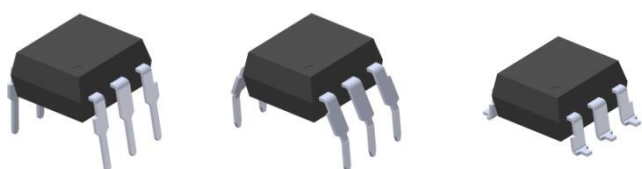




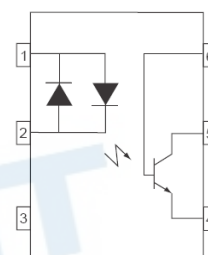
**THE DATASHEET OF
H11AA2S1(TA)**



6 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER AC INPUT PHOTOCOUPLER H11AAX Series



Schematic



Pin Configuration

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

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
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- UL and cUL approved(No. E214129)
- VDE approved (No.132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC 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.

Applications

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

Absolute Maximum Ratings (Ta=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) Derating factor (above 90°C)	P _D	120 3.8	mW 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 _{CB0}	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 to 100	°C
	Storage Temperature	T _{STG}	-55 to 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

Electro-Optical Characteristics (Ta=25°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	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$
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 $T_a = 25^\circ\text{C}$

Typical Electro-Optical Characteristics Curves

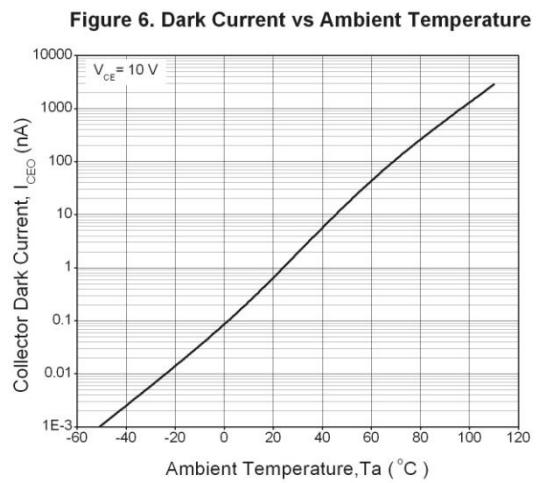
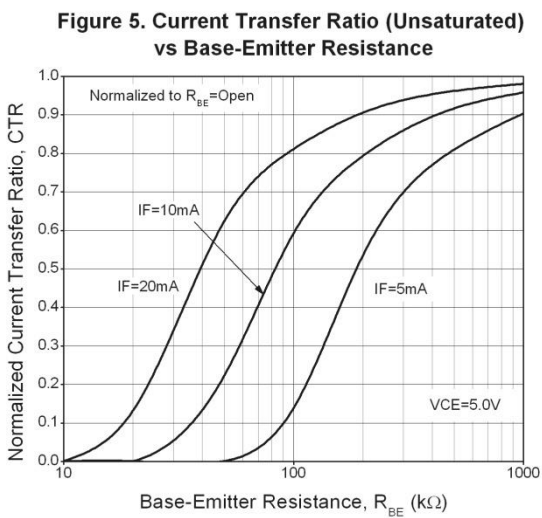
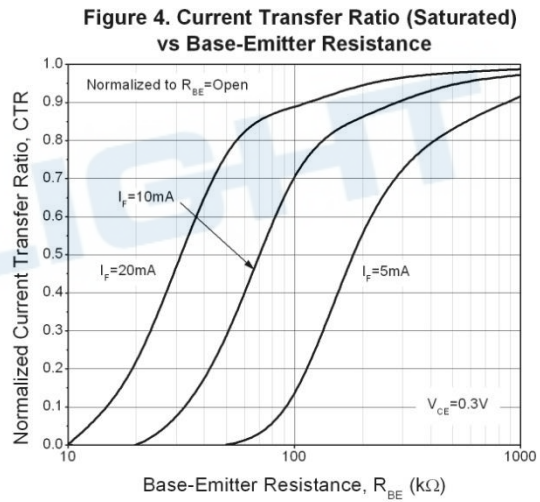
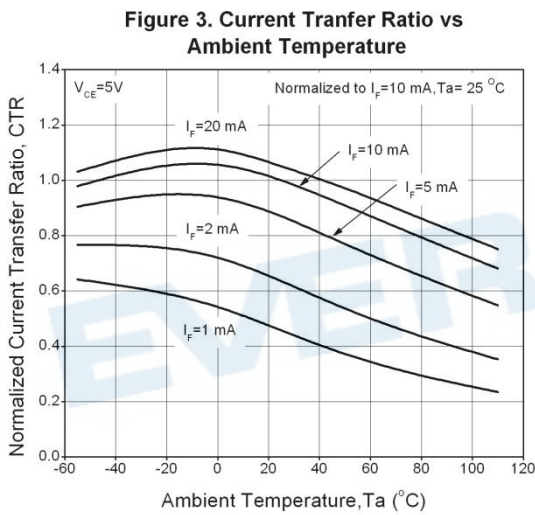
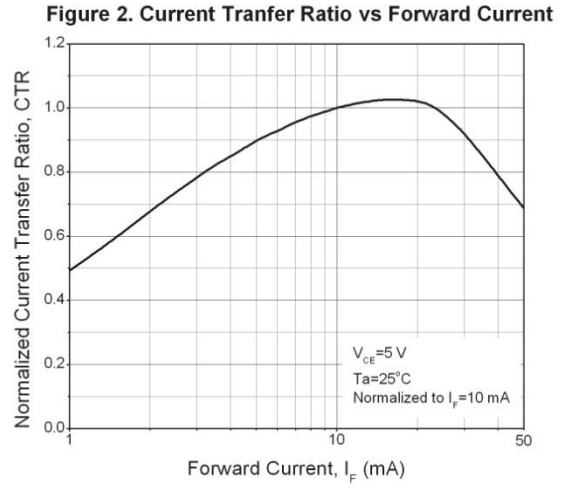
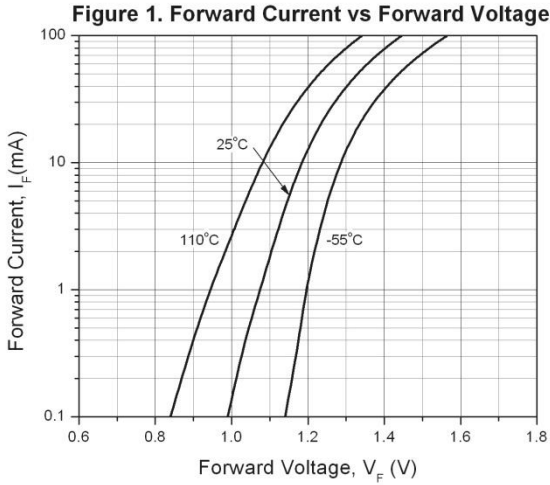


