



**THE DATASHEET OF
Q817B**



QT-Brightek Optocoupler Series

4-PIN DC Input Optocoupler

Part No.: Q817 Series

Product: Q817 Series	Date: March 09, 2018	Page 1 of 19
	Version# 2.0	

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Introduction

Feature:

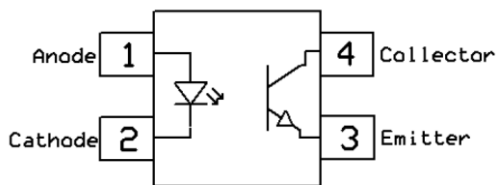
- High isolation voltage between input and output (Viso=5000V rms)
- External creepage distance $\geq 7.5\text{mm}$ (S/SL Type)
- External creepage distance $\geq 8.0\text{mm}$ (SLM Type)
- Operating Temperature up to $110\text{ }^\circ\text{C}$
- Available in Tube or Tape and reel
- Available with standard DIP-4, Gullwing lead bend, SMD lead bend, SMD low profile and SMD Gullwing options.

Certification & Compliance:

- Pb free and RoHS Compliant
- UL (File # E338132)
- VDE (File # 40030457)

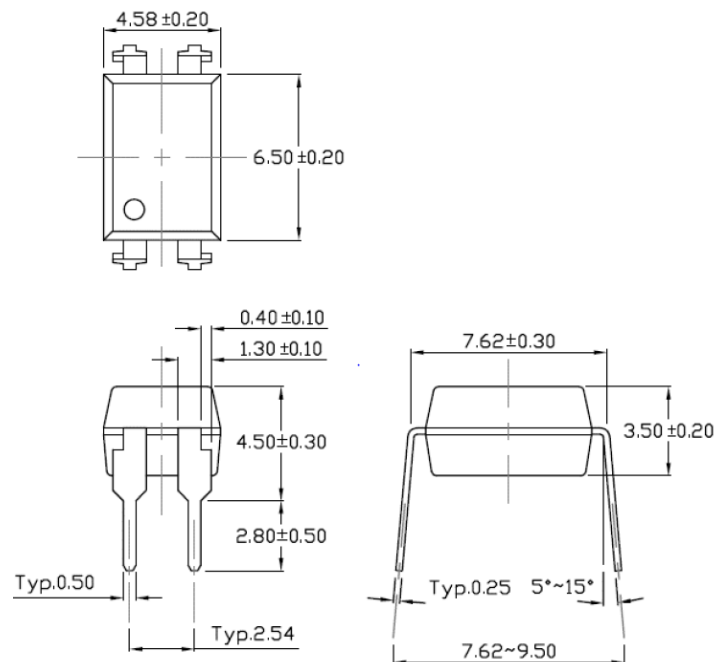


Schematic:

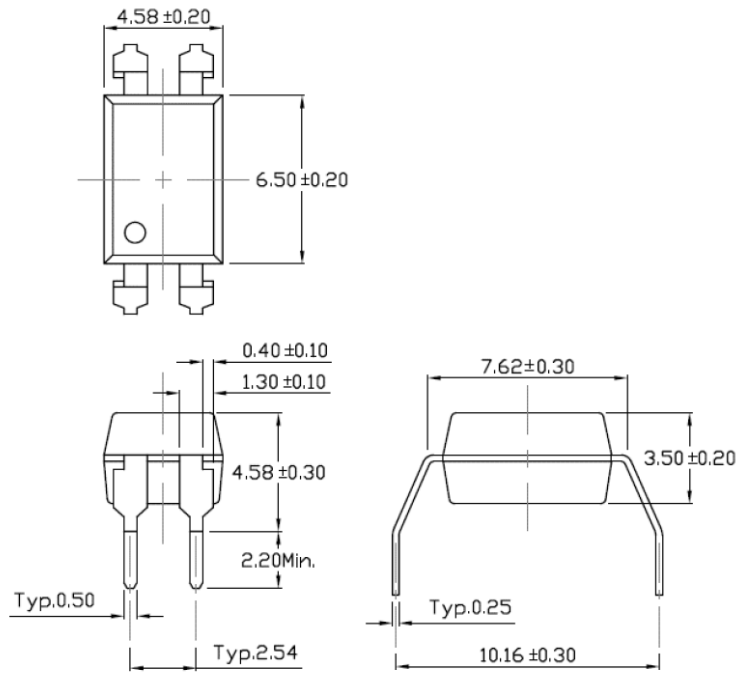


Dimension: (Dot location indicates pin 1)

