



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



QT-Brightek Optocoupler Series

**ZERO-CROSSING High Power TRIAC
OPTOCOUPLER**

Part No.: QTTX213 series

Product: QTTX213 series	Date: February 02, 2018	Page 1 of 16
	Version# 1.0	



Table of Contents:

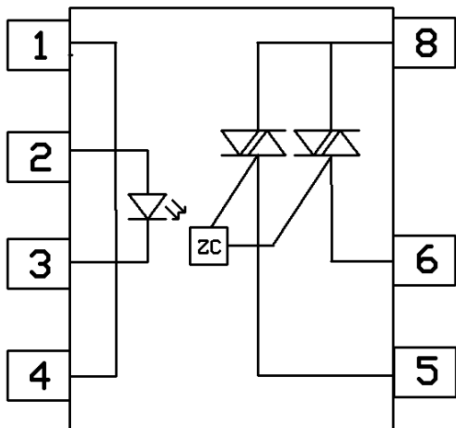
Introduction3
Absolute Maximum Rating6
Electrical Characteristic ($T_A=25\text{ }^\circ\text{C}$).....7
Characteristic Curves.....8
Test Circuit for static dv/dt.....10
Packing & Labeling14
Ordering Information15
Revision History16
Disclaimer16

Introduction

Feature:

- High Isolation voltage between input and output (Viso = 5000V rms)
- Peak Breakdown Voltage – 600V
- Peak Current Load – 0.3A, 0.6A, 0.9A and 1.2A

Schematic:



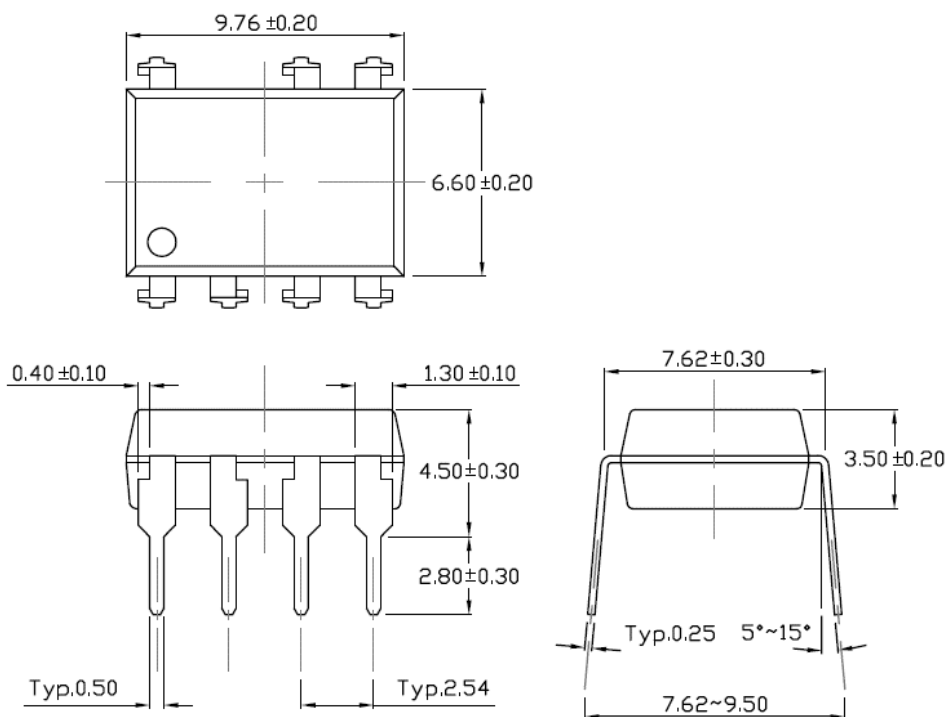
Certification & Compliance:

