

QT-Brightek Opto-Coupler Series

6-PIN DIP PHOTOCOUPLER SCHMITT TRIGGER

Part No.: H11L1_H11L2_H11L3



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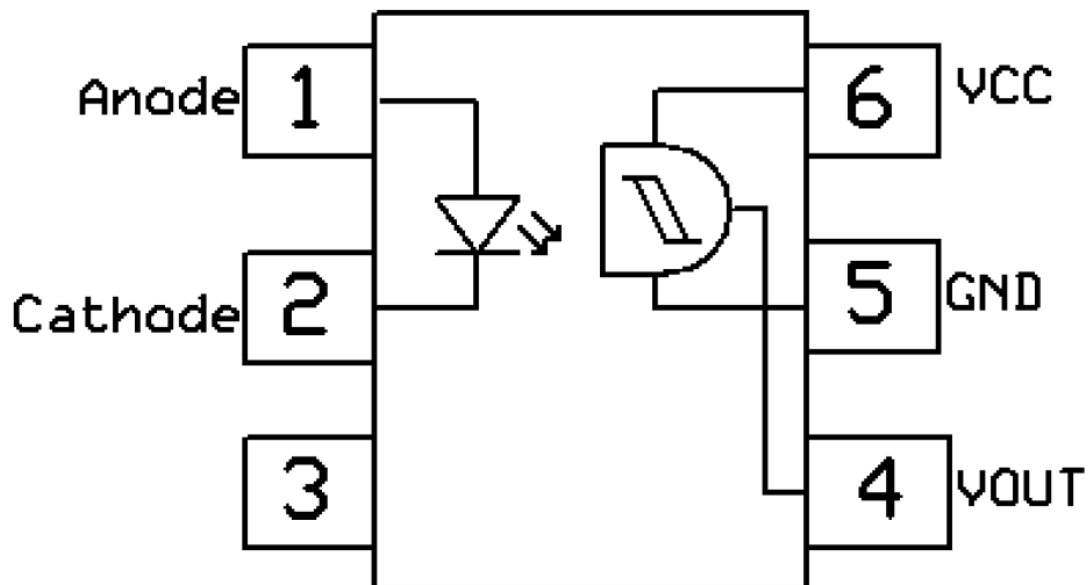
Introduction

Feature:

- High data rate, 1MHz typ. (NRZ)
- Microprocessor compatible drive
- Free from latch up and oscillation throughout voltage and temperature ranges
- Wide supply voltage capability, compatible with all popular logic systems
- High Isolation voltage between input and output (Viso = 5000V rms)
- Logic compatible output sinks 16mA at 0.4V max.
- Guaranteed on/off threshold hysteresis
- Available packaged in Tube or Tape and reel

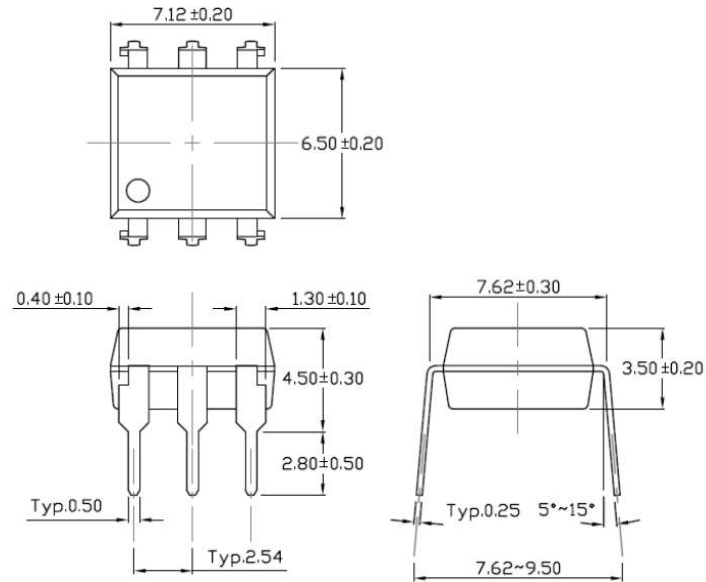
Certification & Compliance:

- Pb free and RoHS Compliant
- UL recognized (File #E338132)
- VDE recognized (File # 40049050)

