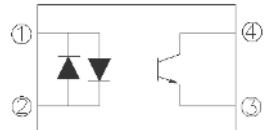


4 PIN SOP PHOTOTRANSISTOR PHOTOCOUPLED AC INPUT PHOTOCOUPLE EL354N-G Series

Schematic

Features

- Halogens free
(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- 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 ($V_{ISO} = 3750\text{ V rms}$)
- Compact small outline package
- Compliance with EU REACH
- 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 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

Pin Configuration

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

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I _F	±50	mA
	Peak forward current (1us, pulse)	I _{FP}	1	A
	Power dissipation Derating factor (above T _a = 90 °C)	P _D	70	mW
Output	Power dissipation Derating factor (above T _a = 70 °C)	P _C	150 3.7	mW 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 (Ta=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
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 EL354NA	20 50	- -	300 150	%	I _F = ±1mA ,V _{CE} = 5V
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	-	-	18	μs	V _{CE} =2V, I _C =2mA,R _L =100Ω
Fall time	t _f	-	-	18	μs	

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves

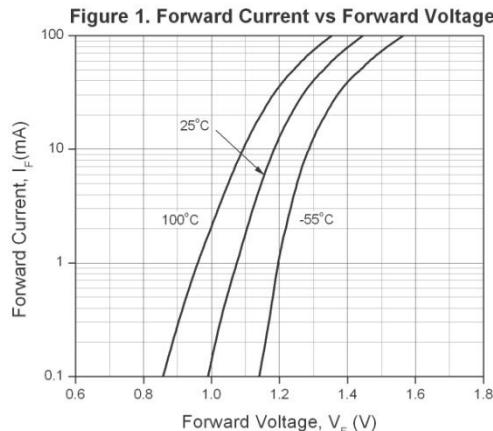


Figure 2. Normalized Collector Current vs Forward Current

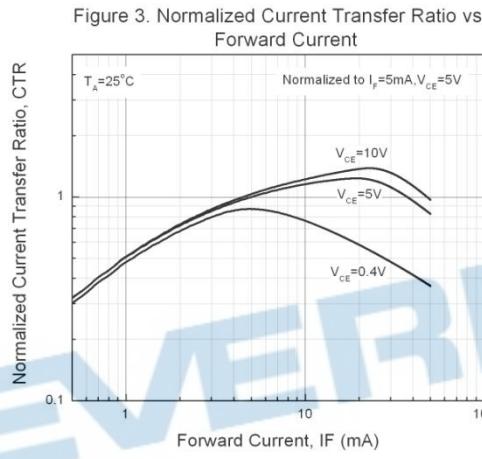
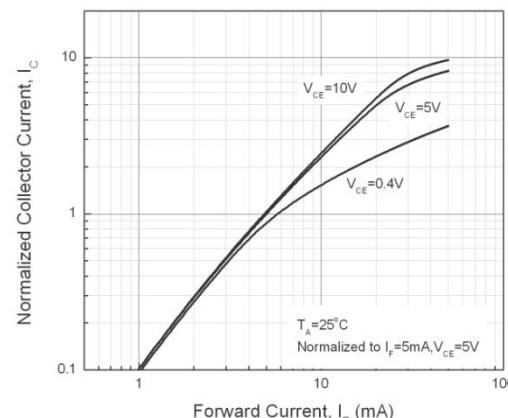


Figure 4. Normalized Collector Current vs Ambient Temperature

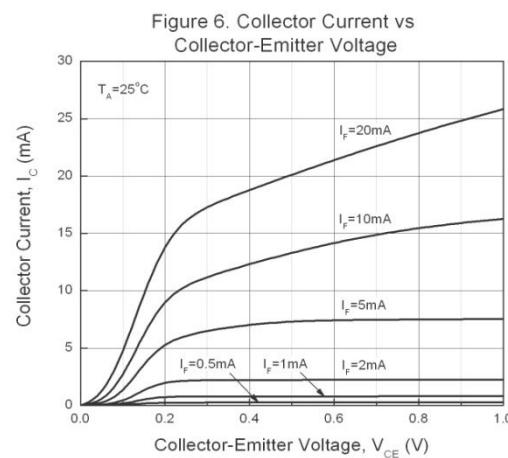
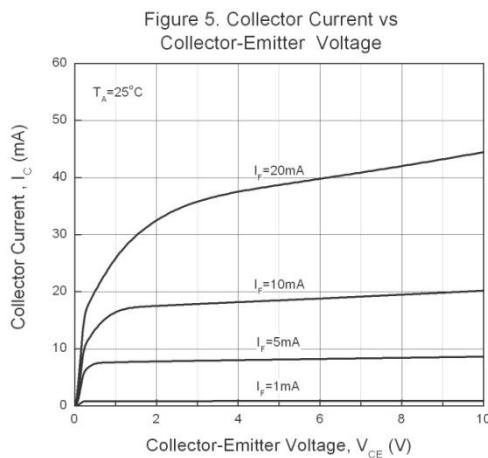
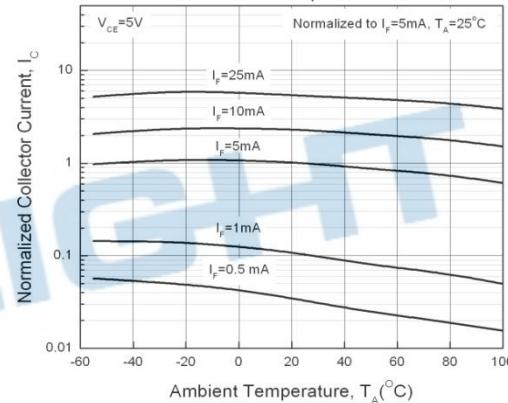


