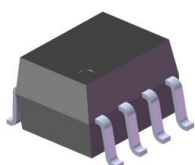


8 PIN SOP PHOTOTRANSISTOR DUAL CHANNEL PHOTOCOUPLER ELD20X Series ELD21X Series



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 and cUL approved(No. E214129)
- VDE approval (No. 40028116)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved

Description

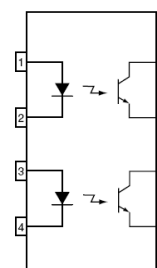
The ELD20X and ELD21X series contain two infrared emitting diodes optically coupled to two phototransistor detectors.

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

Schematic



Pin Configuration

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

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* 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	-	1.2	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}	-	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	-		

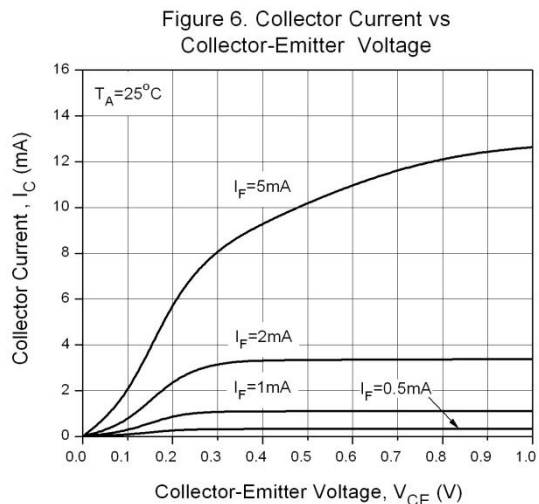
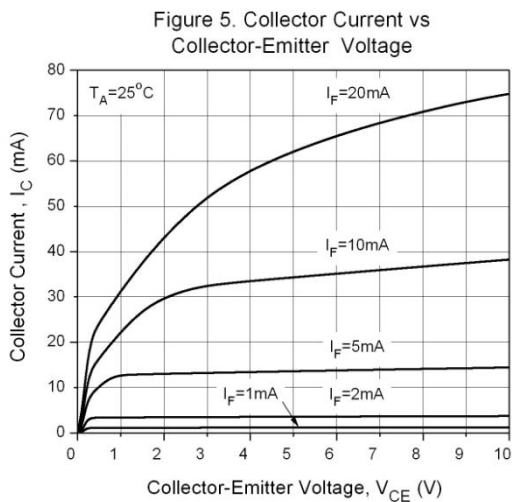
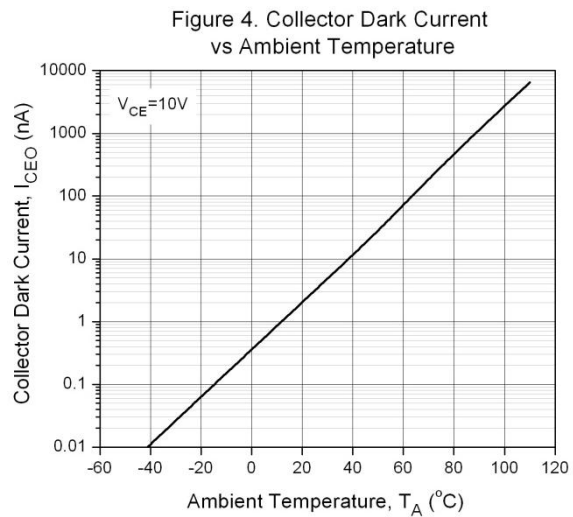
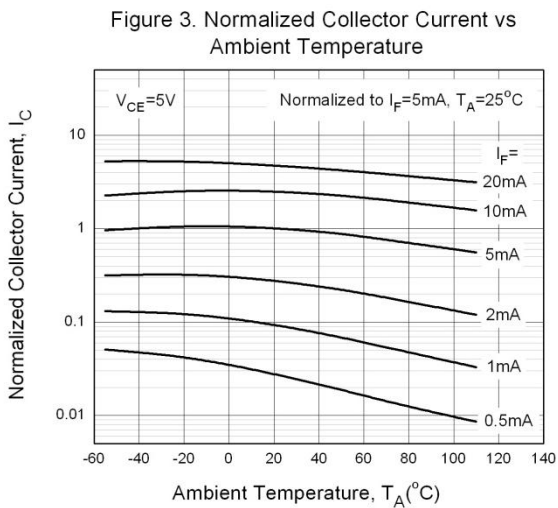
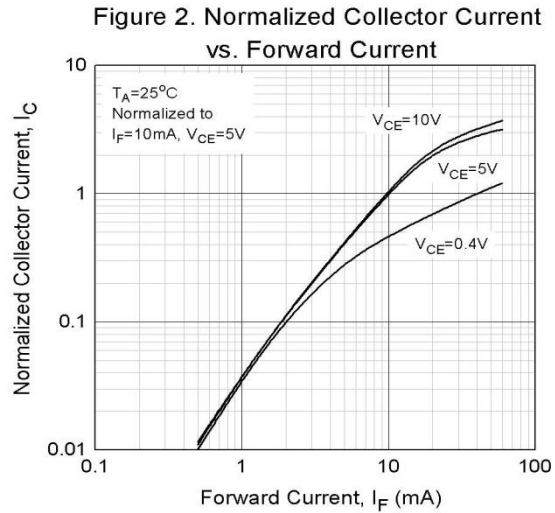
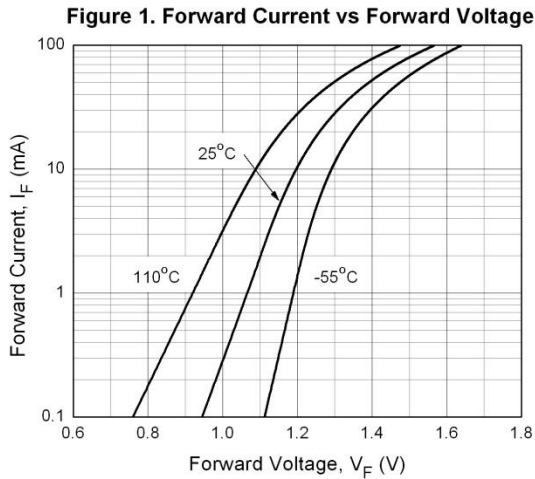
* Typical values at $T_a = 25^\circ\text{C}$

