



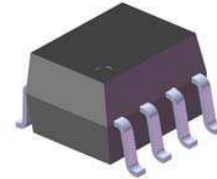
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# 8 PIN SOP PHOTOTRANSISTOR PHOTOCOUPLER

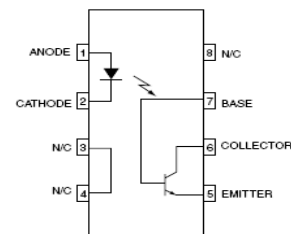
## EL20X / 21X series

### Features

- Current transfer ratios in offered in narrow ranges  
 EL205: 40-80%  
 EL206: 63-125%  
 EL207: 100-200%  
 EL208: 160-320%  
 EL211: >20%  
 EL212: >50%  
 EL213: >100%
- High isolation voltage between input and output  
 Viso = 3750 Vrms
- Operating temperature range of -55 to +110°C
- High BVceo of 80V
- Standard SO-8 footprint package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approval (pending)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved (No. 2007189)



### Schematic



1. Anode
2. Cathode
3. No Connection
4. No Connection
5. Emitter
6. Collector
7. Base
8. No Connection

### Description

The EL20X and EL21X series contain an infrared emitting diode optically coupled to a phototransistor detector.

The devices are packaged in an 8-pin small outline package which conforms to the standard SO-8 footprint.

### Applications

- Feedback Control Circuits
- Interfacing and coupling systems of different potentials and impedances
- General Purpose Switching Circuits
- Monitor and Detection Circuits



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EL20X / 21X series

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

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	60	mA
	Peak forward current (t = 10 $\mu$ s)	$I_{FM}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation No Derating needed	$P_D$	70	mW
Output	Collector power dissipation No derating needed	$P_C$	150	mW
	Collector-Emitter voltage	$V_{CEO}$	80	V
	Collector-Base voltage	$V_{CBO}$	80	V
	Emitter-Collector voltage	$V_{ECO}$	7	V
Total power dissipation		$P_{tot}$	240	mW
Isolation voltage <sup>*1</sup>		$V_{iso}$	3750	V <sub>rms</sub>
Operating temperature		$T_{opr}$	-55~+110	°C
Storage temperature		$T_{stg}$	-55~+150	°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 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

\*2 For 10 seconds.



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# 8 PIN SOP PHOTOTRANSISTOR PHOTOCOUPLER

EL20X / 21X series

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

### Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	$V_F$	-	1.3	1.5	V	$I_F = 10\text{mA}$
Reverse current	$I_R$	-	0.1	100	$\mu\text{A}$	$V_R = 6\text{V}$
Input capacitance	$C_{in}$	-	13	-	pF	$V = 0, f = 1\text{MHz}$

### Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	$I_{CEO}$	-	5.0	50	nA	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	$BV_{CEO}$	80	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	$BV_{ECO}$	7	-	-	V	$I_E = 0.1\text{mA}$
Collector-Emitter capacitance	$C_{CE}$	-	8	-	pF	$V_{CE} = 0\text{V}, f = 1\text{MHz}$

### Transfer Characteristics

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer Ratio	EL205	40	-	80	%	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$
	EL206	63	-	125		
	EL207	100	-	200		
	EL208	160	-	320		
	EL211	20	-	-		
	EL212	50	-	-		
	EL213	100	-	-		
Current Transfer Ratio	EL205	13	25	-	%	$I_F = 1\text{mA}, V_{CE} = 5\text{V}$
	EL206	22	40	-		
	EL207	34	60	-		
	EL208	56	95	-		
	EL215	20	50	-		
	EL216	50	80	-		
	EL217	100	130	-		
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_F = 10\text{mA}, I_C = 2\text{mA}$
Isolation resistance	$R_{IO}$	-	$10^{11}$	-	$\Omega$	$V_{IO} = 500\text{Vdc}$
Input-output capacitance	$C_{IO}$	-	0.5	-	pF	$V_{IO} = 0, f = 1\text{MHz}$



