

DATASHEET

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER EL817 Series



Features:

- Compliance Halogens Free (Only copper leadframe) (Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)
- Current transfer ratio

(CTR: $50\sim600\%$ at IF = 5mA, VcE = 5V)

- High isolation voltage between input and output (Viso = 5000Vrms)
- Creepage distance > 7.62mm
- Operating temperature up to +110°C
- Compact small outline package
- •The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- UL and cUL approved(No.E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

Description

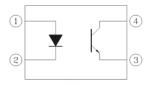
The EL817 series of devices each consist of an infrared emitting diodes, optically coupled to a phototransistor detector.

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



Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Forward current	I _F	60	mA
Peak forward current (1us, pulse)	I _{FP}	1	А
Reverse voltage	V _R	6	V
Power dissipation	D	100	mW
Derating factor (above $T_a = 100$ °C)	P_{D}	2.9	mW/°C
Power dissipation	_	150	mW
Derating factor (above $T_a = 100^{\circ}C$)	Pc	5.8	mW/°C
Collector current	I _C	50	mA
Collector-Emitter voltage	V _{CEO}	35	V
Emitter-Collector voltage	V_{ECO}	6	V
Dissipation	P _{TOT}	200	mW
age*1	V _{ISO}	5000	V rms
mperature	T _{OPR}	-55 to 110	°C
perature	T _{STG}	-55 to 125	°C
mperature* ²	T _{SOL}	260	°C
	Forward current Peak forward current (1us, pulse) Reverse voltage Power dissipation Derating factor (above T _a = 100°C) Power dissipation Derating factor (above T _a = 100°C) Collector current Collector-Emitter voltage Emitter-Collector voltage Dissipation age*1 mperature	Forward current I_F Peak forward current (1us, pulse) I_{FP} Reverse voltage V_R Power dissipation P_D Power dissipation P_D Power dissipation P_D Power dissipation P_C Collector (above P_D P_C Collector current P_C Collector-Emitter voltage P_C Emitter-Collector voltage P_C Dissipation P_T age*1 P_T mperature P_T Tope	Forward current I_F 60 Peak forward current (1us, pulse) I_{FP} 1 Reverse voltage V_R 6 Power dissipation Derating factor (above $T_a = 100^{\circ}\text{C}$) P_D 2.9 Power dissipation Derating factor (above $T_a = 100^{\circ}\text{C}$) P_C 5.8 Collector current I_C 50 Collector-Emitter voltage I_C 7 Emitter-Collector voltage I_C 7 Dissipation I_C 7 Dissipation I_C 7 Prot 200 age*1 I_C 7 Topa -55 to 110 perature I_C 7 Prot 255 to 125

Notes:

^{*1} AC for 1 minute, R.H.= $40 \sim 60\%$ R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

^{*2} For 10 seconds



Electro-Optical Characteristics (Ta=25°C unless specified otherwise)

Input

Parameter	Symbol	Min.	Тур.	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	Тур.	Max.	Unit	Condition	
Collector-Emitter dark	lana	_	_	100	nA	$V_{CE} = 20V, I_{F} = 0mA$	
current	ICEO	_	_	100	ПА	VCE - 20 V, IF - OIIIA	
Collector-Emitter	BV_CEO	35	_	_	V	$I_{\rm C} = 0.1 \rm mA$	
breakdown voltage	DACEO	33	_	_	V	IC = 0. IIIIA	
Emitter-Collector	D\/	6	_	_	V	I - 0.1m1	
breakdown voltage	BV_{ECO}	O	-	-	V	$I_E = 0.1 \text{mA}$	