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}	-	Ω	$V_{IO} = 500Vdc$
Input-output capacitance	C_{IO}	-	0.5	-	pF	$V_{IO} = 0, f = 1MHz$
Turn-on time	T_{on}	-	5.0	-	μs	$V_{CC} = 10V,$ $I_C = 2mA, R_L = 100\Omega$
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



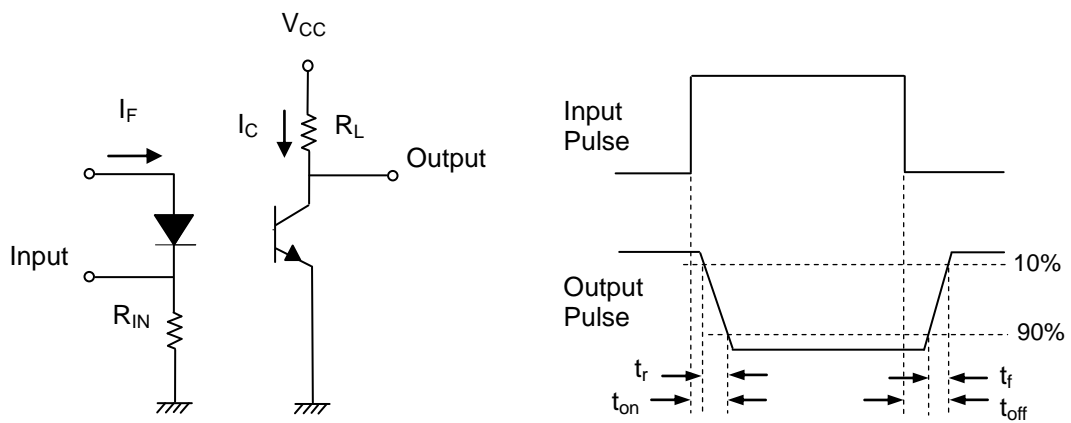
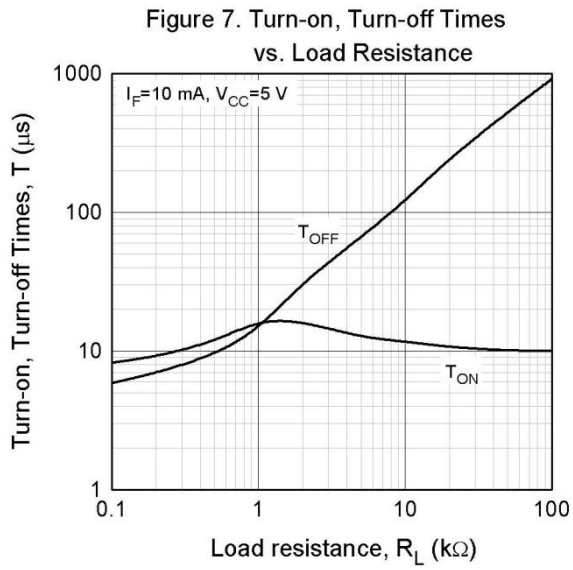