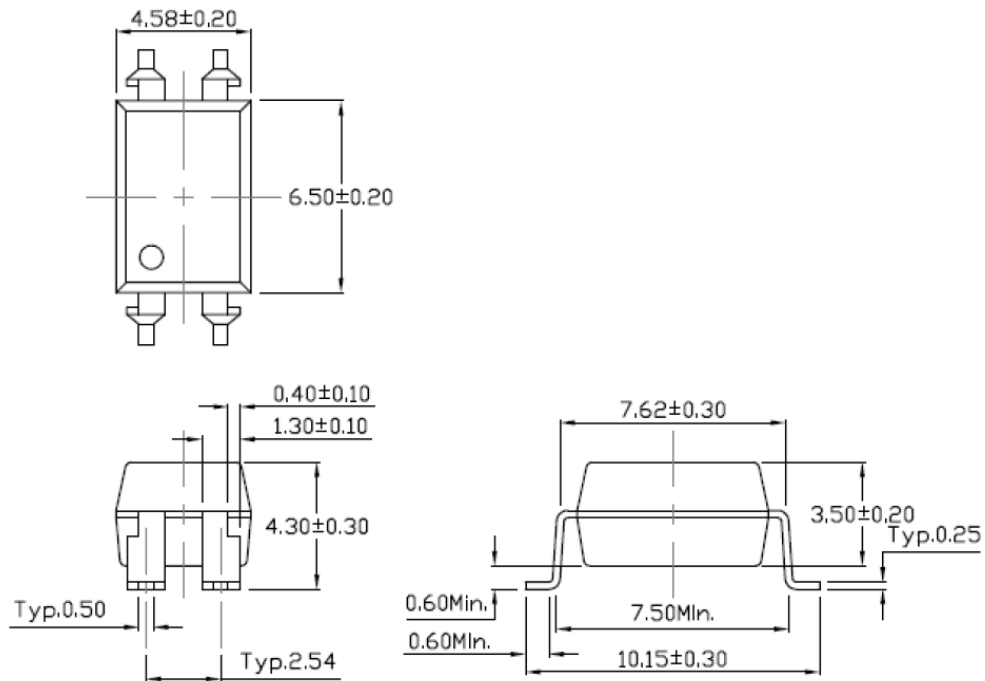
4-Pin DIP Through Hole (Standard):



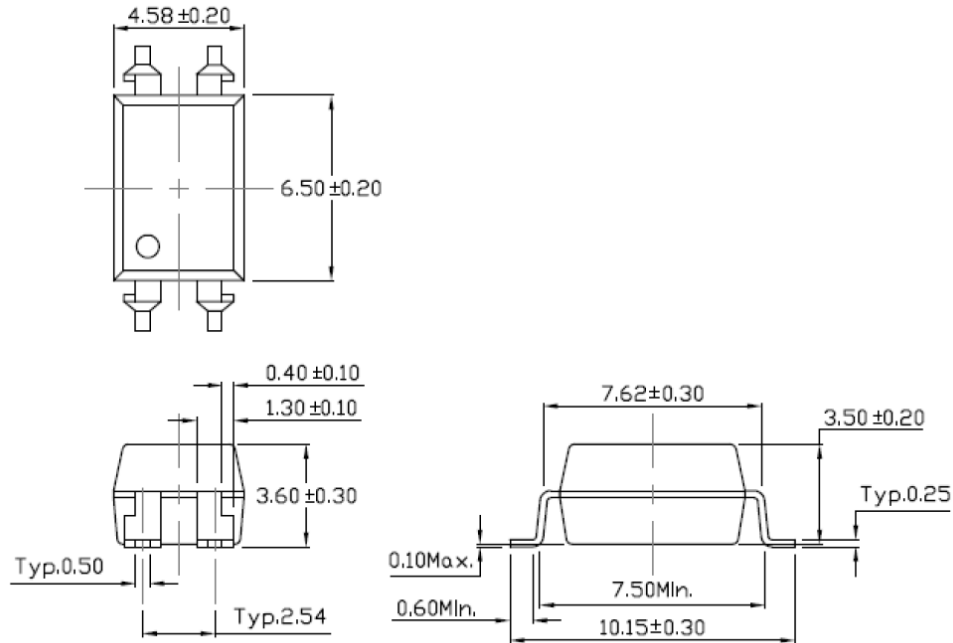
Gullwing (400mil) Lead Bend Through Hole (Option M):



