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H11L1, H11L2, H11L3

DC Input 6-Pin DMC-Isolator®

Schmitt Trigger

Features

- High isolation 5000 VRMS
- Patented coplanar structure DMC-Isolator®
- DC input with Schmitt Trigger output
- 1MHz(NRZ) data rate
- Operating Temperature range - 55 °C to 100 °C
- External Creepage $\geq 7.4\text{mm}$
- Distance Through Isolation $\geq 0.4\text{mm}$
- Clearance Distance $\geq 7.5\text{mm}$ (S/SL Type)
- Clearance Distance $\geq 8.0\text{mm}$ (M Type)
- RoHS and REACH Compliance
- Halogen Free Compliance (Optional)
- MSL class 1
- Regulatory Approvals
 - ✓ UL - UL1577 (E364000)
 - ✓ VDE - EN60747-5-5(VDE0884-5)
 - ✓ CQC – GB4943.1, GB8898
 - ✓ IEC60065, IEC60950

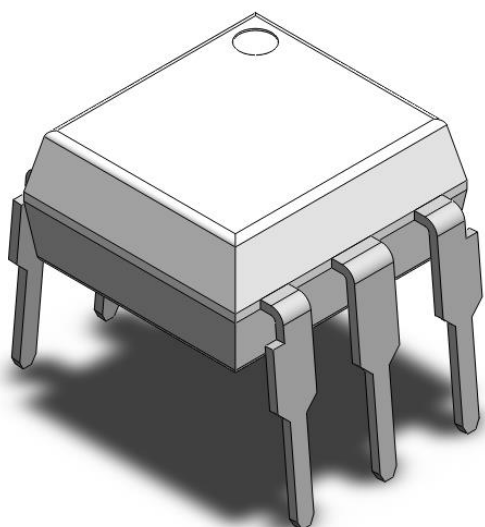
Description

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.

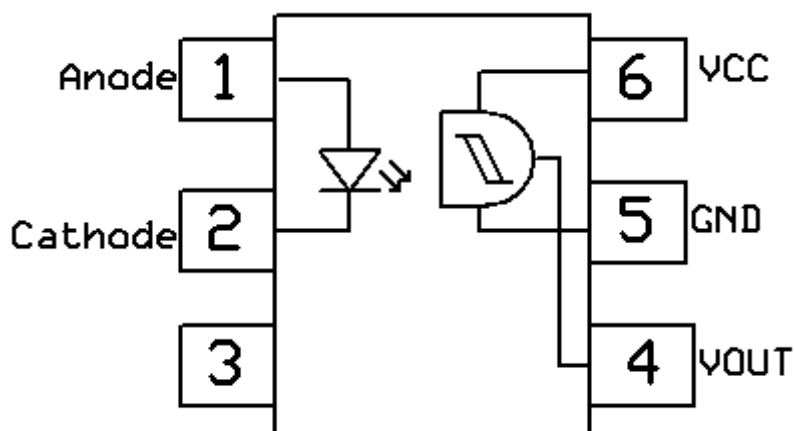
Applications

- 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.



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Absolute Maximum Ratings $T_A = 25^{\circ}\text{C}$, unless otherwise specified

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameters	Ratings	Units	Notes
V_{ISO}	Isolation voltage (AC, 1 minute, 40 ~ 60% R.H.)	5000	V_{RMS}	
T_{OPR}	Operating temperature	-55 ~ +100	$^{\circ}\text{C}$	
T_{STG}	Storage temperature	-55 ~ +150	$^{\circ}\text{C}$	
T_{SOL}	Soldering temperature (For 10 seconds)	260	$^{\circ}\text{C}$	
Emitter				
I_{F}	Forward current	60	mA	
$I_{\text{F(TRANS)}}$	Peak transient current ($\leq 1\mu\text{s P.W, 300pps}$)	1	A	
V_{R}	Reverse voltage	6	V	
P_{D}	Power dissipation	100	mW	
Detector				
P_{D}	Power dissipation	150	mW	
V_{O}	Output Voltage	0 to 16	V	
V_{CC}	Supply Voltage	3 to 16	V	
I_{O}	Output Current	50	mA	



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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	μA	
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	μA	