Figure 8. Switching Time Test Circuit & Waveforms

Order Information

Part Number

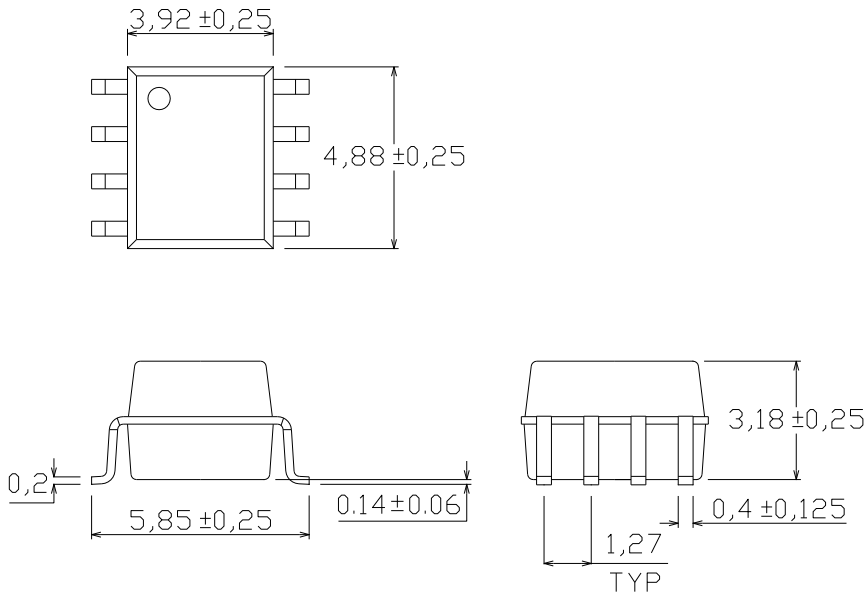
ELD2XX(Y)-V

Note

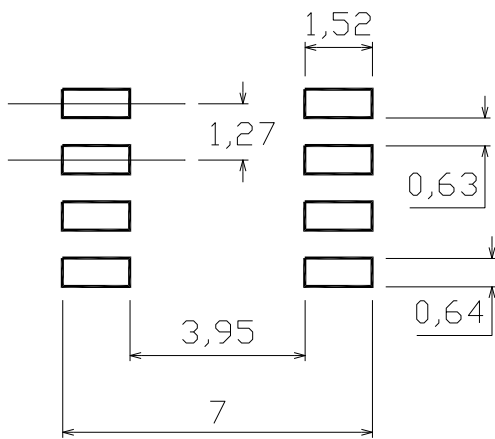
- XX = Part no. (05, 06, 07, 11, 13, or 17)
- Y = Tape and reel option (TA, TB or none).
- V = VDE safety (Optional)

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

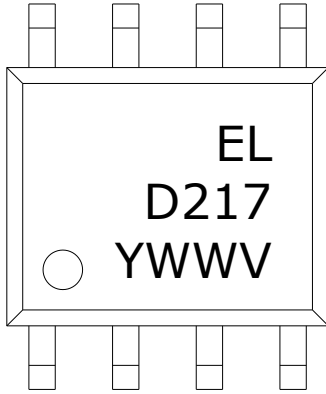
Package Dimension (Dimensions in mm)