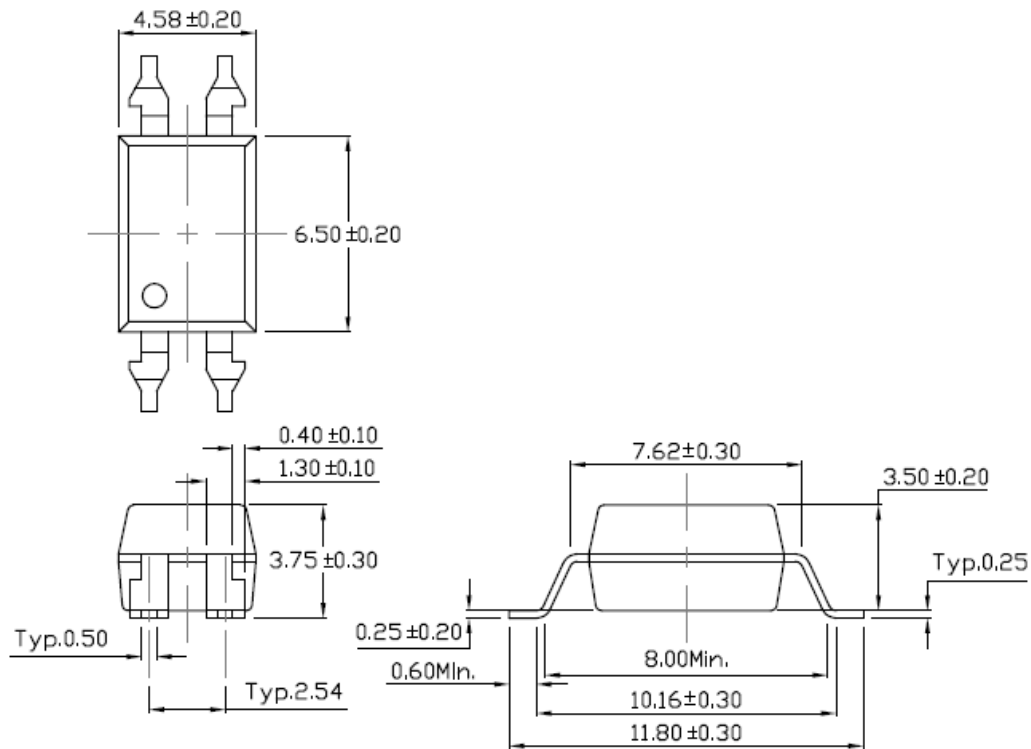
SMD Lead Bend (Option S):



SMD (Low Profile) Bend (Option SL):



SMD (Gullwing) Bend (Option SLM):



All Dimensions are in mm

Absolute Maximum Rating

Symbol	Parameter	Rating	Units
V _{ISO}	Isolation Voltage (AC, 1 minute)	5000	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	60	mA
I _{FP}	Peak Forward Current (≤1us, P.W, 300pps)	1	A
V _R	Reverse Voltage	6	V
P _D	Power Dissipation	100	mW
DETECTOR			
B _{VCEO}	Collector–Emitter Voltage	35	V
B _{VECO}	Emitter-Collector Voltage	6	V
I _C	Continuous Collector Current	50	mA
P _D	Detector Power Dissipation	150	mW

Electrical Characteristic (T_A=25 °C)

Emitter

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V _F	Forward Voltage	Q817	I _F = 10mA	-	1.24	1.4	V
I _R	Reverse Current		V _R = 6V	-	-	5	μA
C _{IN}	Input Capacitance		f = 1MHz	-	10	30	pF

Detector

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
I _{CEO}	Collector-Emitter Dark current	Q817	V _{CE} = 20V, I _F = 0mA	-	-	100	nA
B _{VCEO}	Collector-Emitter Breakdown Voltage		I _C = 100 μA	35	-	-	V
B _{VECO}	Emitter-Collector Breakdown voltage		I _E = 100 μA	6	-	-	V

