



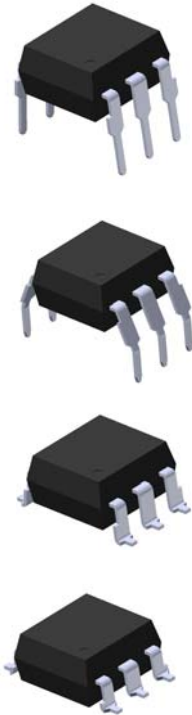
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## 6 PIN DIP RANDOM-PHASE TRIAC PHOTOCOUPLER

EL301x Series  
EL302x Series  
EL305x Series

### Features:

- Peak breakdown voltage
  - 250V, EL301x
  - 400V, EL302x
  - 600V, EL305x
- High isolation voltage between input and output (Viso=5000 V rms )
- Compact dual-in-line package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approval (pending)
- SEMKO approval (pending)
- NEMKO approval (pending)
- DEMKO approval (pending)
- FIMKO approval (pending)
- CSA approval (pending)



### Description

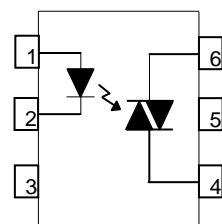
The EL201x, EL302X and EL305x series products consist of GaAs infrared emitting diode optically coupled to a monolithic silicon random phase photo Triac.

They are designed for interfacing between electronic controls and power triacs to control resistive and inductive loads for 115 to 240 VAC operations.

### Applications

- Solenoid/valve controls
- Lamp ballasts
- Static AC power switch
- Interfacing microprocessors to 115 to 240Vac peripherals
- Incandescent lamp dimmers
- Temperature controls
- Motor controls

### Schematic



### Pin Configuration

1. Anode
2. Cathode
3. No Connection
4. Terminal
5. No Connection
6. Terminal



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## Absolute Maximum Ratings (T<sub>a</sub>=25°C)

Parameter		Symbol	Rating	Unit	
Input	Forward current	I <sub>F</sub>	60	mA	
	Reverse voltage	V <sub>R</sub>	6	V	
	Power dissipation	P <sub>D</sub>	100	mW	
Output	Off-state Output Terminal Voltage	V <sub>DRM</sub>	EL301x	250	V
			EL302x	400	
			EL305x	600	
	Peak Repetitive Surge Current	I <sub>TSM</sub>	1	A	
Power dissipation		P <sub>D</sub>	300	mW	
Isolation voltage <sup>*1</sup>		V <sub>iso</sub>	5000	V rms	
Total power dissipation		P <sub>D</sub>	330	mW	
Operating temperature		T <sub>opr</sub>	-55~+100	°C	
Storage temperature		T <sub>stg</sub>	-55~+125	°C	
Soldering temperature <sup>*2</sup>		T <sub>sol</sub>	260	°C	

### Notes

\*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

\*2 For 10 seconds.



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## Electrical Characteristics (T<sub>a</sub>=25°C unless specified otherwise)

### Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V <sub>F</sub>	-	1.18	1.5	V	I <sub>F</sub> = 10mA
Reverse Leakage current	I <sub>R</sub>	-	-	10	μA	V <sub>R</sub> = 6V

### Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Peak Blocking Current	I <sub>DRM</sub>	-	-	100	nA	V <sub>DRM</sub> = Rated V <sub>DRM</sub> I <sub>F</sub> = 0mA
Peak On-state Voltage	V <sub>TM</sub>	-	-	2.5	V	I <sub>TM</sub> =100mA peak, I <sub>F</sub> =Rated I <sub>FT</sub>
Critical Rate of Rise off-state Voltage	dv/dt	1000	-	-	V/μs	Fig.

