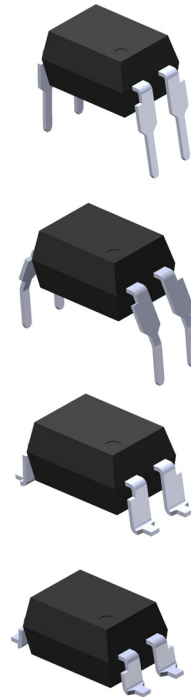


4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL815 Series

Features:

- Current transfer ratio
(CTR: 600~7500% at $I_F = 1\text{mA}$, $V_{CE} = 2\text{V}$)
- High isolation voltage between input and output ($V_{iso} = 5000\text{ V rms}$)
- Creepage distance $> 7.62\text{ mm}$
- Operating temperature up to $+110^\circ\text{C}$
 - Compact small outline package
 - Pb free and RoHS compliant.
 - UL approved (No. E214129)
 - VDE approved (No. 132249)
 - CSA approved (No. 1143601)
 - SEMKO approved
 - NEMKO approved
 - DEMKO approved
 - FIMKO approved
 - CQC approved



Description

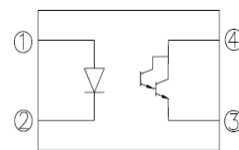
The EL815 series of devices each consist of an infrared emitting diodes, optically coupled to a photo Darlington detector.

They are packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.

Applications

- Telephone set, telephone exchangers
- Sequence controllers
- System appliances, measuring instruments
- Signal transmission between circuits of different potentials and impedances

Schematic



Pin Configuration

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



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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL815 Series

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

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 No derating required up to $T_a = 100^{\circ}\text{C}$	P_D	100	mW
Output	Power dissipation Derating factor (above $T_a = 80^{\circ}\text{C}$)	P_C	150	mW
			5.8	mW/ $^{\circ}\text{C}$
	Collector current	I_C	80	mA
	Collector-Emitter voltage	V_{CEO}	35	V
	Emitter-Collector voltage	V_{ECO}	7	V
Total power dissipation		P_{TOT}	200	mW
Isolation voltage ^{*1}		V_{ISO}	5000	V rms
Operating temperature		T_{OPR}	-55 ~ +110	$^{\circ}\text{C}$
Storage temperature		T_{STG}	-55 ~ +125	$^{\circ}\text{C}$
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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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL815 Series

Electrical Characteristics ($T_a=25^\circ\text{C}$ 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	μA	$V_R = 4\text{V}$
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}	-	-	1	μA	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	35	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	7	-	-	V	$I_E = 0.1\text{mA}$

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

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	CTR	600	-	7500	%	$I_F = 1\text{mA}, V_{CE} = 2\text{V}$
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.8	1.0	V	$I_F = 20\text{mA}, I_C = 5\text{mA}$
Isolation resistance	R_{IO}	5×10^{10}	-	-	Ω	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$
Floating capacitance	C_{IO}	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$
Cut-off frequency	f_c	-	6	-	kHz	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$
Rise time	t_r	-	60	300	μs	$V_{CE} = 2\text{V}, I_C = 10\text{mA},$ $R_L = 100\Omega$
Fall time	t_f	-	53	250	μs	

