

# QT-Brightek Optocoupler Series

4-PIN DC Input Phototransistor

Part No.: QTH217

Product: QTH217	Date: April 12, 2018	Page 1 of 13
	Version# 1.1	



---

**Table of Contents:**

Introduction .....3  
Absolute Maximum Rating .....4  
Electrical Characteristic (T<sub>A</sub>=25 °C).....5  
Characteristic Curves.....7  
Solder Profile & Footprint.....9  
Packing & Labeling ..... 11  
Device Marking ..... 12  
Ordering Information ..... 12  
Revision History ..... 13  
Disclaimer ..... 13

## Introduction

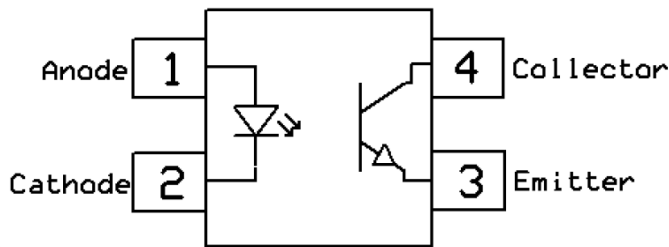
### Feature:

- High Isolation voltage between input and output (Viso = 3750V rms)
- DC input with transistor output
- Operating Temperature up to 110 °C
- Half Pitch Mini-Flat package

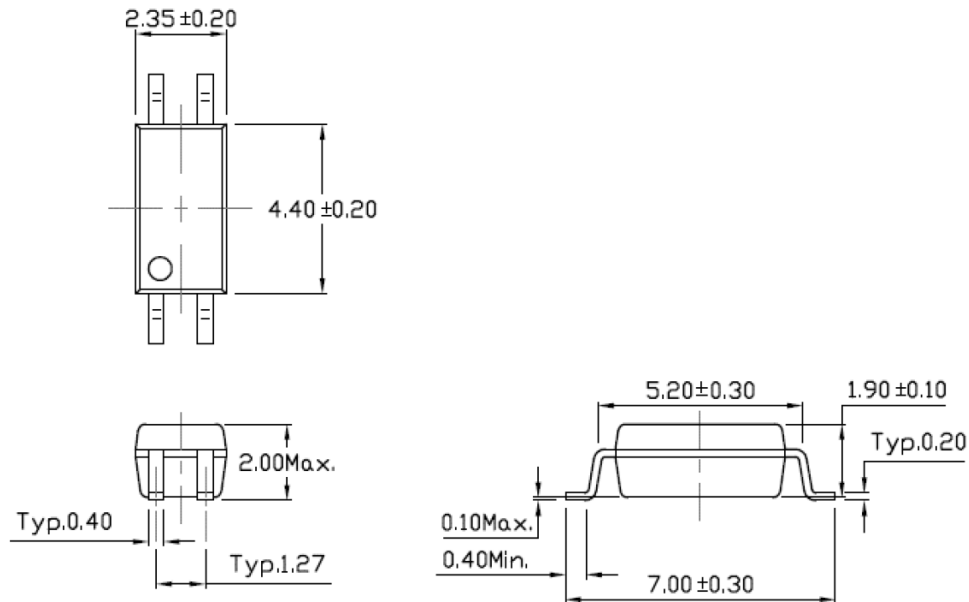
### Certification & Compliance:

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

### Schematic:



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



All Dimensions are in mm

**Absolute Maximum Rating**

Symbol	Parameter	Rating	Units
V <sub>ISO</sub>	Isolation Voltage	3750	V <sub>RMS</sub>
T <sub>STG</sub>	Storage Temperature	-55 ~ +150	°C
T <sub>OPR</sub>	Operating Temperature	-55 ~ +125	°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
I <sub>FP</sub>	Peak Forward Current (≤ 1us, 300pps)	1	A
V <sub>R</sub>	Reverse Voltage	6	V
P <sub>D</sub>	Power Dissipation	70	mW
	Power Dissipation Derated above 100°C	-	mW/°C
<b>DETECTOR</b>			
B <sub>VCEO</sub>	Collector-Emitter Breakdown Voltage	80	V
B <sub>VECO</sub>	Emitter-Collector Breakdown Voltage	7	V
I <sub>C</sub>	Collector current	50	mA
P <sub>C</sub>	Power Dissipation	150	mW