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EL20X / 21X series

### Transfer Characteristics ( Continue )

Turn-on time	$T_{on}$	-	3.0	-	$\mu s$	$V_{CC} = 10V,$ $I_C = 2mA, R_L = 100\Omega$
Turn-off time	$T_{off}$	-	3.0	-		
Rise time	$T_r$	-	1.6	-		
Fall time	$T_f$	-	2.2	-		

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

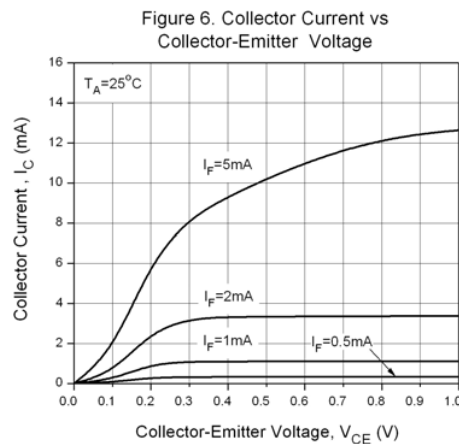
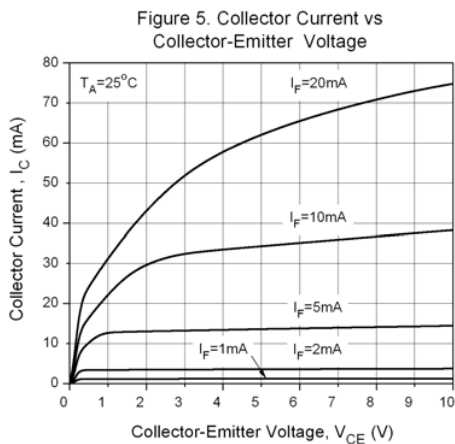
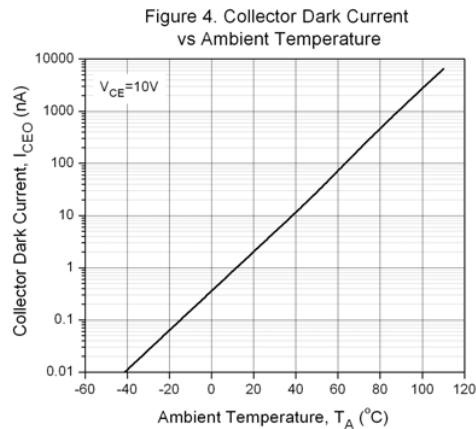
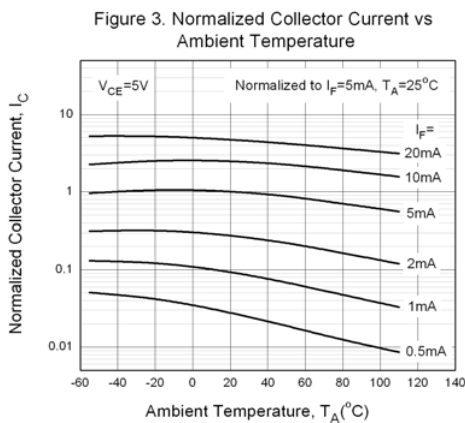
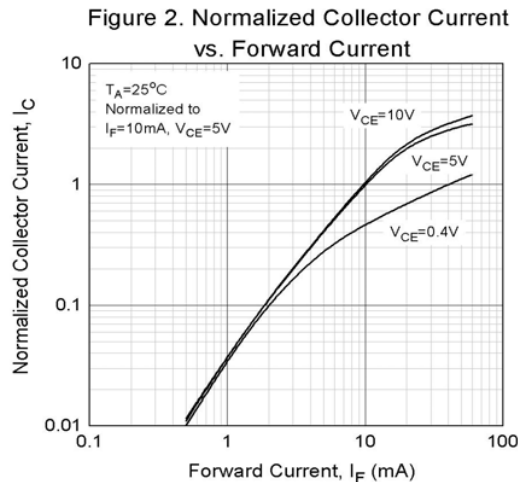
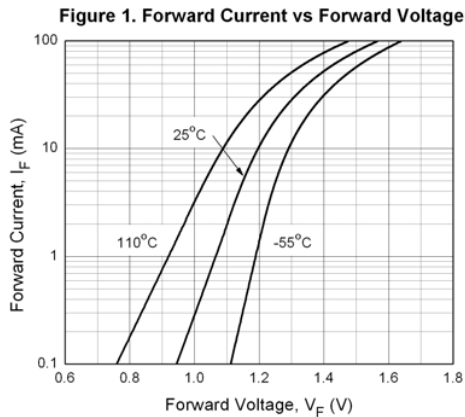


