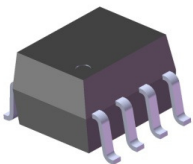




# THE DATASHEET OF ELD205



### 8 PIN SOP PHOTOTRANSISTOR DUAL CHANNEL PHOTOCOUPLER ELD20X Series ELD21X Series

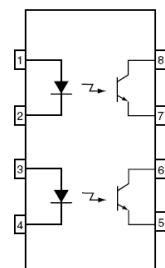


#### Features:

- Dual channel coupler
- Current transfer ratios offered in narrow ranges
 

ELD205: 40-80%	ELD211: >20%
ELD206: 63-125%	ELD213: >100%
ELD207: 100-200%	ELD217: >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 (No. 40028116)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved (No. 2007189)

#### Schematic



#### Pin Configuration

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

#### Description

The ELD20X and ELD21X series contain two infrared emitting diodes optically coupled to two phototransistor detectors.

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

**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
	Collector Current	$I_C$	50	mA
	Total Power Dissipation	$P_{TOT}$	250	mW
	Isolation Voltage* <sup>1</sup>	$V_{ISO}$	3750	V rms
	Operating Temperature	$T_{OPR}$	-55 to 110	°C
	Storage Temperature	$T_{STG}$	-55 to 125	°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 & 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	$V_F$	-	1.2	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	$C_{in}$	-	25	-	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	$C_{CE}$	-	10	-	pF	$V_{CE} = 0\text{V}, f = 1\text{MHz}$

**Transfer Characteristics**

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer Ratio	ELD205	40	-	80	%	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$
	ELD206	63	-	125		
	ELD207	100	-	200		
	ELD211	20	-	-		
	ELD213	100	-	-		
Current Transfer Ratio	ELD205	13	30	-	%	$I_F = 1\text{mA}, V_{CE} = 5\text{V}$
	ELD206	22	45	-		
	ELD207	34	70	-		
	ELD217	100	120	-		