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	
$I_{F(OFF)}/I_{F(ON)}$	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	$V_{IO} = 500\text{V}_{DC}$	1×10^{11}			Ω	
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$		0.25		pF	



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

Switching Characteristics

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



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Typical Characteristic Curves $T_A = 25^\circ\text{C}$, unless otherwise specified

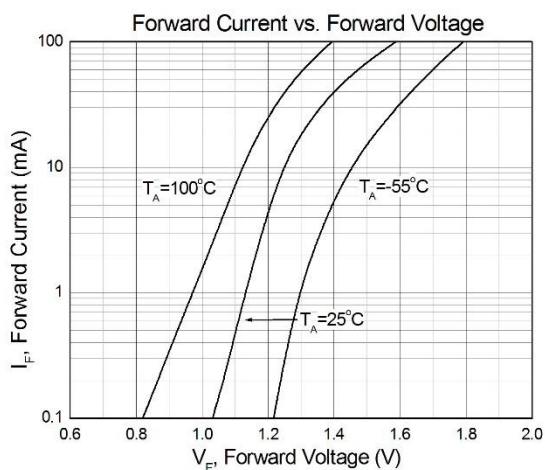


Figure 1

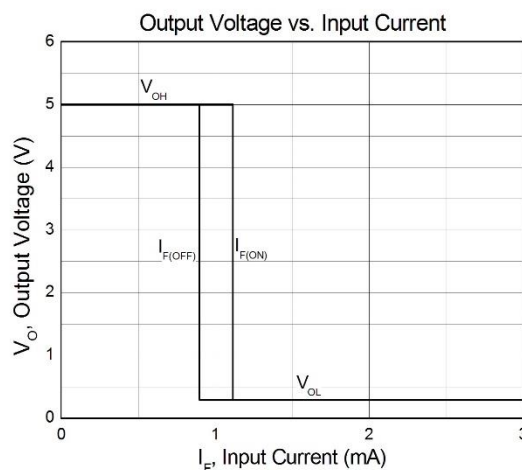


Figure 2

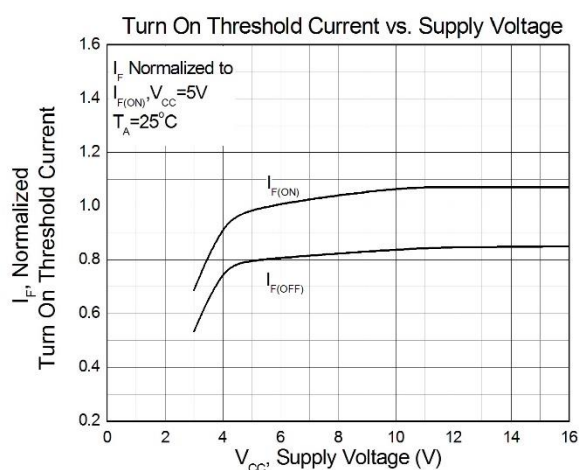


Figure 3

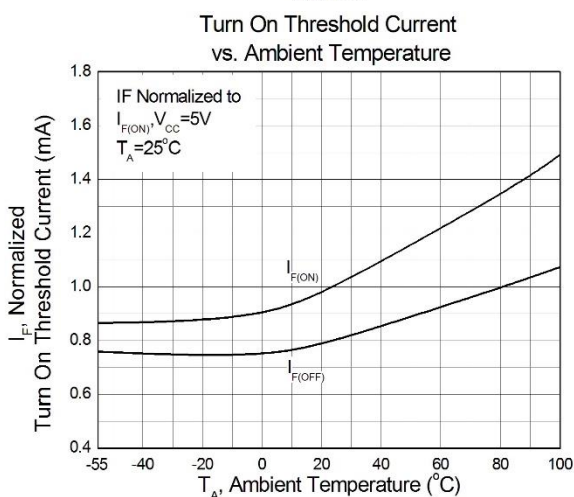


Figure 4

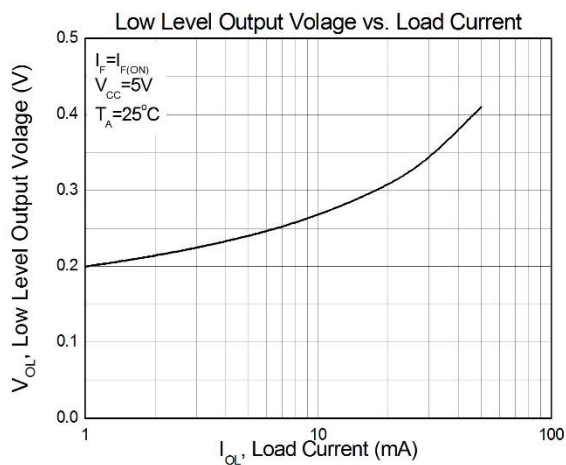


Figure 5

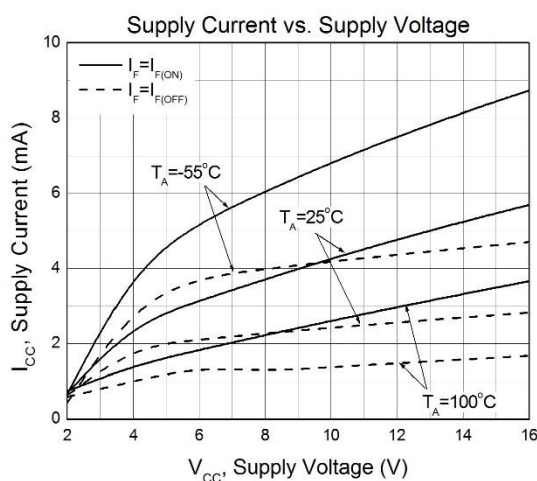


Figure 6



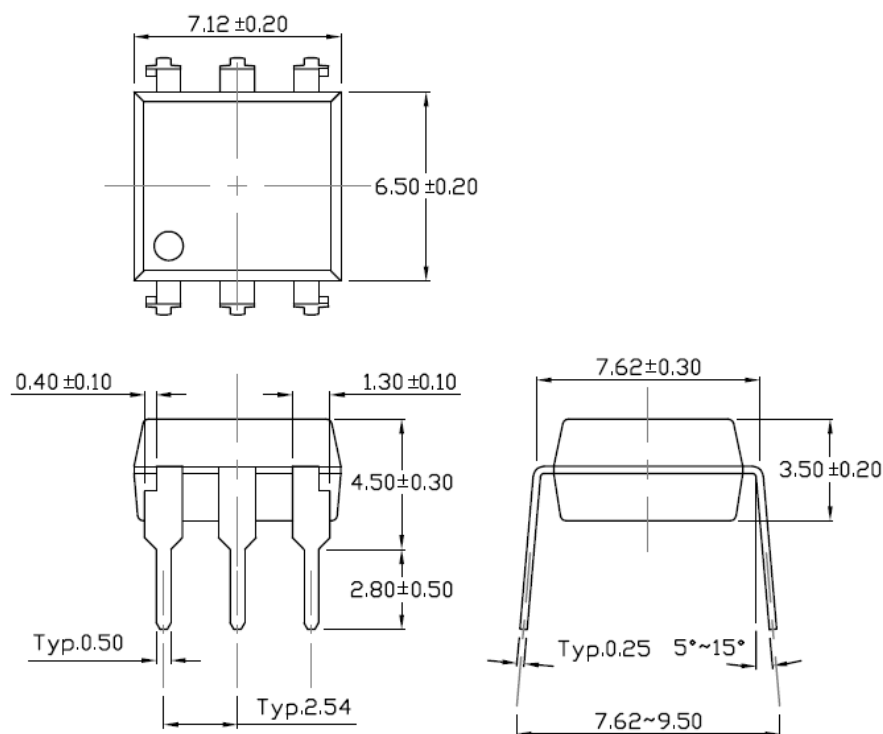
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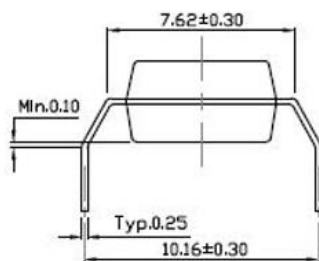
Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole

