

QT-Brightek Optocoupler Series

ZERO-CROSSING TRIAC OPTOCOUPLER

Part No.: Q306X / Q308X Series

Product: Q306X/ Q308X Series	Date: April 02, 2018	Page 1 of 16
	Version# 2.0	

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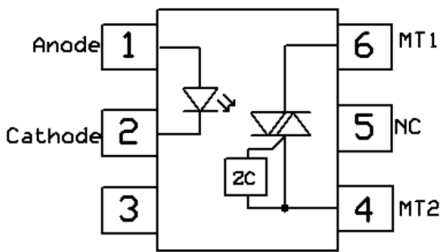
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Introduction

Feature:

- High isolation voltage between input and output (Viso=5000Vrms)
- Peak breakdown voltage
600V: Q3061, Q3062, Q3063
800V: Q3081, Q3082, Q3083
- Operating Temperature up to 100 °C
- Available in Tube or Tape and reel
- Available with standard DIP-6, Gullwing lead bend, SMD lead bend and SMD low profile

Schematic:



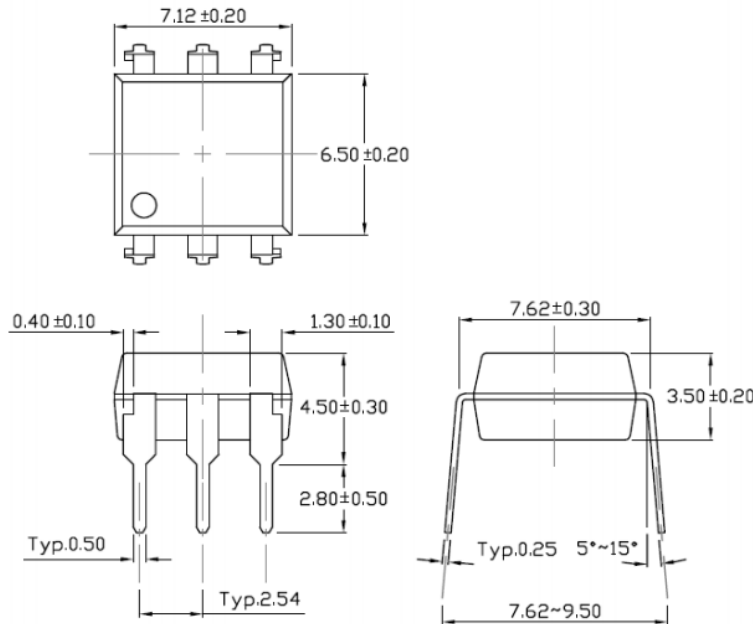
Certification & Compliance:

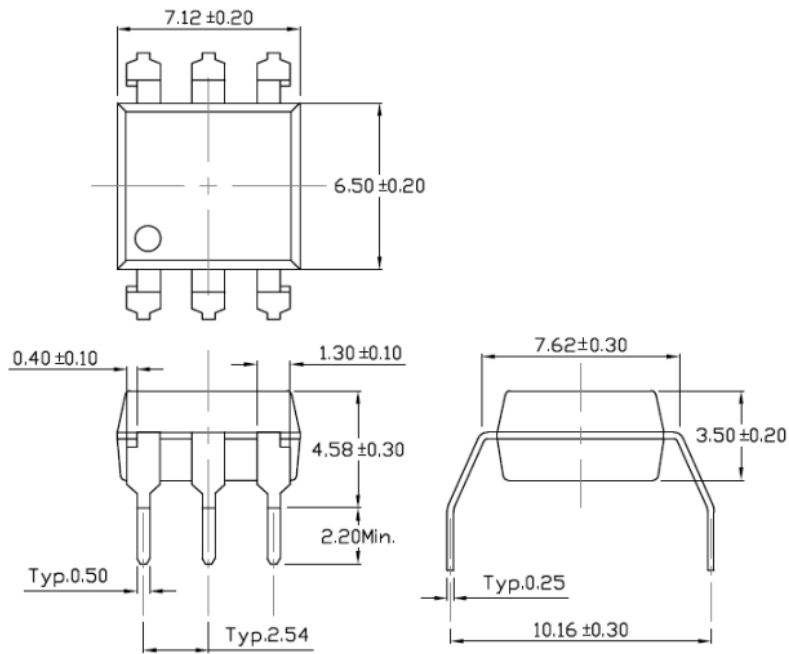
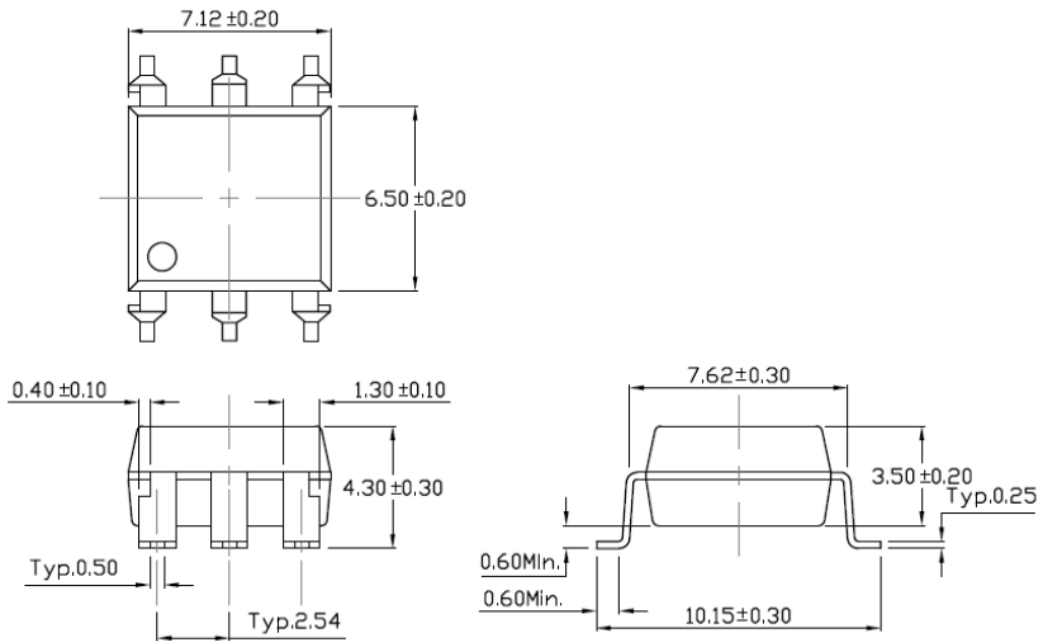
- Pb free and RoHS Compliant
- UL recognized (File # E338132)
- VDE recognized (File # 40030457)

