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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

4-PIN AC Input Phototransistor

Part No.: QTH214

Product: QTH214	Date: April 12, 2018	Page 1 of 12
	Version# 1.1	



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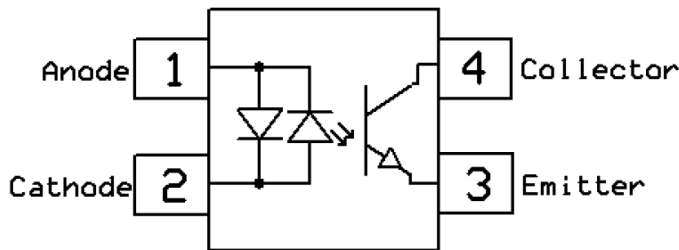
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Introduction

Feature:

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

Schematic:

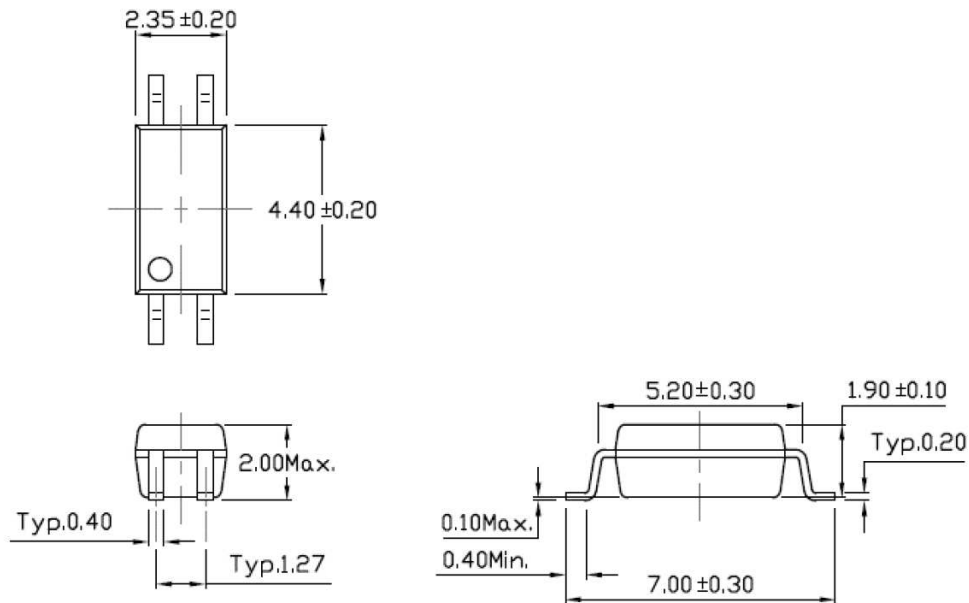


Certification & Compliance:

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



Dimension: (Dot location indicates pin 1)



All Dimensions are in mm

Absolute Maximum Rating

Symbol	Parameter	Rating	Units
V _{ISO}	Isolation Voltage	3750	V _{RMS}
T _{STG}	Storage Temperature	-55 ~ +150	°C
T _{OPR}	Operating Temperature	-55 ~ +110	°C
T _{SOL}	Lead Solder Temperature	260 for 10 sec	°C
P _{TOT}	Total Power Dissipation	200	mW
EMITTER			
I _F	Continuous Forward Current	50	mA
I _{FP}	Peak Forward Current (≤ 1us, 300pps)	1	A
P _D	Power Dissipation	70	mW
	Power Dissipation Derated above 100°C	-	mW/°C
DETECTOR			
B _{VCEO}	Collector-Emitter Breakdown Voltage	80	V
B _{VECO}	Emitter-Collector Breakdown Voltage	6	V
I _C	Collector current	50	mA
P _C	Power Dissipation	150	mW

Electrical Characteristic (T_A=25 °C)

Emitter

Symbol	Characteristics	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V _F	Forward Voltage	-	I _F = 10mA	-	1.24	1.4	V
C _{IN}	Input Capacitance		f = 1kHz	-	30	-	pF

