

# **QT-Brightek Optocoupler Series**

## **4-PIN AC Input Optocoupler**

**Part No.: QTM354**

Product: QTM354	Date: April 13, 2018	Page 1 of 12
	Version# 1.1	



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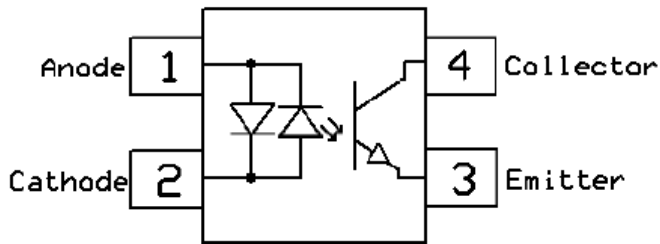
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## Introduction

### Feature:

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

### Schematic:

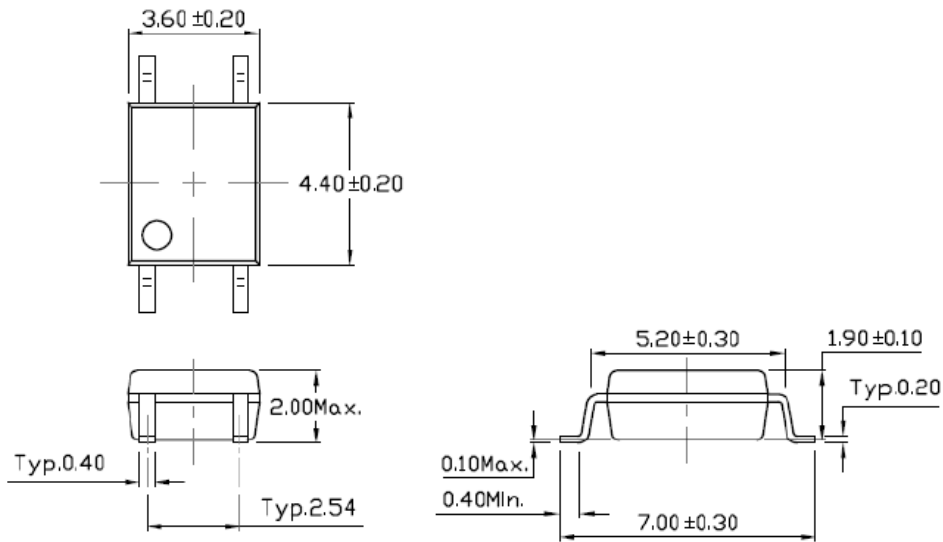


### Certification & Compliance:

- Pb free and RoHS Compliant
- UL recognized (File #E338132)
- cUL 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 <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 ~ +110	°C
T <sub>SOL</sub>	Lead Solder Temperature	260 for 10 sec	°C
<b>EMITTER</b>			
I <sub>F</sub>	Continuous Forward Current	±50	mA
I <sub>FP</sub>	Peak Forward Current (≤ 1us, 300pps)	1	A
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>F</sub> = 50mA	-	-	-	
C <sub>IN</sub>	Input Capacitance		f = 1kHz	-	45	-	pF

