QT-Brightek Optocoupler Series

4-PIN AC Input Optocoupler

Part No.: QTM354

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Introduction

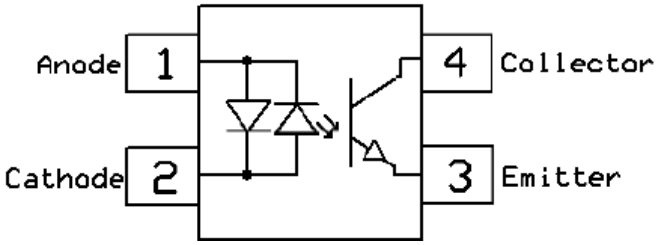
Feature:

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

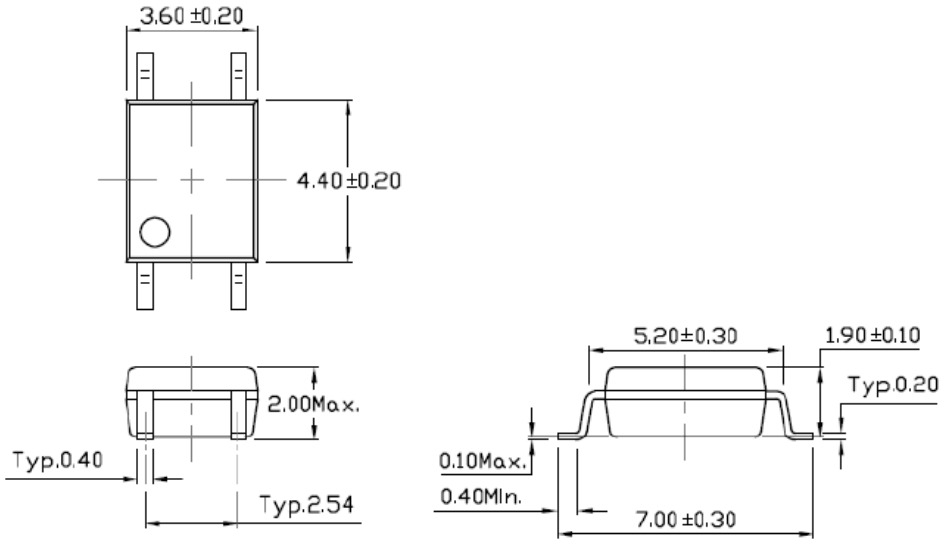
Certification & Compliance:

- 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

Absolute Maximum Rating

Symbol	Parameter	Rating	Units
V_{ISO}	Isolation Voltage	3750	V_{RMS}
T_{STG}	Storage Temperature	-55 ~ +150	ºC
T_{OPR}	Operating Temperature	-55 ~ +110	ºC
T_{SOL}	Lead Solder Temperature	260 for 10 sec	ºC
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 100ºC	-	mW/ºC
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	-	1.24	1.4	V
			I_F = 50mA	-	-	-	
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=100uA	80	-	-	V
B_{VECO}	Emitter-Collector Breakdown Voltage	-	I_C=100uA	7	-	-	uA
I_{CEO}	Collector-Emitter Dark Current	-	V_{CE}=20V, 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	QTM354	I_F = ±1mA, V_{CE}=5V	20	-	300	%
		QTM354A		50	-	150	
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		I_F = ±20mA, I_C=1mA	-	0.1	0.2	V
R_{IO}	Isolation Resistance		V_{IO}=500V_{DC}	$5x10^{10}$	-	-	Ω
C_{IO}	Isolation Capacitance		f=1MHz	-	0.6	1.0	pF

Switching Characteristics (TA=25°C, Vcc=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	18	us
t_f	Fall Time			-	8	18	