### Transfer Characteristics

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
LED Trigger Current	EL3010 EL3021 EL3051	-	-	15	mA	Main terminal Voltage=3V
	EL3011 EL3022 EL3052	-	-	10		
	EL3012 EL3023 EL3053	-	-	5		
Holding Current	I <sub>H</sub>	-	250	-	μA	

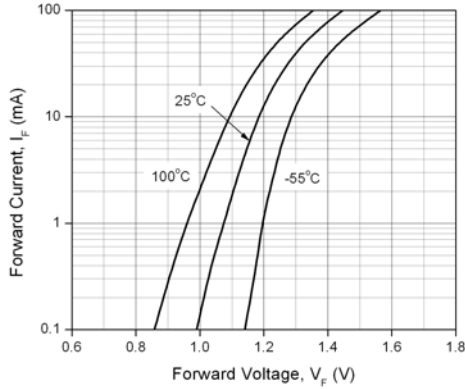
\* Typical values at T<sub>a</sub> = 25°C

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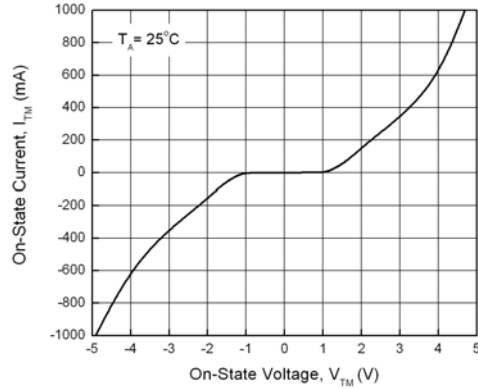
**EL301x Series**  
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## Typical Performance Curves

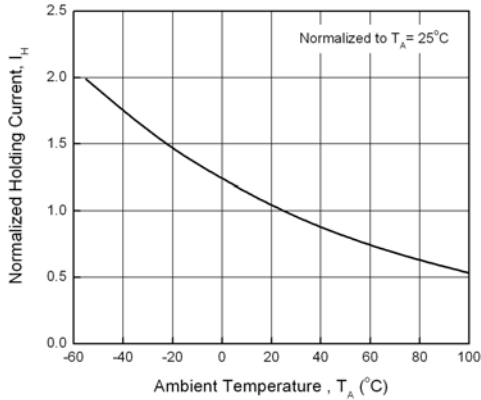
**Figure 1. Forward Current vs Forward Voltage**



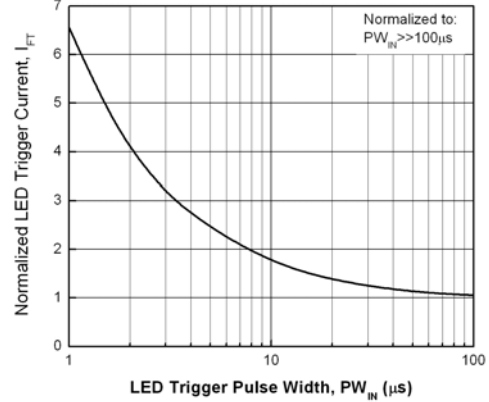
**Figure 2. On-State Characteristics**



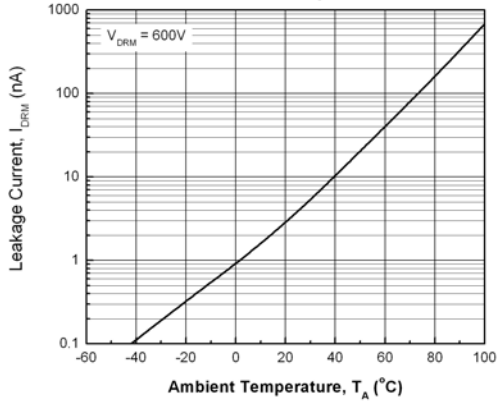
**Figure 3. Holding Current vs. Ambient Temperature**



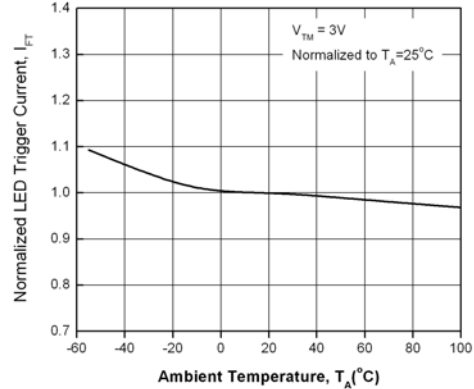
**Figure 4. LED Current Required to Trigger vs. LED Pulse Width**



