

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

EL817(HE) Series

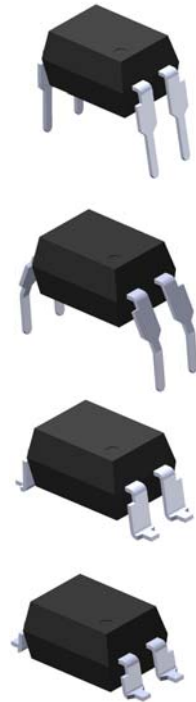
Features:

- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- 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)
- SEMKO approved (No. 716108)
- NEMKO approved (No. P06206474)
- DEMKO approved (No. 313924)
- FIMKO approved (No. FI 22807)
- CSA approved (No. 1143601)

Description

The EL817 series of devices each consist of an infrared emitting diodes, optically coupled to a phototransistor detector.

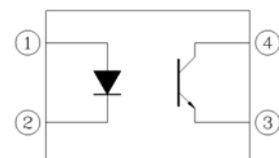
They are packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option.



Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as fan heaters, etc.
- Signal transmission between circuits of different potentials and impedances

Schematic



Pin Configuration

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



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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 No derating required up to $T_a = 100^{\circ}\text{C}$	P_D	70	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	50	mA
	Collector-Emitter voltage	V_{CEO}	35	V
