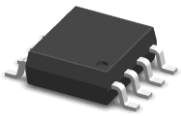
EVERLIGHT

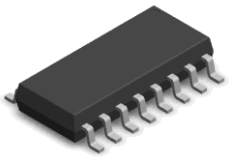
8PIN 16 PIN ULTRA SMALL SSOP PHOTOTRANSISTOR PHOTOCOUPLER

ELD3H7 ELQ3H7 Series

Features:

- Halogens free
- Current transfer ratio
  (CTR: 50~600% at I_F =5mA, V_{CE} =5V)
- High isolation voltage between input and output (Viso=3750 V rms)
- Compact 8 Pin SSOP with a 2.0 mm profile
- Pb free and RoHS compliant.
- UL approved (E214129)
- VDE approved (40028116)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved



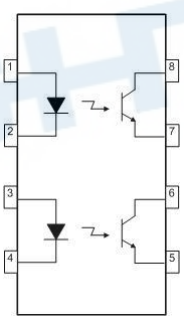


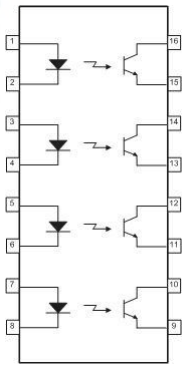
Description

The ELD3H7 and ELQ3H7 contains of an infrared emitting diode optically coupled to a phototransistor detector encapsulated with green compound.

ELD3H7 offers 2 channels in a 8-pin small outline SMD package, while ELQ3H7 offers 4 channels in a 16-pin small outline SMD package.

Schematic





1, 3 Anode
2, 4 Cathode
5, 7 Emitter
6, 8 Collector

1, 3, 5, 7 Anode
2, 4, 6, 8 Cathode
9, 11, 13, 15 Emitter
10, 12, 14, 16 Collector

Applications

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

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Absolute Maximum Ratings (T_a=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Peak forward current (1us, pulse)	I_{FP}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	70	mW
Output	Power dissipation	P_C	150	mW
	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, LED side pins shorted together, and detector side pins shorted together.

*2 For 10 seconds.

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Electrical 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 = 0.1mA

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

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	CTR	50	-	600	%	I_F = 5mA ,V_{CE} = 5V

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

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	I_F = 10mA ,I_C = 1mA
Isolation resistance	R_{IO}	5×10^{10}	-	-	Ω	V_{IO} = 500Vdc, 40~60% R.H.
Floating capacitance	C_{IO}	-	0.3	1.0	pF	V_{IO} = 0, f = 1MHz
Rise time	t_r	-	5	18	μs	V_{CE} = 2V, I_C = 2mA, R_L = 100Ω
Fall time	t_f	-	3	18	μs	

* Typical values at T_a = 25°C

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Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