**Detector**

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

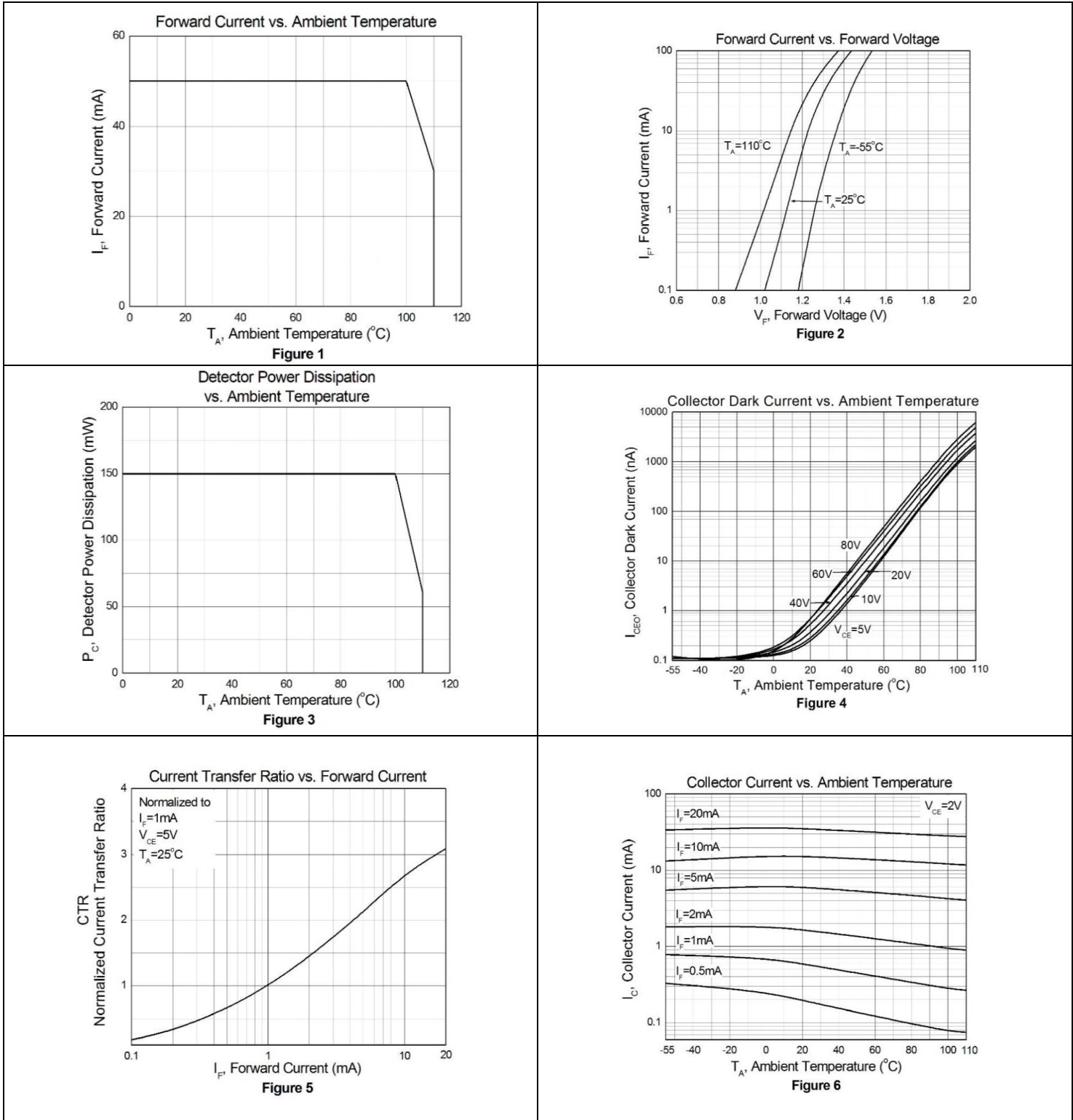
**Transfer Characteristics (T<sub>A</sub>=0 to 70C unless specified otherwise)**