Detector

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
B _{VCEO}	Collector-Emitter Breakdown Voltage	-	I _C =100uA	80	-	-	V
B _{VECO}	Emitter-Collector Breakdown Voltage	-	I _C =100uA	6	-	-	uA
I _{CEO}	Collector-Emitter Dark Current	-	V _{CE} =10V, I _F =0mA	-	-	100	nA

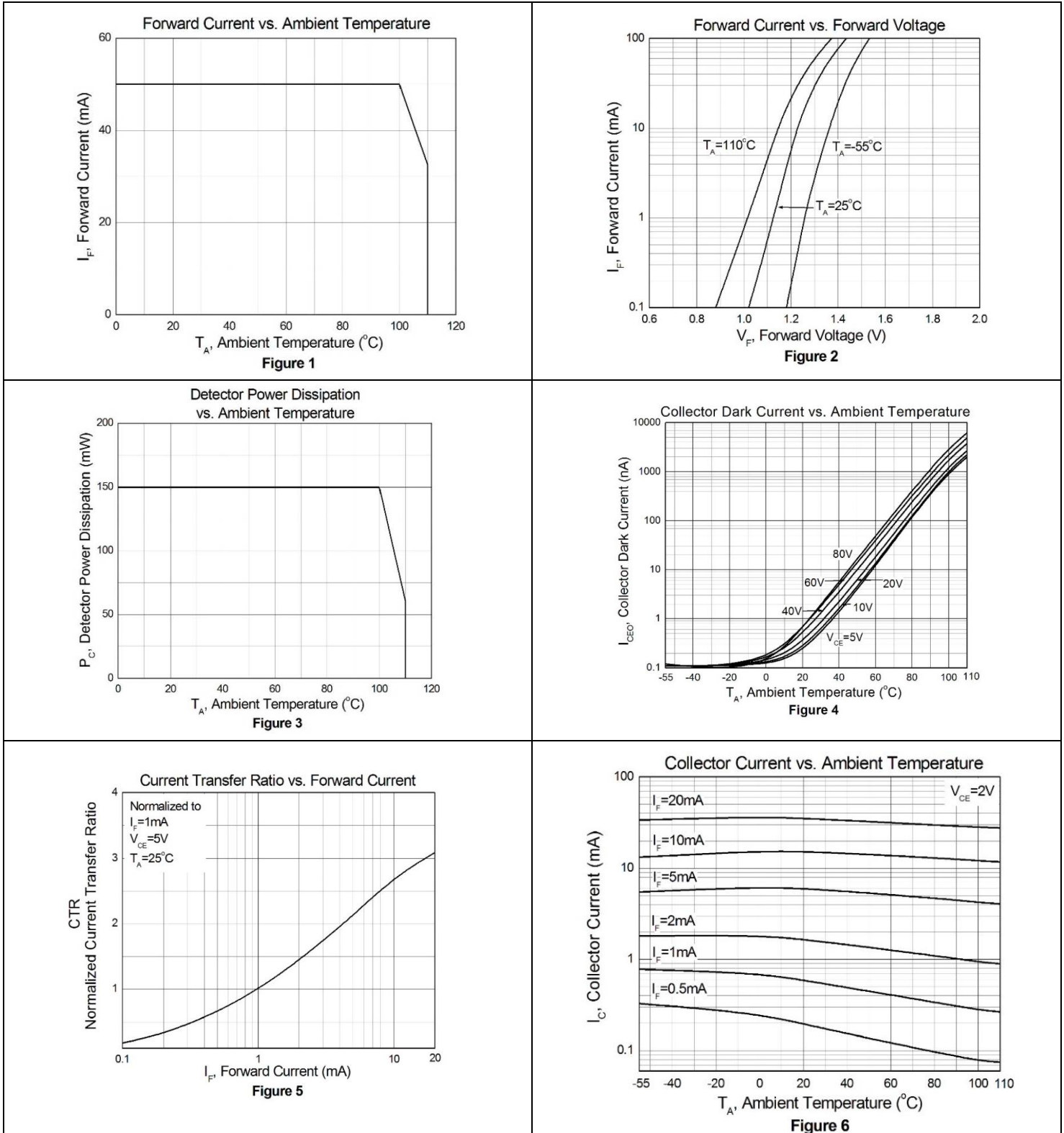
Transfer Characteristics (T_A=0 to 70C unless specified otherwise)

