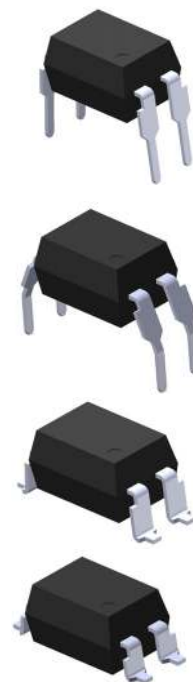


# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL2501-G Series

## Features:

- Halogens free.
- Current transfer ratio  
(CTR: 80~600% at  $I_F = 5\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
- 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 approval
- VDE approval
- SEMKO approval
- NEMKO approval
- DEMKO approval
- FIMKO approval
- CSA approval



## Description

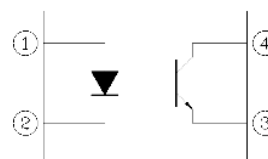
The EL2501-G series of devices each consist of an infrared emitting diodes, optically coupled to a phototransistor detector encapsulated with green compound..

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

## Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as fan heaters, etc.
- Signal transmission between circuits of different potentials and impedances

## Schematic



## Pin Configuration

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



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# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL2501-G Series

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

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	60	mA
	Peak forward current (PW=100us,duty cycle = 1%)	$I_{FP}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation Derating factor ( above $T_a = 100^{\circ}\text{C}$ )	$P_D$	100	mW
	5.8		mW/ $^{\circ}\text{C}$	
Output	Power dissipation Derating factor (above $T_a = 100^{\circ}\text{C}$ )	$P_C$	150	mW
			5.8	mW/ $^{\circ}\text{C}$
	Collector current	$I_C$	50	mA
	Collector-Emitter voltage	$V_{CEO}$	80	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

## EL2501-G 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> = 10mA
Reverse current	I <sub>R</sub>	-	-	5	μA	V <sub>R</sub> = 5V
Input capacitance	C <sub>in</sub>	-	50	250	pF	V = 0, f = 1MHz

#### Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I <sub>CEO</sub>	-	-	100	nA	V <sub>CE</sub> = 80V, 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>	7	-	-	V	I <sub>E</sub> = 0.1mA

