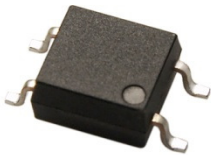
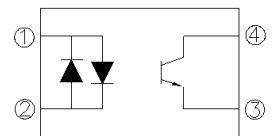


4 PIN SOP PHOTOTRANSISTOR PHOTOCOUPLER AC INPUT PHOTOCOUPLE EL354N-G Series



Schematic



Pin Configuration

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

Features:

- Halogens free
- Current transfer ratio
(CTR: Min. 20% at $I_F = \pm 1\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output (Viso=3750 V rms)
- Compact small outline package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved (No. 1408633)

Description

The EL354N-G series of devices each consist of two infrared emitting diode, connected in inverse parallel, optically coupled to a phototransistor detector.

They are packaged in a 4-pin small outline package.

Applications

- AC line monitor
- Programmable controllers
- Telephone line interface
- Unknown polarity DC sensor

Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	±50	mA
	Peak forward current (1 us, pulse)	I_{FP}	1	A
	Power dissipation Derating factor (above $T_a = 90^\circ\text{C}$)	P_D	70	mW
Output	Power dissipation Derating factor (above $T_a = 70^\circ\text{C}$)	P_C	150	mW
			3.7	mW/°C
	Collector-Emitter voltage	V_{CEO}	80	V
	Emitter-Collector voltage	V_{ECO}	6	V
Total Power Dissipation		P_{TOT}	200	mW
Isolation Voltage*1		V_{ISO}	3750	Vrms
Operating temperature		T_{OPR}	-55 ~ +100	°C
Storage temperature		T_{STG}	-55 ~ +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 are shorted together, and pins 3, 4 are shorted together.

*2 For 10 seconds

Electro-Optical 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}	-	50	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}	80	-	-	V	I _C = 0.1mA
Emitter-Collector breakdown voltage	BV _{ECO}	7	-	-	V	I _E = 0.1mA

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

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	EL354N	20	-	300	%	I _F = ±1mA, V _{CE} = 5V
	EL354NA	50	-	150		
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	10 ¹¹	-	Ω	V _{IO} = 500Vdc, 40~60%R.H
Cut-off frequency	f _c	-	80	-	kHz	V _{CE} =5V, I _C =2 mA, R _L =100Ω, -3dB
Floating capacitance	C _{IO}	-	0.6	1.0	pF	V _{IO} = 0, f = 1MHz
Rise time	t _r	-	6	18	μs	V _{CE} =2V,
Fall time	t _f	-	8	18	μs	I _C =2mA, R _L =100Ω