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

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL815 Series

Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

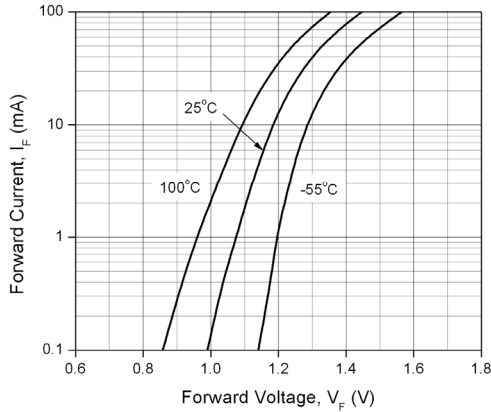


Figure 2. Current Transfer Ratio vs. Ambient Temperature

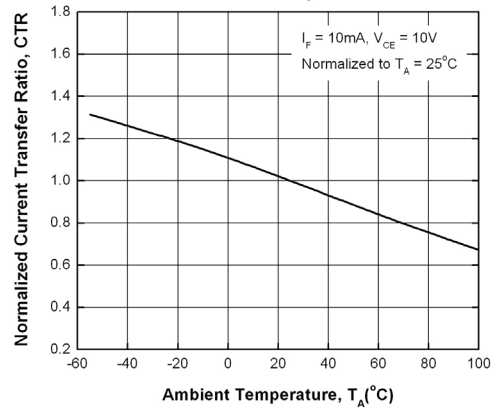


Figure 3. Normalized Current Transfer Ratio vs Forward Current

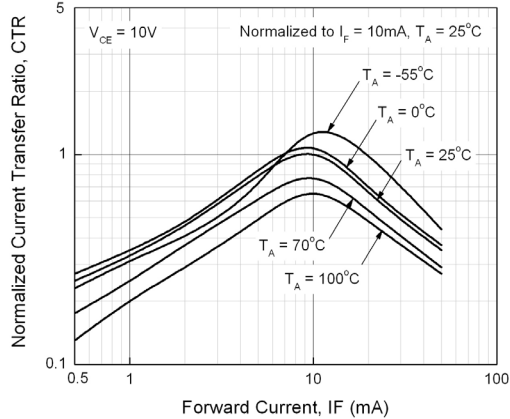


Figure 4. Collector Dark Current vs Ambient Temperature

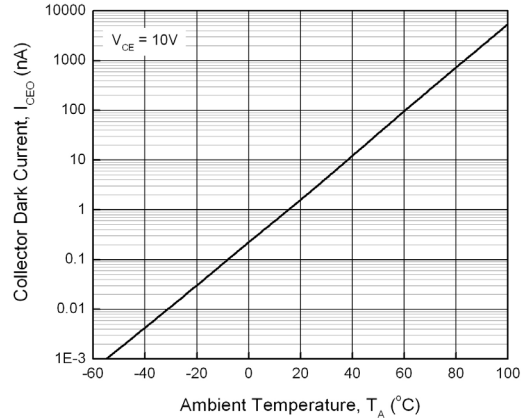


Figure 5. Turn-on Time vs Forward Current

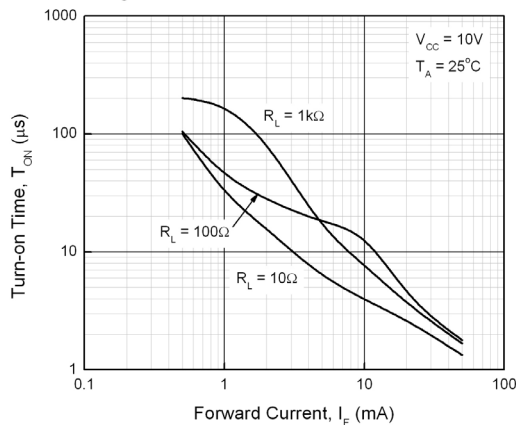
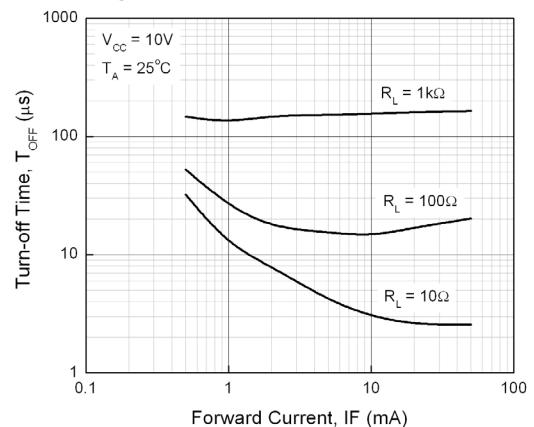


