

# EL357NE(TA)-VG Datasheet



DiGi Electronics Part Number	EL357NE(TA)-VG-DG
Manufacturer	<a href="#">Everlight Electronics Co Ltd</a>
Manufacturer Product Number	EL357NE(TA)-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(TA)-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)

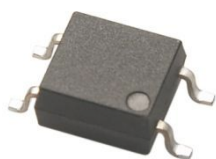
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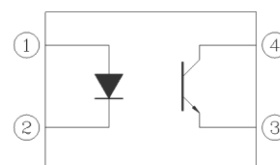
# EVERLIGHT

## 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 (Ta=25°C unless specified otherwise)**
**Input**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	$V_F$	-	1.2	1.4	V	$I_F = 20\text{mA}$
Reverse current	$I_R$	-	-	10	$\mu\text{A}$	$V_R = 4\text{V}$
Input capacitance	$C_{in}$	-	30	250	pF	$V = 0, f = 1\text{kHz}$

**Output**

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Collector-Emitter dark current	$I_{CEO}$	-	-	100	nA	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	$BV_{CEO}$	80	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	$BV_{ECO}$	7	-	-	V	$I_E = 0.01\text{mA}$

**Transfer Characteristics (Ta=25°C unless specified otherwise)**

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition	
Current Transfer ratio	EL357N	50	-	600	%	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	
	EL357NA	80	-	160			
	EL357NB	130	-	260			
	EL357NC	CTR	200	-			400
	EL357ND		300	-			600
	EL357NE		100	-			200
	EL357NF		150	-			300
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	$I_F = 20\text{mA}, I_C = 1\text{mA}$	
Isolation resistance	$R_{IO}$	$5 \times 10^{10}$	-	-	$\Omega$	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$	
Floating capacitance	$C_{IO}$	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$	
Rise time	$t_r$	-	3	18	$\mu\text{s}$	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$	
Fall time	$t_f$	-	4	18			