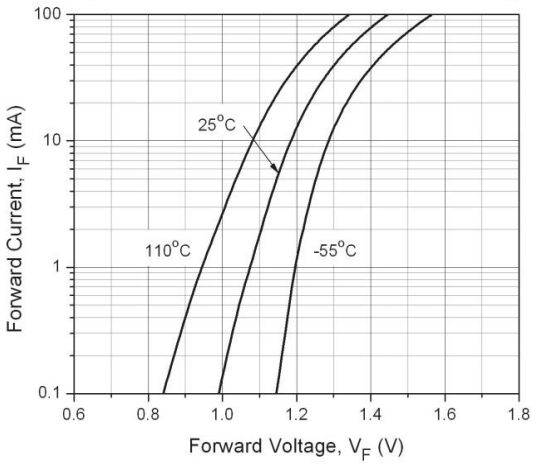

Figure 2. Normalized Collector Current vs Forward Current

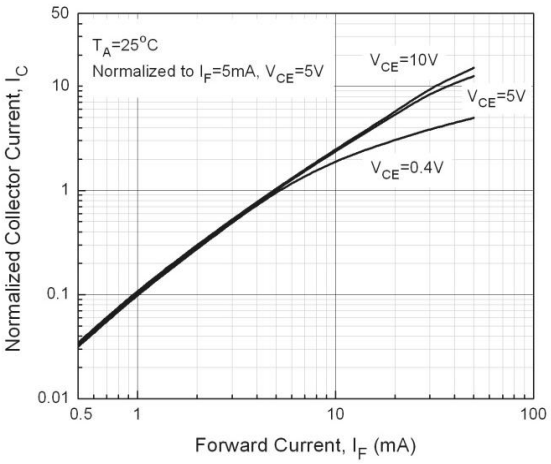

Figure 3. Normalized Current Transfer Ratio vs Forward Current

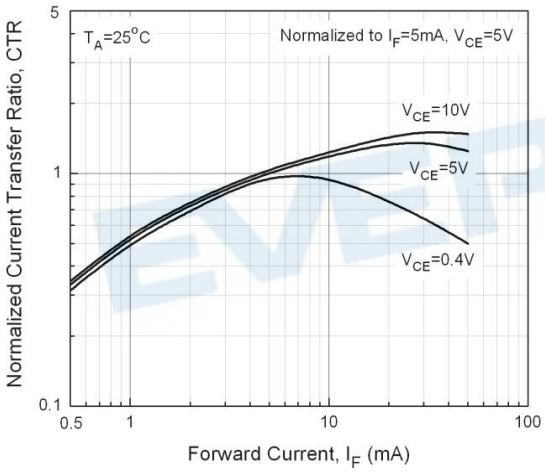

Figure 4. Normalized Collector Current vs Ambient Temperature

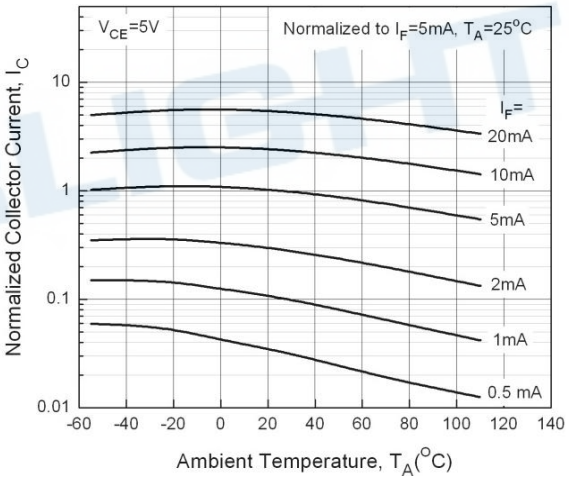

Figure 5. Normalized Current Transfer Ratio vs Ambient Temperature

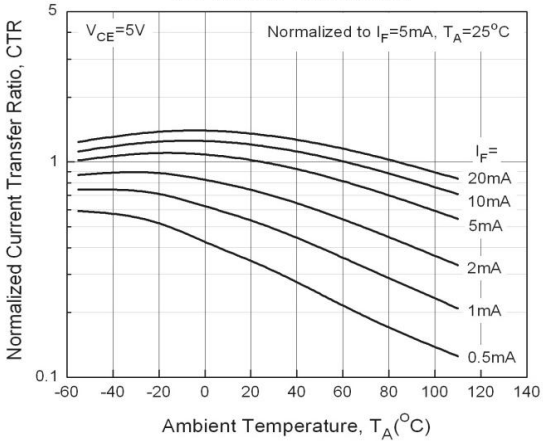

Figure 6. Collector Current vs Collector-Emitter Voltage

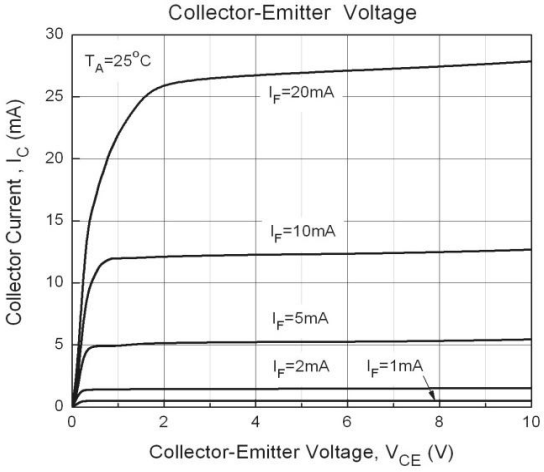

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Figure 7. Collector Current vs Collector-Emitter Voltage