Figure 6. Turn-off Time vs Forward Current



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EL815 Series

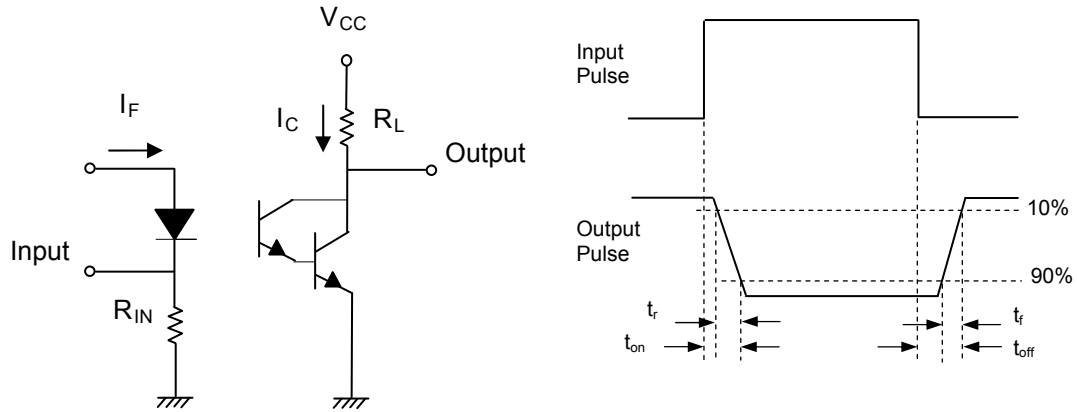


Figure 7. Switching Time Test Circuit & Waveforms



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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL815 Series

Order Information

Part Number

EL815(X)(Z)-V

Note

- X = Lead form option (S, S1, M or none)
- Z = Tape and reel option (TA, TB, TU, TD or none).
- V = VDE safety (optional).

Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 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
S (TU)	Surface mount lead form + TU tape & reel option	1500 units per reel
S (TD)	Surface mount lead form + TD tape & reel option	1500 units per reel
S1 (TU)	Surface mount lead form (low profile) + TU tape & reel option	1500 units per reel
S1 (TD)	Surface mount lead form (low profile) + TD tape & reel option	1500 units per reel

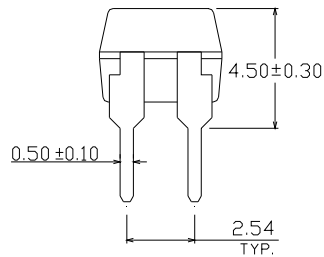
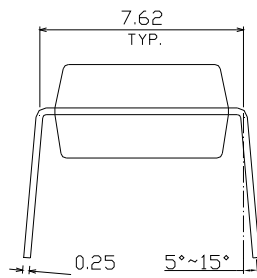
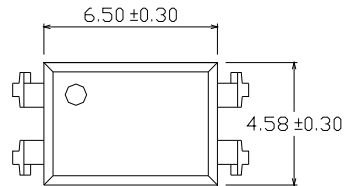
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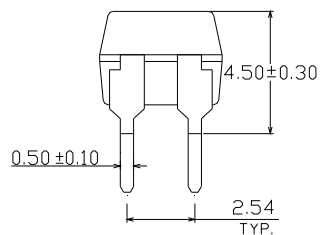
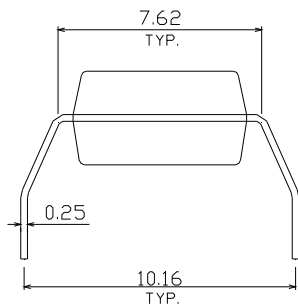
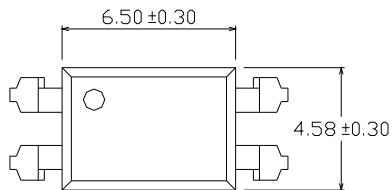
Package Drawing

(Dimensions in mm)