**Figure 5. Leakage Current vs. Ambient Temperature**



**Figure 6. LED Trigger Current vs. Ambient Temperature**



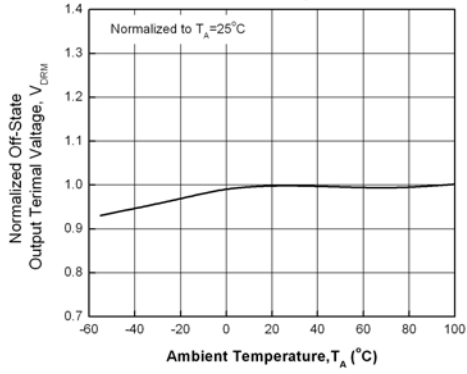


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Figure 7. Off-State Output Terminal Voltage vs. Ambient Temperature





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## 6 PIN DIP RANDOM-PHASE TRIAC PHOTOCOUPLER

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### Order Information

#### Part Number

**EL301XY(Z)-V**  
or **EL302XY(Z)-V**  
or **EL305XY(Z)-V**

#### Note

X = Part No. 3010 – 15mA, 3011 – 10mA, 3012 – 5mA

X = Part No. (1 for  $I_{FT}=15mA$ , 2 for  $I_{FT}=10mA$ , 3 for  $I_{FT}=5mA$ )

Y = Lead form option (S, S1, M or none)

Z = Tape and reel option (TA, TB or none).

V = VDE safety option

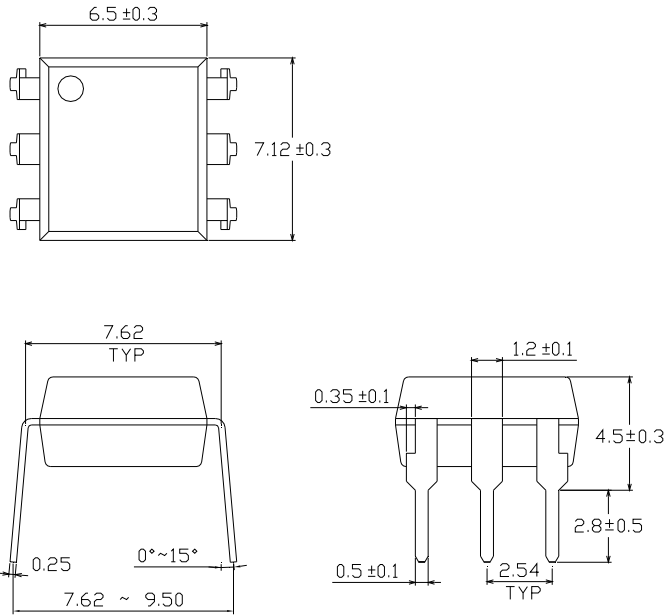
Option	Description	Packing quantity
None	Standard DIP-6	65 units per tube
M	Wide lead bend (0.4 inch spacing)	65 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 (TB)	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel

**6 PIN DIP RANDOM-PHASE TRIAC  
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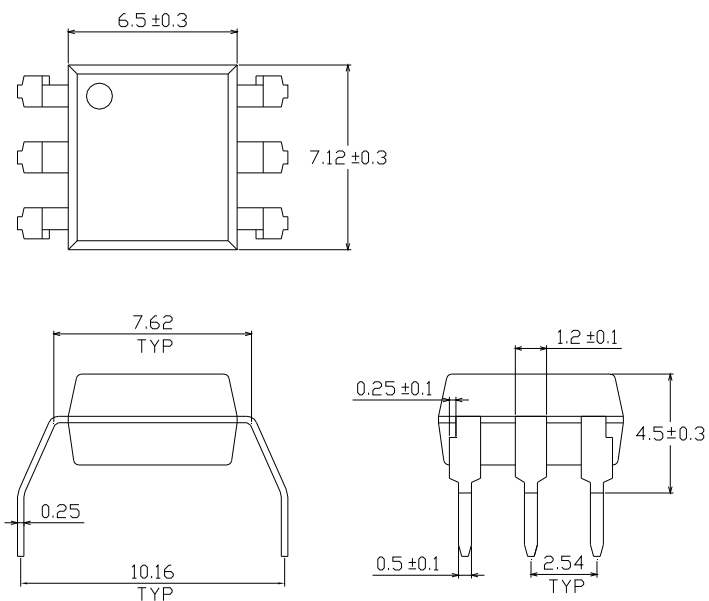
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**Package Drawings  
(Dimensions in mm)**

