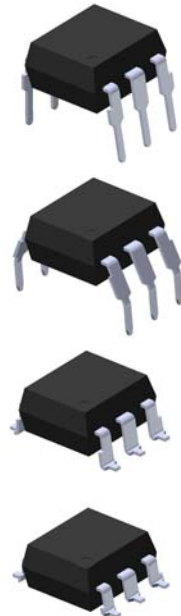


6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

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

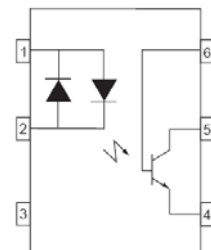


Description

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

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Peak forward current ($t = 10\mu\text{s}$)	I_{FM}	1	A
	Power dissipation ($T_A = 25^{\circ}\text{C}$)	P_D	120	mW
	Derating factor (above 90°C)		3.8	mW/ $^{\circ}\text{C}$
Output	Power dissipation ($T_A = 25^{\circ}\text{C}$) 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	Vrms
Operating temperature		T_{opr}	-55~+100	$^{\circ}\text{C}$
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 & 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°C unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V _F	-	1.2	1.5	V	I _F = ±10mA
Input capacitance	C _{in}	-	80	-	pF	V = 0, f = 1MHz

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I _{CEO}	-	-	50	nA	V _{CE} = 10V, I _F = 0mA
Collector-Emitter breakdown voltage	BV _{CEO}	80	-	-	V	I _C = 1mA
Collector-Base breakdown voltage	BV _{CBO}	80	-	-	V	I _C = 0.1mA
Emitter-Collector breakdown voltage	BV _{ECO}	7	-	-	V	I _E = 0.1mA
Collector-Emitter capacitance	C _{CE}	-	10	-	pF	V _{CE} = 0V, f = 1MHz

Transfer Characteristics

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Current Transfer Ratio	H11AA1	20	-	-	%	I _F = ±10mA, V _{CE} = 10V
	H11AA2	10	-	-		
	H11AA3	50	-	-		
	H11AA4	100	-	-		
CTR Symmetry		0.5	-	2.0		I _F = ±10mA, V _{CE} = 10V
Collector-emitter saturation voltage	V _{CE(sat)}	-	-	0.4	V	I _F = ±10mA, I _C = 0.5mA
Isolation resistance	R _{IO}	10 ¹¹	-	-	Ω	V _{IO} = 500Vdc
Input-output capacitance	C _{IO}	-	0.7	-	pF	V _{IO} = 0, f = 1MHz
Turn-on time	T _{on}	-	-	10	μs	V _{CC} = 10V, I _C = 10mA, R _L = 100Ω
Turn-off time	T _{off}	-	-	10		
Rise time	T _r	-	-	10		
Fall time	T _f	-	-	10		