DC Transfer Characteristic

Symbol	Characteristic	Device	Bin	Test Condition	Range			Unit
					Min	Typ	Max	
CTR	Current Transfer Ratio	Q817	-	I _F = 5mA, V _{CE} = 5V	50	-	600	%
			A		80	-	160	
			B		130	-	260	
			C		200	-	400	
			D		300	-	600	
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	-	0.25	1	pF

AC Characteristic

Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
t _r	Rise Time	V _{CE} = 2V, I _C = 2mA, R _L = 100Ω	-	6	18	μs
t _f	Fall Time		-	8	18	

Characteristic Curves

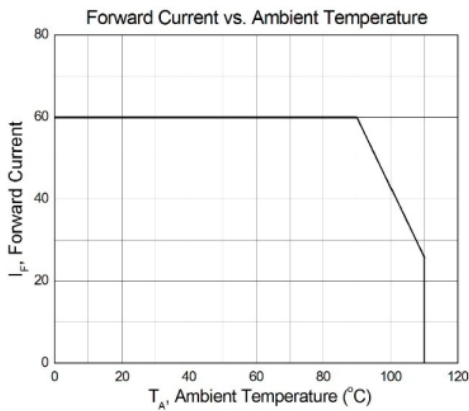


Figure 1

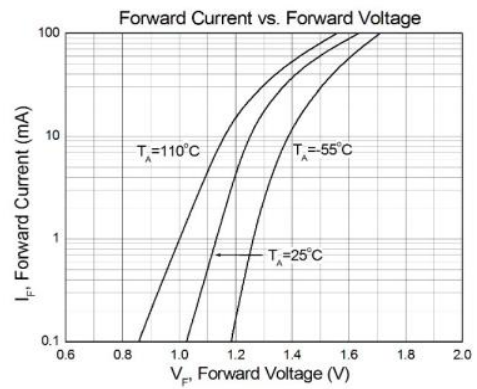


Figure 2

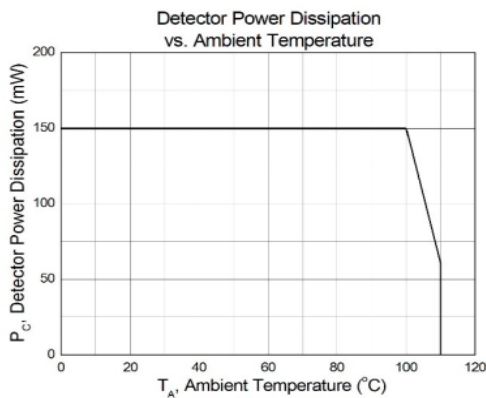


Figure 3

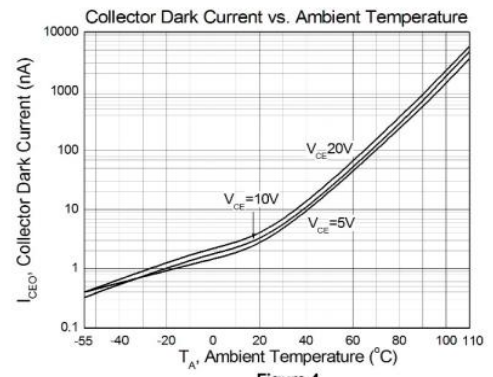


Figure 4

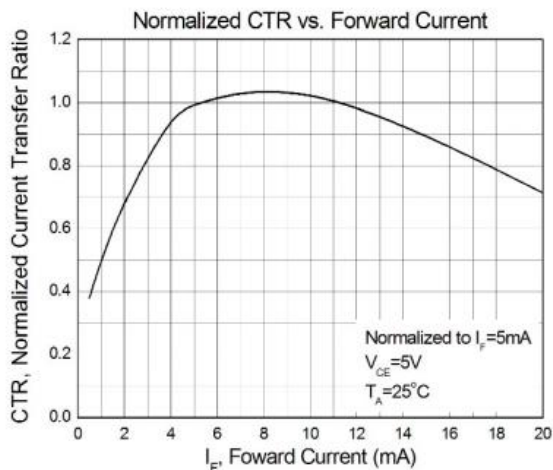


Figure 5

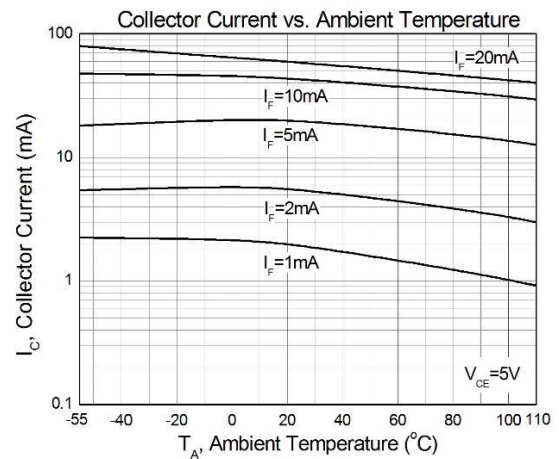