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

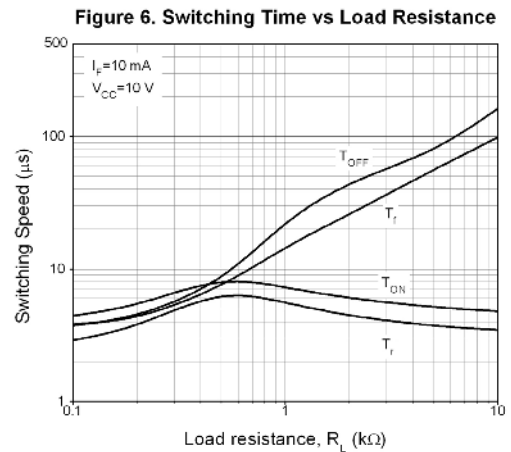
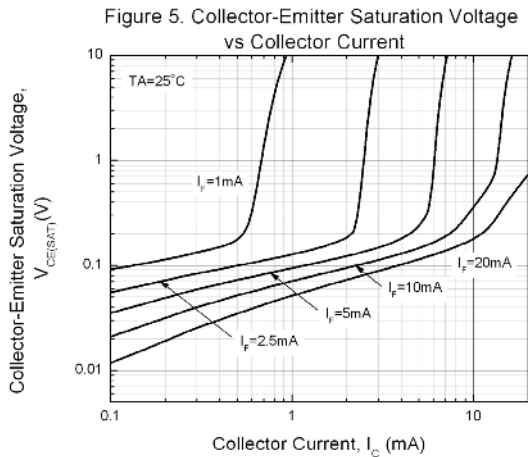
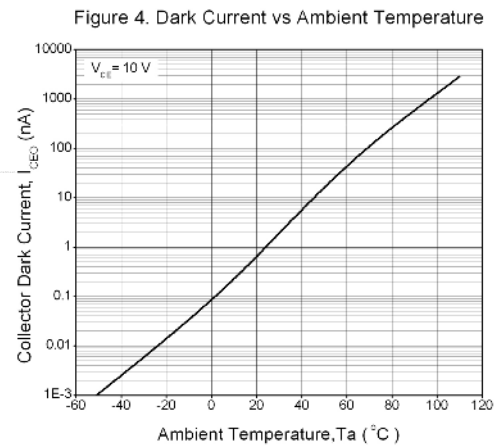
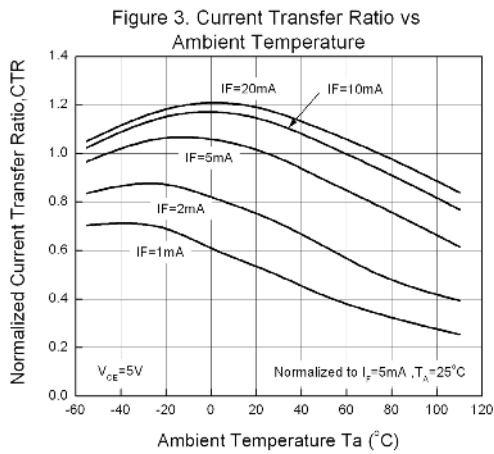
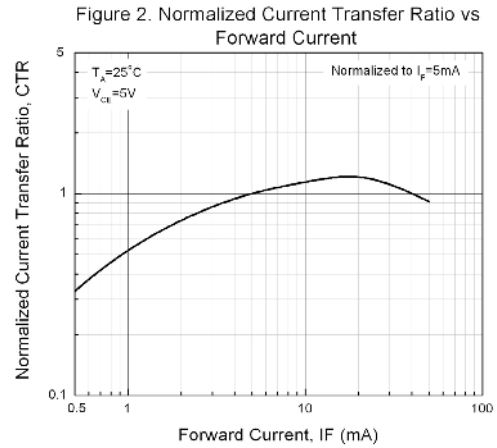
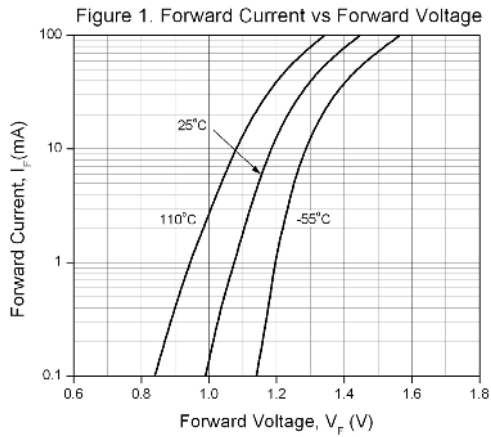
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL2501N	80	-	600	%	I <sub>F</sub> = 5mA, V <sub>CE</sub> = 5V
	EL2501H	80	-	160		
	EL2501W	130	-	260		
	EL2501L	200	-	400		
	EL2501K	300	-	600		
	EL2501Q	100	-	200		
	EL2501D	150	-	300		
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	-	0.1	0.3	V	I <sub>F</sub> = 10mA, I <sub>C</sub> = 2mA
Isolation resistance	R <sub>IO</sub>	10 <sup>11</sup>	-	-	Ω	V <sub>IO</sub> = 1K Vdc, 40~60% R.H.
Floating capacitance	C <sub>IO</sub>	-	0.6	1.0	pF	V <sub>IO</sub> = 0, f = 1MHz
Cut-off frequency	f <sub>c</sub>	-	80	-	kHz	V <sub>CE</sub> = 5V, I <sub>C</sub> = 2mA R <sub>L</sub> = 100Ω, -3dB
Rise time	t <sub>r</sub>	-	3	18	μs	V <sub>CC</sub> = 10V, I <sub>C</sub> = 2mA, R <sub>L</sub> = 100Ω
Fall time	t <sub>f</sub>	-	5	18	μs	