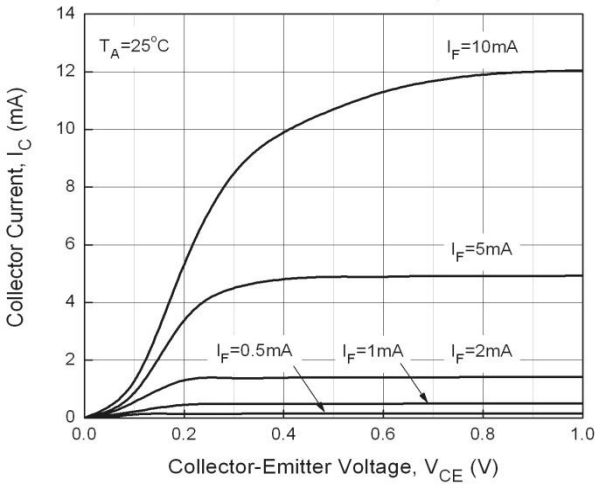


Figure 8. Collector Dark Current vs Ambient Temperature

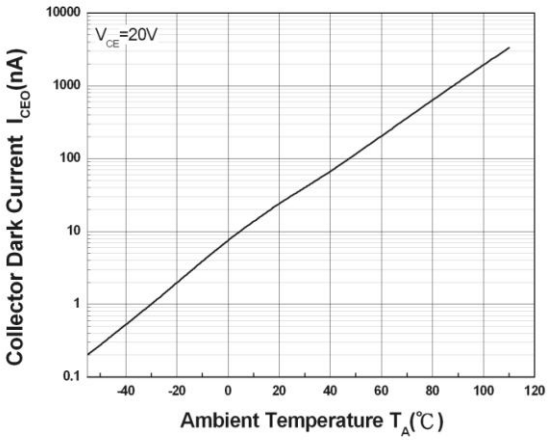


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

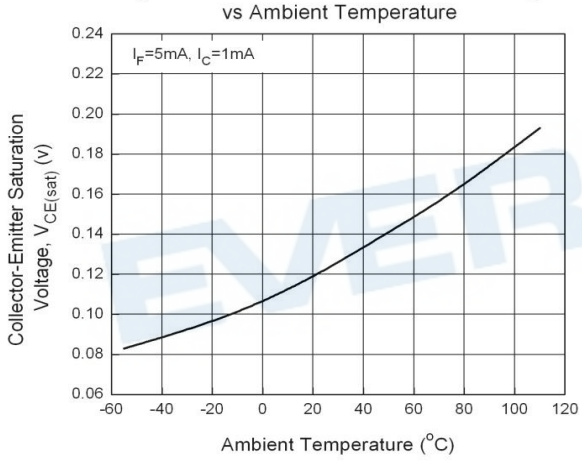
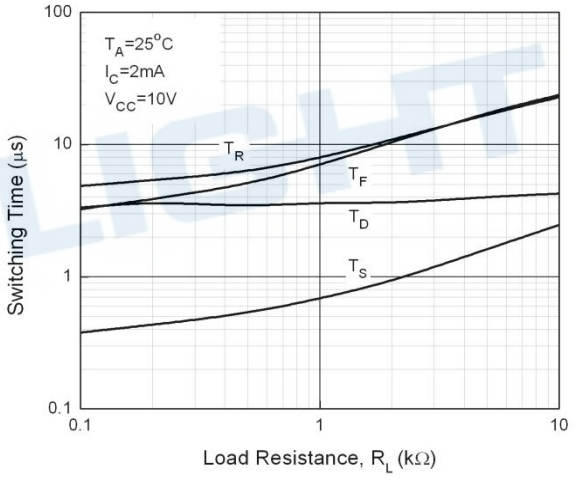


