

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

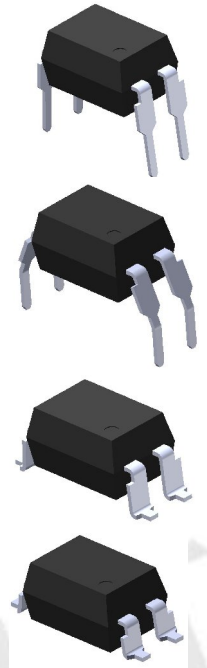
Features:

- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output ($V_{iso} = 5000\text{ V rms}$)
- Creepage distance $> 7.62\text{ mm}$
- Operating temperature up to $+110^\circ\text{C}$
- Compact small outline package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved (No. 716108)
- NEMKO approved (No. P08209467)
- DEMKO approved (No. 314683)
- FIMKO approved (No. FI 224433)
- CSA approved (No. 1143601)

Description

The EL817 series of devices each consist of an infrared emitting diodes, optically coupled to a phototransistor detector.

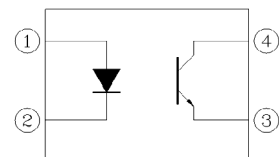
They are packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.



Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as fan heaters, etc.
- Signal transmission between circuits of different potentials and impedances

Schematic



Pin Configuration

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



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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

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

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Peak forward current (1us, pulse)	I_{FP}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	100	mW
	Derating factor (above $T_a = 100^{\circ}\text{C}$)		2.9	mW/ $^{\circ}\text{C}$
Output	Power dissipation	P_C	150	mW
	Derating factor (above $T_a = 100^{\circ}\text{C}$)		5.8	mW/ $^{\circ}\text{C}$
	Collector current	I_C	50	mA
	Collector-Emitter voltage	V_{CEO}	35	V
	Emitter-Collector voltage	V_{ECO}	6	V
Total power dissipation		P_{TOT}	200	mW
Isolation voltage ^{*1}		V_{ISO}	5000	V rms
Operating temperature		T_{OPR}	-55 ~ +110	$^{\circ}\text{C}$
Storage temperature		T_{STG}	-55 ~ +125	$^{\circ}\text{C}$
Soldering temperature ^{*2}		T_{SOL}	260	$^{\circ}\text{C}$

Notes

*1 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.

*2 For 10 seconds.

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

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

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V _F	-	1.2	1.4	V	I _F = 20mA
Reverse current	I _R	-	-	10	μA	V _R = 4V
Input capacitance	C _{in}	-	30	250	pF	V = 0, f = 1kHz

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I _{CEO}	-	-	100	nA	V _{CE} = 20V, I _F = 0mA
Collector-Emitter breakdown voltage	BV _{CEO}	35	-	-	V	I _C = 0.1mA
Emitter-Collector breakdown voltage	BV _{ECO}	6	-	-	V	I _E = 0.1mA

Transfer Characteristics (T_a=25°C unless specified otherwise)