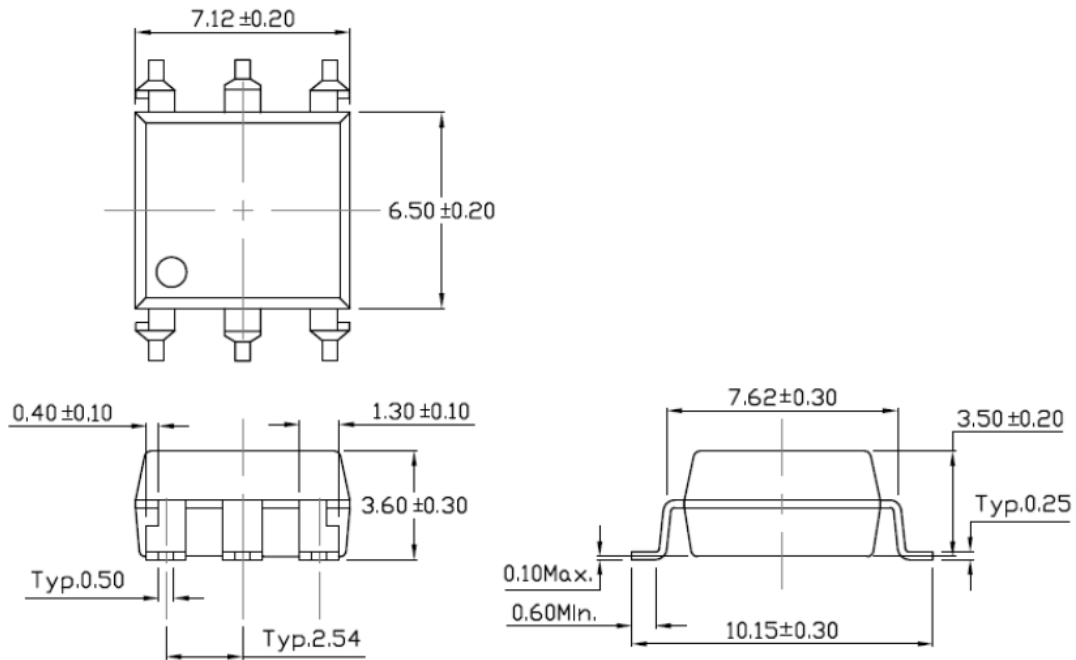


Dimension: (Dot location indicates pin 1)

6-Pin Dip (standard):



Wide lead bend (Option M):**SMD lead bend (Option S):**

SMD (Low Profile) Bend (Option SL):

All Dimensions are in mm

Absolute Maximum Rating

Symbol	Parameter	Rating	Units	
V _{ISO}	Isolation Voltage	5000	V _{RMS}	
T _{OPR}	Operating Temperature	-55 ~ +100	°C	
T _{STG}	Storage Temperature	-55 ~ +150	°C	
T _{SOL}	Lead Solder Temperature	260 for 10 sec	°C	
EMITTER				
I _F	Continuous Forward Current	60	mA	
I _{FP}	Peak Forward Current (≤1us, P.W, 300pps)	1	A	
V _R	Reverse Voltage	6	V	
P _D	Power Dissipation	100	mW	
DETECTOR				
P _D	Power Dissipation	300	mW	
V _{DRM}	Off-state Output Terminal Voltage	Q306X series	600	V
		Q308X series	800	
I _{TSM}	Peak Repetitive Surge Current	1	A	

Electrical Characteristic (T_A=25 °C)

Emitter

Symbol	Characteristic	Test Condition	Range			Unit
			Min.	Typ.	Max.	
V _F	Forward Voltage	I _F =10mA	-	1.24	1.4	V
I _R	Reverse Current	V _R =6V	-	-	5	μA
C _{IN}	Input Capacitance	f=1MHz	-	45	-	pF

Detector

Symbol	Characteristic		Test Condition	Range			Unit
				Min	Typ	Max	
I_{DRM1}	Peak Blocking Current	Q306X Q308X	$V_{DRM}=\text{Rated } V_{DRM},$ $I_F=0\text{mA}$	-	-	500	nA
I_{DRM2}	Inhibit Leakage Current		$V_{DRM}=\text{Rated } V_{DRM},$ $I_F=\text{Rated } I_{FT}$			500	μA
V_{INH}	Inhibit Voltage		$I_F=\text{Rated } I_{FT}$	-	-	20	V
V_{TM}	Peak On-state Voltage		$I_{TM}=100\text{mA},$ $I_F=\text{Rated } I_{FT}$	-	-	3	V
dv/dt	Critical Rate of Rise Off-State Voltage	Q306X	$V_{PEAK}=\text{Rated } V_{DRM}$	1000	-	-	V/ μs
		Q308X		600			

Transfer Characteristic

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
I_{FT}	LED Trigger Current	Q3061, Q3081	Main terminal voltage=3V, $I_{TM}=100\text{mA}$	-	-	15	mA
		Q3062, Q3082		-	-	10	
		Q3063, Q3083		-	-	5	
I_H	Holding Current			-	380	-	μA
R_{IO}	Isolation Resistance		$V_{IO}=500V_{DC}$	1×10^{11}	-	-	Ω
C_{IO}	Isolation Capacitance		$f=1\text{MHz}$	-	0.25	-	pF