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

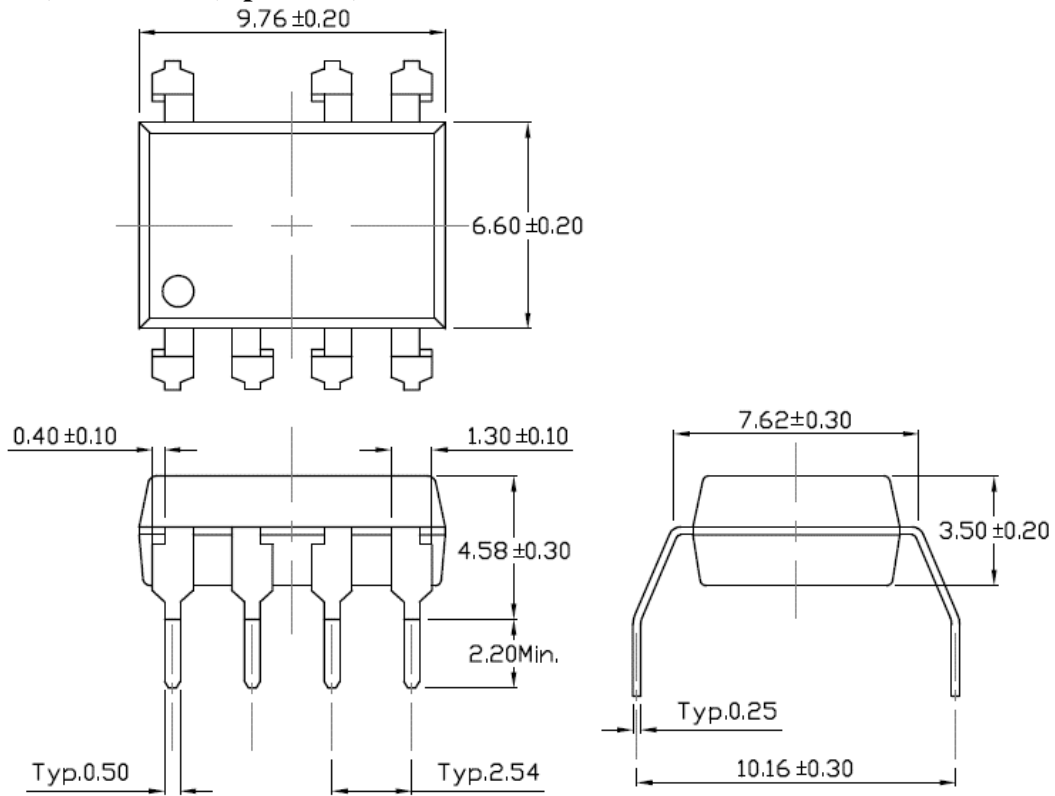


Dimension: (Dot location indicates pin 1)

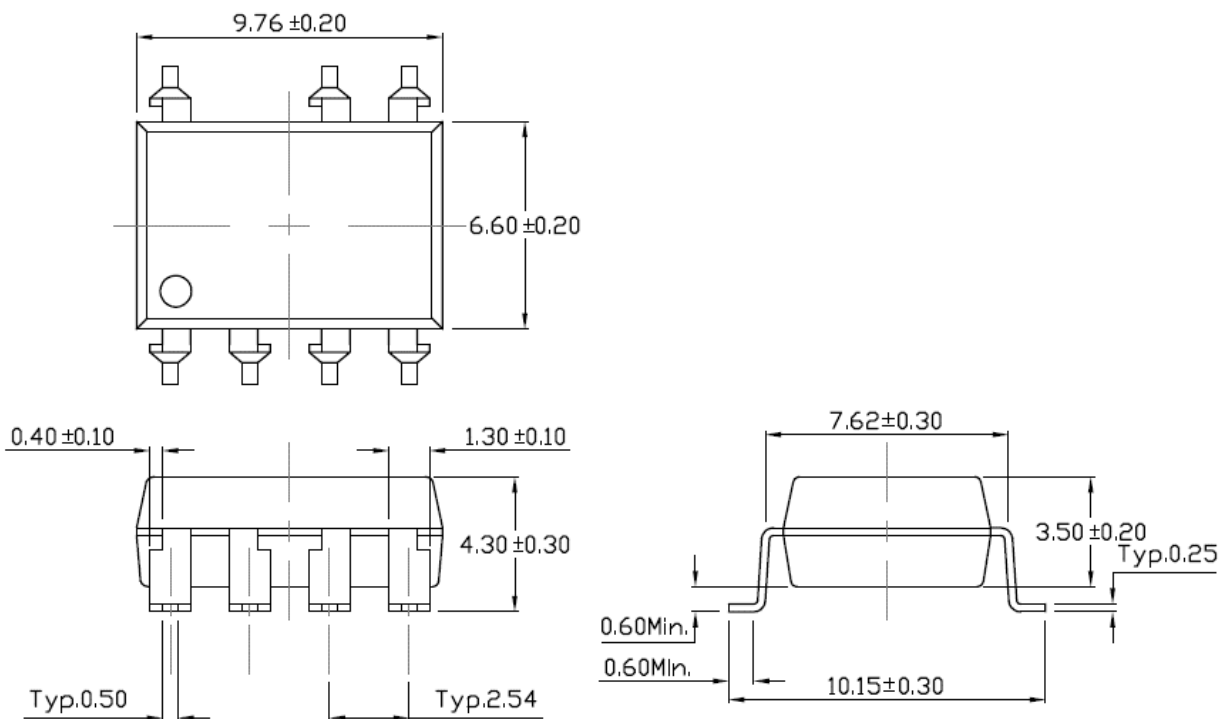
7-Pin Dip (standard):