**Standard DIP Type**



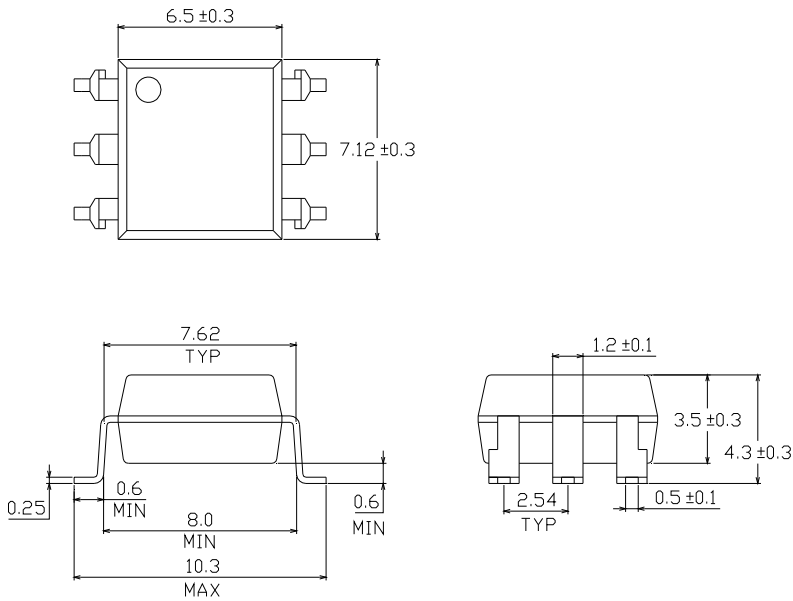
**Option M Type**



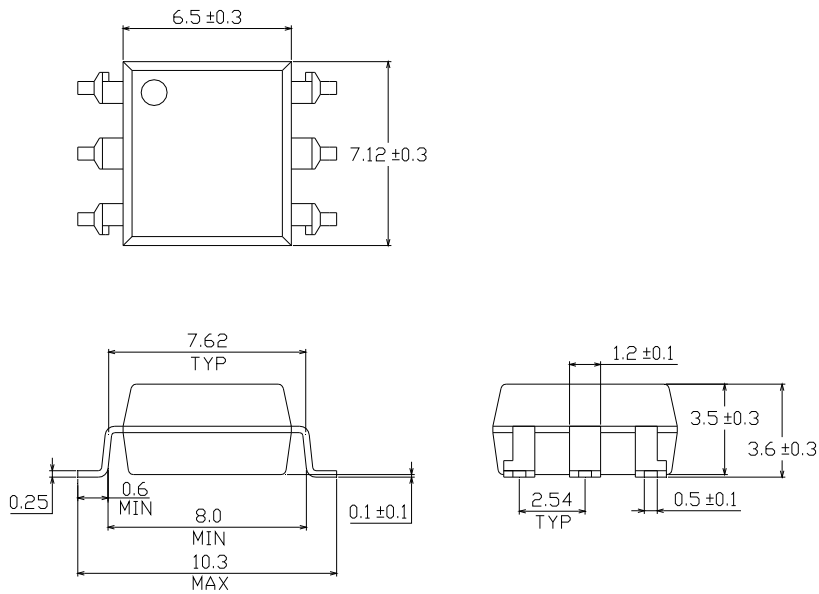
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**Option S Type**



