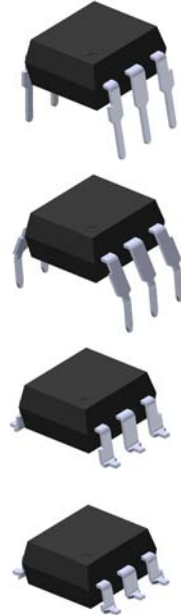


## 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## 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 approval pending
- SEMKO approval pending
- NEMKO approval pending
- DEMKO approval pending
- FIMKO approval pending
- CSA approval pending



### Description

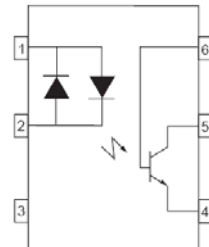
The H11AAX series of devices each consist of two infrared emitting diode, connected in inverse parallel, optically coupled to a phototransistor detector.

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

### Applications

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

### Schematic



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



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## 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 $90^{\circ}\text{C}$ )		3.8	mW/ $^{\circ}\text{C}$
Output	Power dissipation ( $T_A = 25^{\circ}\text{C}$ ) No derating up to $100^{\circ}\text{C}$	$P_C$	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 <sup>*1</sup>		$V_{iso}$	5000	V <sub>rms</sub>
Operating temperature		$T_{opr}$	-55~+100	$^{\circ}\text{C}$
Storage temperature		$T_{stg}$	-55~+125	$^{\circ}\text{C}$
Soldering temperature <sup>*2</sup>		$T_{sol}$	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 ( $T_a=25^\circ\text{C}$ 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	$R_{IO}$	$10^{11}$	-	-	$\Omega$	$V_{IO} = 500\text{Vdc}$	
Input-output capacitance	$C_{IO}$	-	0.7	-	pF	$V_{IO} = 0, f = 1\text{MHz}$	
Turn-on time	$T_{on}$	-	-	10	$\mu\text{s}$	$V_{CC} = 10\text{V}, I_C = 10\text{mA}, R_L = 100\Omega$	
Turn-off time	$T_{off}$	-	-	10			
Rise time	$T_r$	-	-	10			
Fall time	$T_f$	-	-	10			