* Typical values at T_a = 25°C

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

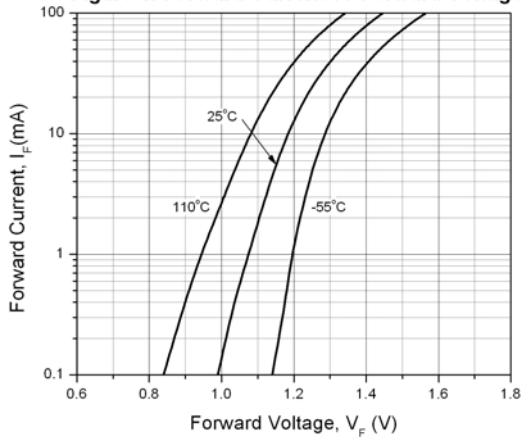


Figure 2. Current Transfer Ratio vs Forward Current

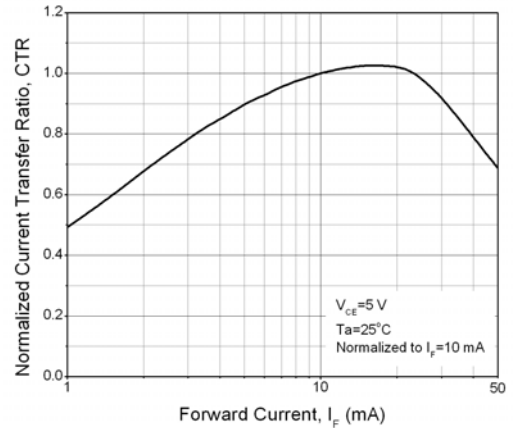


Figure 3. Current Transfer Ratio vs Ambient Temperature

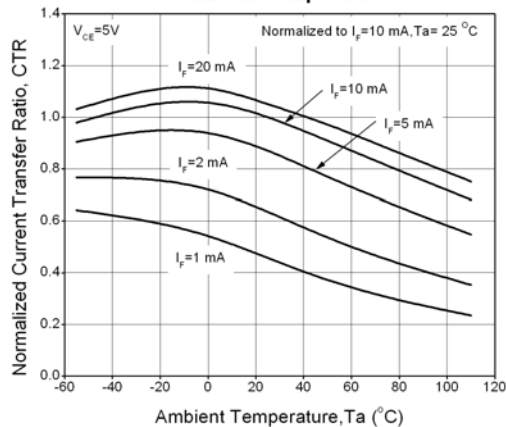


Figure 4. Current Transfer Ratio (Saturated) vs Base-Emitter Resistance

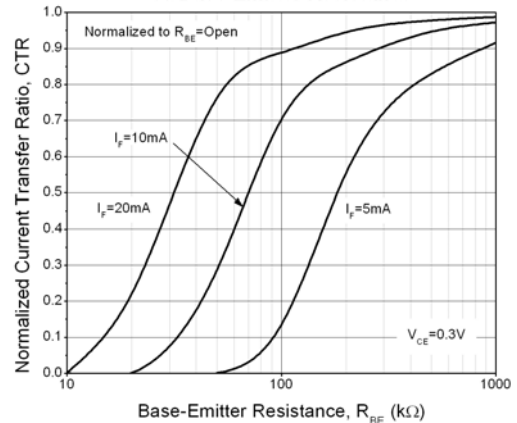


Figure 5. Current Transfer Ratio (Unsaturated) vs Base-Emitter Resistance

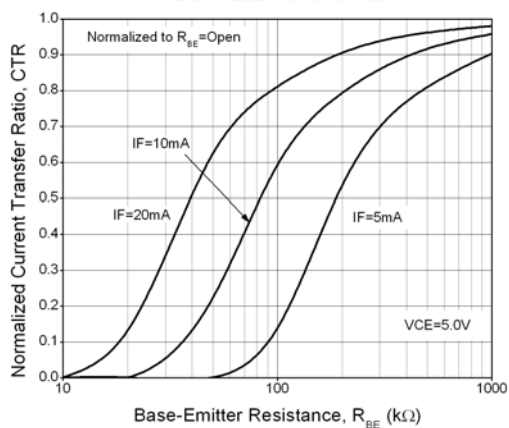
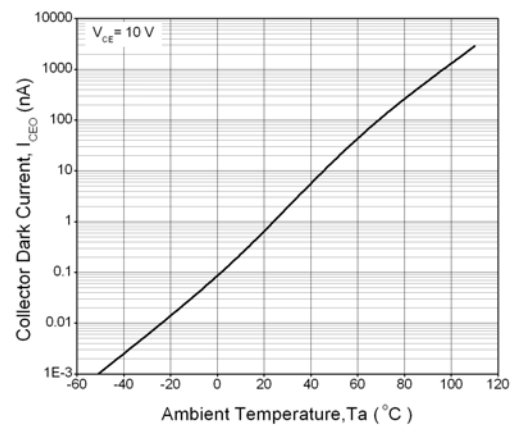


Figure 6. Dark Current vs Ambient Temperature



6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Figure 7. Collector-Emitter Saturation Voltage vs Collector Current