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

#### Emitter

Symbol	Characteristics	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V <sub>F</sub>	Forward Voltage	-	I <sub>F</sub> = 10mA	-	1.24	1.4	V
I <sub>R</sub>	Reverse Current		V <sub>R</sub> =6V	-	-	5	uA
C <sub>IN</sub>	Input Capacitance		f =1kHz	-	30	-	pF

#### Detector

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
B <sub>VCEO</sub>	Collector-Emitter Breakdown Voltage	-	I <sub>C</sub> =0.1mA	80	-	-	V
B <sub>VECO</sub>	Emitter-Collector Breakdown Voltage	-	I <sub>C</sub> =0.1mA	7	-	-	uA
I <sub>CEO</sub>	Collector-Emitter Dark Current	-	V <sub>CE</sub> =20V, I <sub>F</sub> =0mA	-	-	100	nA

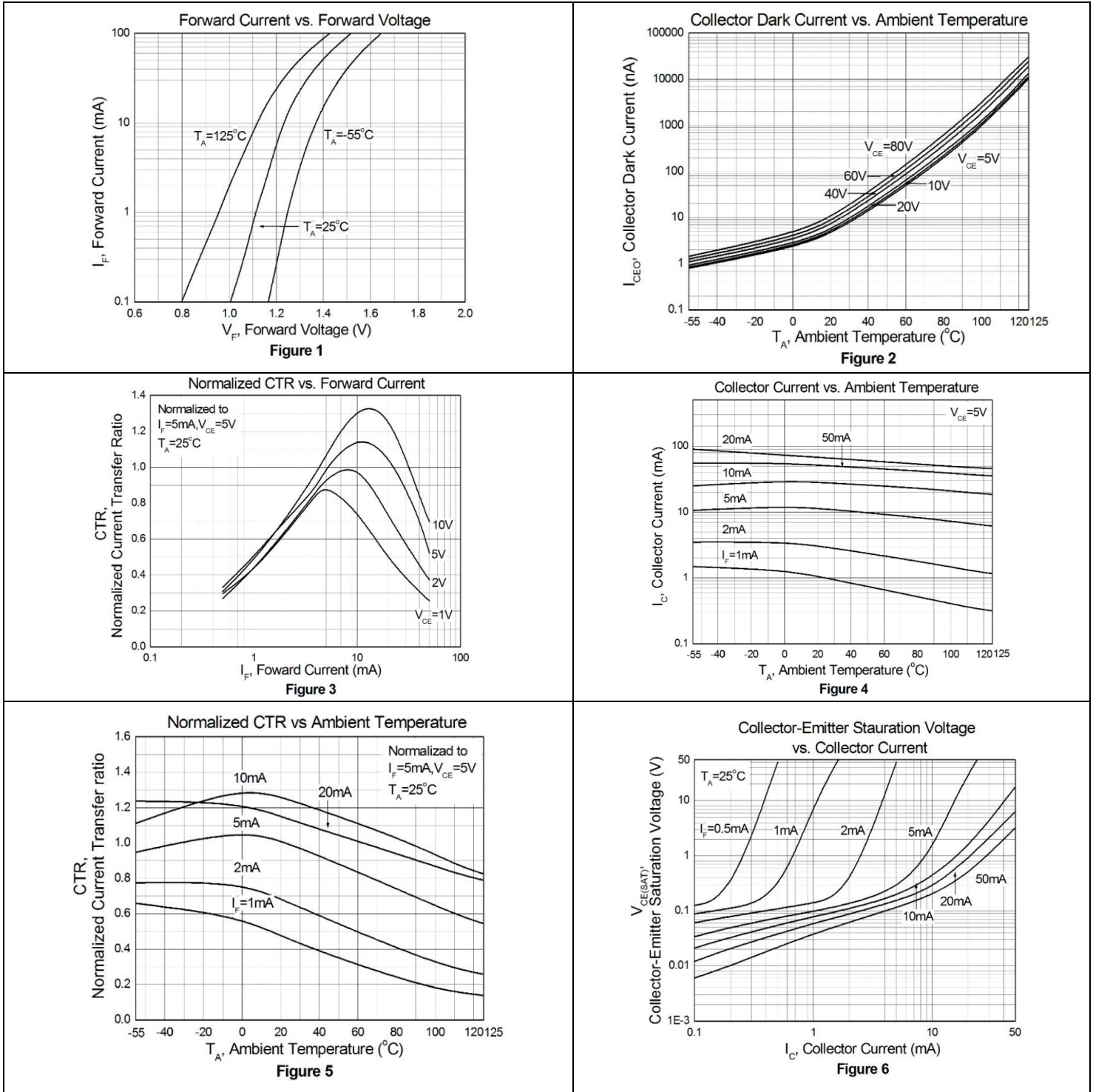
### Transfer Characteristics (T<sub>A</sub>=0 to 70C unless specified otherwise)