Figure 10. Switching Time vs Load Resistance



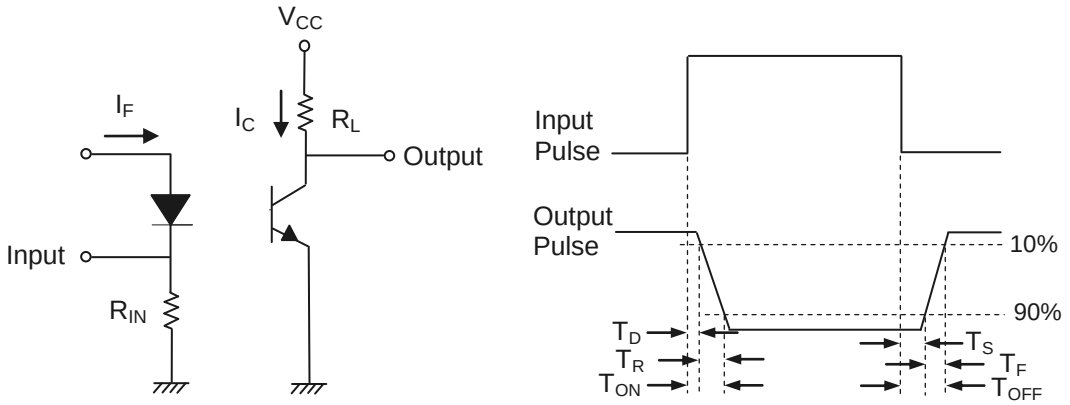


Figure 11. Switching Time Test Circuit & Waveforms

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Order Information

Part Number

ELD3H7(Z)-V, ELQ3H7(Z)-V

Note
D3H7, Q3H7 = Part No.
Z = Tape and reel option (TA or none).
V = VDE (optional)

Option	Description	Packing quantity
None	Tube option of ELD3H7	80 units per tube
(TA)	Tape & reel option of ELD3H7	1000 units per reel
None	Tube option of ELQ3H7	40 units per tube
(TA)	Tape & reel option of ELQ3H7	1000 units per reel

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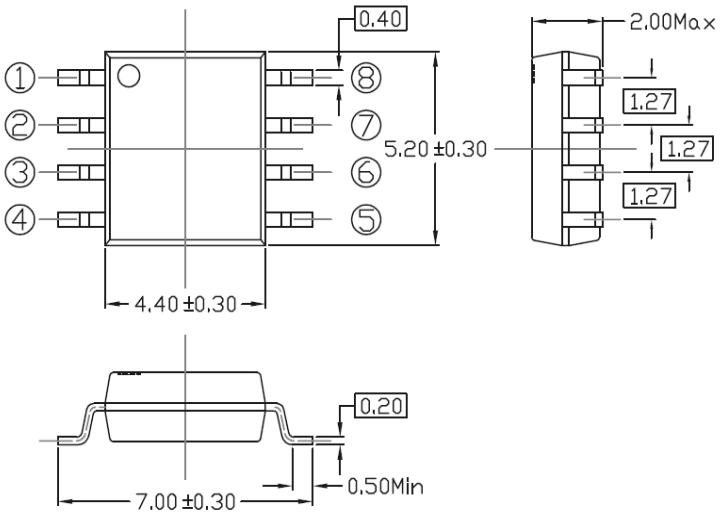
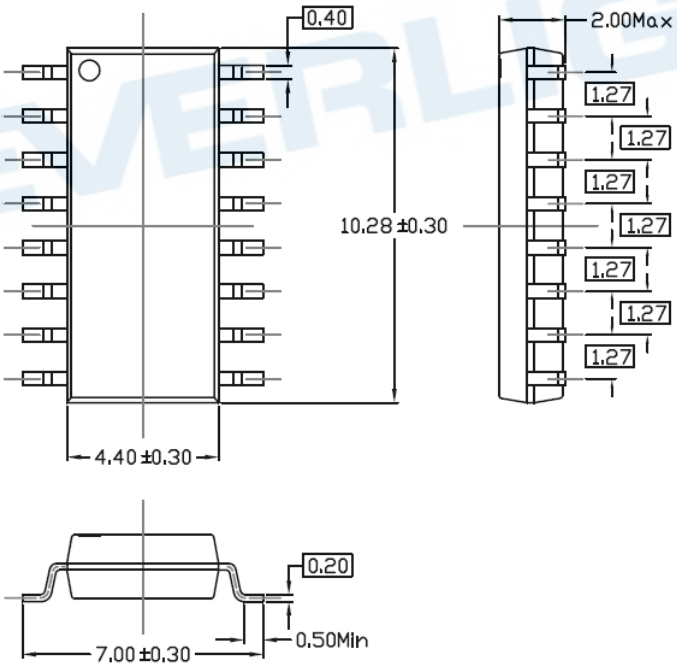
Package Drawing

(Dimensions in mm)

ELD3H7



ELQ3H7



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Recommended pad layout for surface mount leadform

