

QT-Brightek Optocoupler Series

4-PIN Long Mini-Flat Phototransistor Optocoupler

Part No.: QT101X-W

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Introduction

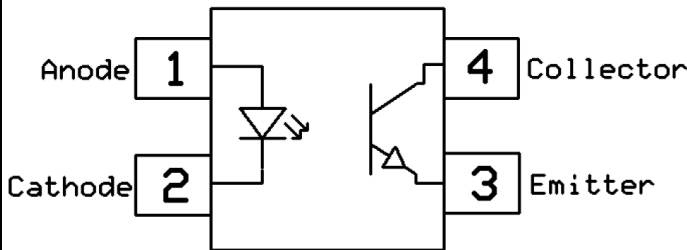
Feature:

- High Isolation voltage between input and output (Viso = 5000V rms)
- Extra low coupling capacitance
- Creepage distance > 8mm
- Operating Temperature up to 125 °C
- Long Mini-Flat package.
- -W: White housing package

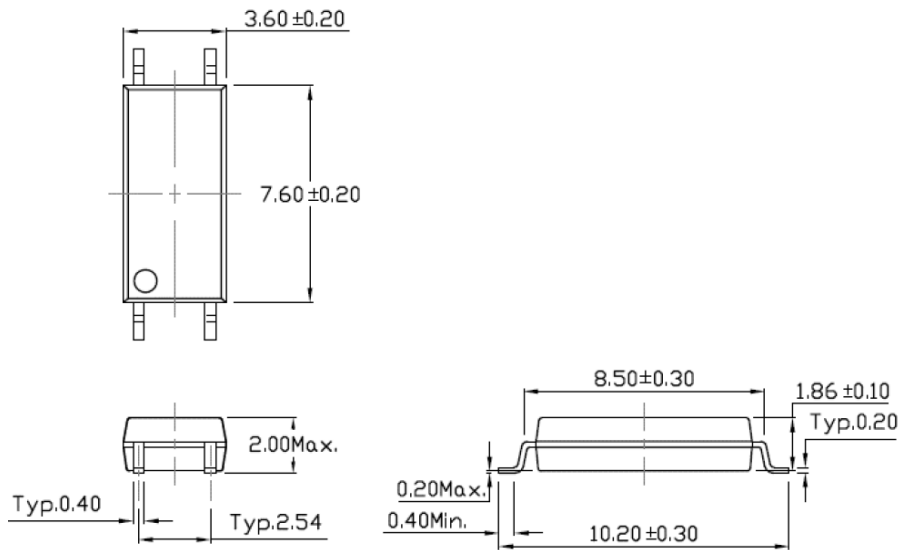
Certification & Compliance:

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

Schematic:



Dimension: (Dot location indicates pin 1)



All Dimensions are in mm

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Absolute Maximum Rating

Symbol	Parameter	Rating	Units
V_{ISO}	Isolation Voltage	5000	V_{RMS}
T_{STG}	Storage Temperature	-55 ~ +150	°C
T_{OPR}	Operating Temperature	-55 ~ +125	°C
T_{SOL}	Lead Solder Temperature	260 for 10 sec	°C

EMITTER

I_F	Continuous Forward Current	50	mA
I_{FP}	Peak Forward Current ($\leq 1\mu s$, 300pps)	1	A
V_R	Reverse Voltage	6	V
P_D	Power Dissipation	85	mW
	Power Dissipation Derated above 100°C	-	mW/°C

DETECTOR

B_{VCEO}	Collector-Emitter Breakdown Voltage	80	V
B_{VECO}	Emitter-Collector Breakdown Voltage	7	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	-	1.26	1.4	V
			I _F = 50mA		1.42	1.5	
I _R	Reverse Current		V _R = 6V	-	-	5	μA
C _{IN}	Input Capacitance		f = 1kHz	-	45	-	pF