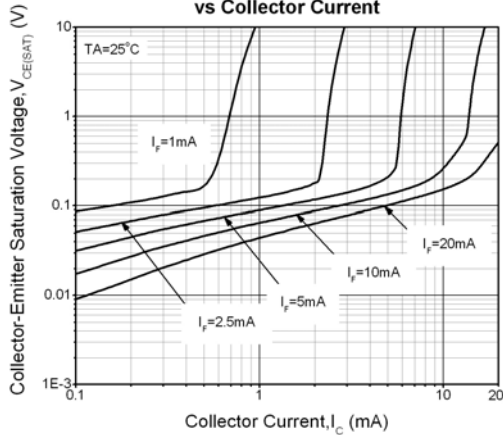


Figure 8. Switching Time vs Load Resistance

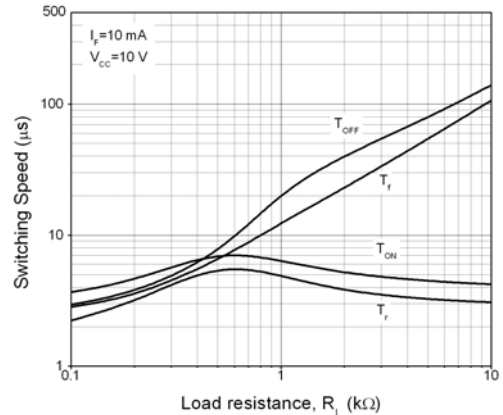


Figure 9. Turn-on Time vs Base-Emitter Resistance

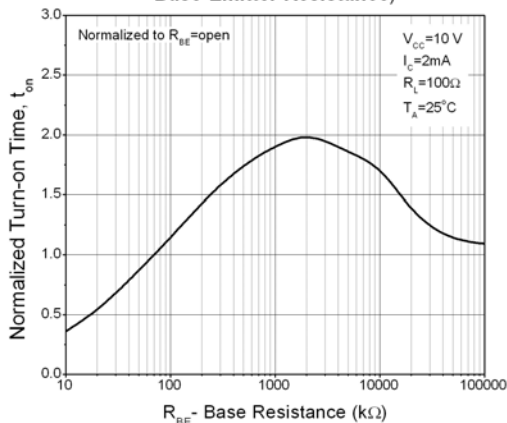


Figure 10. Turn-off Time vs Base-Emitter Resistance

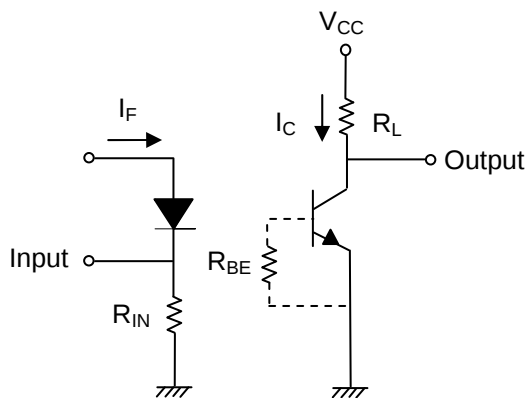
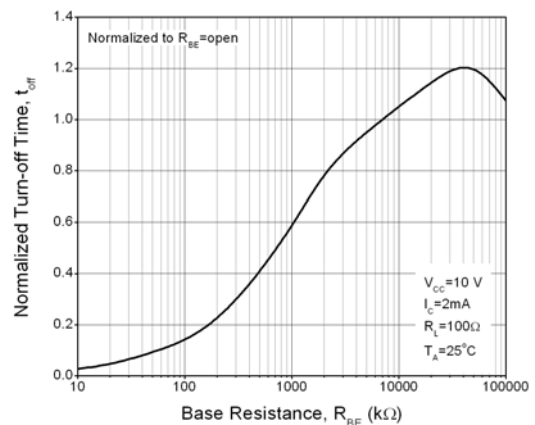