Standard DIP Type



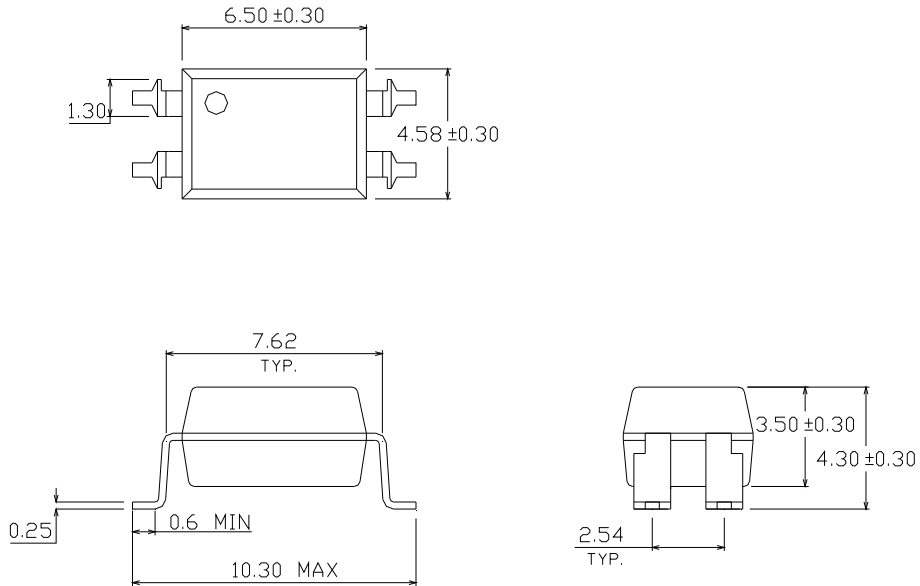
Option M Type



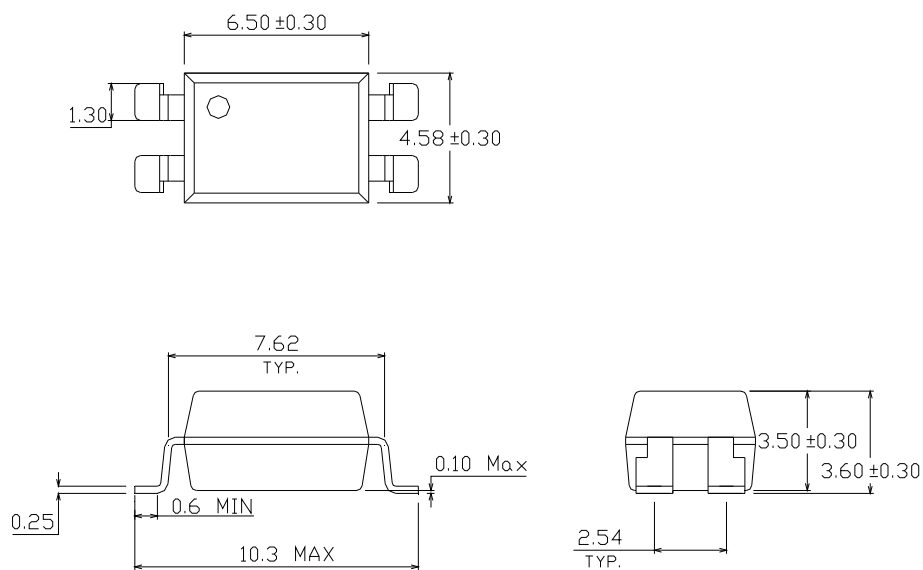
4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

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Option S Type



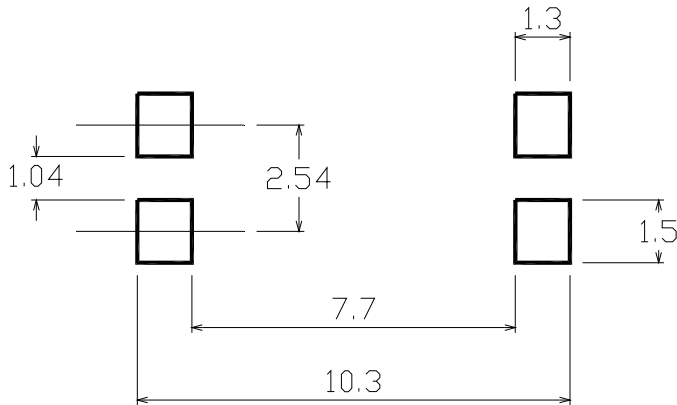
Option S1 Type



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Recommended pad layout for surface mount leadform