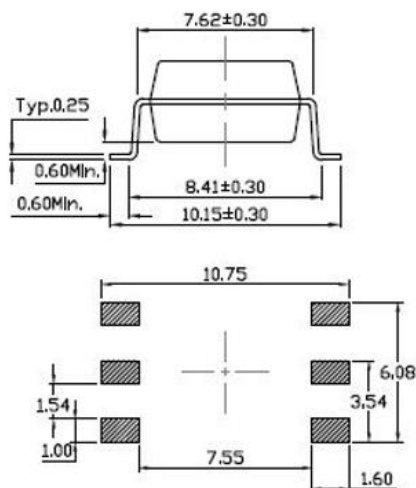


Forming Option

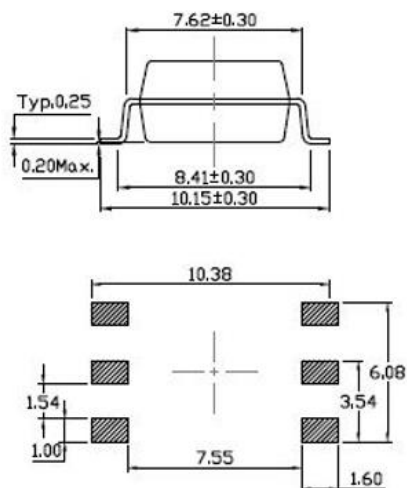
M Type



S Type



SL Type



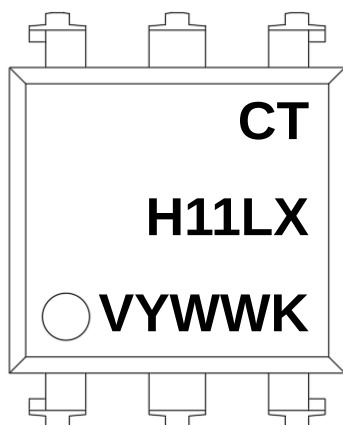


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Marking Information



Note:

CT : Denotes “CT Micro”
H11LX : Part Number (X=1, 2, or 3)
V : VDE Safety Mark Option (Blank or V)
Y : One Digit Year Code
WW : Two Digit Work Week
K : Manufacturing Code

Ordering Information

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

CT = Denotes “CT Micro”
H11LX = Part Number
V = VDE Safety Mark Option (Blank or V)
Y = Lead Form Option (S, SL, M or Blank)
Z = Tape and Reel Option (Blank, T1 or T2)
G = Material Option (G: Halogen Free, Blank: Non-Halogen Free)

Option	Description	Quantity
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



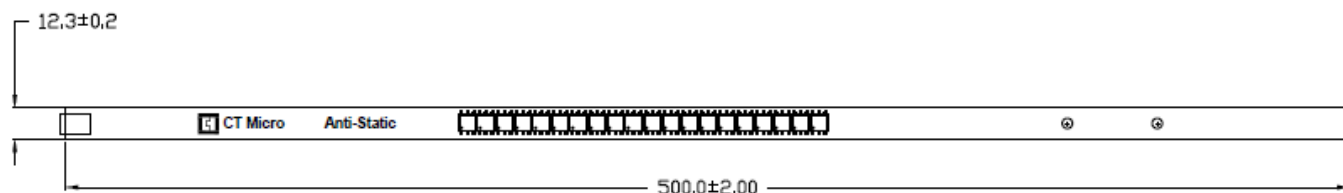
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Carrier Specifications *Dimensions in mm unless otherwise stated*