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
CTR	Current Transfer Ratio	QTH214	I _F = ±1mA, V _{CE} =5V	20	-	300	%
		QTH214A		50	-	150	
	CTR Symmetry		I _F = ±1mA, V _{CE} =5V	0.7	-	1.3	
V _{CE(SAT)}	Collector-Emitter Saturation Voltage		I _F = ±20mA, I _C =1mA	-	0.04	0.2	V
R _{IO}	Isolation Resistance		V _{IO} =500V _{DC}	5x10 ¹⁰	-	-	Ω
C _{IO}	Isolation Capacitance		f=1MHz	-	0.5	1.0	pF

Switching Characteristics (T_A=25°C, V_{CC}=5V)

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
t _r	Rise Time		I _C =2mA, V _{CE} 2V, R _L =100Ω	-	6	-	us
t _f	Fall Time			-	8	-	

Characteristic Curves



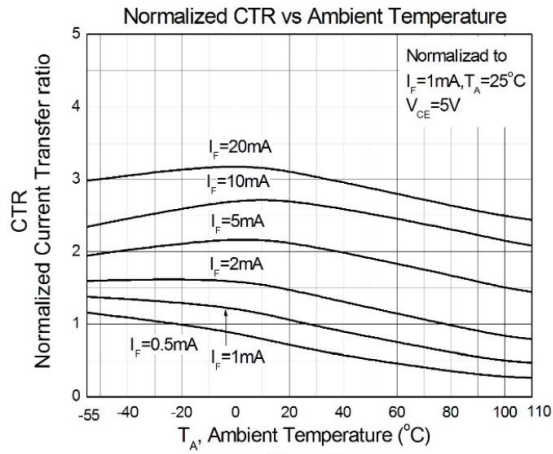


Figure 7

