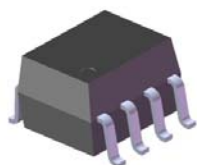


8 PIN SOP PHOTOTRANSISTOR PHOTOCOUPLER EL20X Series EL21X Series



Features:

- Halogens free.(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- Current transfer ratios offered in narrow ranges

EL205: 40-80%	EL211: >20%
EL206: 63-125%	EL212: >50%
EL207: 100-200%	EL213: >100%
EL208: 160-320%	
- 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
- Compliance with EU REACH
- Pb free and RoHS compliant
- UL and cUL approved(No. E214129)
- VDE approval (pending)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved

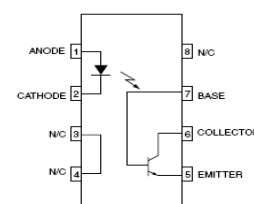
Description

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

Schematic



Pin Configuration

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

Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Peak forward current (t = 10μs)	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation No derating needed	P_D	90	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* ¹		V_{ISO}	3750	V rms
Operating Temperature		T_{OPR}	-55 to 110	°C
Storage Temperature		T_{STG}	-55 to 125	°C
Soldering Temperature* ²		T_{SOL}	260	°C

Notes:

*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2, 3 & 4 are shorted together, and pins 5, 6, 7 & 8 are shorted together.

*2 For 10 seconds

Electro-Optical Characteristics (Ta=25°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	μA	$V_R = 6\text{V}$
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	-		

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

Transfer Characteristics

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_F = 10mA, I_C = 2mA$
Isolation resistance	R_{IO}	-	10^{11}	-	Ω	$V_{IO} = 500Vdc$
Input-output capacitance	C_{IO}	-	0.5	-	pF	$V_{IO} = 0, f = 1MHz$
Turn-on time	T_{on}	-	3.0	-	μs	$V_{CC} = 10V,$ $I_C = 2mA, R_L = 100\Omega$
Turn-off time	T_{off}	-	3.0	-		
Rise time	T_r	-	1.6	-		
Fall time	T_f	-	2.2	-		

