

# **QT-Brightek Optocoupler Series**

## **4-PIN DC Input Optocoupler**

**Part No.: Q817 Series**

Product: Q817 Series	Date: November 04, 2016	Page 1 of 15
	Version# 1.5	

---

**Table of Contents:**

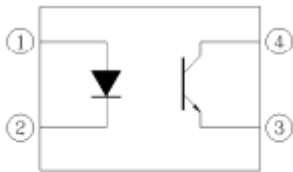
Introduction .....	3
Absolute Maximum Rating .....	6
Electrical Characteristic ( $T_A=25^\circ\text{C}$ ).....	7
DC Transfer Characteristic.....	8
AC Characteristic .....	8
Isolation Characteristic.....	8
Characteristic Curves.....	9
Test Circuit for Response Time.....	10
Solder Profile & Footprint.....	11
Packing & Labeling .....	12
Device Marking .....	14
Ordering Information .....	14
Revision History .....	15
Disclaimer .....	15

## Introduction

### Feature:

- Halogen Free
- High Isolation voltage between input and output (Viso = 5000V rms)
- Creepage distance > 7.62mm
- Operating Temperature up to 100 °C
- Available in Tube or Tape and reel
- Available with standard DIP-4, Wide lead bend, and SMD lead bend options.
- Conventional black housing package

### Schematic:



#### Pin Configuration

1. Anode
2. Cathode
3. Emitter
4. Collector

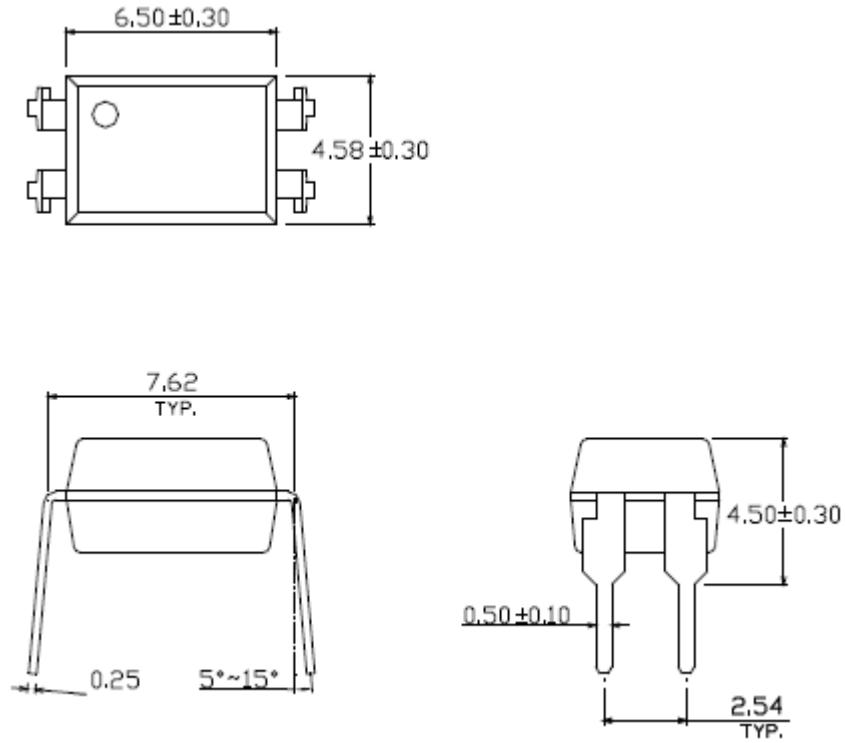
### Certification & Compliance:

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

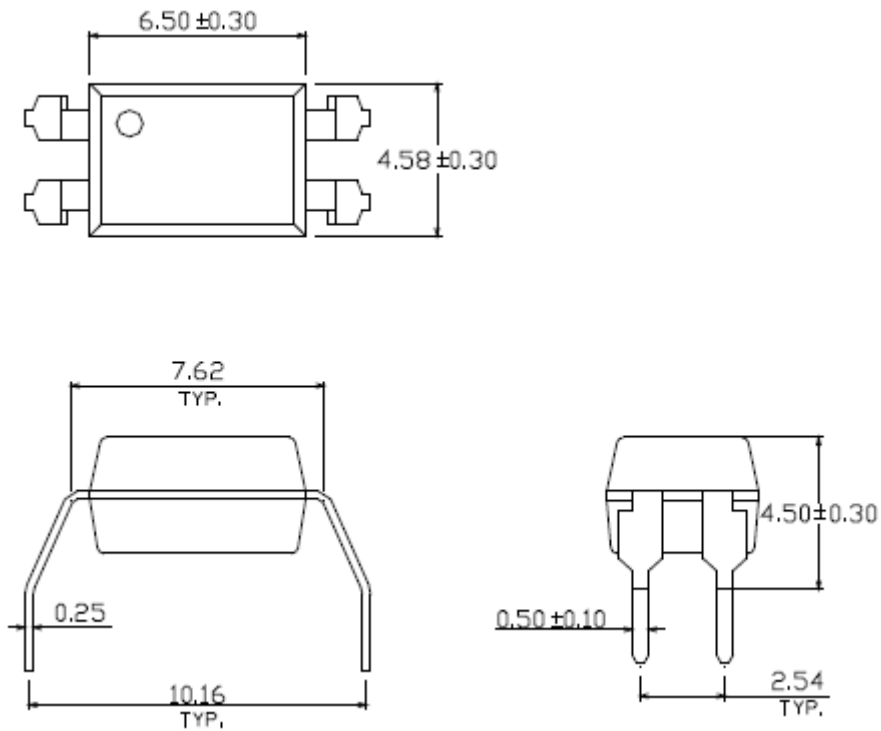


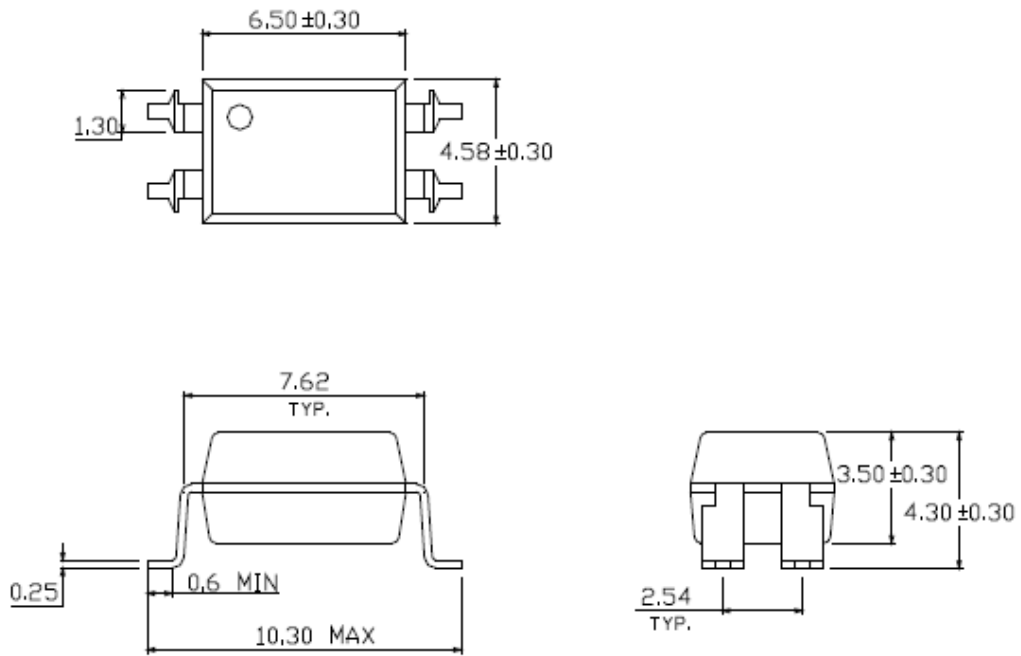
**Dimension: (Dot location indicates pin 1)**