Characteristic Curves

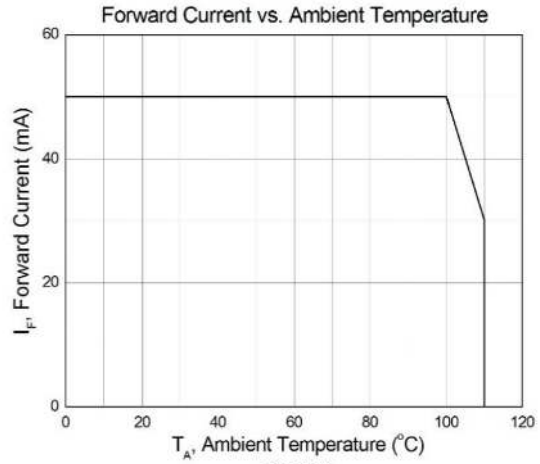


Figure 1

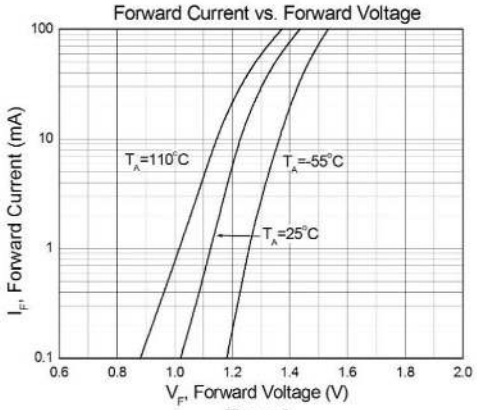


Figure 2

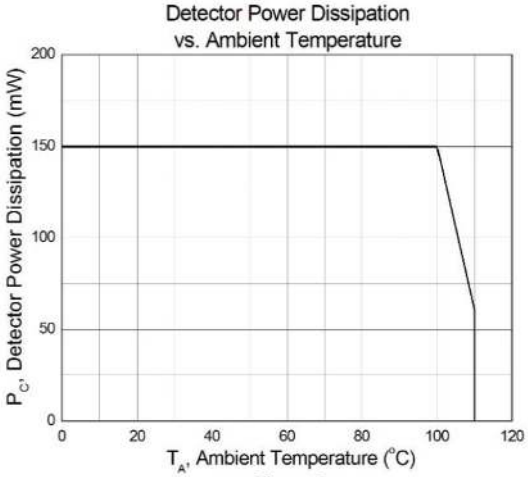


Figure 3