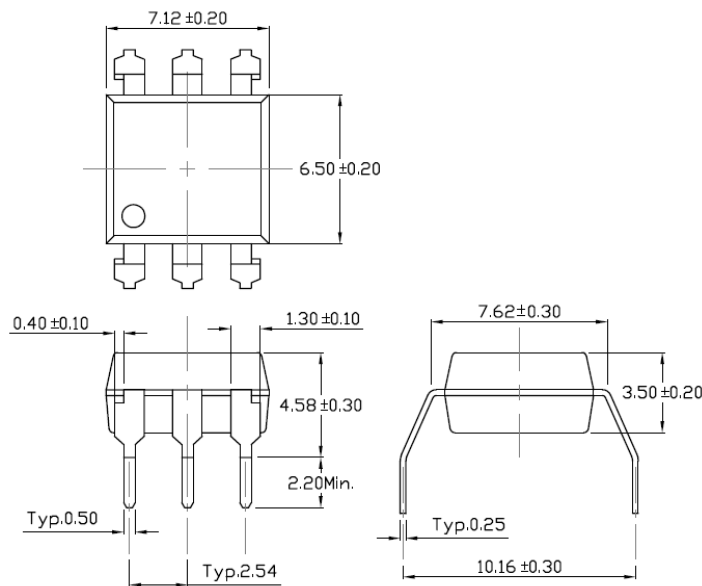
**Schematic:**

Dimension: (Dot location indicates pin 1)

6-Pin Dip (standard):



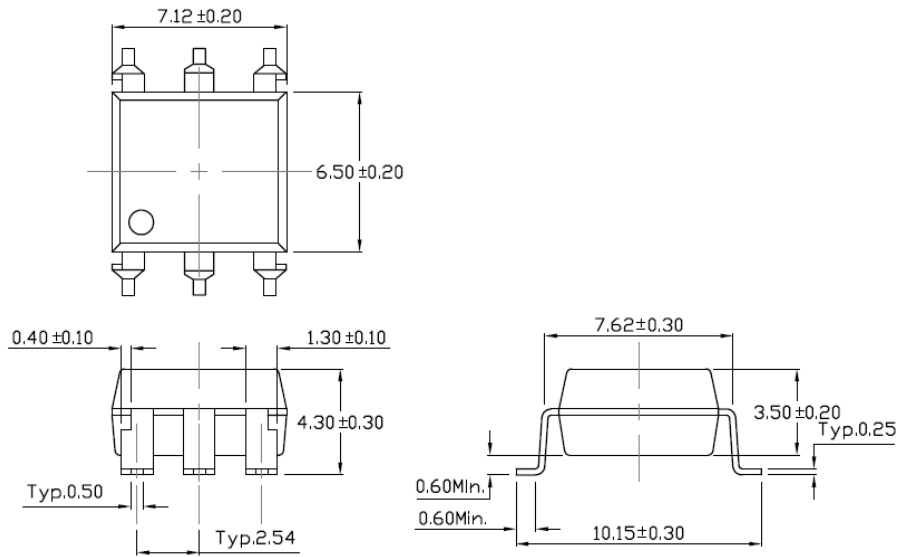
Wide lead bend (Option W):



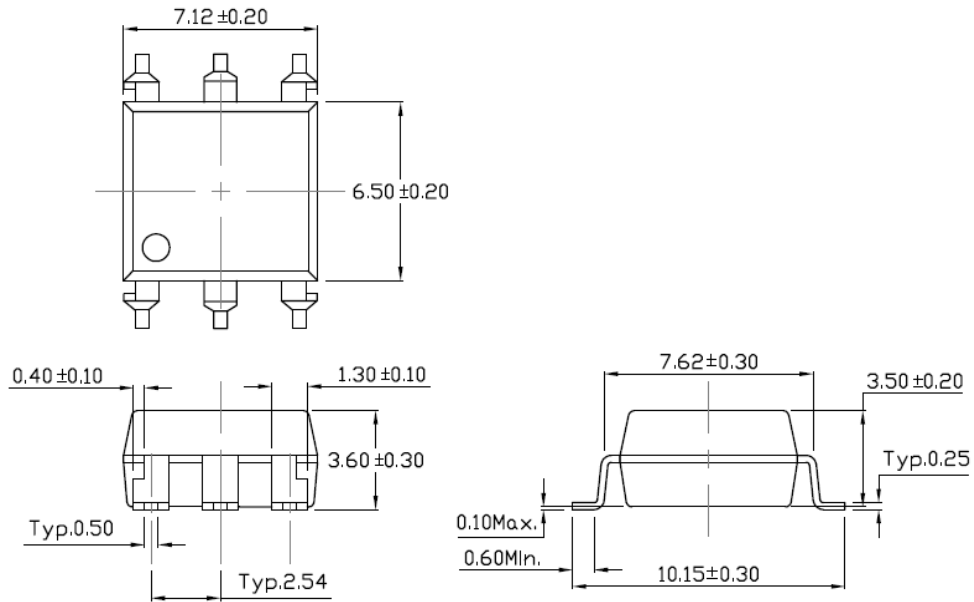
All Dimensions are in mm
Tolerance = +/- 0.1mm

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SMD lead bend (Option S):



SMD (Low Profile) bend (Option SL):



