

EL357NE(TB)-VG Datasheet



DiGi Electronics Part Number	EL357NE(TB)-VG-DG
Manufacturer	Everlight Electronics Co Ltd
Manufacturer Product Number	EL357NE(TB)-VG
Description	OPTOISOLATOR 3.75KV TRANS 4-SOP
Detailed Description	Optoisolator Transistor Output 3750Vrms 1 Channel 4-SOP (2.54mm)

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Purchase and inquiry

Manufacturer Product Number:

EL357NE(TB)-VG

Series:

-

Number of Channels:

1

Current Transfer Ratio (Min):

100% @ 5mA

Turn On / Turn Off Time (Typ):

-

Input Type:

DC

Voltage - Output (Max):

80V

Voltage - Forward (Vf) (Typ):

1.2V

Vce Saturation (Max):

200mV

Mounting Type:

Surface Mount

Supplier Device Package:

4-SOP (2.54mm)

Manufacturer:

Everlight Electronics Co Ltd

Product Status:

Active

Voltage - Isolation:

3750Vrms

Current Transfer Ratio (Max):

200% @ 5mA

Rise / Fall Time (Typ):

3µs, 4µs

Output Type:

Transistor

Current - Output / Channel:

50mA

Current - DC Forward (If) (Max):

50 mA

Operating Temperature:

-55°C ~ 110°C

Package / Case:

4-SMD, Gull Wing

Base Product Number:

EL357

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

ECCN:

EAR99

Moisture Sensitivity Level (MSL):

1 (Unlimited)

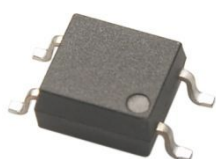
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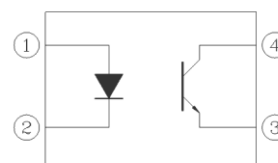
EVERLIGHT

DATASHEET

4 PIN SOP PHOTOTRANSISTOR PHOTOCOUPLER EL357N-G Series



Schematic



Features:

- Halogens free
(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output (Viso=3750 V rms)
- Compact 4 Pin SOP with a 2.0 mm profile
- Compliance with EU REACH
- Pb free and RoHS compliant
- UL and cUL approved (No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved

Pin Configuration

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

Description

The EL357N-G series contains an infrared emitting diode, optically coupled to a phototransistor detector.

The devices in a 4-pin small outline SMD package.

Applications

- DC-DC Converters
- Programmable controllers
- Telecommunication equipments
- Signal transmission between circuits of different potentials and impedances

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
	Reverse voltage	V_R	6	V
	Power dissipation Derating factor (about Ta=100°C)	P_D	70 2.9	mW mW/C
Output	Power dissipation Derating factor (above Ta = 70°C)	P_C	150 3.7	mW mW/°C
	Collector current	I_C	50	mA
	Collector-Emitter voltage	V_{CEO}	80	V
	Emitter-Collector voltage	V_{ECO}	7	V
	Total Power Dissipation	P_{TOT}	200	mW
	Isolation Voltage*1	V_{ISO}	3750	V rms
	Operating temperature	T_{OPR}	-55 ~ +110	°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}	-	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}	80	-	-	V	I _C = 0.1mA
Emitter-Collector breakdown voltage	BV _{ECO}	7	-	-	V	I _E = 0.01mA

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

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	EL357N	50	-	600	%	I _F = 5mA, V _{CE} = 5V
	EL357NA	80	-	160		
	EL357NB	130	-	260		
	EL357NC	200	-	400		
	EL357ND	300	-	600		
	EL357NE	100	-	200		
	EL357NF	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
Rise time	t _r	-	3	18	μs	V _{CE} = 2V, I _C = 2mA, R _L = 100Ω
Fall time	t _f	-	4	18		