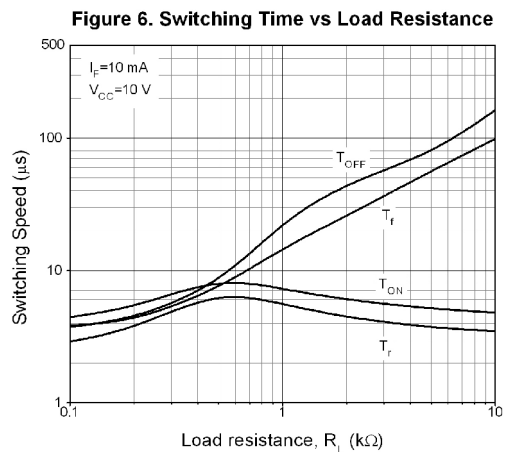
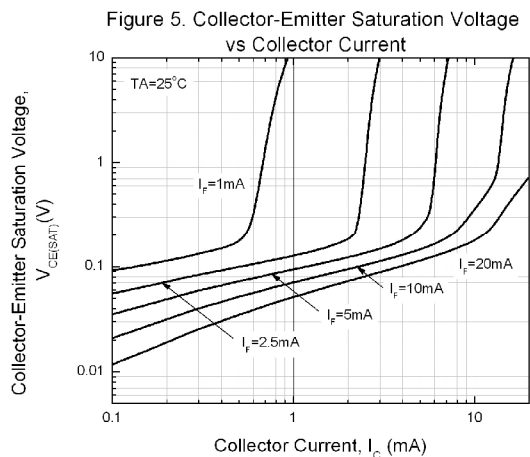
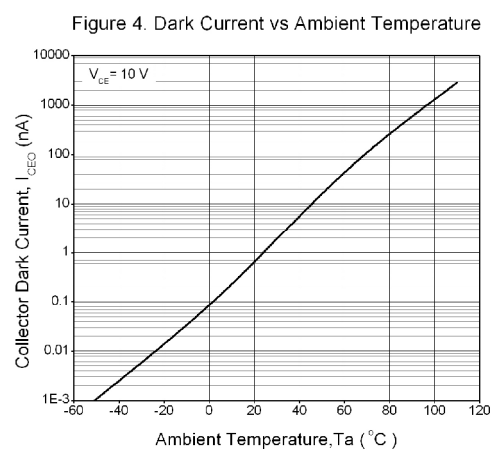
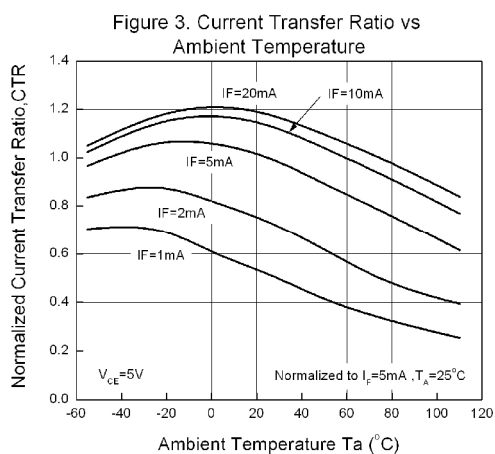
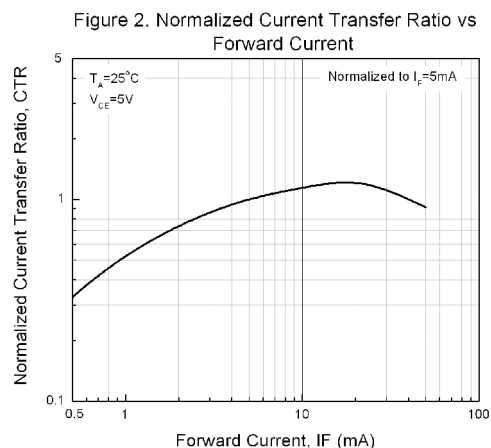
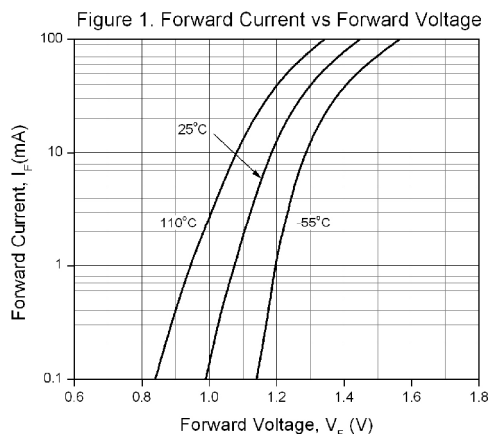
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL817	50	-	600	%	I _F = 5mA, V _{CE} = 5V
	EL817A	80	-	160		
	EL817B	130	-	260		
	EL817C	200	-	400		
	EL817D	300	-	600		
	EL817X	100	-	200		
	EL817Y	150	-	300		
Collector-Emitter saturation voltage	V _{CE(sat)}	-	0.1	0.2	V	I _F = 20mA, I _C = 1mA
Isolation resistance	R _{IO}	5×10 ¹⁰	-	-	Ω	V _{IO} = 500Vdc, 40~60% R.H.
Floating capacitance	C _{IO}	-	0.6	1.0	pF	V _{IO} = 0, f = 1MHz
Cut-off frequency	f _c	-	80	-	kHz	V _{CE} = 5V, I _C = 2mA R _L = 100Ω, -3dB
Rise time	t _r	-	4	18	μs	V _{CE} = 2V, I _C = 2mA, R _L = 100Ω
Fall time	t _f	-	3	18	μs	

