

# QT-Brightek SMD Display Series

## 0.40" Three Digit Display

**Part No.: QBTS40ZXX**

**XX= Color Code**  
**Z= 1: Common Cathode**  
**Z = 0: Common Anode**

---

**Table of Contents:**

Introduction .....	3
Electrical / Optical Characteristic: (Ta=25 °C) .....	4
Absolute Maximum Rating: .....	4
Pin Configuration: .....	5
Characteristic Curves.....	6
Solder Profile & Footprint.....	8
Packing .....	9
Ordering Information: .....	10
Revision History .....	11
Disclaimer .....	11

## Introduction

### Feature:

- 0.40" three digit seven segments display
- Low power consumption
- Packed in reel
- White segment and grey surface
- Z = 0 (common anode) or 1 (common cathode)
- XX = color code

### Description:

These 0.40" three digit seven segments displays are made with white segment and grey surface. The viewing distance is up to seven meters.

### Application:

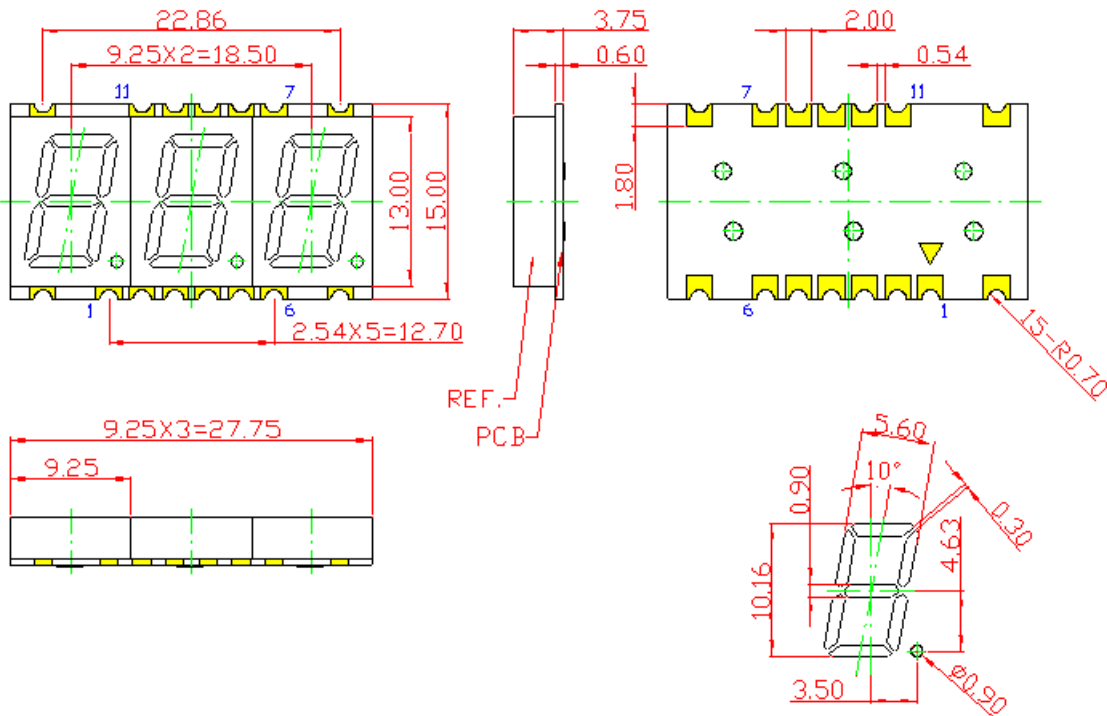
- Instrument panels
- Indoor/Outdoor display board
- Audio equipment

### Certification & Compliance:

- TS16949
- ISO9001
- RoHS Compliant



## Dimension:



Units: mm / tolerance = +/-0.25mm

**Electrical / Optical Characteristic: (Ta=25 °C)**

Product		Material	Color	I <sub>F</sub> (mA)	V <sub>F</sub> (V)		λ <sub>D</sub> (nm)			I <sub>V</sub> (mcd)
CC	CA				Typ.	Max.	Min.	Typ.	Max.	Typ.
QBTS401R	QBTS400R	AllnGaP	Red	20	2.0	2.6	619	625	629	40
QBTS401S	QBTS400S	AllnGaP	Deep Red	20	2.0	2.6	636	640	645	8
QBTS401Y	QBTS400Y	AllnGaP	Yellow	20	2.0	2.6	585	590	595	20
QBTS401O	QBTS400O	AllnGaP	Orange	20	2.0	2.6	604	610	614	20
QBTS401AG	QBTS400AG	AllnGaP	Yellow Green	20	2.1	2.6	566	570	576	9
QBTS401IG	QBTS400IG	InGaN	Green	20	2.8	3.8	515	520	530	200
QBTS401IB	QBTS400IB	InGaN	Blue	20	3.1	4.0	464	470	474	60