Detector

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
B _{VCEO}	Collector-Emitter Breakdown Voltage	-	I _C =0.1mA	80	-	-	V
B _{VECO}	Emitter-Collector Breakdown Voltage	-	I _C =0.1mA	7	-	-	μA
I _{CEO}	Collector-Emitter Dark Current	-	V _{CE} =20V, I _F =0mA	-	-	100	nA

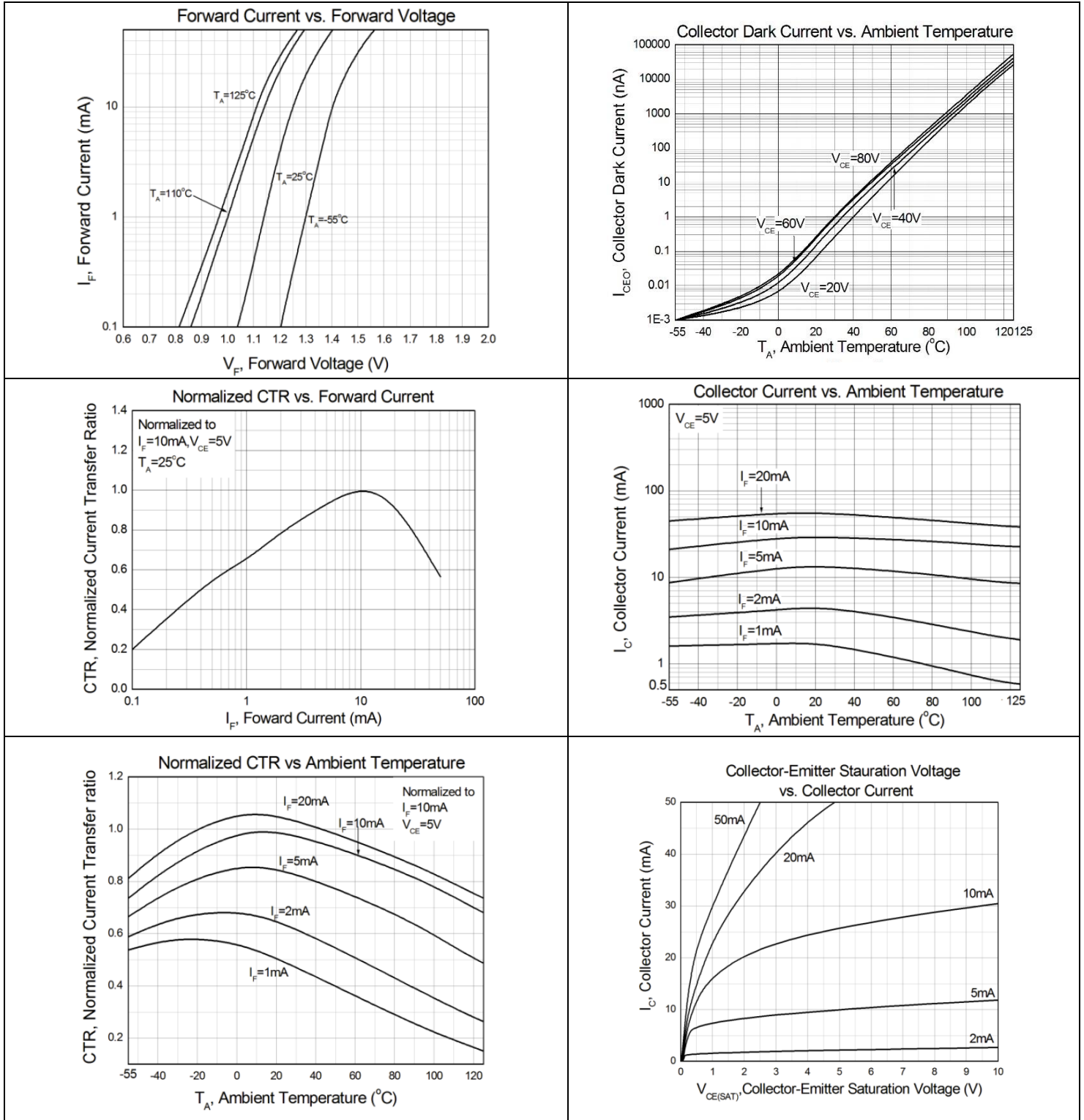
Transfer Characteristics ($T_A=0$ to 70°C unless specified otherwise)