* Typical values at T_a = 25°C

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

Typical Performance Curves



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EL817 Series

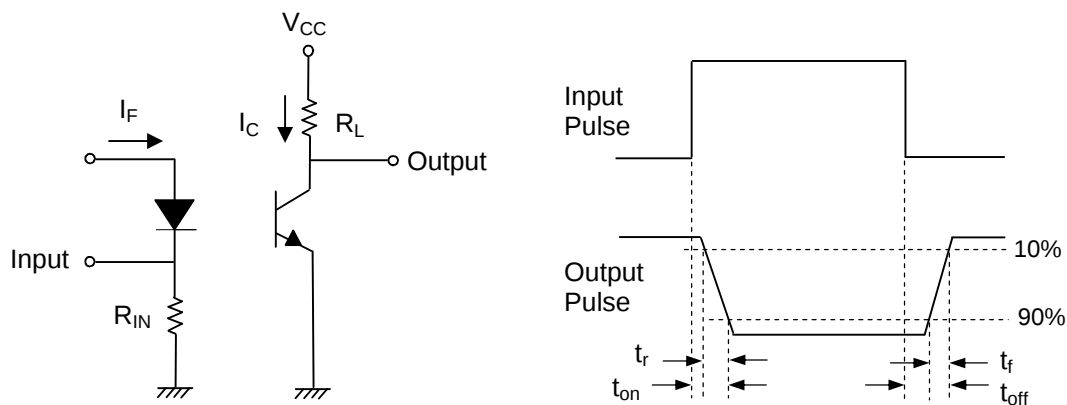


Figure 7. Switching Time Test Circuit & Waveforms

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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

Order Information

Part Number

EL817(X)(Y)(Z)-FV

Note

- X = Lead form option (S, S1, S2, M or none)
Y = CTR Rank (A, B, C, D, X, Y or none)
Z = Tape and reel option (TA, TB, TU, TD or none).
F = Lead frame option (F: Iron, None: copper)
V = VDE safety (optional).

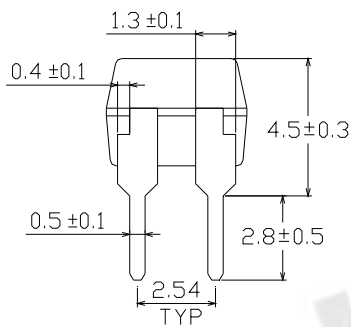
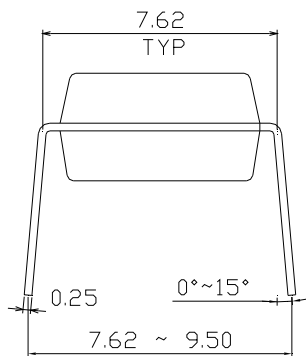
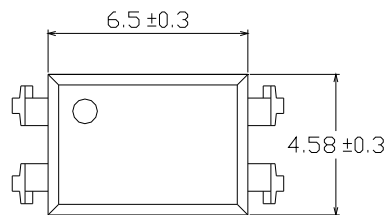
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount 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
S2 (TA)	Surface mount lead form (Gull-wing) + TA tape & reel option	500 units per reel
S2 (TB)	Surface mount lead form (Gull-wing) + TB tape & reel option	500 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

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

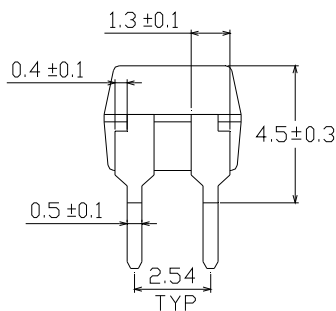
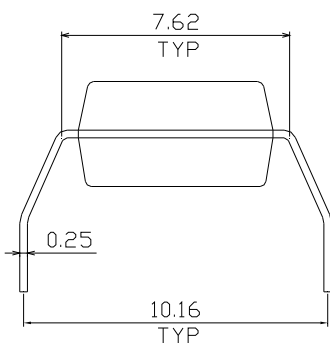
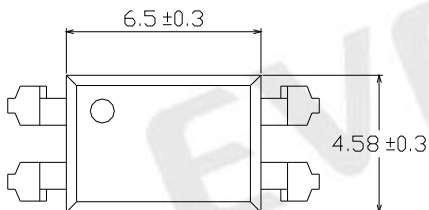
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Package Drawing (Dimensions in mm)