	Emitter-Collector voltage	V_{ECO}	6	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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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}	-	-	100	μA	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	35	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	6	-	-	V	$I_E = 0.1\text{mA}$

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

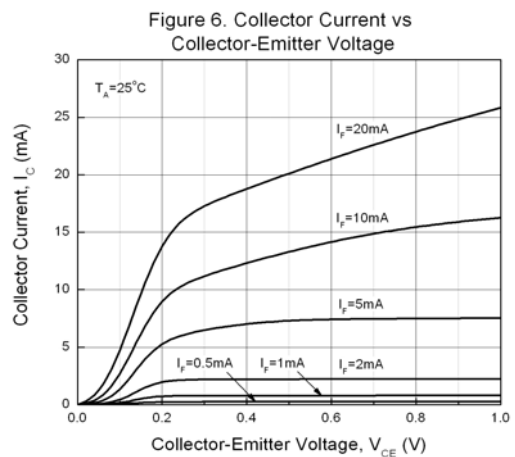
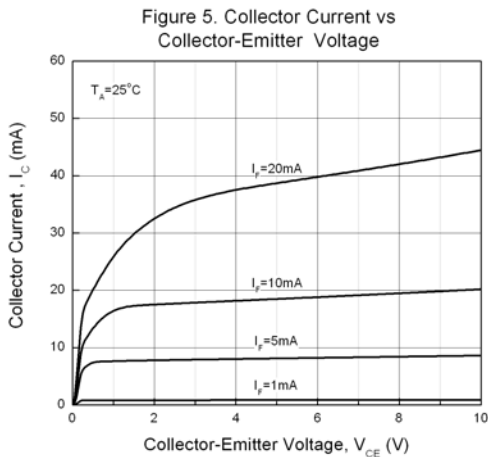
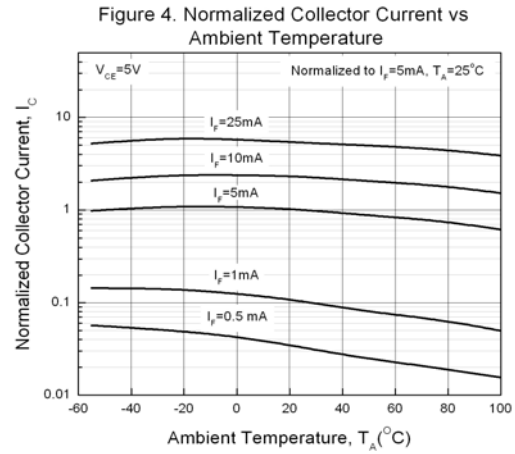
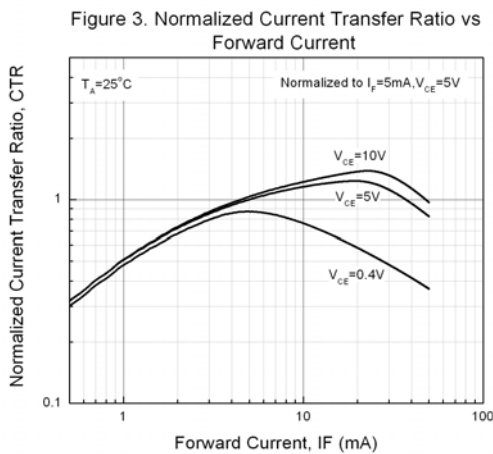
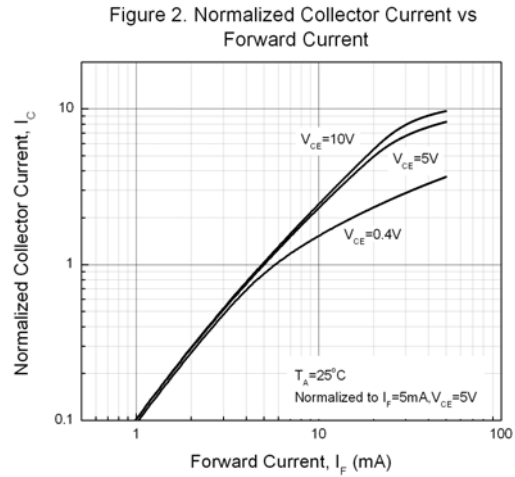
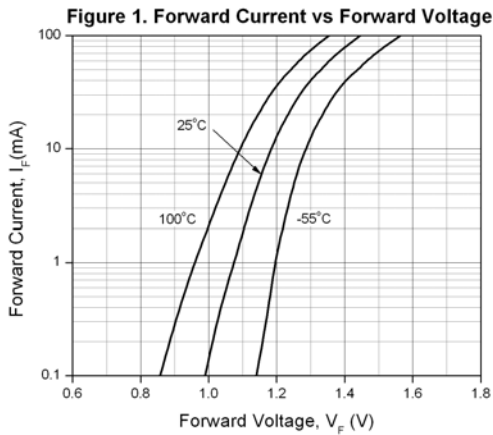
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer ratio	EL817C CTR	200	-	300	%	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	$I_F = 1\text{mA}, I_C = 20\text{mA}$
Isolation resistance	R_{IO}	5×10^{10}	-	-	Ω	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$
Floating capacitance	C_{IO}	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$
Cut-off frequency	f_c	-	80	-	kHz	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$
Rise time	t_r	-	4	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