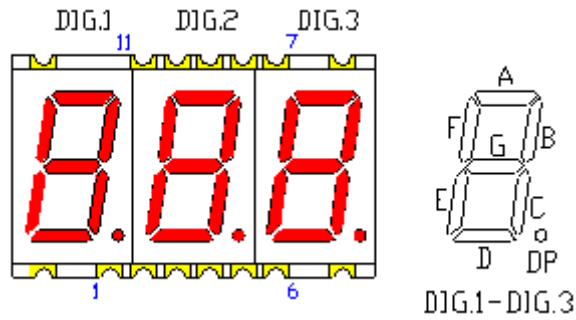
**Absolute Maximum Rating:**

Material	P <sub>d</sub> (mW)	Derating linear from 25°C (mA/°C)	I <sub>F</sub> (mA)	I <sub>FP</sub> (mA)*	V <sub>R</sub> (V)	T <sub>OP</sub> (°C)	T <sub>ST</sub> (°C)	T <sub>SOL</sub> (°C)**
AllnGaP	70	0.28	25	90	5	-40 to +105	-40 to +105	260
InGaN	120	0.3	30	100	5	-40 to +105	-40 to +105	260

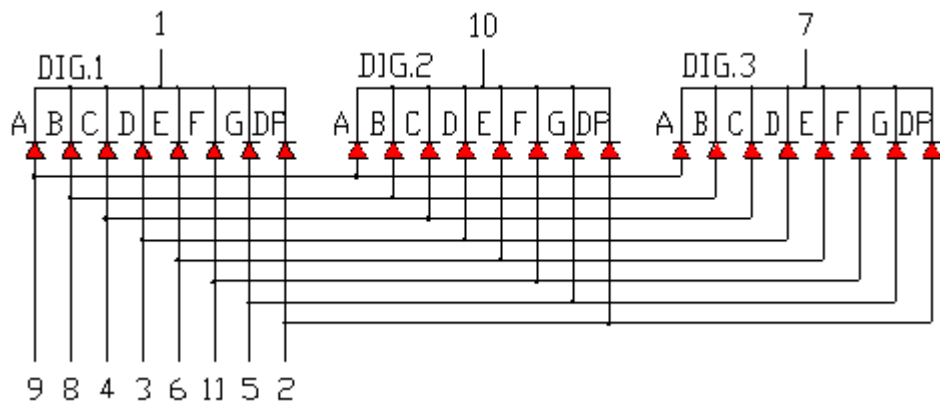
\*Duty 1/10 @ 1KHz

\*\*IR Reflow for no more than 5 sec @ 260 °C

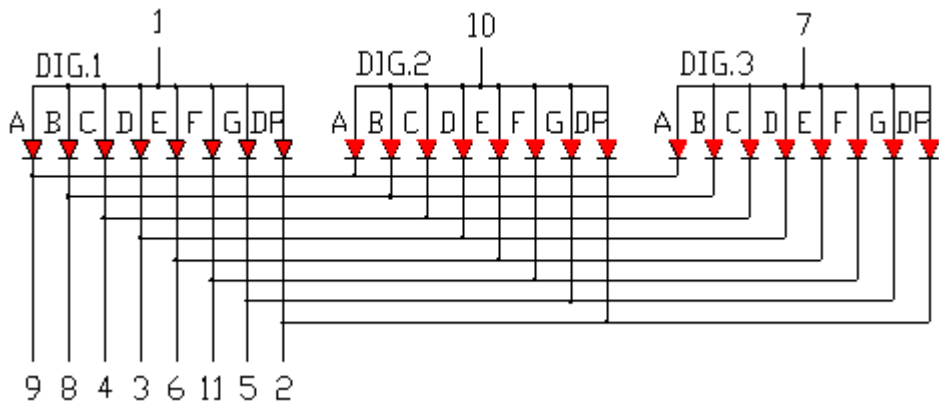