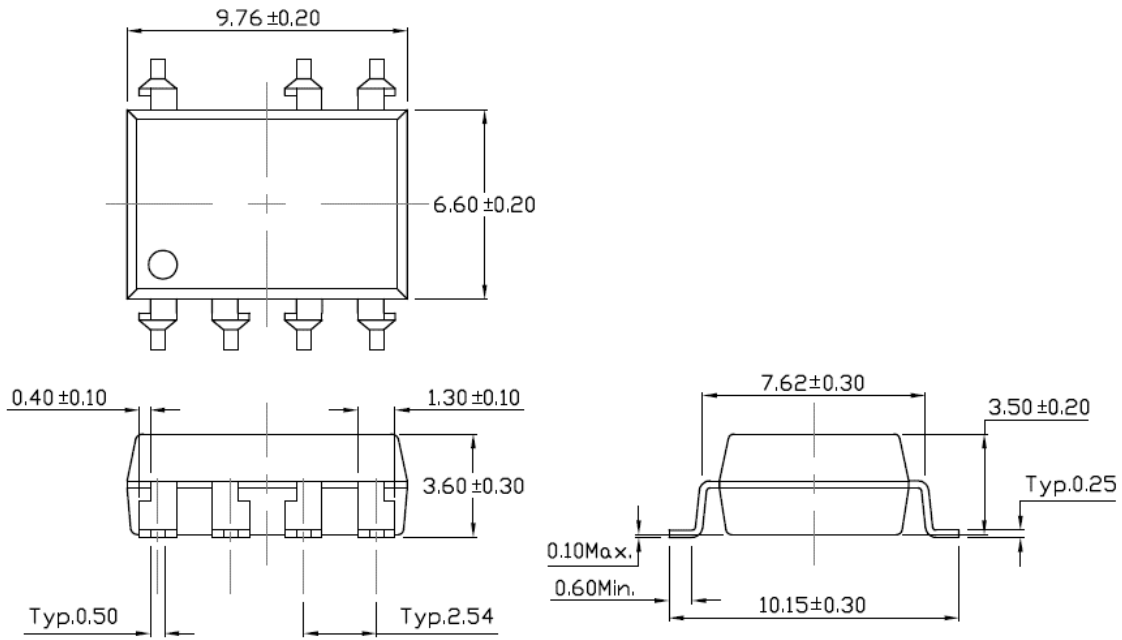


Gullwing (400mil) lead bend (Option M):



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 _{STG}	Storage Temperature	-55 ~ 125	°C	
T _{OPR}	Operating Temperature	-55 ~ 85	°C	
T _{SOL}	Soldering Temperature	260 for 10 sec	°C	
EMITTER				
I _F	Continuous Forward Current	50	mA	
I _{FP}	Peak Forward Current (≤ 1us, 300pps)	1	A	
V _R	Reverse Voltage	6	V	
P _D	Power Dissipation	75	mW	
DETECTOR				
P _{OUT}	Power Dissipation	800	mW	
P _T	Total Power Dissipation	850	mW	
I _{T(RMS)}	Continuous Current Load	QTT0213	0.3	A
		QTT1213	0.6	
		QTT2213	0.9	
		QTT3213	1.2	
I _{TSM}	Peak Current Load	QTT0213	3	A
		QTT1213	6	
		QTT2213	9	
		QTT3213	12	
V _{DRM}	Off-state Output Terminal Voltage	600	V	
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	-	-	1.3	V
I _R	Reverse Current	V _R = 6V	-	-	5	μA
C _{IN}	Input Capacitance	f = 1kHz	-	45	-	pF

Detector

Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
I _{DRM1}	Peak Blocking Current	V _{DRM} = 600V, I _F = 0mA	-	-	100	μA
I _{DRM2}	Inhibit Leakage Current	I _F = Rated I _{FT} , V _{DRM} = 600V	-	-	500	μA
V _{INH}	Inhibit Voltage	I _F = Rated I _{FT}	-	-	20	V
V _{TM}	Peak on-state voltage	I _{TM} = 100mA peak, I _F = Rated I _{FT}	-	-	2.5	V
dv/dt	Critical Rate of Rise off-state voltage	V _{PEAK} = Rated V _{DRM} , I _F = 0 (refer to test circuit for dv/dt)	200	-	-	V/ μs

Transfer Characteristic

Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
I _{FT}	LED Trigger Current	Main terminal voltage = 3V	-	-	10	mA
I _H	Holding Current		-	-	25	mA
R _{IO}	Isolation Resistance	V _{IO} = 500V _{DC}	1×10 ¹¹	-	-	Ω
C _{IO}	Isolation Capacitance	F = 1MHz	-	0.25	-	pF