**4-Pin Dip (standard):**



**Wide lead bend (Option W):**



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

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

**Absolute Maximum Rating**

Symbol	Parameter	Rating	Units
T <sub>STG</sub>	Storage Temperature	-55 ~ 150	°C
T <sub>OPR</sub>	Operating Temperature	-55 ~ 100	°C
T <sub>SOL</sub>	Lead Solder Temperature	260 for 10 sec	°C
P <sub>TOT</sub>	Total Power Dissipation	200	mW
<b>EMITTER</b>			
I <sub>F</sub>	Continuous Forward Current	50	mA
V <sub>R</sub>	Reverse Voltage	6	V
P <sub>D</sub>	Power Dissipation	70	mW
	Power Dissipation Derated above 100°C	2.9	mW/°C
<b>DETECTOR</b>			
V <sub>CEO</sub>	Collector–Emitter Voltage	80	V
V <sub>ECO</sub>	Emitter-Collector Voltage	7	V
I <sub>C</sub>	Continuous Collector Current	50	mA
P <sub>C</sub>	Collector Power Dissipation	150	mW
	Collector Power Dissipation Derated above 80 °C	5.8	mW/°C

**Electrical Characteristic (T<sub>A</sub>=25 °C)****Emitter**

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V <sub>F</sub>	Forward Voltage	Q817	I <sub>F</sub> = 20mA	-	1.2	1.4	V
I <sub>R</sub>	Reverse Current		V <sub>R</sub> = 4V	-	-	10	μA
C <sub>t</sub>	Input Capacitance		V = 0, f = 1kHz	-	30	250	pF

**Detector**

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
I <sub>CEO</sub>	Collector-Emitter Dark current	Q817	V <sub>CE</sub> = 20V, I <sub>F</sub> = 0mA	-	-	100	nA
BV <sub>CEO</sub>	Collector-Emitter breakdown voltage		I <sub>C</sub> = 0.1mA	80	-	-	V
BV <sub>ECO</sub>	Emitter-Collector breakdown voltage		I <sub>E</sub> = 0.1mA	7	-	-	V

**DC Transfer Characteristic**

Symbol	Characteristic	Device	Bin	Test Condition	Range			Unit
					Min	Typ	Max	
		Q817	-	$I_F=5mA, V_{CE}=5V$	50	-	600	%
			A		80	-	160	
			B		130	-	260	
			C		200	-	400	
			D		400	-	600	
			T	$I_F=10mA, V_{CE}=5V$	63	-	125	
$V_{CE(Sat)}$	Collector-Emitter saturation voltage			$I_F=20mA, I_C=1mA$	-	0.1	0.2	V