Figure 7. Collector Dark Current vs Ambient Temperature

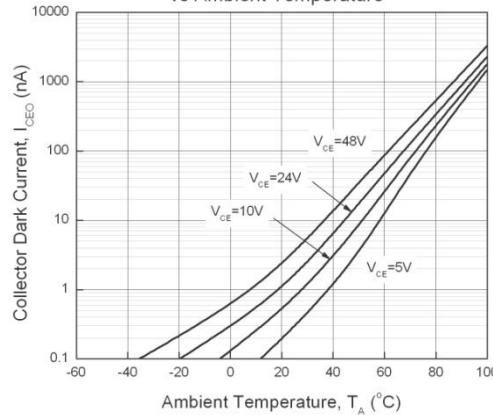


Figure 8. Switching Time vs Load Resistance

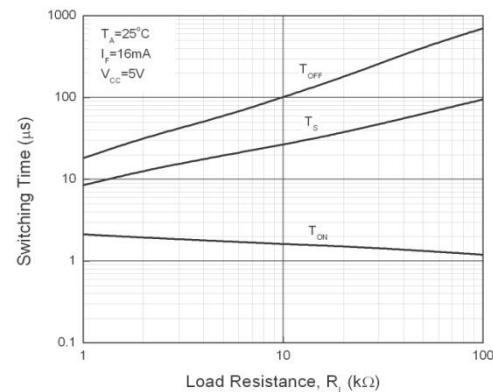


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

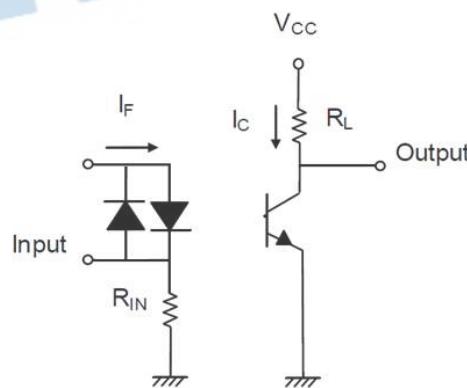
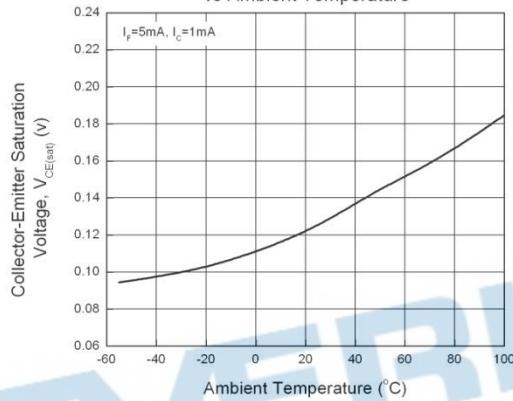


Figure 10. Switching Time Test Circuit & Waveforms

Order Information

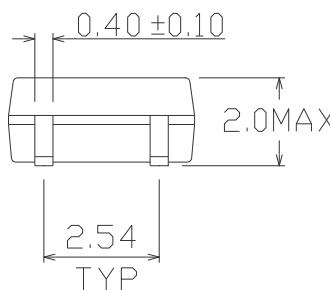
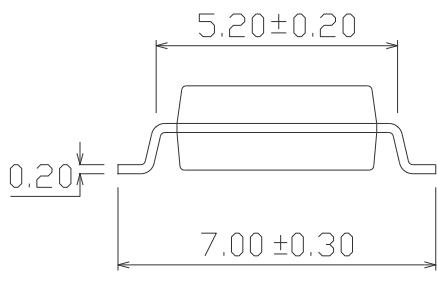
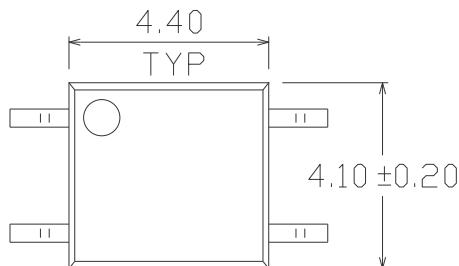
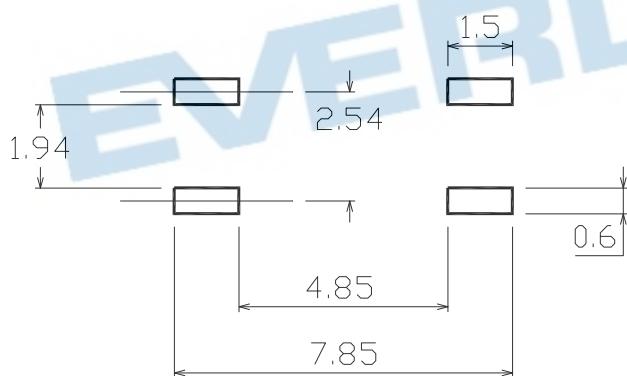
Part Number