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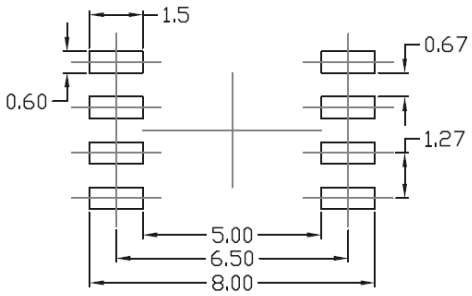
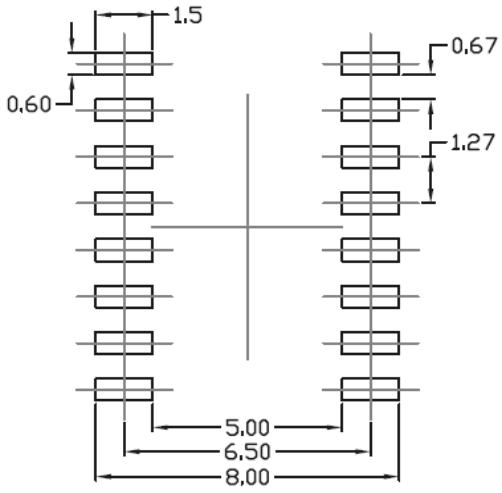
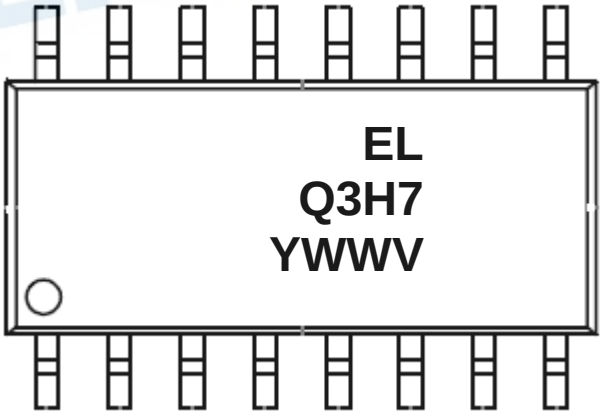


ELQ3H7



Device Marking



Notes

EL	denotes Everlight
Q3H7 D3H7	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

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Tape & Reel Packing Specifications

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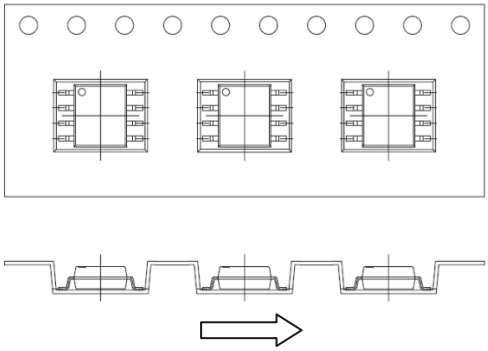
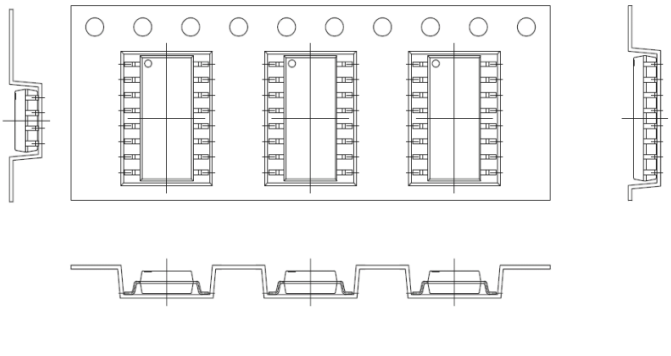
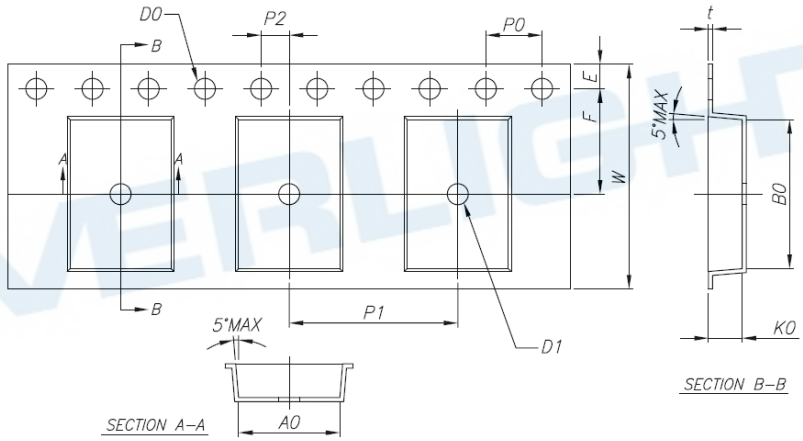