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## EL20X / 21X series

### Typical Performance Curves



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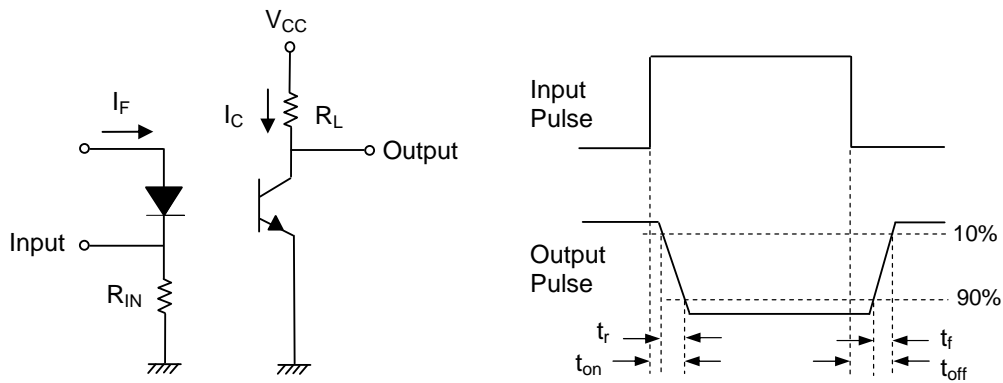
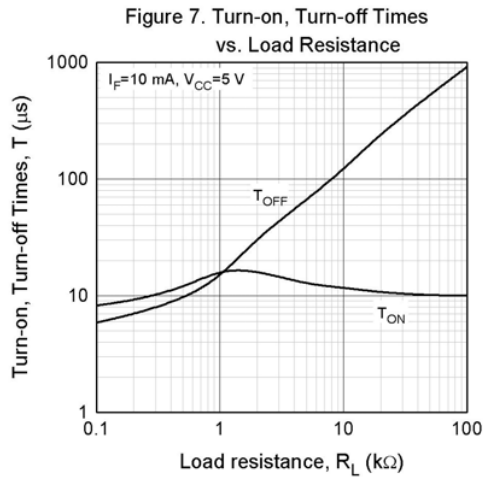


Figure 8. Switching Time Test Circuit & Waveforms



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### Order Information

#### Part Number

# EL2XX(Y)

#### Note

XX = Part no. (05, 06, 07, 08, 11, 12, 13, 15, 16 or 17)

Y = Tape and reel option (TA, TB or none).

Option	Description	Packing quantity
None	Standard	100 units per tube
(TA)	TA tape & reel option	2000 units per reel
(TB)	TB tape & reel option	2000 units per reel