Tube Option Standard DIP

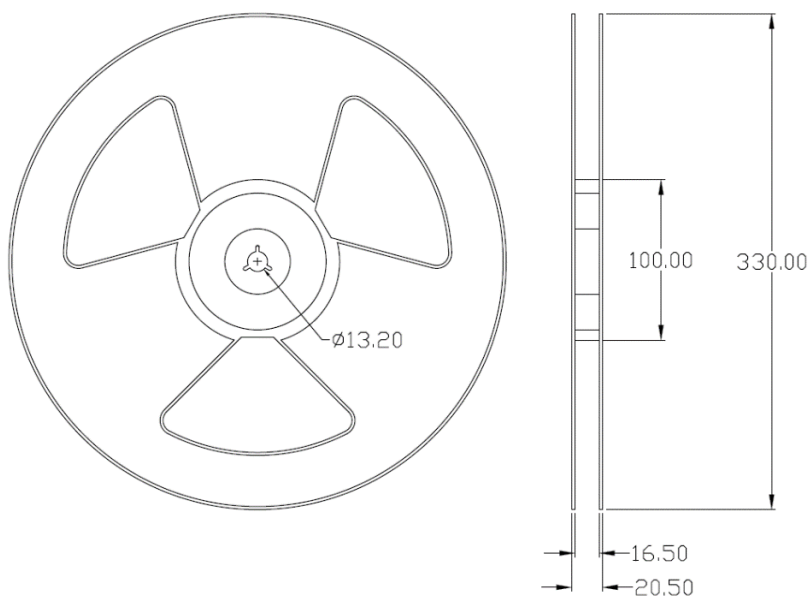


Tube Option M Type



Reel Dimension *All dimensions are in mm, unless otherwise stated*

Option S(T1/T2) & SL(T1/T2)





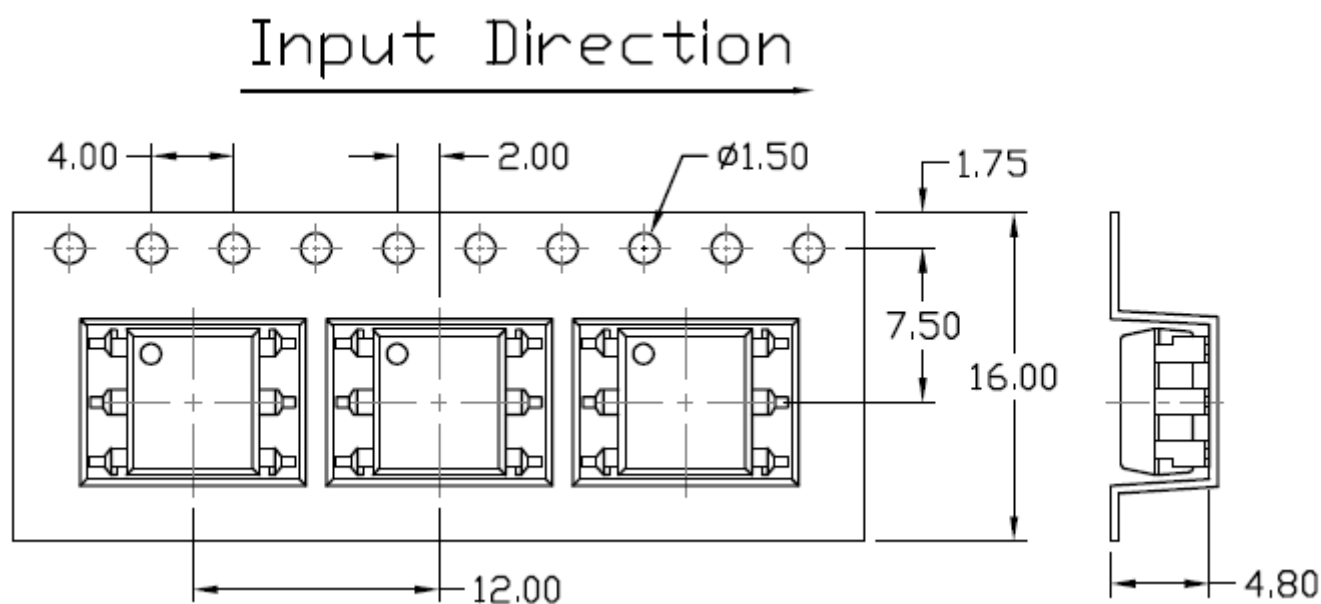
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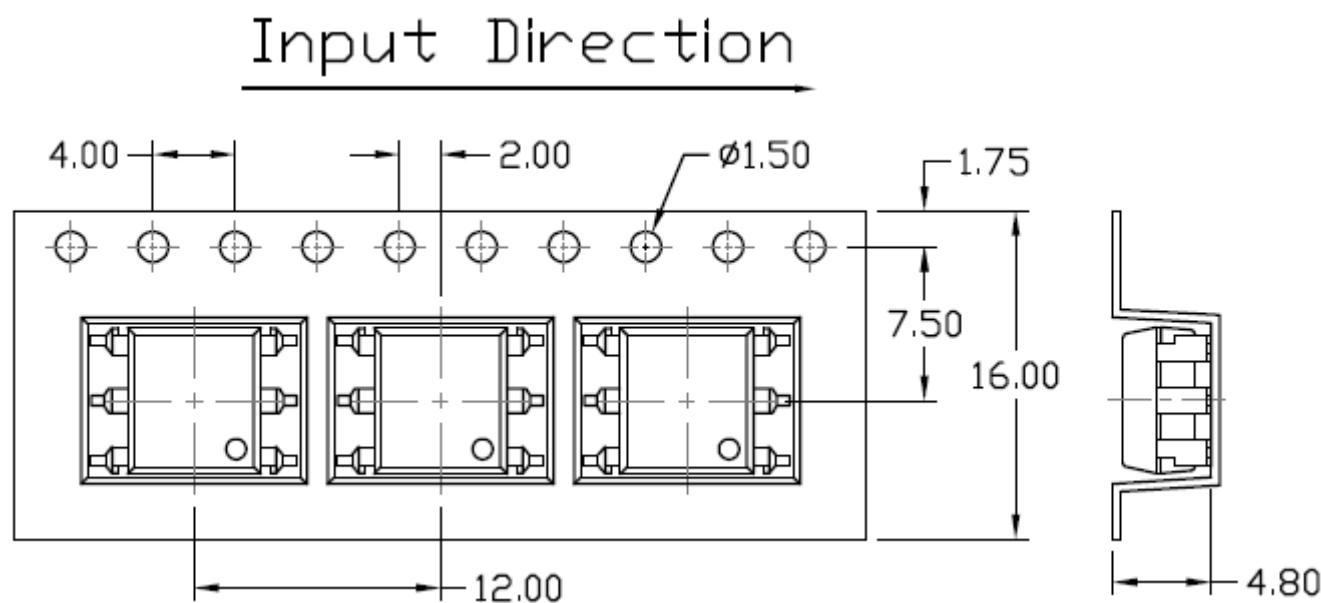
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S (T1) & SL (T1)



