

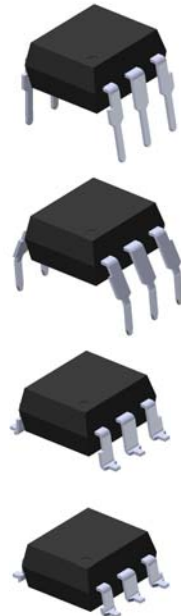


6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Features

- H11AAX series: H11AA1, H11AA2, H11AA3, H11AA4
- High isolation voltage between input and output
Viso = 5000 Vrms
- Creepage distance >7.62 mm
- Compact dual-in-line package
- Pb free and RoHS compliant.
- UL approved (No. E214129)
- VDE approved (No.132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CSA approved

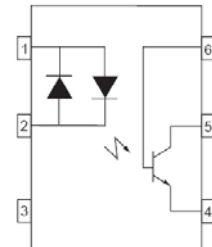


Description

The H11AAX series of devices each consist of two infrared emitting diode, connected in inverse parallel, optically coupled to a phototransistor detector.

They are packaged in a 6-pin DIP package and available in wide-lead spacing and SMD option.

Schematic



Applications

- AC line monitor
- Unknown polarity DC sensor
- Telephone line interface

1. Anode / Cathode
2. Cathode / Anode
3. No Connection
4. Emitter
5. Collector
6. Base

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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 (t = 10μs)	I _{FM}	1	A
	Power dissipation (T _A = 25°C)	P _D	120	mW
	Derating factor (above 90°C)		3.8	mW/°C
Output	Power dissipation (T _A = 25°C) No derating up to 100°C	P _C	150	mW
	Collector-Emitter voltage	V _{CEO}	80	V
	Collector-Base voltage	V _{CBO}	80	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~+100	°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, pins 1, 2 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

*2 For 10 seconds.

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

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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	1.5	V	$I_F = \pm 10\text{mA}$
Input capacitance	C_{in}	-	80	-	pF	$V = 0, f = 1\text{MHz}$

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I_{CEO}	-	-	50	nA	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	80	-	-	V	$I_C = 1\text{mA}$
Collector-Base breakdown voltage	BV_{CBO}	80	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	7	-	-	V	$I_E = 0.1\text{mA}$
Collector-Emitter capacitance	C_{CE}	-	10	-	pF	$V_{CE} = 0\text{V}, f = 1\text{MHz}$