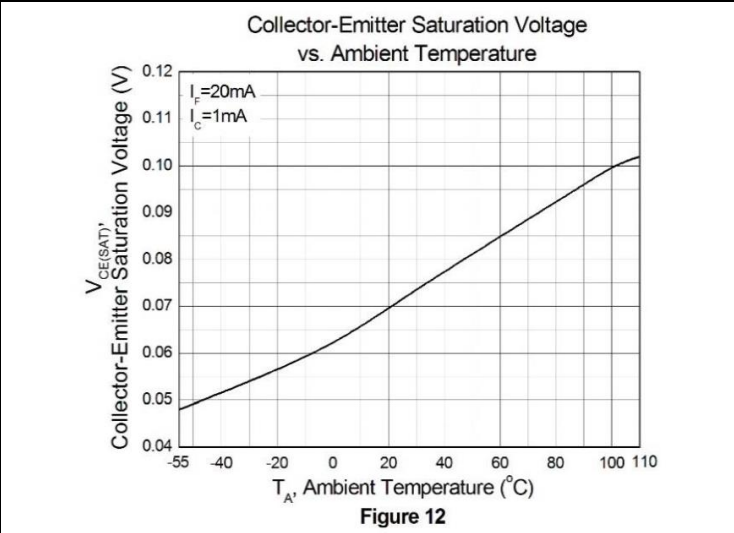
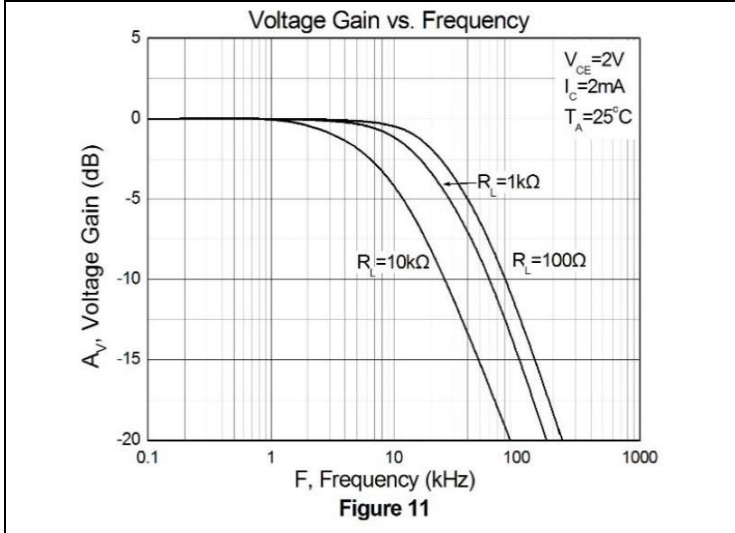
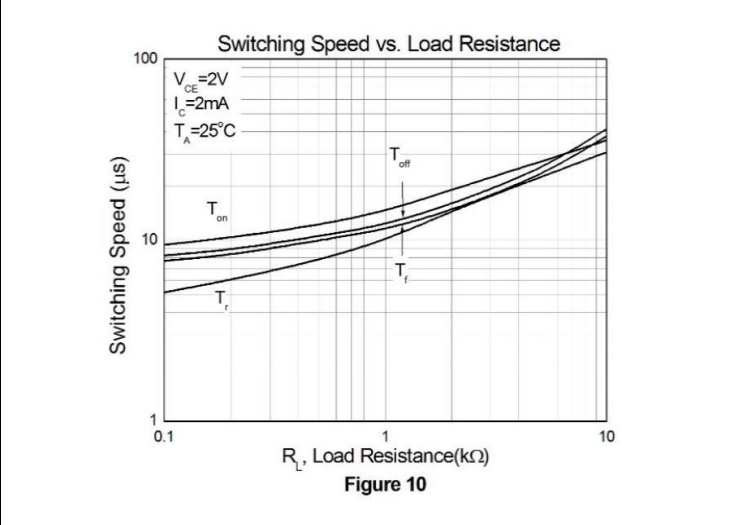
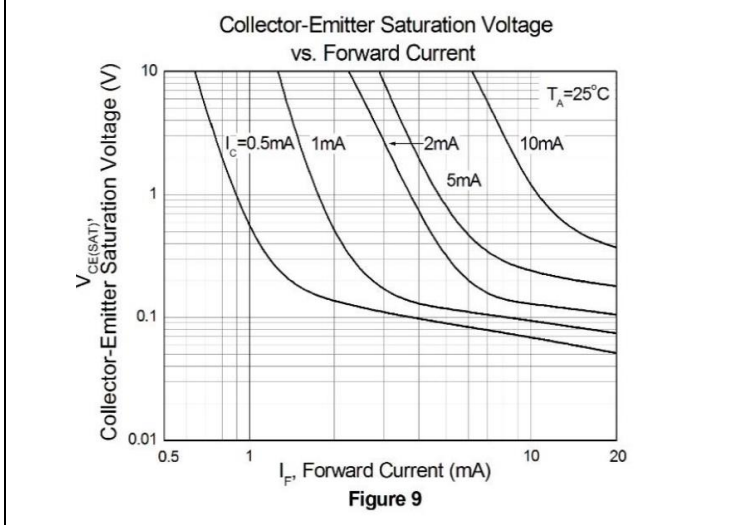
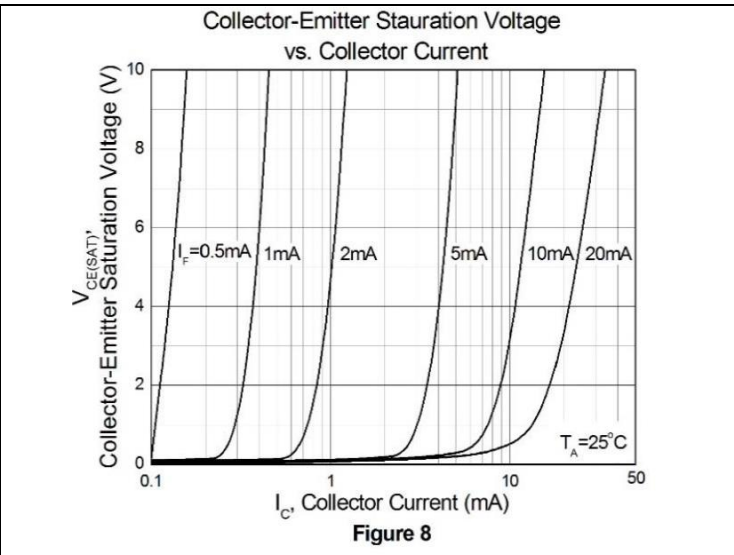
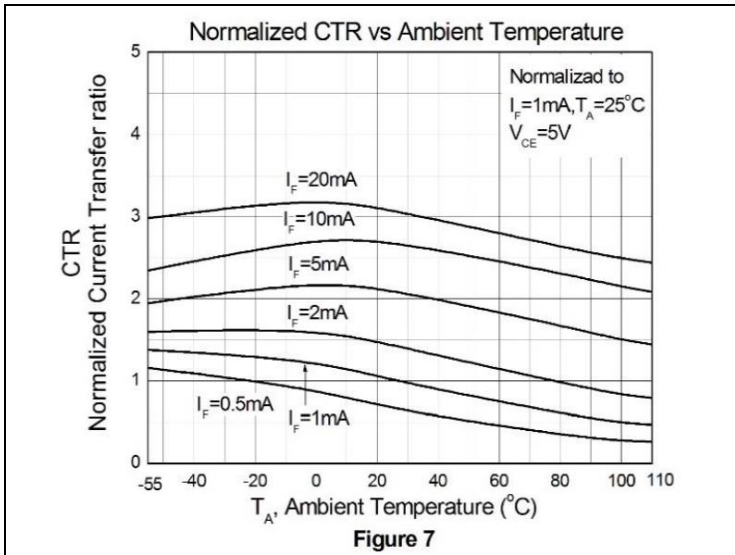
Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
CTR	Current Transfer Ratio	QTM354	I <sub>F</sub> = ±1mA, V <sub>CE</sub> =5V	20	-	300	%
		QTM354A		50	-	150	
V <sub>CE(SAT)</sub>	Collector-Emitter Saturation Voltage		I <sub>F</sub> = ±20mA, I <sub>C</sub> =1mA	-	0.1	0.2	V
R <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	-	0.6	1.0	pF