**AC Characteristic**

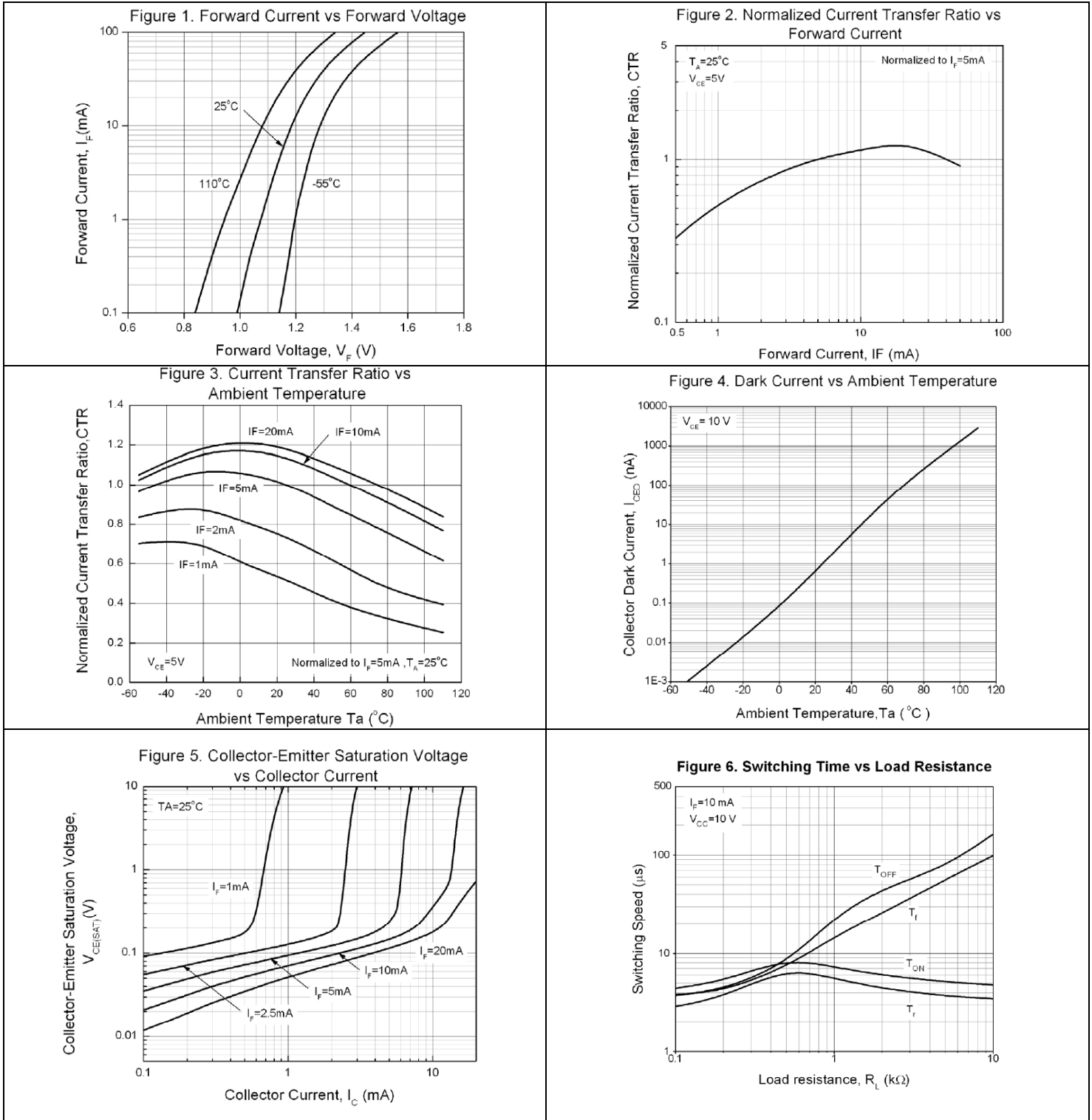
Symbol	Characteristic	Device	Bin	Test Condition	Range			Unit
					Min	Typ	Max	
$t_r$	Rise time			$V_{CE}=2V, I_C=2mA, R_L=100\Omega$	-	6	18	$\mu s$
$t_f$	Fall time				-	8	18	

**Isolation Characteristic**

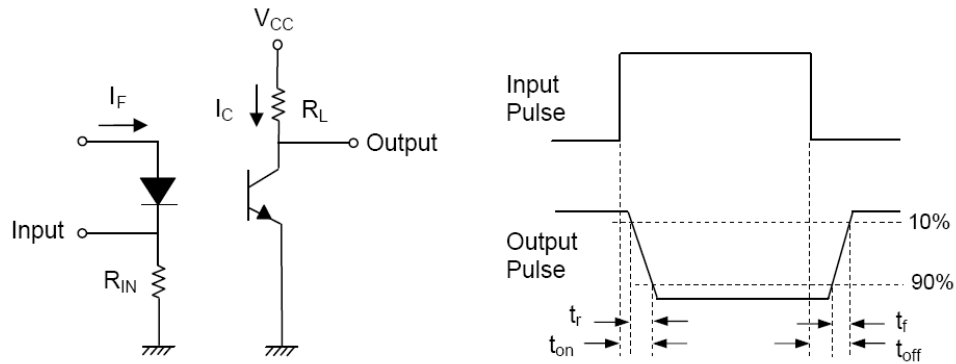
Symbol	Characteristic	Device	Bin	Test Condition	Range			Unit
					Min	Typ	Max	
$R_{ISO}$	Isolation Resistance			$V_{IO}=500Vdc, 40-60\% R.H$	$5 \times 10^{10}$	-	-	$\Omega$
$C_{ISO}$	Isolation Capacitance			$V_{IO}=0, f=1MHz$	-	0.6	1.0	pF
$V_{ISO}$	Isolation Voltage			$f=60Hz, t=1min, I_{I-O} \leq 2 \mu A$	5000	-	-	V rms