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves

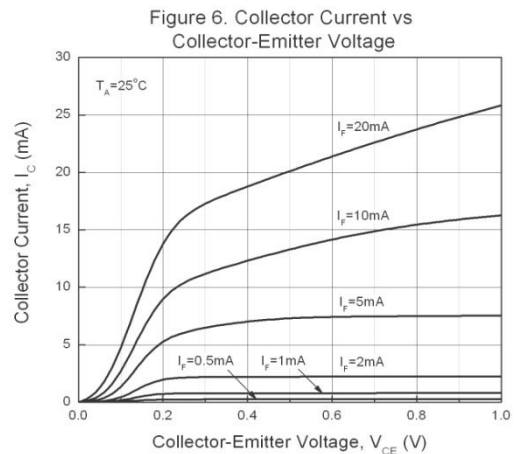
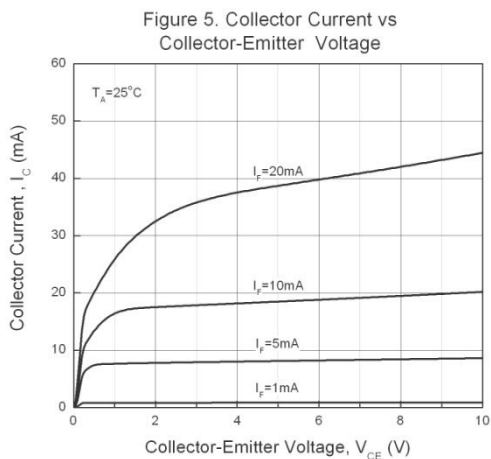
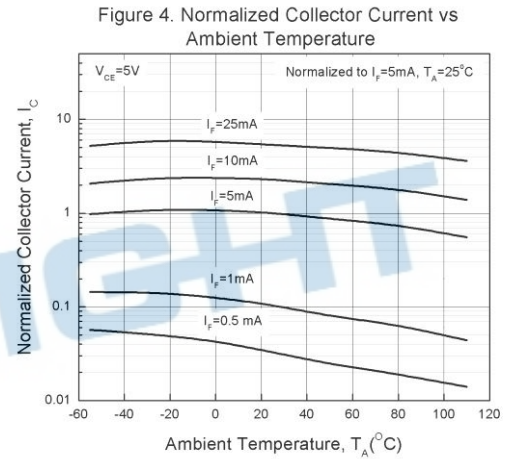
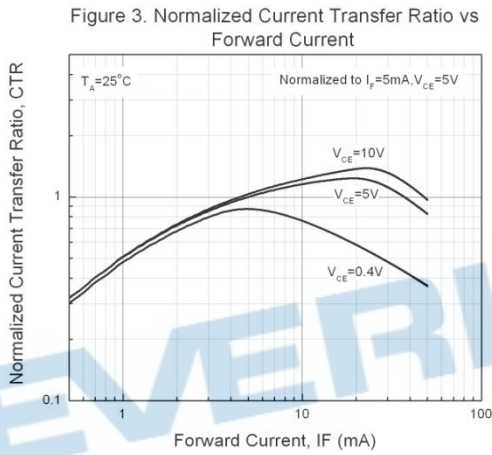
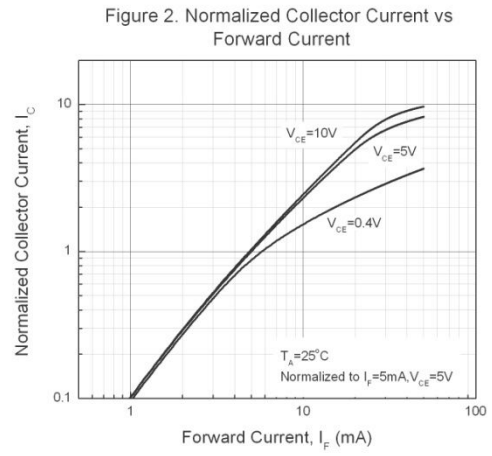
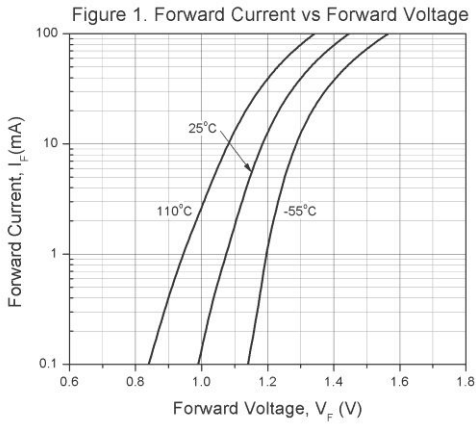