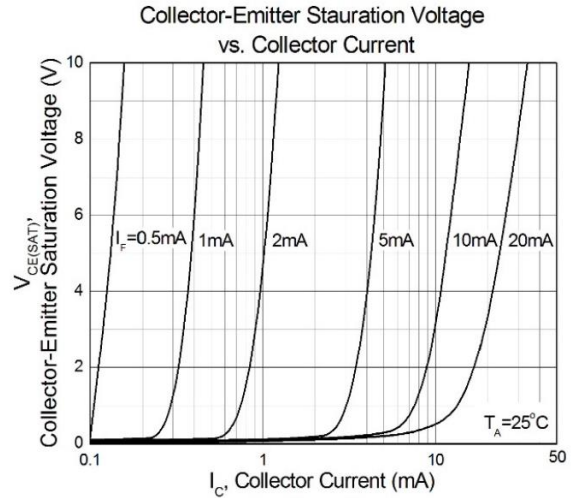


Figure 8

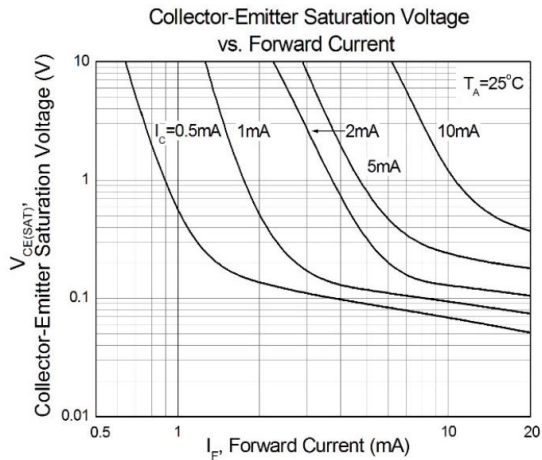


Figure 9

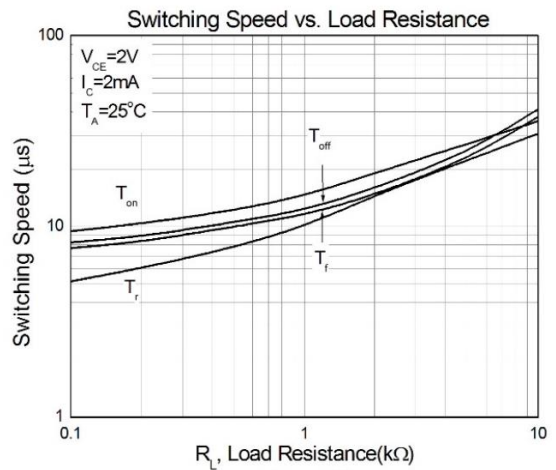


Figure 10

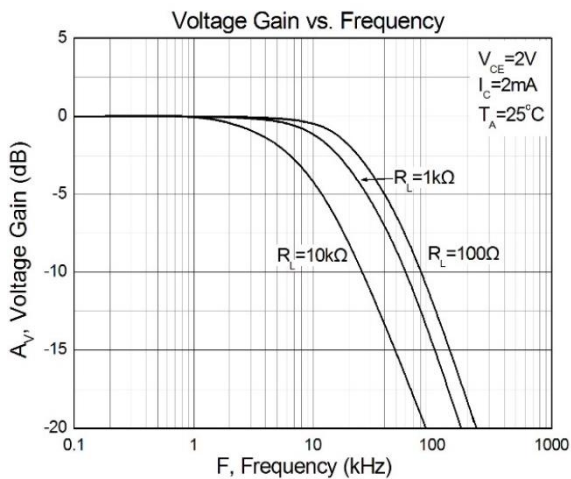


Figure 11

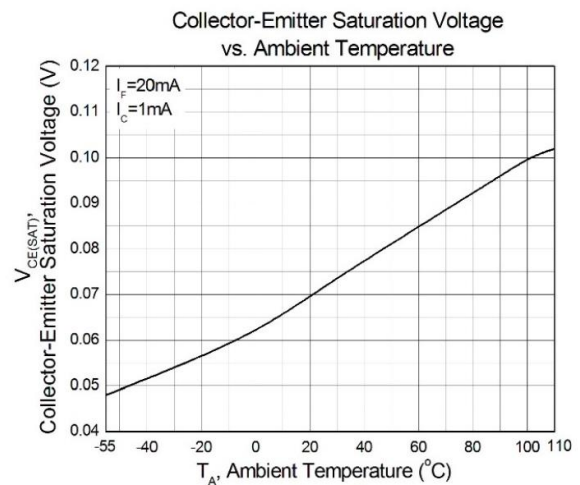
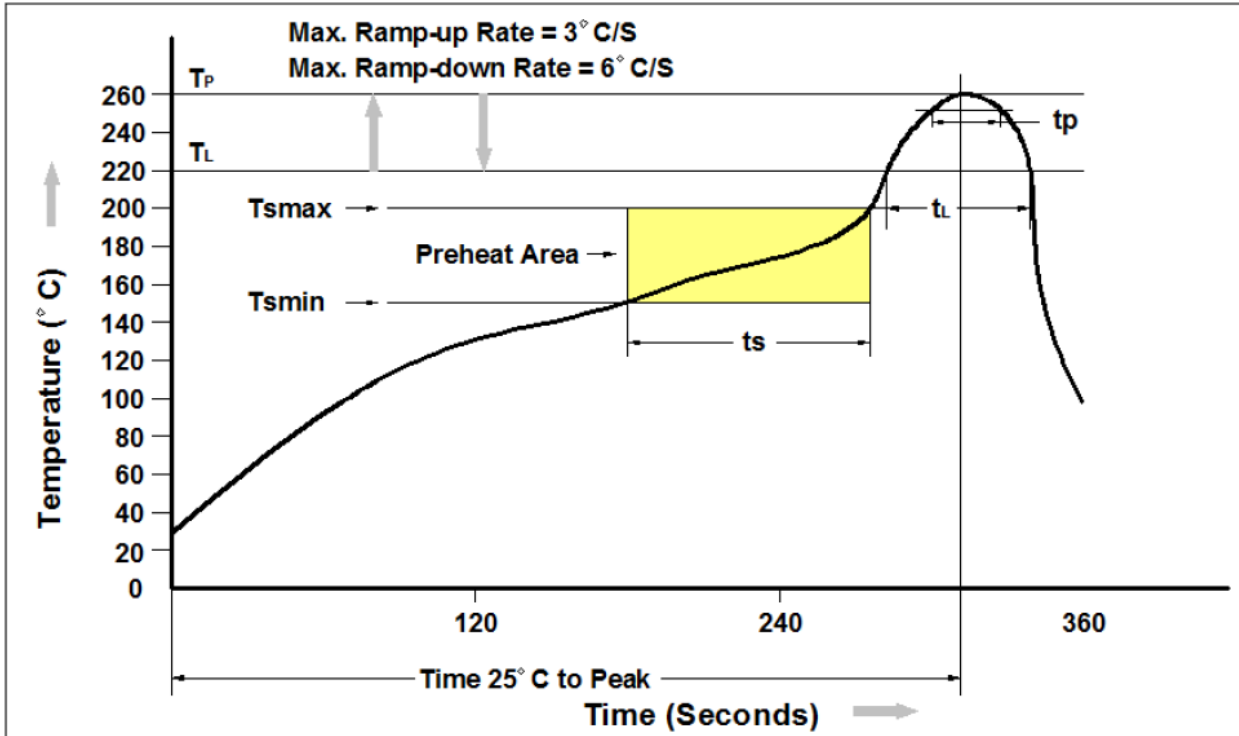
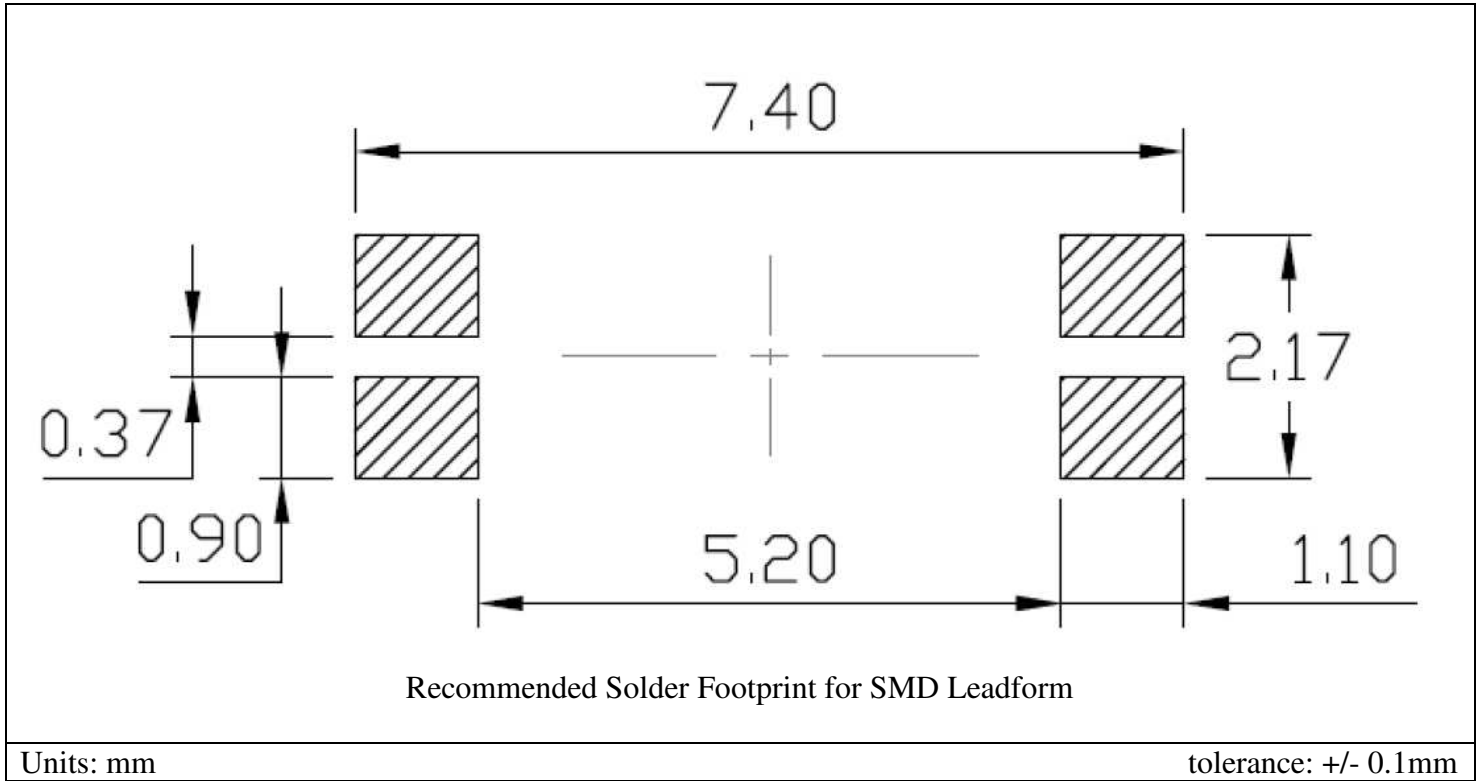