Characteristic Curves

QTTX213

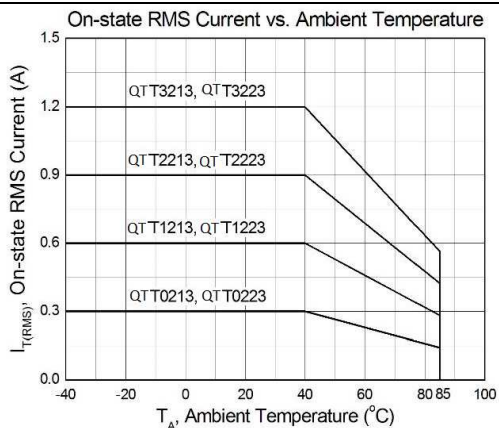


Figure 1

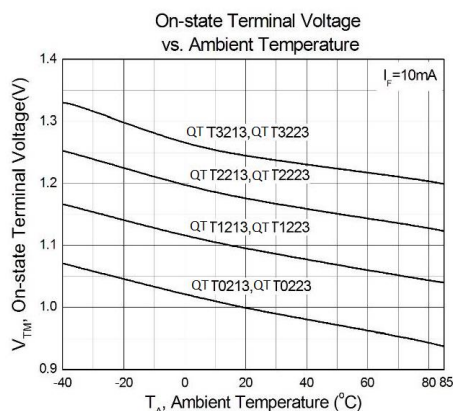


Figure 2

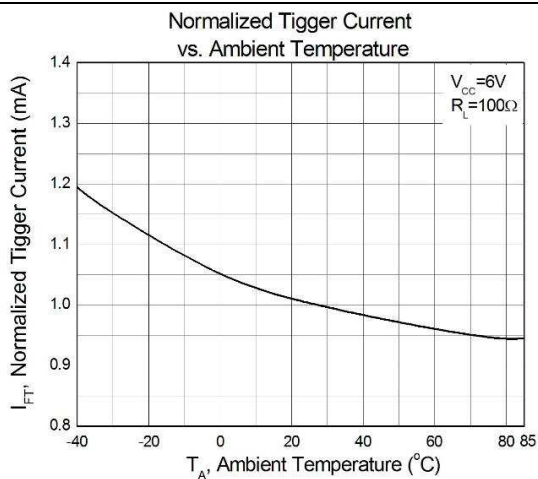


Figure 3

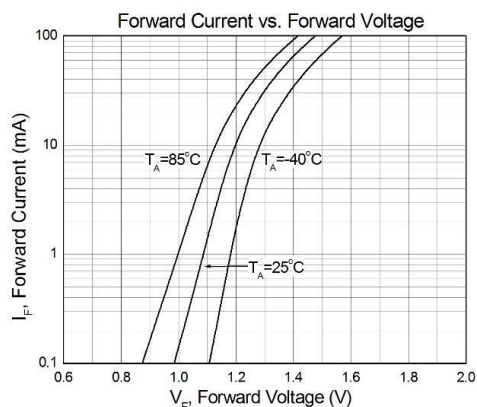