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

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs Forward Voltage

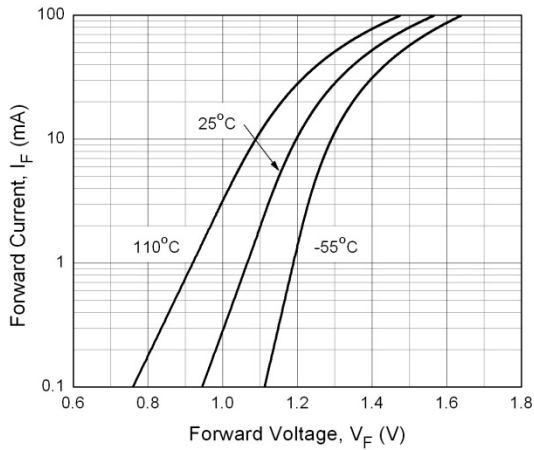


Figure 2. Normalized Collector Current vs. Forward Current

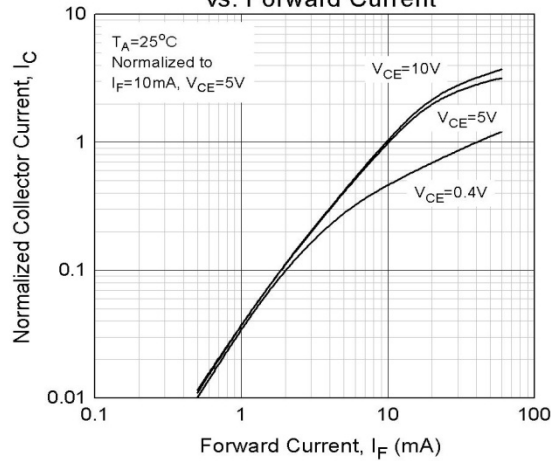


Figure 3. Normalized Collector Current vs Ambient Temperature

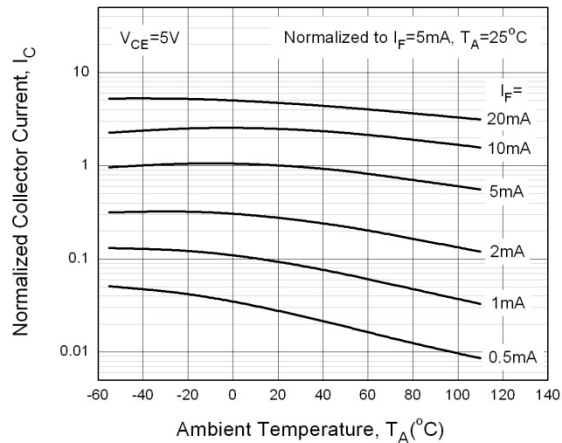


Figure 4. Collector Dark Current vs Ambient Temperature

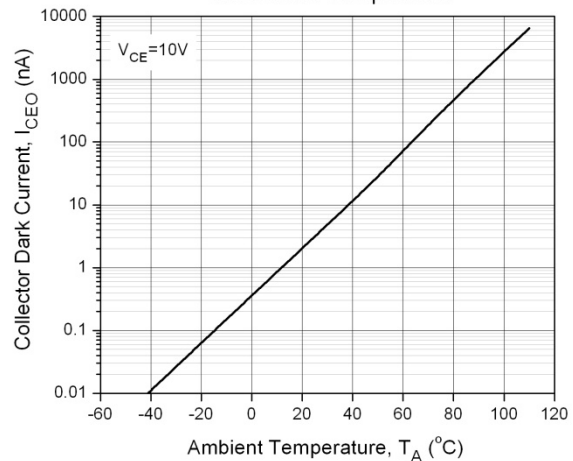


Figure 5. Collector Current vs Collector-Emitter Voltage

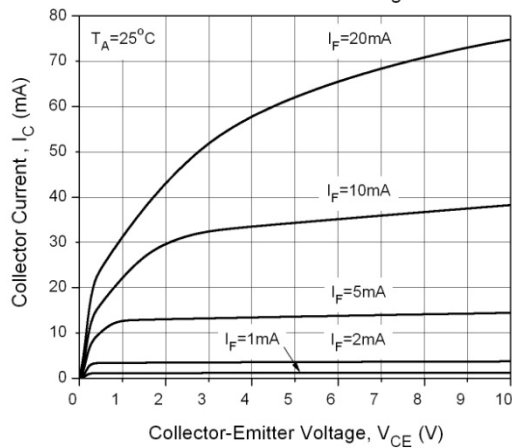
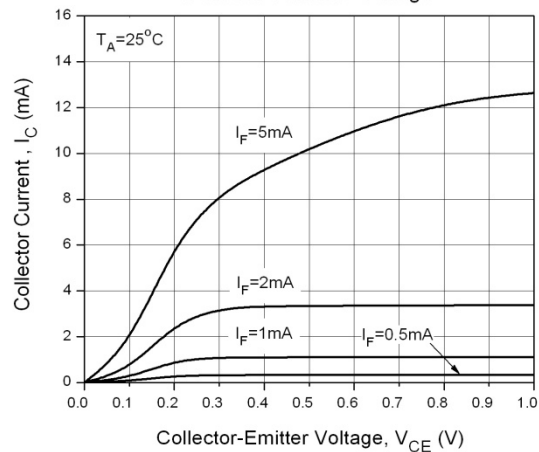