Characteristic Curves

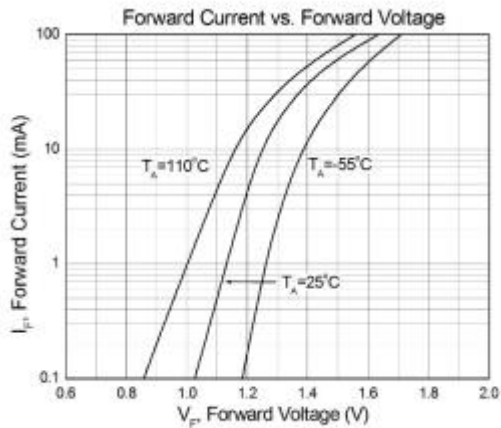


Figure 1

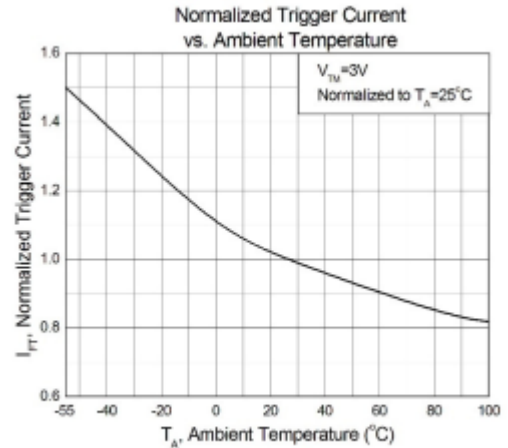


Figure 2

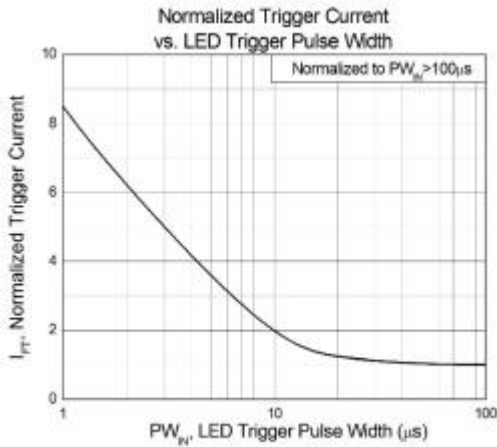


