



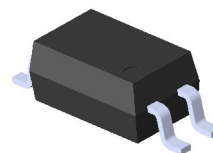
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4 PIN ULTRA SMALL SSOP PHOTOTRANSISTOR PHOTOCOUPLER

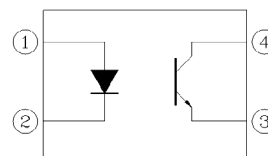
EL3H7-G Series

Features:

- Halogens free
- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
(CTR: 40~320% at $I_F = 10\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output ($V_{iso} = 3750\text{ V rms}$)
- Compact 4 Pin SSOP with a 2.0 mm profile
- Pb free and RoHS compliant.
- UL approved (No. 214129)
- VDE approval (132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved



Schematic



Description

The EL3H7-G series devices consist of an infrared emitting diode, optically coupled to a phototransistor detector encapsulated with green compound.

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

Pin Configuration

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

Applications

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

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EL3H7-G Series

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

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 (above $T_a = 90^{\circ}\text{C}$)	P_D	70	mW
	2.0		mW/ $^{\circ}\text{C}$	
Output	Power dissipation Derating factor (above $T_a = 70^{\circ}\text{C}$)	P_C	150	mW
			3.1	mW/ $^{\circ}\text{C}$
	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	$^{\circ}\text{C}$
Storage temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$
Soldering temperature ^{*2}		T_{SOL}	260	$^{\circ}\text{C}$

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.



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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	EL3H7	50	-	600	%	I _F = 5mA, V _{CE} = 5V
	EL3H7A	80	-	160		
	EL3H7B	130	-	260		
	EL3H7C	200	-	400		
	EL3H7D	300	-	600		
	EL3H7E	100	-	200		
	EL3H7F	150	-	300		I _F = 10mA, V _{CE} = 5V
	EL3H7H	40	-	80		
	EL3H7I	63	-	125		
	EL3H7J	100	-	200		
	EL3H7K	160	-	320		
	CTR					



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Transfer Characteristics ($T_a=25^\circ\text{C}$ unless specified otherwise)

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

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

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Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

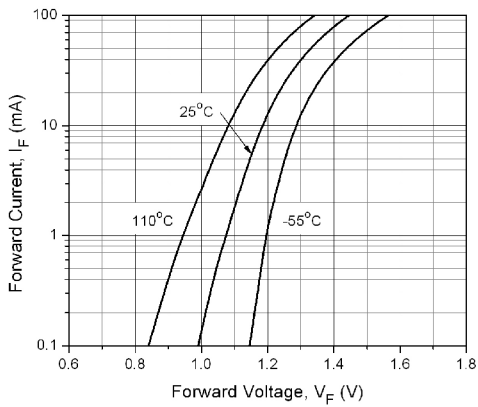


Figure 2. Normalized Collector Current vs Forward Current

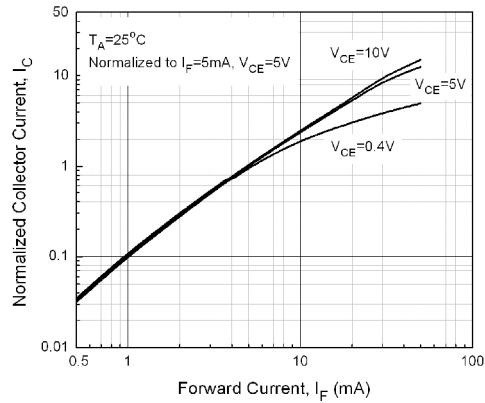


Figure 3. Normalized Current Transfer Ratio vs Forward Current

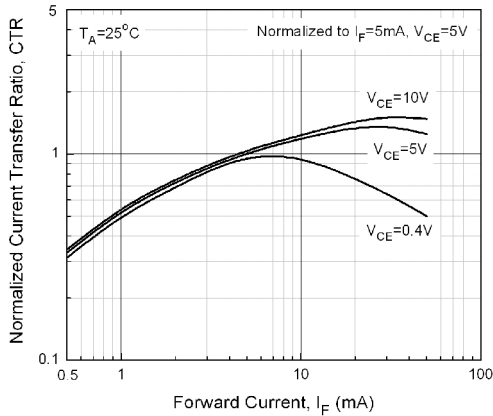
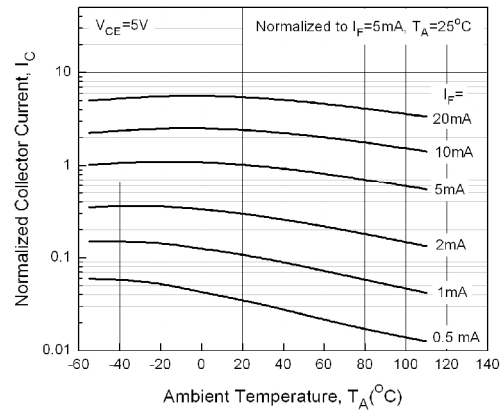