Figure 6. Collector Current vs Collector-Emitter Voltage



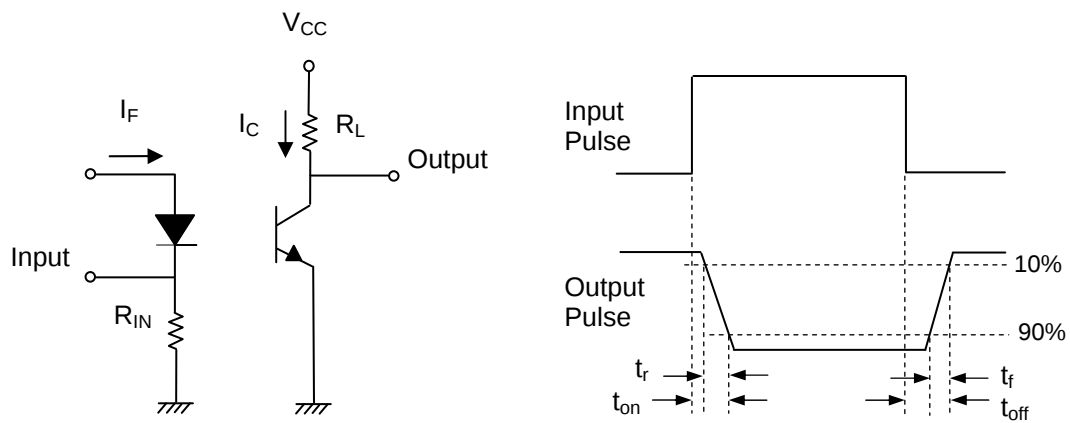
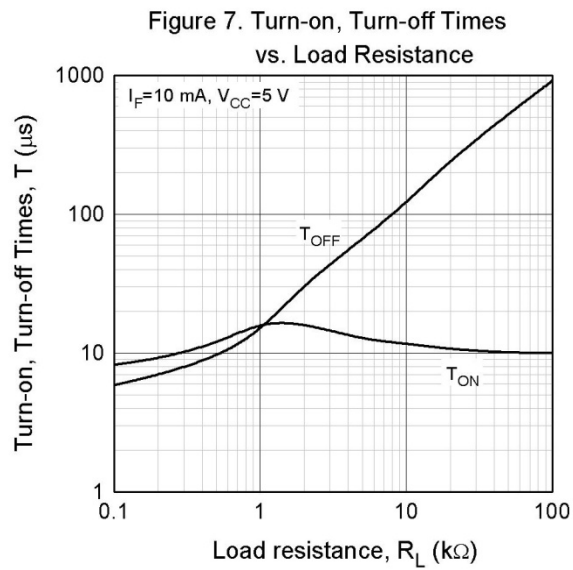


Figure 8. Switching Time Test Circuit & Waveforms

Order Information

Part Number

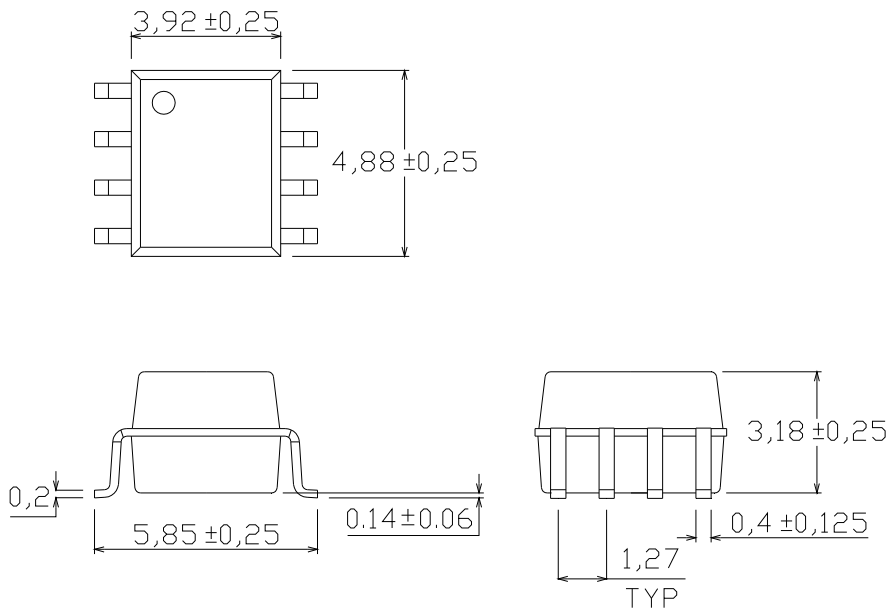
EL2XX(Y)-V

Note

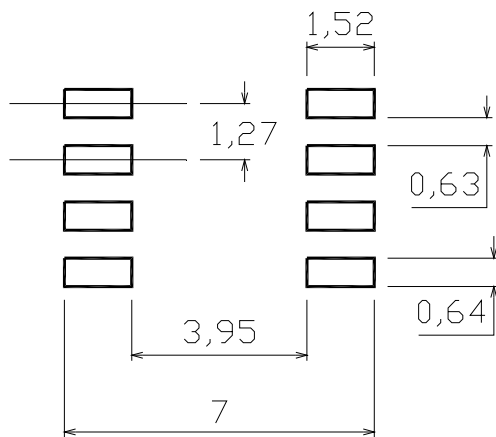
XX = Part no. (05, 06, 07, 08, 11, 12, 13, 15, 16 or 17)
Y = Tape and reel option (TA, TB or none).
V = VDE safety (Optional)

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

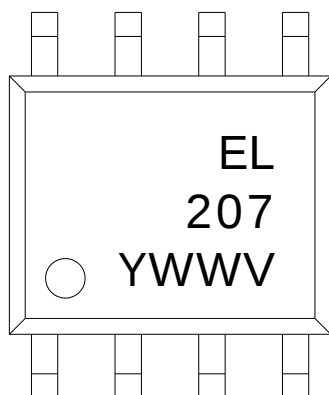
Package Dimension (Dimensions in mm)



