

### **EL814 Series**

#### Features:

- AC input response
- Current transfer ratio (CTR: Min. 20% at I<sub>F</sub> =±1mA, V<sub>CE</sub> =5V)
- High isolation voltage between input and output (Viso=5000 V rms)
- Wide Operating temperature range -55~110°C
- High collector-emitter voltage V<sub>CEO</sub>=80V
- 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.

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#### **Applications**

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

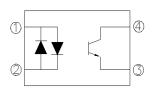








#### Schematic



#### Pin Configuration

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



### **EL814 Series**

#### **Absolute Maximum Ratings (T<sub>a</sub>=25°C)**

	Parameter	Symbol	Rating	Unit
	Forward current	I <sub>F</sub>	±60	mA
Input	Peak forward current (t = 10µs)	I <sub>FM</sub>	1	А
	Power dissipation		100	mW
	Derating factor (above 100 °C)	$P_{D}$	2.9	mW/ºC
	Power dissipation		150	mW
	Derating factor (above 100 °C)	P <sub>C</sub>	5.8	mW/°C
Output	Collector-Emitter voltage	V <sub>CEO</sub>	80	V
	Emitter-Collector voltage	$V_{ECO}$	6	V
Total power dissipation		P <sub>tot</sub>	200	mW
Isolation voltage *1		V <sub>iso</sub>	5000	V rms
Operating temperature		$T_{opr}$	-55~+110	°C
Storage temperature		T <sub>stg</sub>	-55~+125	°C
Soldering temp	Soldering temperature *2		260	°C

#### **Notes**

<sup>\*1</sup> 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.

<sup>\*2</sup> For 10 seconds.



### **EL814 Series**

## Electrical Characteristics ( $T_a$ =25°C unless specified otherwise)

Input

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

**Output** 

- atpat						
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	-	-	٧	I <sub>C</sub> = 0.1mA
Emitter-Collector breakdown voltage	BV <sub>ECO</sub>	6	-	-	٧	I <sub>E</sub> = 0.1mA

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

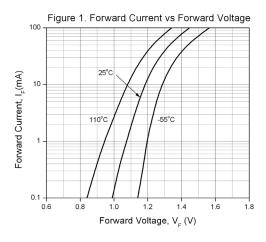
Parameter		Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL814	CTR	20	-	300	%	
	EL814A		50	-	150		$I_F = \pm 1 \text{mA}$ , $V_{CE} = 5 \text{V}$
CTR Symmetry			0.7		1.3		$I_F = \pm 1 \text{mA}$ , $V_{CE} = 5 \text{V}$
Collector-emitter saturation voltage		V <sub>CE(sat)</sub>	-	0.05	0.2	V	$I_F = \pm 20$ mA $I_c = 1$ mA
Isolation resistance		R <sub>IO</sub>	5×10 <sup>10</sup>	10 <sup>11</sup>	-	Ω	$V_{IO} = 500 Vdc,$
Cut-off frequency		f <sub>c</sub>	-	80	-	kHz	$V_{CE}$ =5V, $I_{C}$ =2 mA, $R_{L}$ =100 $\Omega$ , -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	
Fall time		T <sub>f</sub>	-	11	18	μs	$V_{CE}$ =2V, $I_{C}$ =2mA, $R_{L}$ =100 $\Omega$

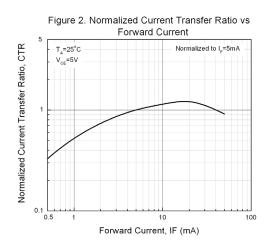
<sup>\*</sup> Typical values at  $T_a = 25$ °C

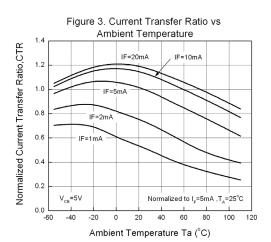


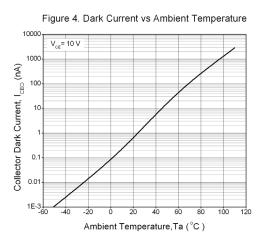
### **EL814 Series**

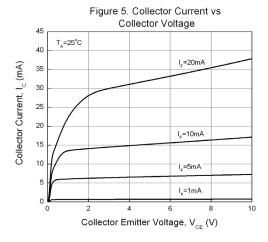
#### **Typical Performance Curves**

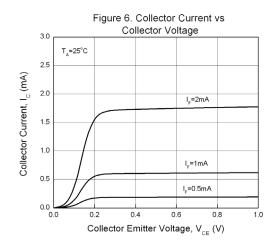














### **EL814 Series**

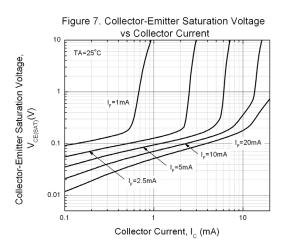


Figure 8. Switching Time vs Load Resistance  $\int_{0}^{500} \int_{T_r=10 \text{ mA}} \int_{0.1}^{T_{cor}=10 \text{ V}} \int_{0.1}^{T_{cor}=10 \text{ V}}$ 

