



# H11L1, H11L2, H11L3

## Schmitt Trigger Output 6-Pin Optocoupler

### Features

- High isolation 5000 VRMS
- DC input with Schmitt Trigger output
- 1MHz(NRZ) data rate
- RoHS compliance
- REACH compliance
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950

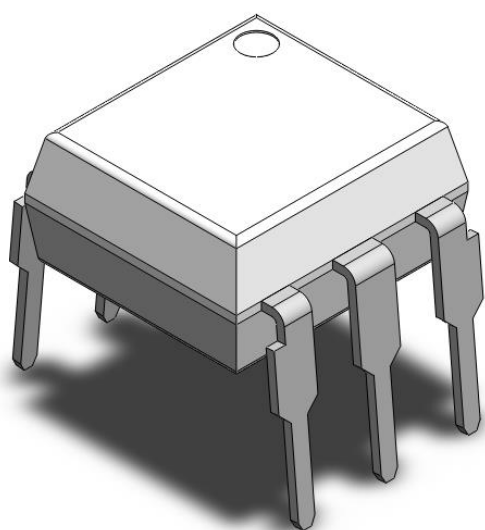
### Description

The H11L1, H11L2 and H11L3 series consist of a Schmitt Trigger optically coupled to a gallium arsenide Infrared-emitting diode in a 6-lead DIP package with different lead forming options.

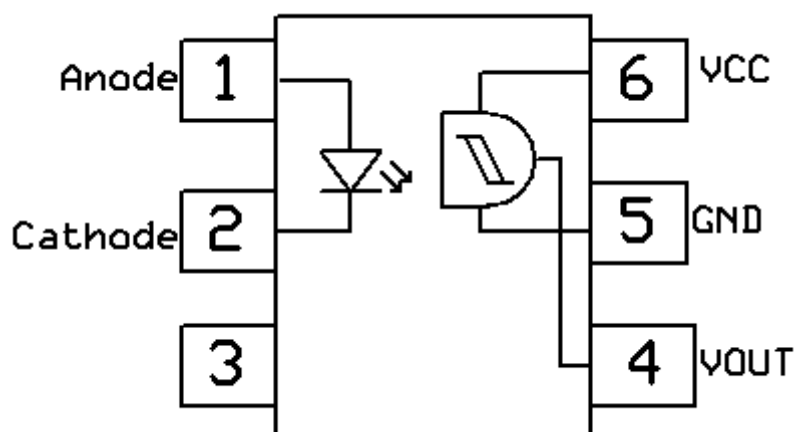
### Applications

- Line Receiver
- Logic to Logic Isolator
- Microprocessor system interface
- AC to TTL conversion

### Package Outline



### Schematic



Note: Different lead forming options available. See package dimension.



# H11L1, H11L2, H11L3

## Schmitt Trigger Output 6-Pin Optocoupler

### Absolute Maximum Rating at 25°C

<b>Symbol</b>	<b>Parameters</b>	<b>Ratings</b>	<b>Units</b>	<b>Notes</b>
V <sub>ISO</sub>	Isolation voltage	5000	V <sub>RMS</sub>	
T <sub>OPR</sub>	Operating temperature	-55 ~ +100	°C	
T <sub>STG</sub>	Storage temperature	-55 ~ +150	°C	
T <sub>SOL</sub>	Soldering temperature	260	°C	
<b>Emitter</b>				
I <sub>F</sub>	Forward current	60	mA	
I <sub>F(TRANS)</sub>	Peak transient current (≤1μs P.W,300pps)	1	A	
V <sub>R</sub>	Reverse voltage	6	V	
P <sub>D</sub>	Power dissipation	100	mW	
<b>Detector</b>				
P <sub>D</sub>	Power dissipation	150	mW	
V <sub>O</sub>	Output Voltage	0 to 16	V	
V <sub>CC</sub>	Supply Voltage	3 to 16	V	
I <sub>O</sub>	Output Current	50	mA	



# H11L1, H11L2, H11L3

## Schmitt Trigger Output 6-Pin Optocoupler

### Electrical Characteristics $T_A = 25^\circ\text{C}$ (unless otherwise specified)

#### Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$V_F$	Forward voltage	$I_F=10\text{mA}$		1.24	1.4	V	
$I_R$	Reverse Current	$V_R = 6\text{V}$	-	-	5	$\mu\text{A}$	
$C_{IN}$	Input Capacitance	$f= 1\text{MHz}$	-	45	-	pF	

#### Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$V_{CC}$	Supply Voltage		3	-	15	V	
$I_{CCH}$	Logic High Supply Current	$I_F= 0\text{mA}, V_{CC}= 5\text{V}$		1.5	5	mA	
$I_{OH}$	Logic High Output Current	$I_F= 0\text{mA}, V_{CC}=V_O=15\text{V}$			100	$\mu\text{A}$	

#### Transfer Characteristics

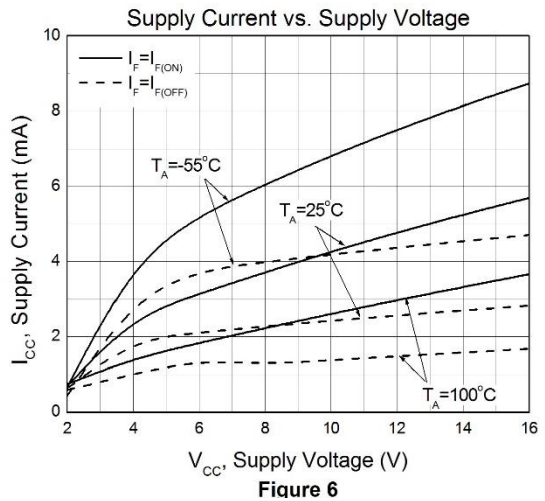
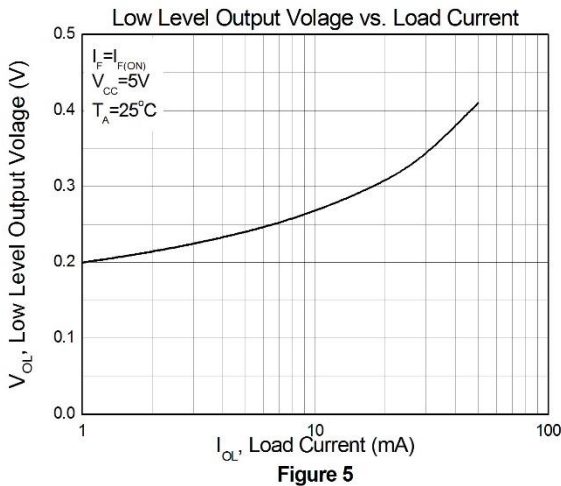
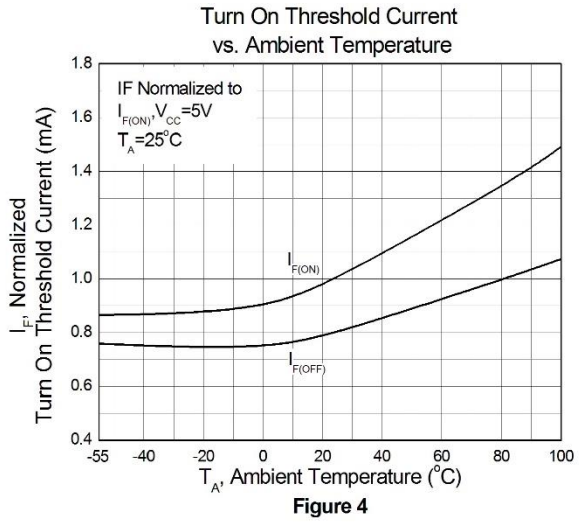
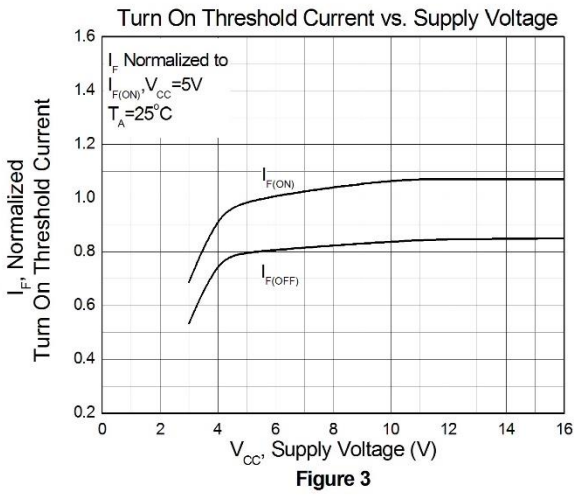
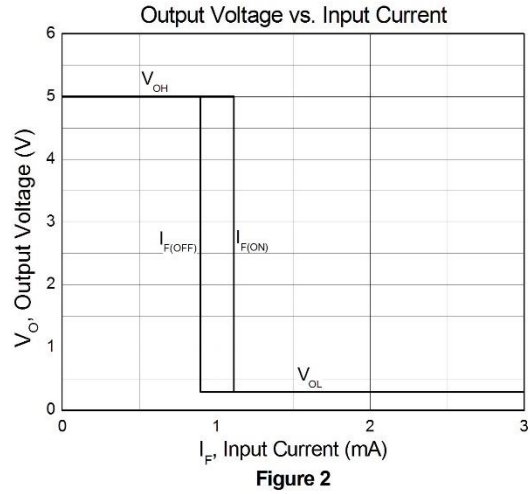
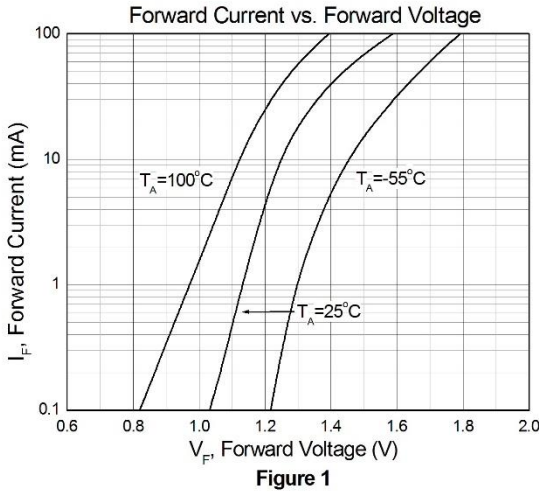
Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$I_{CCL}$	Logic Low Supply Current	$I_F= 10\text{mA}, V_{CC}= 5\text{V}$		1.5	5	mA	
$I_{F(ON)}$	Input Threshold Current	H11L1	$V_{CC}= 5\text{V}, R_L= 270\ \Omega$			1.6	mA
		H11L2				10	mA
		H11L3				5	mA
$I_{F(OFF)}$	Off Threshold Current	$V_{CC}= 5\text{V}, R_L= 270\ \Omega$	0.3	1		mA	
$I_{F(ON)}/I_{F(OFF)}$	Hysteresis Ratio		0.5		0.9		
$V_{OL}$	Logic Low Output Voltage	$I_F= I_{F(ON)} \text{ Max}, V_{CC}= 5\text{V}, R_L= 270\ \Omega$			0.4	V	
$R_{IO}$	Isolation Resistance	$V_{IO}= 500\text{V}_{DC}$	$1 \times 10^{11}$			$\Omega$	
$C_{IO}$	Isolation Capacitance	$f= 1\text{MHz}$		0.25		pF	

#### Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$t_{ON}$	Turn On Time	$I_F= I_{F(ON)}, V_{CC}= 5\text{V}, R_L= 270\ \Omega$	-	-	3.8	$\mu\text{s}$	
$t_r$	Rise Time		-	0.1	-		
$t_{OFF}$	Turn Off Time		-	-	3.8		
$t_f$	Fall Time		-	0.1	-		
	Data Rate		-	1	-	MHz	



Typical Characteristic Curves



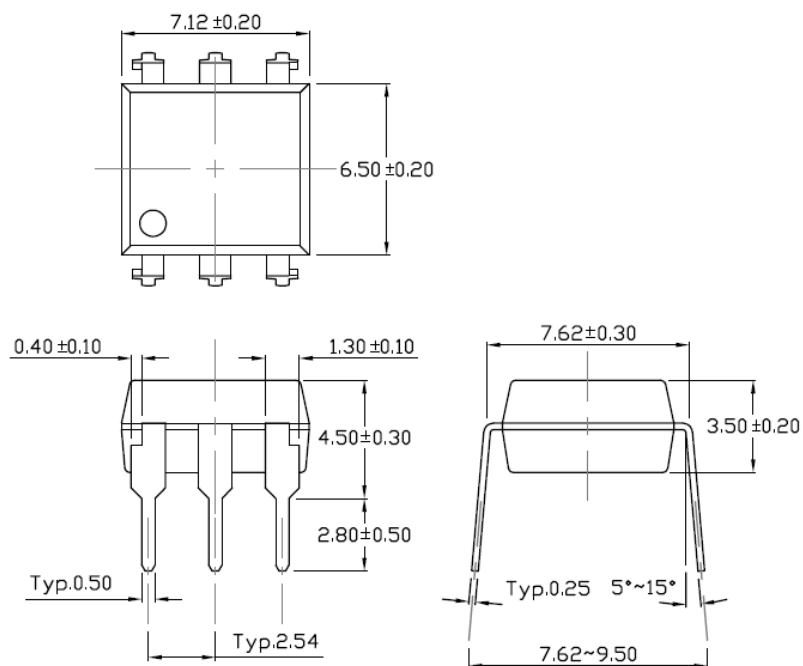


# H11L1, H11L2, H11L3

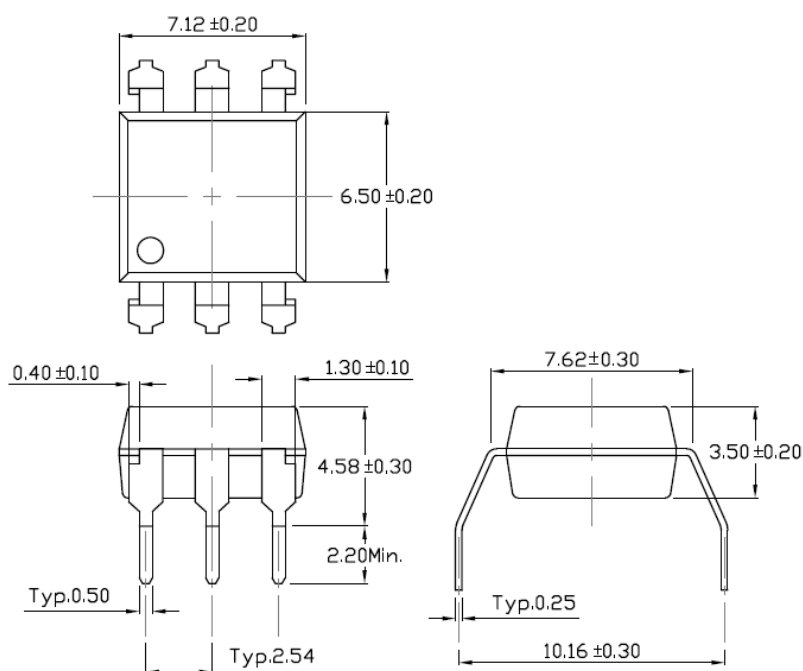
## Schmitt Trigger Output 6-Pin Optocoupler