Standard DIP Type



Option M Type



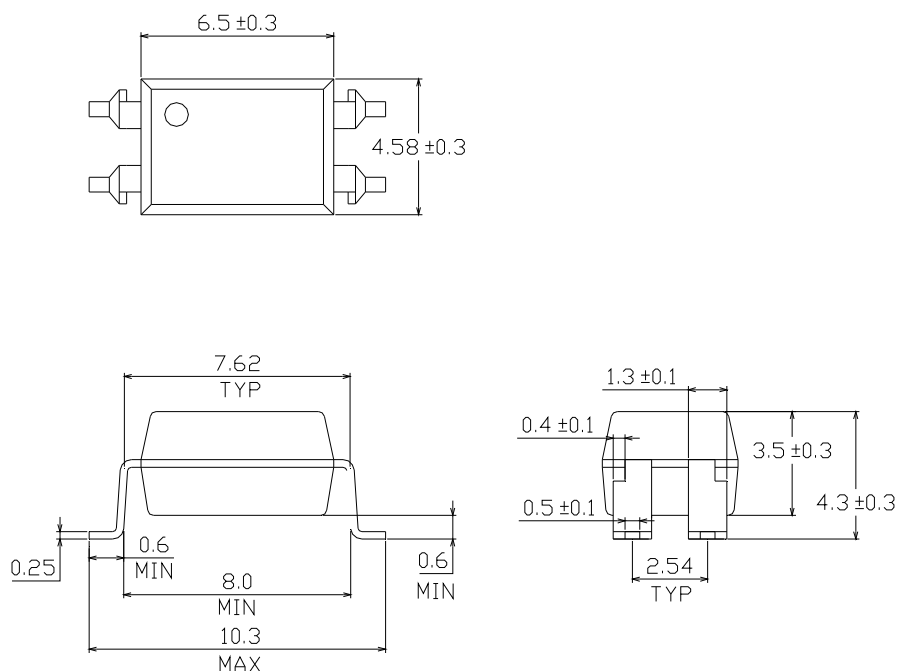


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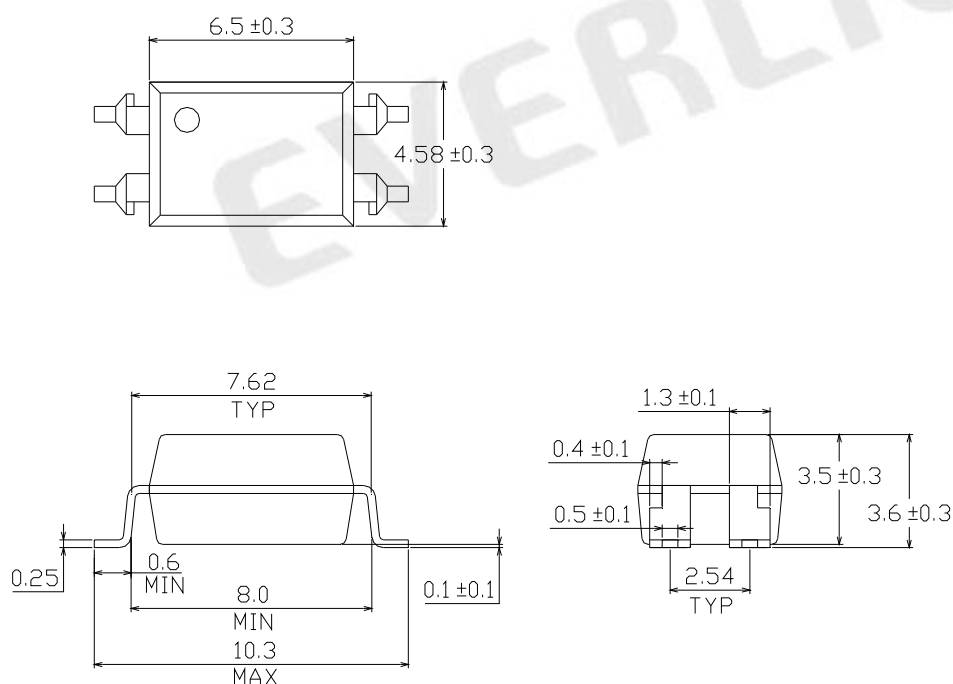
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Option S Type