Figure 7. Collector-Emitter Saturation Voltage vs Collector Current

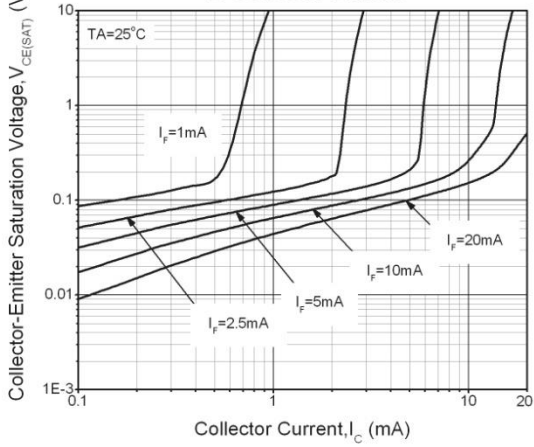


Figure 8. Switching Time vs Load Resistance

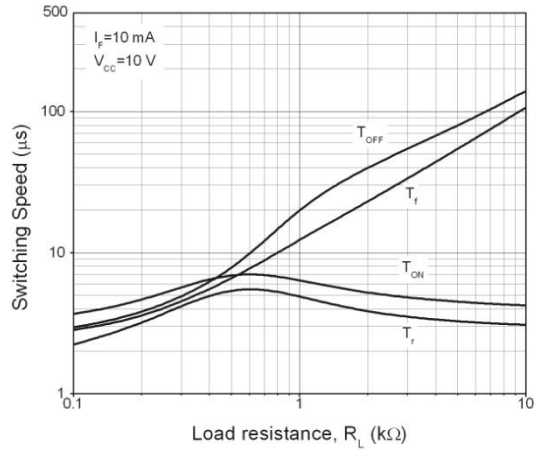


Figure 9. Turn-on Time vs Base-Emitter Resistance

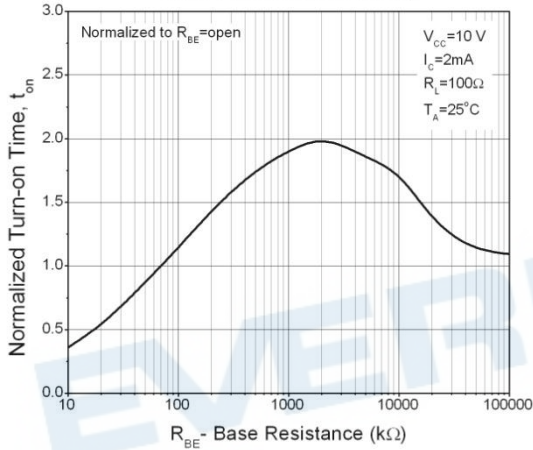


Figure 10. Turn-off Time vs Base-Emitter Resistance

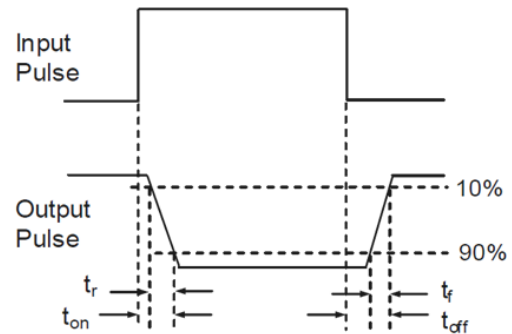
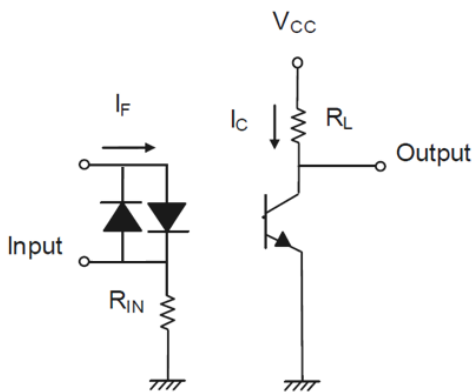
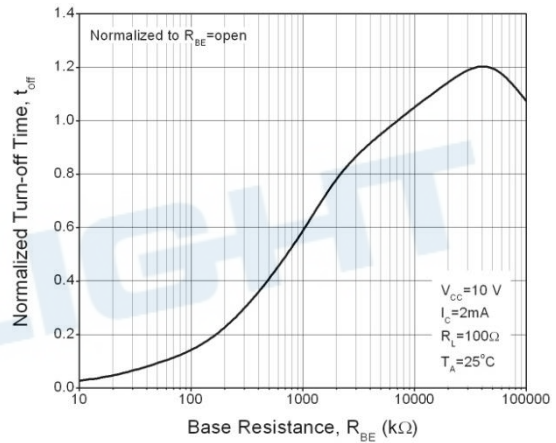