### Package Dimension *Dimensions in mm unless otherwise stated*

#### Standard DIP – Through Hole



#### Wide Lead Forming – Through Hole (M Type)

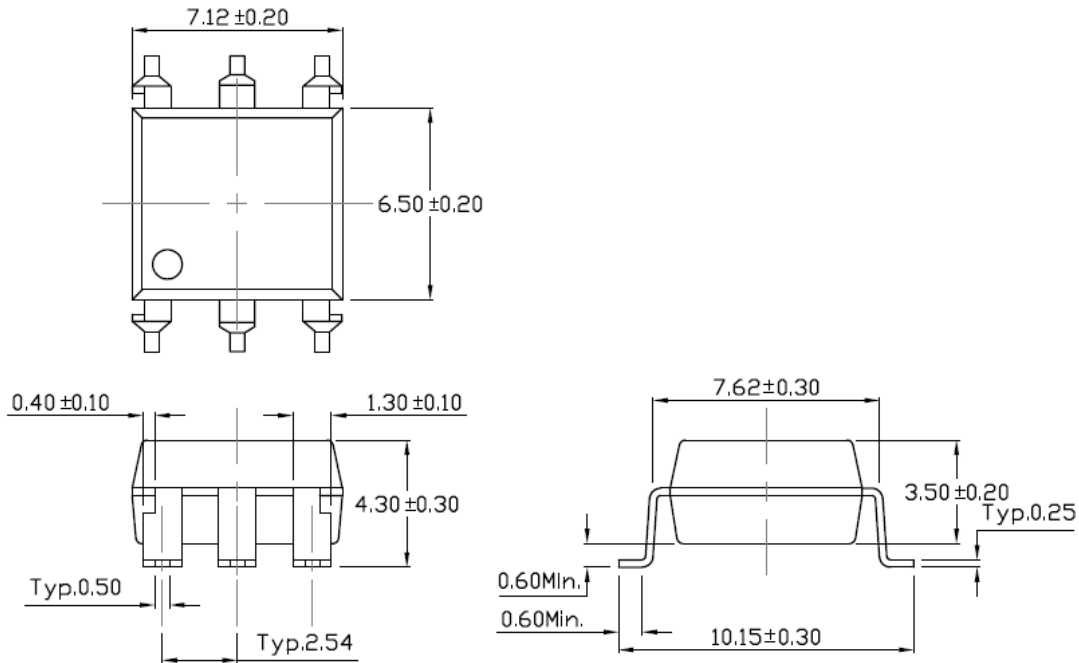




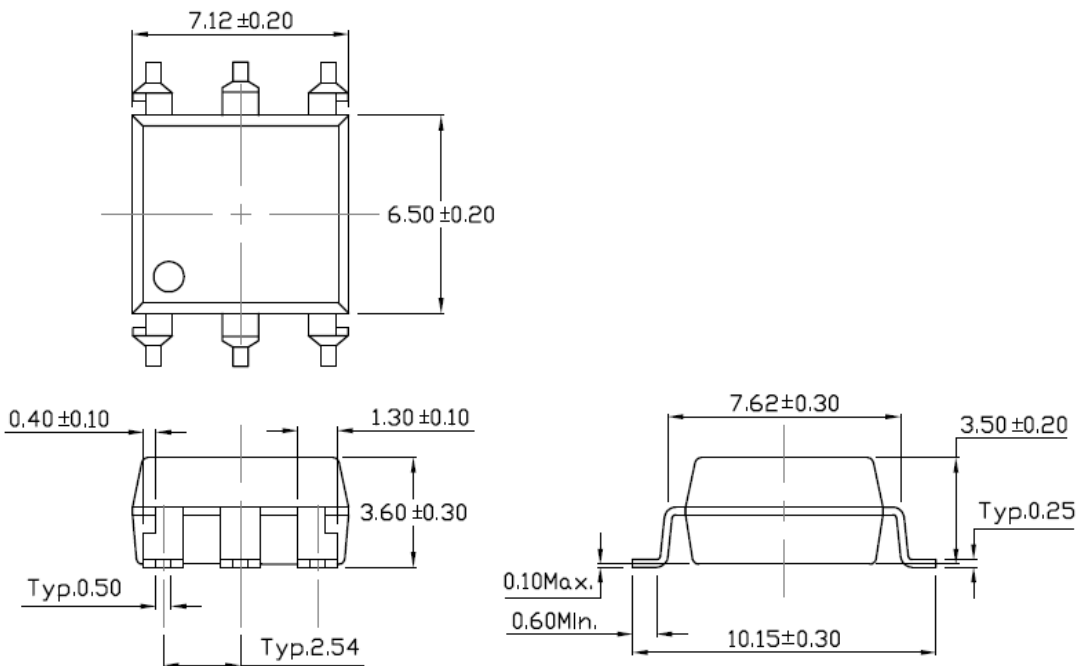
# H11L1, H11L2, H11L3

## Schmitt Trigger Output 6-Pin Optocoupler

### Surface Mount Forming (S Type)



### Surface Mount Forming (Low Profile) (SL Type)

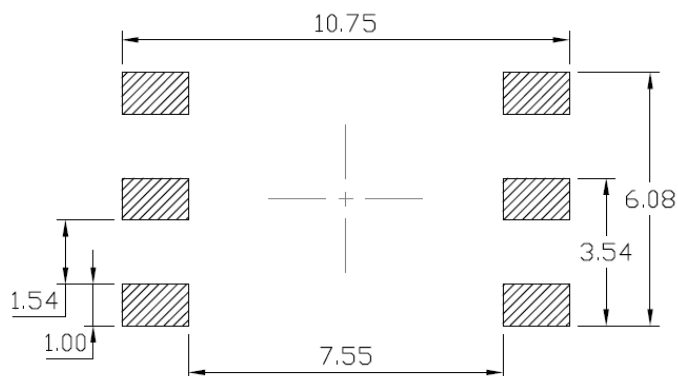




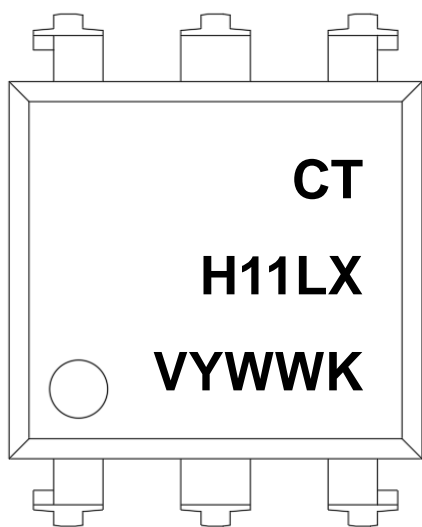
# H11L1, H11L2, H11L3

## Schmitt Trigger Output 6-Pin Optocoupler

### Recommended Solder Mask Dimensions in mm unless otherwise stated



### Marking Information



#### Note:

- CT : Denotes "CT Micro"
- H11LX : Part Number (X=1, 2, or 3)
- V : VDE Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code