Figure 7. Collector Dark Current vs Ambient Temperature

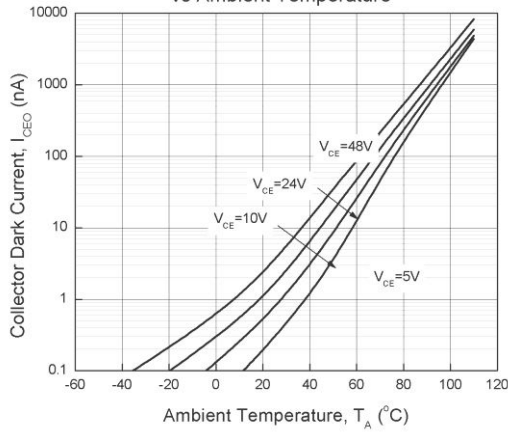


Figure 8. Switching Time vs Load Resistance

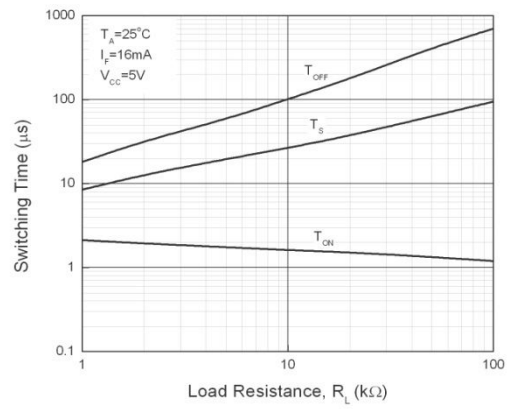


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

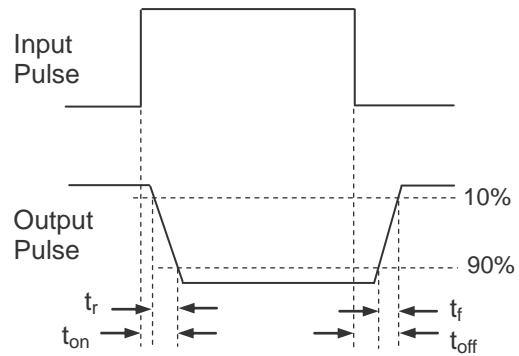
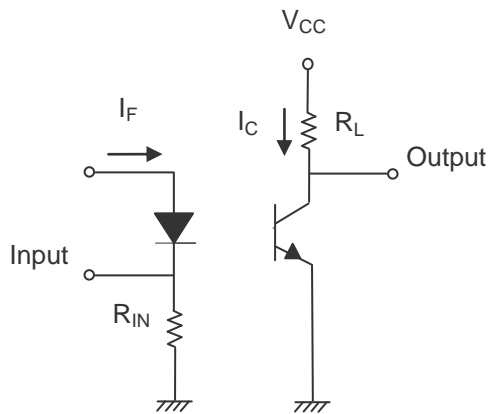
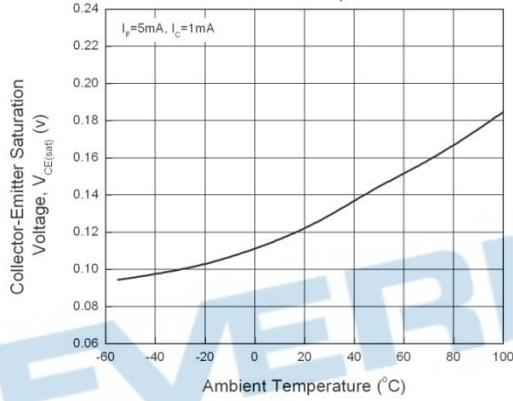