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

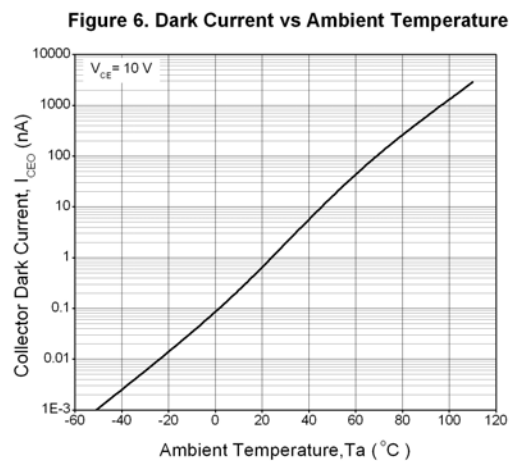
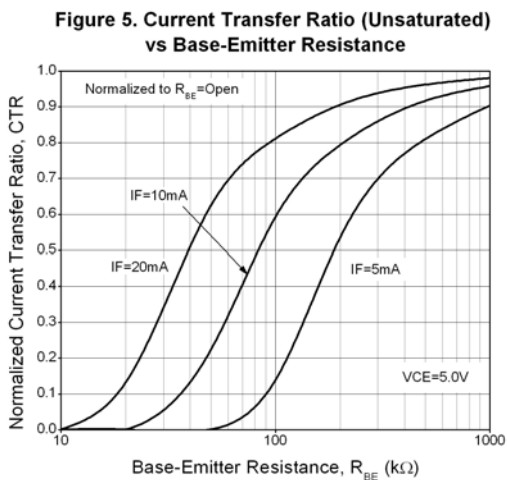
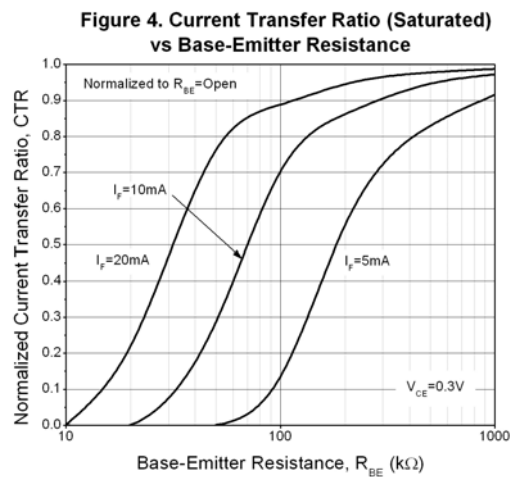
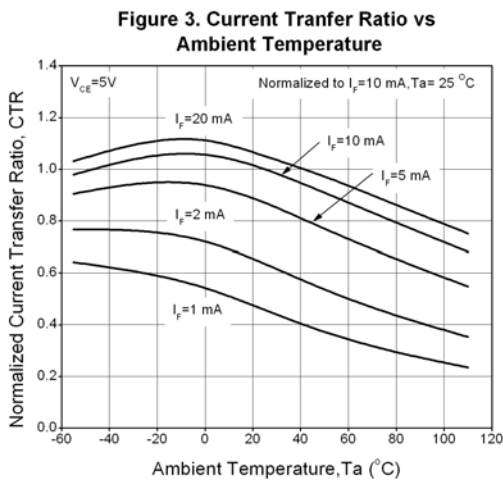
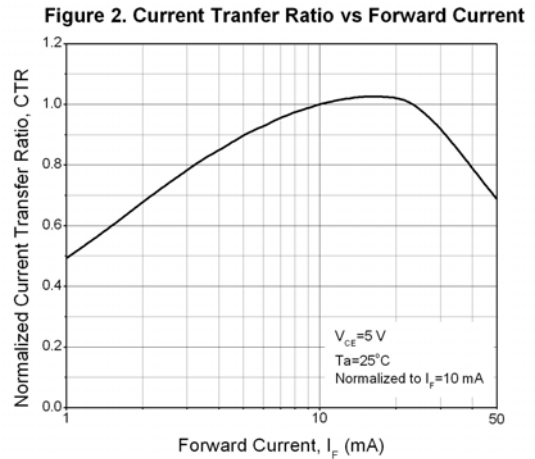
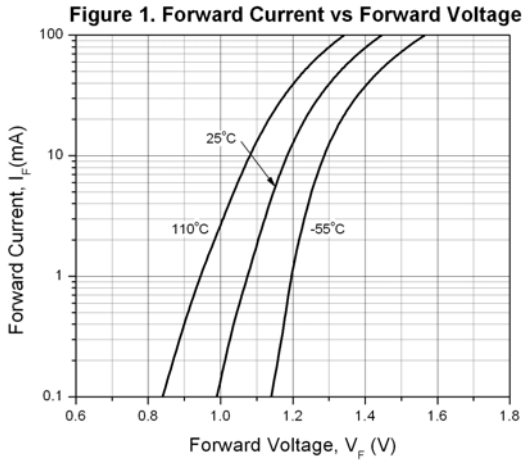


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# 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