**Pin Configuration:**



**CC**



**CA**



**Characteristic Curves**

AllnGaP

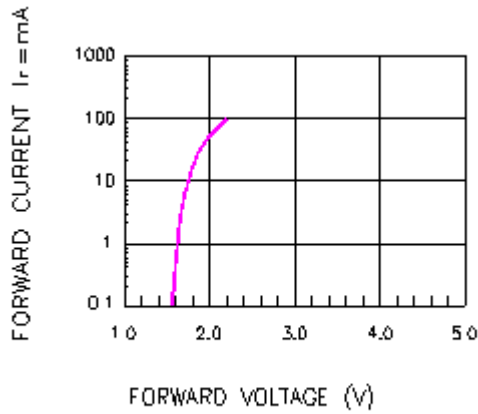
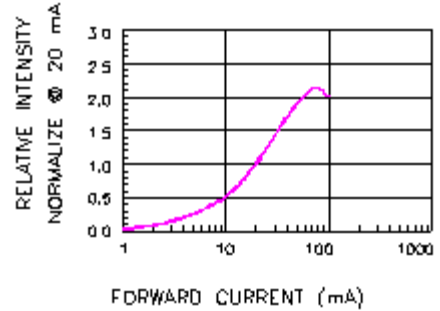


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE



RELATIVE INTENSITY VS. FORWARD CURRENT

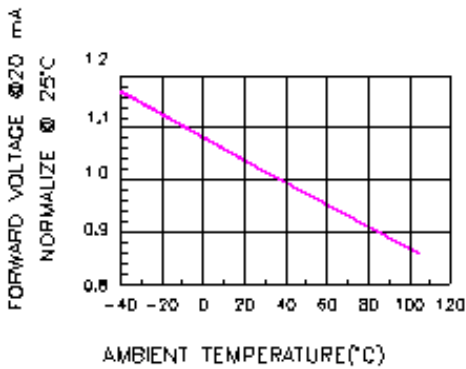


Fig.3 FORWARD VOLTAGE VS. TEMPERATURE

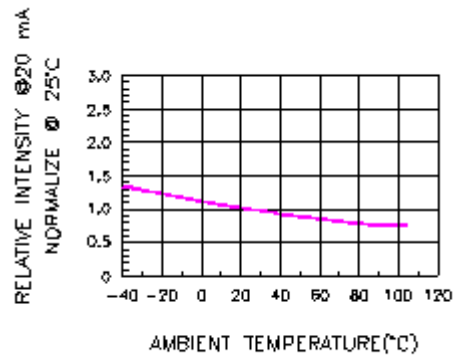


Fig.4 RELATIVE INTENSITY VS. TEMPERATURE

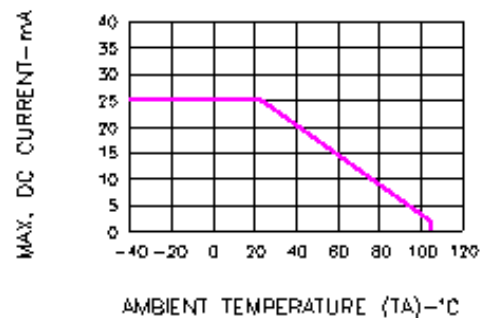
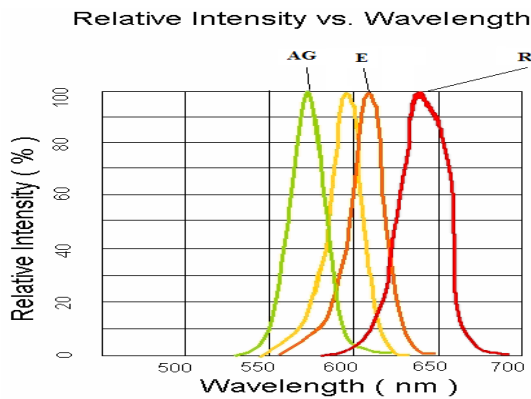