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

# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

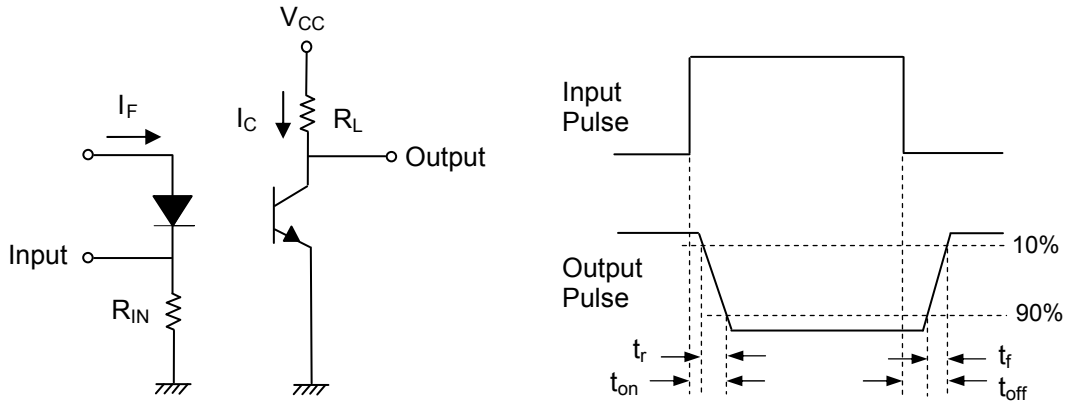
## EL2501-G Series

### Typical Performance Curves



**4 PIN DIP PHOTOTRANSISTOR  
PHOTOCOUPLER**

**EL2501-G Series**



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



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# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL2501-G Series

### Order Information

#### Part Number

# EL2501(X)(Y)(Z)-VG

#### Note

- X = Lead form option (S, S1, S2, M or none)
- Y = CTR Rank (N, H, K, L, W, Q or none)
- Z = Tape and reel option (TA, TB, TU, TD or none).
- V = VDE safety (optional).
- G = Halogen free

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
S2 (TA)	Surface mount lead form (Gull-wing) + TA tape & reel option	500 units per reel
S2 (TB)	Surface mount lead form (Gull-wing) + TB tape & reel option	500 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

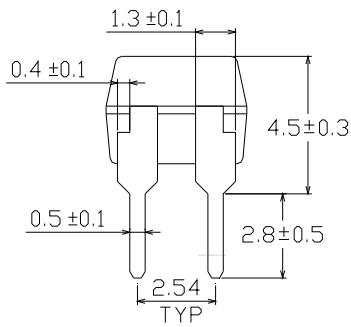
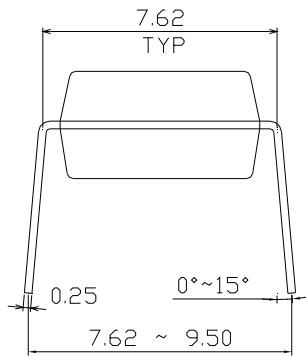
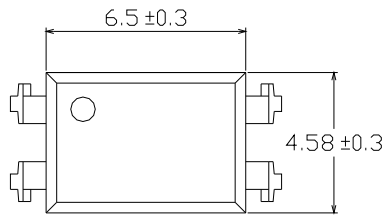
# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL2501-G Series**

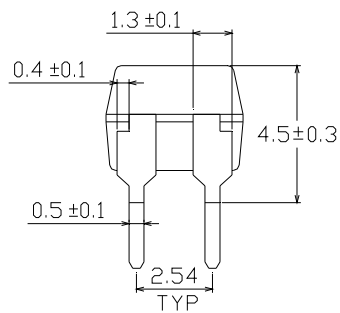
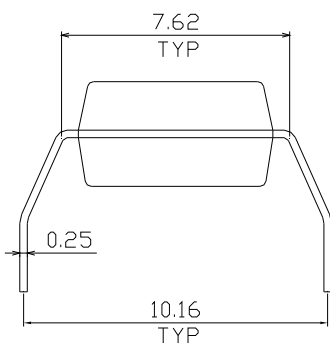
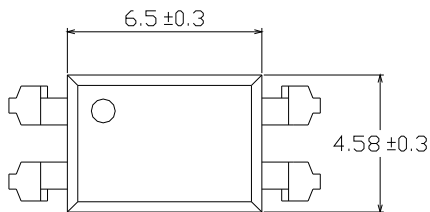
## Package Drawing