Figure 4

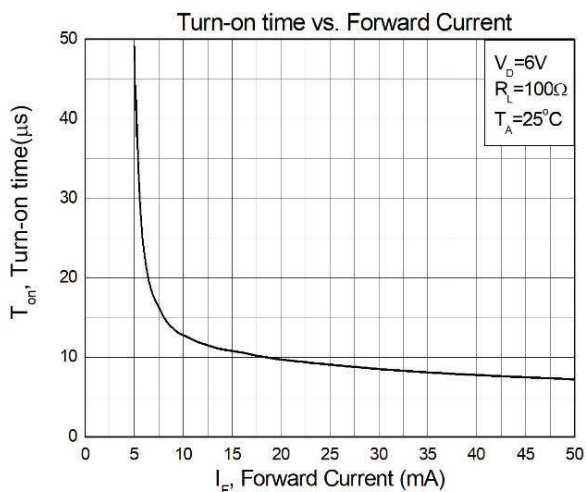


Figure 5

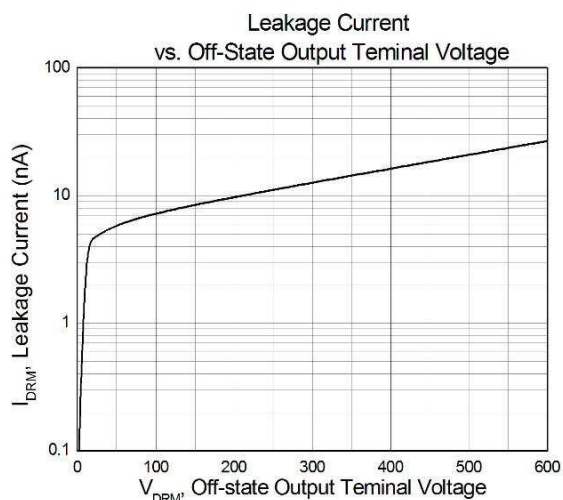
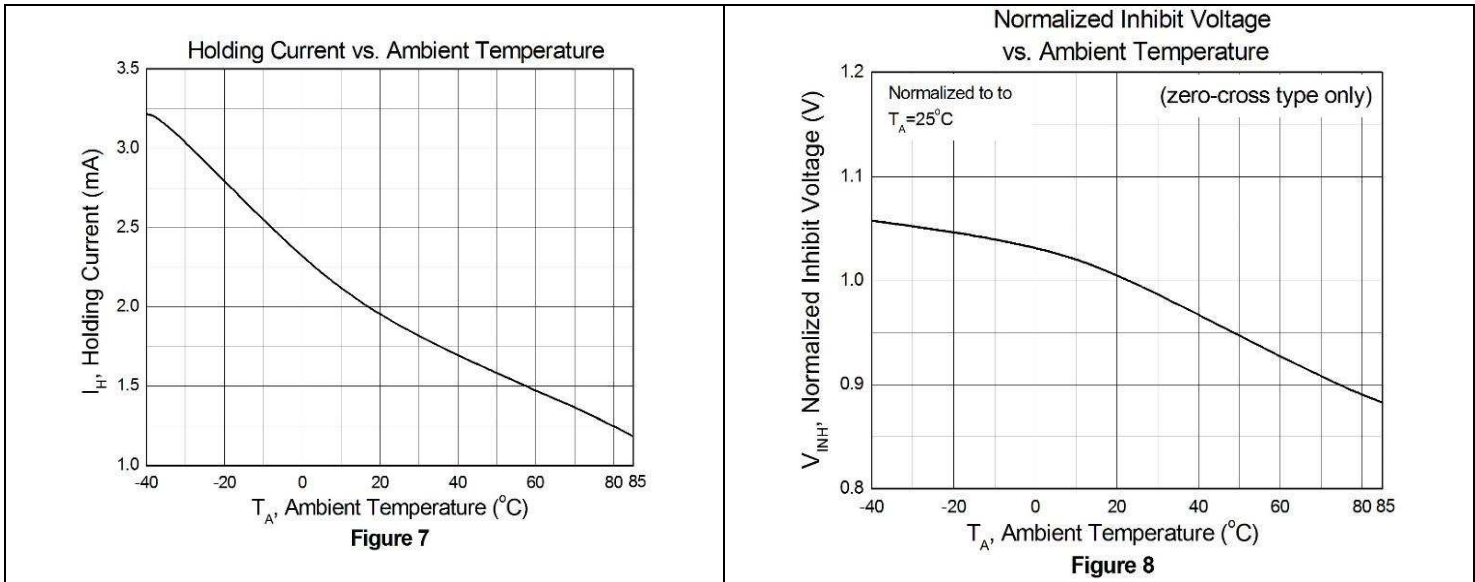
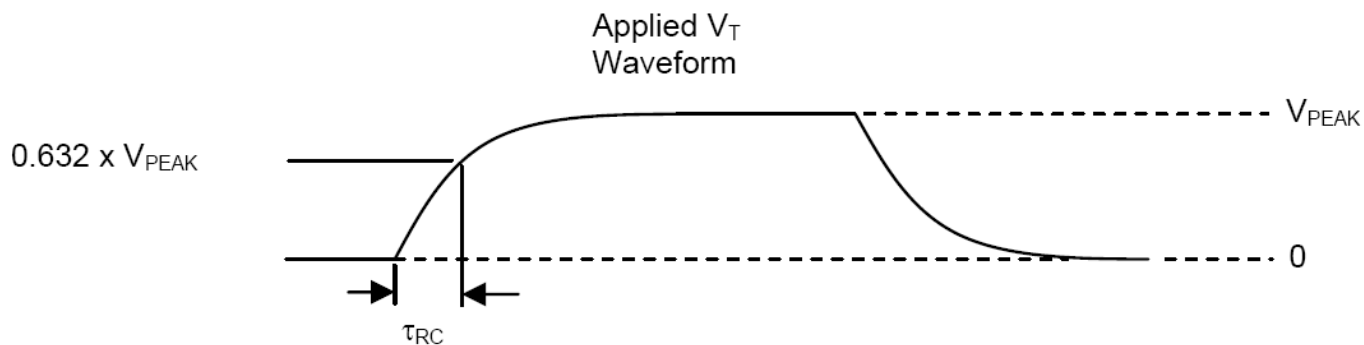
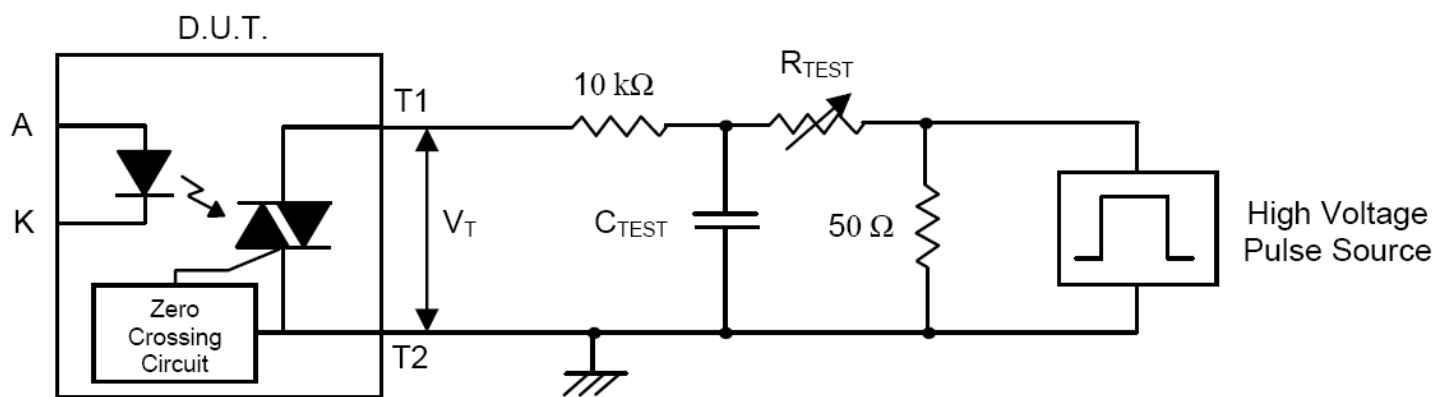