**Option S1 Type**

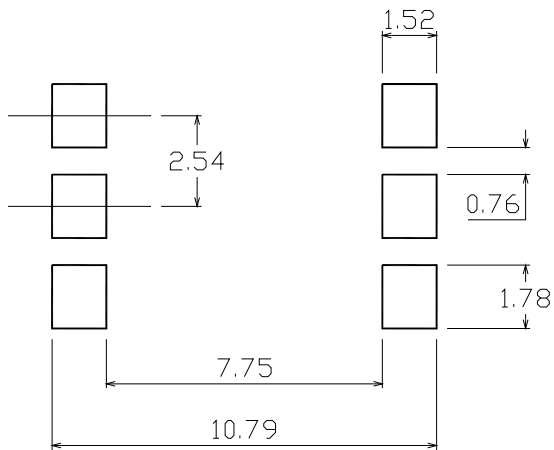




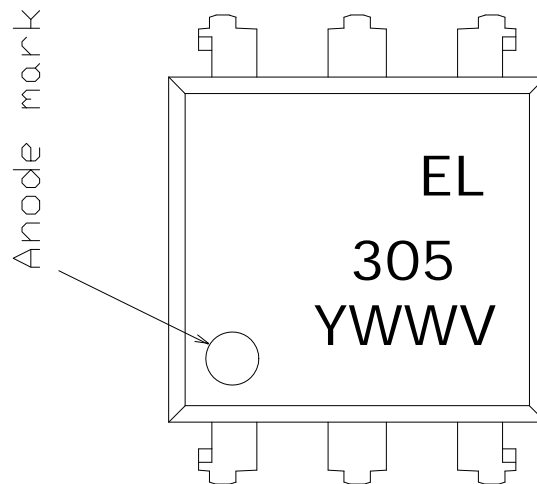
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## Recommended pad layout for surface mount leadform



## Device Marking



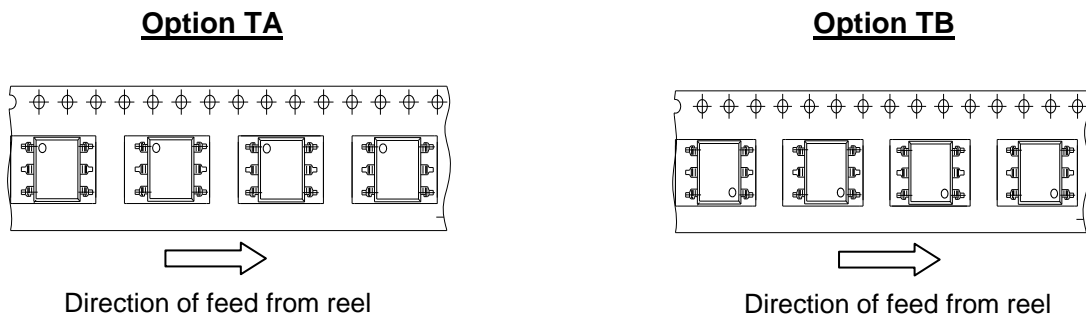
## Notes

- EL denotes Everlight
- 3053 denotes Device Number
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE safety option (optional)

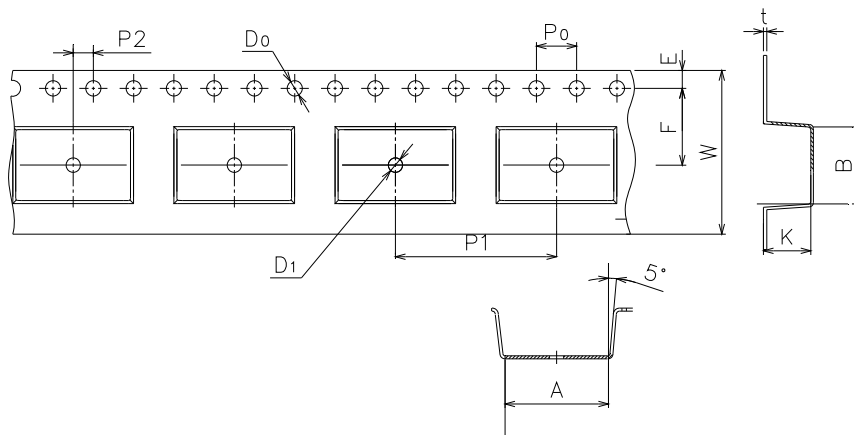
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## Tape & Reel Packing Specifications