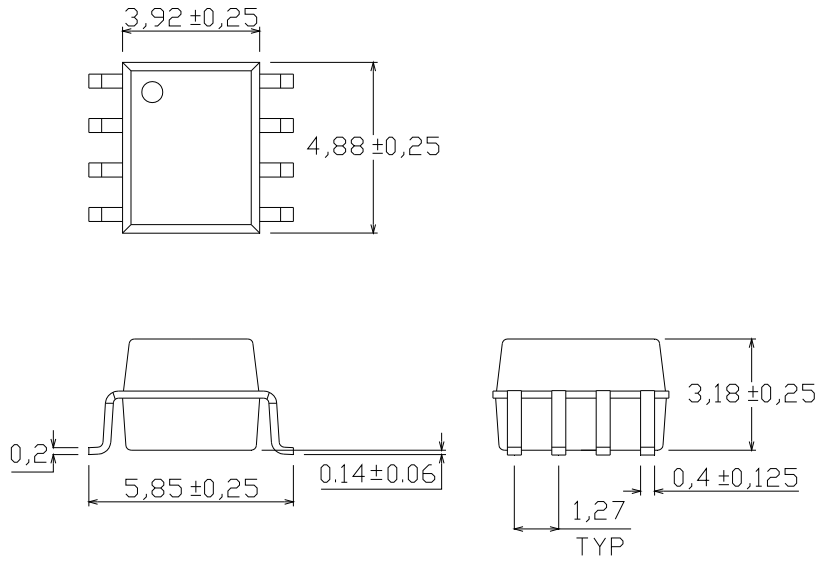


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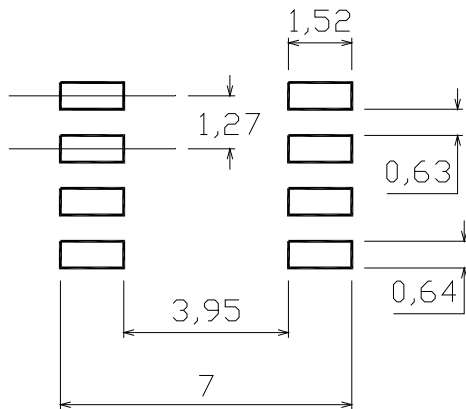
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### Package Drawings (Dimensions in mm)



### Recommended pad layout for surface mount leadfrom





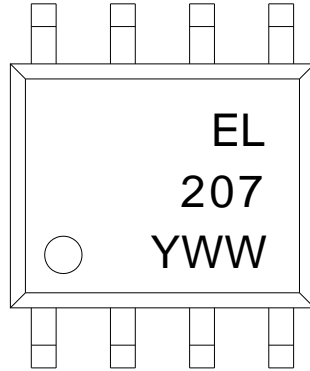


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## Device Marking



## Notes

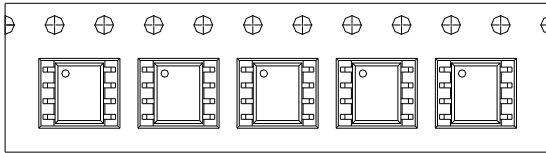
EL denotes Everlight  
207 denotes Part Number  
Y denotes 1 digit Year code  
WW denotes 2 digit Week code

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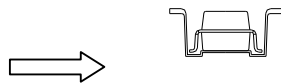
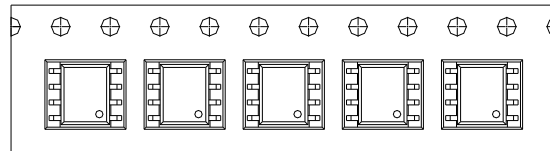
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## Tape & Reel Packing Specifications