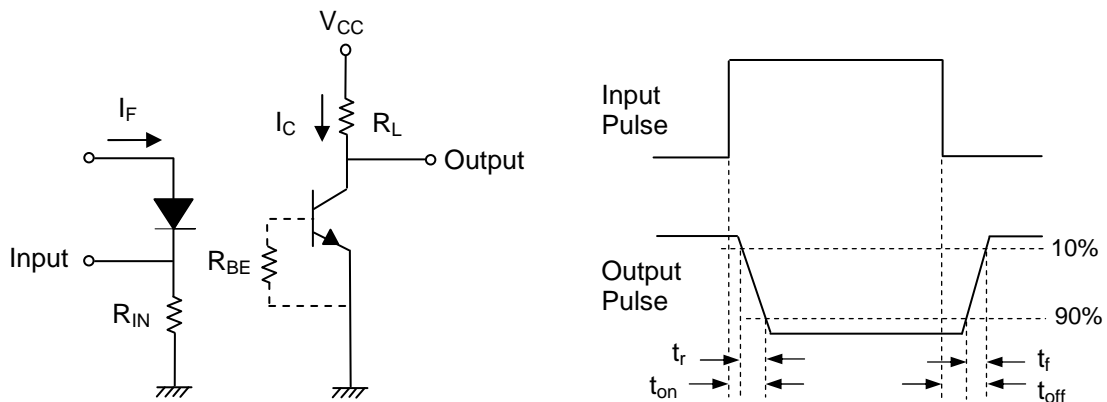
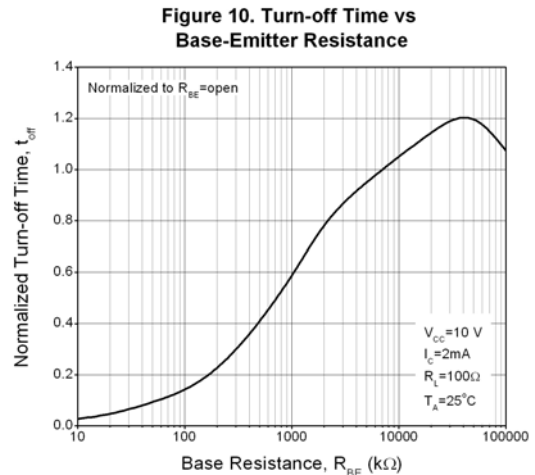
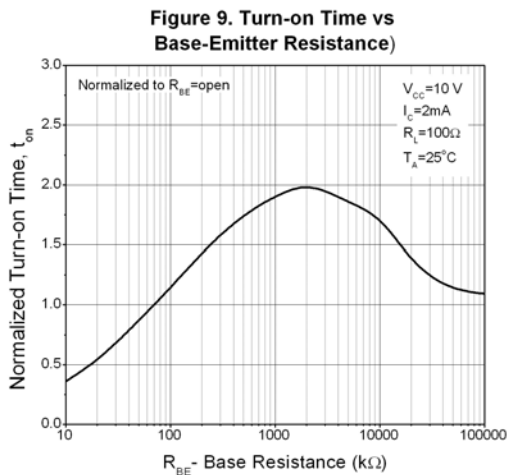
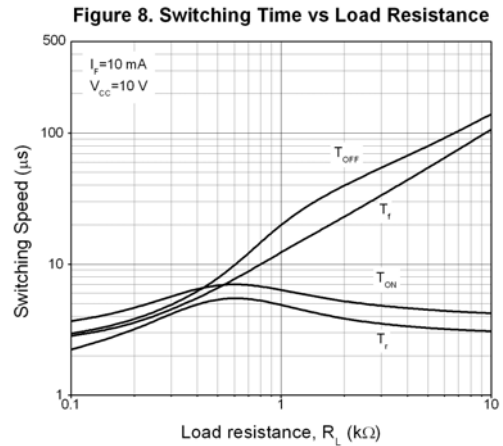
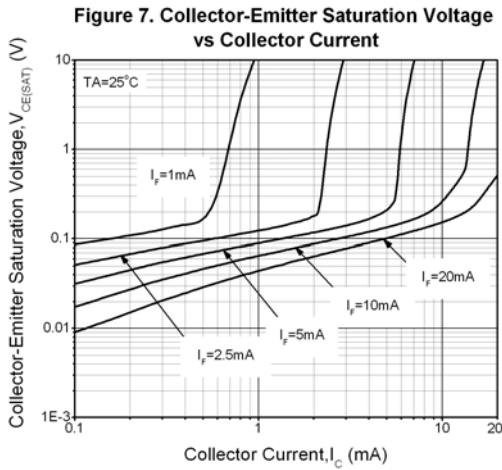
## H11AAX Series

### Typical Performance Curves



# 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## H11AAX Series



**Figure 11. Switching Time Test Circuit & Waveforms**



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# 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



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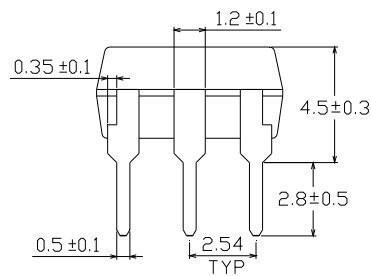
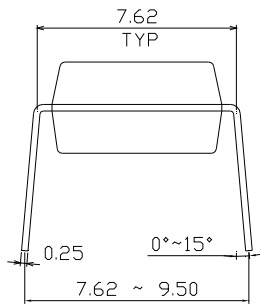
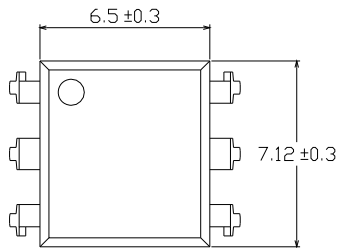
# 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## H11AAX Series