**Switching Characteristics (T<sub>A</sub>=25°C, V<sub>CC</sub>=5V)**

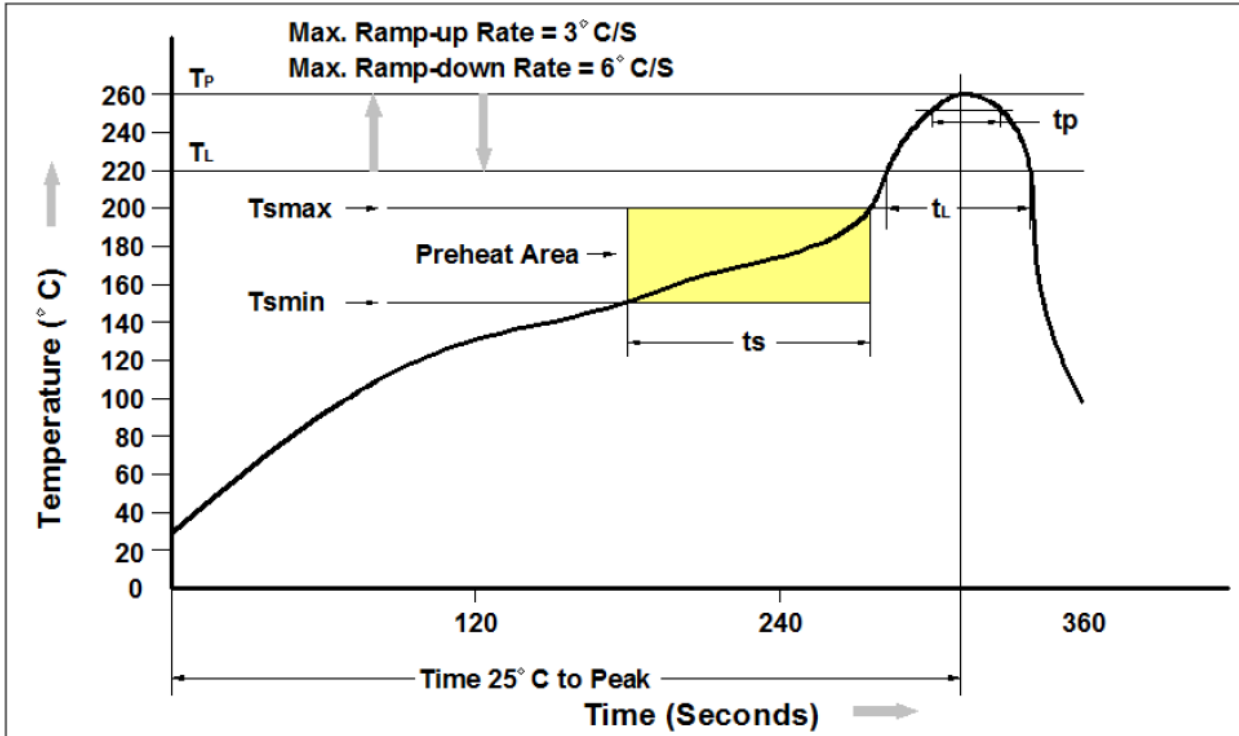
Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
t <sub>r</sub>	Rise Time		I <sub>C</sub> =2mA, V <sub>CE</sub> 2V, R <sub>L</sub> =100Ω	-	6	18	us
t <sub>f</sub>	Fall Time			-	8	18	