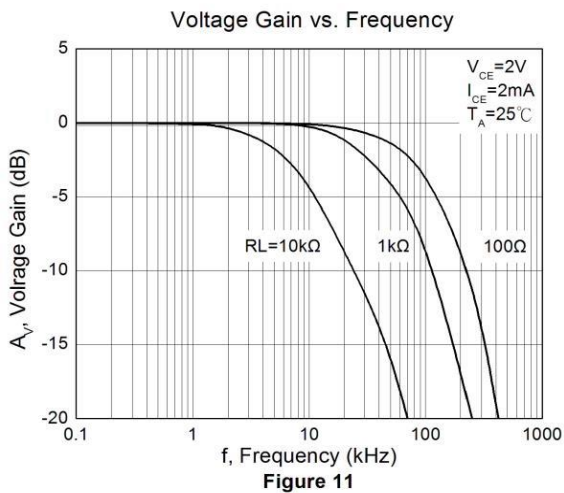
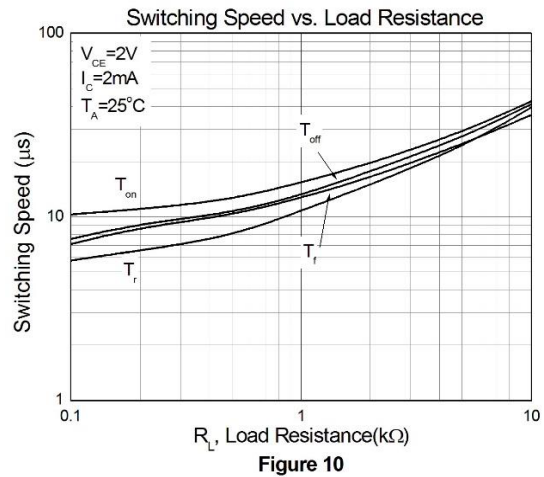
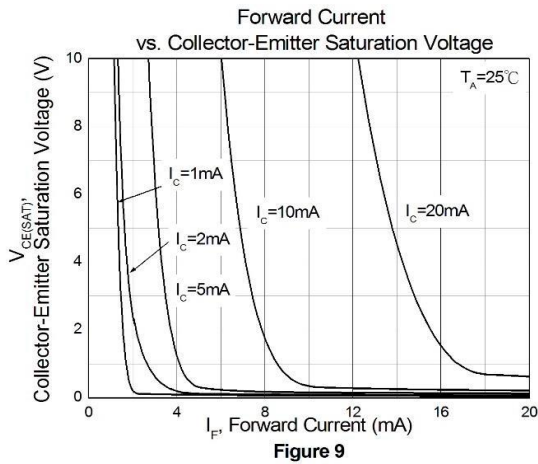
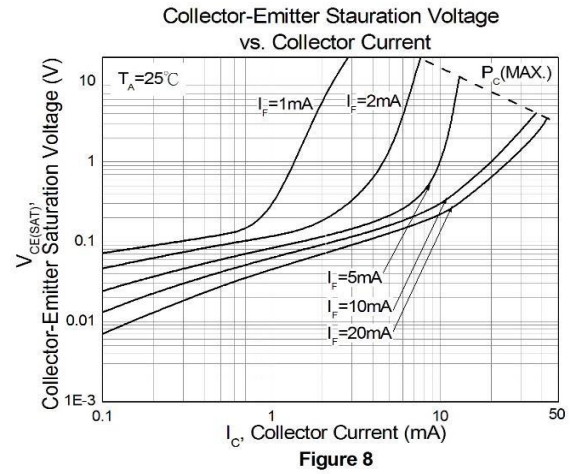
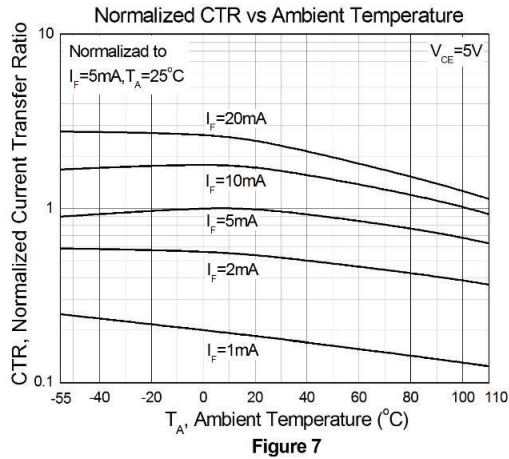
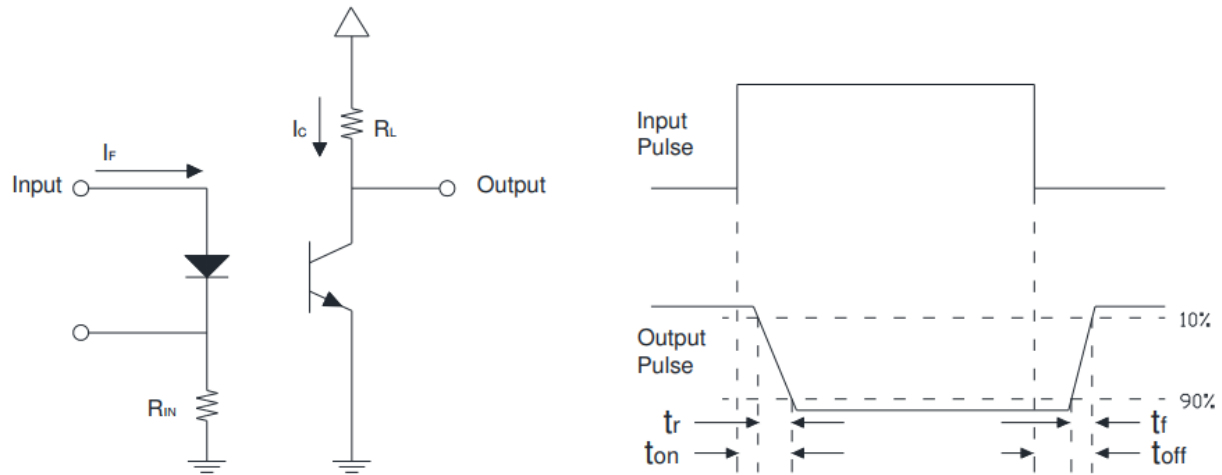
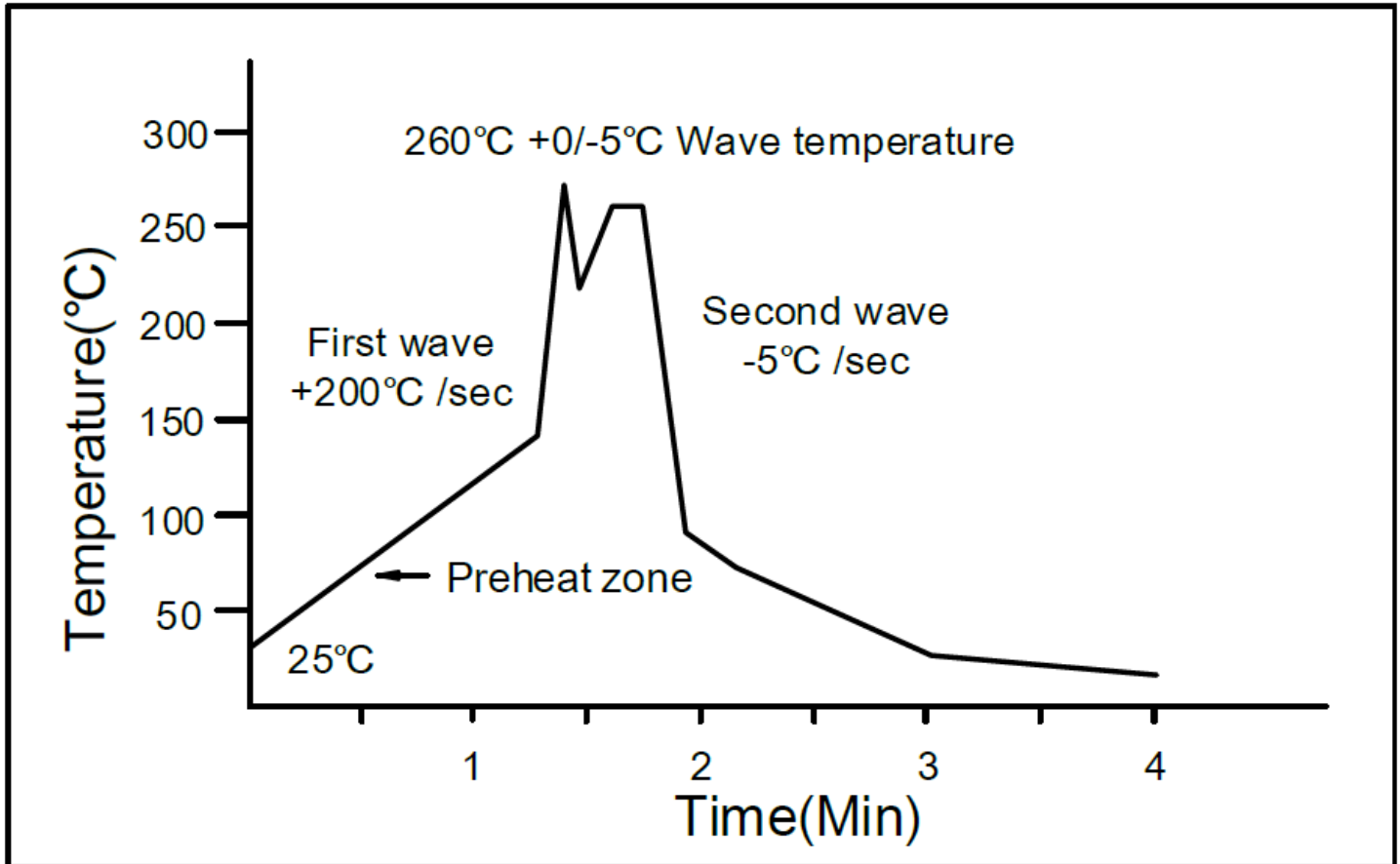


