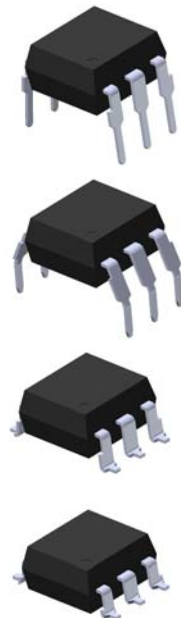


6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

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

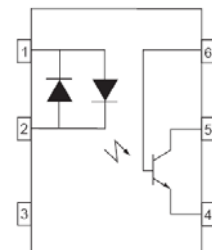


Description

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

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

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

H11AAX 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	1.5	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

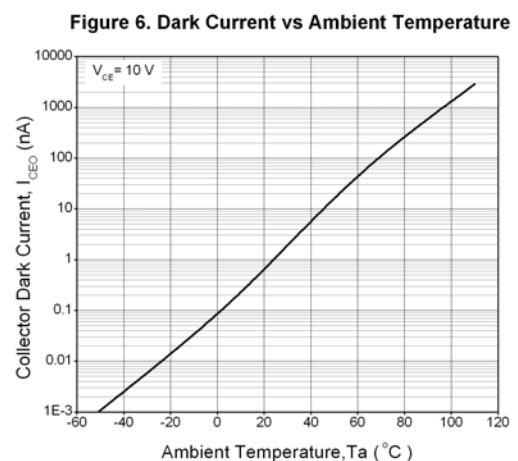
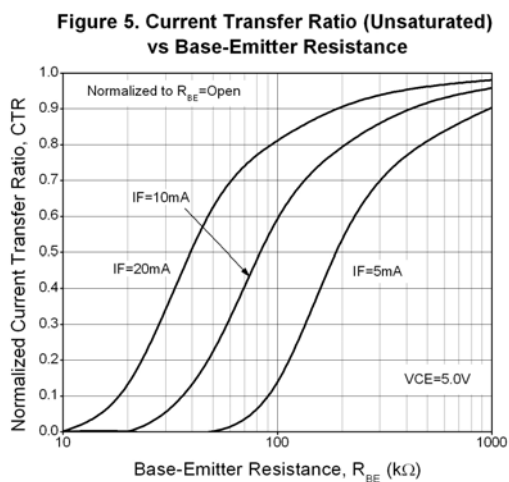