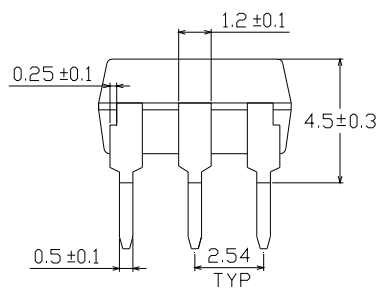
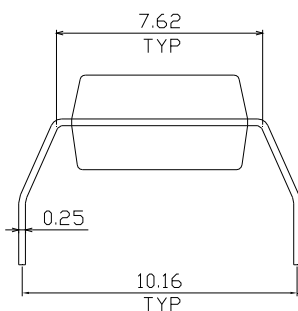
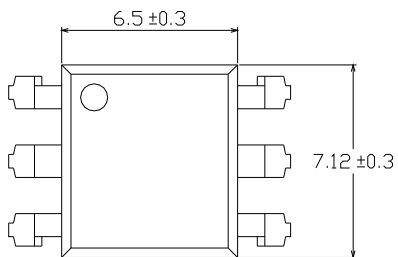
### Package Drawings

(Dimensions in mm)

#### Standard DIP Type



#### Option M Type



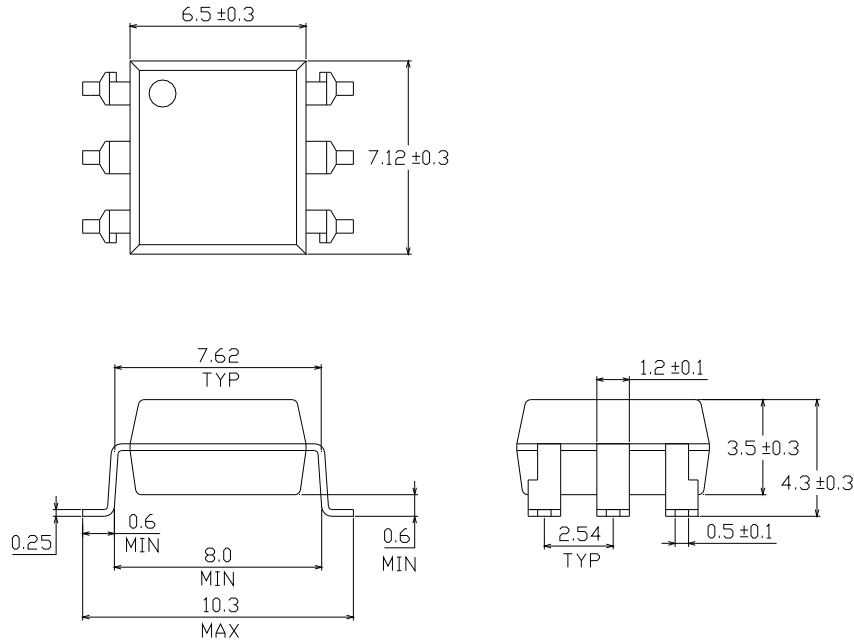


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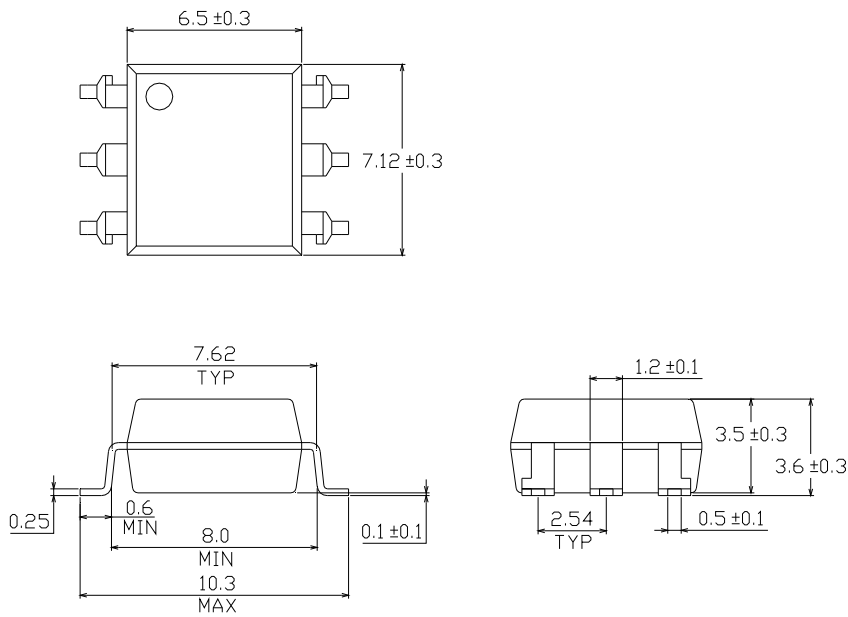
# 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## H11AAX Series

### Option S Type



### Option S1 Type





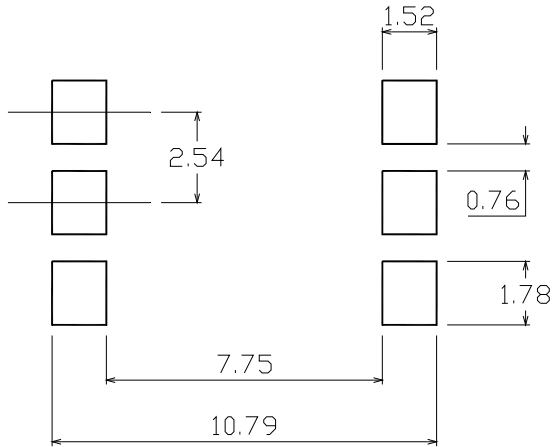


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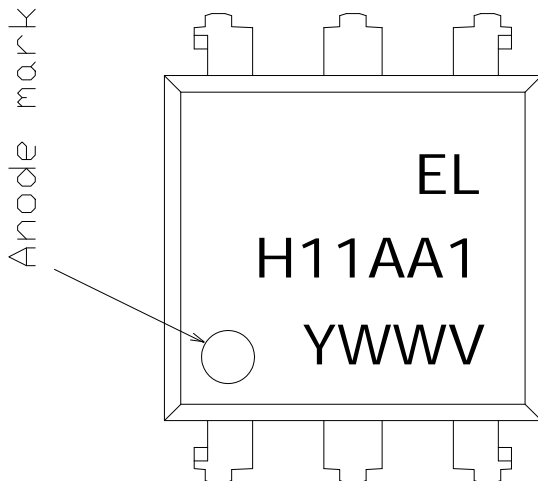
# 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## H11AAX Series

### Recommended pad layout for surface mount leadform



### Device Marking



### Notes

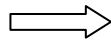
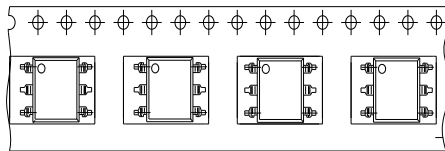
- EL denotes Everlight
- H11AA1 denotes Part Number
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VED safety (optional)

# 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## H11AAX Series

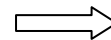
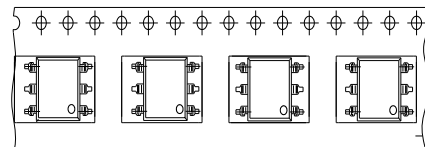
### Tape & Reel Packing Specifications