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Figure 7. Collector Dark Current vs Ambient Temperature

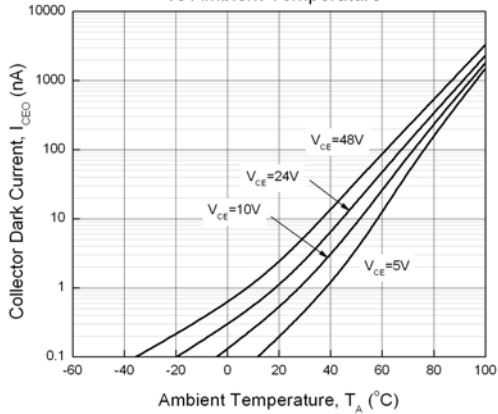


Figure 8. Switching Time vs Load Resistance

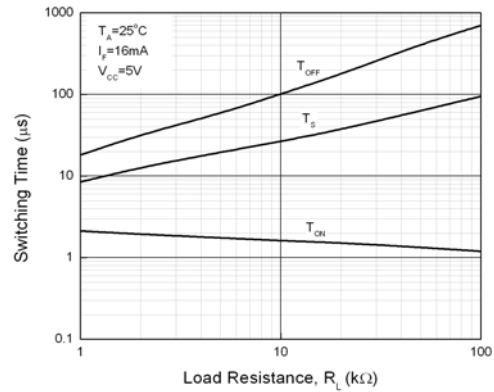


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

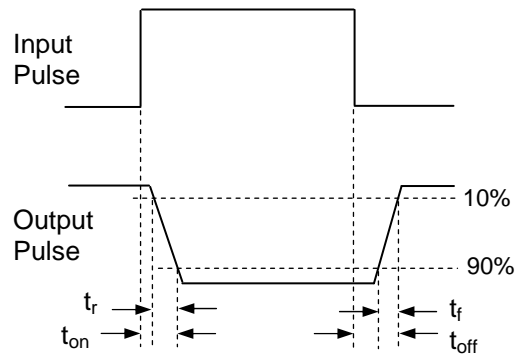
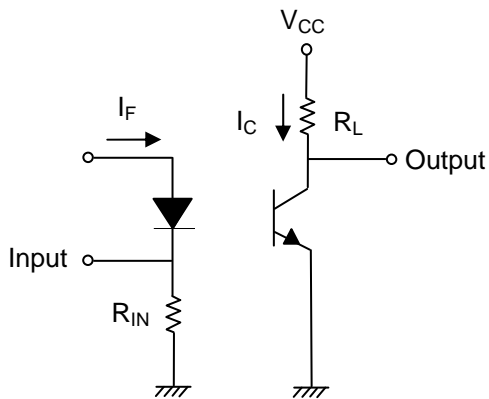
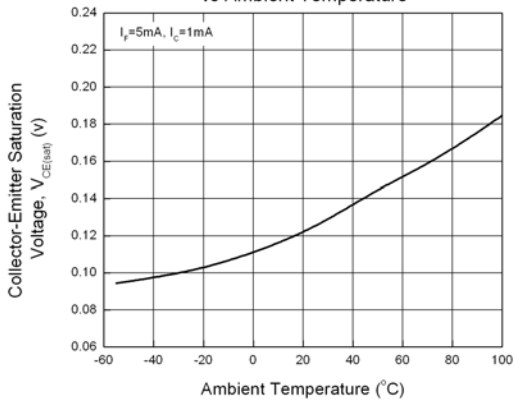


Figure 10. Switching Time Test Circuit & Waveforms



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Order Information

Part Number

EL817(X)(C)(Z)(HE)-FV

Note

- X = Lead form option (S, S1, M or none)
- C = CTR Rank
- Z = Tape and reel option (TA, TB, TU, TD or none)
- HE = Customer name
- F = Lead frame option (F: Iron, None: copper)
- V = VDE (option)

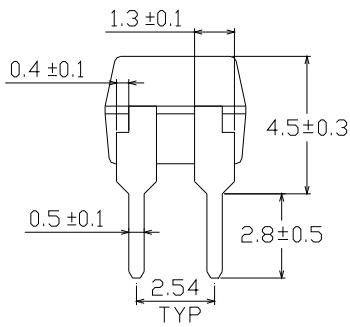
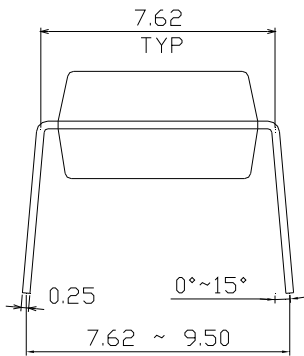
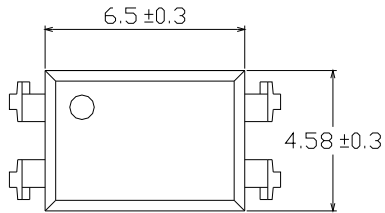
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount 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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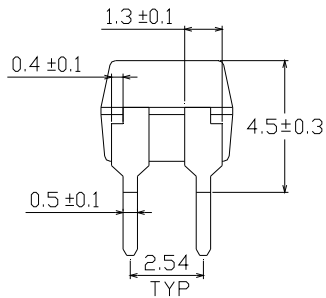
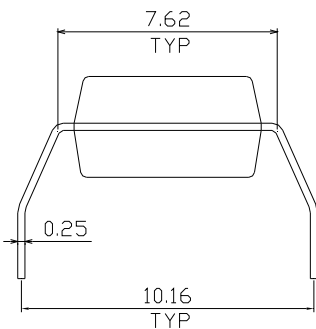
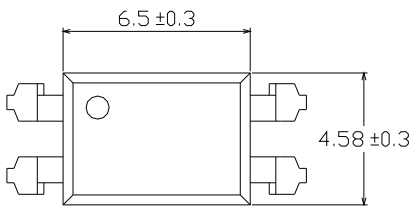
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Package Drawing (Dimensions in mm)