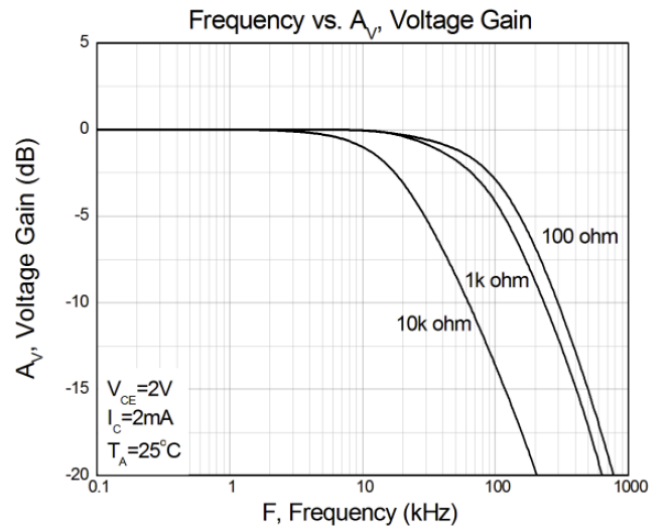
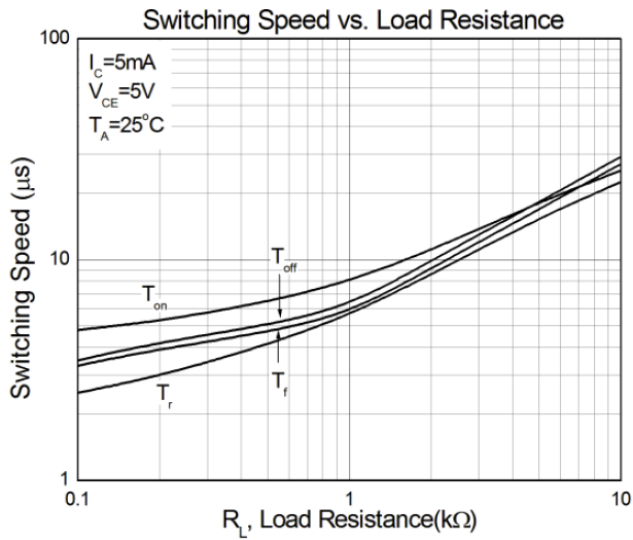
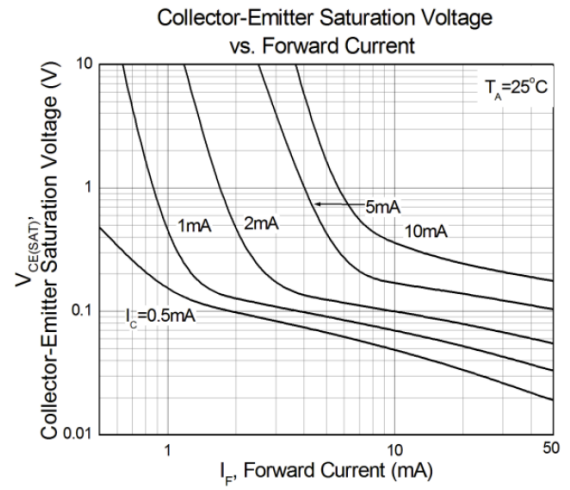
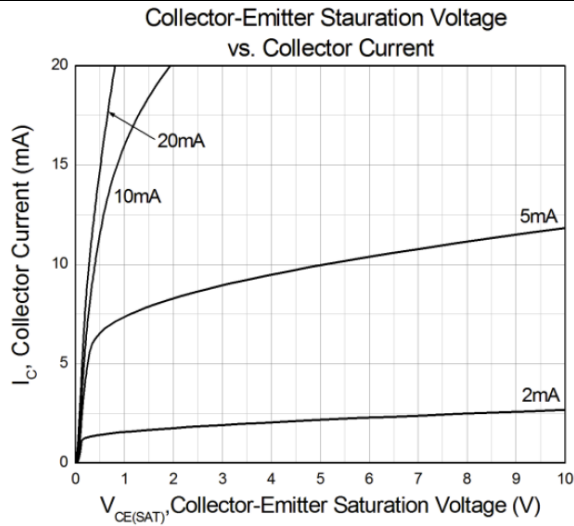
Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
CTR	Current Transfer Ratio	QT1012-W	$I_F = 1\text{mA}, V_{CE}=5\text{V}$	22	-	-	%
		QT1013-W		34	-	-	
		QT1014-W		56	-	-	
		QT1011-W	$I_F = 10\text{mA}, V_{CE}=5\text{V}$	60	-	300	
		QT1012-W		63	-	125	
		QT1013-W		100	-	200	
		QT1014-W		160	-	320	
		QT1010-W	$I_F = 5\text{mA}, V_{CE}=5\text{V}$	50	-	600	
		QT1015-W		50	-	150	
		QT1016-W		100	-	300	
		QT1017-W		80	-	160	
		QT1018-W		130	-	260	
		QT1019-W		200	-	400	
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		$I_F = 10\text{mA}, I_C=1\text{mA}$	-	-	0.4	V
R_{IO}	Isolation Resistance		$V_{IO}=500\text{V}_{DC}$	5×10^{10}	-	-	Ω
C_{IO}	Isolation Capacitance		$f=1\text{MHz}$	-	1	-	pF