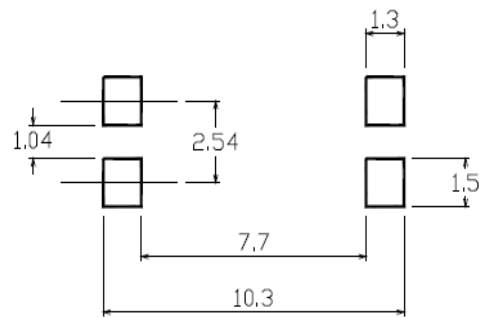
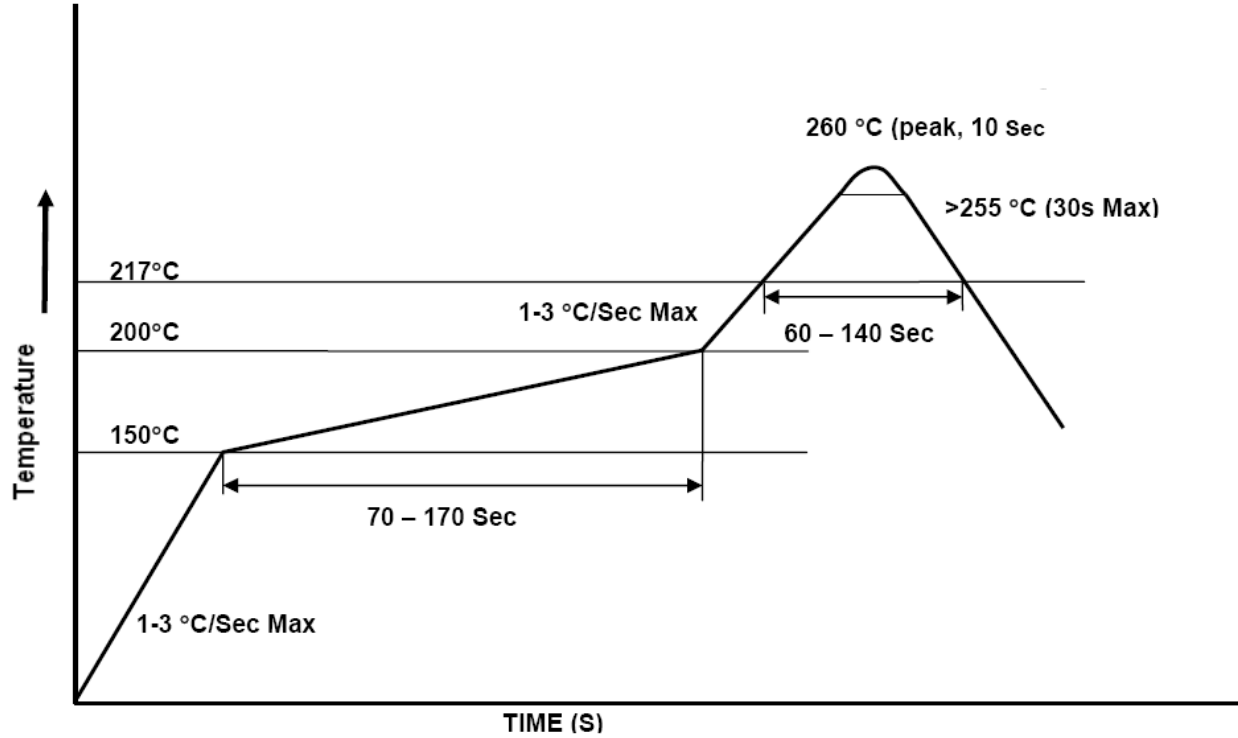
**Characteristic Curves**