Recommended pad layout for surface mount leadform



Device Marking

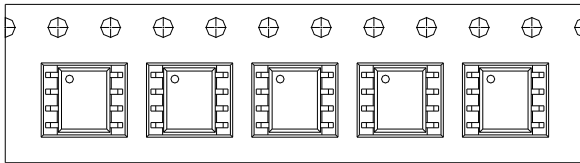


Notes

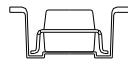
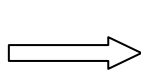
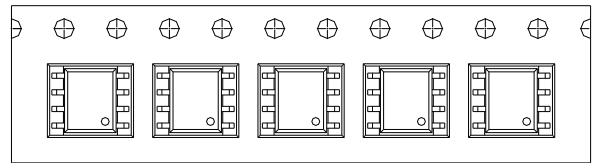
EL	denotes Everlight
D217	denotes Part Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code

Tape & Reel Packing Specifications

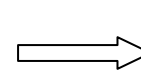
Option TA



Option TB

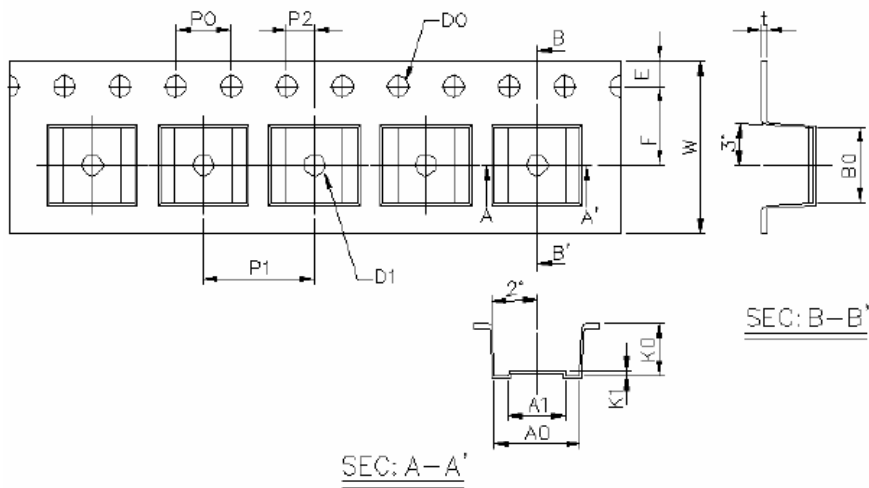


Direction of feed from reel



Direction of feed from reel

Tape dimensions

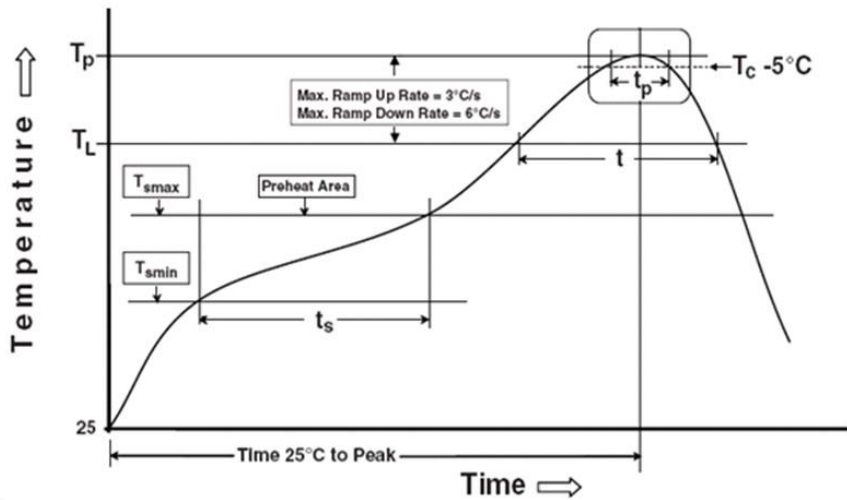


Dimension No.	A0	A1	B0	D0	D1	E	F
Dimension (mm)	6.2±0.1	4.1±0.1	5.28±0.1	1.5±0.1	1.5±0.3	1.75±0.1	5.5±0.1
Dimension No.	Po	P1	P2	t	W	K0	K1
Dimension (mm)	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	12.0+0.3/ -0.1	3.7±0.1	0.3±0.1

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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