Switching Characteristics ($T_A=25^\circ\text{C}$, $V_{CC}=5\text{V}$)

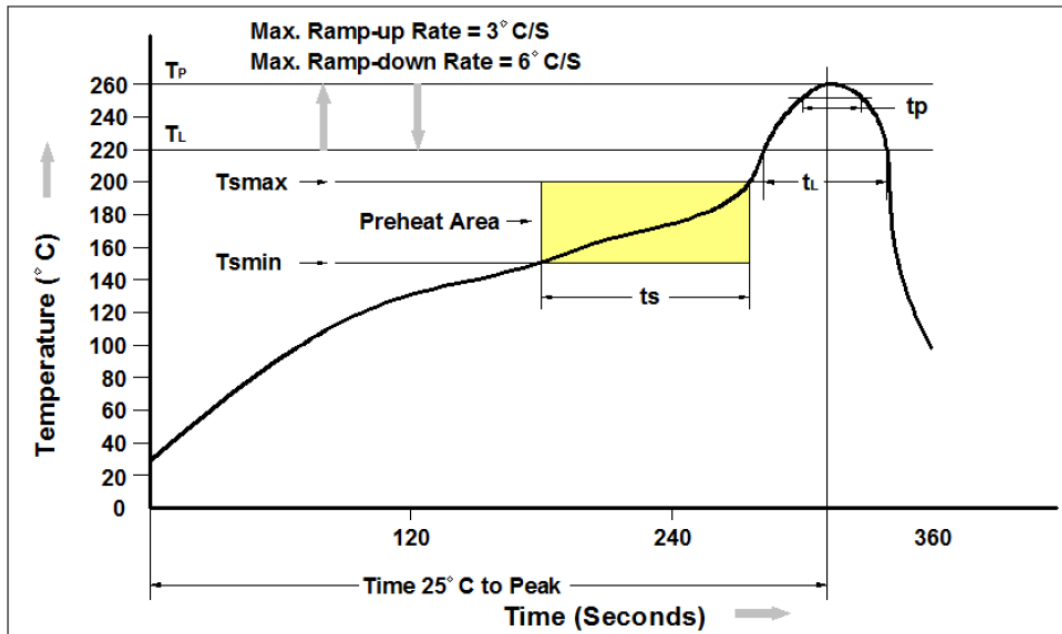
Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
T_{ON}	Turn On Time		$I_C=5\text{mA}, V_{CE}=5\text{V}, R_L=100\Omega$	-	4.8	-	μs
T_{OFF}	Turn Off Time			-	4.2	-	
t_r	Rise Time			-	2.8	-	
t_f	Fall Time			-	4	-	