Figure 6



Test Circuit for static dv/dt

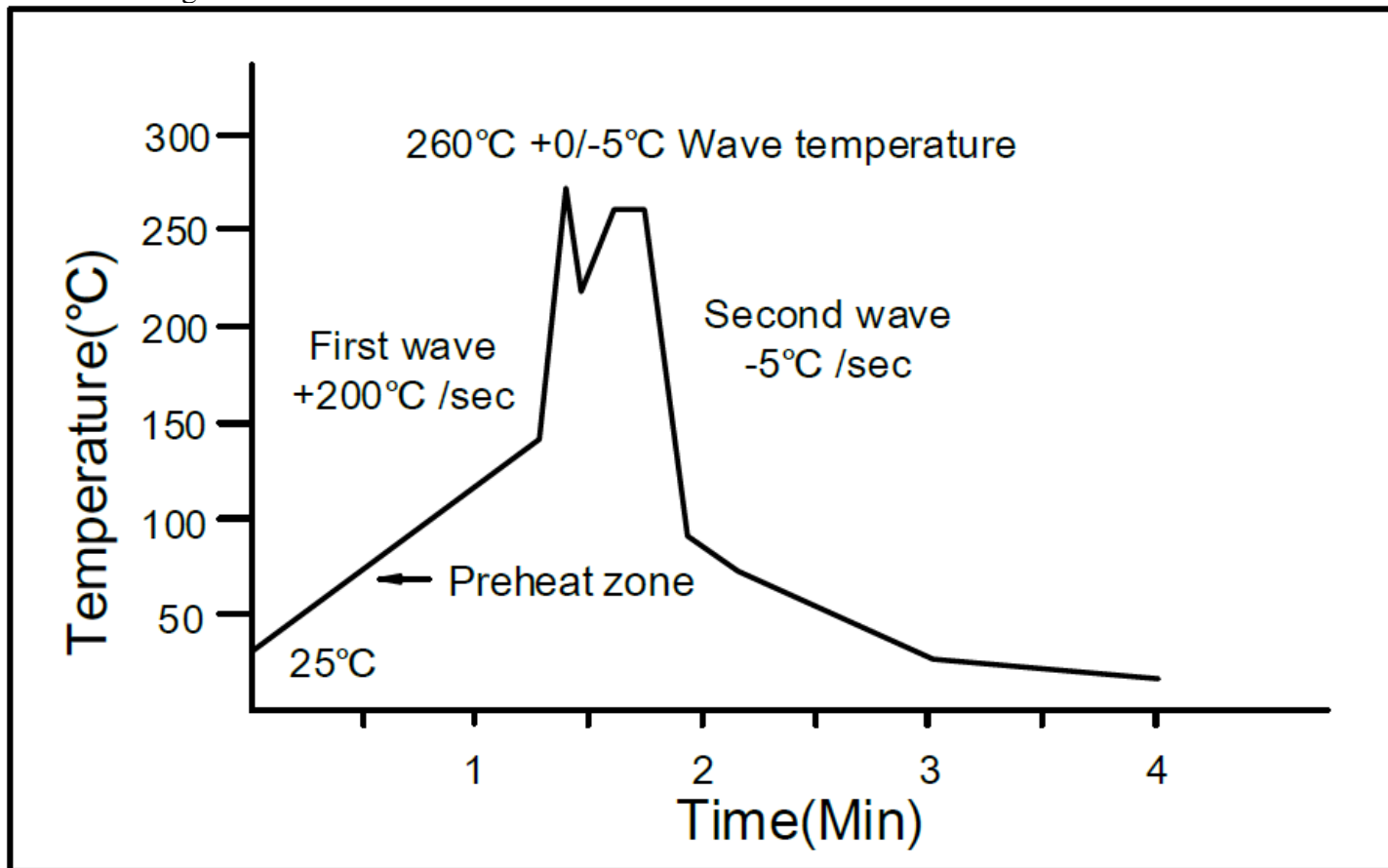


The high voltage pulse is set to the required V_{PEAK} value and applied to the D.U.T. output side through the RC circuit above. LED current is not applied. The waveform V_T is monitored using a x100 scope probe. By varying R_{TEST} , the dv/dt (slope) is increased, until the D.U.T. is observed to trigger (waveform collapses). The dv/dt is then decreased until the D.U.T. stops triggering. At this point, τ_{RC} is recorded and the dv/dt calculated.