Standard DIP Type



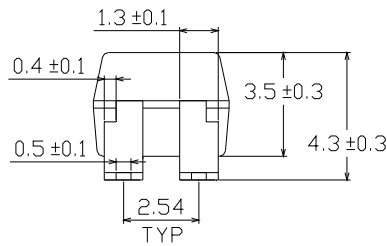
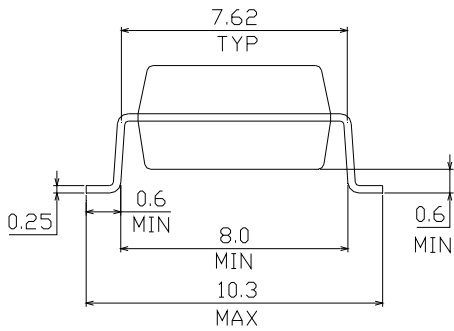
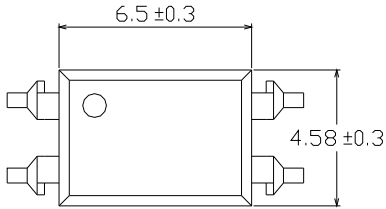
Option M Type



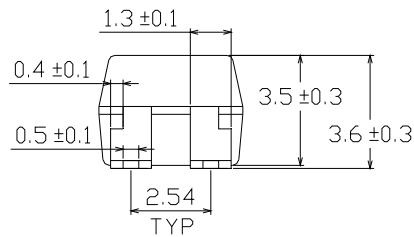
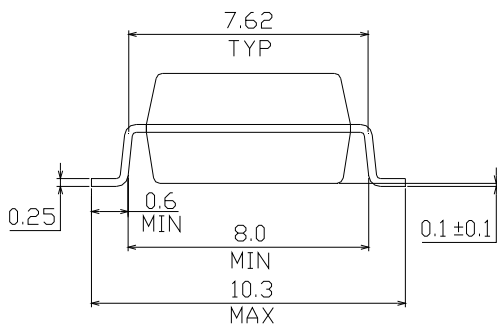
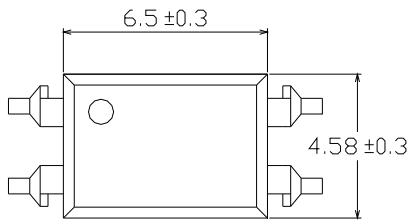
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Option S Type



Option S1 Type



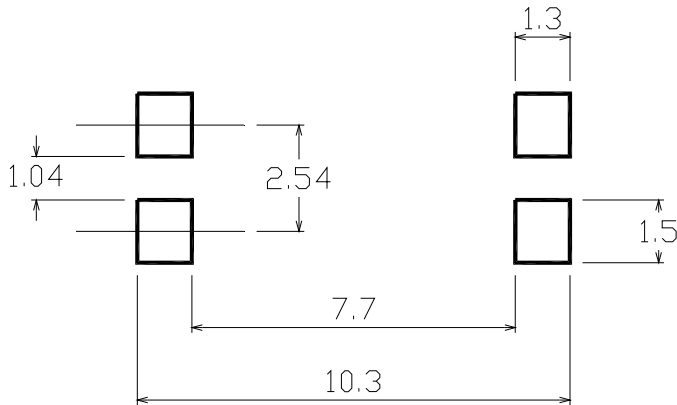


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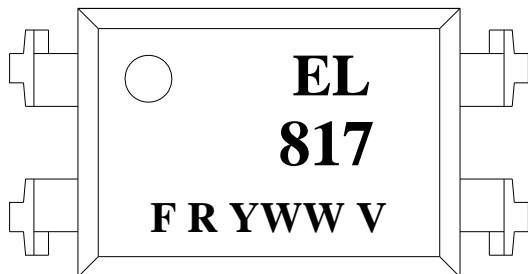
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Recommended pad layout for surface mount leadform