Device Marking



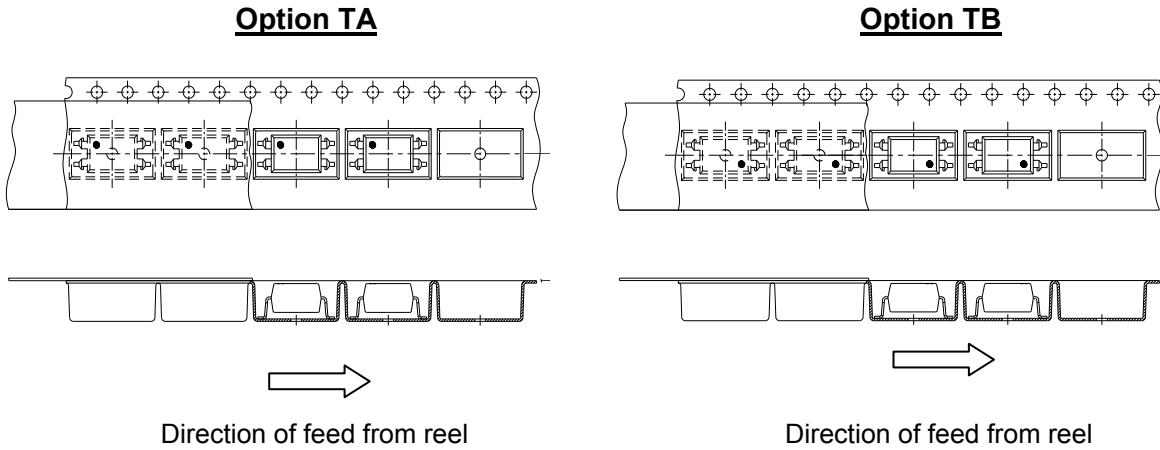
Notes

- EL denotes EVERLIGHT
- 815 denotes Device Number
- F denotes Factory Code (None: China, T: Taiwan)
- R denotes CTR Rank
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE optional

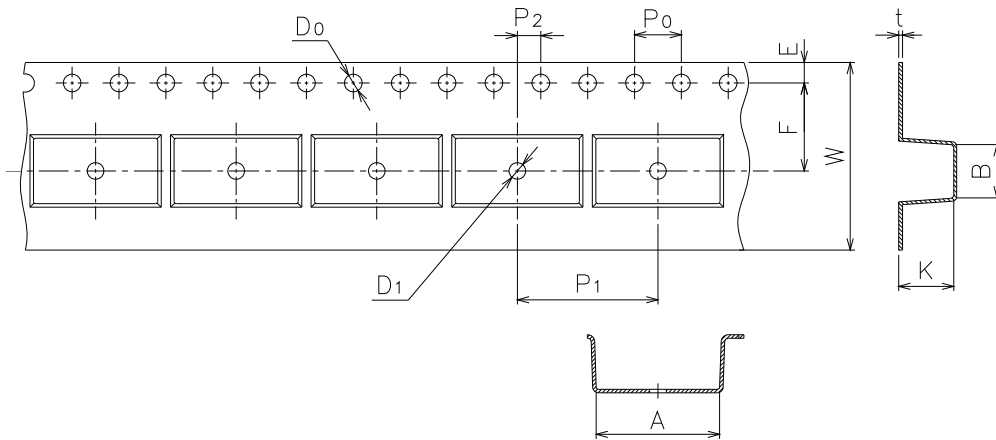
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Tape & Reel Packing Specifications



Tape dimensions

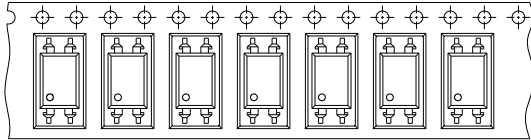


Dimension No.	A	B	Do	D1	E	F
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

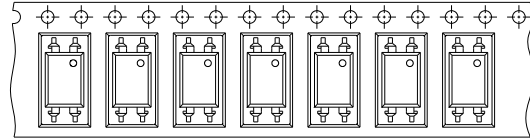
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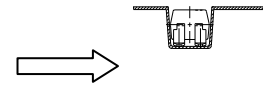
Option TD