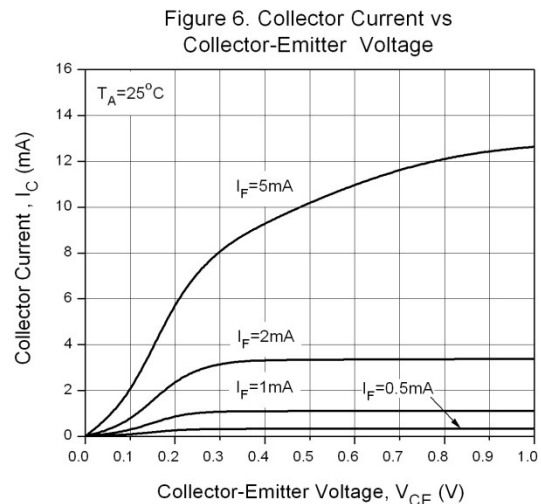
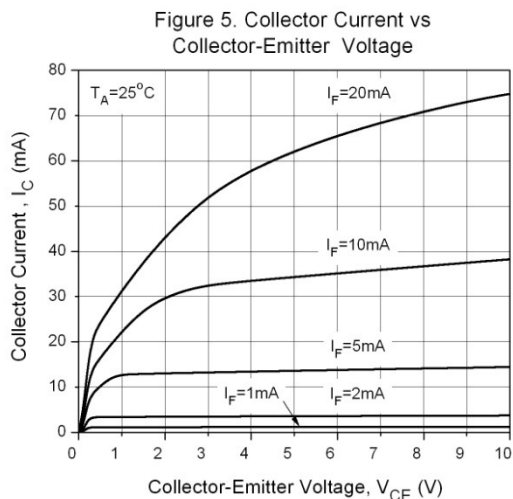
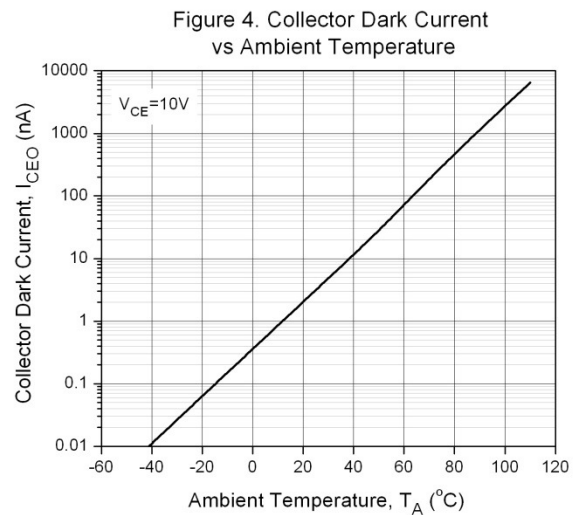
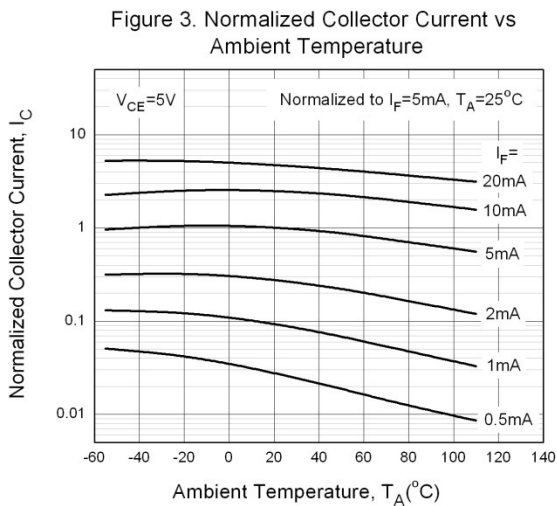
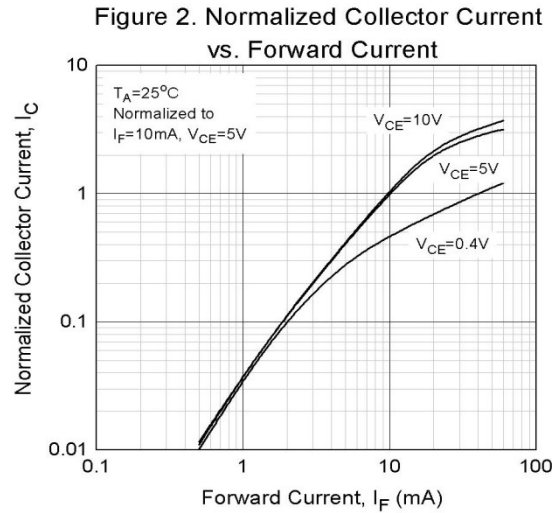
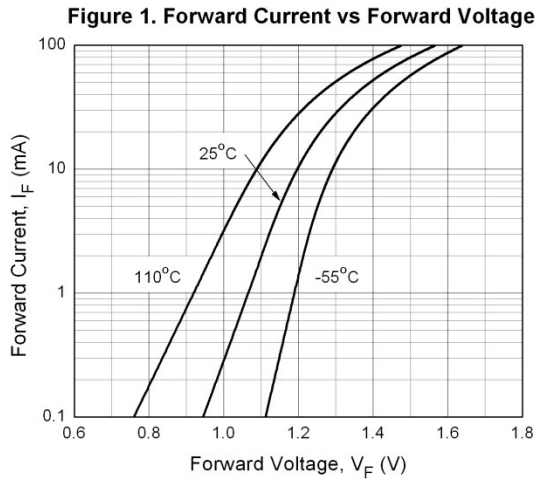
\* Typical values at  $T_a = 25^\circ\text{C}$

**Transfer Characteristics**

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_F = 10mA, I_C = 2.5mA$
Isolation resistance	$R_{IO}$	-	$10^{11}$	-	$\Omega$	$V_{IO} = 500Vdc$
Input-output capacitance	$C_{IO}$	-	0.5	-	pF	$V_{IO} = 0, f = 1MHz$
Turn-on time	$T_{on}$	-	5.0	-	$\mu s$	$V_{CC} = 10V, I_C = 2mA, R_L = 100\Omega$
Turn-off time	$T_{off}$	-	4.0	-		
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