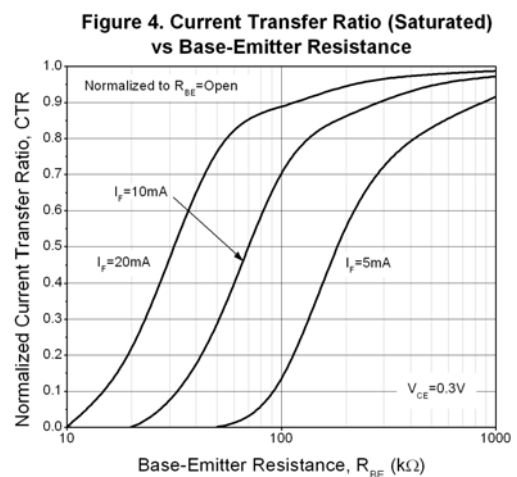
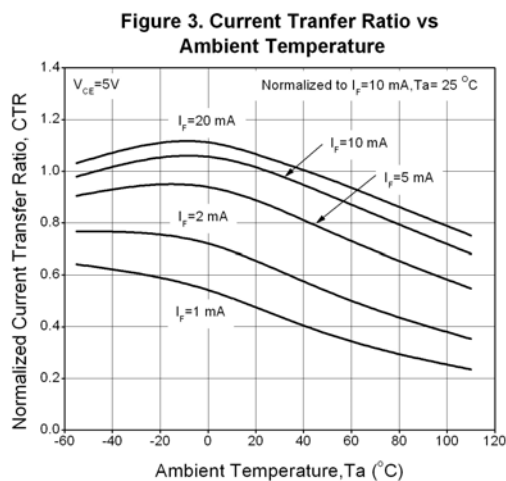
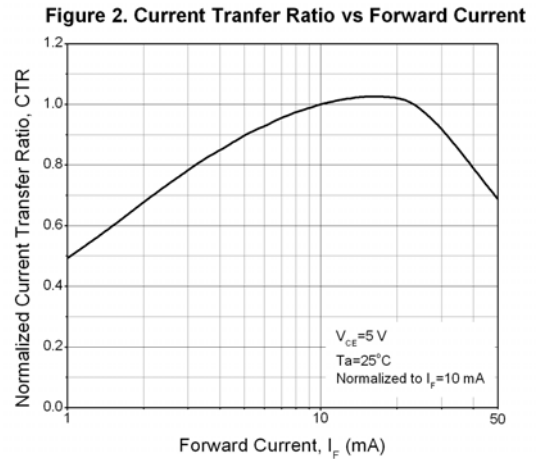
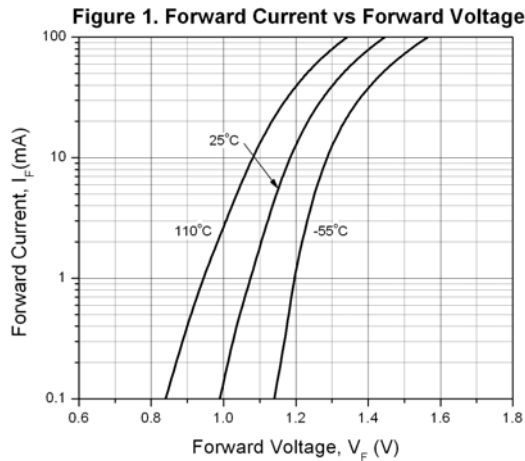
Parameter		Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer Ratio	H11AA1	CTR	20	-	-	%	$I_F = \pm 10\text{mA}, V_{CE} = 10\text{V}$
	H11AA2		10	-	-		
	H11AA3		50	-	-		
	H11AA4		100	-	-		
CTR Symmetry			0.5	-	2.0		$I_F = \pm 10\text{mA}, V_{CE} = 10\text{V}$
Collector-emitter saturation voltage		$V_{CE(sat)}$	-	-	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 $T_a = 25^{\circ}\text{C}$