$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

Solder Profile & Footprint

Wave soldering



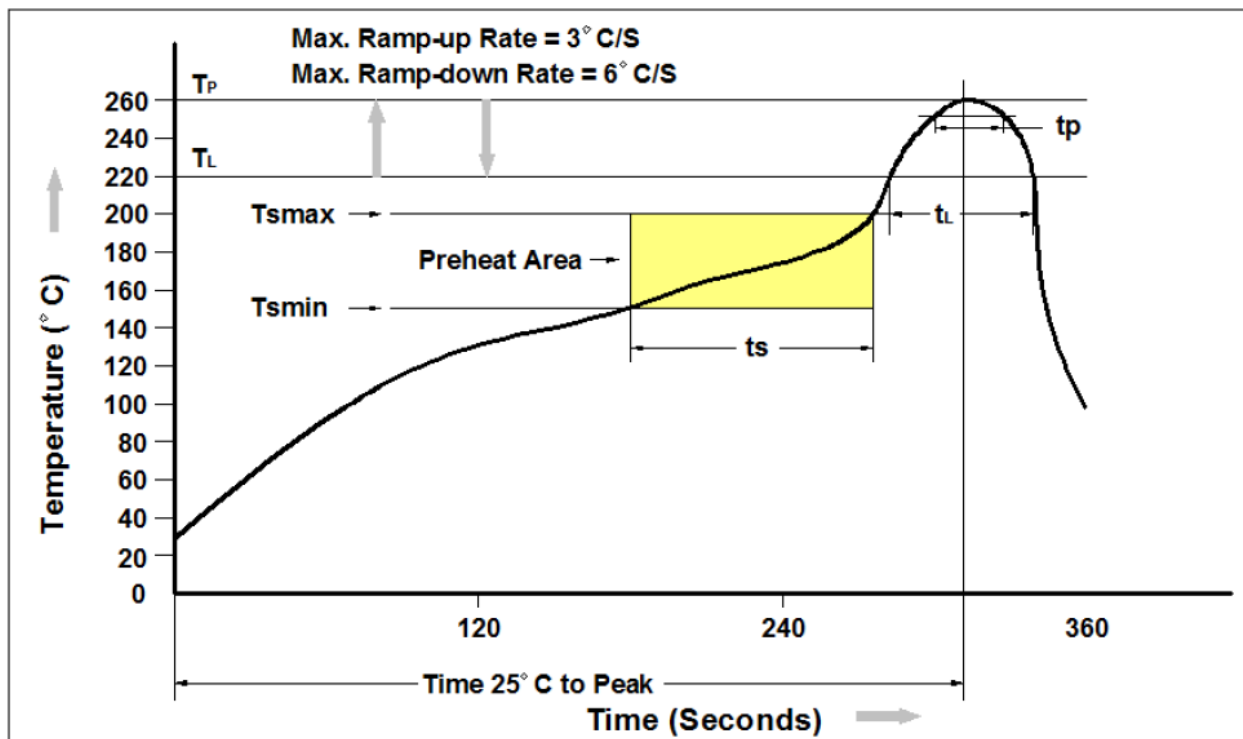
Temperature: 260 +0/-5 °C

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.