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves

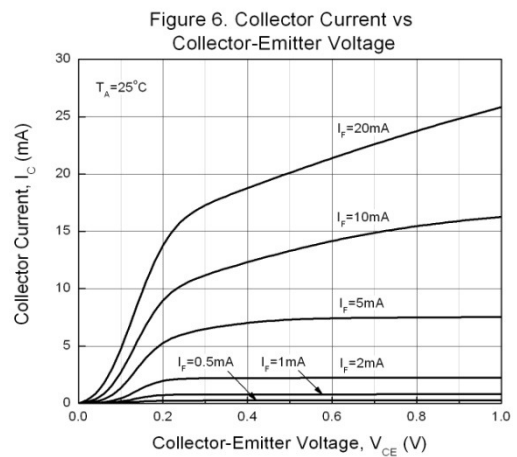
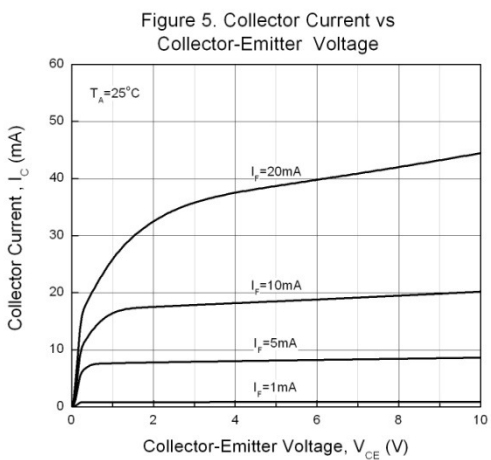
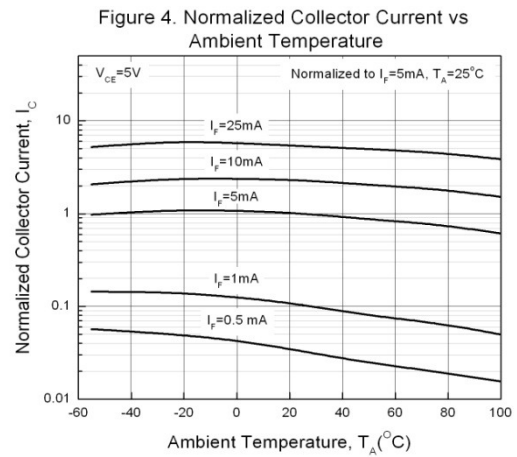
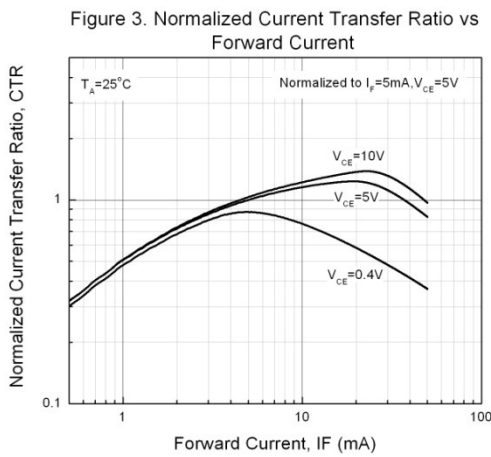
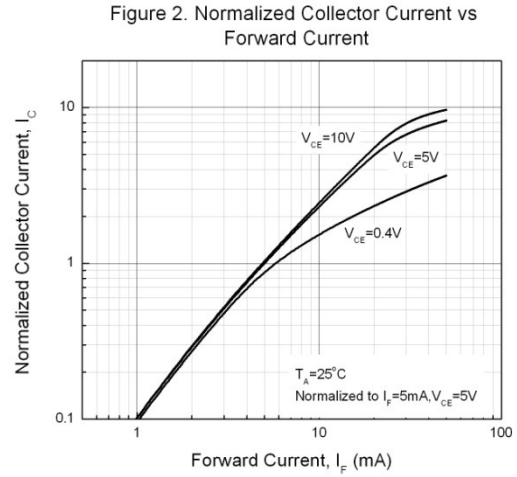
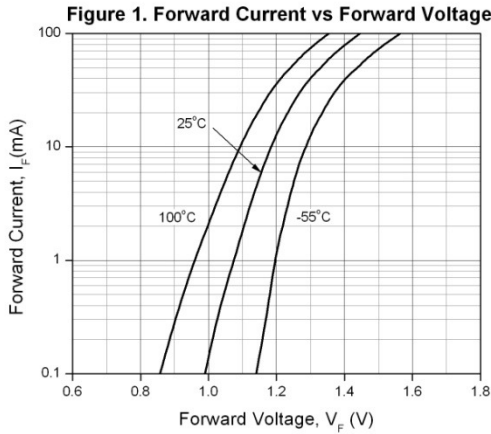