Option S (T2) & SL (T2)





Solderability spec (follow the JEDEC standard JESD22-B102)

Reflow Soldering: Immersed surface, other than the end of pin as cut-surface, must be covered by solder.

Solder-Bath: More than 95% of the electrode must be covered with solder.

Wave soldering (follow the JEDEC standard JESD22-A111)

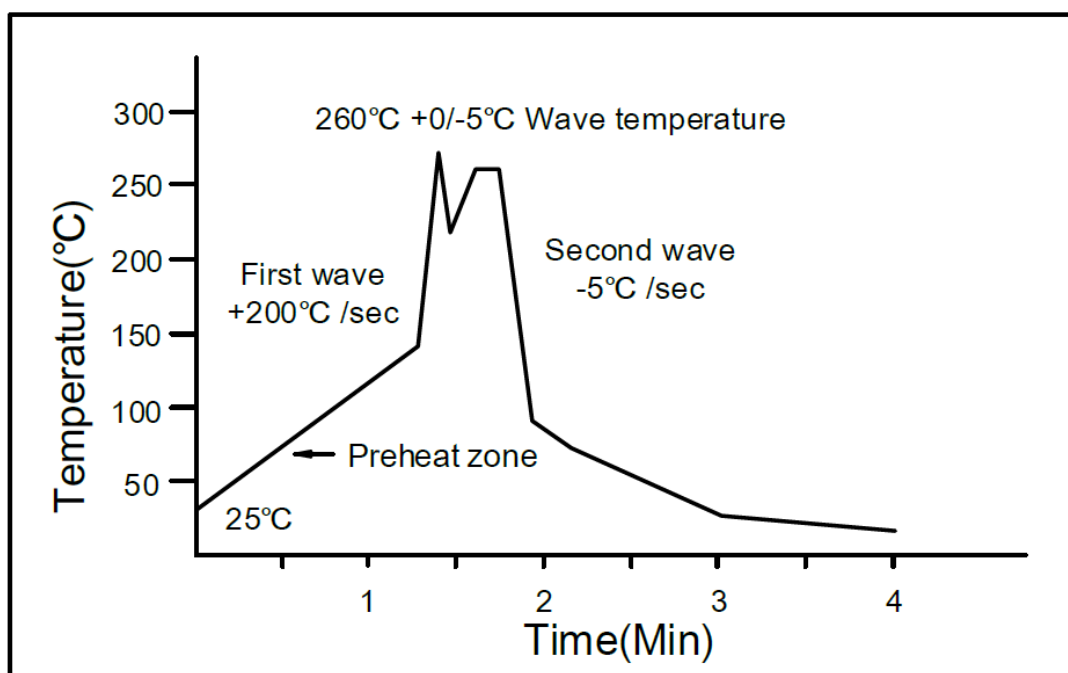
One time soldering is recommended within the condition of temperature.