Figure 4. Normalized Collector Current vs Ambient Temperature



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Figure 5. Normalized Current Transfer Ratio vs Ambient Temperature

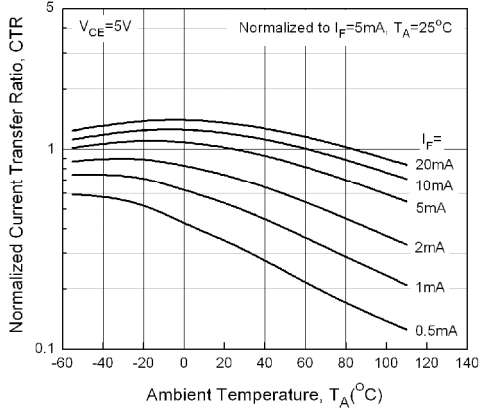


Figure 6. Collector Current vs Collector-Emitter Voltage

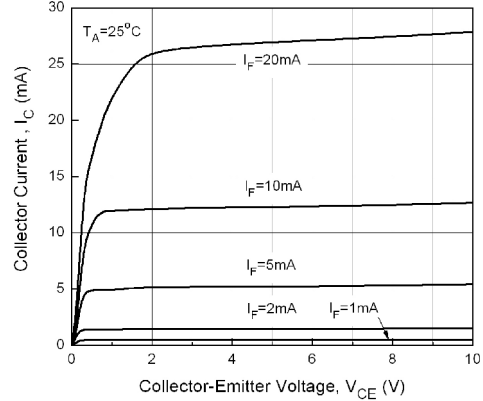


Figure 7. Collector Current vs Collector-Emitter Voltage

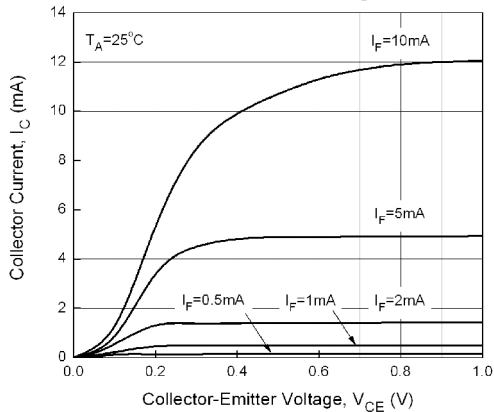


Figure 8. Collector Dark Current vs Ambient Temperature

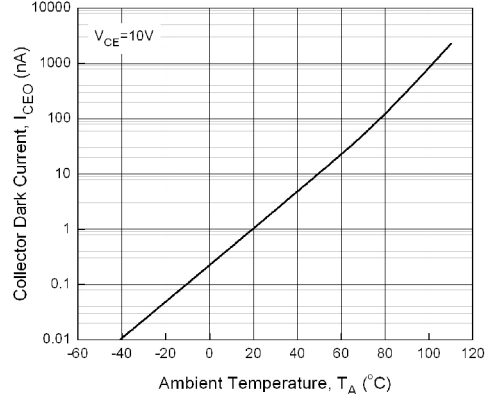


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

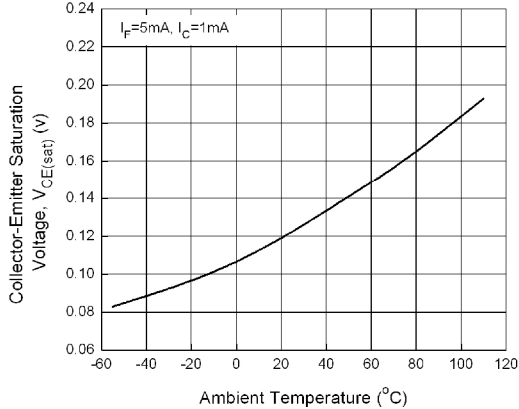
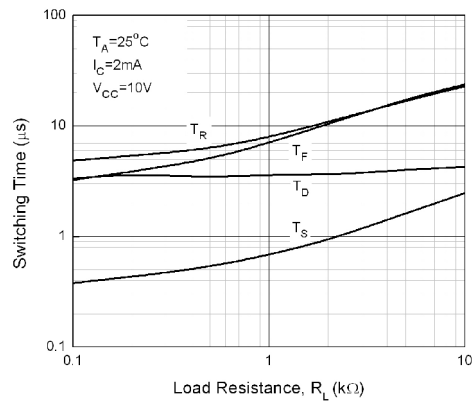


Figure 10. Switching Time vs Load Resistance



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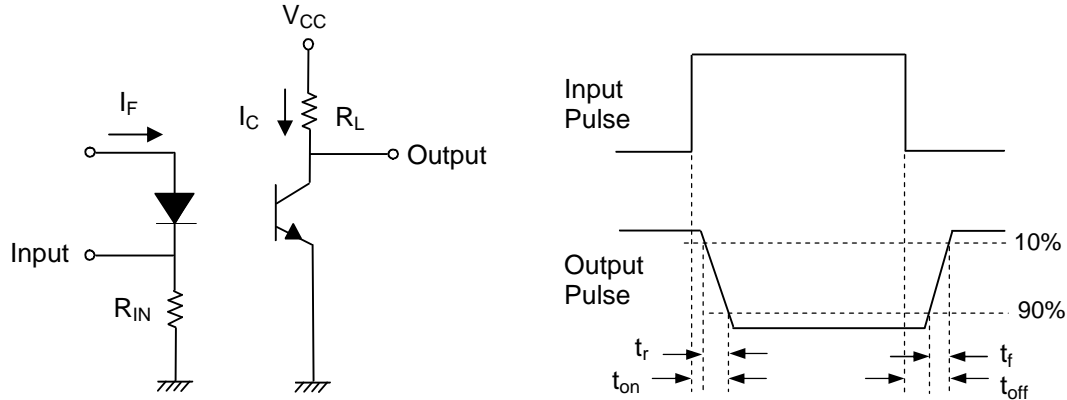


Figure 11. Switching Time Test Circuit & Waveforms

Order Information

Part Number

EL3H7(X)(Y)-VG

Note

- 3H7 = Part No.
- X = CTR Rank (A, B, C, D, E, F, H, I, J, K or none)
- Y = Tape and reel option (TA, TB, EA, EB or none).
- V = VDE (optional)
- G = Halogens free

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Option	Description	Input Pulse	Output Pulse	Packing quantity
None	Standard SMD option			100 units per tube
-V	Standard SMD option + VDE			100 units per tube
(TA)	TA Tape & reel option			5000 units per reel
(TB)	TB Tape & reel option			5000 units per reel
(TA)-V	TA Tape & reel option + VDE			5000 units per reel
(TB)-V	TB Tape & reel option + VDE			5000 units per reel
(EA)	TA Tape & reel option			1000 units per reel
(EB)	TB Tape & reel option			1000 units per reel
(EA)-V	TA Tape & reel option + VDE			1000 units per reel
(EB)-V	TB Tape & reel option + VDE			1000 units per reel