EL354N(X)(Y)-VG

Notes

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****Notes**

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

Device Marking



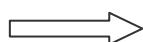
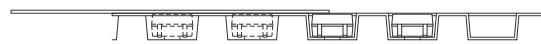
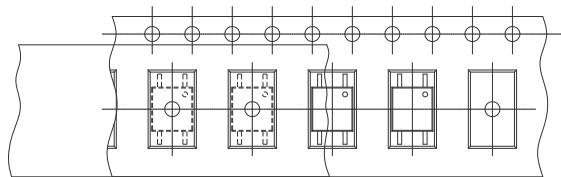
Notes

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)

EVERLIGHT

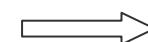
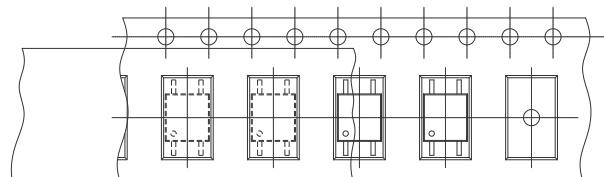
Tape & Reel Packing Specifications

Option TA



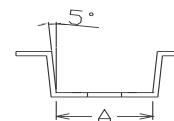
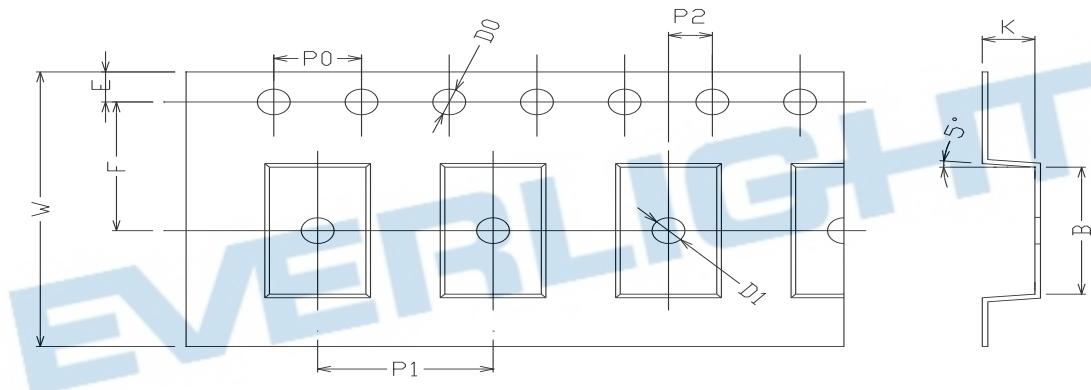
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions

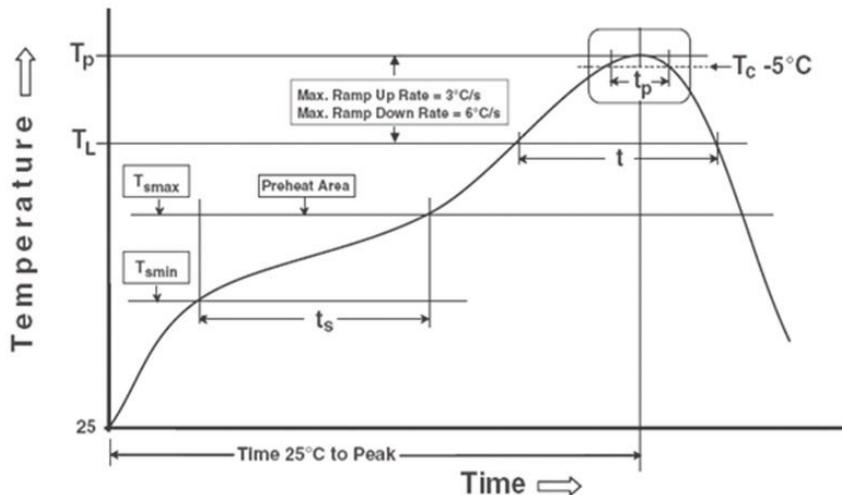


Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.4 ± 0.1	7.6 ± 0.1	$1.5 + 0.1/-0$	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.05
Dimension No.	P0	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.05	8.0 ± 0.1	2.0 ± 0.05	0.25 ± 0.03	16.0 ± 0.2	2.4 ± 0.1

Precautions for Use

1. Soldering Condition

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



Notes

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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