## Tape dimensions



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.52±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1

Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.15	1.6±0.1	2.0±0.1	0.35±0.03	16.0±0.2	4.5±0.1

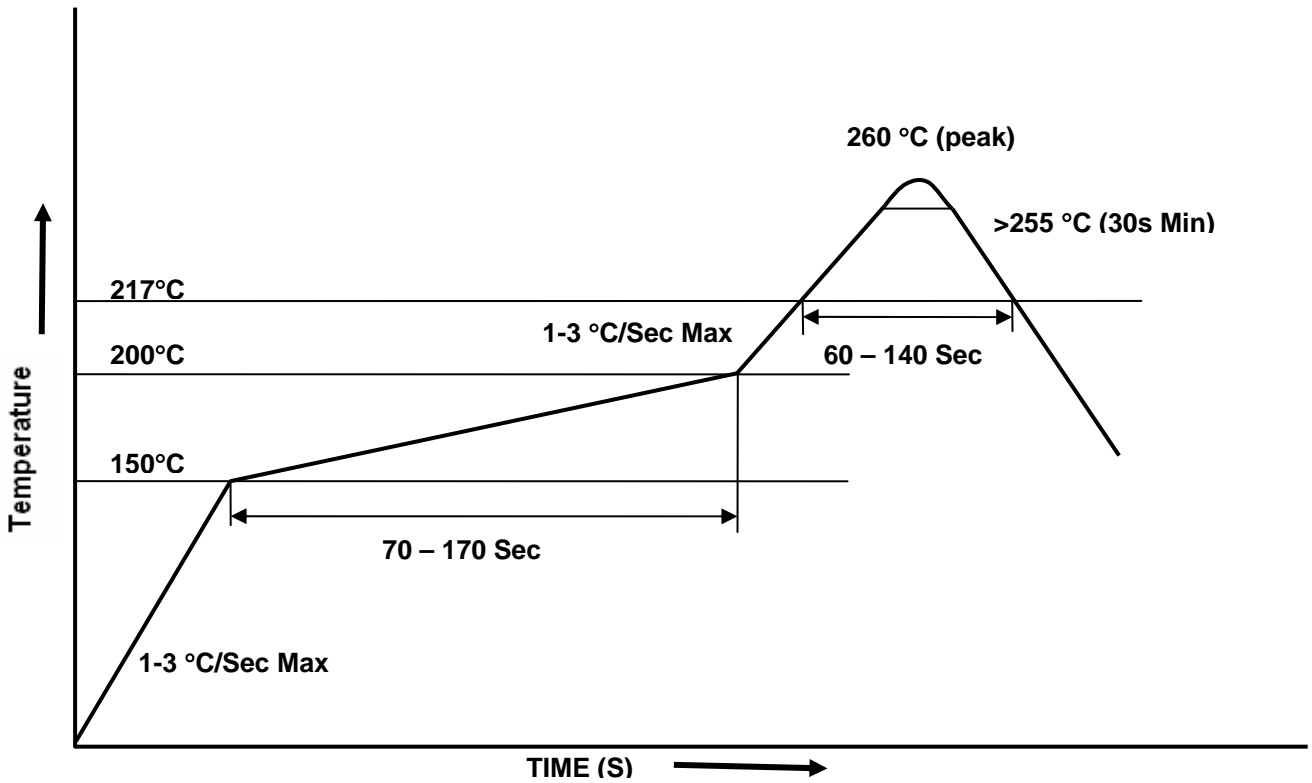


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## Solder Reflow Temperature Profile





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