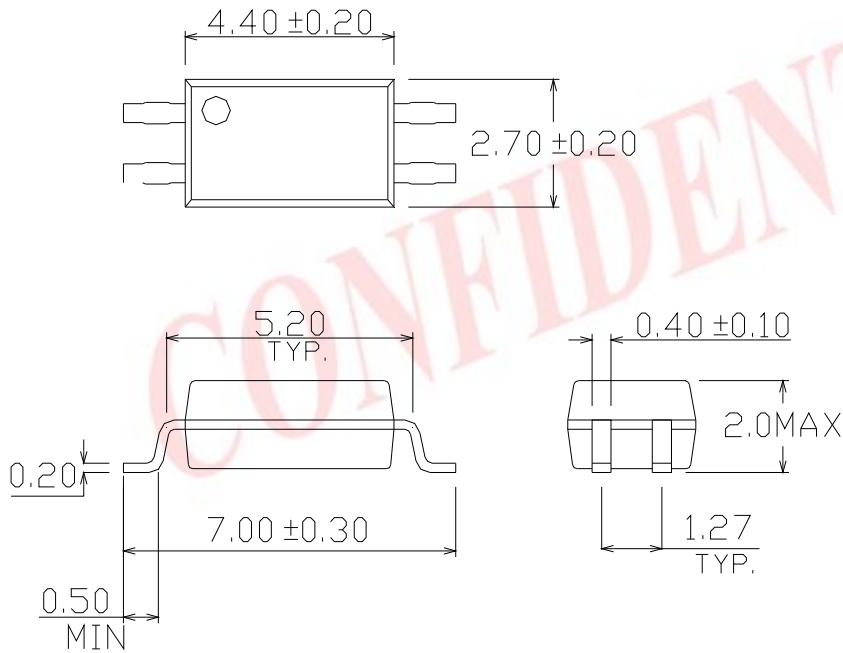


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Package Drawing
(Dimensions in mm)



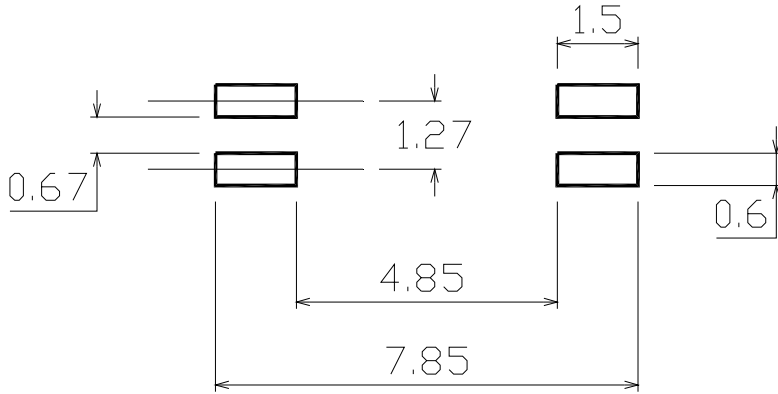
Recommended pad layout for surface mount leadform



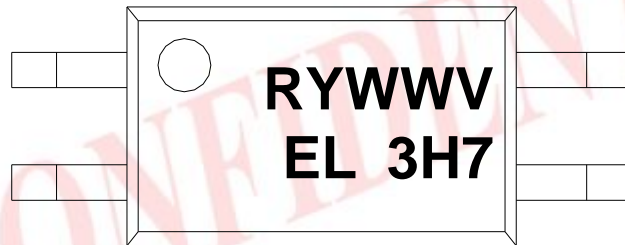
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Device Marking



Notes

- EL denotes Everlight
- 3H7 denotes Device Number
- R denotes CTR Rank (A, B, C, D, E, F, H, I, J, K or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE (optional)



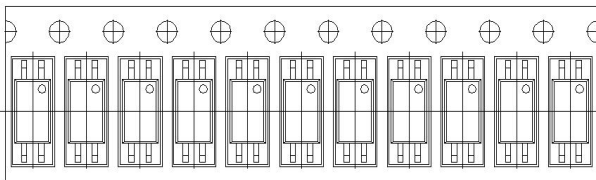
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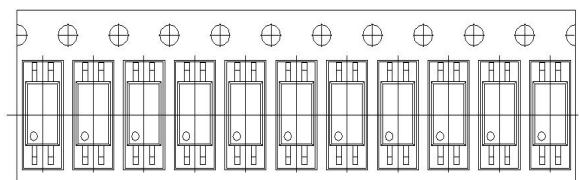
Tape & Reel Packing Specifications

Option TA



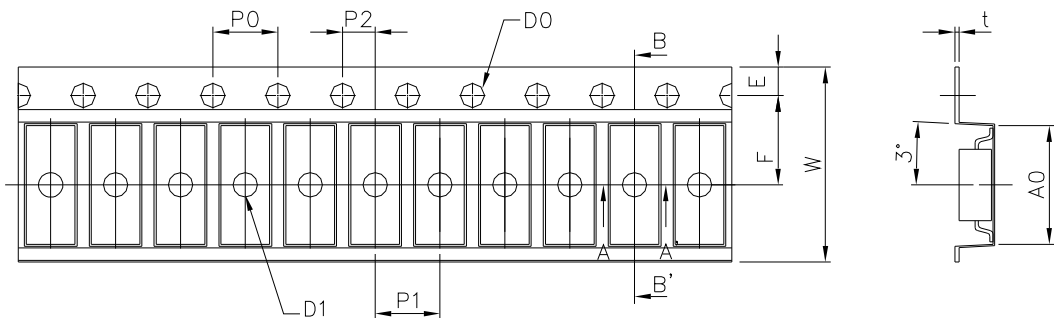
Direction of feed from reel

Option TB

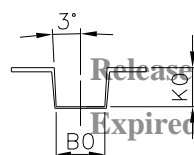


Direction of feed from reel

Tape dimensions



SEC: B-B'