Figure 3

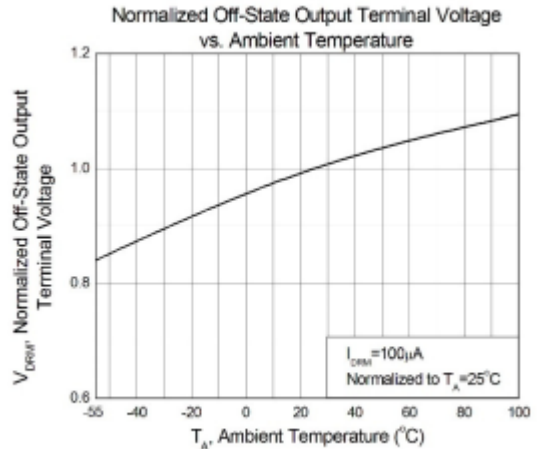


Figure 4

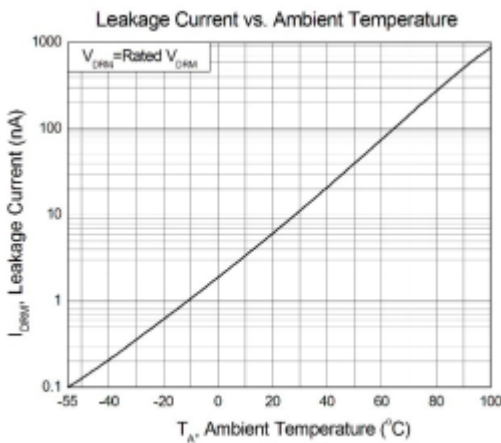


Figure 5

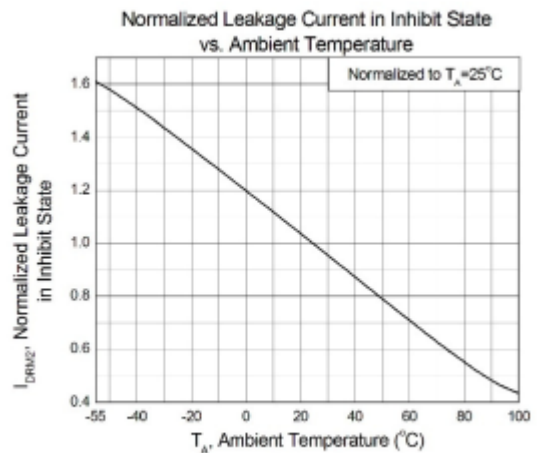