(Dimensions in mm)

### Standard DIP Type



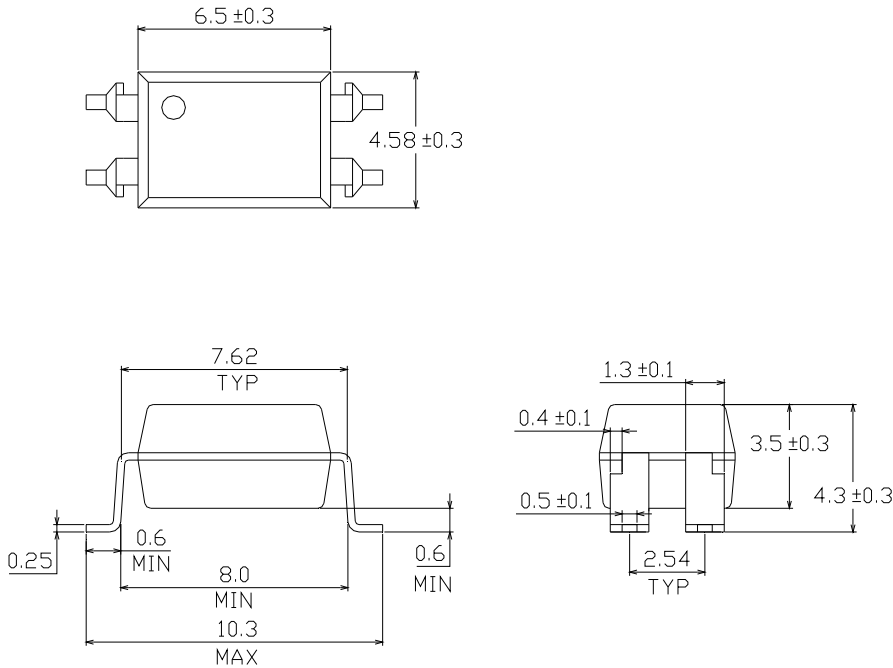
### Option M Type



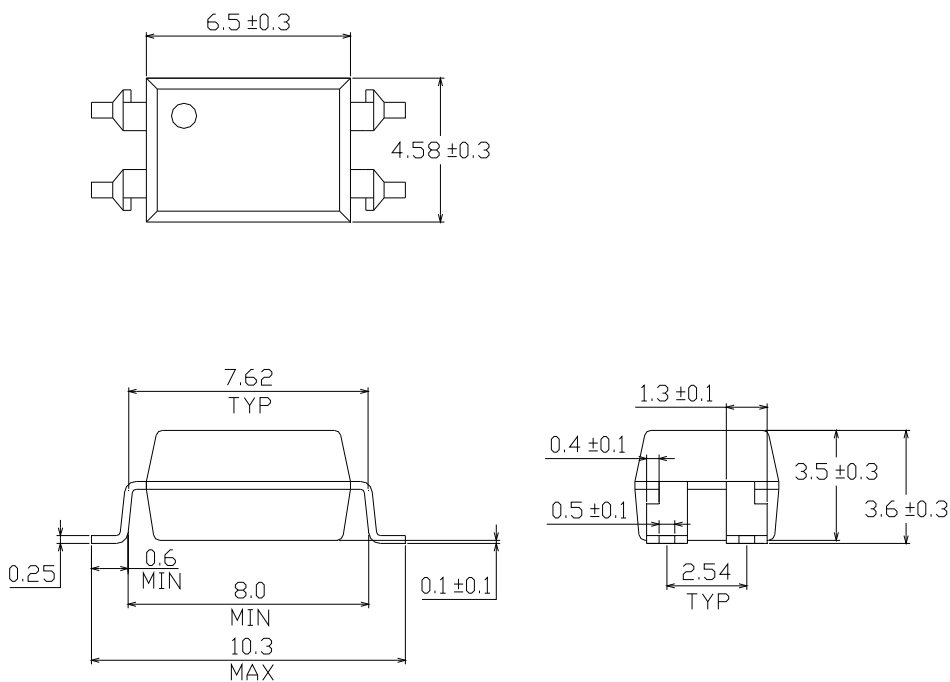
# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL2501-G Series**