Transfer Characteristics

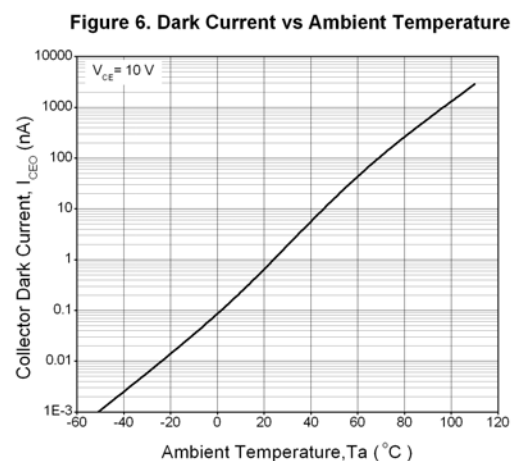
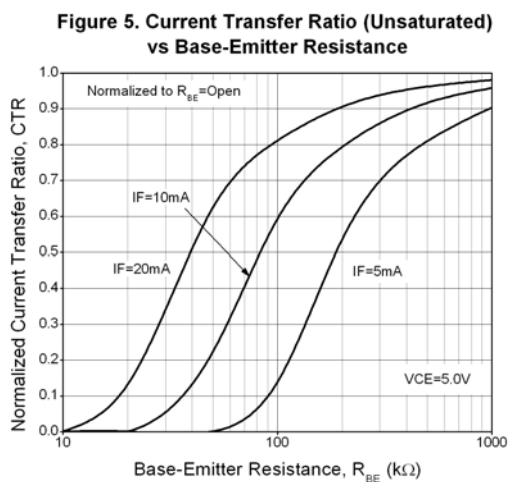
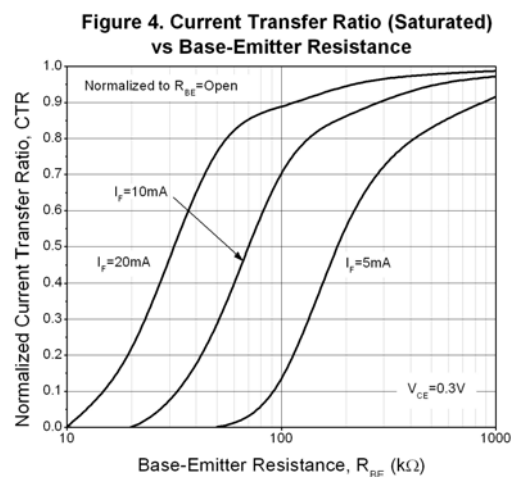
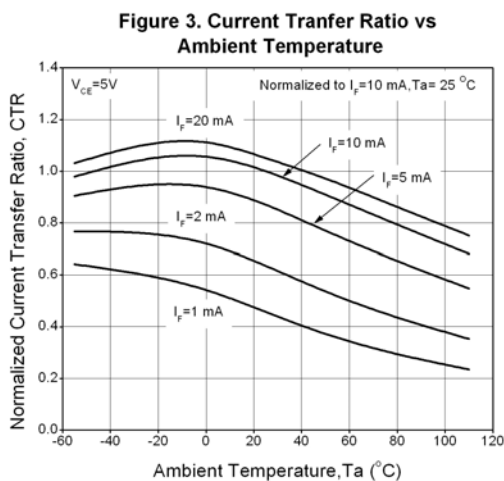
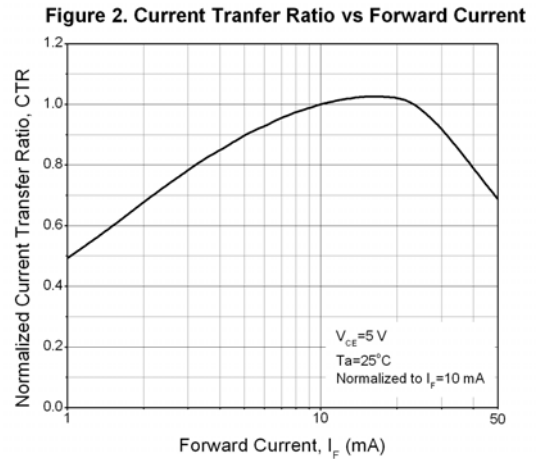
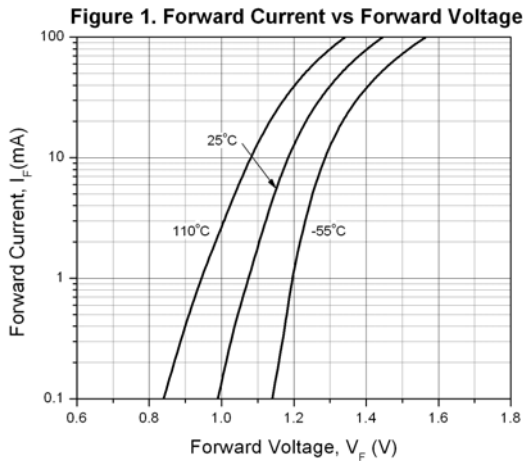
Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer Ratio	H11AA1	20	-	-	%	$I_F = \pm 10\text{mA}, V_{CE} = 10\text{V}$
	H11AA2	10	-	-		
	H11AA3	50	-	-		
	H11AA4	100	-	-		
CTR Symmetry		0.5	-	2.0		$I_F = \pm 10\text{mA}, V_{CE} = 10\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_F = \pm 10\text{mA}, I_C = 0.5\text{mA}$
Isolation resistance	R_{IO}	10^{11}	-	-	Ω	$V_{IO} = 500\text{Vdc}$
Input-output capacitance	C_{IO}	-	0.7	-	pF	$V_{IO} = 0, f = 1\text{MHz}$
Turn-on time	T_{on}	-	-	10	μs	$V_{CC} = 10\text{V}, I_C = 10\text{mA}, R_L = 100\Omega$
Turn-off time	T_{off}	-	-	10		
Rise time	T_r	-	-	10		
Fall time	T_f	-	-	10		

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

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H11AAX Series

Typical Performance Curves



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Figure 7. Collector-Emitter Saturation Voltage vs Collector Current