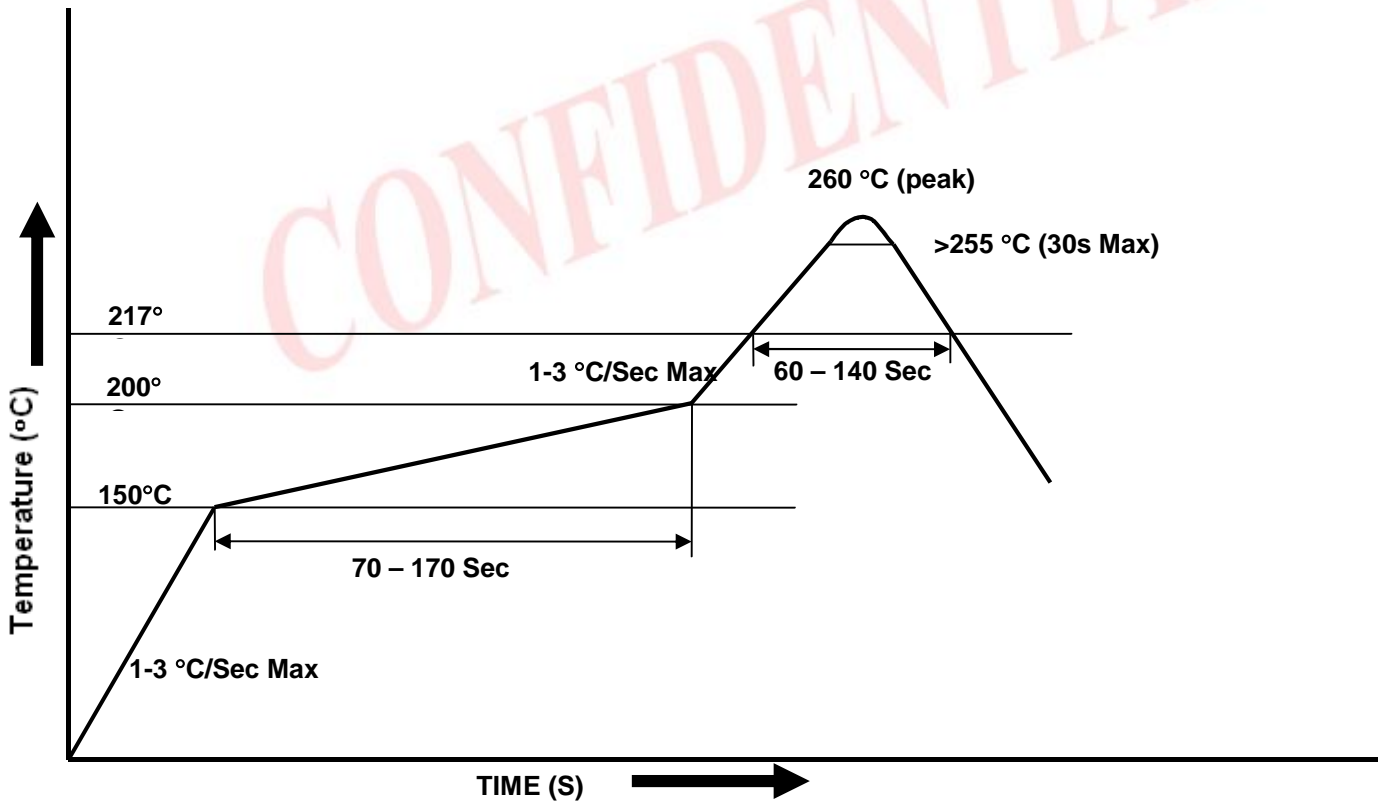
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Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	3.0 ± 0.1	7.3 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.7 5± 0.1	5.5 ± 0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.15	4.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	12.0 ± 0.2	2.4 ± 0.1

Solder Reflow Temperature Profile





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