Fig.6 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

InGaN

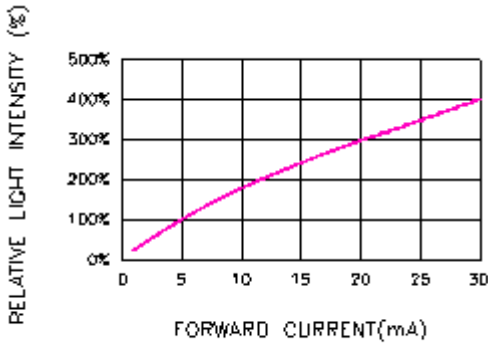


Fig.1 RELATIVE LIGHT INTENSITY VS. FORWARD CURRENT

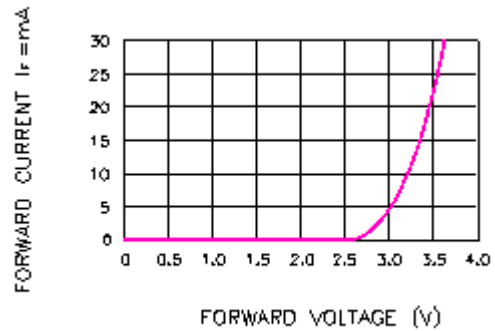


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

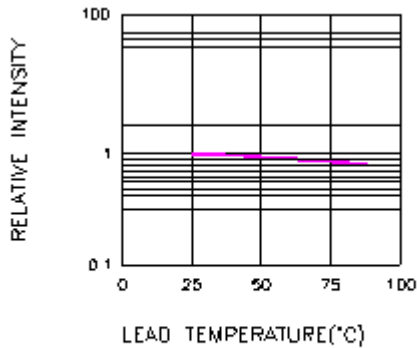


Fig.3 RELATIVE INTENSITY VS. LEAD TEMPERATURE (PULSED 20 mA; 300us PULSE, 10ms PERIOD)

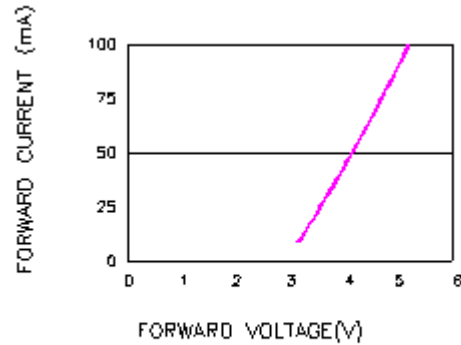


Fig.4 PEAK FORWARD VOLTAGE VS. FORWARD CURRENT (100us TEST PULSE, 1% DUTY CYCLE)

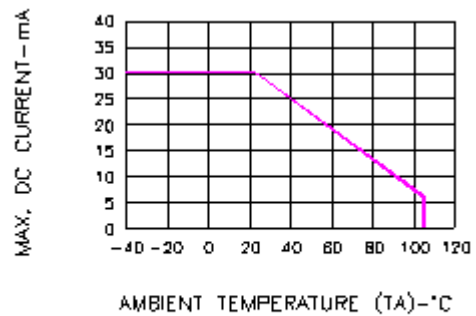
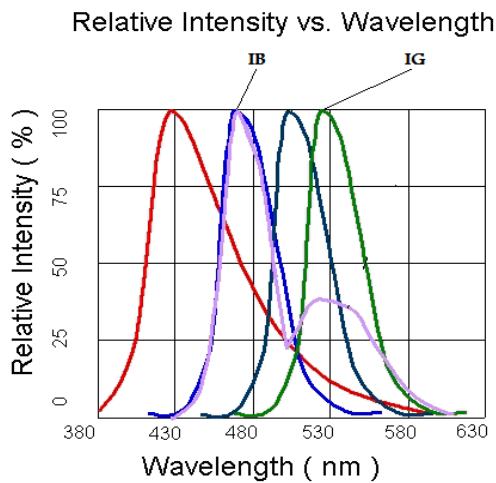
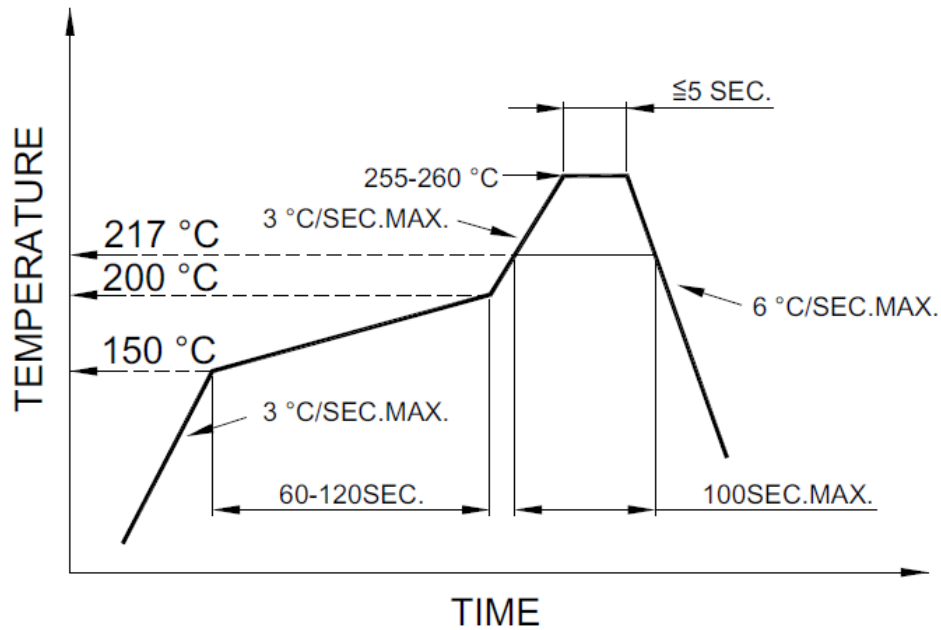