\* Typical values at  $T_a = 25^\circ\text{C}$

Typical Electro-Optical Characteristics Curves

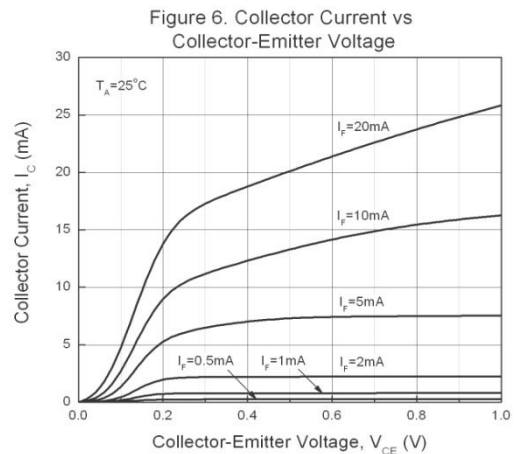
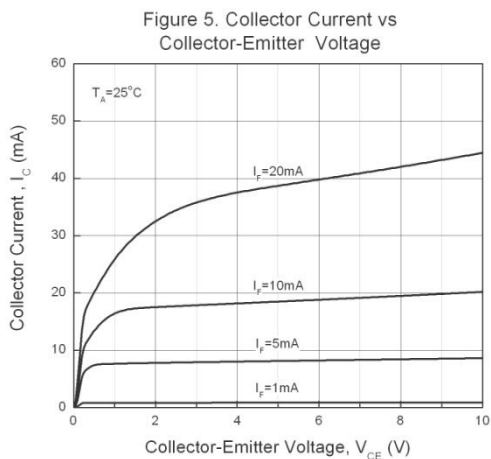
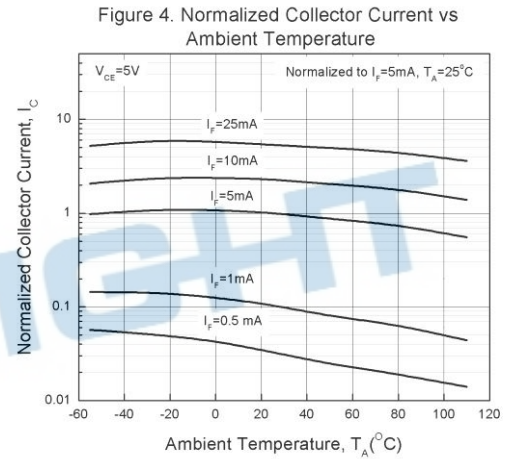
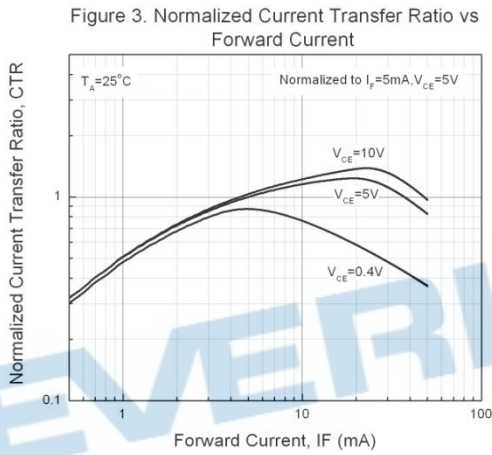
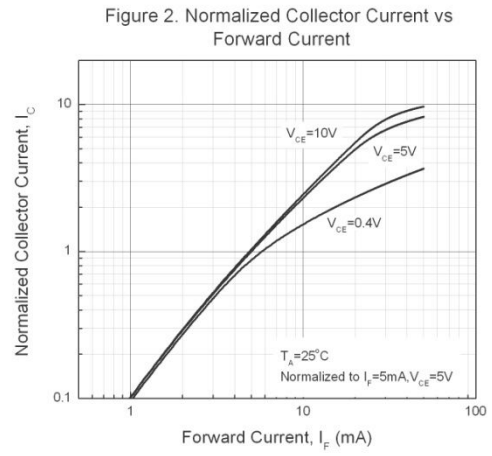
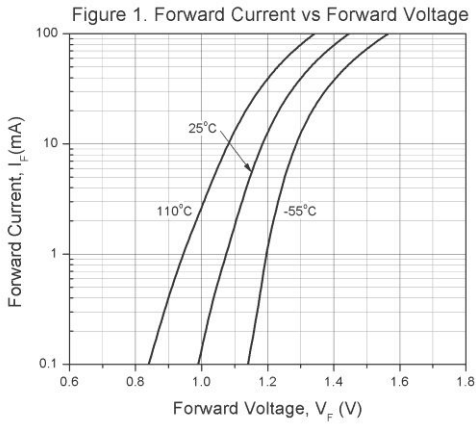