Option TU

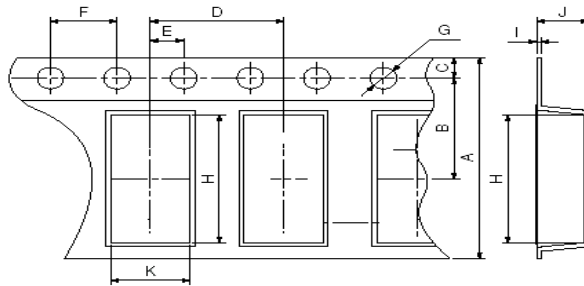


Direction of feed from reel



Direction of feed from reel

Tape dimensions



Dimension No.	A	B	C	D	E	F
Dimension(mm)	16.00±0.3	7.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1
Dimension No.	G	H	I	J	K	
Dimension(mm)	1.5+0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	

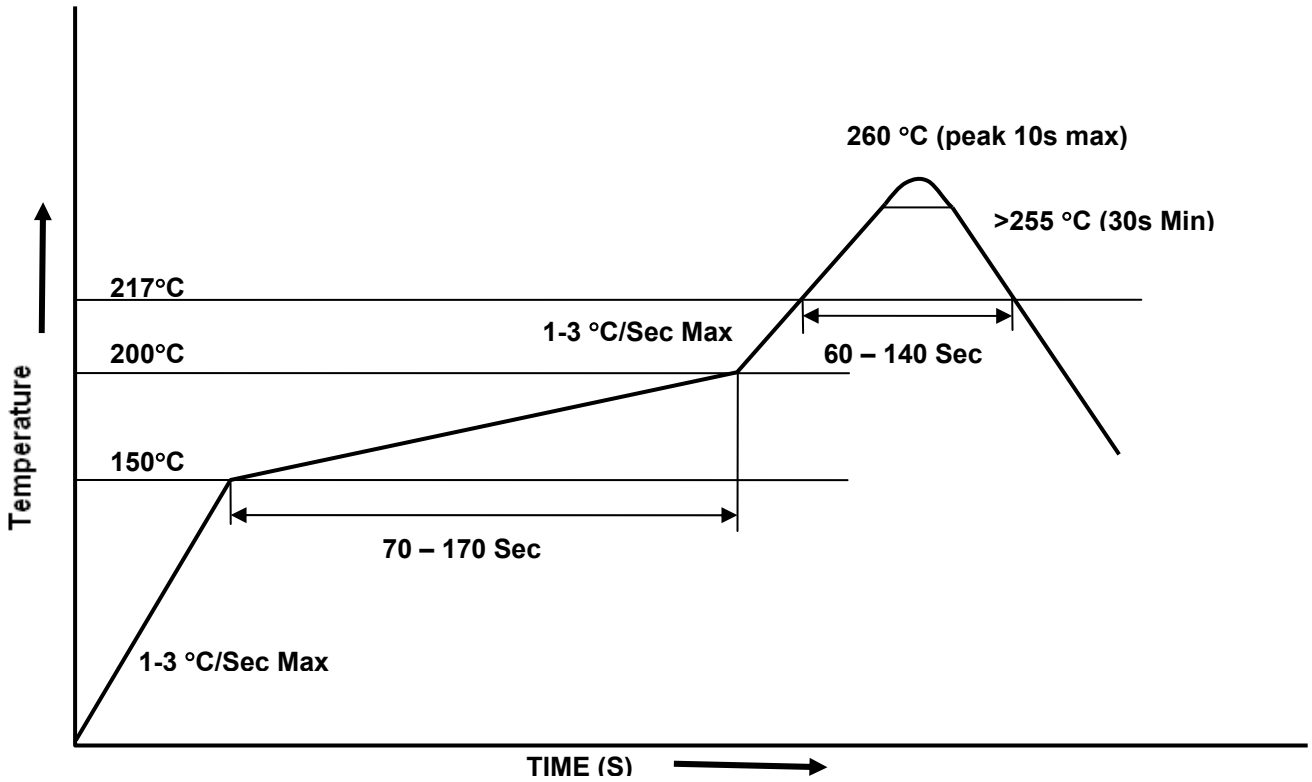


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Solder Reflow Temperature Profile





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4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

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