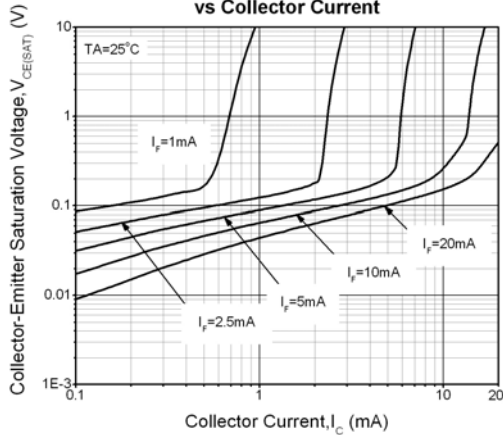


Figure 8. Switching Time vs Load Resistance

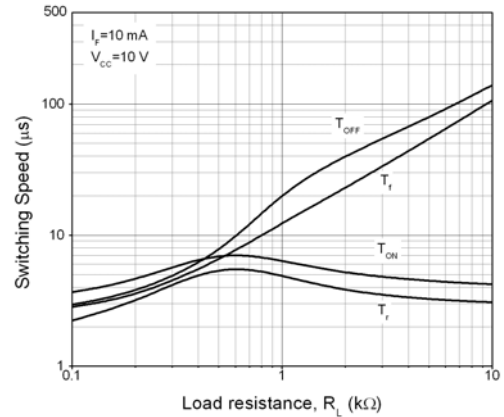


Figure 9. Turn-on Time vs Base-Emitter Resistance

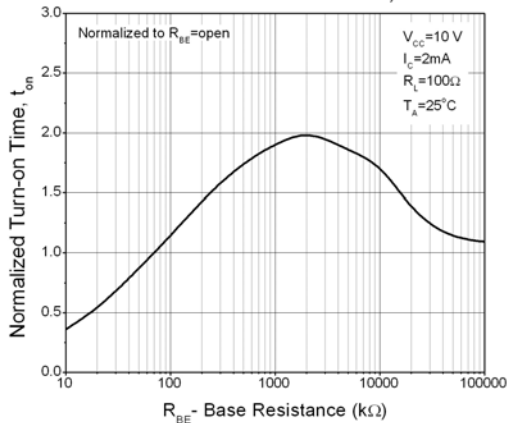


Figure 10. Turn-off Time vs Base-Emitter Resistance

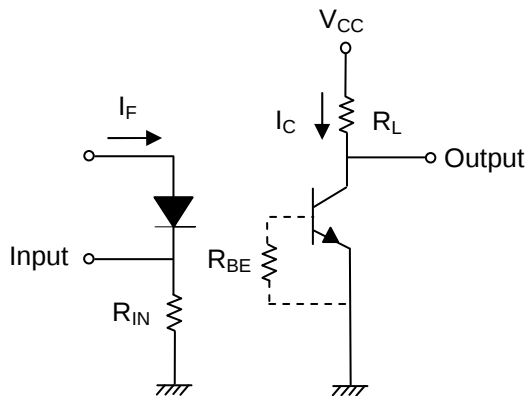
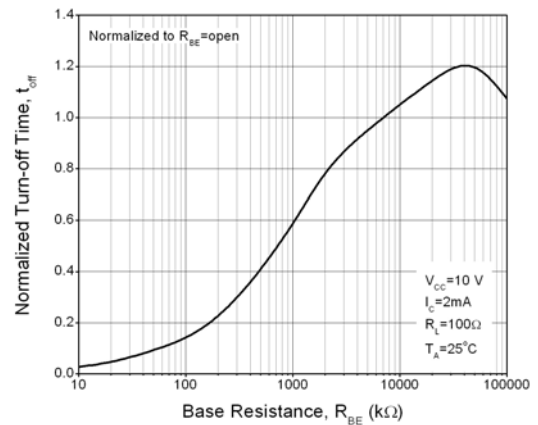


Figure 11. Switching Time Test Circuit & Waveforms

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H11AAX Series

Order Information

Part Number

H11AAXY(Z)-V

Note

X = Part no. (1, 2, 3 or 4)

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

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

V = VDE safety (optional)