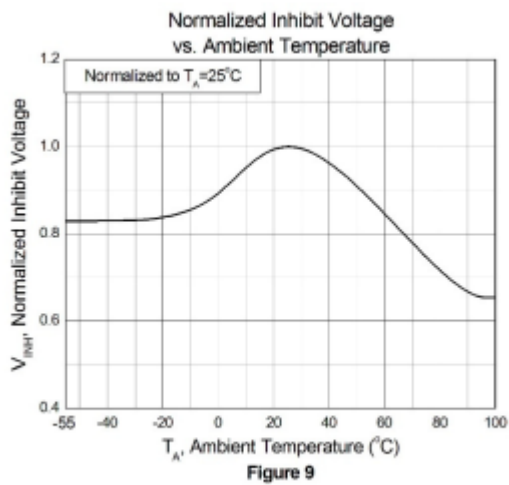
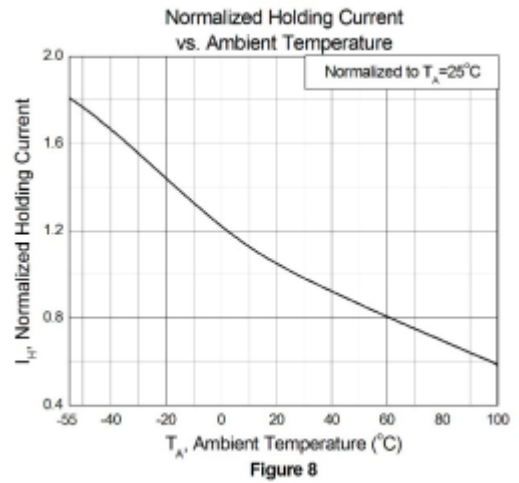
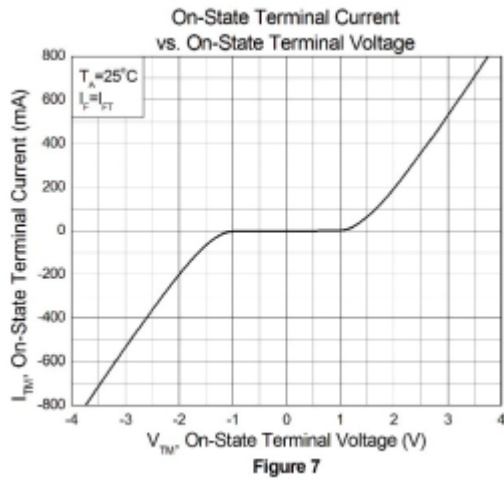
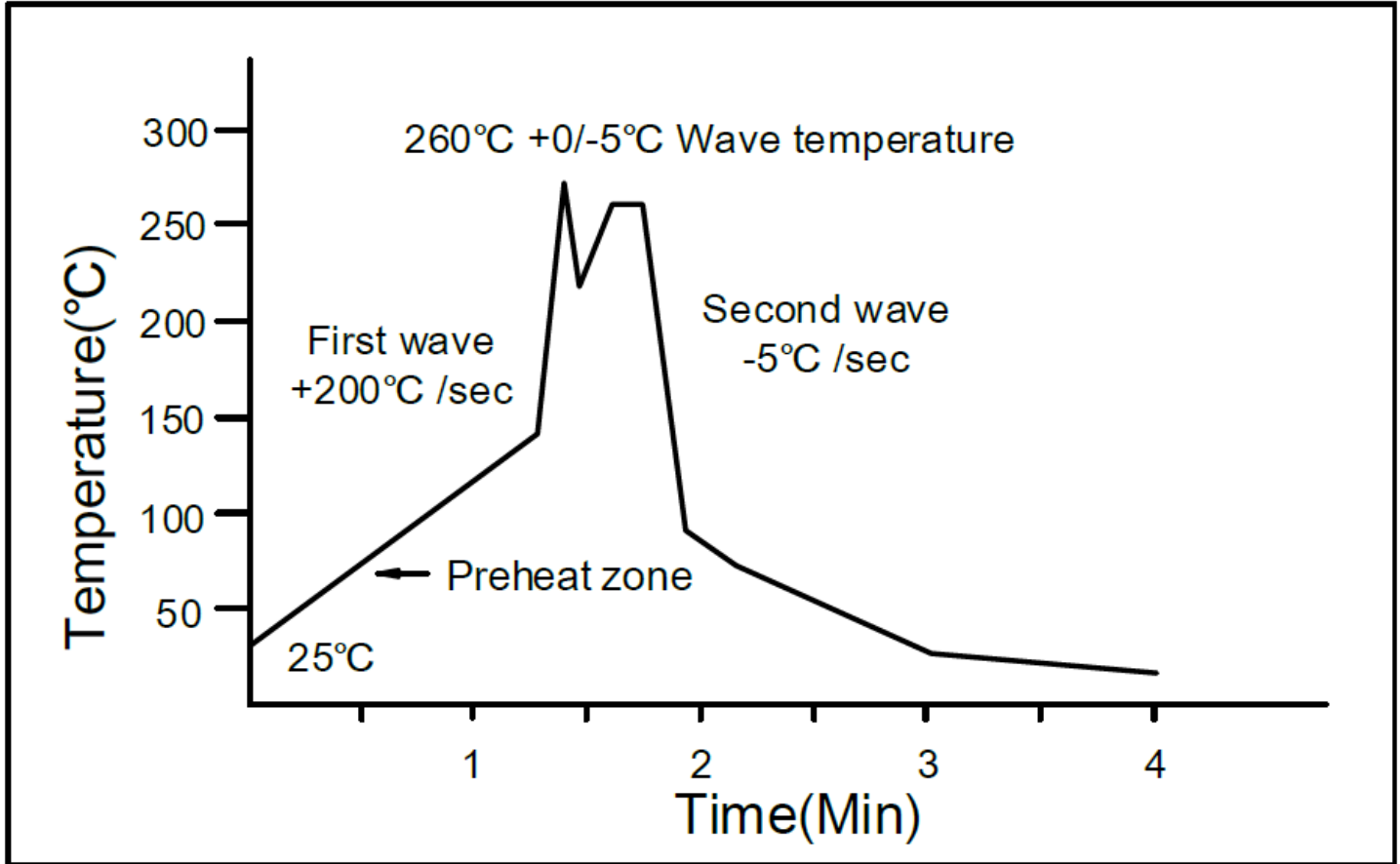