---

**Test Circuit for Response Time**

## Solder Profile & Footprint



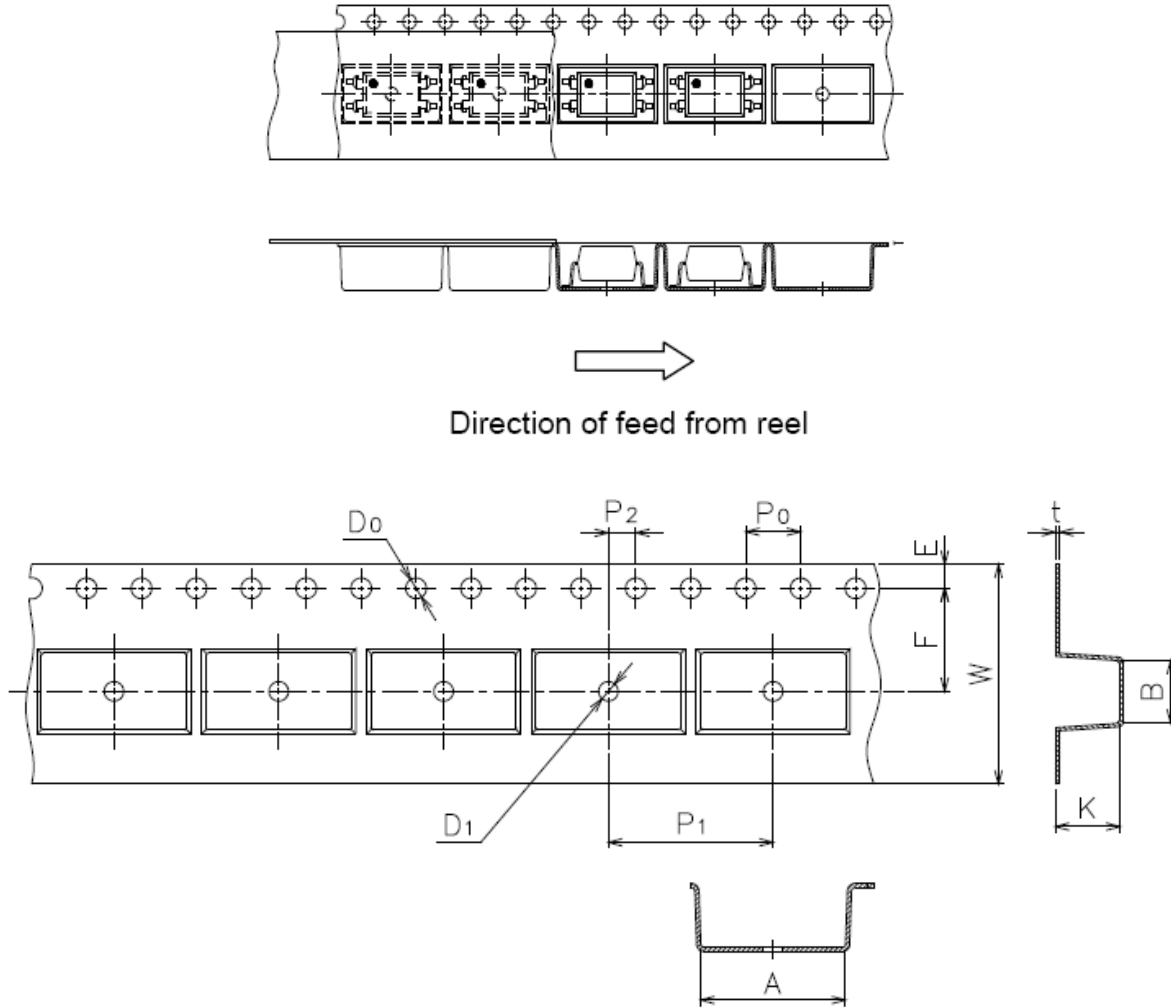
Recommended Solder Footprint for SMD Leadform