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

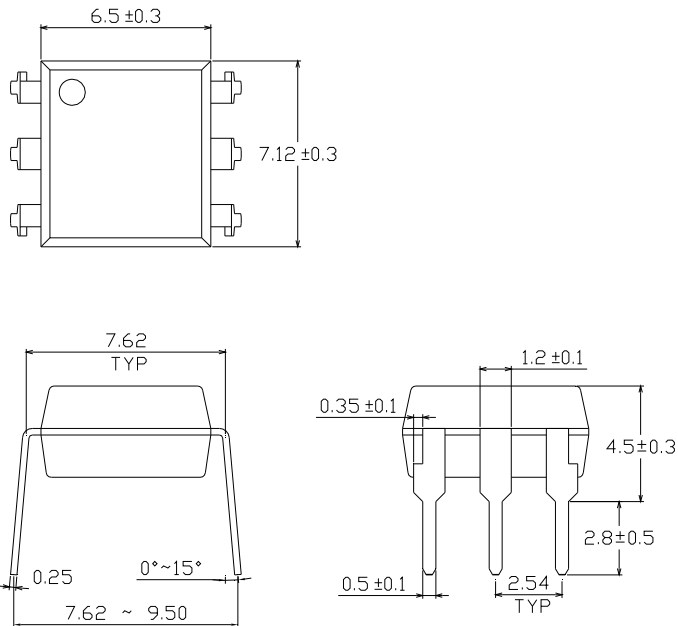
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

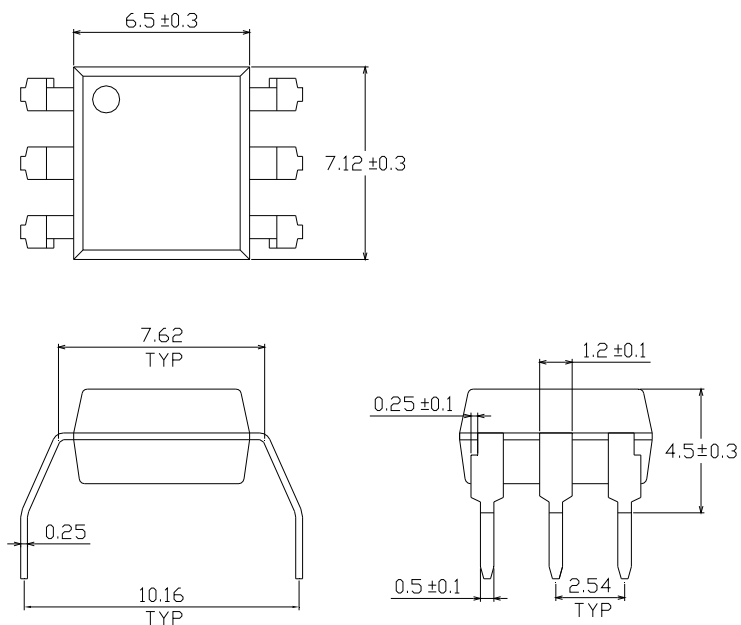
Package Drawings

(Dimensions in mm)