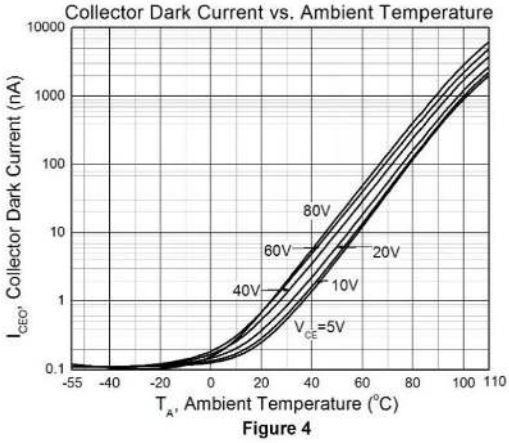


Figure 4

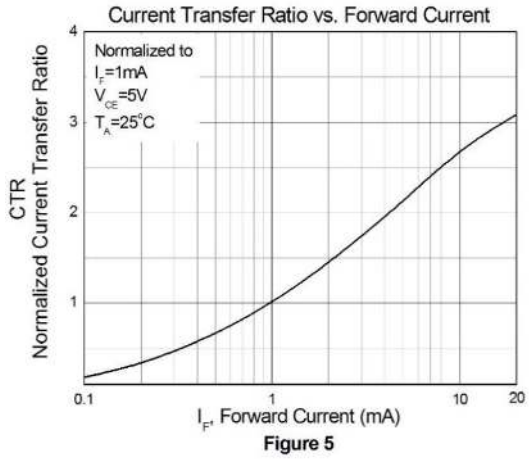


Figure 5

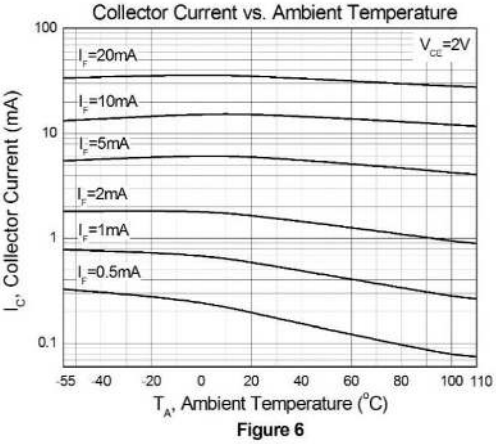


Figure 6

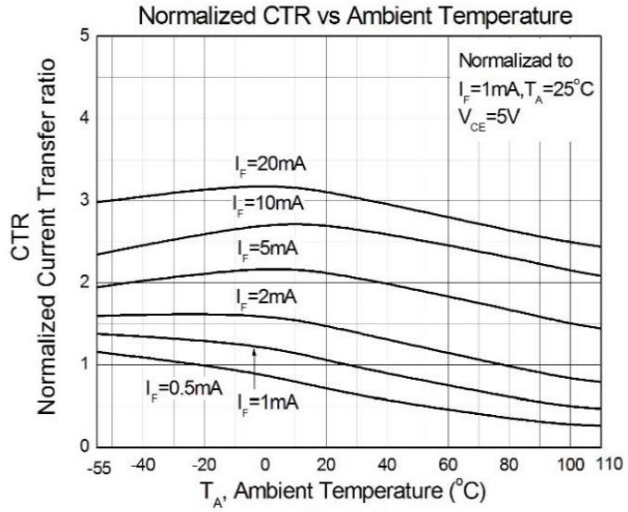