## Option S Type



## Option S1 Type

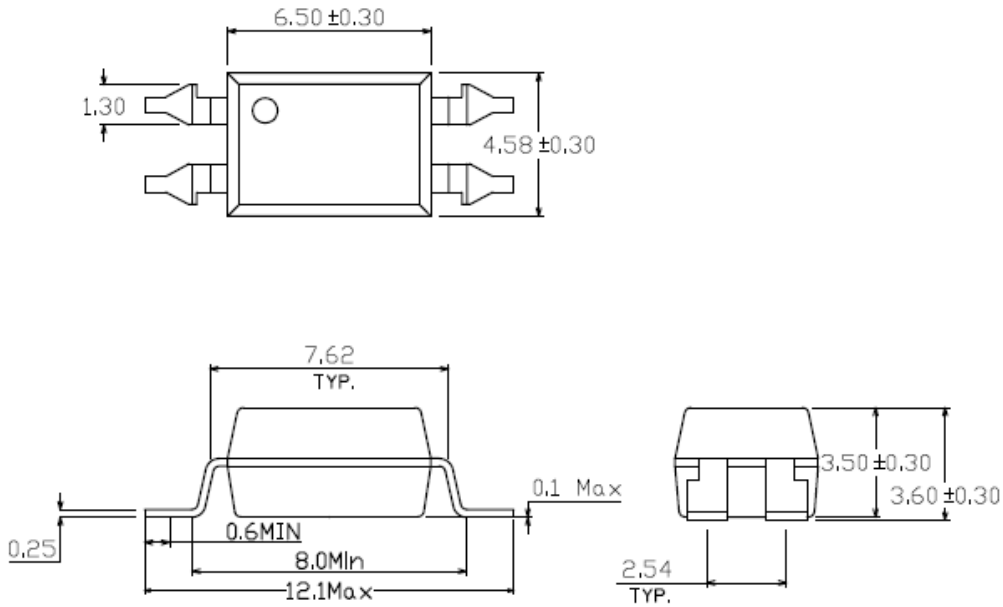




# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL2501-G Series**

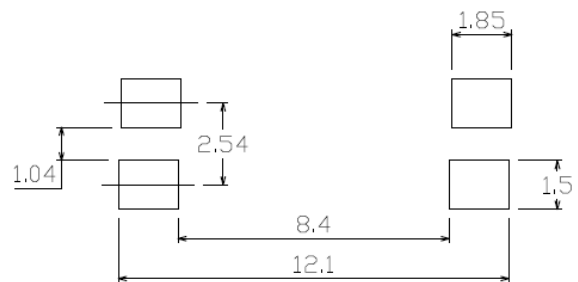
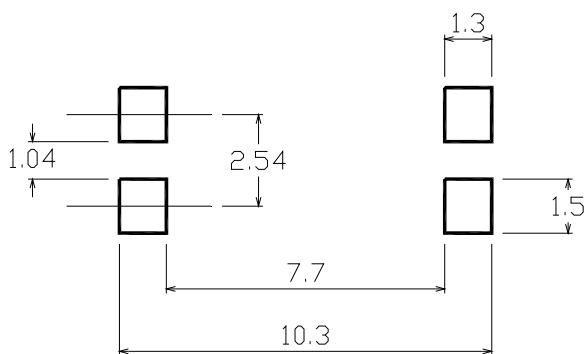
## Option S2 Type



## Recommended pad layout for surface mount leadform

For S and S1 option

For S2 option





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# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL2501-G Series

### Device Marking



### Notes

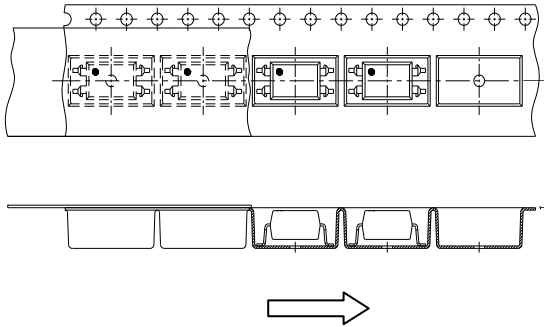
EL	denotes EVERLIGHT
2501	denotes Device Number
F	denotes Factory Code (G: China and Green part)
R	denotes CTR Rank (N, L, K, Q or none)
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## EL2501-G Series