Standard DIP Type



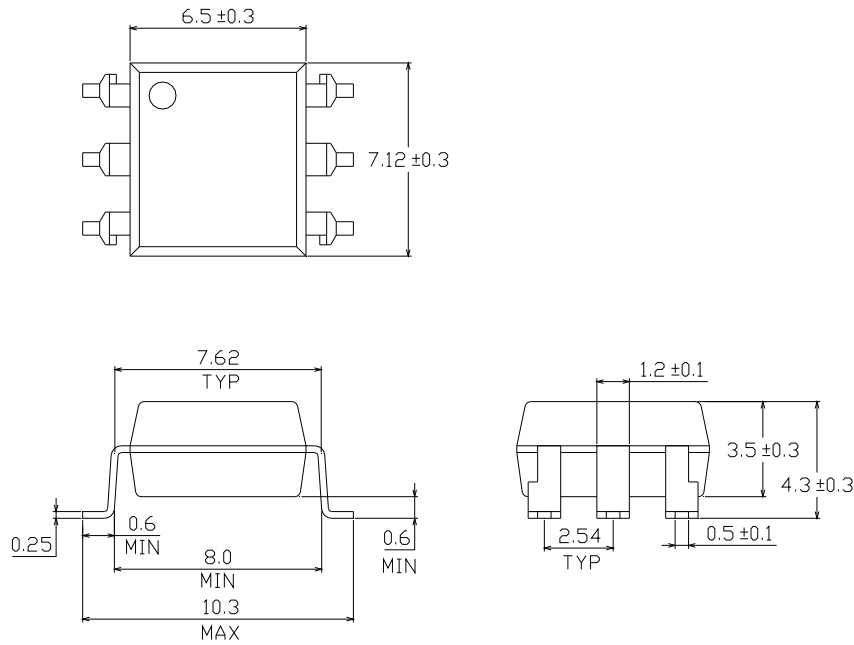
Option M Type



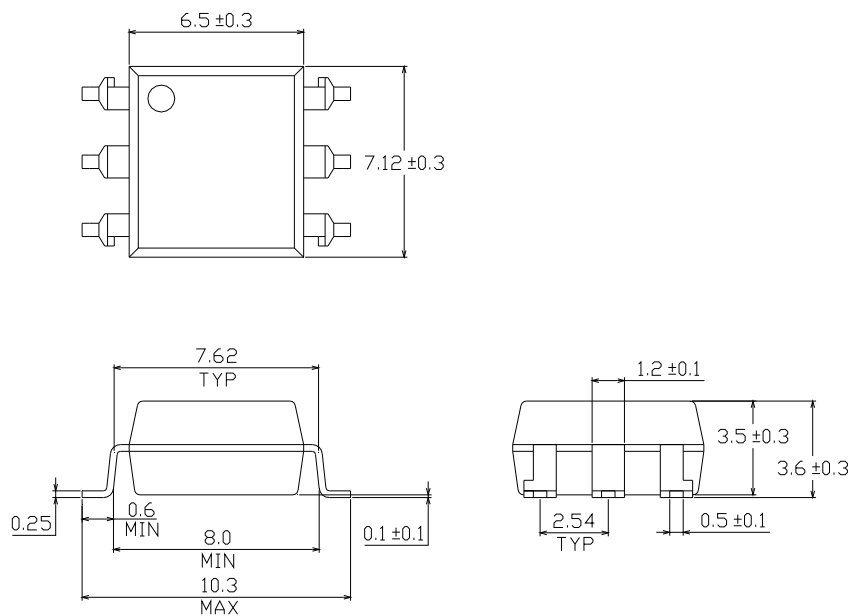
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Option S Type



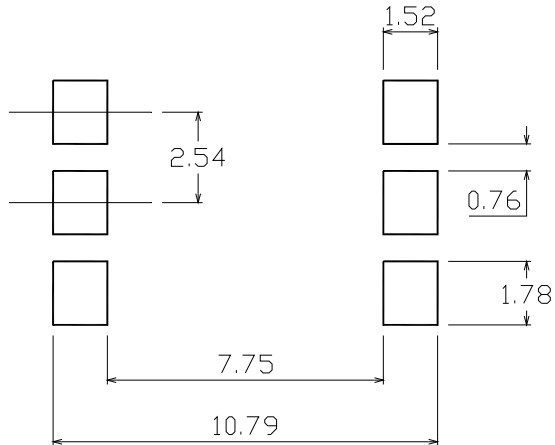
Option S1 Type



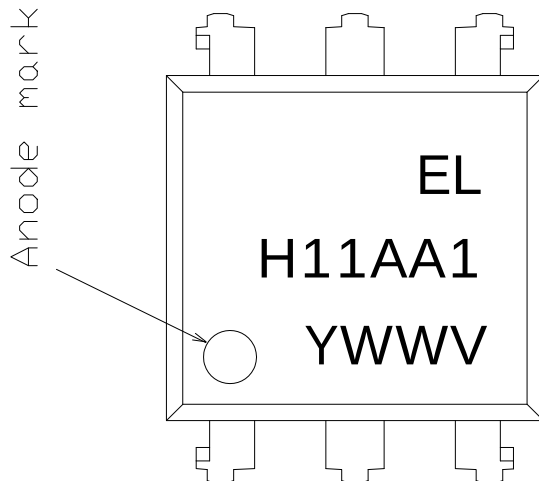
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H11AAX Series

Recommended pad layout for surface mount leadform



Device Marking



Notes

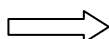
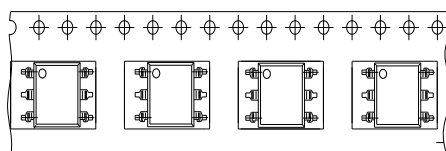
EL denotes Everlight
H11AA1 denotes Part Number
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE safety (optional)

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H11AAX Series

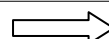
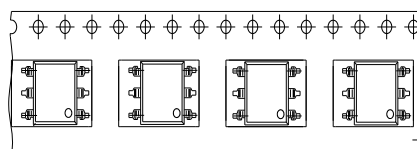
Tape & Reel Packing Specifications