Figure 7. Collector Dark Current vs Ambient Temperature

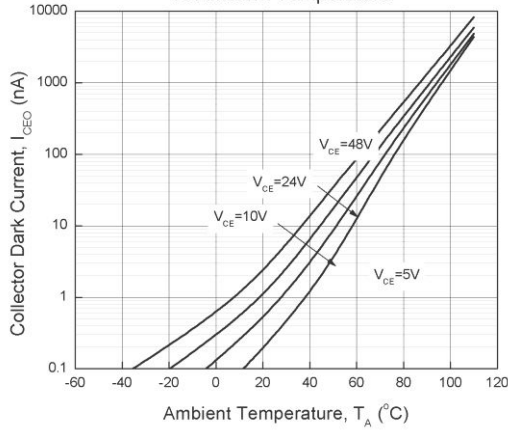


Figure 8. Switching Time vs Load Resistance

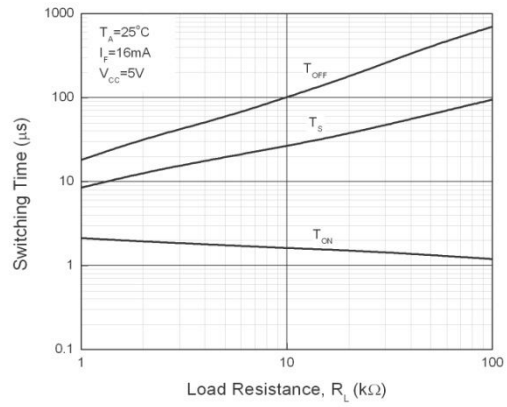


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

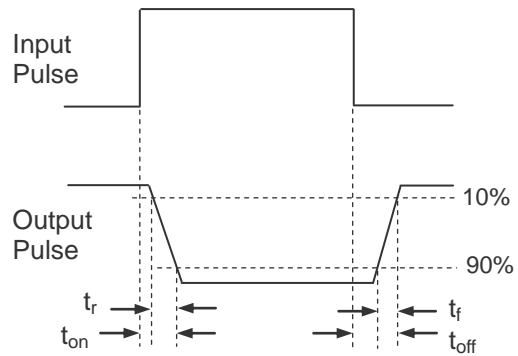
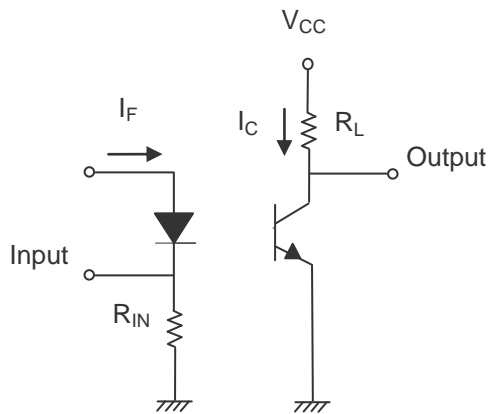
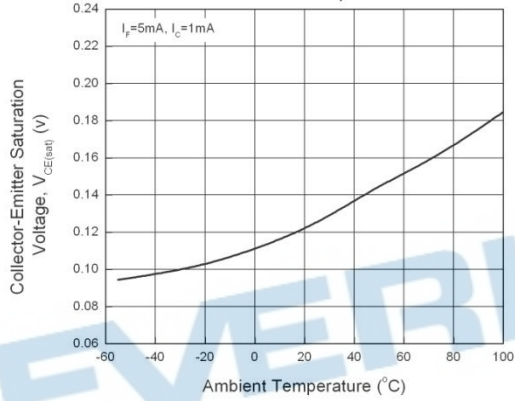