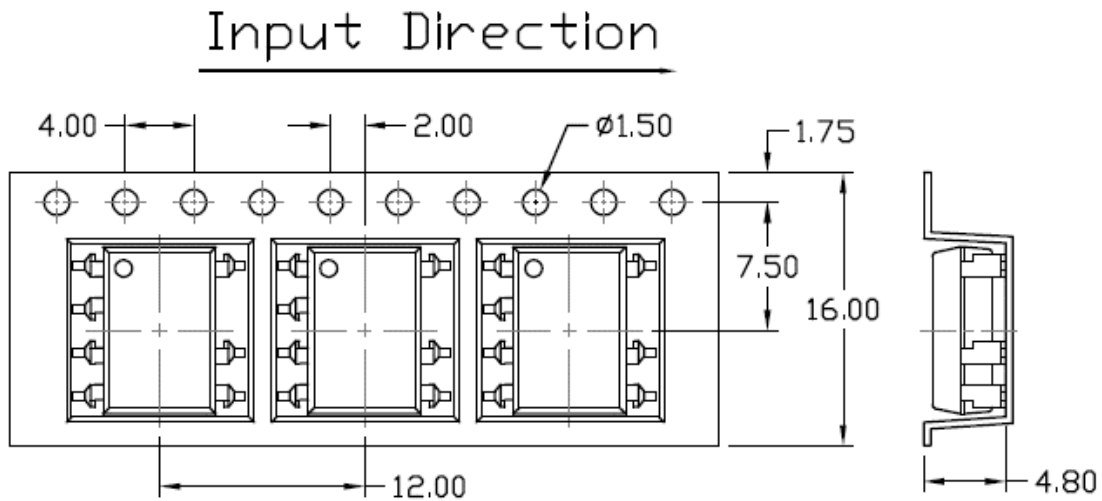
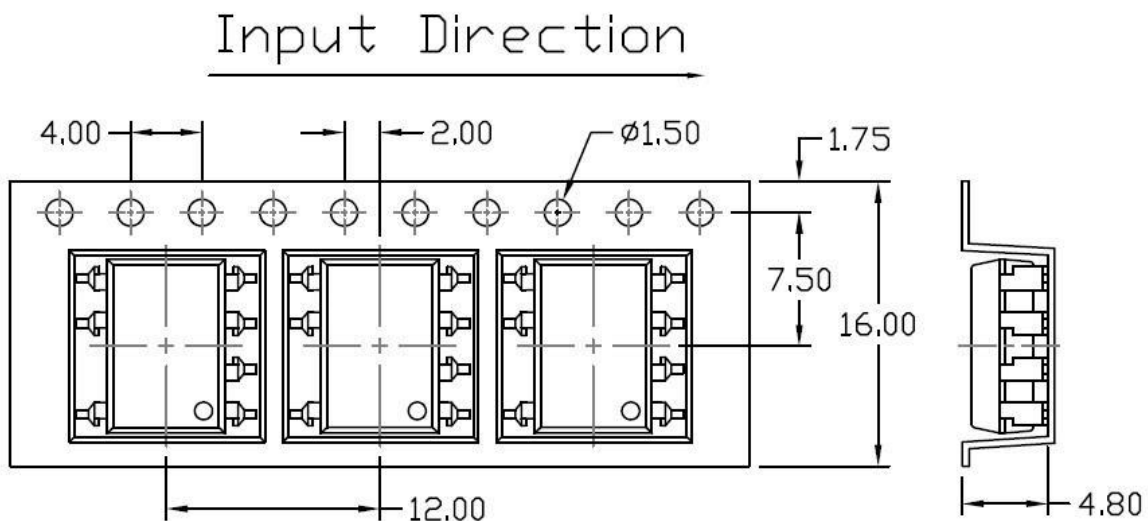
Recommended Solder Footprint for SMD Leadform

Units: mm

tolerance: +/- 0.1mm

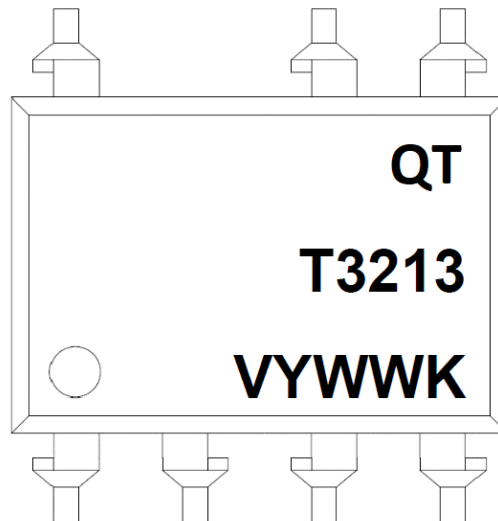
Packing & Labeling

Tape Dimension:

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

Unit: mm

Device Marking:



QT = QT-Brightek Corporation
 T3213 = part number
 Y = Year
 WW = Week
 V = VDE Option
 K= Manufacturing code

Ordering Information

QTTX213 (V)(Y)(Z)
 TX213 = Part number (X=0, 1, 2, or 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 8-Pin DIP	40 Units/Tube
M	Gullwing	40 Units/Tube
S(T1)	Surface Mount Lead Forming – with Option 1 Taping	1000 pcs/ reel
S(T2)	Surface Mount Lead Forming – with Option 2 Taping	1000 pcs/ reel
SL(T1)	SMD (Low Profile) Lead Forming – with Option 1 Taping	1000 pcs/ reel
SL(T2)	SMD (Low Profile) Lead Forming – with Option 2 Taping	1000 pcs/ reel



Revision History

Description:	Revision #	Revision Date
Initial of QTTX213 series	1.0	02/02/2018



Disclaimer

QT-BRIGHTTEK reserves the right to make changes without further notice to any products herein to improve reliability, function or design. QT-BRIGHTTEK does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights, nor the rights of others.

Life Support Policy

QT-BRIGHTTEK's products are not authorized for use as critical components in life support devices or systems without the express written approval of QT-BRIGHTTEK. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
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.