## Characteristic Curves



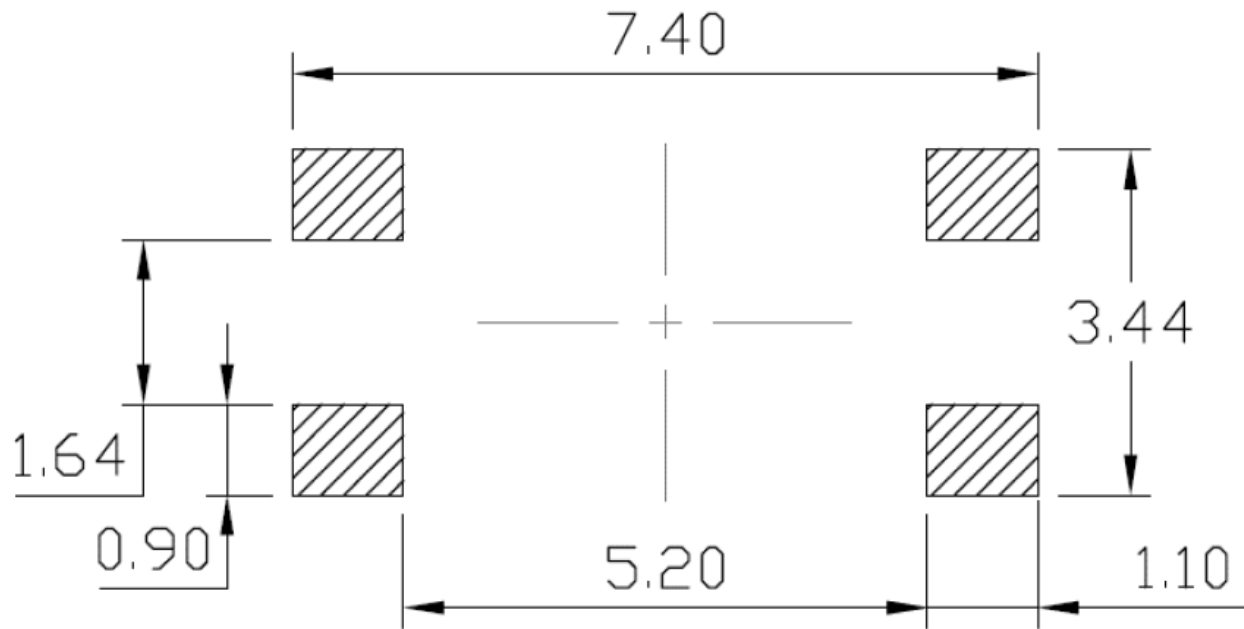


## Solder Profile & Footprint



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.





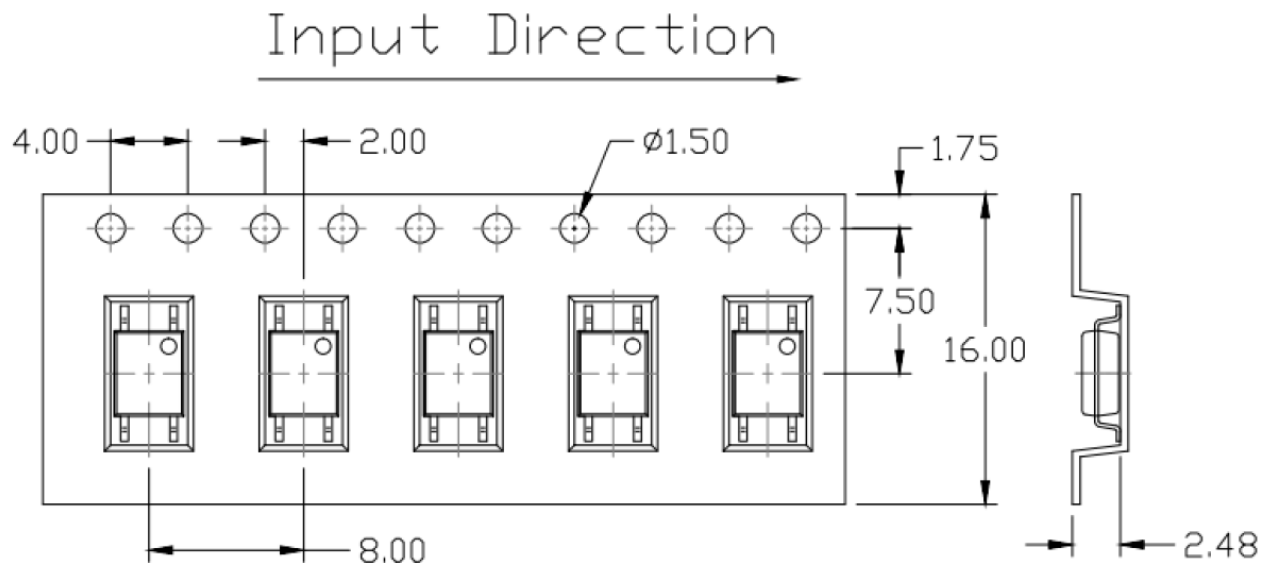
Recommended Solder Footprint for SMD Leadform