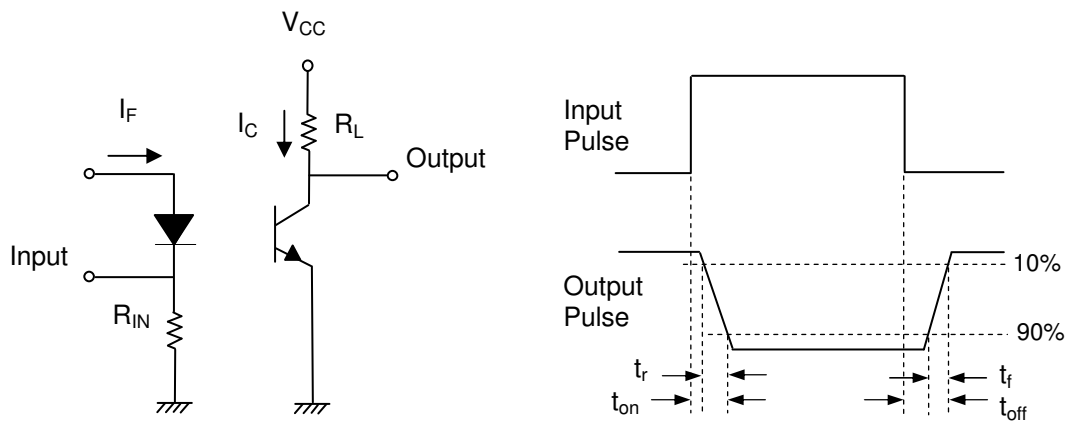
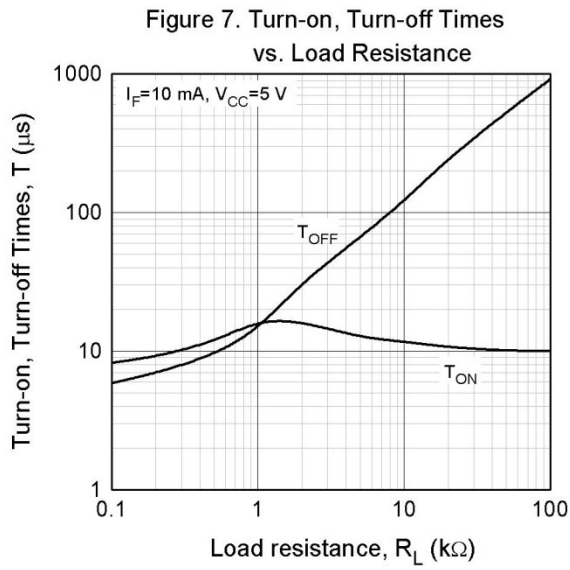


Figure 8. Switching Time Test Circuit & Waveforms

## Order Information

### Part Number

**ELD2XX(Y)-V**

#### Note

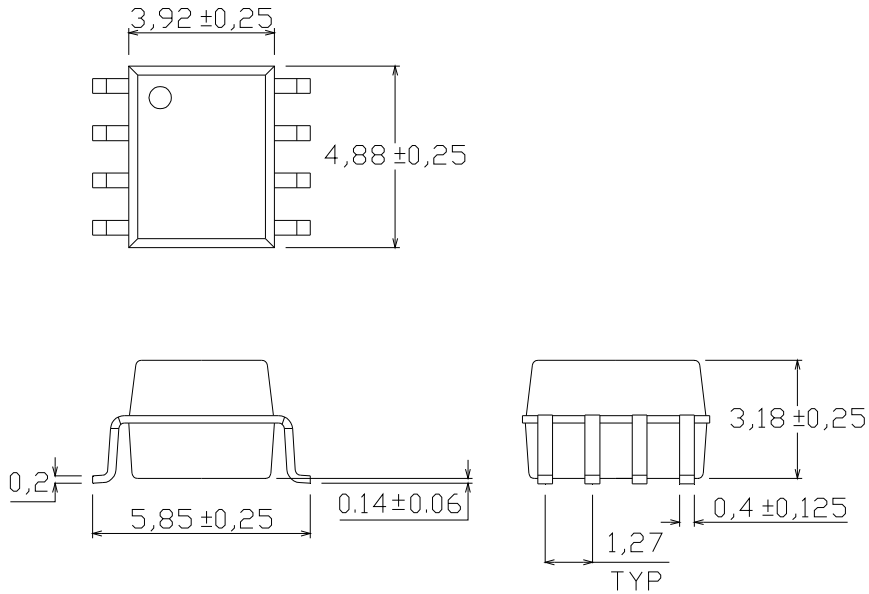
XX = Part no. (05, 06, 07, 11, 13, or 17)

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

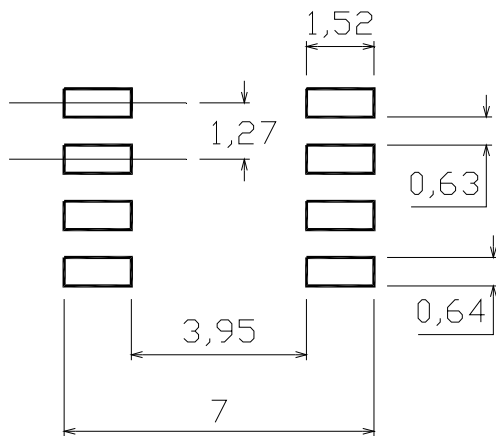
V = VDE safety (Optional)