Figure 11. Switching Time Test Circuit & Waveforms

Order Information

Part Number

H11AAXY(Z)-V

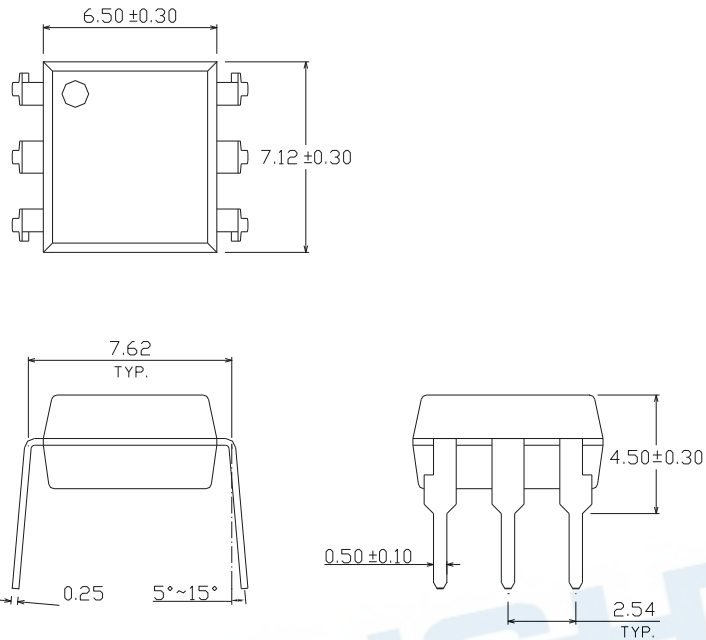
Notes

- X = CTR Rank (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).

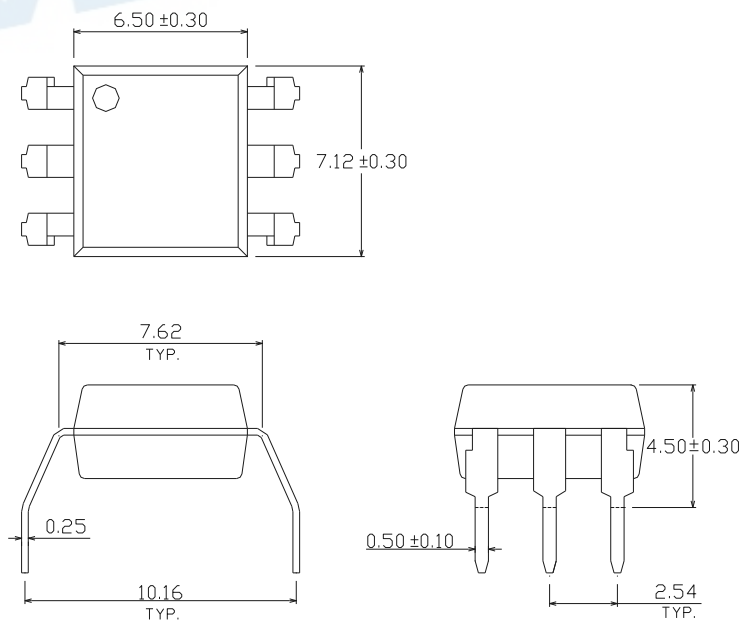
Option	Description	Packing quantity
None	Standard DIP-6	65 units per tube
M	Wide lead bend (0.4 inch spacing)	65 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead 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

Package Dimension (Dimensions in mm)