All Dimensions are in mm

Tolerance = +/- 0.1mm

Absolute Maximum Rating

Symbol	Parameter	Rating	Units
		H11L1 H11L2 H11L3	
T _{STG}	Storage Temperature	-55 ~ +150	°C
T _{OPR}	Operating Temperature	-40 ~ +100	°C
T _{SOL}	Lead Solder Temperature	260	°C
V _{ISO}	Isolation voltage	5000	VRMS
EMITTER			
I _F	Continuous Forward Current	60	mA
I _{PF}	Peak Forward Current (300us pulse, ≤1 μs P.W)	1	A
V _R	Reverse Voltage	6	V
P _D	Power Dissipation	100	mW
DETECTOR			
V _O	Output Voltage	0 to 16	V
V _{CC}	Supply Voltage	3 to 16	V
I _O	Output Current	50	mA
P _D	Power Dissipation	150	mW

**Electrical Characteristic: (T=25 °C)
Emitter**

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V _F	Forward voltage	H11L1 H11L2 H11L3	I _F = 10mA	-	1.2	1.4	V
I _R	Reverse current	H11L1 H11L2 H11L3	V _R = 6V	-	-	5	μA
C _J	Capacitance	H11L1 H11L2 H11L3	V = 0, f = 1KHz	-	45	-	pF

Detector

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V _{CC}	Operation Voltage Range	H11L1 H11L2 H11L3		3	-	15	V
I _{CCH}	Logic High Supply Current	H11L1 H11L2 H11L3	I _F = 0mA, V _{CC} = 5v	-	1.5	5	mA
I _{OH}	Logic High Output Current	H11L1 H11L2 H11L3	I _F = 0mA, V _{CC} = V _O = 15V	-	-	100	μA