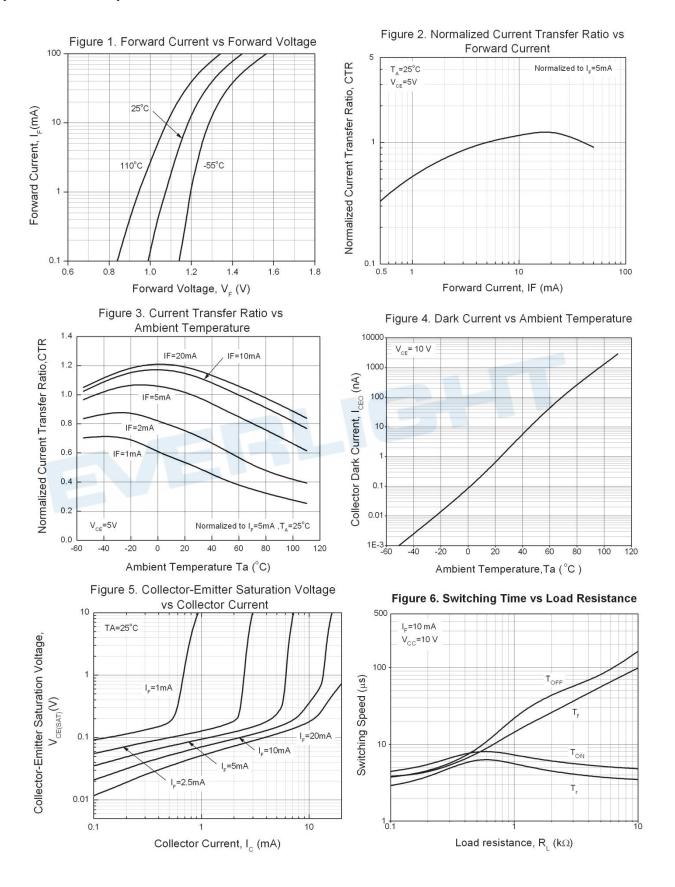
Transfer Characteristics

Para	meter	Symbol	Min	Тур.	Max.	Unit	Condition
	EL817		50		600		
	EL817A		80	_	160		
Current	Current EL817B		130	-	260	_ _ % _	
Transfer	EL817C	CTR	200	-	400		$I_F = 5mA$, $V_{CE} = 5V$
ratio	EL817D		300	-	600		
	EL817X		100	-	200		
	EL817Y		150	-	300		
Collector-E saturation		$V_{\text{CE(sat)}}$	-	0.1	0.2	V	$I_F = 20 \text{mA}, I_C = 1 \text{mA}$
Isolation re	esistance	R _{IO}	5×10 ¹⁰	-	-	Ω	V _{IO} = 500Vdc, 40~60% R.H.
Floating ca	apacitance	C_{IO}	-	0.6	1.0	pF	$V_{IO} = 0$, $f = 1MHz$
Cut-off free	quency	fc	-	80	-	kHz	$V_{CE} = 5V$, $I_{C} = 2mA$ $R_{L} = 100\Omega$, $-3dB$
Rise time		t _r	-	-	18	μs	$V_{CE} = 2V$, $I_C = 2mA$,
Fall time		t _f	-	-	18	μs	$R_L = 100\Omega$

^{*} Typical values at T_a = 25°C



Typical Electro-Optical Characteristics Curves





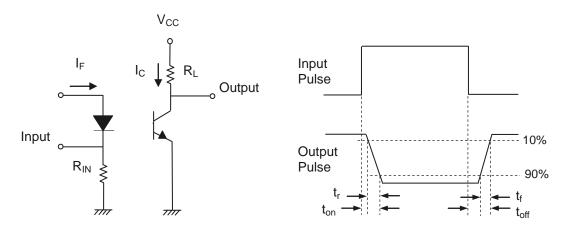


Figure 7. Switching Time Test Circuit & Waveforms





Order Information

Part Number

EL817X(Y)(Z)-FV

Note

X = Lead form option (S1, S2, M or none)

Y = CTR Rank (A, B, C, D, X, Y or none)

Z = Tape and reel option (TU, TD or none)

F = Lead frame option (F: Iron, None: copper)

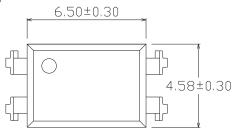
V = VDE safety (optional)

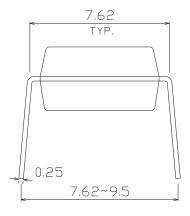
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S1 (TU)	Surface mount lead form (low profile) + TU tape & reel option	1500 units per reel
S1 (TD)	Surface mount lead form (low profile) + TD tape & reel option	1500 units per reel
S2 (TU)	Surface mount lead form (low profile) + TU tape & reel option	2000 units per reel
S2 (TD)	Surface mount lead form (low profile) + TD tape & reel option	2000 units per reel

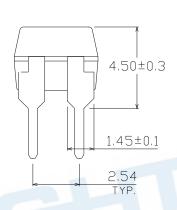


Package Dimension (Dimensions in mm)