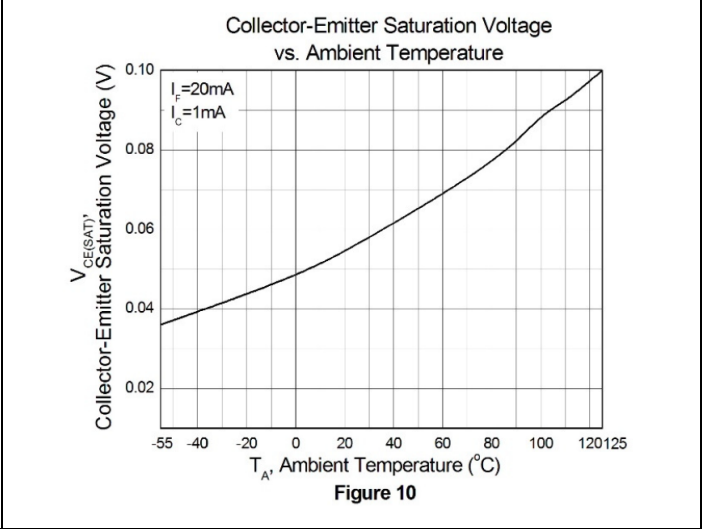
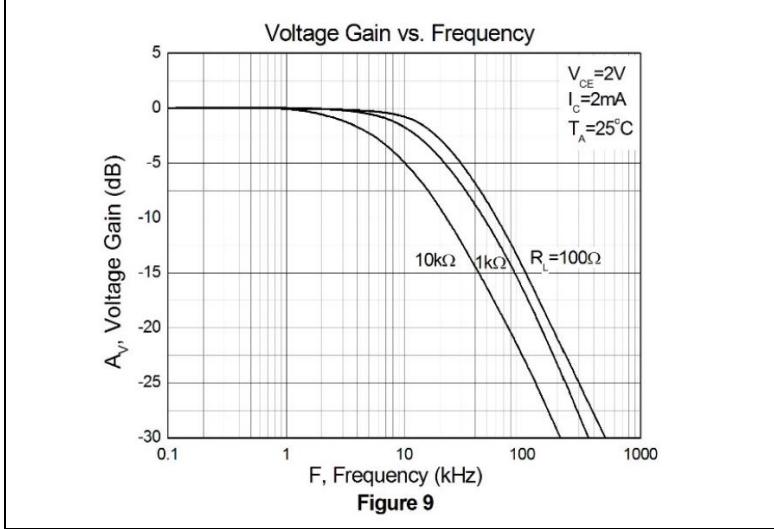
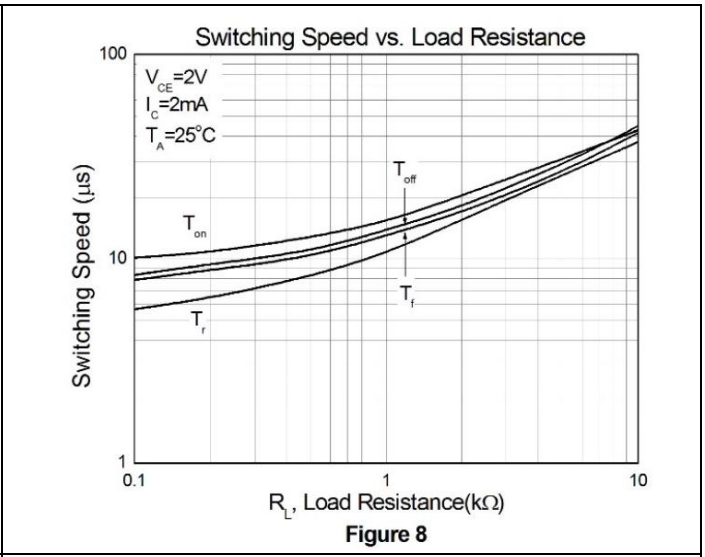
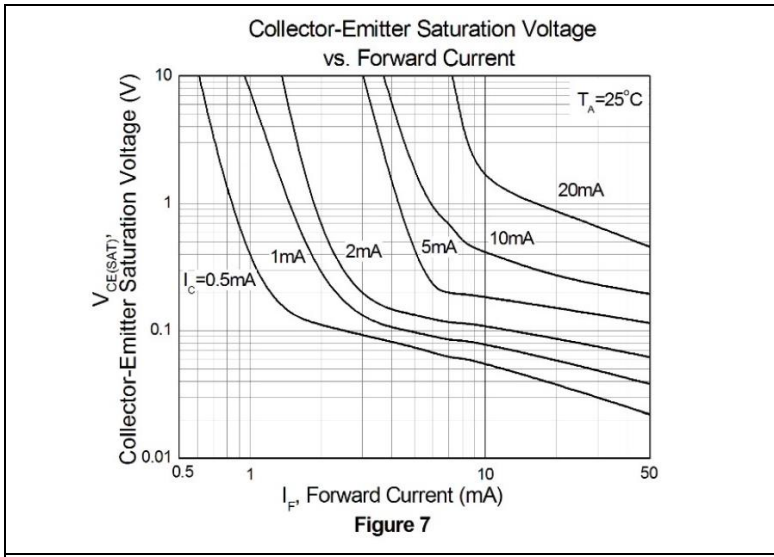
Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
CTR	Current Transfer Ratio	QTH217	I <sub>F</sub> = 5mA, V <sub>CE</sub> =5V	50	-	600	%
		QTH217A		80	-	160	
		QTH217B		130	-	260	
		QTH217C		200	-	400	
		QTH217D		300	-	600	
V <sub>CE(SAT)</sub>	Collector-Emitter Saturation Voltage		I <sub>F</sub> = 20mA, I <sub>C</sub> =1mA	-	0.1	0.2	V
R <sub>IO</sub>	Isolation Resistance		V <sub>IO</sub> =500V <sub>DC</sub>	5x10 <sup>10</sup>	-	-	Ω
C <sub>IO</sub>	Isolation Capacitance		f=1MHz	-	0.5	1.0	pF