Figure 7. Collector Dark Current vs Ambient Temperature

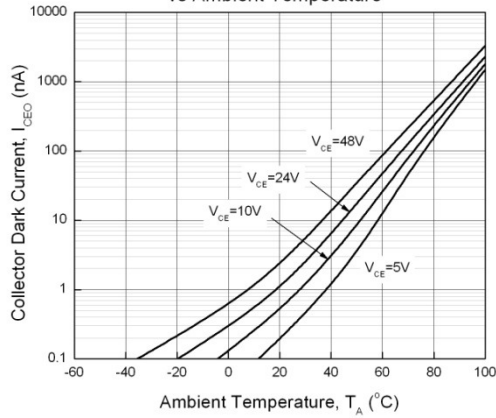


Figure 8. Switching Time vs Load Resistance

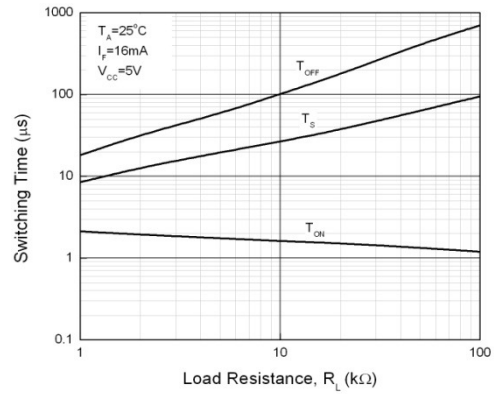


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

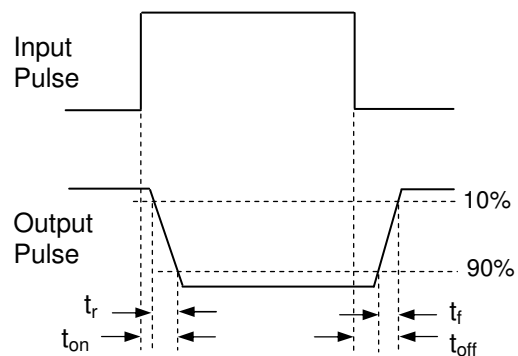
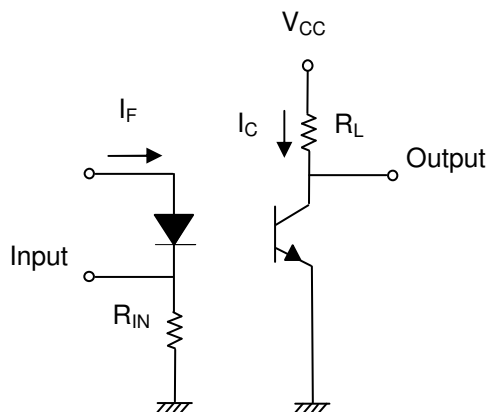
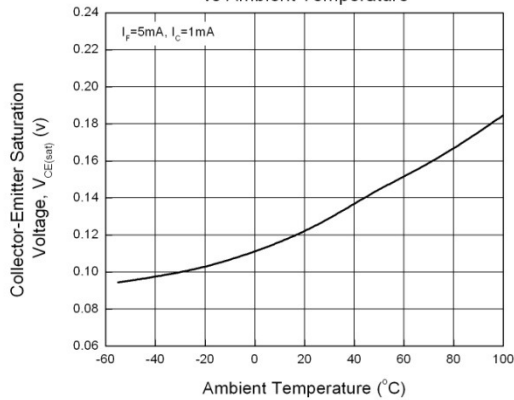