Figure 12

Solder Profile & Footprint



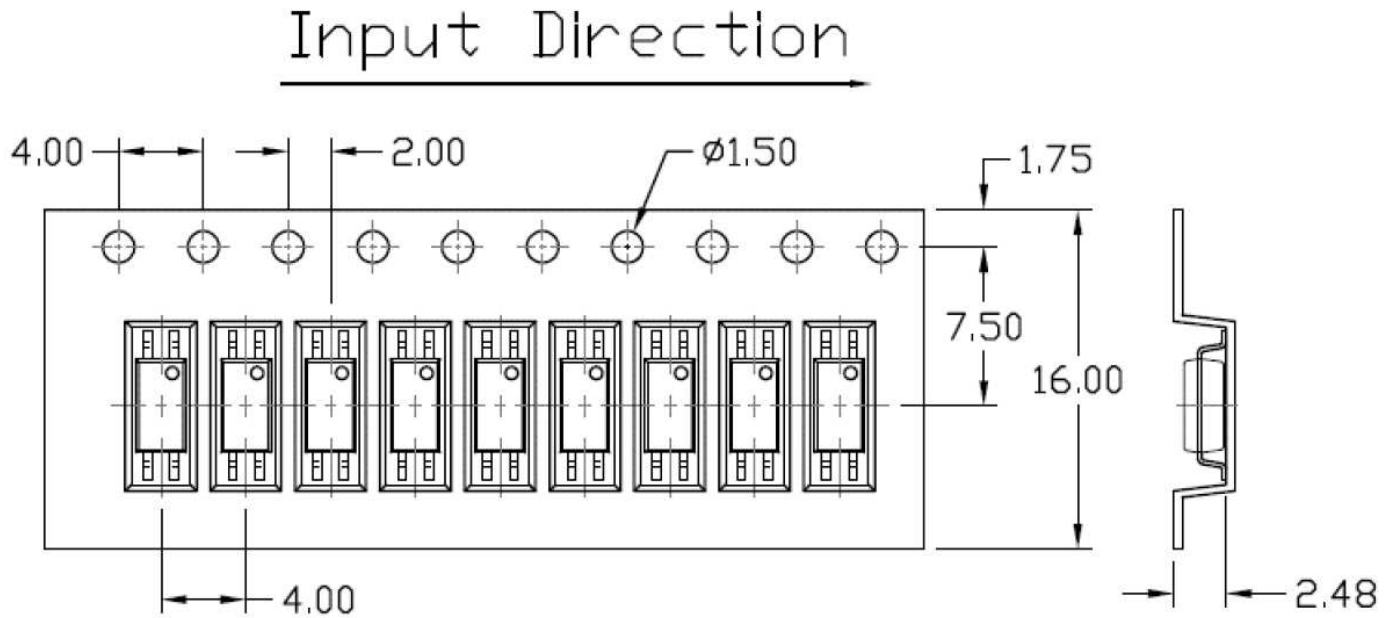
Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	150°C
Temperature Max. (T _{smax})	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds
Ramp-up Rate (t _L to t _p)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds
Peak 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.