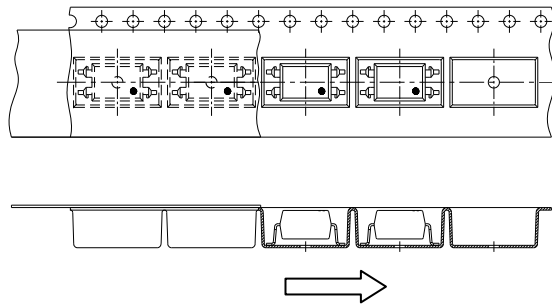
### Tape & Reel Packing Specifications

**Option TA**



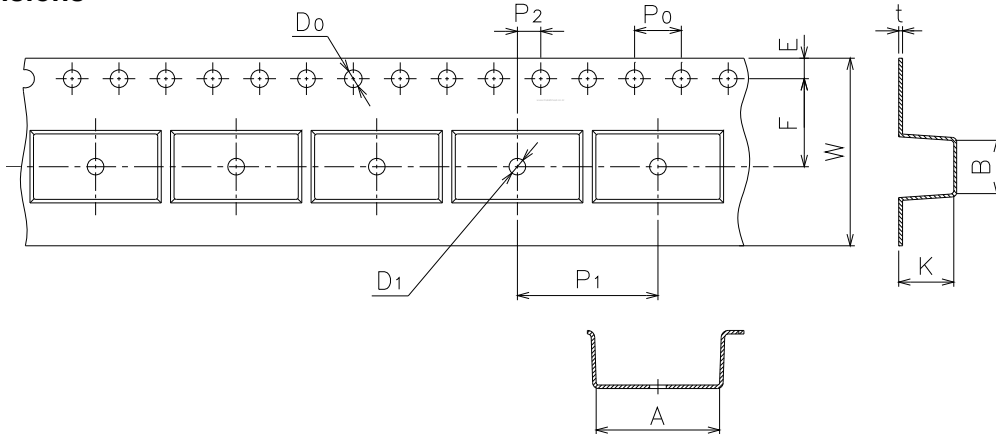
Direction of feed from reel

**Option TB**



Direction of feed from reel

### Tape dimensions

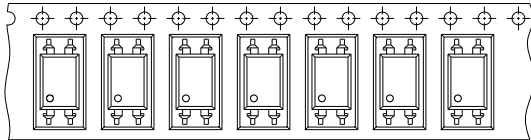


Dimension No.	A	B	Do	D1	E	F
For S2 type						
Dimension(mm)	12.15±0.1	4.65±0.1	1.55±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
For S2 type						
Dimension(mm)	4.0±0.1	16.0±0.1	2.0±0.1	0.35±0.1	16.0+0.3/ -0.1	4.55±0.1
Dimension(mm)	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

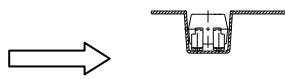
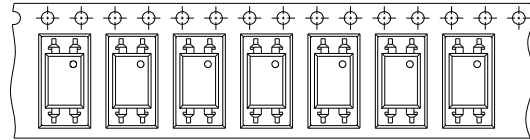
# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL2501-G Series**