Figure 7

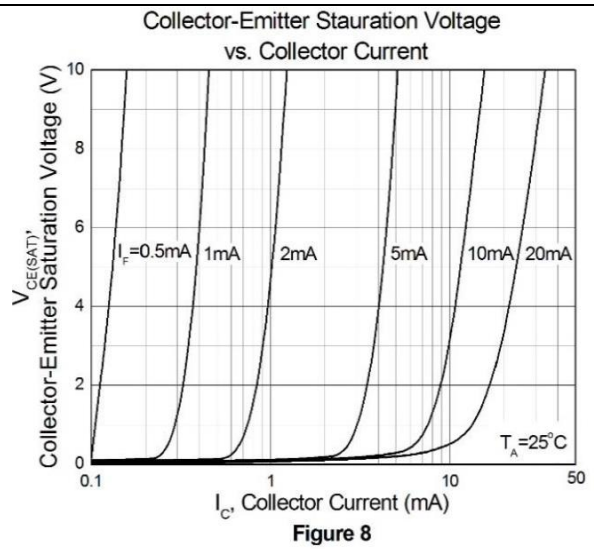


Figure 8

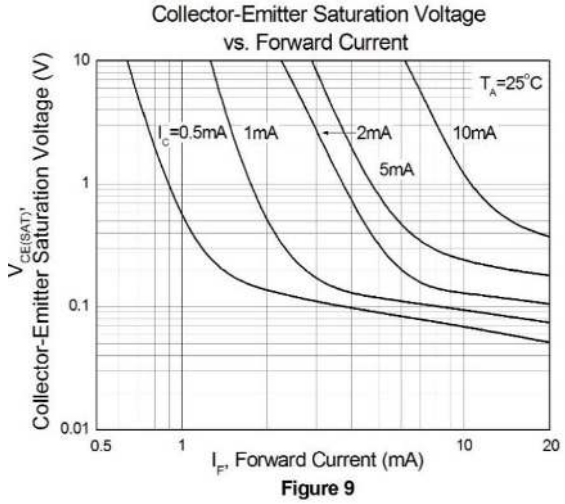


Figure 9

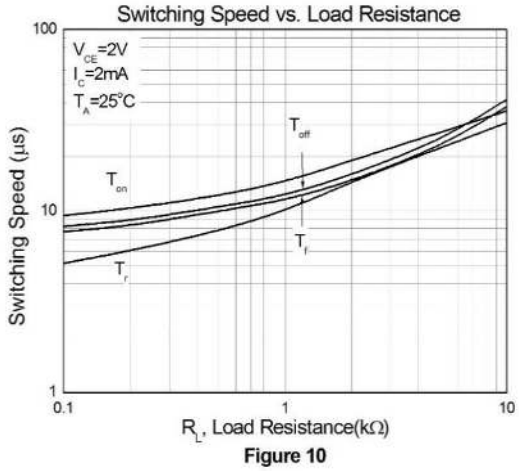


Figure 10

