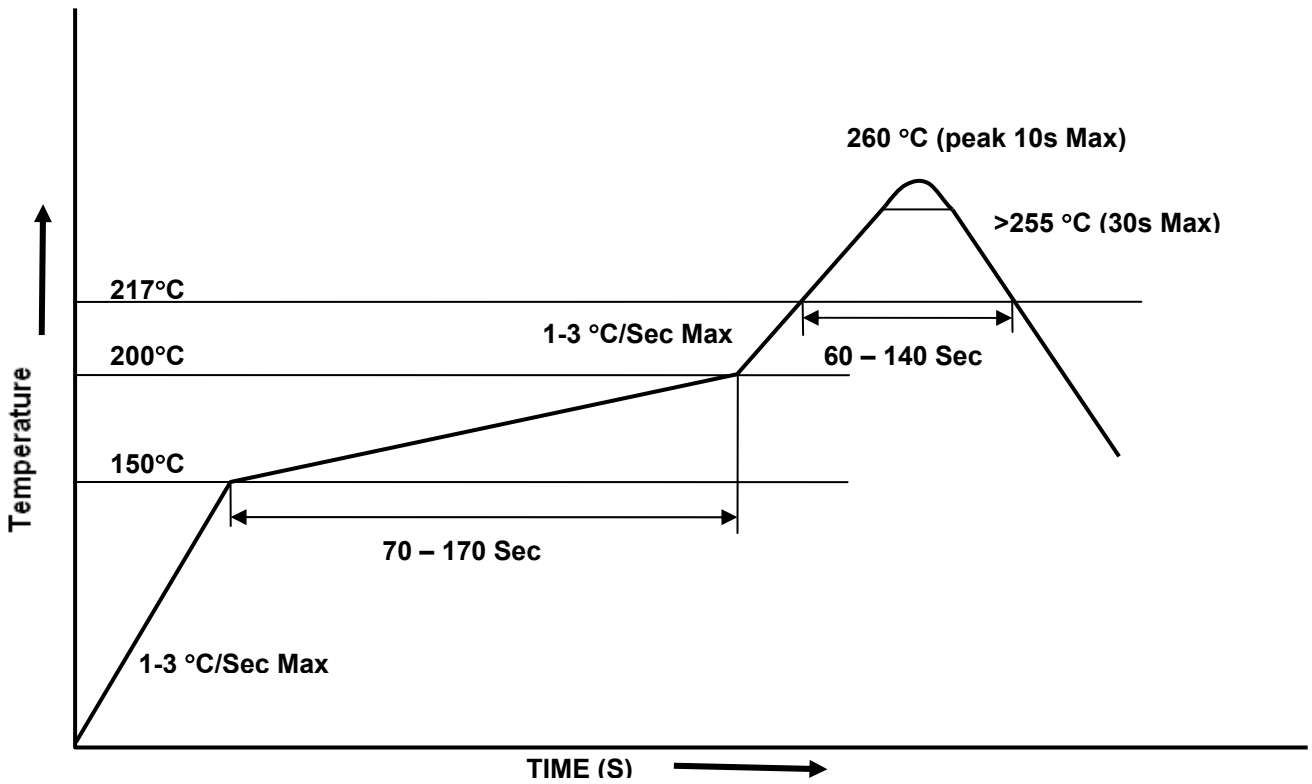


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# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL825 Series

### Solder Reflow Temperature Profile





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## 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL825 Series**

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