Figure 6



Solder Profile & Footprint**Recommended Wave Soldering Profile**

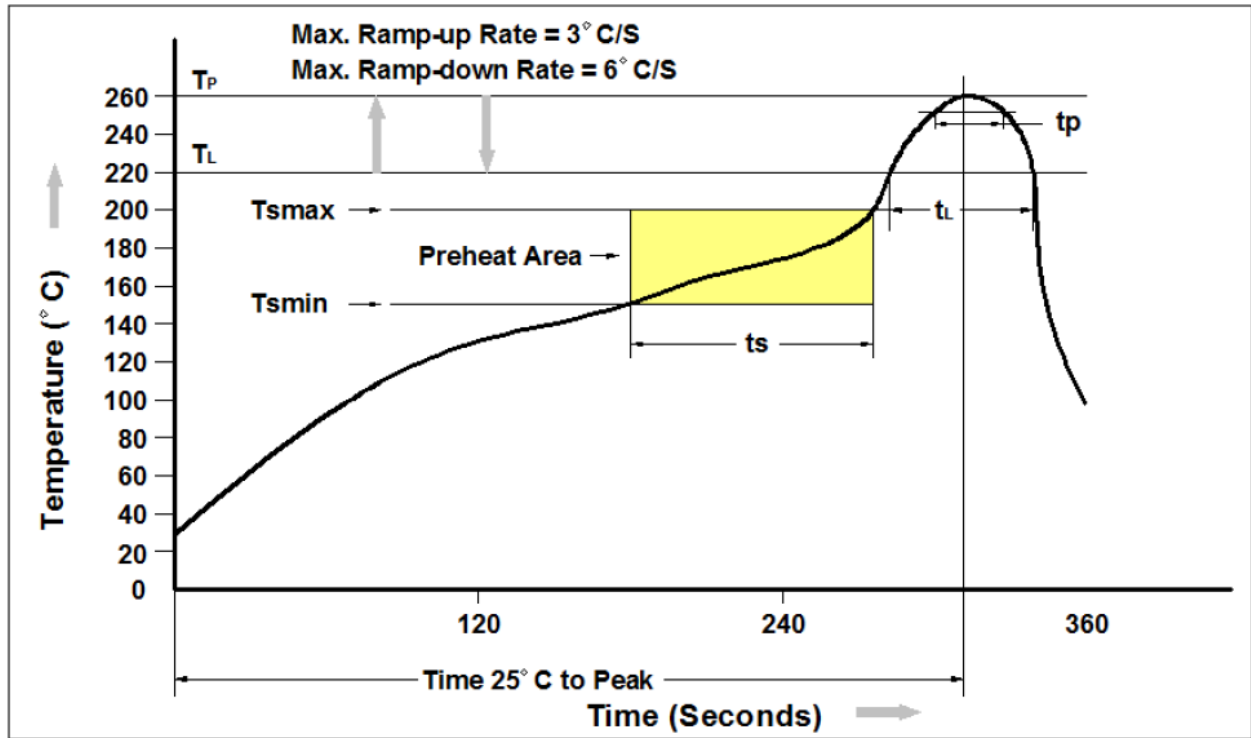
Temperature: 260 +0/-5 °C

Time: 10 Sec

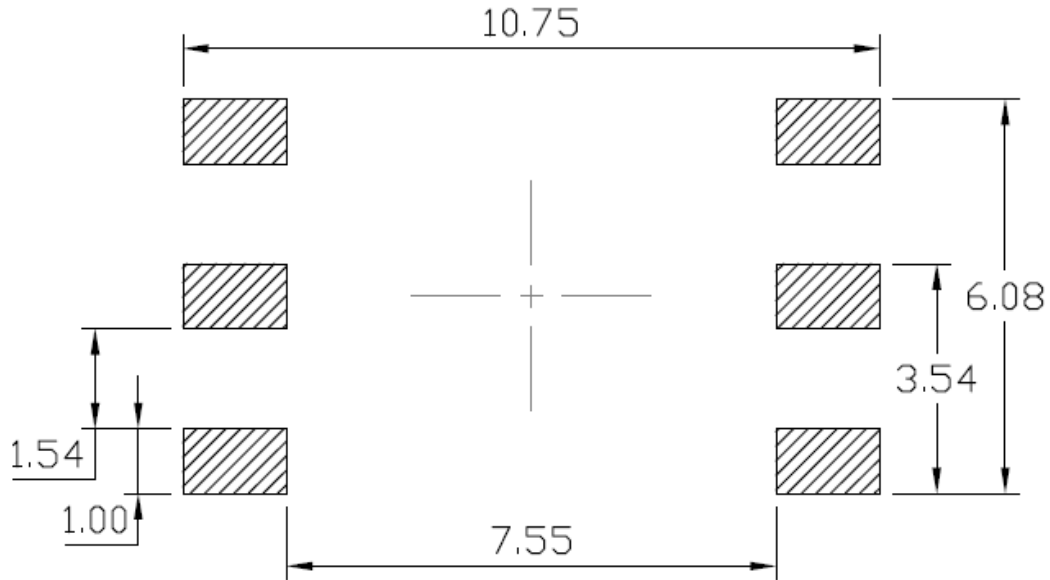
Preheat temperature: 25 to 140 °C

Preheat time: 30 to 80 sec.