Recommended pad layout for surface mount leadform



Device Marking

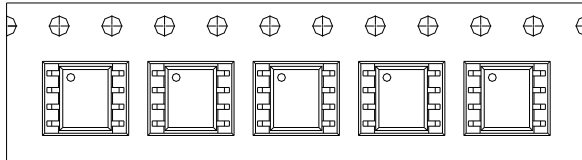


Notes

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

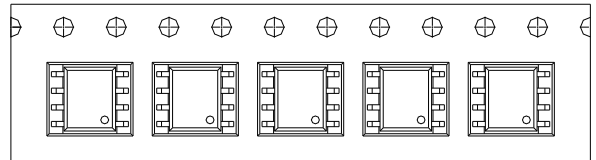
Tape & Reel Packing Specifications

Option TA



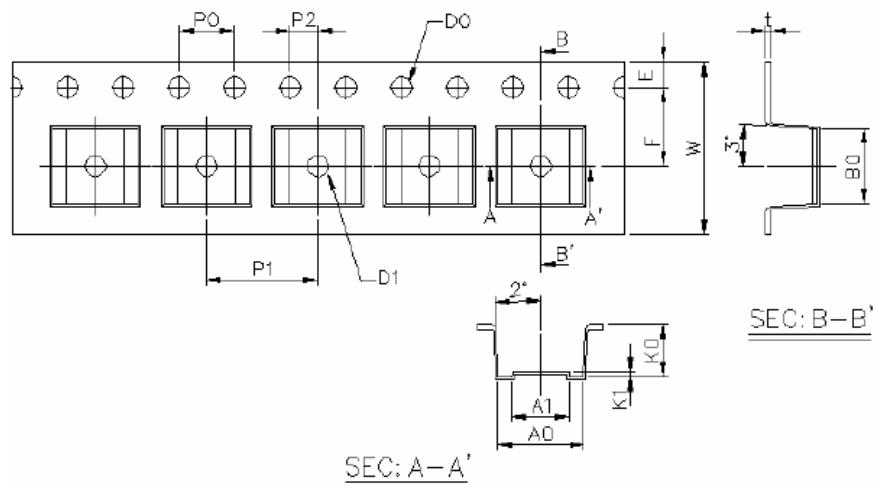
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions

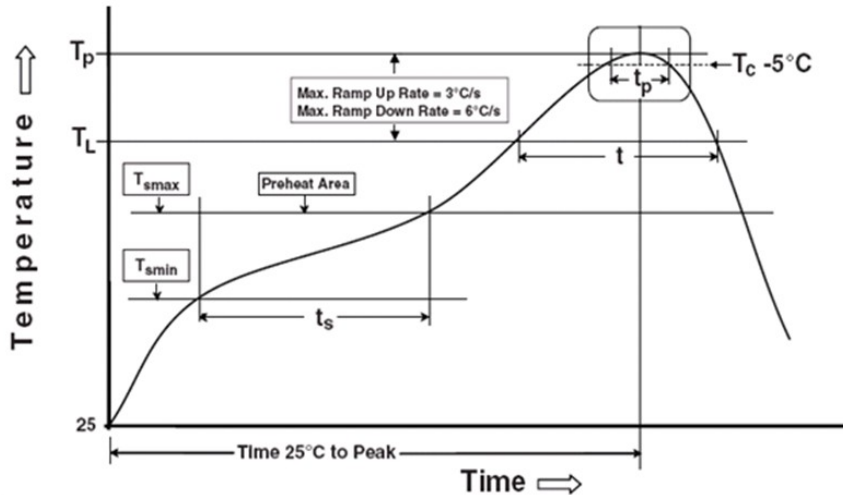


Dimension No.	A0	A1	B0	D0	D1	E	F
Dimension (mm)	6.2±0.1	4.1±0.1	5.28±0.1	1.5±0.1	1.5±0.3	1.75±0.1	5.5±0.1
Dimension No.	P0	P1	P2	t	W	K0	K1
Dimension (mm)	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	12.0+0.3/ -0.1	3.7±0.1	0.3±0.1

Precautions for Use

1. Soldering Condition

1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Reference: IPC/JEDEC J-STD-020D

Preheat

Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max

Other

Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times

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