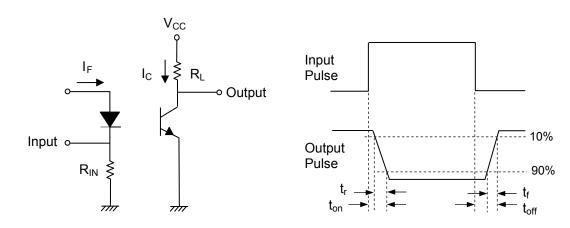


Figure 9. Switching Time Test Circuit & Waveforms



**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
М	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

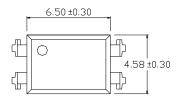


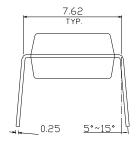
### **EL814 Series**

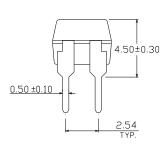
#### **Package Drawings**

(Dimensions in mm)

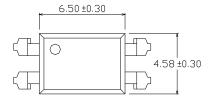
### **Standard DIP Type**

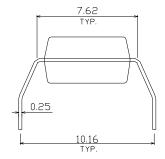


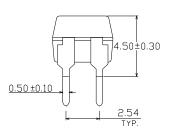




#### **Option M Type**





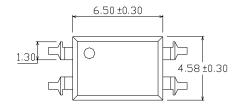


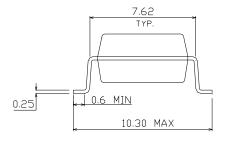
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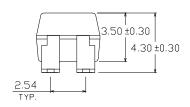


### **EL814 Series**

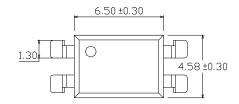
#### **Option S Type**

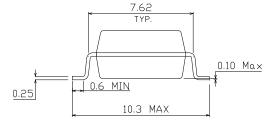


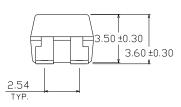




#### **Option S1 Type**



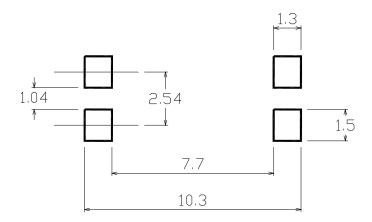




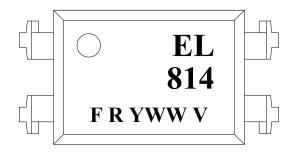


### **EL814 Series**

#### Recommended pad layout for surface mount leadform



### **Device Marking**



#### **Notes**

EL denotes EVERLIGHT 814 denotes Device Number

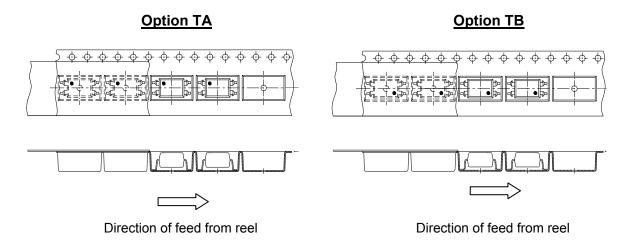
F denotes Factory Code (None: China, T: Taiwan)

R denotes CTR Rank (A or none)
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE (optional)

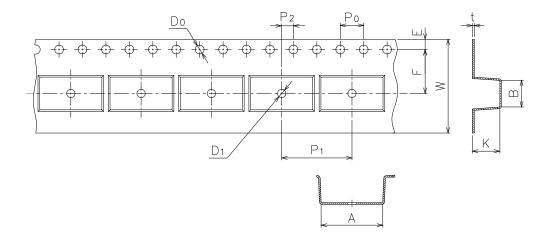


### **EL814 Series**

#### **Tape & Reel Packing Specifications**



#### **Tape dimensions**

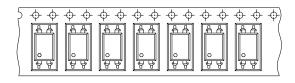


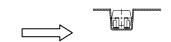
Dimension No.	Α	В	Do	D1	E	F
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	Ро	P1	P2	4	W	<b>V</b>
		FI	FZ	ι	VV	K



### **EL814 Series**

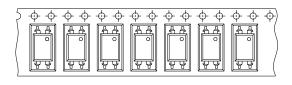
#### **Option TD**





Direction of feed from reel

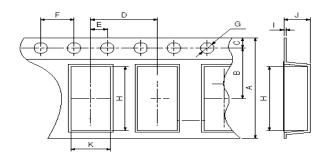
#### **Option TU**





Direction of feed from reel

#### **Tape dimensions**

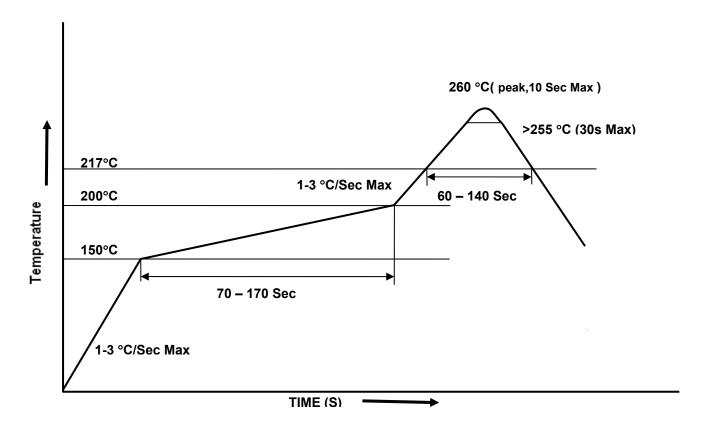


Dimension No.	Α	В	С	D	E	F
Dimension(mm)	16.00±0.3	7.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1
Dimension No.	G	Н	ı	J	К	
Dimension(mm)	1.5+0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	



### **EL814 Series**

#### **Solder Reflow Temperature Profile**





**EL814 Series** 

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