Figure 10. Switching Time Test Circuit & Waveforms

## Order Information

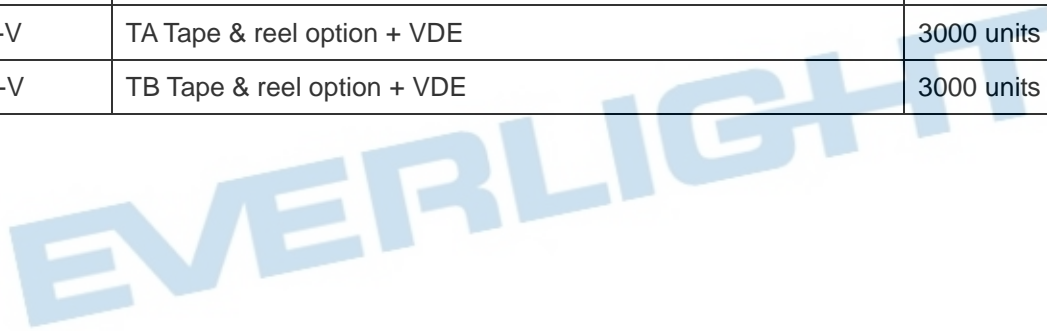
### Part Number

# EL357N(X)(Y)-VG

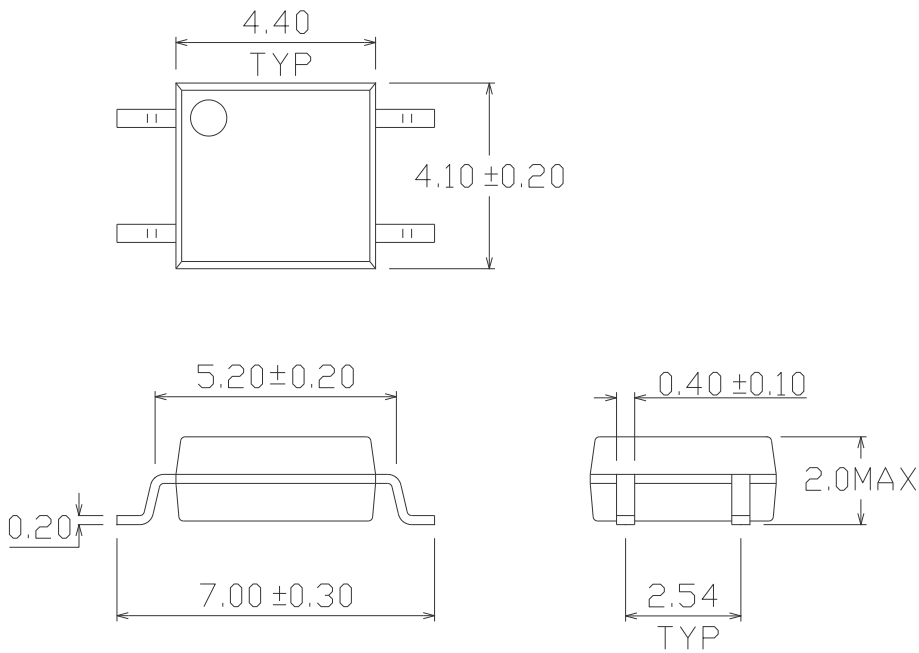
### Note

- 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

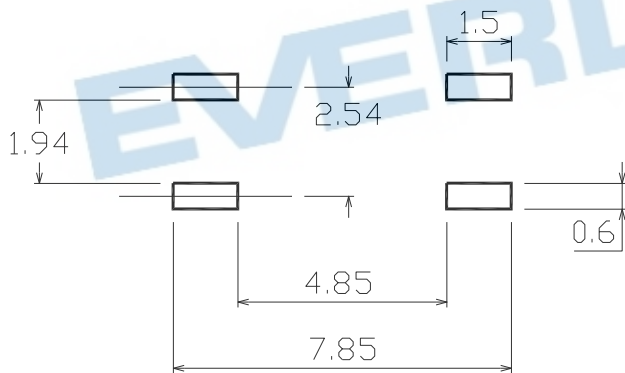
Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	3000 units per reel
(TB)	TB Tape & reel option	3000 units per reel
(TA)-V	TA Tape & reel option + VDE	3000 units per reel
(TB)-V	TB Tape & reel option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