Figure 10. Switching Time Test Circuit & Waveforms

Order Information

Part Number

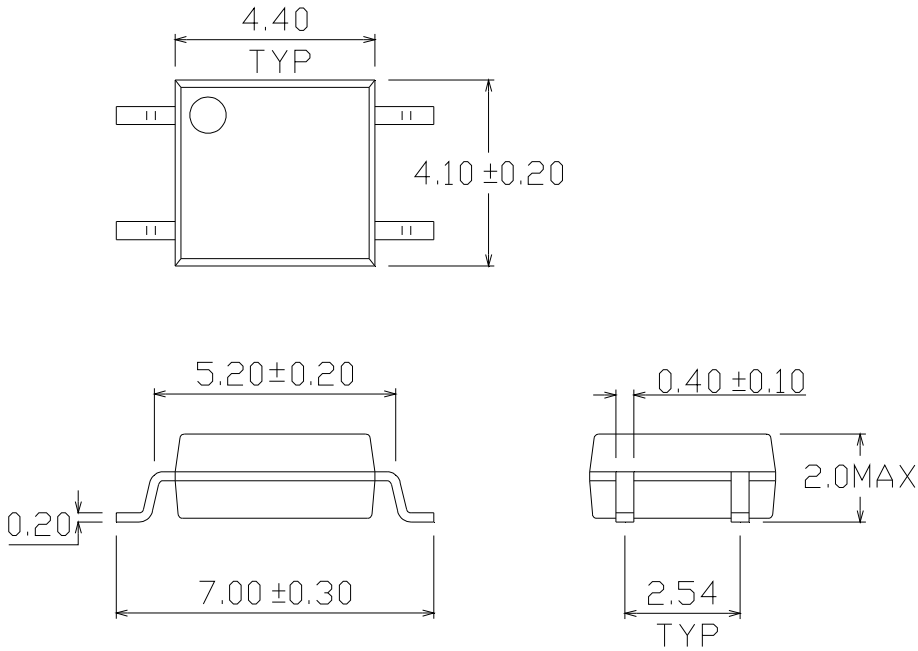
EL354N(X)(Y)-VG

Note

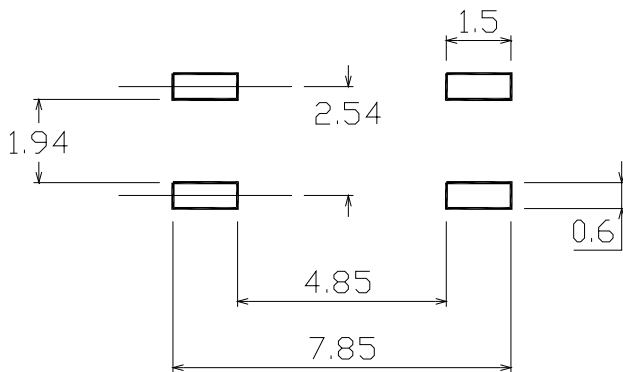
- X = CTR Rank option (A, or none)
- Y = Tape and reel option (TA, TB, or none).
- V = VDE (option)
- G = Halogens free

Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	3000 units per reel
(TB)	TB Tape & reel option	3000 units per reel
(TA)-V	TA Tape & reel option + VDE	3000 units per reel
(TB)-V	TB Tape & reel option + VDE	3000 units per reel

Package Dimension (Dimensions in mm)



Recommended pad layout for surface mount leadform



Device Marking

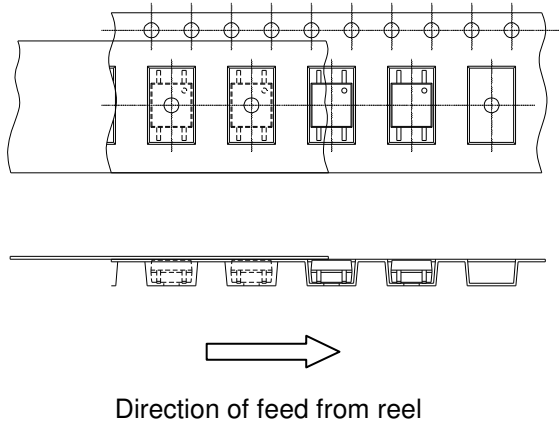


Notes

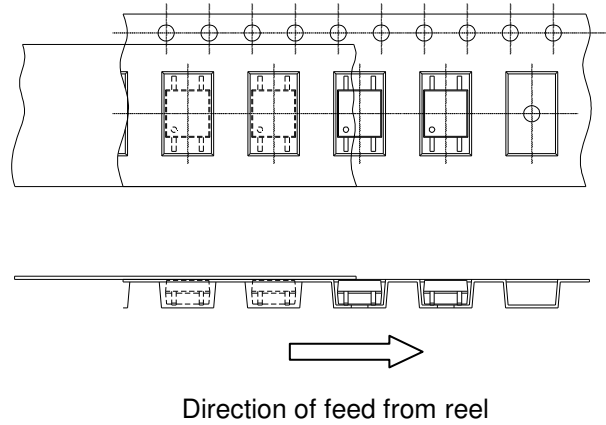
EL	denotes Everlight
354N	denotes Device Number
R	denotes CTR Rank (A or none)
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE approved (optional)