**Option TA**



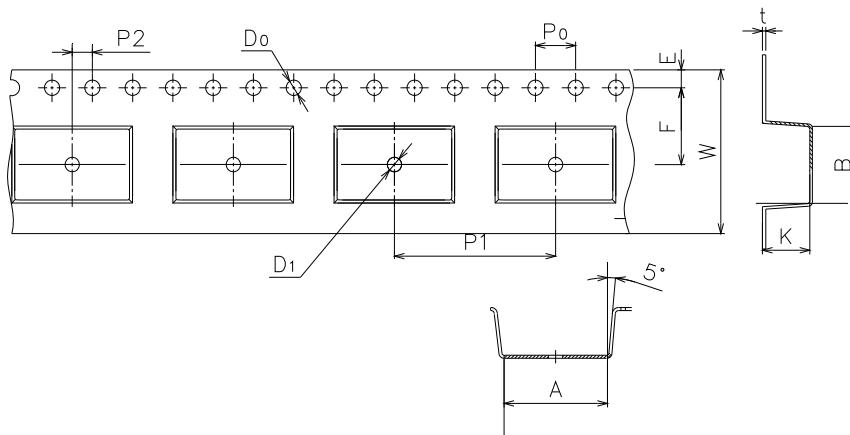
Direction of feed from reel

**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

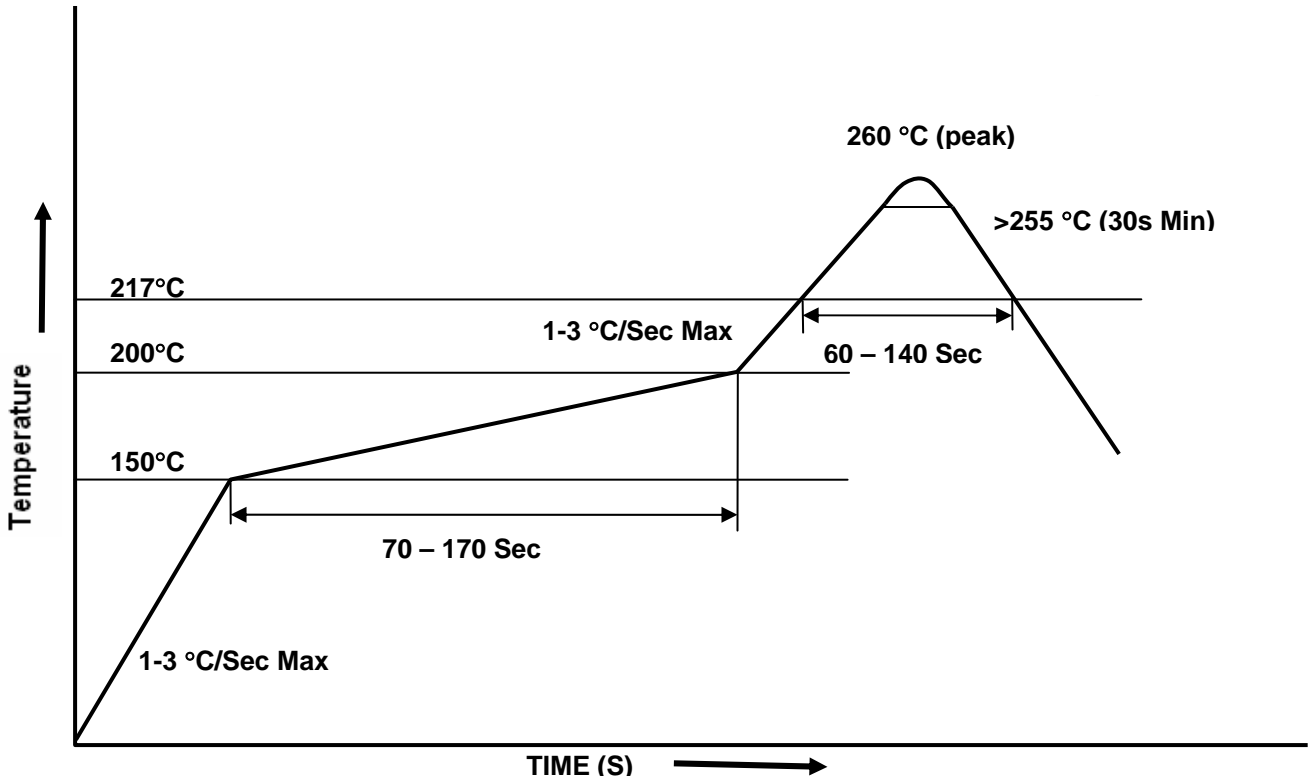


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# 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

## H11AAX Series

### Solder Reflow Temperature Profile





## 6 PIN DIP PHOTOTRANSISTOR AC INPUT PHOTOCOUPLER

**H11AAX Series**

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