**Package Dimension (Dimensions in mm)**



**Recommended pad layout for surface mount leadform**



## Device Marking

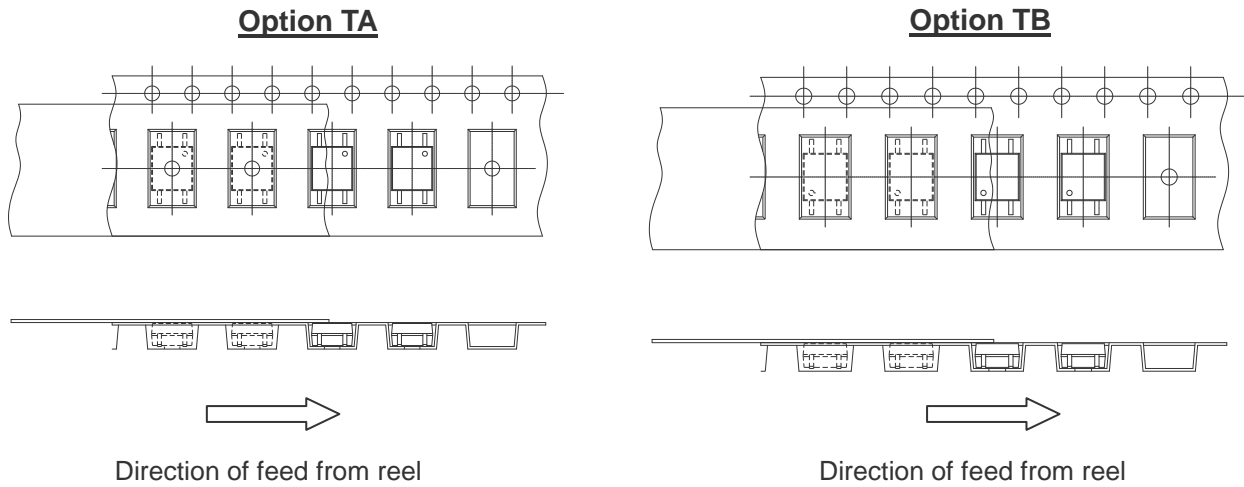


## Notes

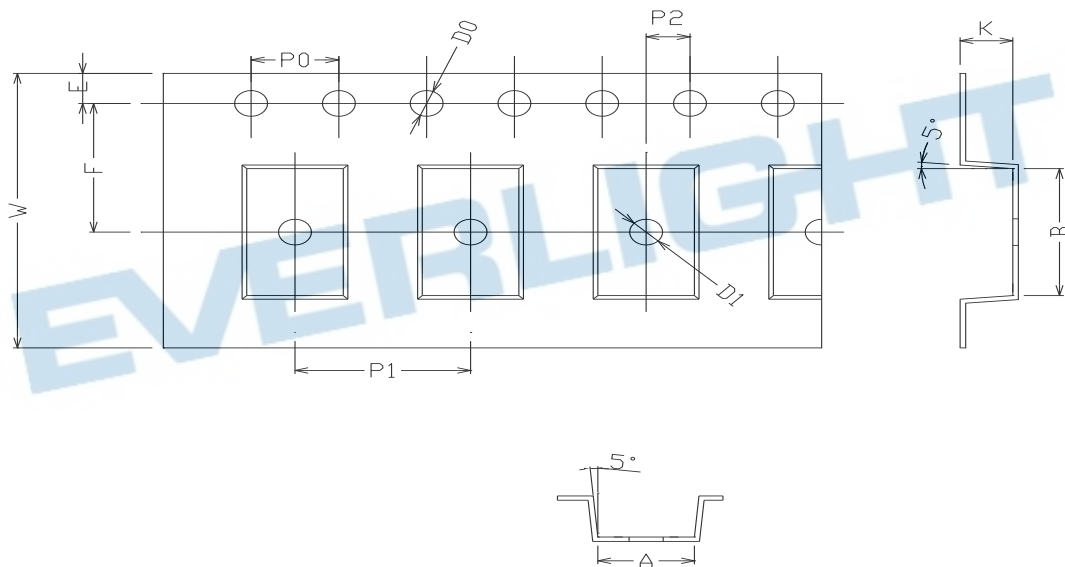
EL	denotes Everlight
357N	denotes Device Number
R	denotes CTR Rank
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE approved (optional)

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**Tape & Reel Packing Specifications**



**Tape dimensions**

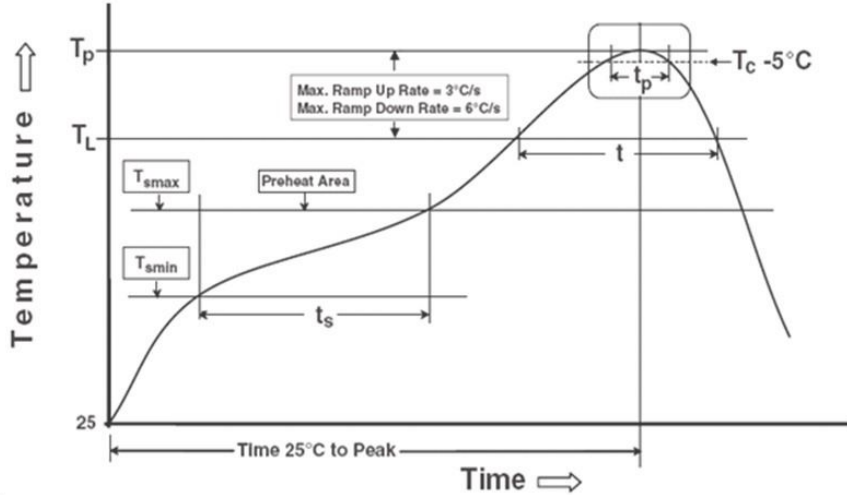


Dimension No.	<b>A</b>	<b>B</b>	<b>Do</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension (mm)	4.4 ± 0.1	7.4 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75± 0.1	7.5 ± 0.05
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K</b>
Dimension (mm)	4.0 ± 0.15	8.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	16.0 ± 0.2	2.4± 0.1

## 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

**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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