Characteristic Curves



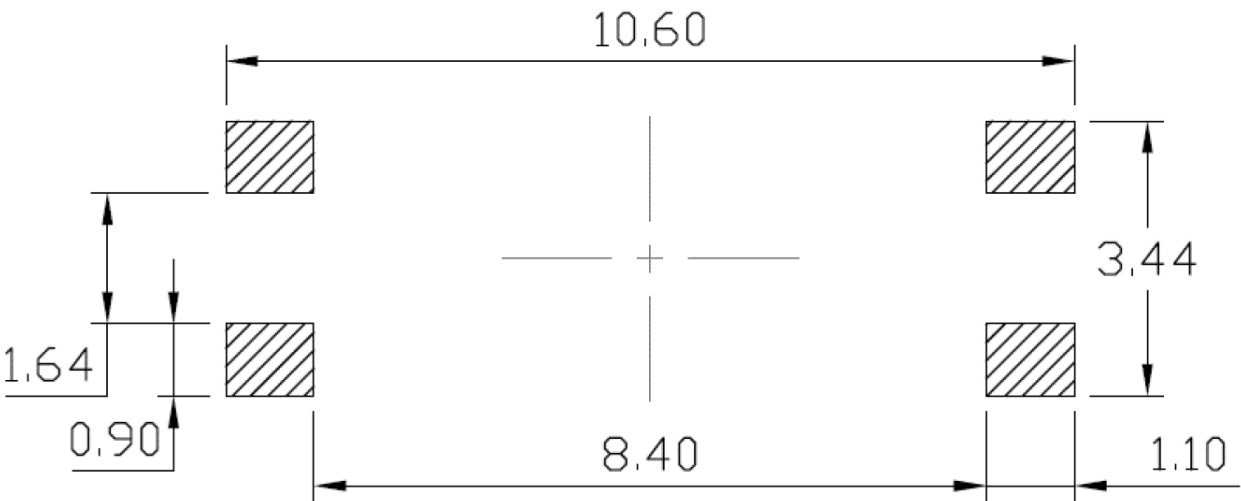


Solder Profile & Footprint



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.