**Option TA**



**Option TB**

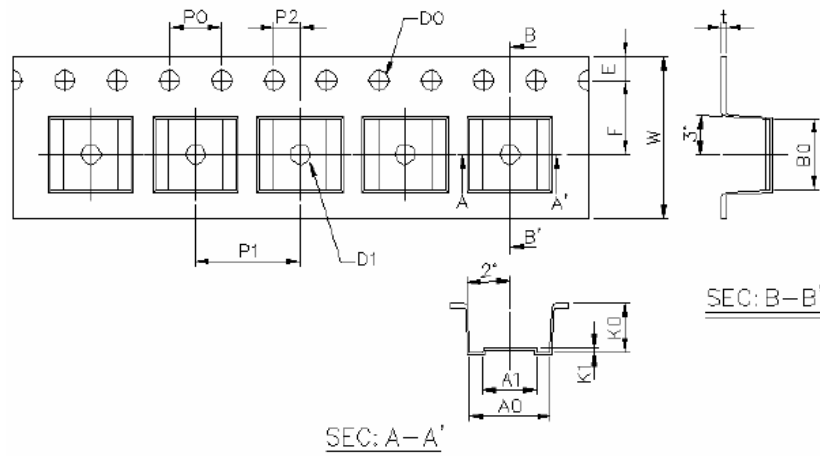


Direction of feed from reel



Direction of feed from reel

## Tape dimensions



Dimension No.	<b>A0</b>	<b>A1</b>	<b>B0</b>	<b>D0</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension(mm)	6.2±0.1	4.1±0.1	5.28±0.1	1.5±0.1	1.5±0.3	1.75±0.1	5.5±0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K0</b>	<b>K1</b>
Dimension(mm)	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	12.0+0.3/ -0.1	3.7±0.1	0.3±0.1

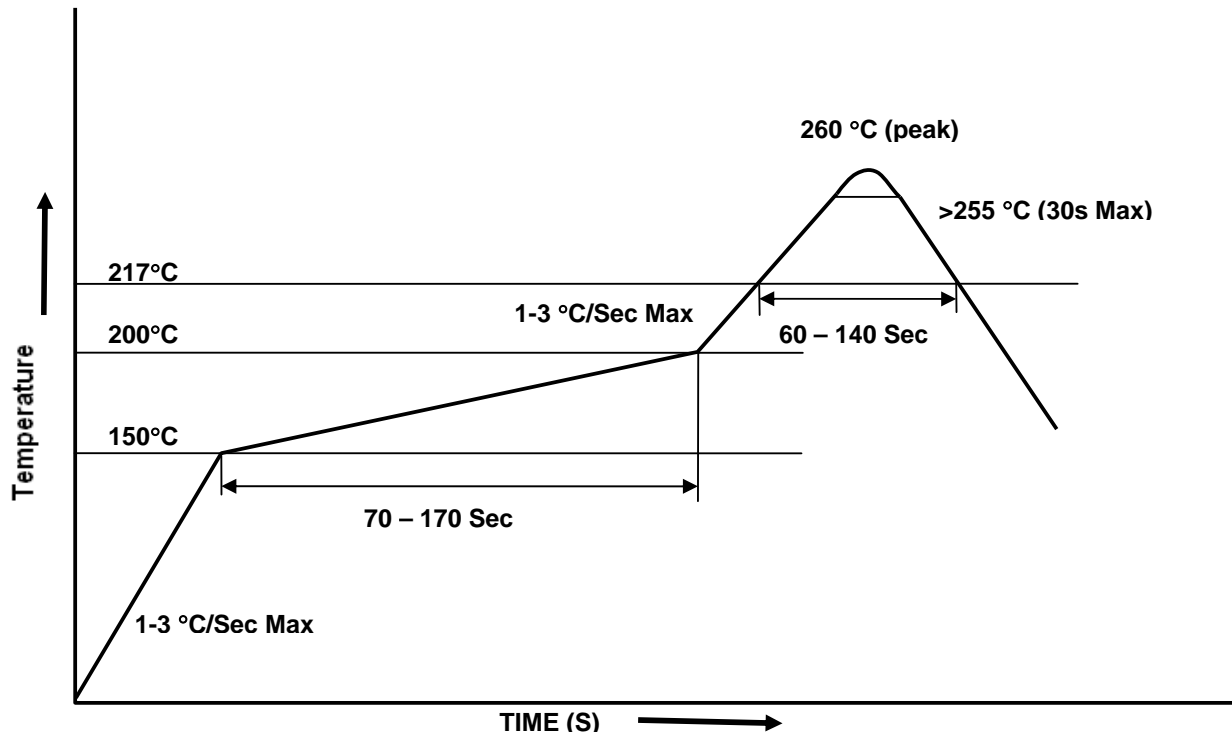


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## Solder Reflow Temperature Profile





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