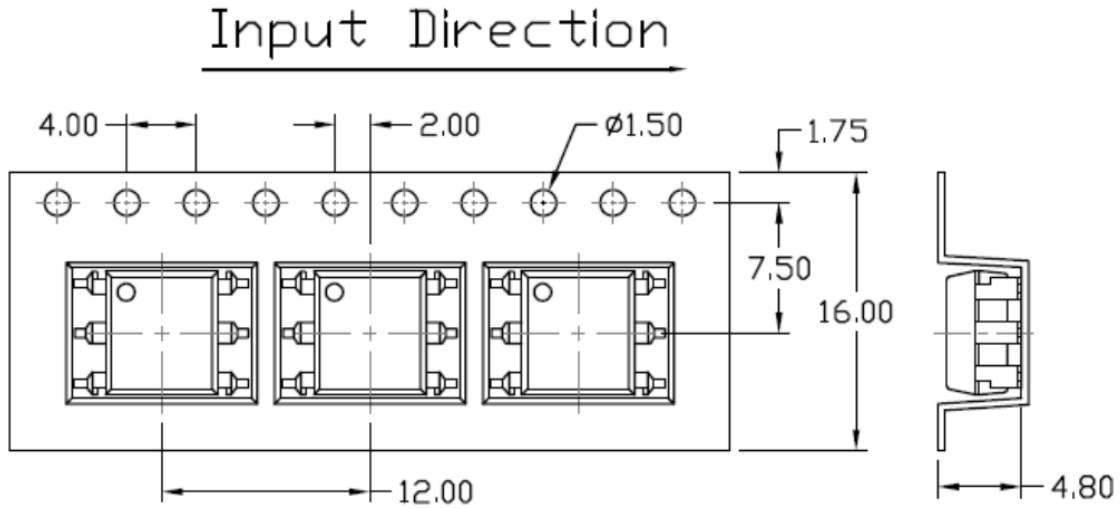
Recommended Reflow Soldering Profile



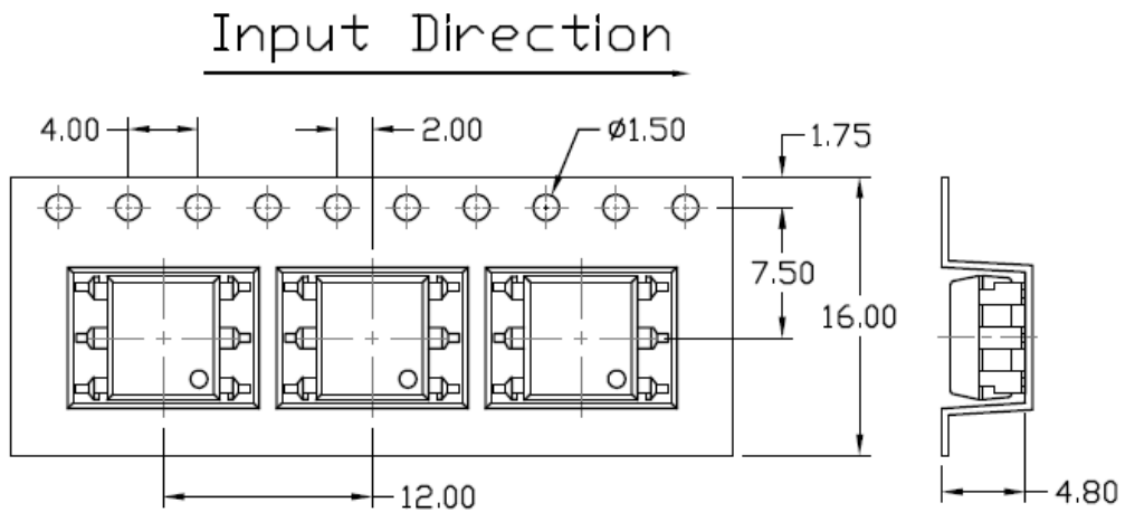
Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	150 °C
Temperature Max. (T_{smax})	200 °C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217 °C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak Body 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 Pattern for SMD**

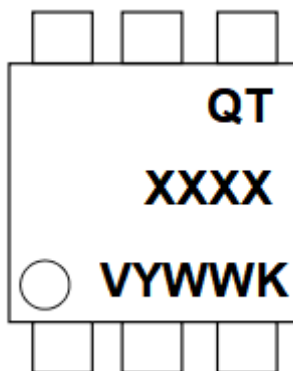
Units: mm

Packing & Labeling**Option 1: ST1 & SLT1**

Unit: mm

Option 2: ST2 & SLT2

Unit: mm

Device Marking**Example**

QT = QT-Brightek Corporation

XXXX = Part Number (3061, 3062, 3063, 3081, 3082, 3083)

V = VDE Option

Y = Year

WW = Week

K = Manufacturing code

Ordering Information

Q306XVYZ, Q308XVYZ

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

V = VDE option (V or None)

Y = Lead form option (S, SL, M 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 Lead Bend	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 Q303X/Q304X/Q306X/Q308X series	1.0	4/22/2010
Feature, certification & compliance and ordering information updates	1.1	02/01/2011
Update format	1.2	05/15/2013
Update specs, format, and packing method, and part number	2.0	04/02/2018

Disclaimer

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.