Recommended Solder Footprint for SMD Leadform

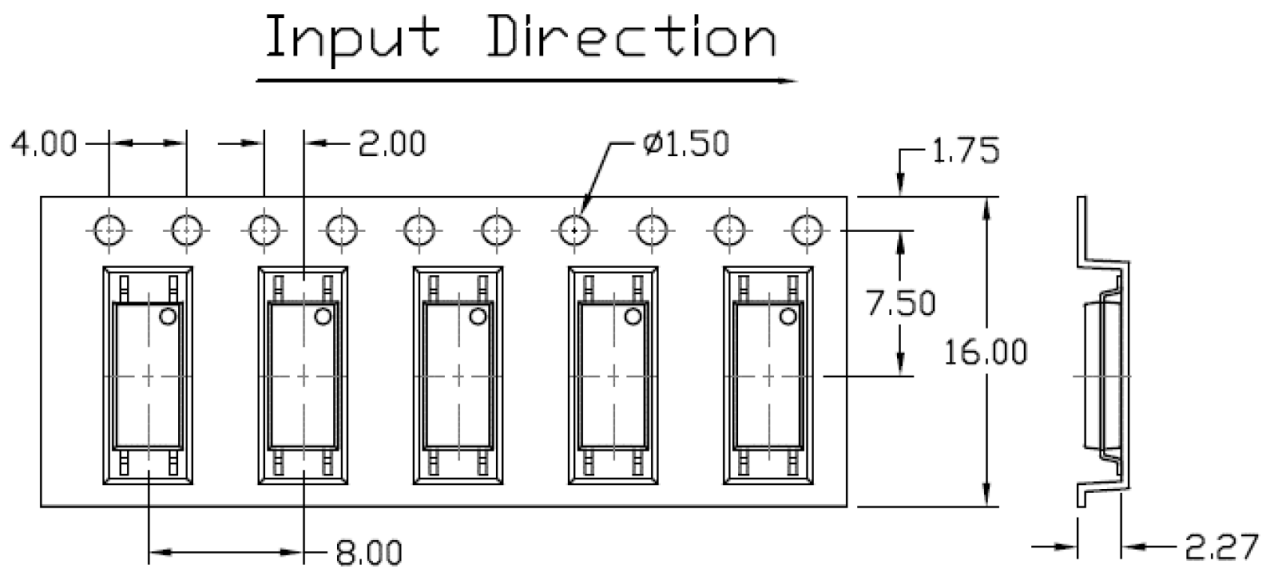


Units: mm

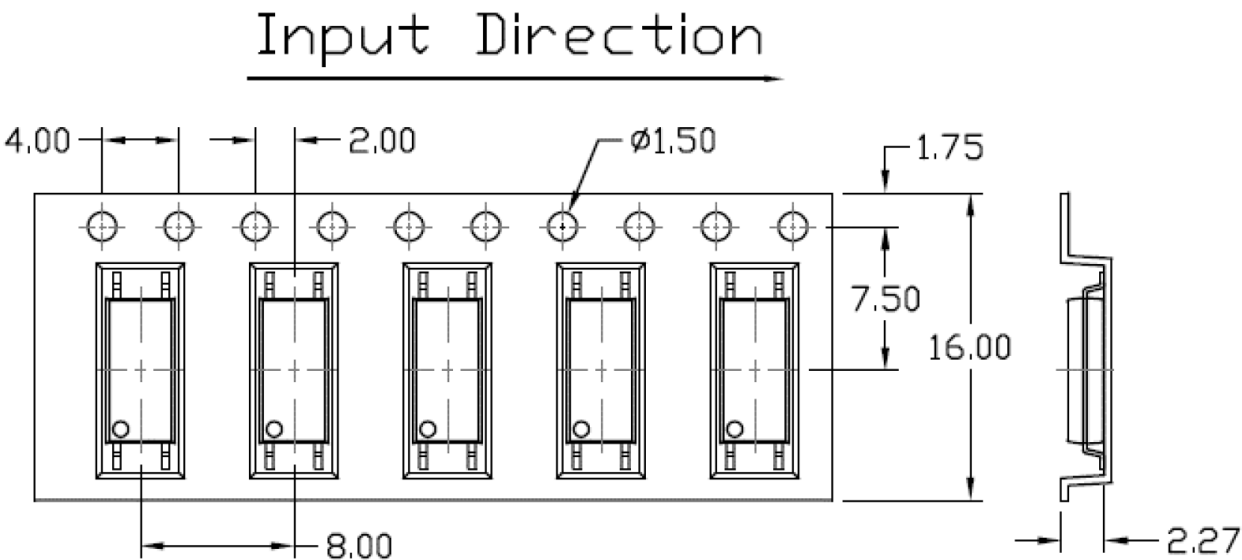
tolerance: +/- 0.1mm

Packing & Labeling

Tape Dimension:
Option T1



Option T2



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Device Marking



QT = QT-Brightek Corporation
 1019 = part number
 Y = Year
 WW = Week
 V = VDE Option
 K= Manufacturing code

Ordering Information

QT101XVY-W
 X = Part number (X=0,1,2,3,4,5,6,7,8,9)
 V = VDE option (V or None)
 Y = Tape and reel option (T1 or T2)

Option	Description	Quantity
T1	Surface Mount Lead Forming – with Option 1 Taping	3000 pcs/ reel
T2	Surface Mount Lead Forming – with Option 2 Taping	3000 pcs/ reel



Revision History

Description:	Revision #	Revision Date
Initial release of QT101X-W	1.0	02/12/2018
Amend order information	1.1	05/09/2018
Update info on the ordering info / fix typos	1.2	09/13/2018

Disclaimer

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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.

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