Option TA



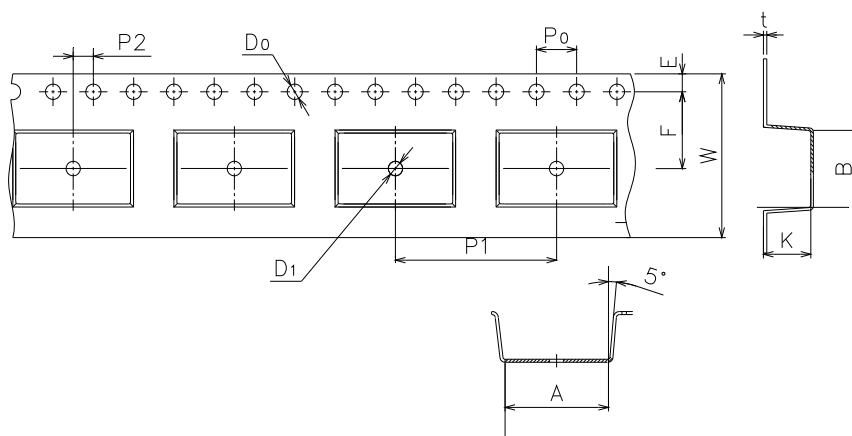
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions



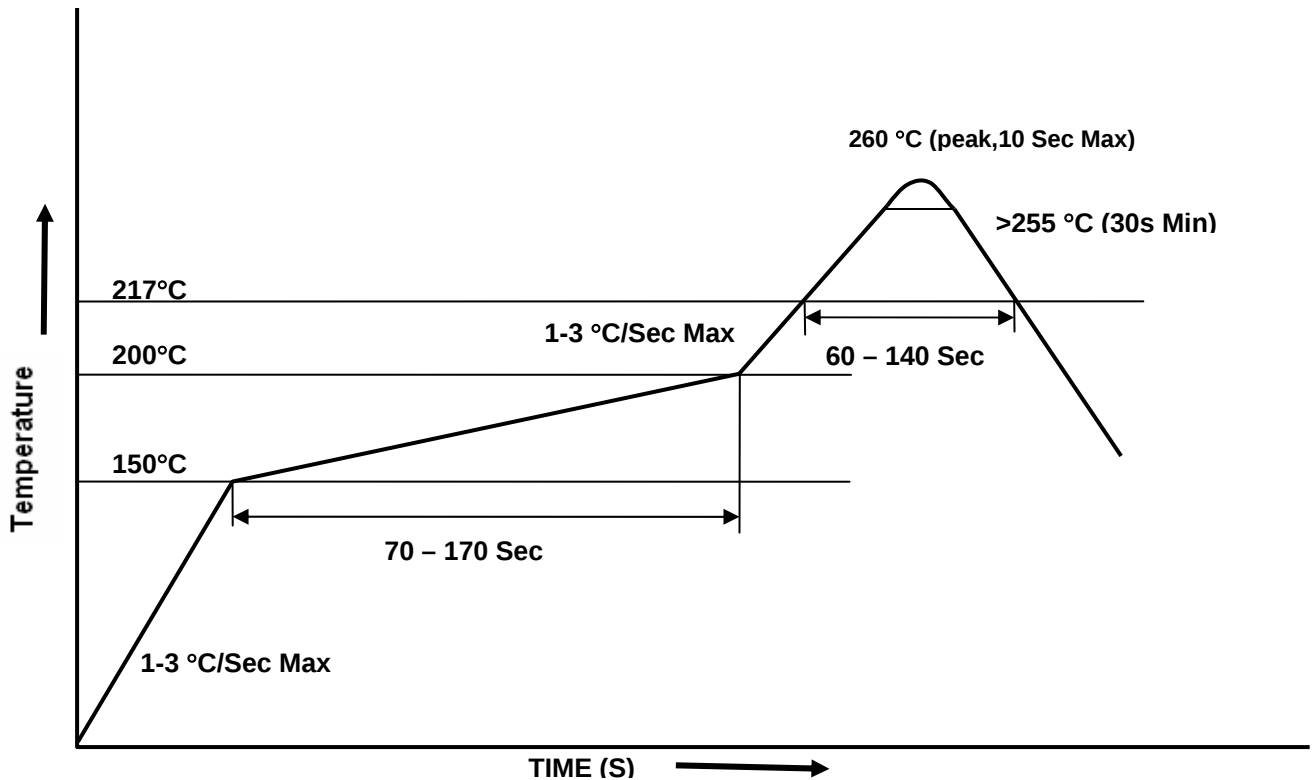
Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.52±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1

Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.15	16.0±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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