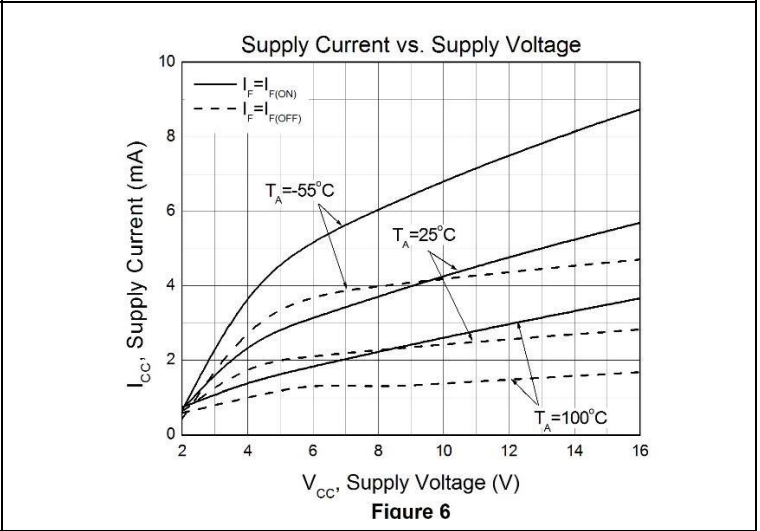
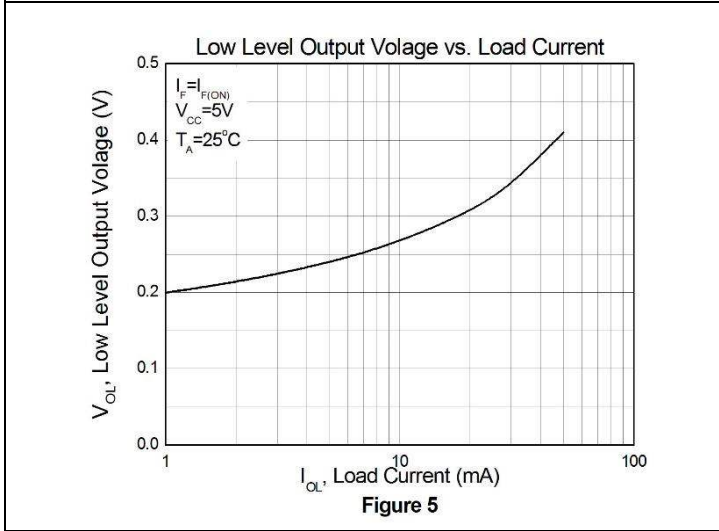
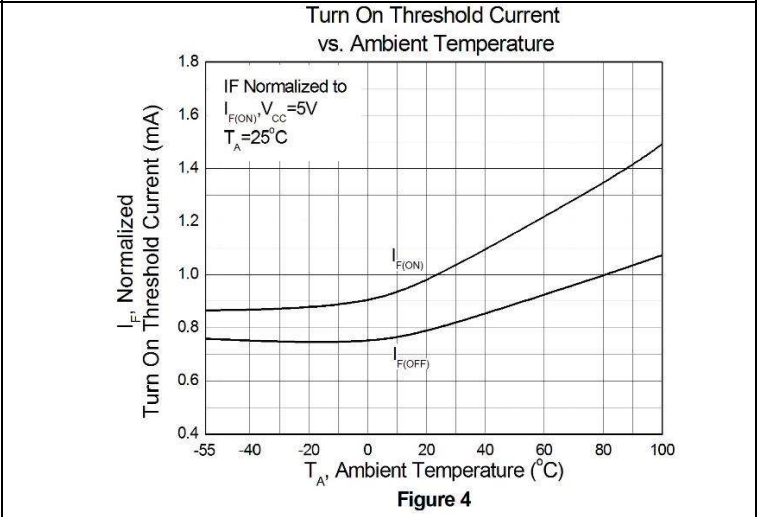
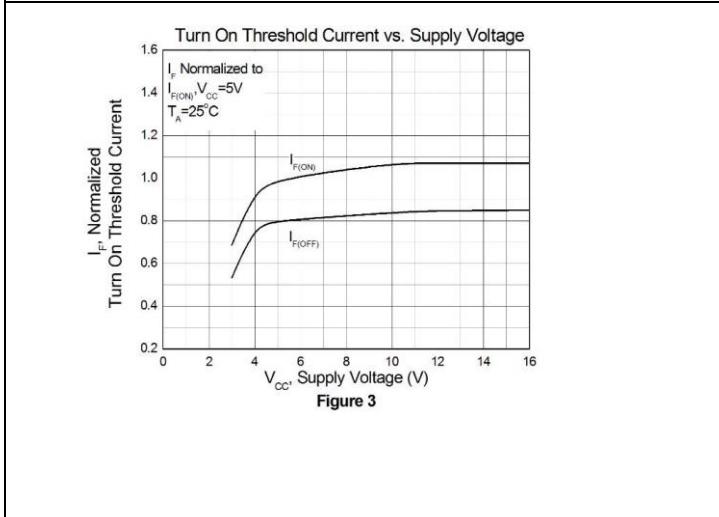
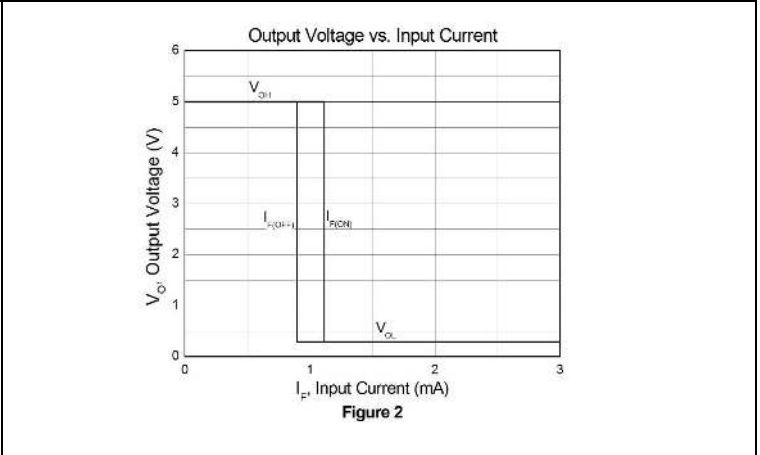
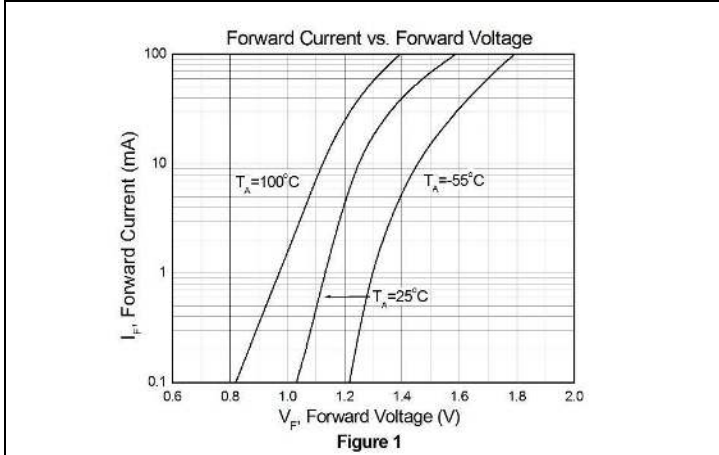
Isolation Characteristics

R _{ISO}	Isolation Resistance	H11L1 H11L2 H11L3	V _{LO} = 500VCD	10 ¹¹	-	-	Ω
C _{IO}	Isolation Capacitance		f = 1 MHz	-	0.25	-	pF