Device Marking



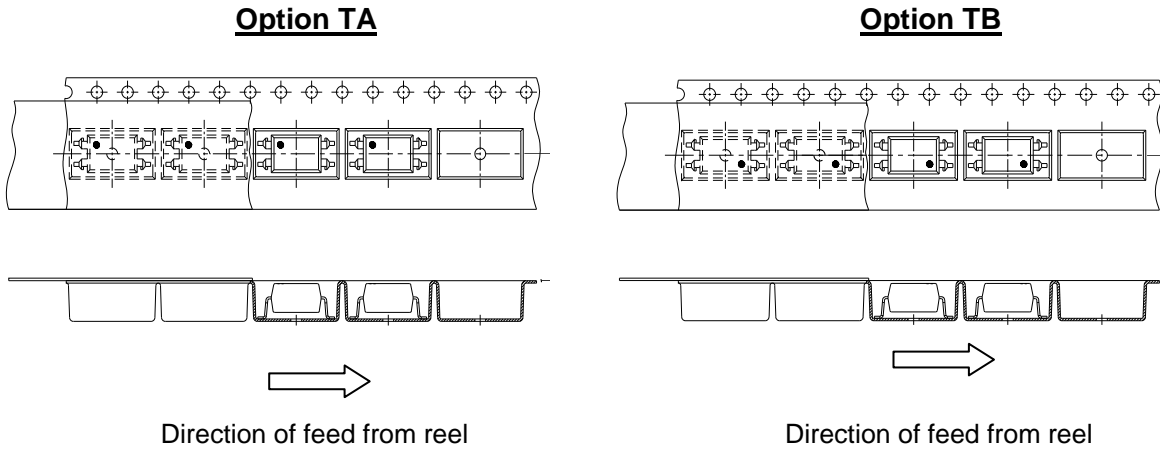
Notes

- EL denotes EVERLIGHT
- 817 denotes Device Number
- F denotes Factory Code (None: China, T: Taiwan)
- R denotes CTR Rank (A, B, C, D or none)
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE (option)

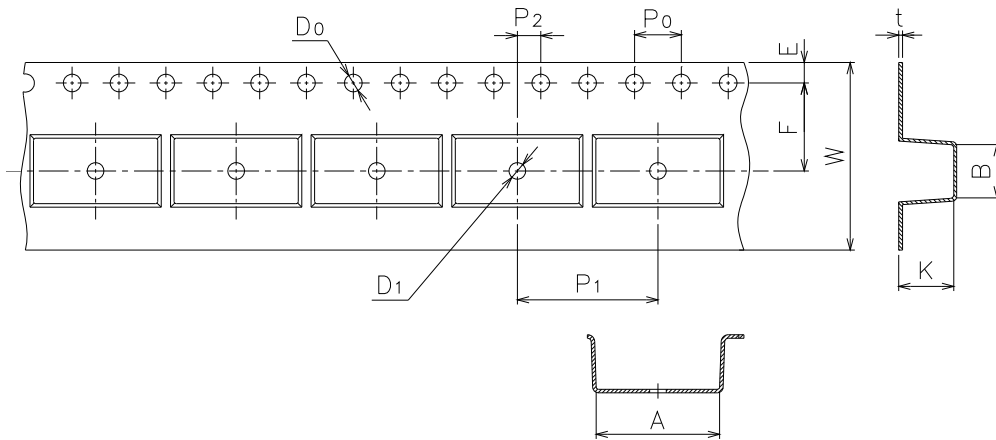
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Tape & Reel Packing Specifications



Tape dimensions

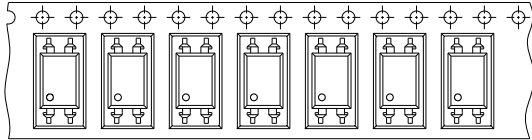


Dimension No.	A	B	Do	D1	E	F
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

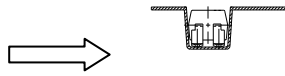
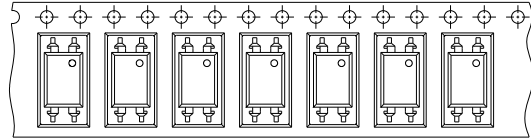
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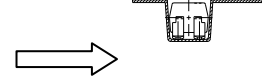
Option TD