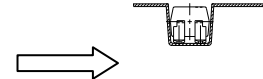
**Option TD**



**Option TU**

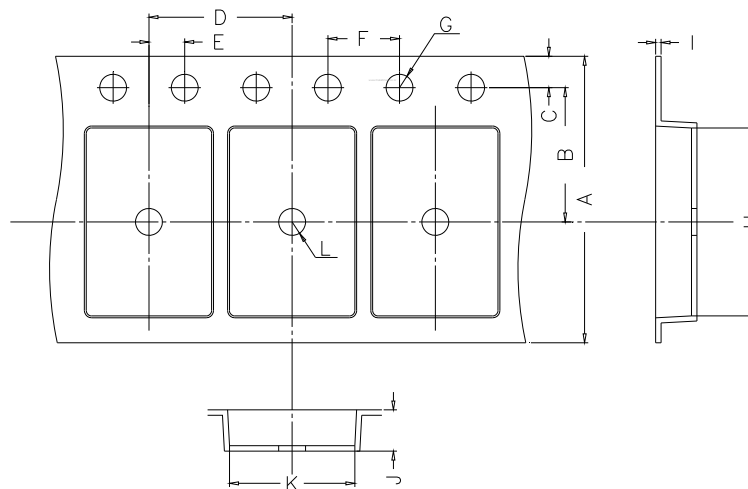


Direction of feed from reel



Direction of feed from reel

## Tape dimensions

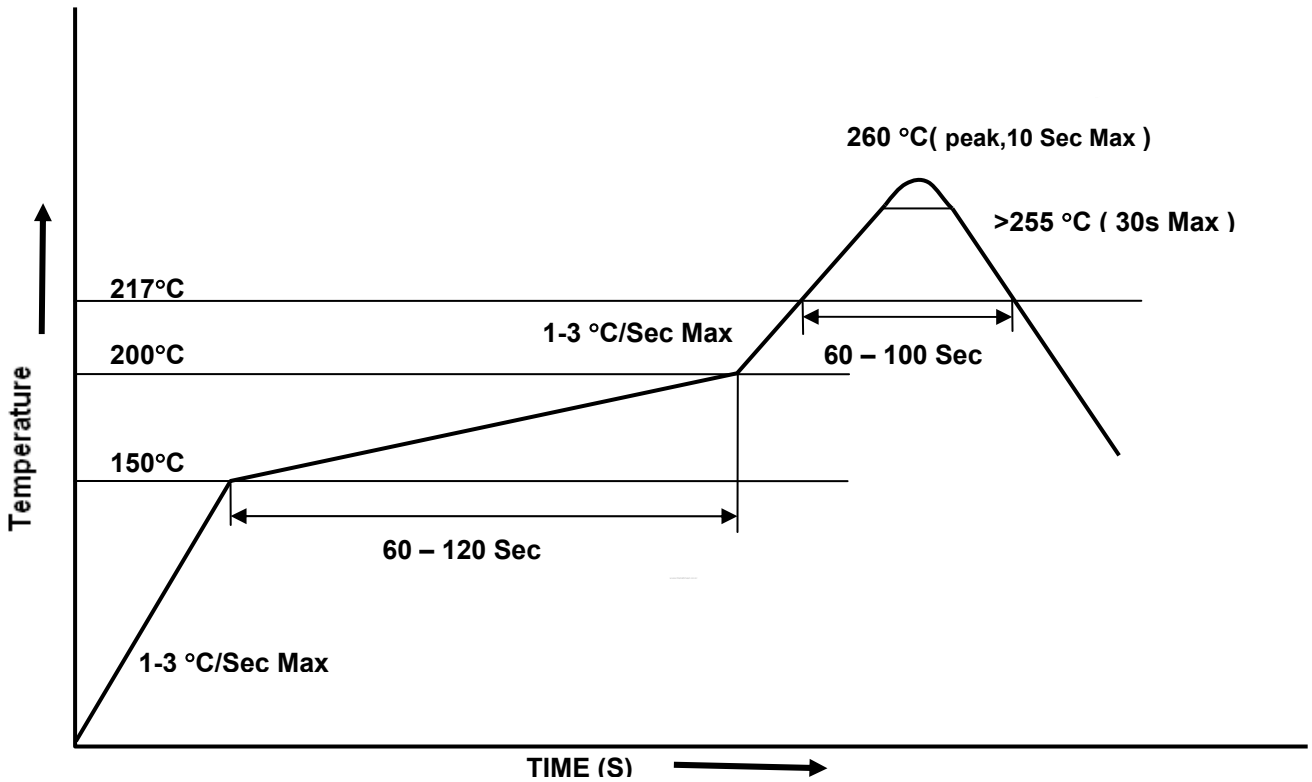


Dimension No.	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
Dimension(mm)	16.00±0.3	7.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1
Dimension No.	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>
Dimension(mm)	1.5±0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	1.5±0.05

# 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL2501-G Series**

## Solder Reflow Temperature Profile





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## 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

**EL2501-G Series**

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