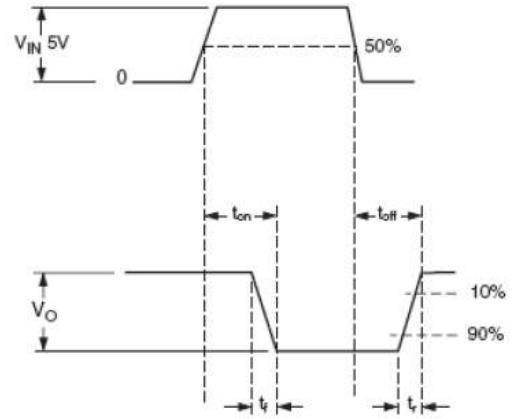
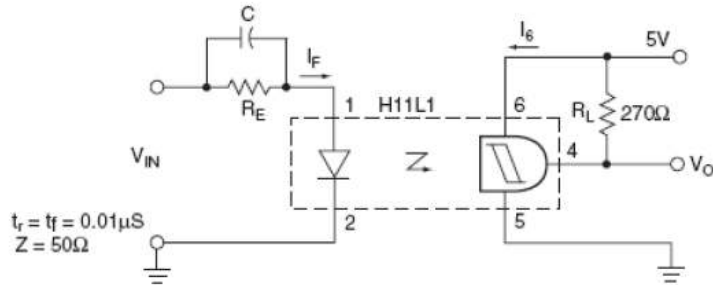
Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
DC Transfer Characteristic							
I_{CCL}	Logic Low Supply Current	H11L1 H11L2 H11L3	$I_F = 10\text{mA}, V_{CC} = 5\text{V}$	-	1.5	5	mA
V_{OL}	Logic Low Output Voltage	H11L1 H11L2 H11L3	$V_{CC} = 5\text{V}, I_F = I_{FON}(\text{max}), R_L = 270\Omega$	-	-	0.4	V
I_{FON}	Turn on Threshold Current ¹	H11L1	$V_{CC} = 5\text{V}, R_L = 270\Omega$	-	-	1.6	mA
		H11L2		-	-	10	mA
		H11L3		-	-	5	mA
I_{FOFF}	Turn off Threshold Current	H11L1 H11L2 H11L3	$V_{CC} = 5\text{V}, R_L = 270\Omega$	0.3	1	-	mA
I_{fon}/I_{foo}	Hysteresis Ratio	H11L1 H11L2 H11L3	$V_{CC} = 5\text{V}, R_L = 270\Omega$	0.5	-	0.9	
AC Transfer Characteristic							
T_{on}	Turn on Time	H11L1 H11L2 H11L3	$V_{CC} = 5\text{V}, I_F = I_{FON}, R_L = 270\Omega$	-	-	3.8	μS
T_r	Rise Time	H11L1 H11L2 H11L3	$V_{CC} = 5\text{V}, I_F = I_{FON}, R_L = 270\Omega$	-	0.1	-	μS
T_{off}	Turn off Time	H11L1 H11L2 H11L3	$V_{CC} = 5\text{V}, I_F = I_{FON}, R_L = 270\Omega$	-	-	3.8	μS
T_f	Fall Time	H11L1 H11L2 H11L3	$V_{CC} = 5\text{V}, I_F = I_{FON}, R_L = 270\Omega$	-	0.1	-	μS
	Data Rate	H11L1 H11L2 H11L3		-	1	-	MHz

¹. Max. $I_{F(on)}$ is the maximum current required to trigger the output. For examples, a 1.6mA maximum trigger current would require the LED to be driven at a current greater than 1.6mA to guarantee the device will turn on. A 10% guard band is recommended to account for degradation of the LED over its lifetime. The maximum allowable LED drive current is 60mA