Figure 11. Switching Time Test Circuit & Waveforms

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

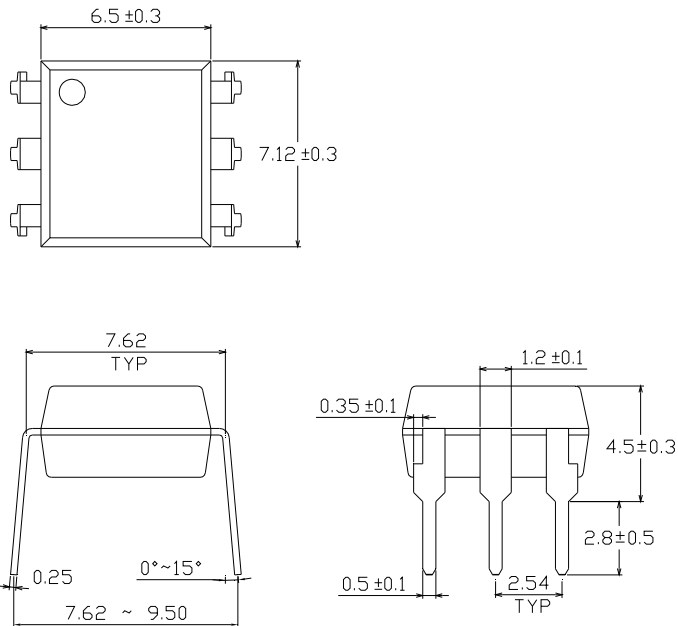
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

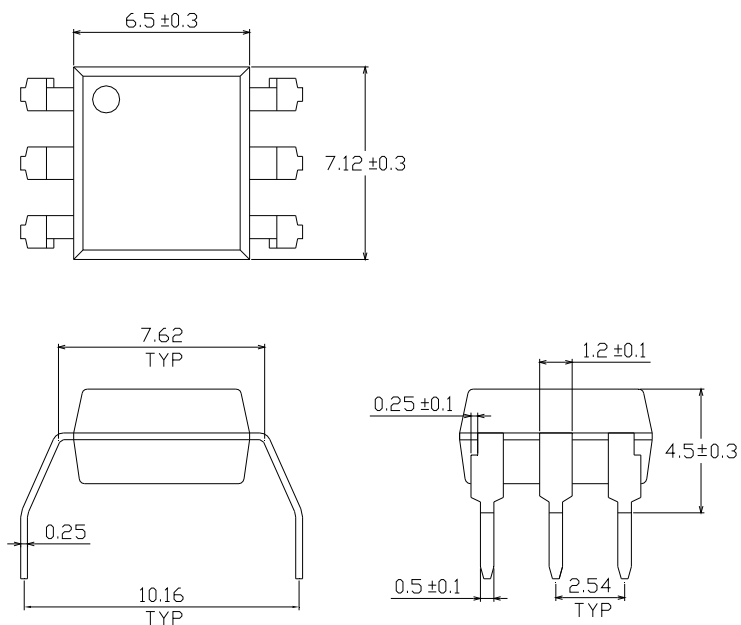
Package Drawings

(Dimensions in mm)