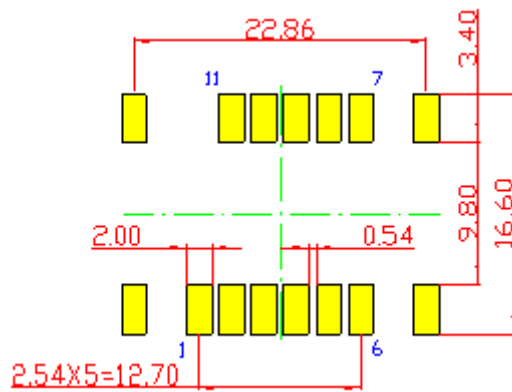
Fig.6 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

## Solder Profile & Footprint

### Recommended Lead-free Solder Profile



### Recommended Pad Layout



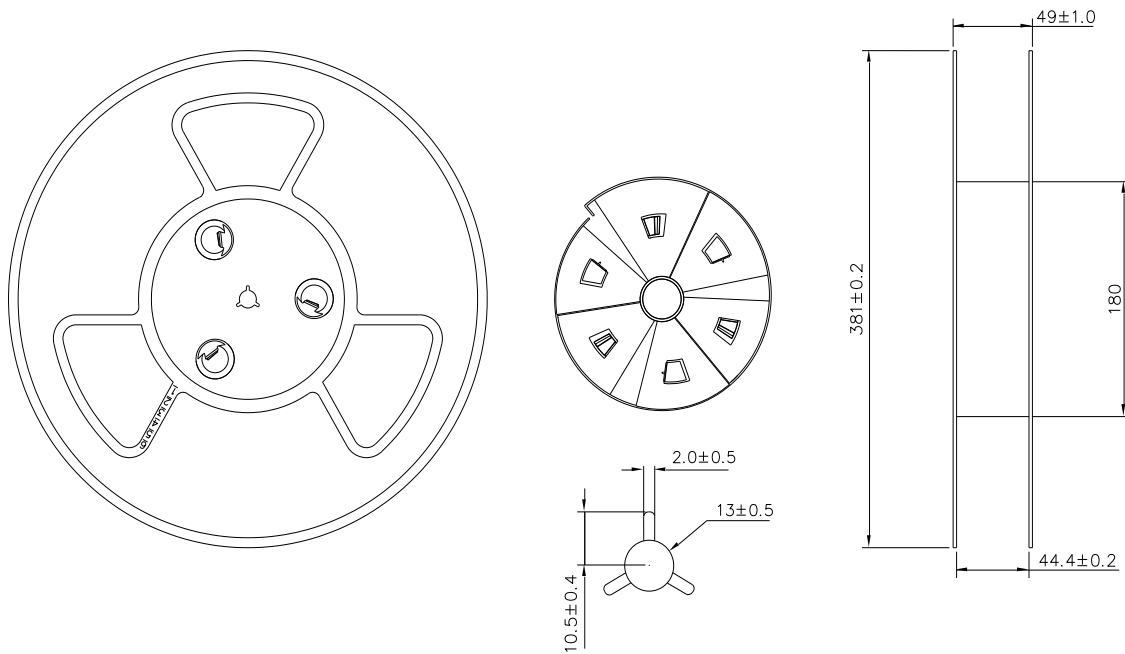
Units: mm

Tolerance: ±0.25mm



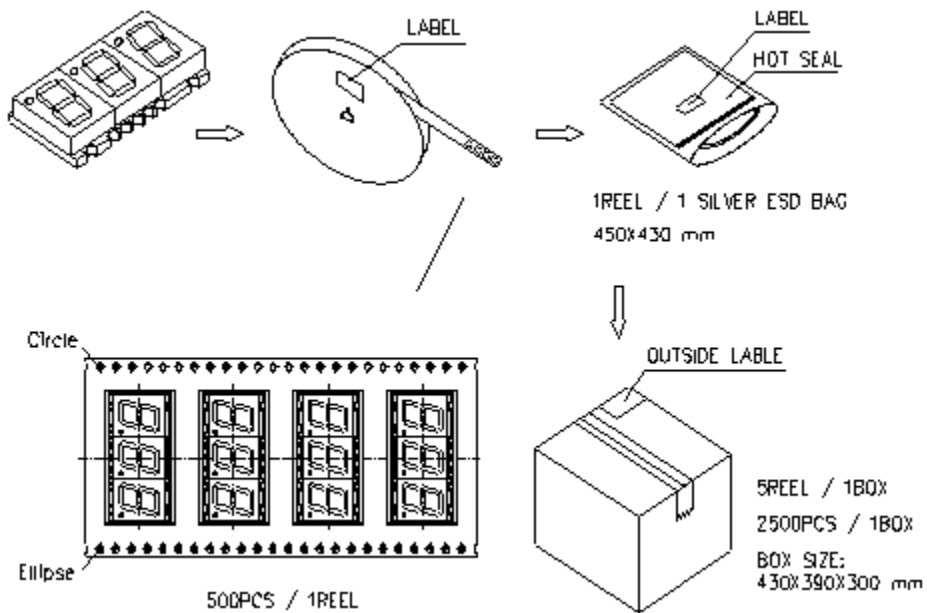
## Packing

Reel Dimensions:



Unit: mm

Packing Specifications:



**Ordering Information:**

Product		Orderable Part #		Spec Range	Quantity per Reel
CC	CA	CC	CA		
QBTS401R	QBTS400R	QBTS401R	QBTS400R	Iv=40mcd typ. @ I <sub>F</sub> =20mA / λ <sub>D</sub> :625nm typ.	500
QBTS401S	QBTS400S	QBTS401S	QBTS400S	Iv=8mcd typ. @ I <sub>F</sub> =20mA / λ <sub>D</sub> :640nm typ.	500
QBTS401Y	QBTS400Y	QBTS401Y	QBTS400Y	Iv=20mcd typ. @ I <sub>F</sub> =20mA / λ <sub>D</sub> :590nm typ.	500
QBTS401O	QBTS400O	QBTS401O	QBTS400O	Iv=20mcd typ. @ I <sub>F</sub> =20mA / λ <sub>D</sub> :610nm typ.	500
QBTS401AG	QBTS400AG	QBTS401AG	QBTS400AG	Iv=9mcd typ. @ I <sub>F</sub> =20mA / λ <sub>D</sub> :570nm typ.	500
QBTS401IG	QBTS400IG	QBTS401IG	QBTS400IG	Iv=200mcd typ. @ I <sub>F</sub> =20mA / λ <sub>D</sub> :520nm typ.	500
QBTS401IB	QBTS400IB	QBTS401IB	QBTS400IB	Iv=60mcd typ. @ I <sub>F</sub> =20mA / λ <sub>D</sub> :470nm typ.	500

## Revision History

Description:	Revision #	Revision Date
New Release of QBTS40ZXX	V1.0	03/25/2014
Update spec and dimension drawing / Add more color options	V1.1	11/02/2015

## 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.