Characteristic Curves

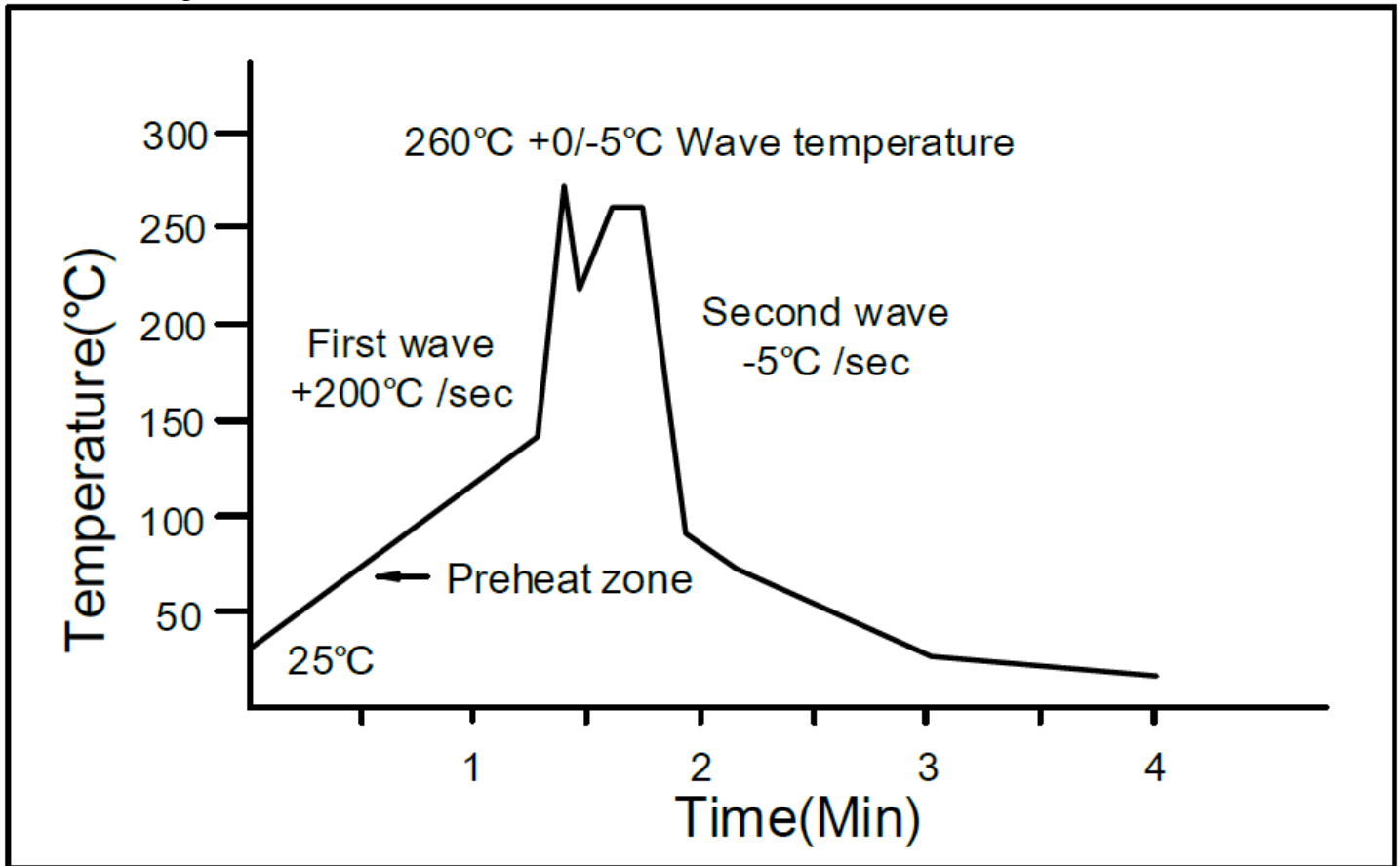


Test Circuit for Response Time



Solder Profile & Footprint

Wave soldering



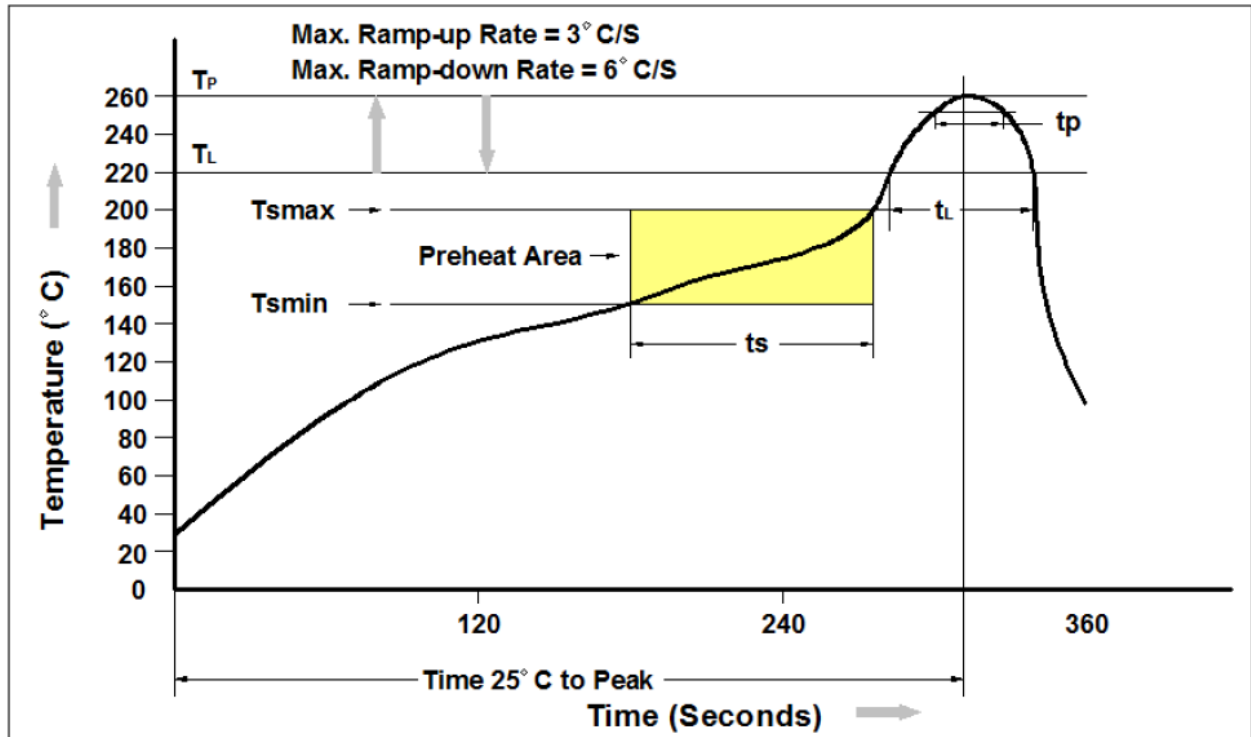
Temperature: 260 +0/-5 °C

Time: 10 Sec

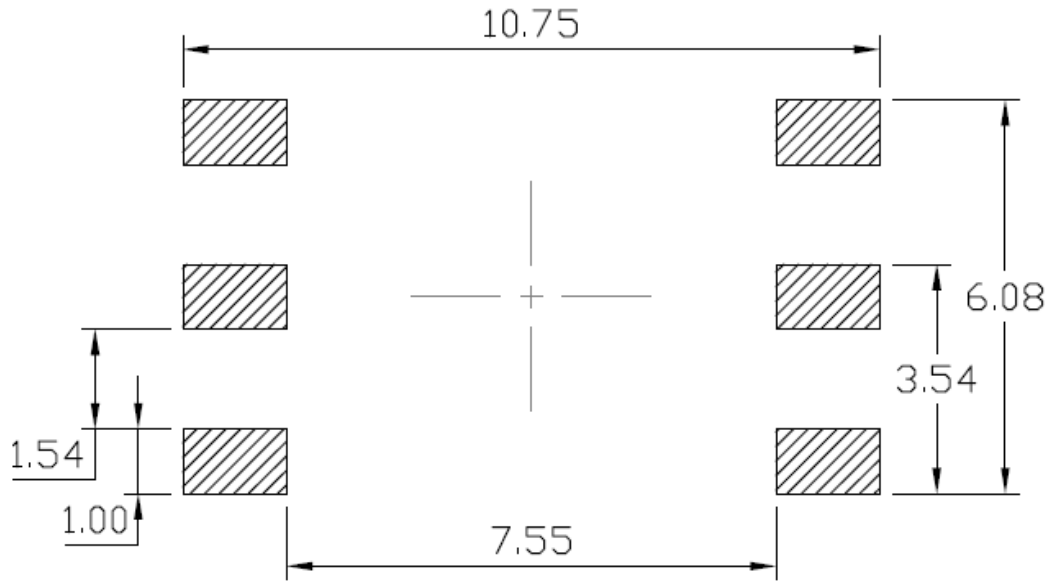
Preheat temperature: 25 to 140 °C