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Typical Performance Curves



6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Figure 7. Collector-Emitter Saturation Voltage vs Collector Current

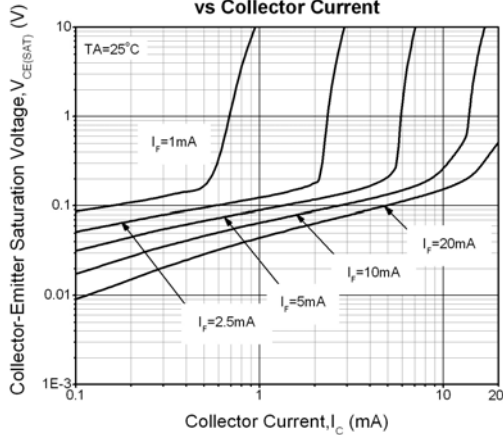


Figure 8. Switching Time vs Load Resistance

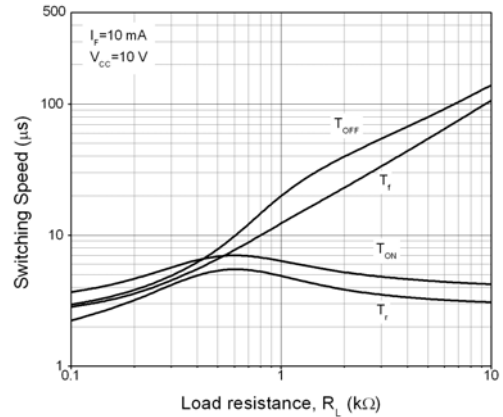


Figure 9. Turn-on Time vs Base-Emitter Resistance

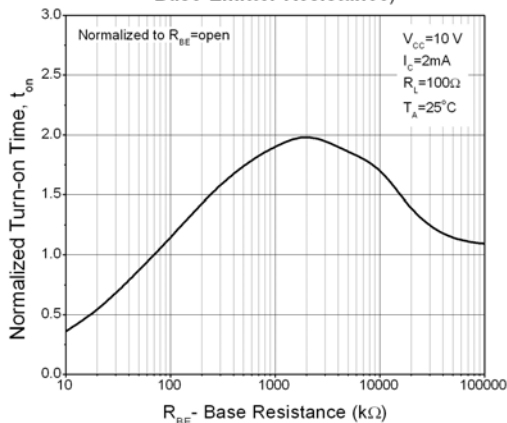


Figure 10. Turn-off Time vs Base-Emitter Resistance

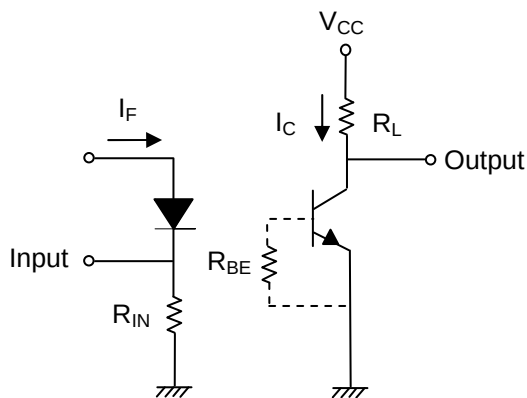
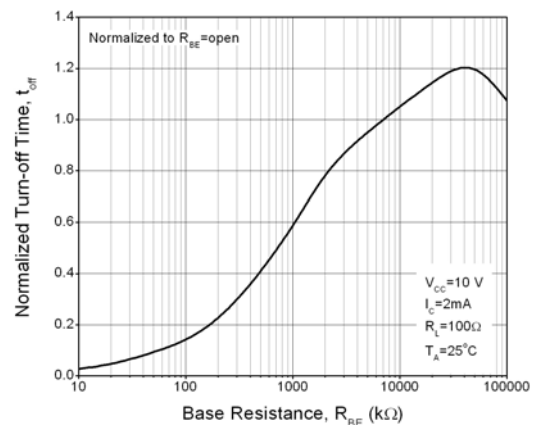


Figure 11. Switching Time Test Circuit & Waveforms

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

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

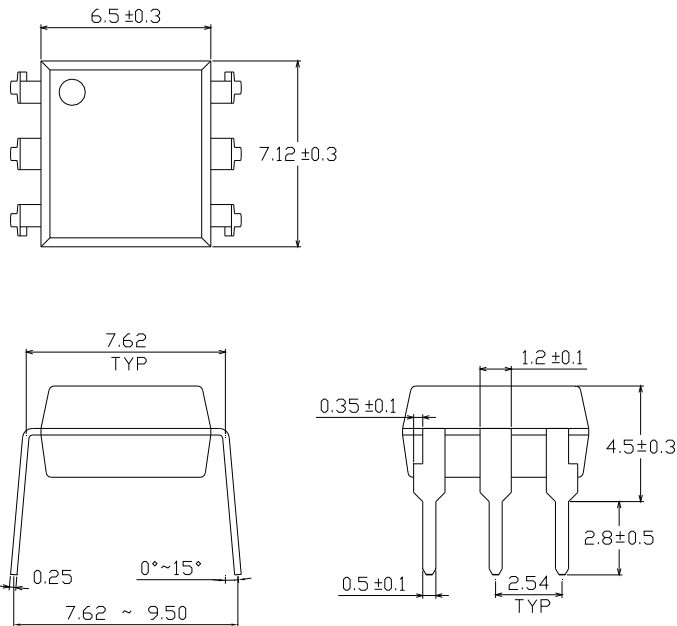
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