Figure 10. Switching Time Test Circuit & Waveforms

Order Information

Part Number

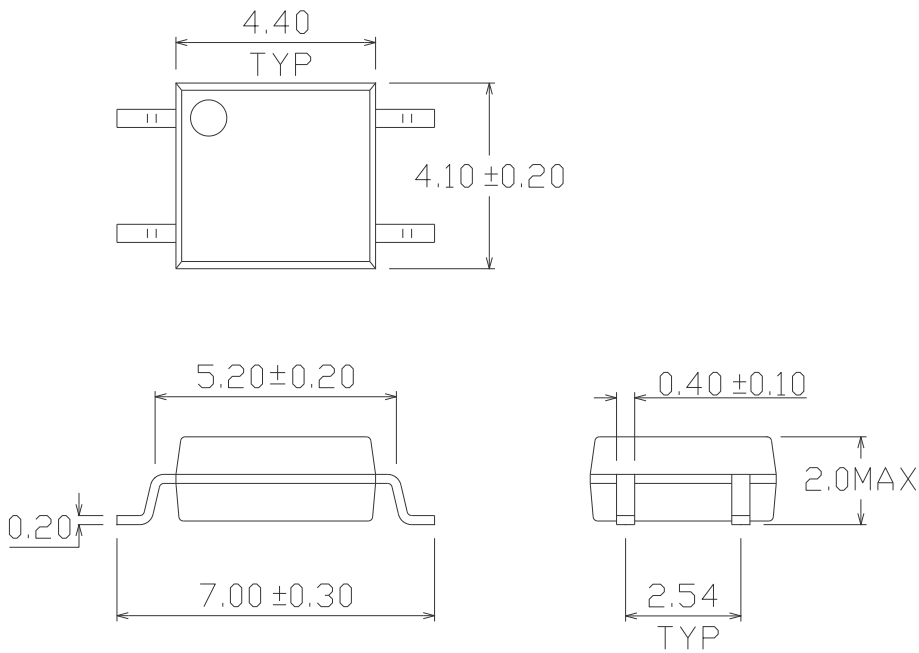
EL357N(X)(Y)-VG

Note

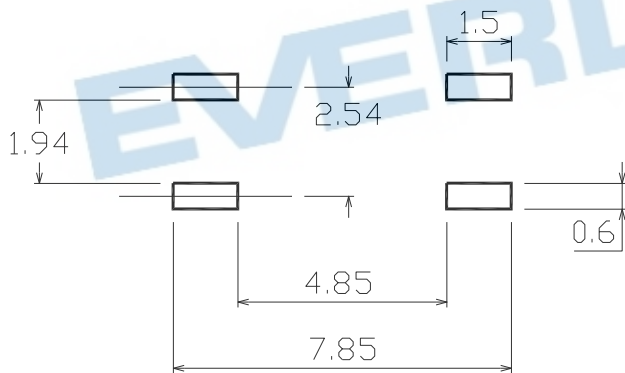
- X = CTR Rank (A, B, C, D, E, For none)
 Y = Tape and reel option (TA, TB or none).
 V = VDE (option)
 G = Halogen free