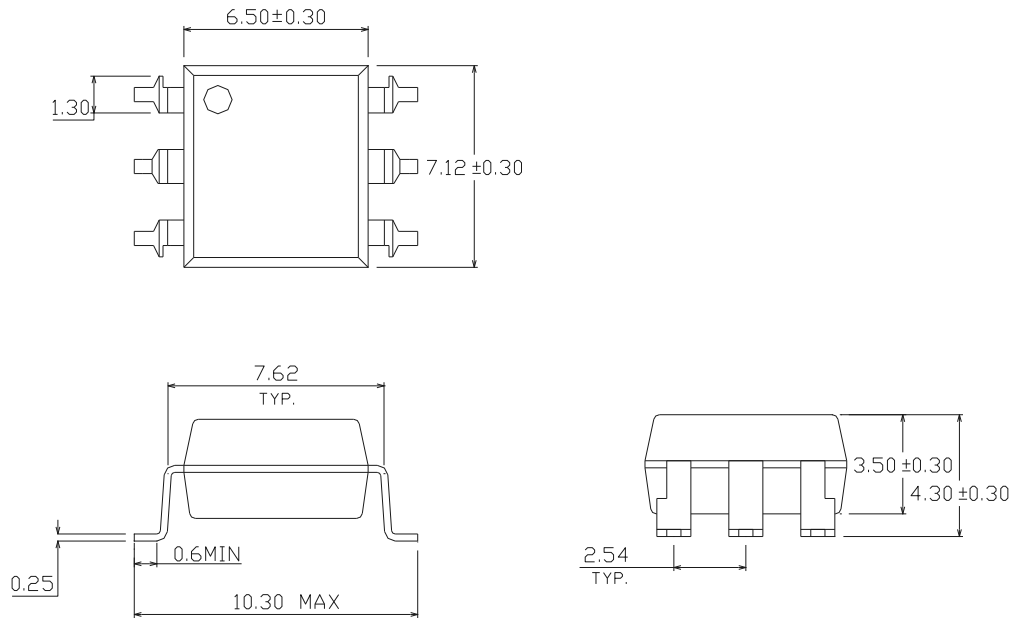
Standard DIP Type



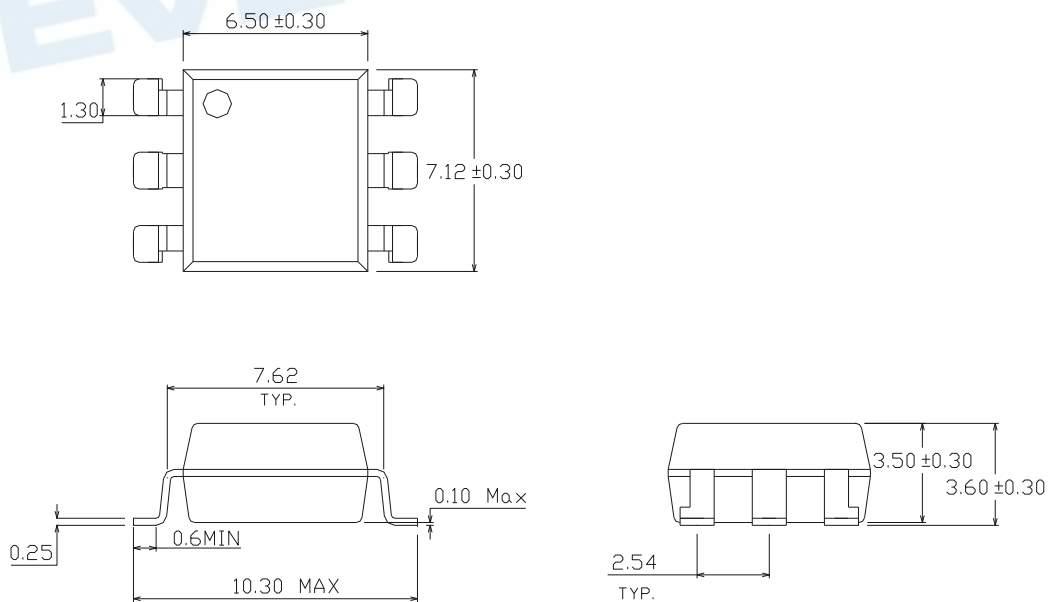
Option M Type



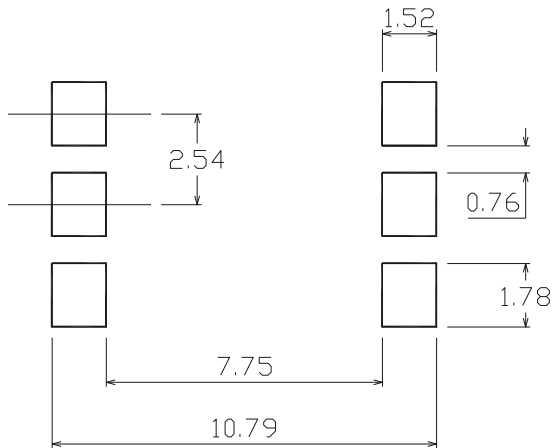
Option S Type



Option S1 Type



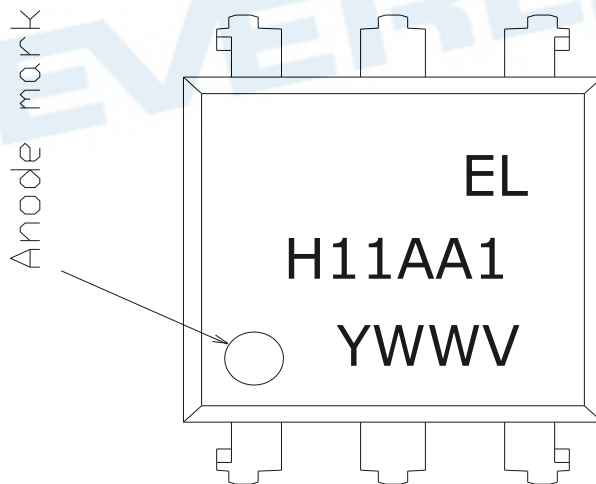
Recommended pad layout for surface mount leadform



Notes

Suggested pad dimension is just for reference only.
Please modify the pad dimension based on individual need.