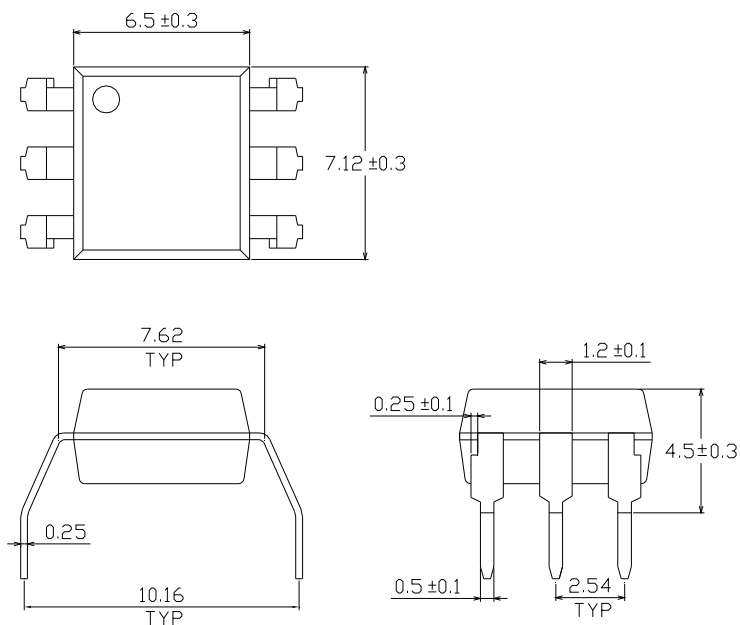
Package Drawings

(Dimensions in mm)