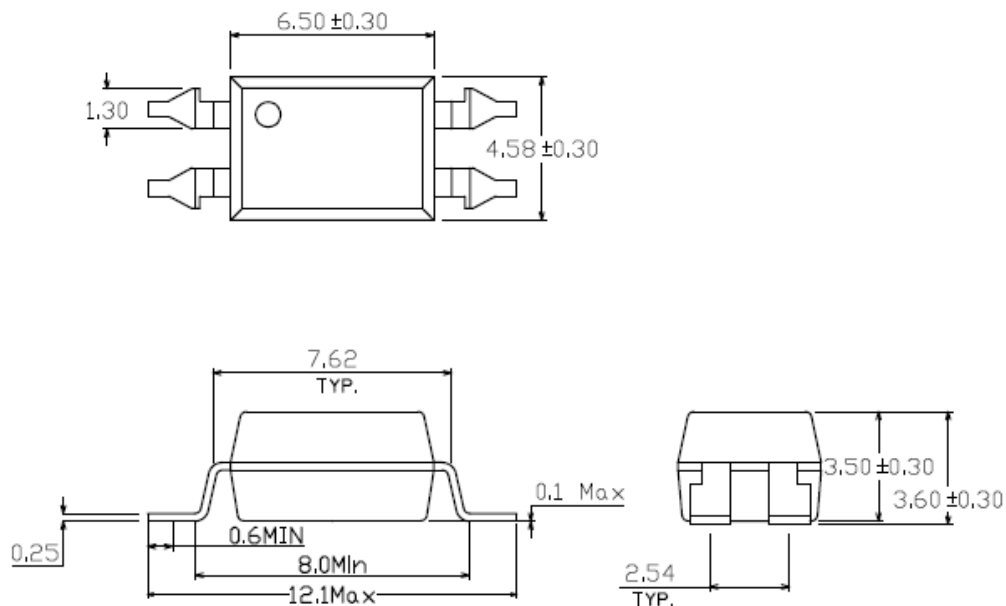
Option S1 Type



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EL817 Series

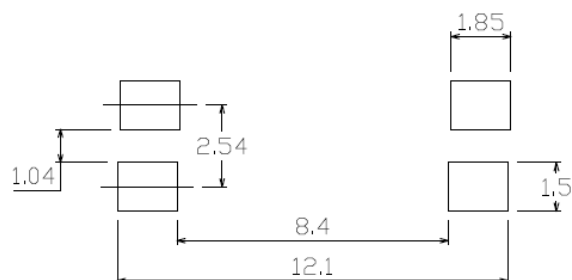
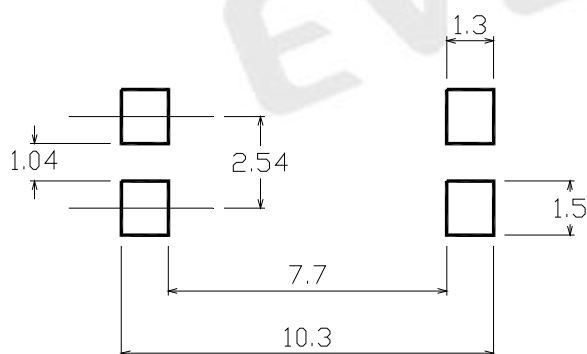
Option S2 Type



Recommended pad layout for surface mount leadform

For S and S1 option

For S2 option



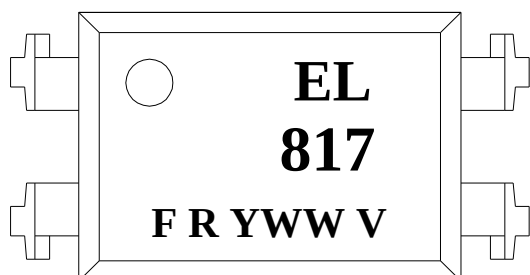


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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