Temperature: $260 \pm 0/-5^{\circ}\text{C}$.

Time: 10 sec.

Preheat temperature: 25 to 140°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.

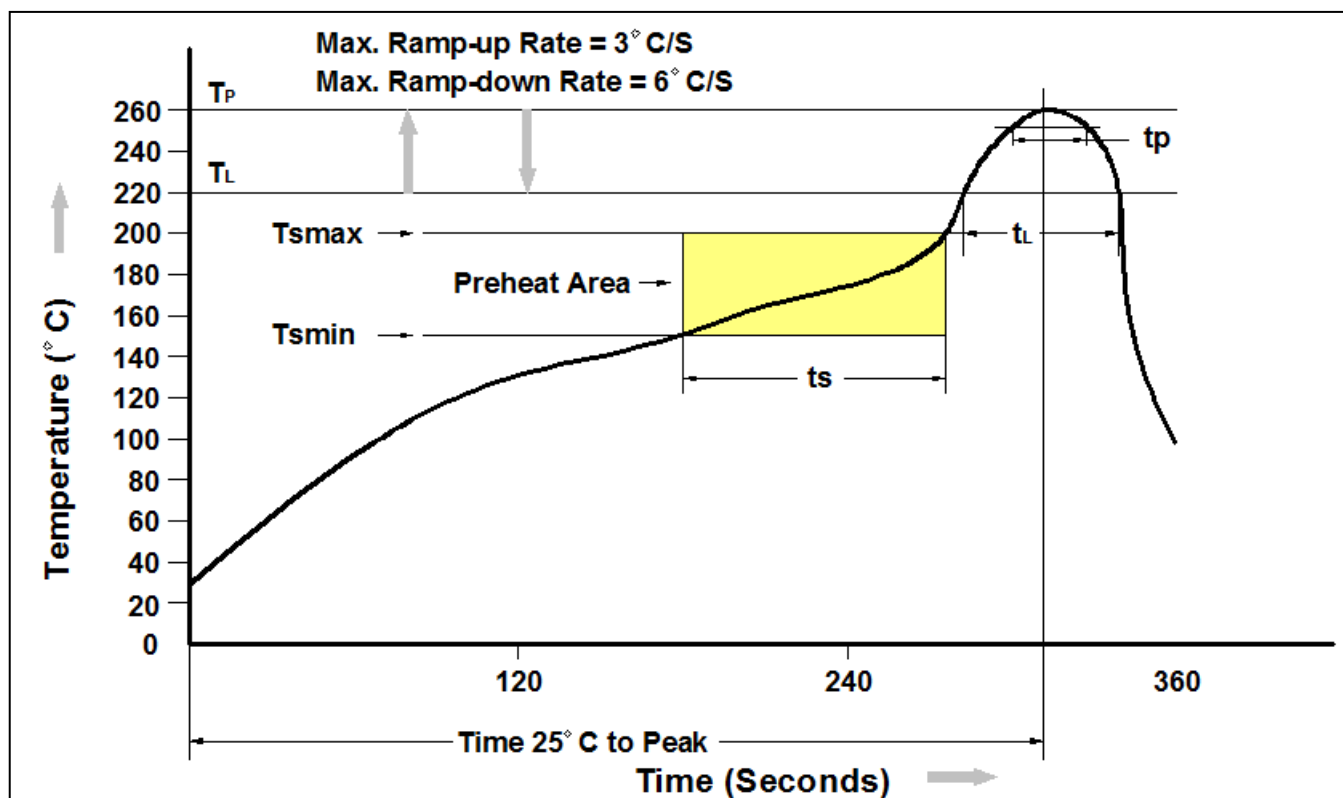


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Reflow Profile (follow the JEDEC standard J-STD-020)



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 (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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