Standard DIP Type



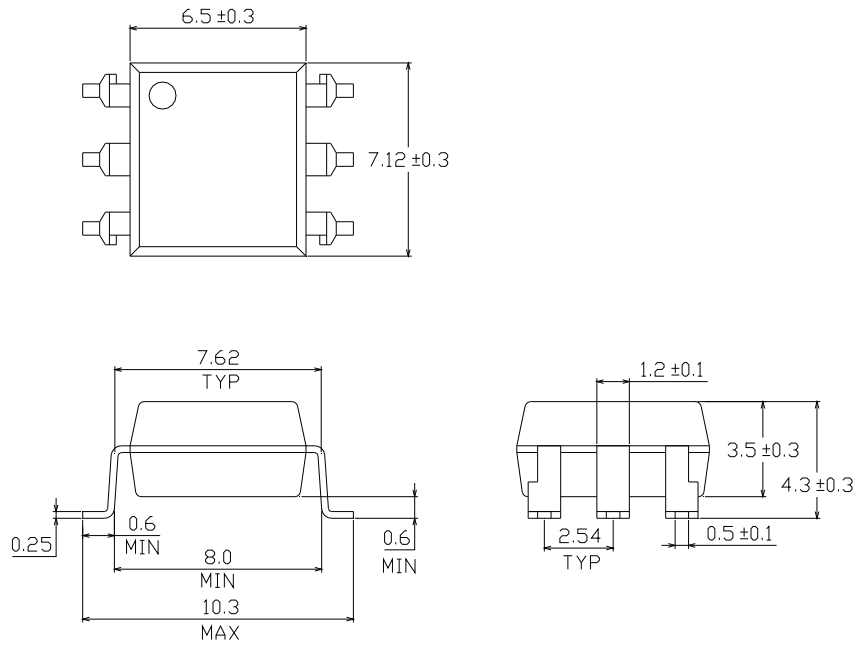
Option M Type



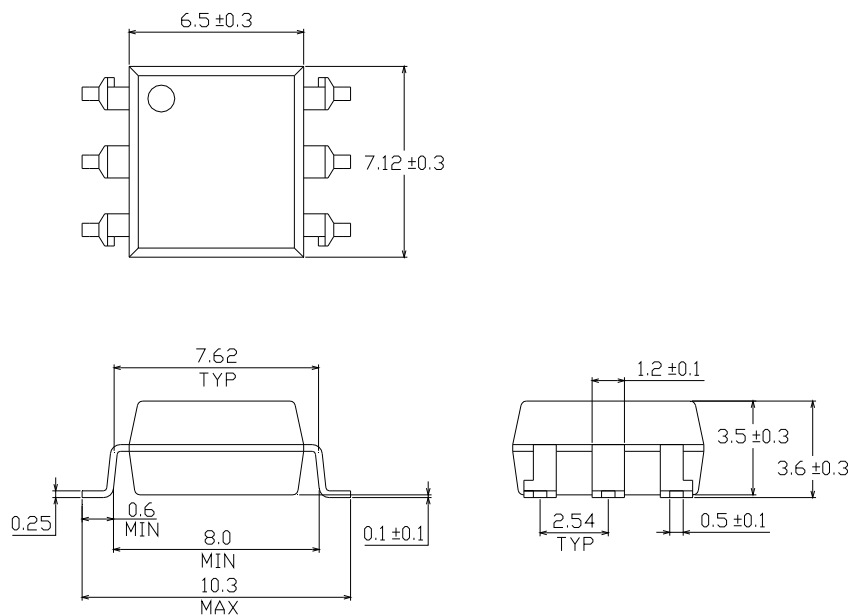
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Option S Type



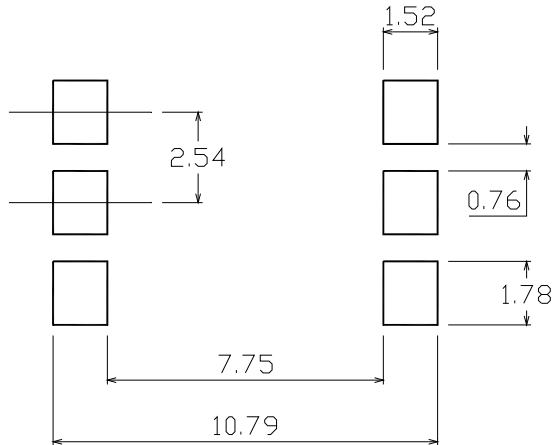
Option S1 Type



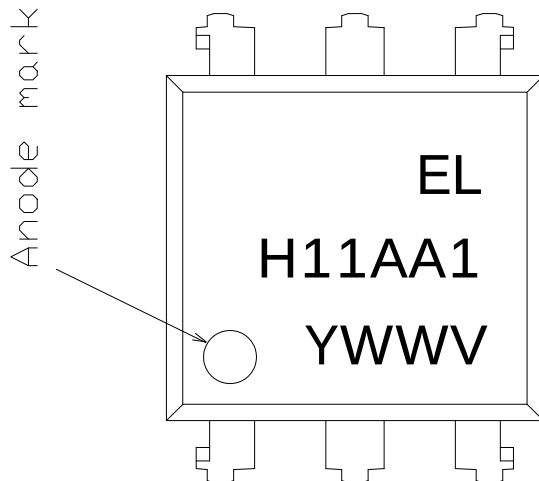
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Recommended pad layout for surface mount leadform



Device Marking



Notes

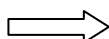
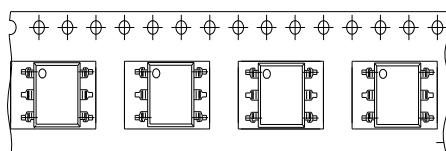
EL denotes Everlight
H11AA1 denotes Part Number
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE safety (optional)

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

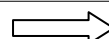
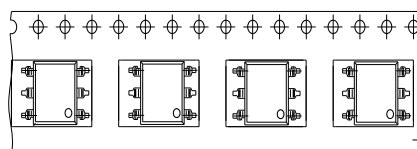
Tape & Reel Packing Specifications