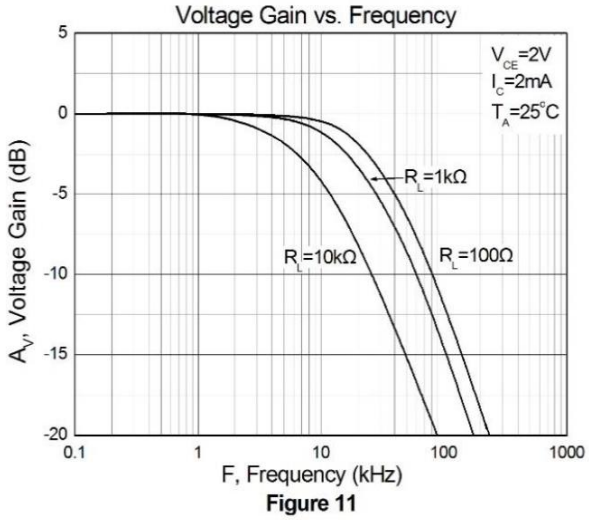


Figure 11

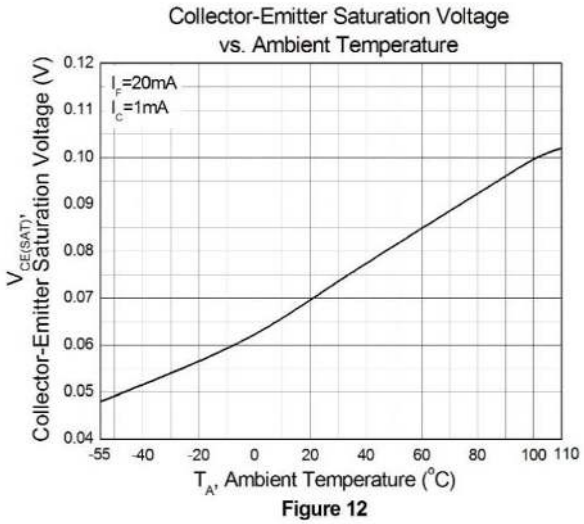
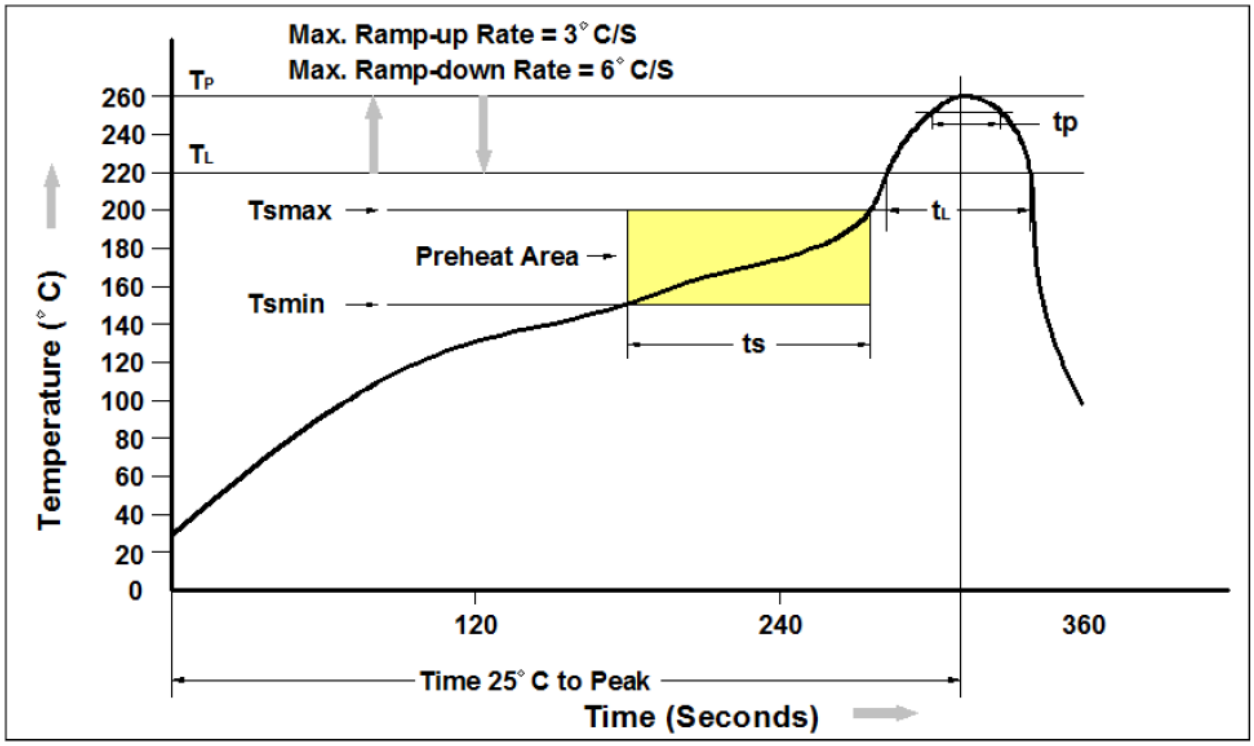
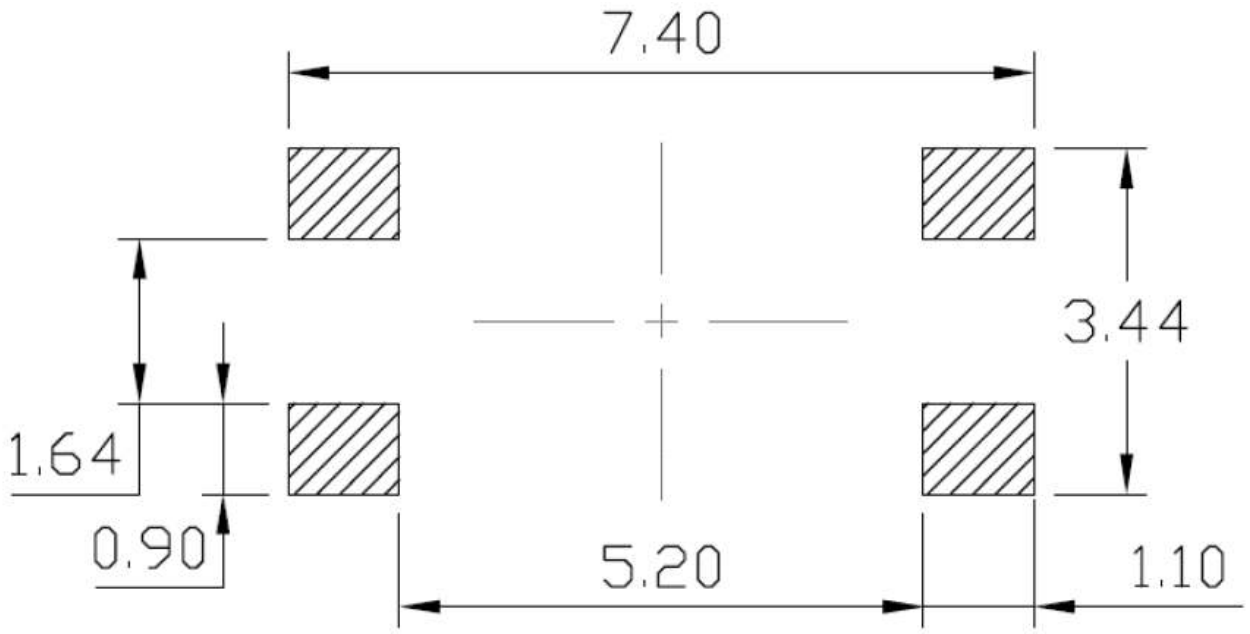