Option TU

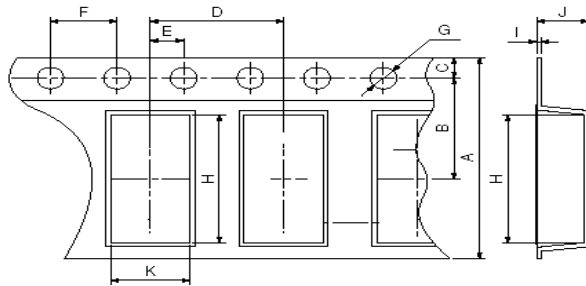


Direction of feed from reel



Direction of feed from reel

Tape dimensions

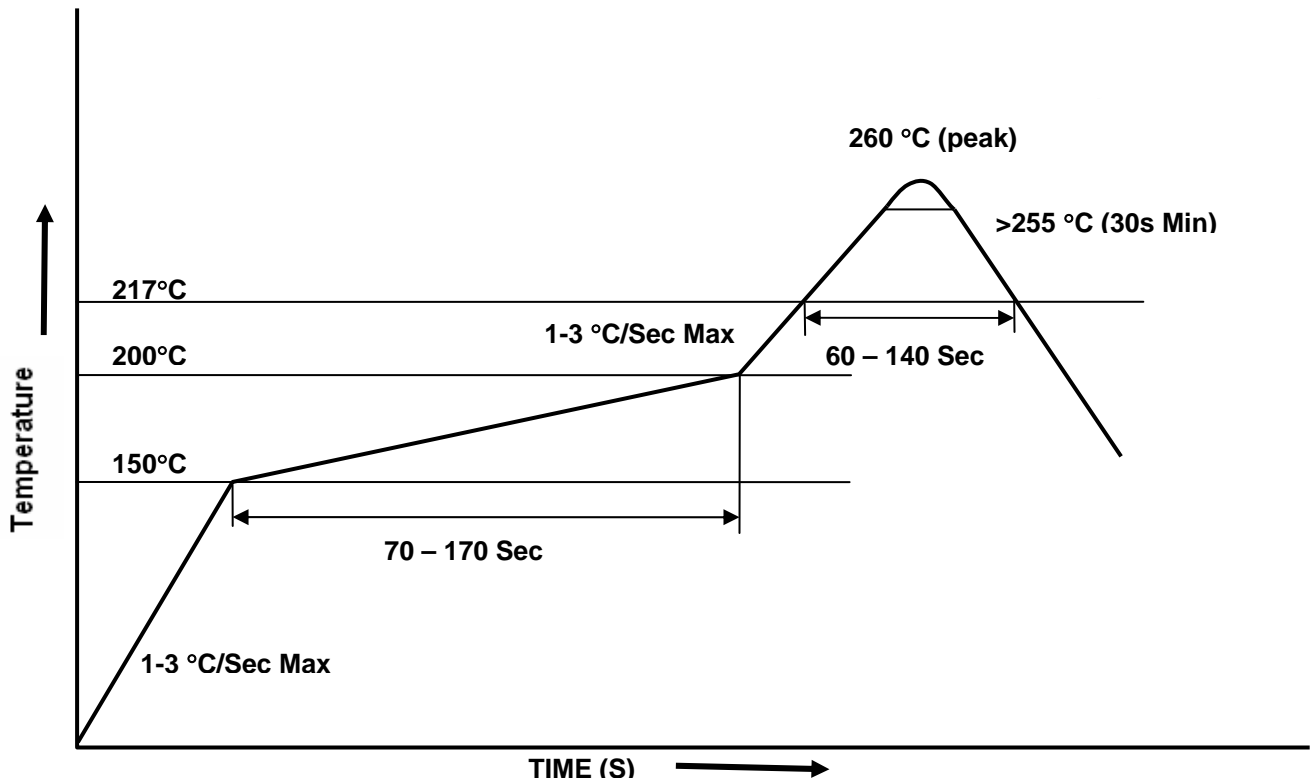


Dimension No.	A	B	C	D	E	F
Dimension(mm)	16.00±0.3	7.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1
Dimension No.	G	H	I	J	K	
Dimension(mm)	1.5+0.1/-0	10.4±0.1	0.4±0.05	4.55±0.1	5.1±0.1	

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Solder Reflow Temperature Profile





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