Tape & Reel Packing Specifications

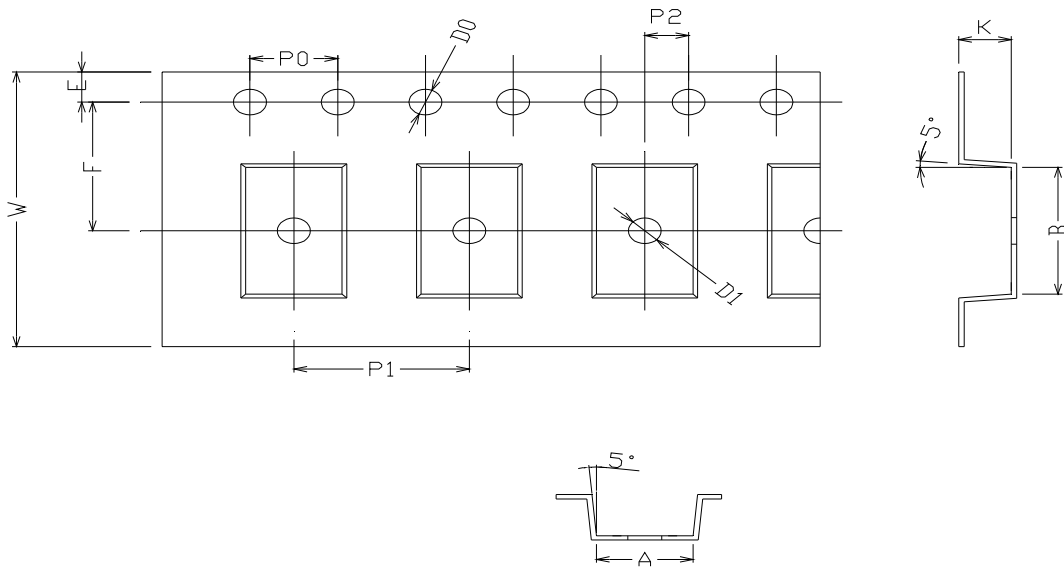
Option TA



Option TB



Tape dimensions

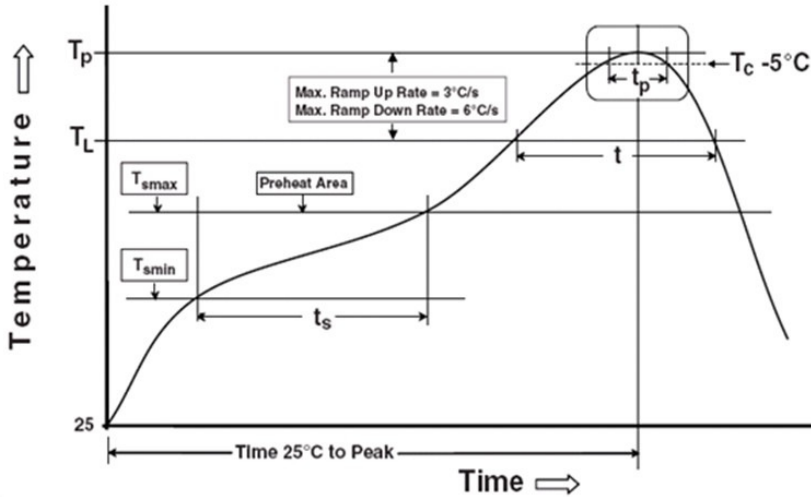


Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.4 ± 0.1	7.6 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.05
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.05	8.0 ± 0.1	2.0 ± 0.05	0.25 ± 0.03	16.0 ± 0.2	2.4 ± 0.1

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

DISCLAIMER

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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