Option TA



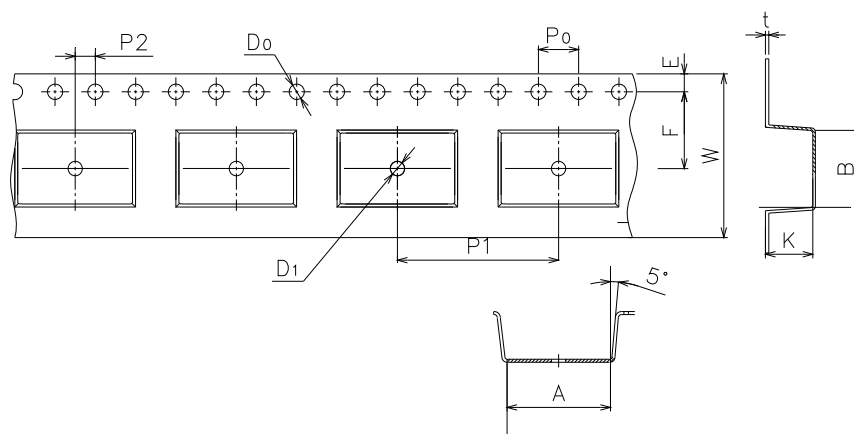
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions



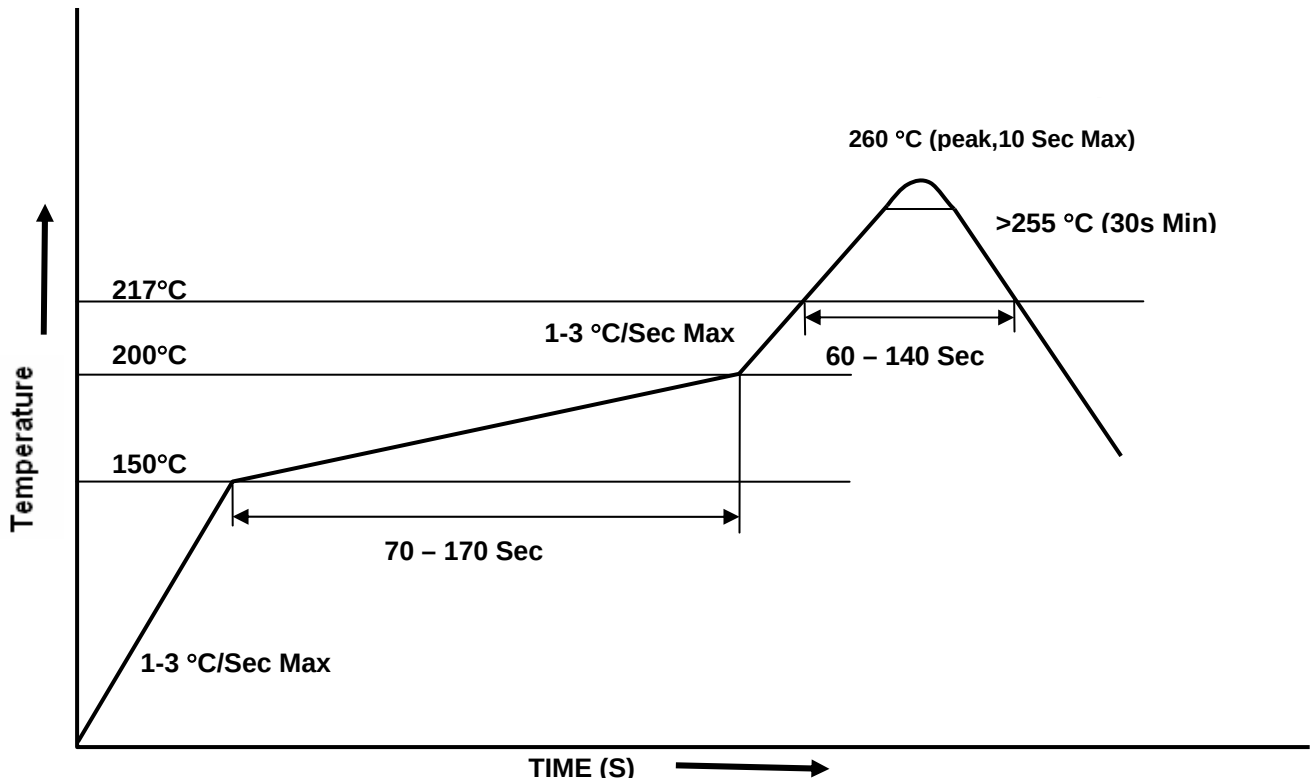
Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.52±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1

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

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Solder Reflow Temperature Profile



6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

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2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.

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