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

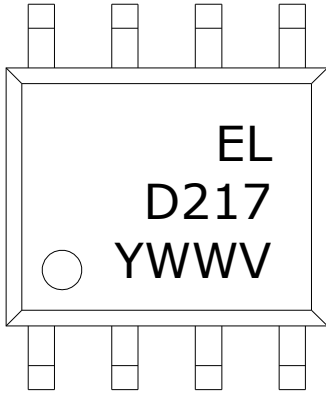
**Package Dimension (Dimensions in mm)**



**Recommended pad layout for surface mount leadform**



### Device Marking

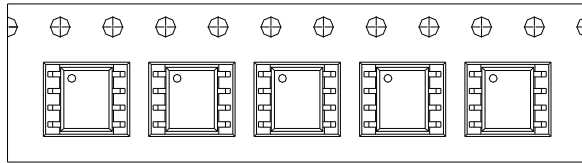


### Notes

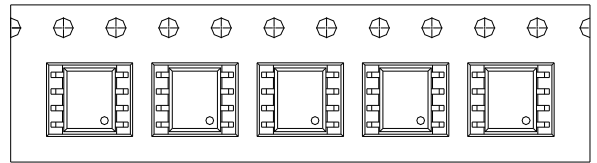
EL	denotes Everlight
D217	denotes Part Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code

**Tape & Reel Packing Specifications**

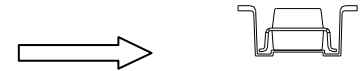
**Option TA**



**Option TB**

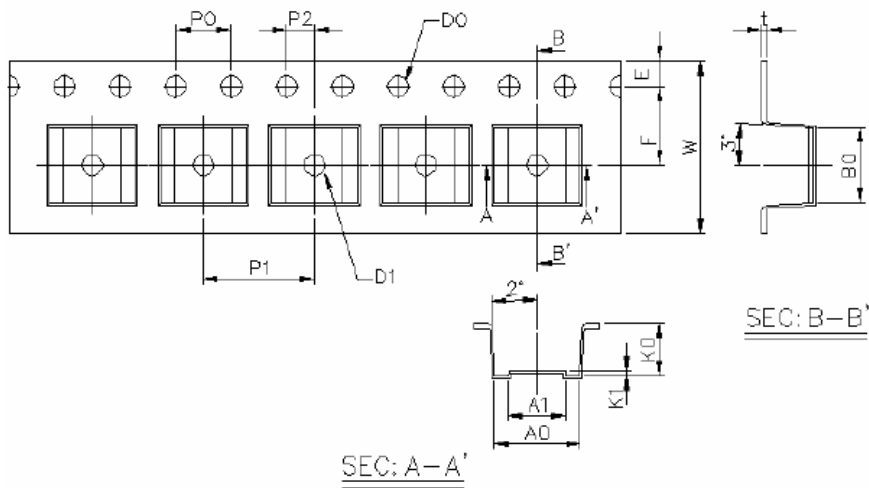


Direction of feed from reel



Direction of feed from reel

**Tape dimensions**

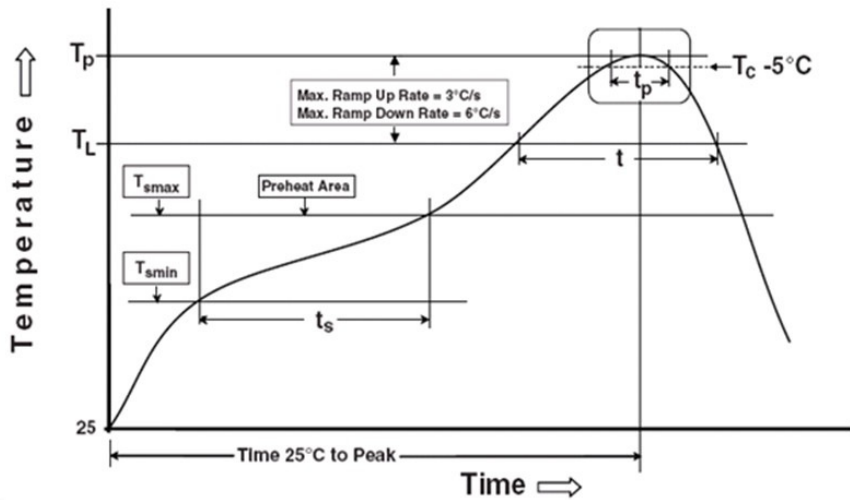


Dimension No.	<b>A0</b>	<b>A1</b>	<b>B0</b>	<b>D0</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension (mm)	6.2±0.1	4.1±0.1	5.28±0.1	1.5±0.1	1.5±0.3	1.75±0.1	5.5±0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K0</b>	<b>K1</b>
Dimension (mm)	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	12.0+0.3/ -0.1	3.7±0.1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

## 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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