# H11L1, H11L2, H11L3

## Schmitt Trigger Output 6-Pin Optocoupler

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### Ordering Information

#### H11LX(V)(Y)(Z)-G

H11LX = Part No. (X=1, 2, or 3. Please refer to test condition. )

V = VDE option (V or none)

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

Z = Tape and reel option (T1, T2 or none)

G = Material option (G: Green, None: Non-green)

<b>Option</b>	<b>Description</b>	<b>Quantity</b>
None	Standard 6 Pin Dip	50 Units/Tube
M	Gullwing (400mil) Lead Forming	50 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1000 Units/Reel



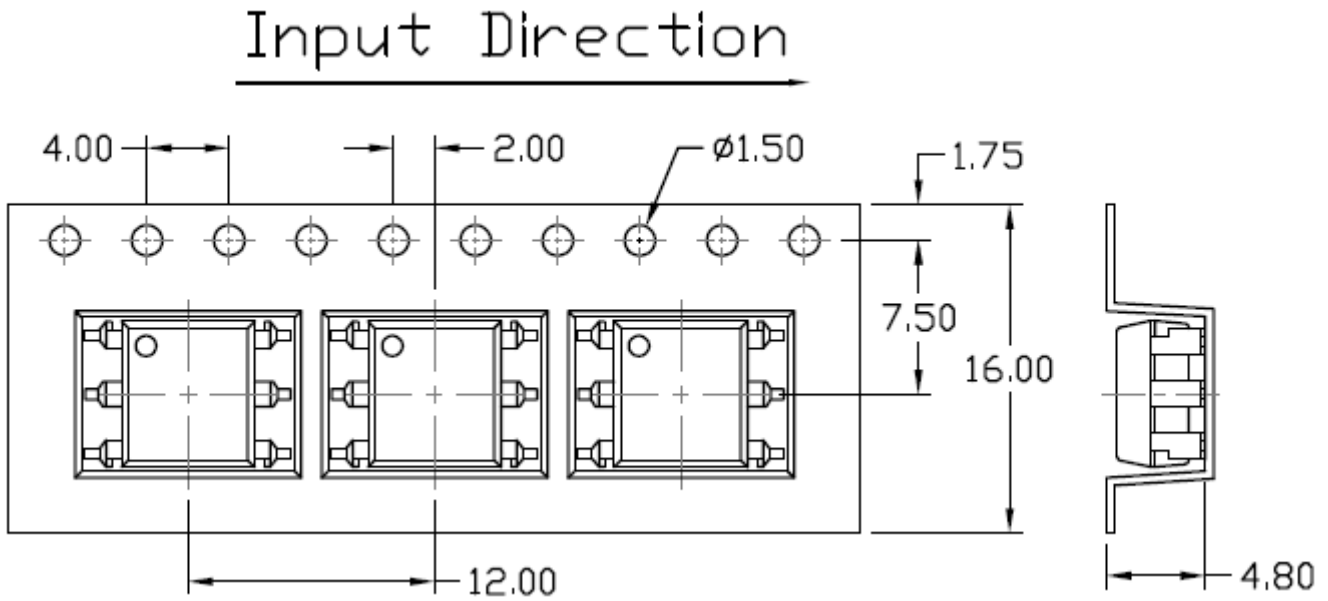


# H11L1, H11L2, H11L3

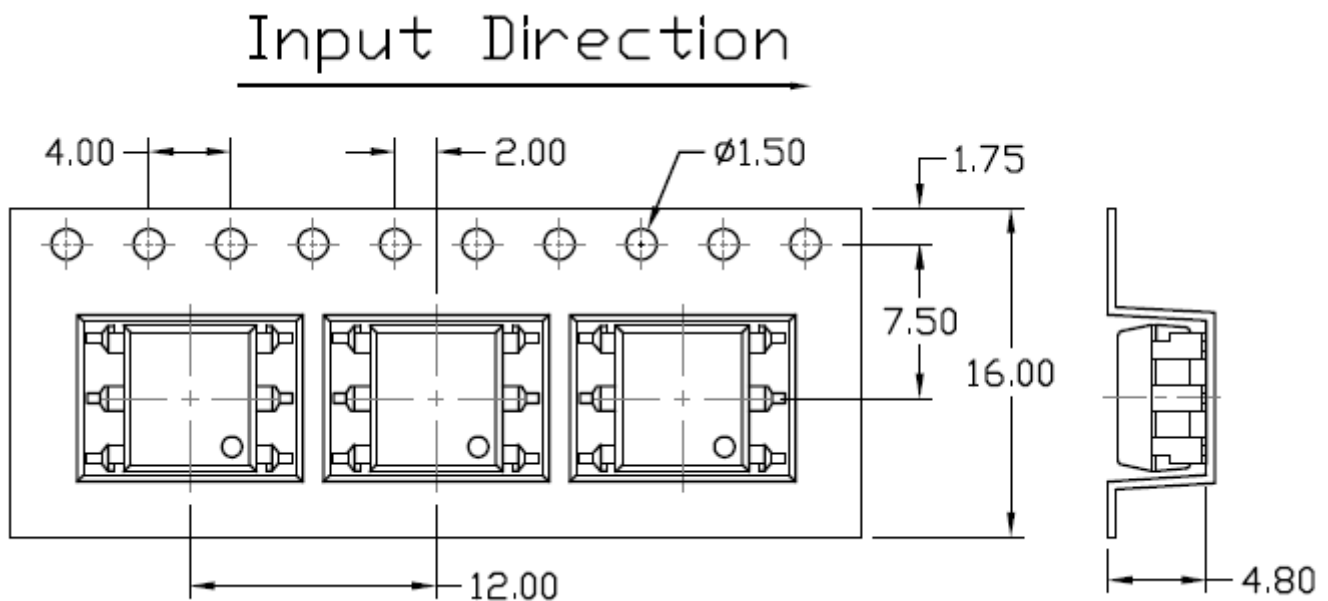
## Schmitt Trigger Output 6-Pin Optocoupler

### Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

#### Option S(T1) & SL(T1)



#### Option S(T2) & SL(T2)





## H11L1, H11L2, H11L3 Schmitt Trigger Output 6-Pin Optocoupler

### Wave soldering (follow the JEDEC standard JESD22-A111)

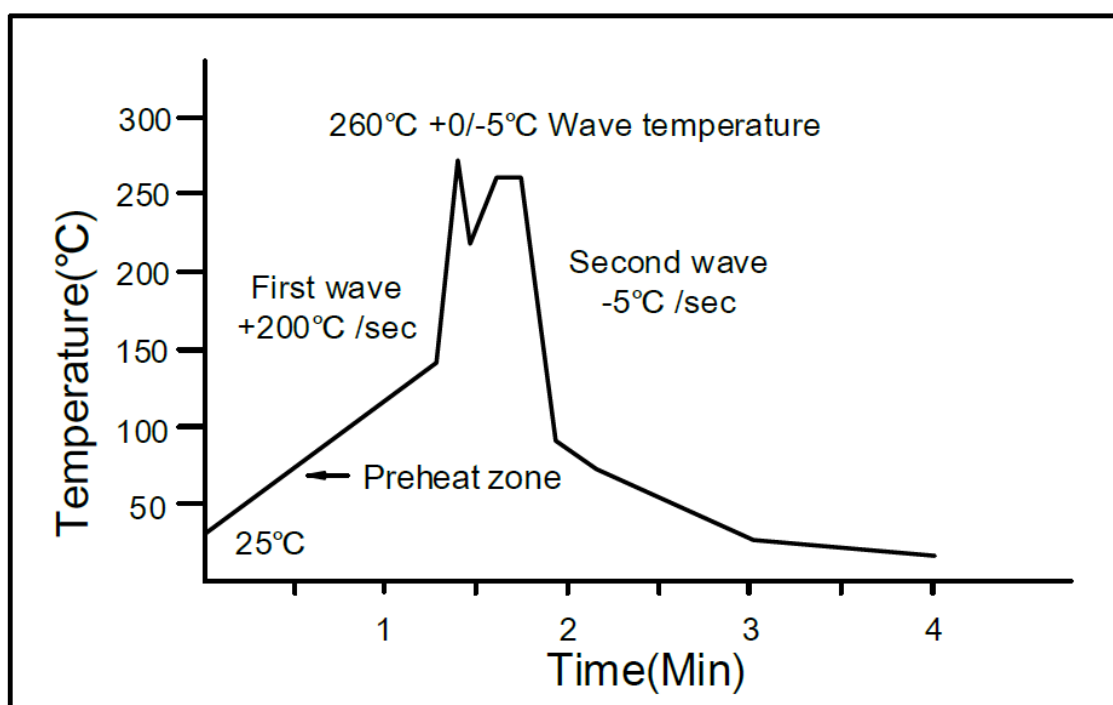
One time soldering is recommended within the condition of temperature.