Preheat time: 30 to 80 sec.

Reflow soldering



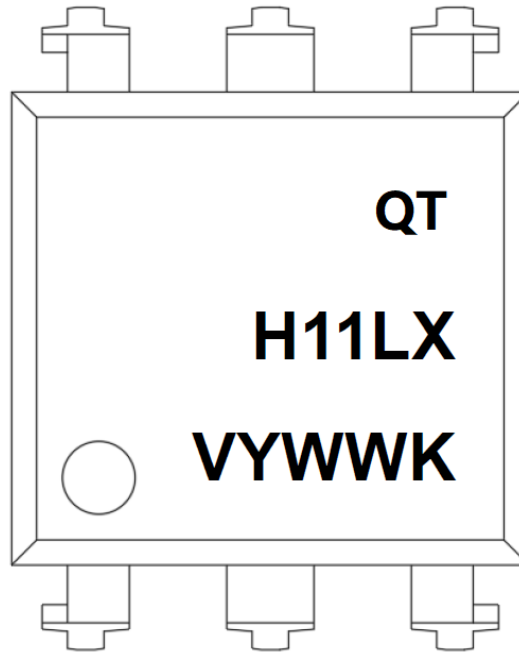
Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	150°C
Temperature Max. (T _{smax})	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t _P) within 5°C of 260°C	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