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

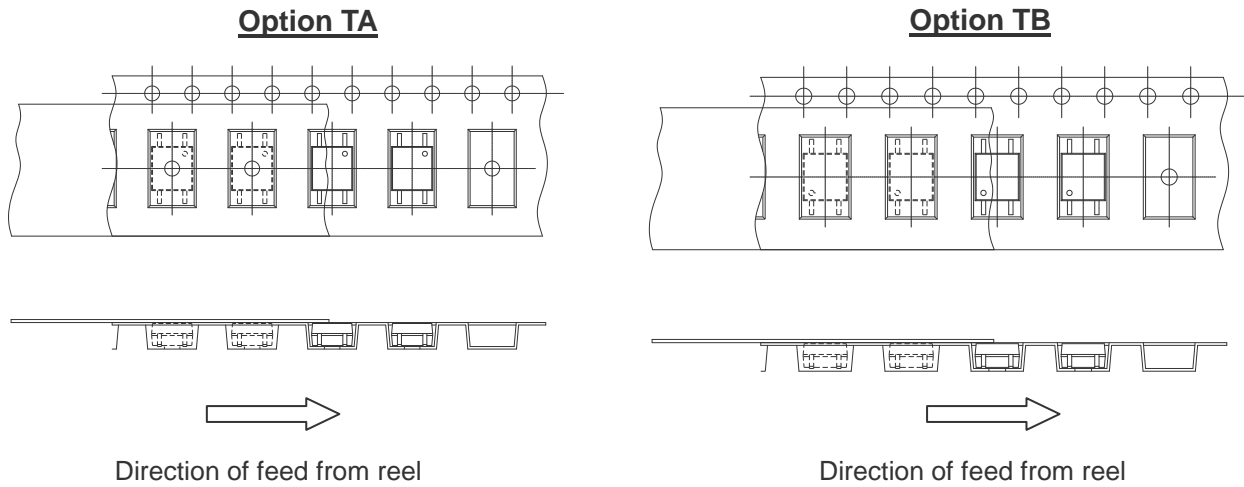


Device Marking**Notes**

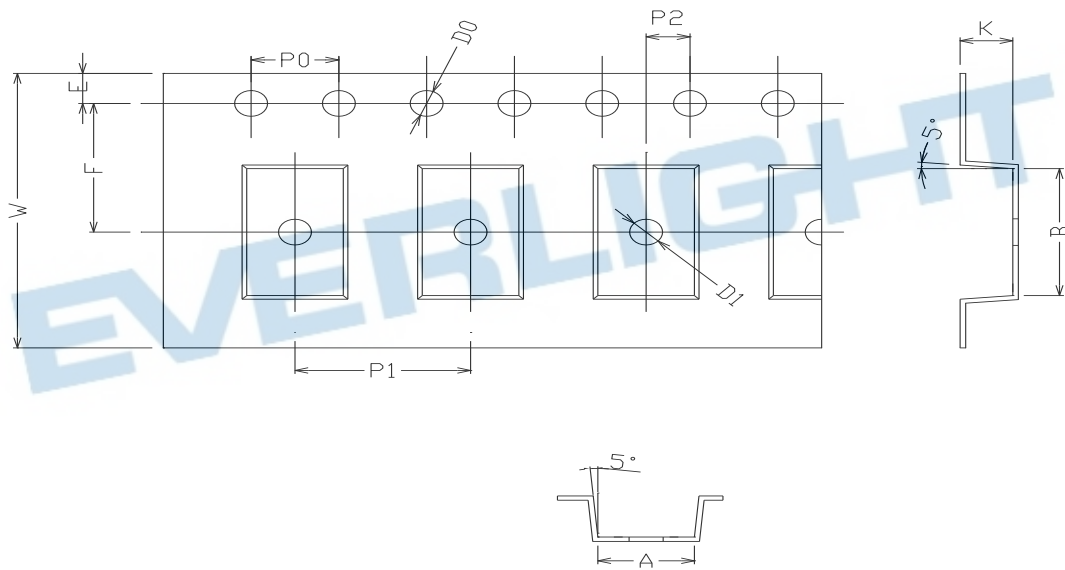
EL	denotes Everlight
357N	denotes Device Number
R	denotes CTR Rank
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE approved (optional)

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Tape & Reel Packing Specifications



Tape dimensions

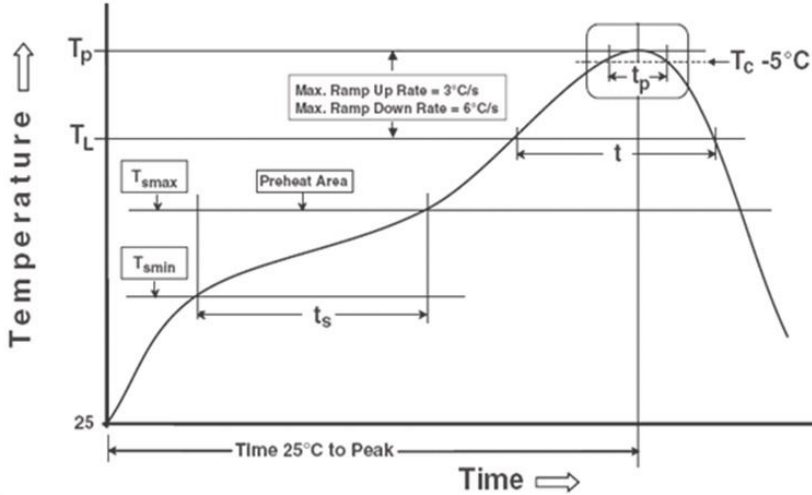


Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.4 ± 0.1	7.4 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75± 0.1	7.5 ± 0.05
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.15	8.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	16.0 ± 0.2	2.4± 0.1

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

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