Standard DIP Type



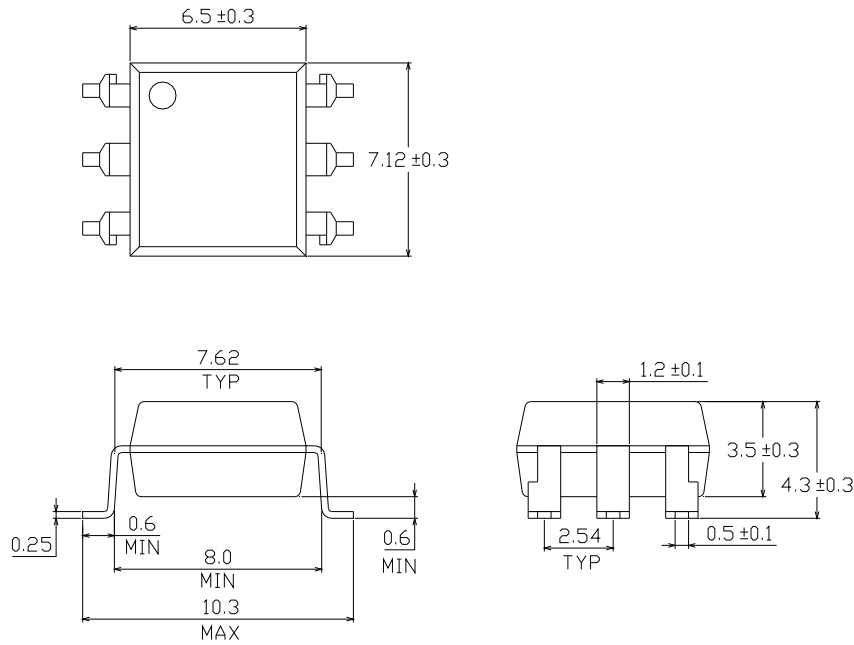
Option M Type



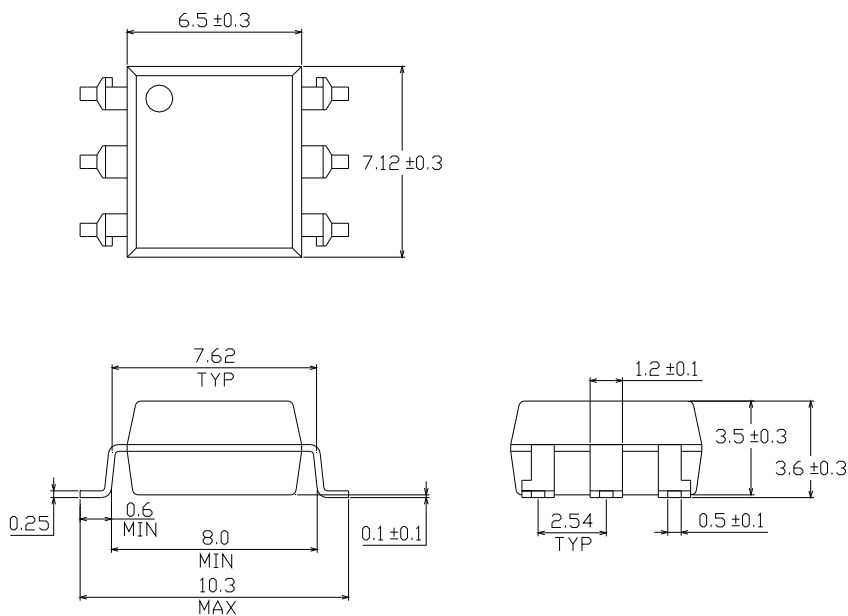
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Option S Type



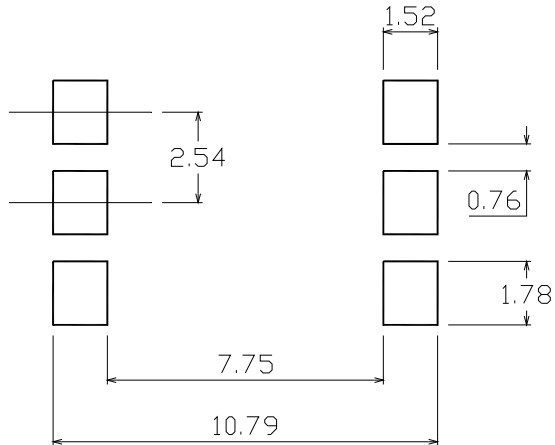
Option S1 Type



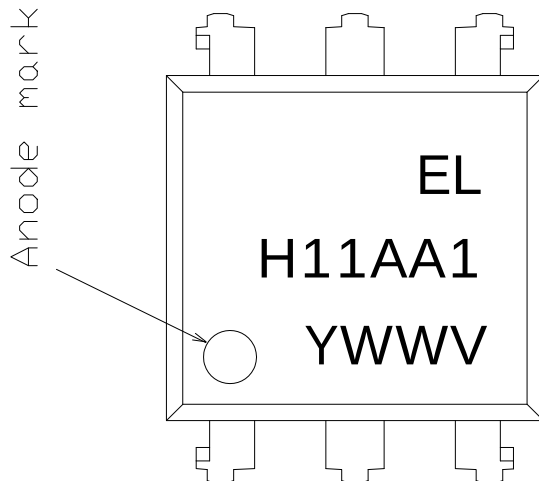
6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