Device Marking



Notes

EL	denotes EVERLIGHT
817	denotes Device Number
F	denotes Factory Code (None: China, T: Taiwan)
R	denotes CTR Rank (A, B, C, D or none)
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

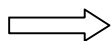
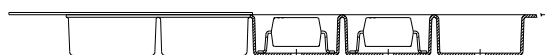
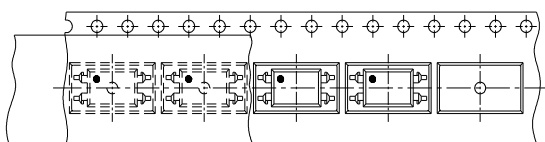
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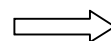
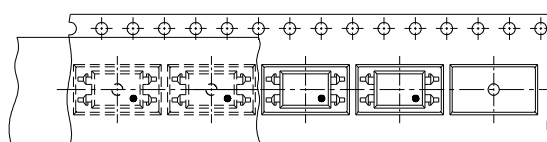
Tape & Reel Packing Specifications

Option TA



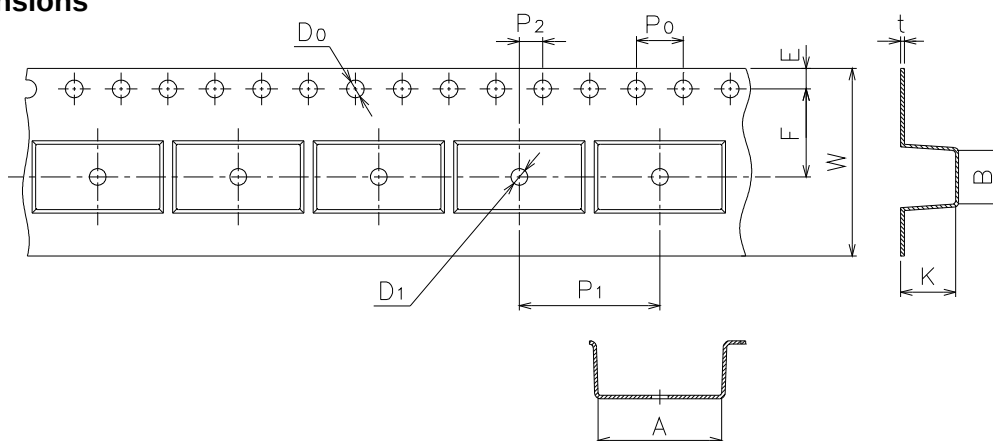
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions

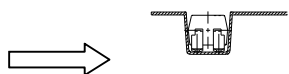
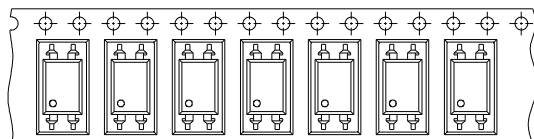


Dimension No.	A	B	Do	D1	E	F
For S2 type						
Dimension(mm)	12.15±0.1	4.65±0.1	1.55±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
For S2 type						
Dimension(mm)	4.0±0.1	16.0±0.1	2.0±0.1	0.35±0.1	16.0+0.3/ -0.1	4.55±0.1
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

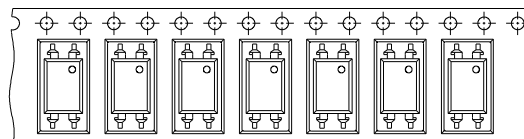
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Option TD