Solder Profile & Footprint

Recommended Solder Footprint for SMD Leadform

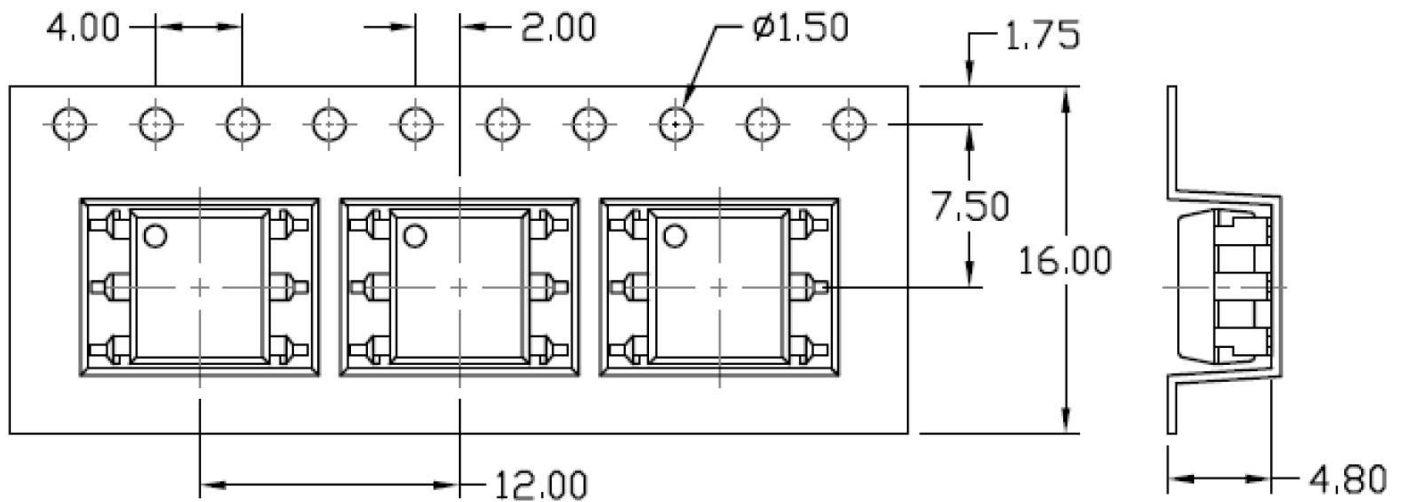
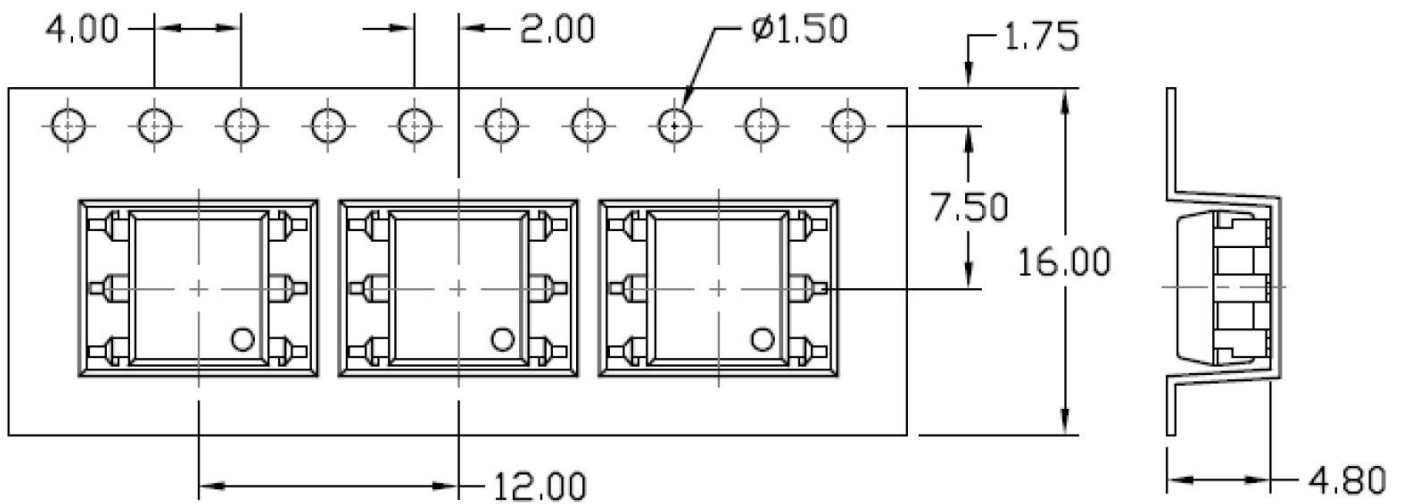
Units: mm

tolerance: +/- 0.1mm

Device Marking

QT = QT-Brightek Corporation
H11LX = part number (X=1, 2, or 3)
Y = Year
WW = Week
V = VDE Option
K = Manufacturing code

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Tape and Reel Packing Specifications**Option ST1 & SLT1**Input Direction
→**Option ST2 & SLT2**Input Direction
→



Ordering Information

H11LXVYZ

X= Part number (X=1, 2, or 3)

V = VDE option (V or None)

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

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

Option	Description	Quantity
None	Standard 6-Pin DIP	50 Units/Tube
M	Gullwing	50 Units/Tube
ST1	Surface Mount Lead Forming – with Option 1 Taping	1000 pcs/ reel
ST2	Surface Mount Lead Forming – with Option 2 Taping	1000 pcs/ reel
SLT1	SMD (Low Profile) Lead Forming – with Option 1 Taping	1000 pcs/ reel
SLT2	SMD (Low Profile) Lead Forming – with Option 2 Taping	1000 pcs/ reel



Revision History

Description:	Revision #	Revision Date
Initial release of H11L1 H11L2 H11L3	1.0	4/22/2010
Information updates	1.1	04/07/2011
Amend packing information	1.2	12/16/2011
Update to new format/update packing spec	1.3	07/17/2012
Amend the spec and packing information	1.4	02/09/2018

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