Figure 12

Solder Profile & Footprint



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150℃
Temperature Max. (Tsmax)	200℃
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (t_L to t_P)	3℃/second max.
Liquidous Temperature (T_L)	217℃
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak Body Package Temperature	260℃ +0℃ / -5℃
Time (t_P) within 5℃ of 260℃	30 seconds
Ramp-down Rate (T_P to T_L)	6℃/second max
Time 25℃ to Peak Temperature	8 minutes max.



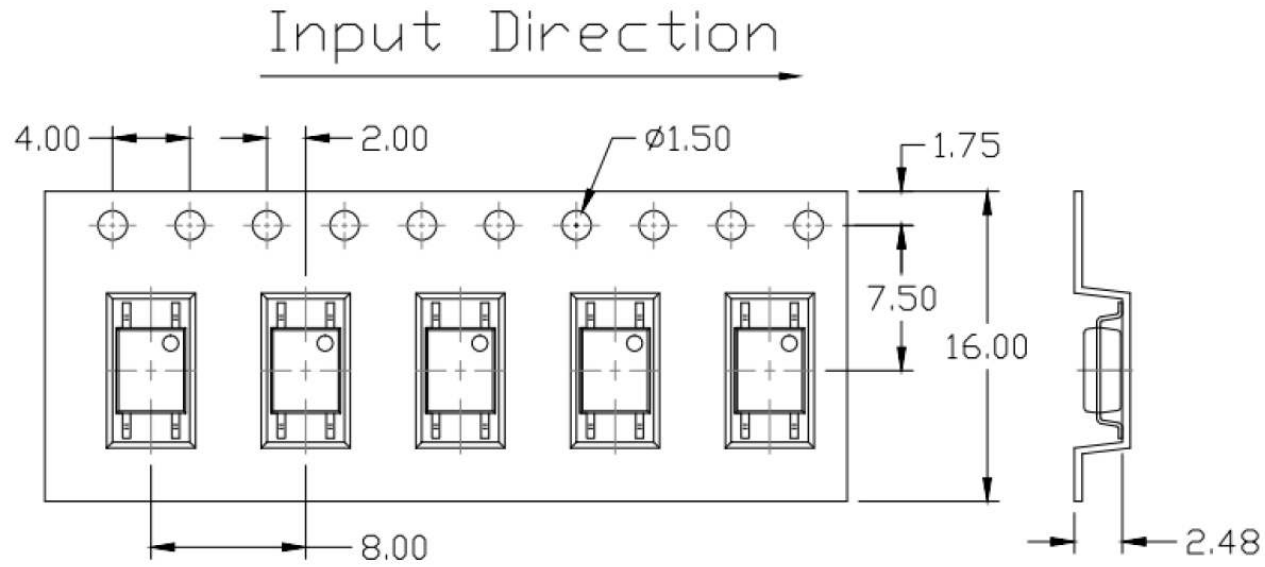
Recommended Solder Footprint for SMD Leadform

Units: mm tolerance: +/- 0.1mm

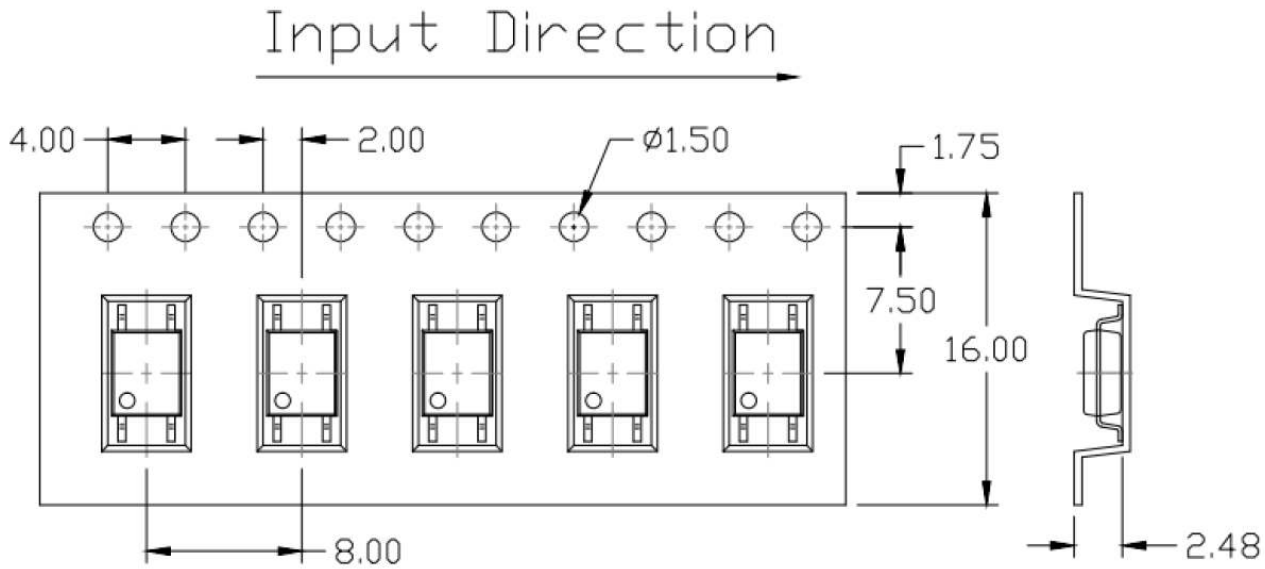
Packing & Labeling

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

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.