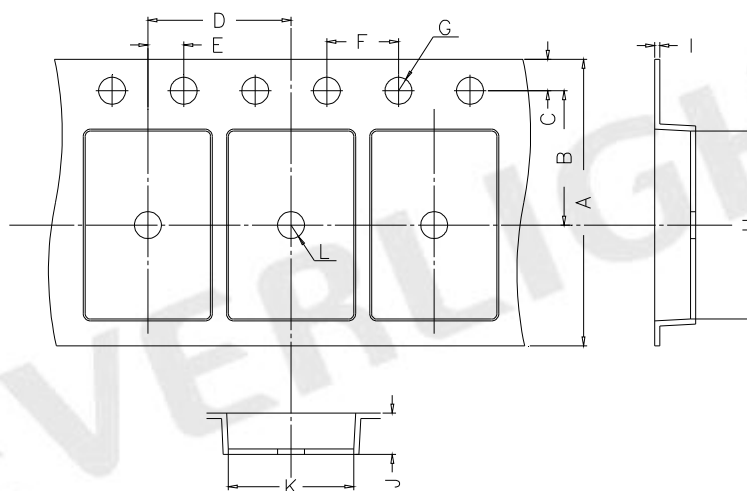
Direction of feed from reel

Option TU



Direction of feed from reel

Tape dimensions



Dimension No.	A	B	C	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	H	I	J	K	L
Dimension(mm)	1.5±0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	1.5±0.05

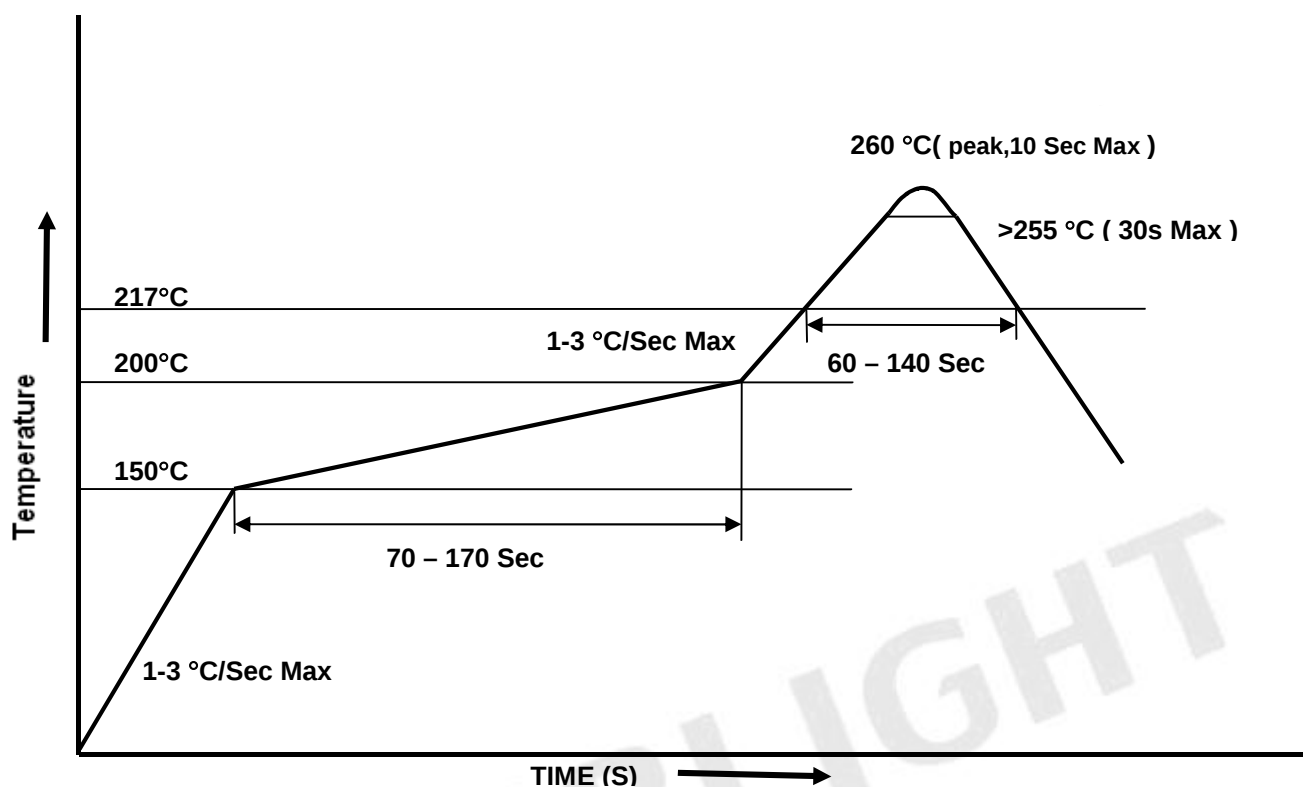


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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

Solder Reflow Temperature Profile



4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817 Series

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