**Switching Characteristics** (TA=25°C, Vcc=5V)

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
t <sub>r</sub>	Rise Time		I <sub>C</sub> =2mA, V <sub>CE</sub> 2V, R <sub>L</sub> =100Ω	-	6	-	us
t <sub>f</sub>	Fall ie			-	8	-	

## Characteristic Curves

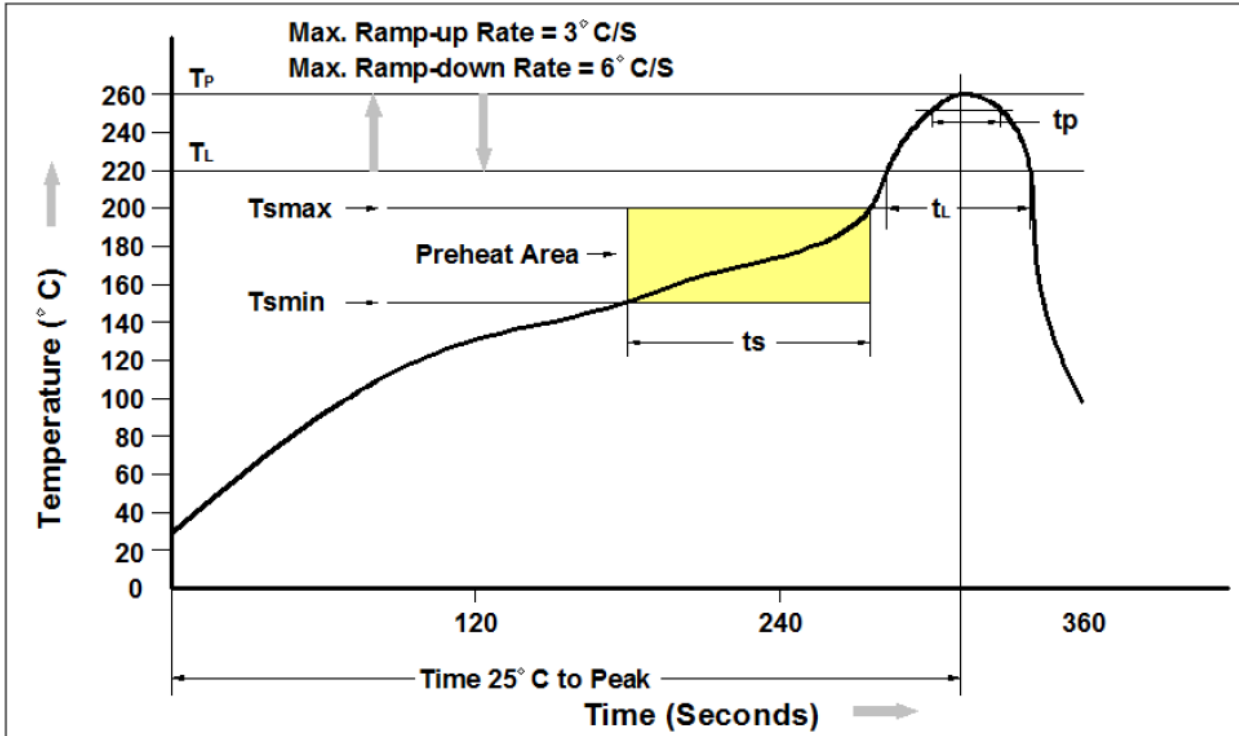




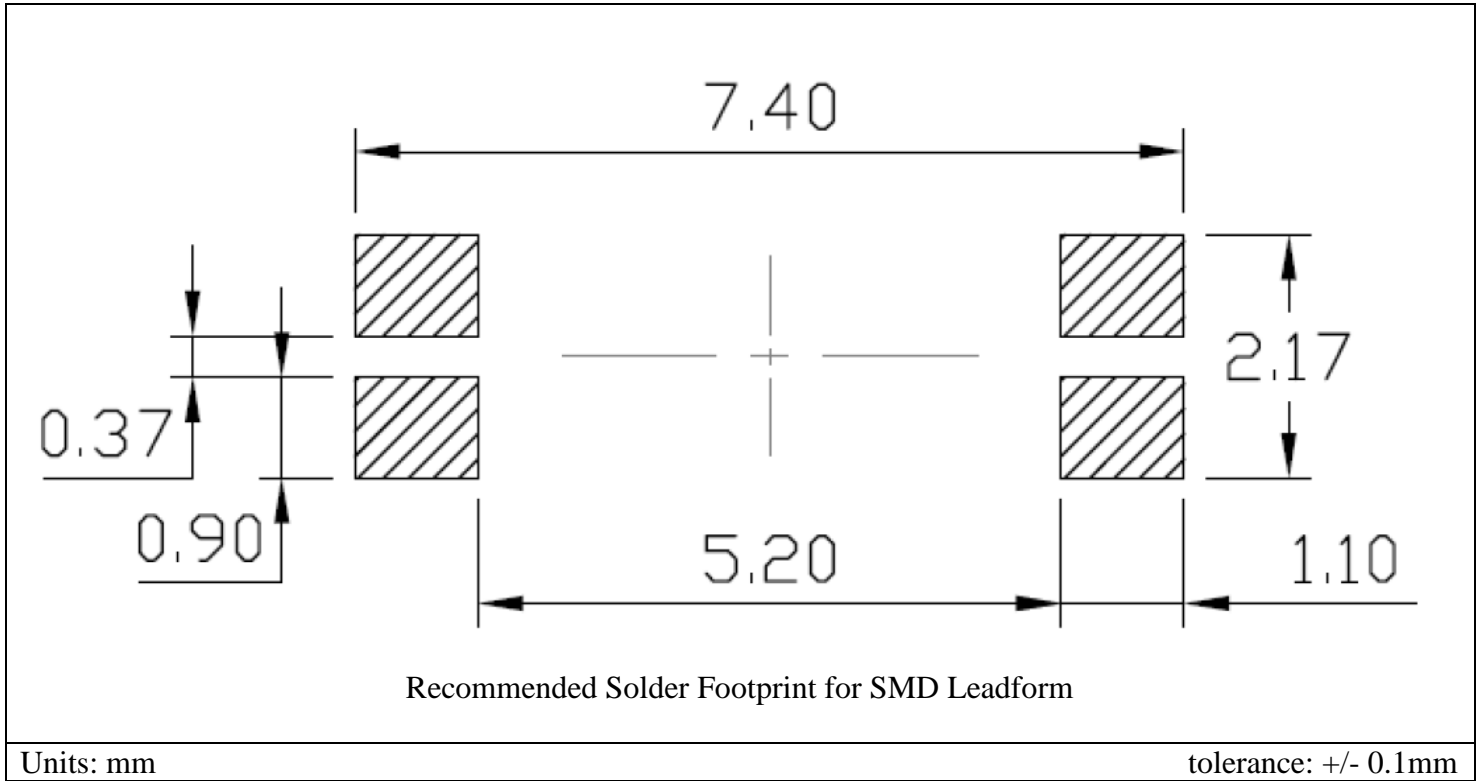
--	--