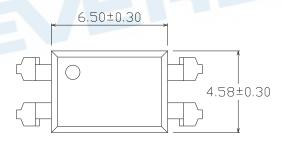
Standard DIP Type

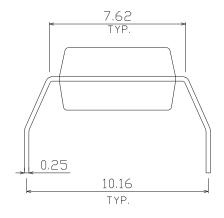


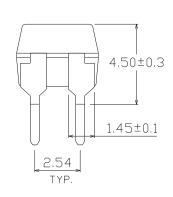




Option M Type

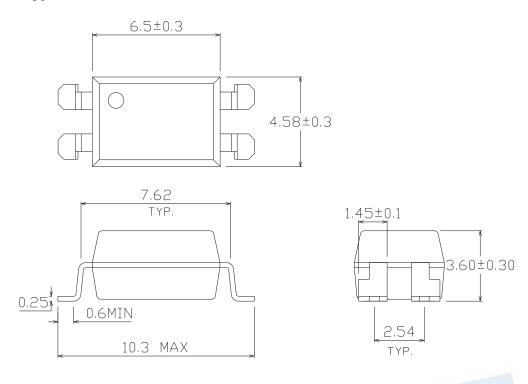




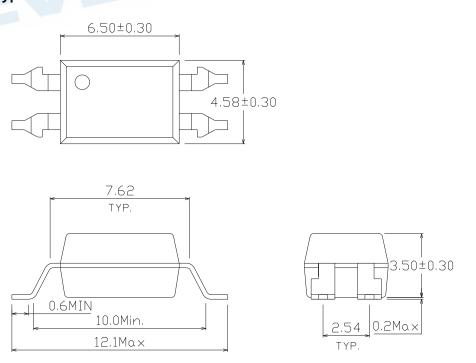




Option S1 Type

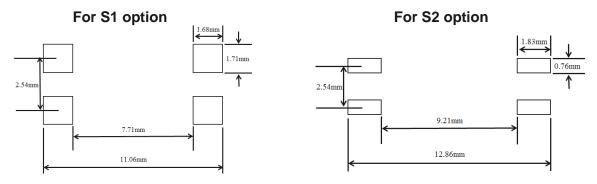


Option S2 Type





Recommended pad layout for surface mount leadform



Notes

Suggested pad dimension is just for reference only. Please modify the pad dimension based on individual need.





Device Marking



Notes

EL	denotes EVERLIGHT
817	denotes Device Number

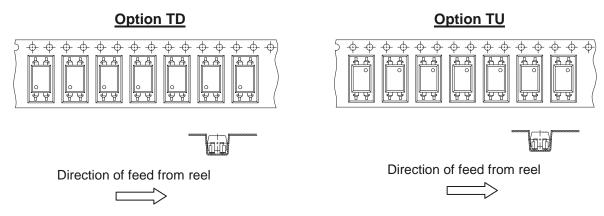
F denotes Factory Code (G: China and Green part) R denotes CTR Rank (A, B, C, D, X, Y or none)

Y denotes 1 digit Year code WW denotes 2 digit Week code V denotes VDE (optional)

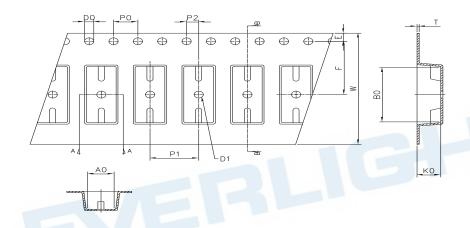




Tape & Reel Packing Specifications



Tape dimensions



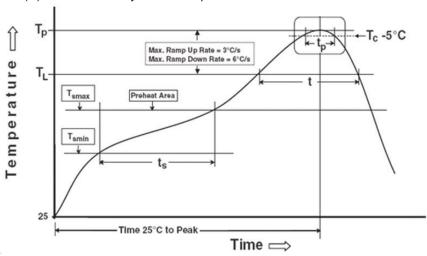
Dimension No.	Ao	Во	Do	D1	E	F
Dimension (mm) S1	4.90±0.1	10.40±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.50±0.1
Dimension (mm) S2	4.88±0.1	12.55±0.1	1.5±0.1	1.50±0.1	1.75±0.1	11.5±0.1
Dimension No.	Ро	P1	P2	t	w	Ko
Dimension (mm) S1	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	16.00±0.3	4.60±0.1
Dimension (mm)	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	24.00±0.3	4.00±0.1



Precautions for Use

1. Soldering Condition

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



Note:

Preheat

Temperature min (T_{smin})

Temperature max (T_{smax})

Time (Tsmin to Tsmax) (ts)

Average ramp-up rate (Tsmax to Tp)

Other

Liquidus Temperature (T_L)

Time above Liquidus Temperature (t L)

Peak Temperature (T_P)

Time within 5 °C of Actual Peak Temperature: T_P - 5°C

Ramp- Down Rate from Peak Temperature

Time 25°C to peak temperature

Reflow times

Reference: IPC/JEDEC J-STD-020D

150 °C

200°C

60-120 seconds

3 °C/second max

217 °C

60-100 sec

260°C

30 s

6°C /second max.

8 minutes max.

3 times



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