Units: mm

tolerance: +/- 0.1mm

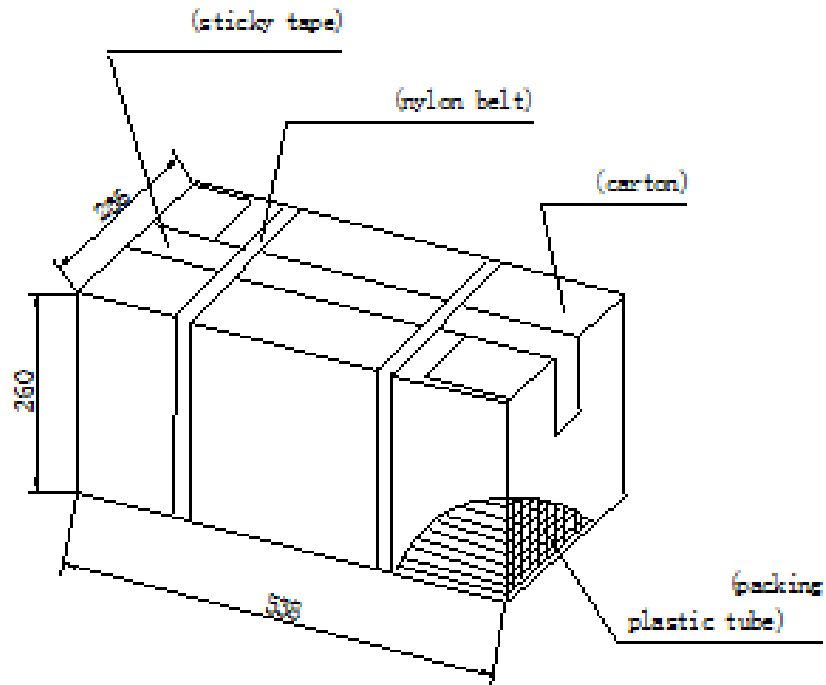
**Packing & Labeling**

**Tape Dimension:**



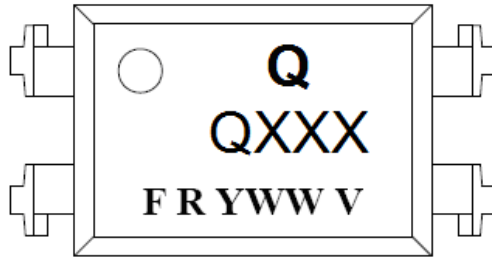
Dimension No.	<b>A</b>	<b>B</b>	<b>Do</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension(mm)	10.4±0.1	4.55±0.1	1.5±0.1	1.5±0.05	1.75±0.1	7.5±0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K</b>
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.33±0.1	16.0+0.3/ -0.1	4.55±0.1

**Carton/Tube:**



Quantity per Tube: 100 PCS per Tube  
Quantity per Carton: 40000 PCS per Carton

Product: Q817 Series	Date: November 04, 2016	Page 13 of 15
	Version# 1.5	

**Device Marking**

Q = QT-Brightek Corporation  
 QXXX = Device Part Number  
 F = Country of Origin  
 R = Binning Option  
 Y = Year  
 WW = Week  
 V = VDE Option

**Ordering Information**

Part Number	Orderable Part Number	Options	Description	Quantity per packing
Q817	Q817X	None	Standard 4pin DIP	100pcs / Tube
	Q817XV	None	Standard 4 pin Dip + With VDE marking	100pcs / Tube
	Q817XW	W	Wide lead bend (0.4 inch spacing)	100pcs / Tube
	Q817XWV	W	Wide lead bend (0.4 inch spacing) + VDE marking	100pcs / Tube
	Q817XSTA	S	SMD lead form with tape and reel option	2000pcs / reel
	Q817XSTAV	S	SMD lead form with tape and reel option + VDE marking	2000pcs / reel

X – Note is CTR Binning.

## Revision History

Description:	Revision #	Revision Date
Initial release	1.0	4/12/2010
Add CTR rank binning option and VDE number	1.1	7/28/2010
Feature, certification & compliance and ordering information updates	1.2	02/01/2011
Update to new format	1.3	12/13/2012
Add carton/tube information to packing spec	1.4	12/18/2012
Add new bin option	1.5	11/04/2016

## 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.