## Solder Profile & Footprint



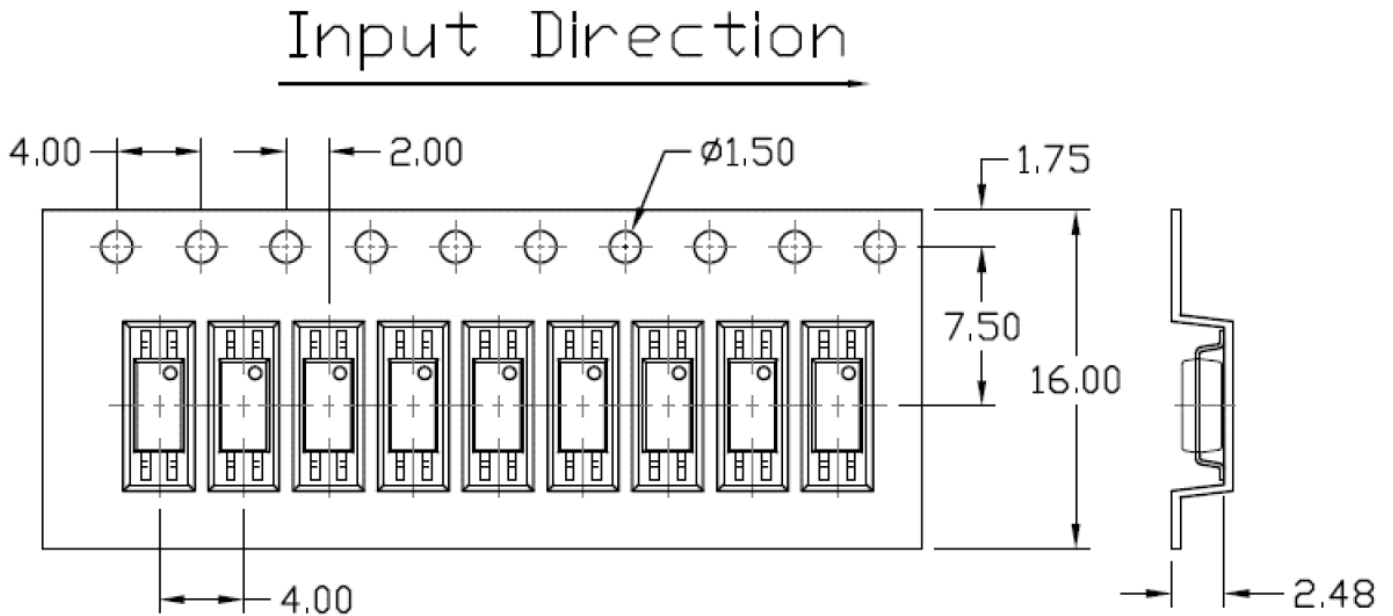
Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T <sub>smin</sub> )	150°C
Temperature Max. (T <sub>smax</sub> )	200°C
Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	60-120 seconds
Ramp-up Rate (t <sub>L</sub> to t <sub>p</sub> )	3°C/second max.
Liquidous Temperature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