Recommended pad layout for surface mount leadform



Device Marking



Notes

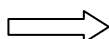
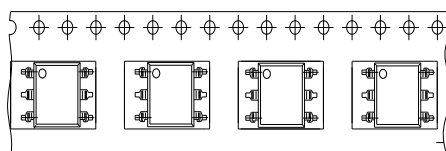
EL denotes Everlight
H11AA1 denotes Part Number
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE safety (optional)

6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

H11AAX Series

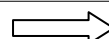
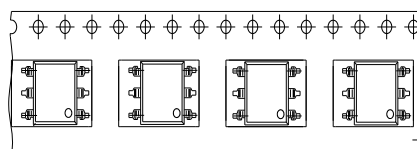
Tape & Reel Packing Specifications

Option TA



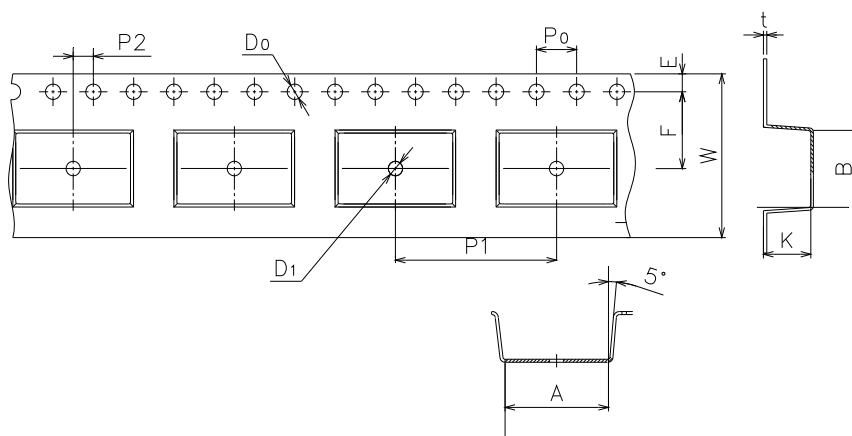
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions



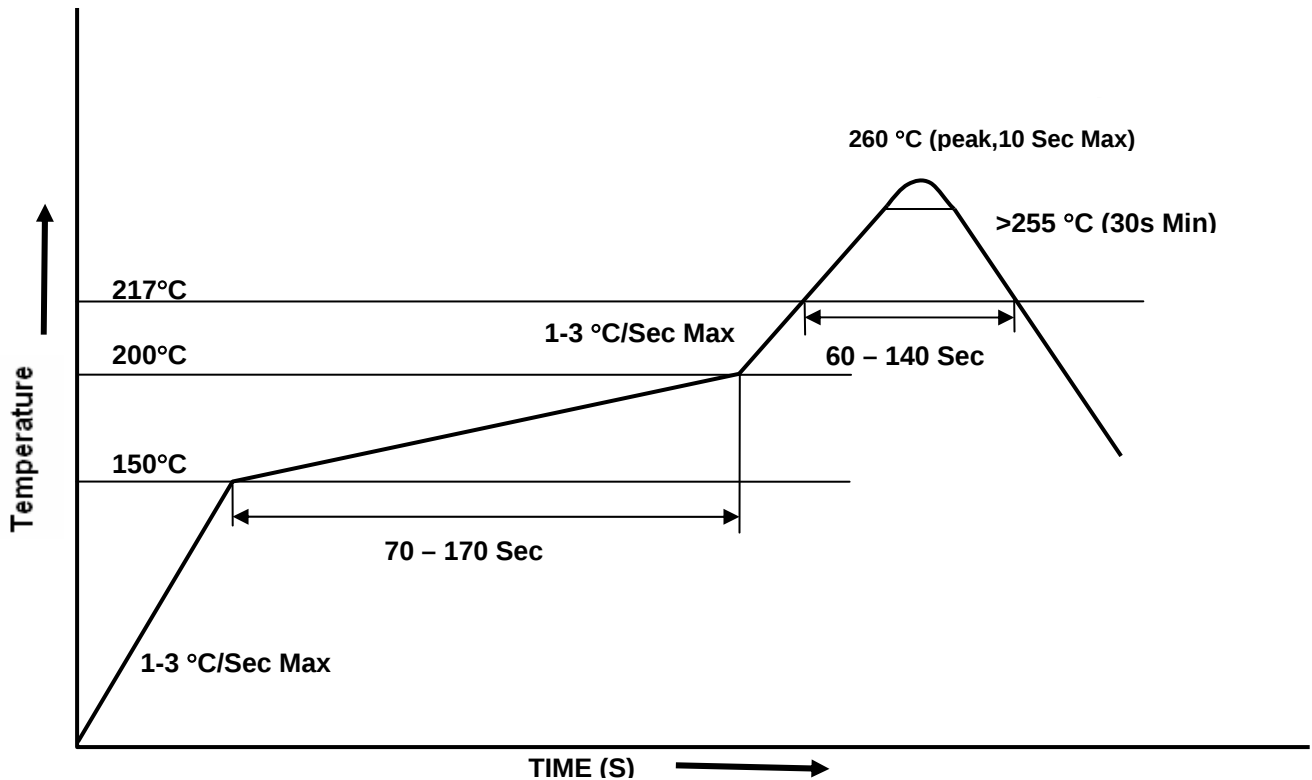
Dimension No.	A	B	D0	D1	E	F
Dimension (mm)	10.4±0.1	7.52±0.1	1.5±0.1	1.5±0.1/-0	1.75±0.1	7.5±0.1

Dimension No.	P0	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

DISCLAIMER

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
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.

These specification sheets include materials protected under copyright of EVERLIGHT. Reproduction in any form is prohibited without the specific consent of EVERLIGHT.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Everlight:

[H11AA1](#) [H11AA1M](#) [H11AA1S\(TA\)](#) [H11AA1S\(TA\)-V](#) [H11AA1S\(TB\)](#) [H11AA1S1\(TA\)](#) [H11AA1S1\(TA\)-V](#)
[H11AA1S1\(TB\)](#) [H11AA1S1\(TB\)-V](#) [H11AA1-V](#) [H11AA2](#) [H11AA2M](#) [H11AA2S\(TA\)](#) [H11AA2S\(TA\)-V](#) [H11AA2S\(TB\)](#)
[H11AA2S\(TB\)-V](#) [H11AA2S1\(TA\)](#) [H11AA2S1\(TA\)-V](#) [H11AA2S1\(TB\)](#) [H11AA2S1\(TB\)-V](#) [H11AA2-V](#) [H11AA3](#)
[H11AA3M](#) [H11AA3S\(TA\)](#) [H11AA3S\(TA\)-V](#) [H11AA3S\(TB\)](#) [H11AA3S\(TB\)-V](#) [H11AA3S1\(TA\)](#) [H11AA3S1\(TA\)-V](#)
[H11AA3S1\(TB\)](#) [H11AA3S1\(TB\)-V](#) [H11AA3-V](#) [H11AA4](#) [H11AA4M](#) [H11AA4S\(TA\)](#) [H11AA4S\(TA\)-V](#) [H11AA4S\(TB\)](#)
[H11AA4S\(TB\)-V](#) [H11AA4S1\(TA\)](#) [H11AA4S1\(TA\)-V](#) [H11AA4S1\(TB\)](#) [H11AA4S1\(TB\)-V](#) [H11AA4-V](#)