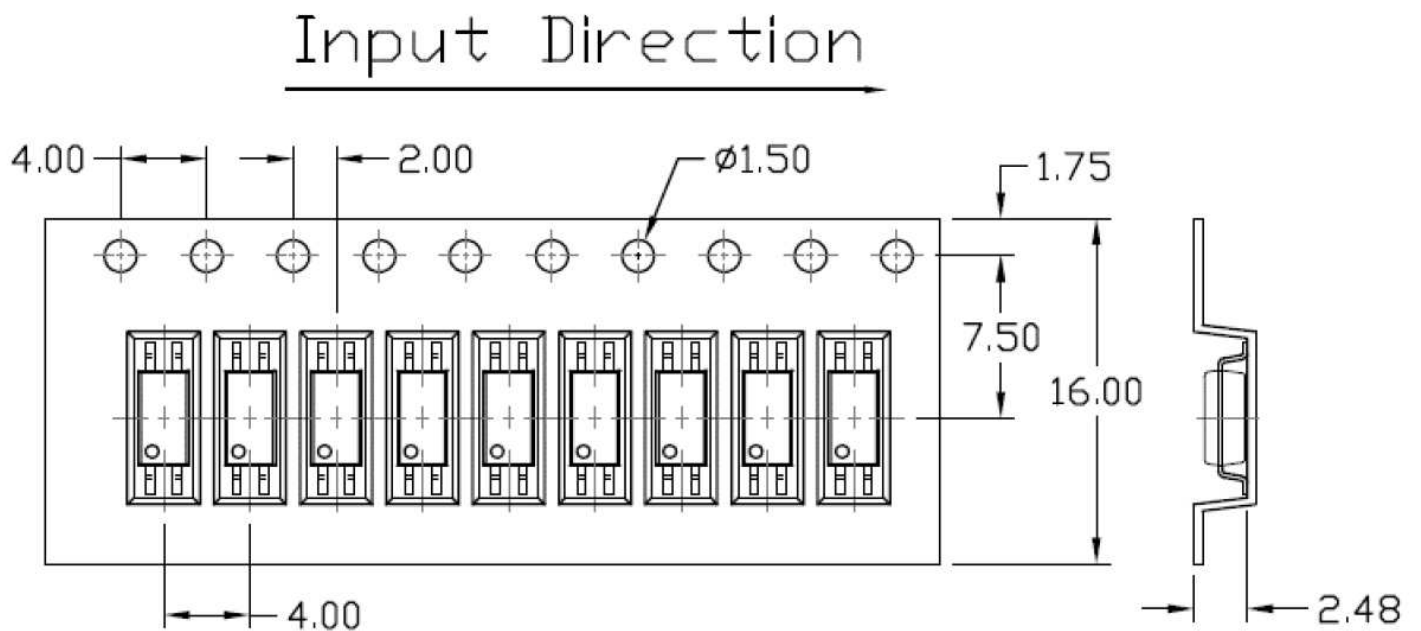
Packing & Labeling

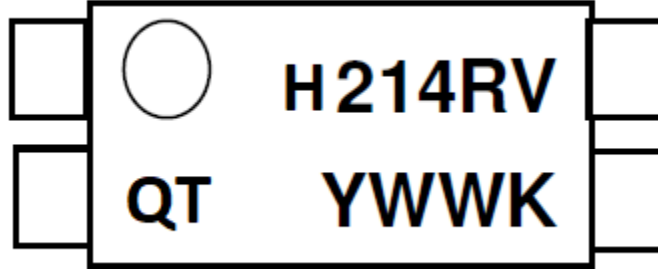
Tape Dimension:

Option T1



Option T2



Device Marking

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

Ordering Information

QTH214X(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 QTH214	1.0	02/08/2018
Amend Marking	1.1	04/12/2018

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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.