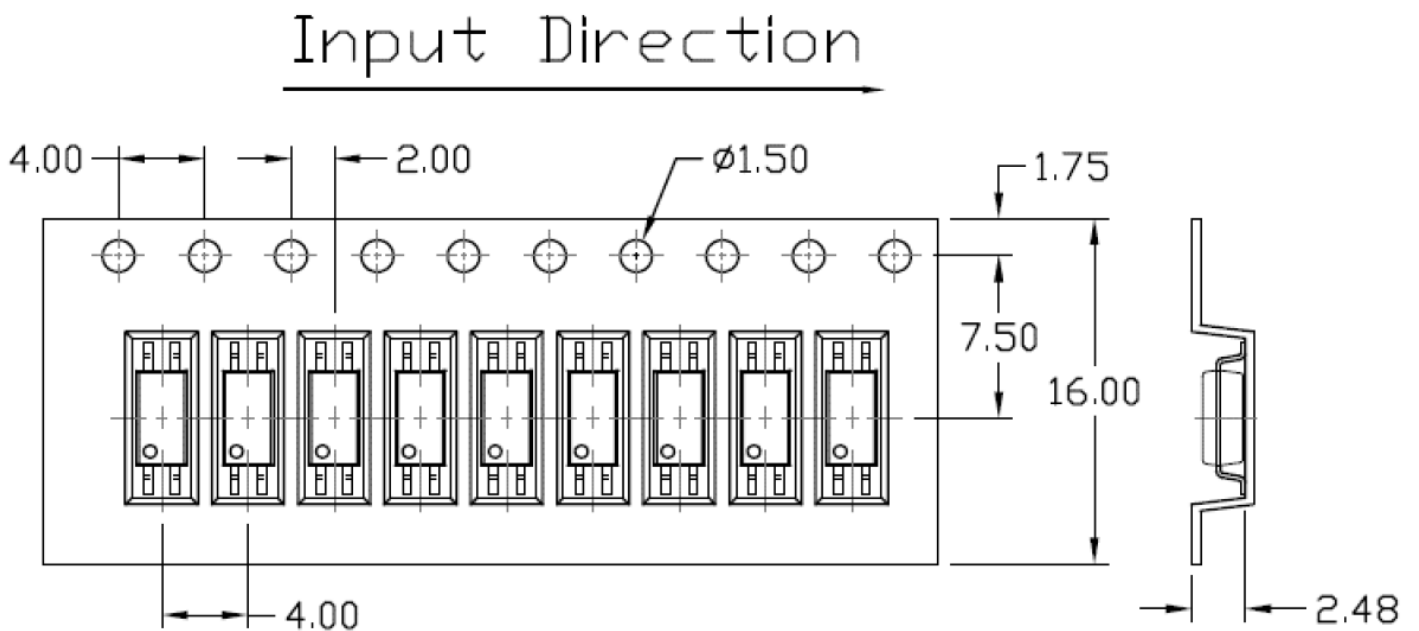
## Packing & Labeling

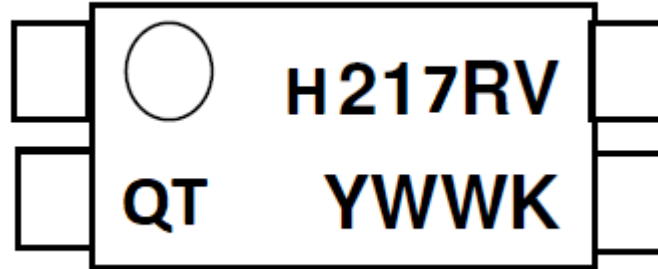
### Tape Dimension:

Option T1



Option T2



**Device Marking**

QT = QT-Brightek Corporation  
 H= Half Pitch Mini-Flat Package  
 217 = part number  
 R= CTR Rank  
 Y = Year  
 WW = Week  
 V = VDE Option  
 K= Manufacturing code

**Ordering Information**

QTH217X(V)(Z)  
 X = Part number (X=A or None)  
 V = VDE option (V or None)  
 Z = Tape and reel option (T1 or T2)

Option	Description	Quantity
T1	Surface Mount Lead Forming – with Option 1 Taping	5000 pcs/ reel
T2	Surface Mount Lead Forming – with Option 2 Taping	5000 pcs/ reel



## Revision History

Description:	Revision #	Revision Date
Initial release of QTH217	1.0	02/08/2018
Amend the marking	1.1	04/21/2018

## Disclaimer

QT-BRIGHTEK reserves the right to make changes without further notice to any products herein to improve reliability, function or design. QT-BRIGHTEK 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-BRIGHTEK's products are not authorized for use as critical components in life support devices or systems without the express written approval of QT-BRIGHTEK. 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.