Temperature:  $260 \pm 5^\circ\text{C}$ .

Time: 10 sec.

Preheat temperature:  $25$  to  $140^\circ\text{C}$ .

Preheat time: 30 to 80 sec.



### Iron soldering (follow the standard MIL-STD 202G, Method 210F)

Allow single lead soldering in every single process.

One time soldering is recommended. Temperature:  $350 \pm 10^\circ\text{C}$

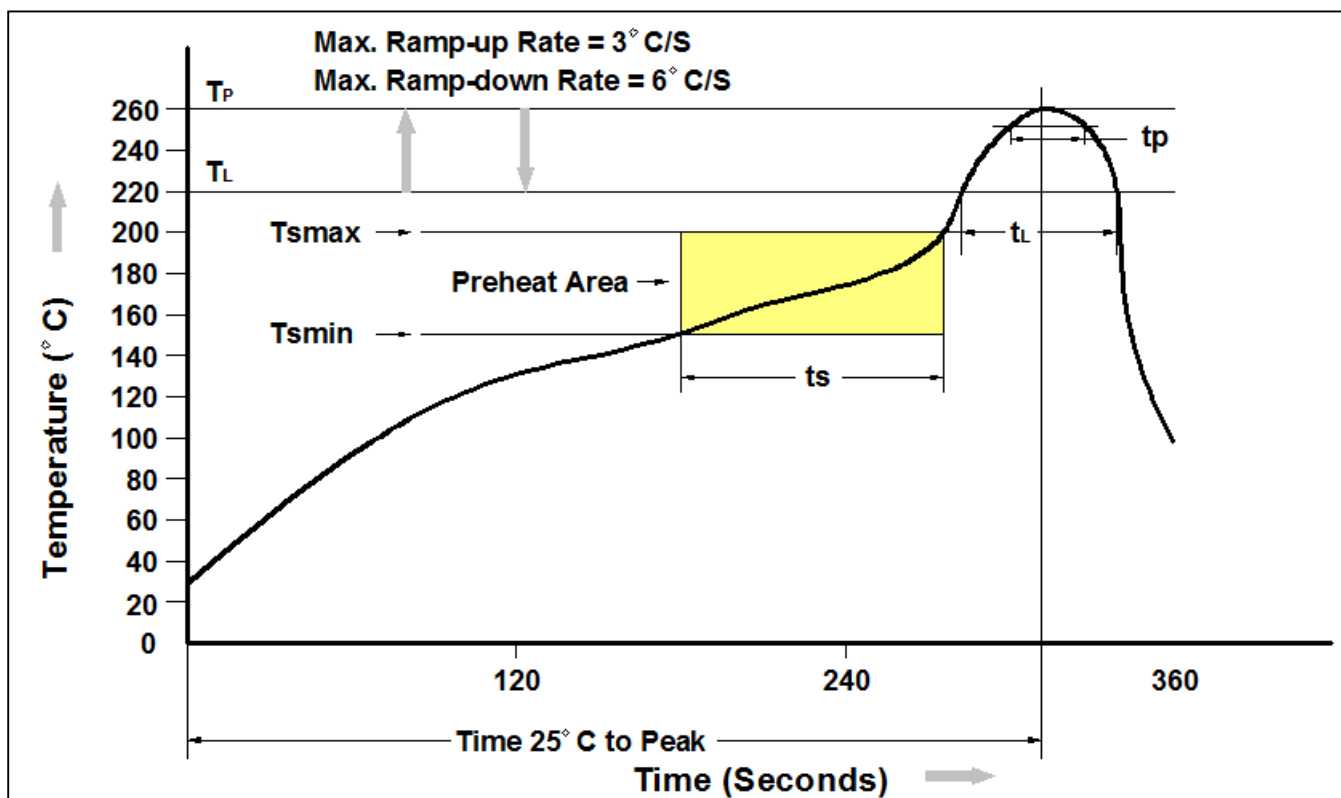
Time: 5 sec max.



# H11L1, H11L2, H11L3

## Schmitt Trigger Output 6-Pin Optocoupler

### Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (t <sub>L</sub> to t <sub>P</sub> )	3°C/second max.
Liquidous Temperature (T <sub>L</sub> )	217°C
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t <sub>P</sub> ) within 5°C of 260°C	30 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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