ELQ3H7



Direction of feed from reel

Tape dimensions



Dimension No.		***A0***	***B0***	***D0***	***D1***	***E***	***F***
Dimension (mm)	D3H7	7.4±0.1	5.6±0.1	1.5+0.1 -0	1.5+0.1 -0	1.75±0.1	7.5±0.1
	Q3H7	7.2±0.1	10.6±0.1	1.5+0.1 -0	1.5+0.1 -0	1.75±0.1	7.5±0.1
Dimension No.		***P0***	***P1***	***P2***	***t***	***W***	***K0***
Dimension (mm)	D3H7	4.0±0.1	12.0±0.1	2.0±0.1	0.3±0.05	16.0±0.3	2.4±0.1
	Q3H7	4.0±0.1	12.0±0.1	2.0±0.1	0.3±0.05	16.0±0.3	2.4±0.1

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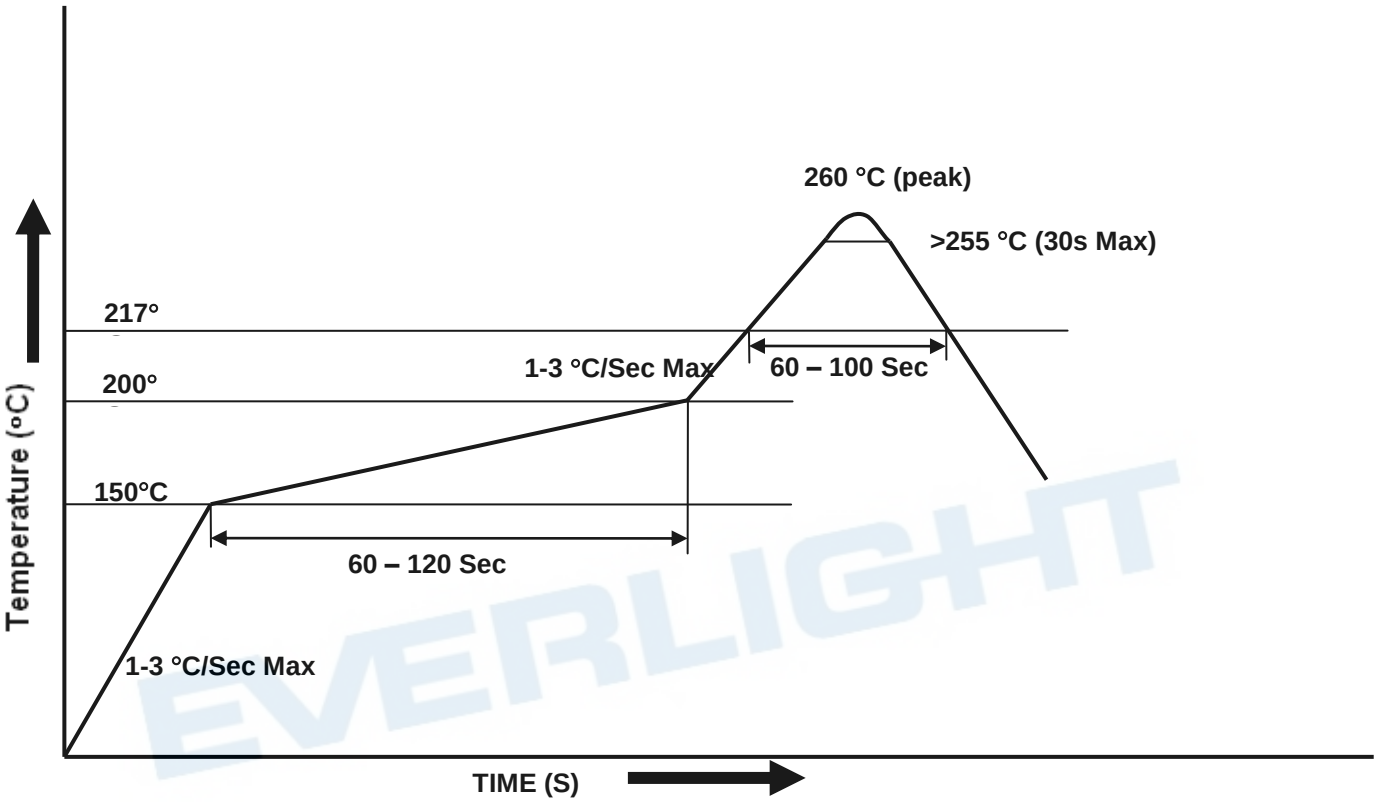
Solder Reflow Temperature Profile



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