Units: mm

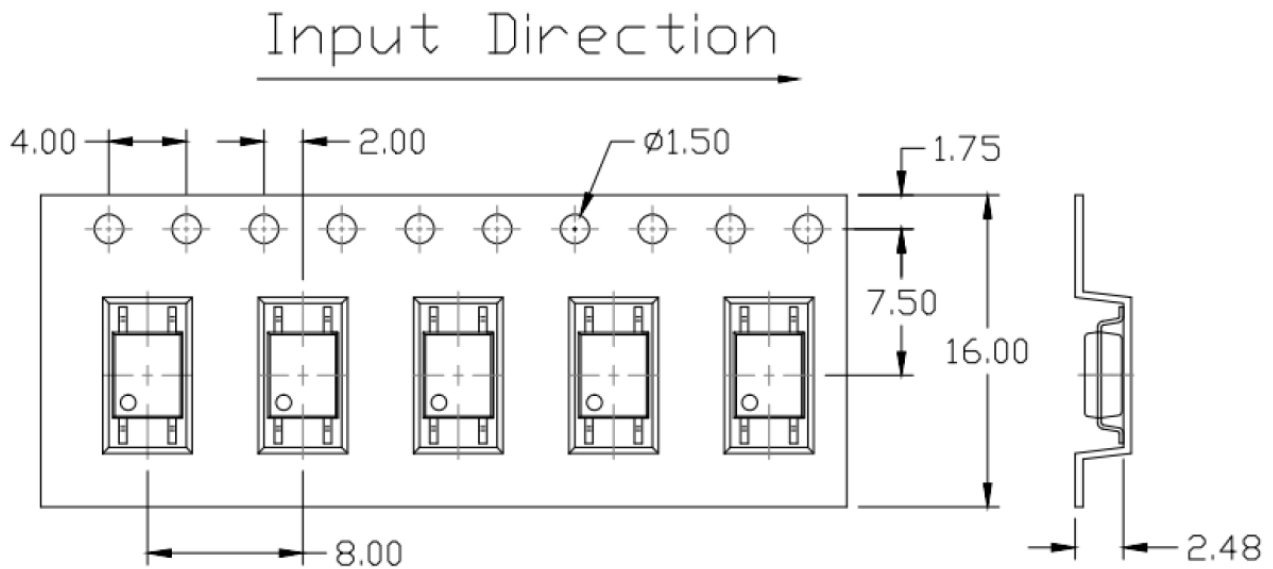
tolerance: +/- 0.1mm

**Packing & Labeling****Tape Dimension:**

Option (T1)



Option (T2)



**Device Marking**

QT=QT-Brightek Corporation  
 M=Mini-Flat Package  
 354=part number  
 R=CTR Rank  
 Y=Year  
 WW=Week  
 V=VDE Option  
 K= Manufacturing code

**Ordering Information**

QTM354XVZ

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	3000 pcs/ reel
T2	Surface Mount Lead Forming – with Option 2 Taping	3000 pcs/ reel



**Revision History**

Description:	Revision #	Revision Date
Initial release of QTM354	1.0	02/08/2018
Amend the Marking	1.1	04/13/2018

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