Device Marking

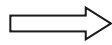
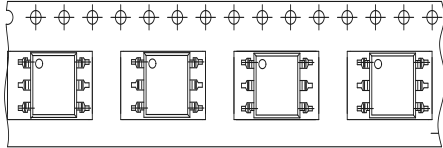


Notes

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

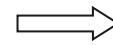
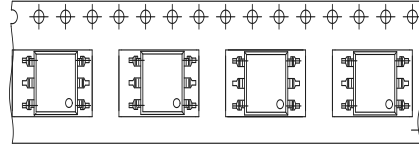
Tape & Reel Packing Specifications

Option TA



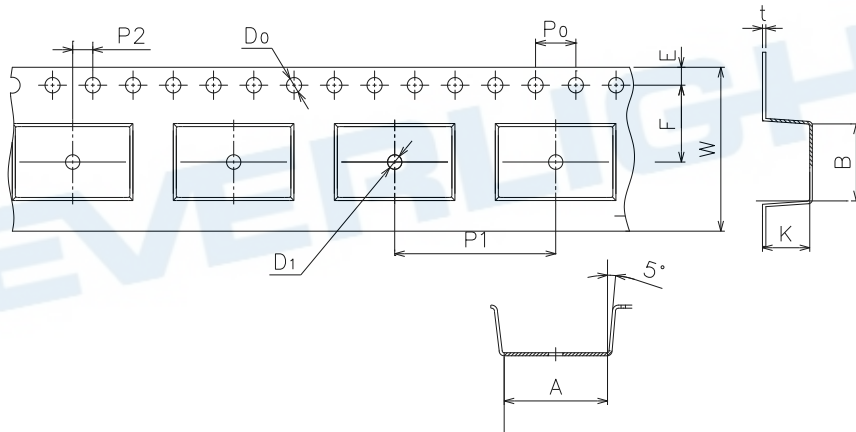
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions

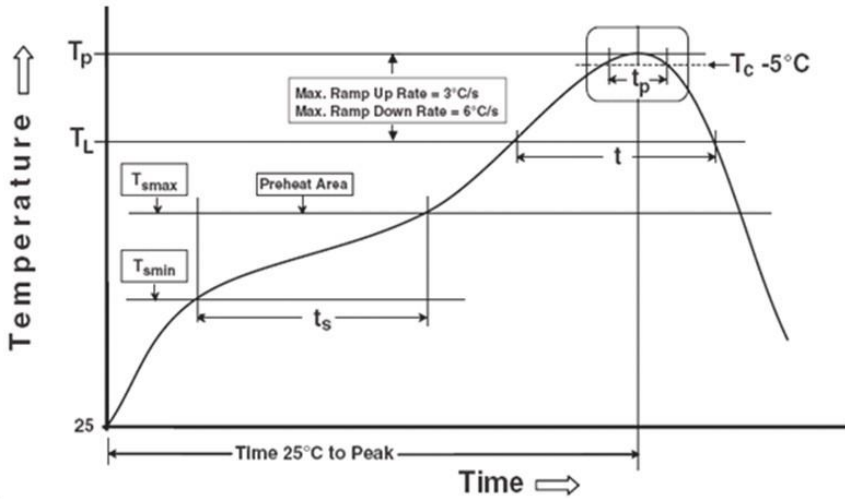


Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.8±0.1	7.5±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.15	12±0.1	2.0±0.1	0.35±0.03	16.0±0.2	4.5±0.1

Precautions for Use

1. Soldering Condition

1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Notes

Reference: IPC/JEDEC J-STD-020D

Preheat

Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max

Other

Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times

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