Figure 6



Test Circuit for Response Time



Solder Profile & Footprint**Recommended Wave Soldering Profile**

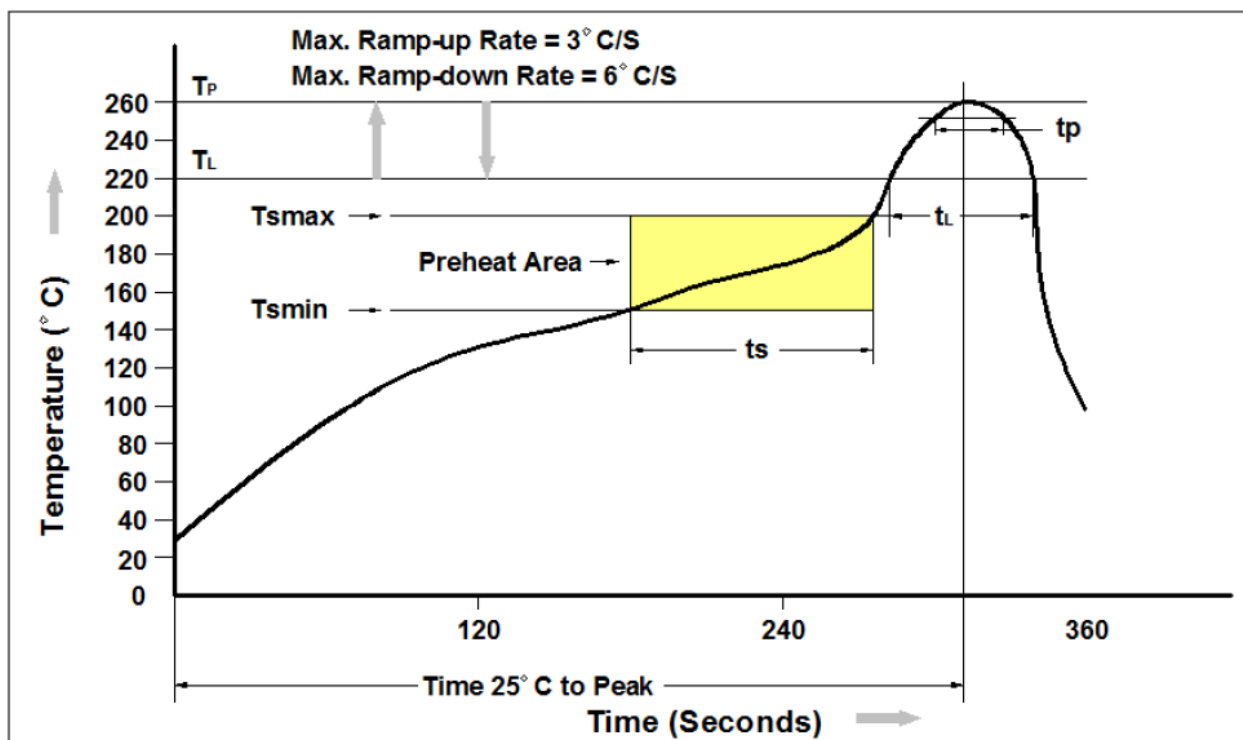
Temperature: 260 +0/-5 °C

Time: 10 Sec

Preheat temperature: 25 to 140 °C

Preheat time: 30 to 80 sec.

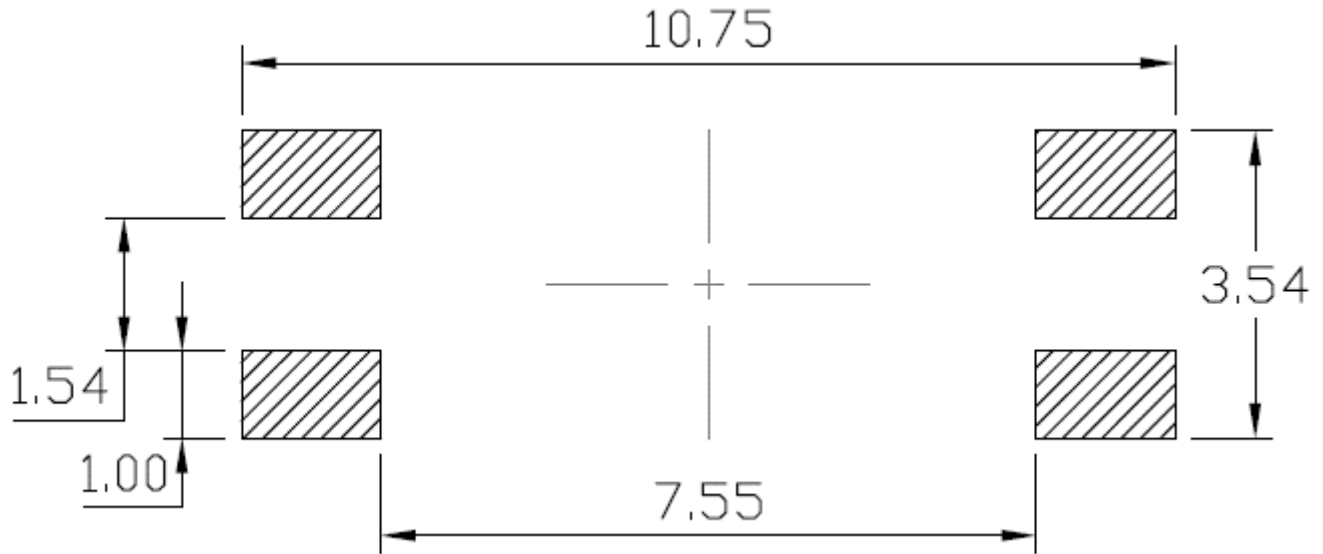
Recommended Reflow Soldering Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T Amin)	150 °C
Temperature Max. (Tsmax)	200 °C
Time (ts) from (T Amin to Tsmax)	60-120 seconds
Ramp-up Rate (tL to tp)	3°C/second max.
Liquidous Temperature (TL)	217 °C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (tp) within 5 °C of 260 °C	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25 °C to Peak Temperature	8 minutes max.

SMD Lead Bend (Option S) & SMD Low Profile Bend (Option SL):

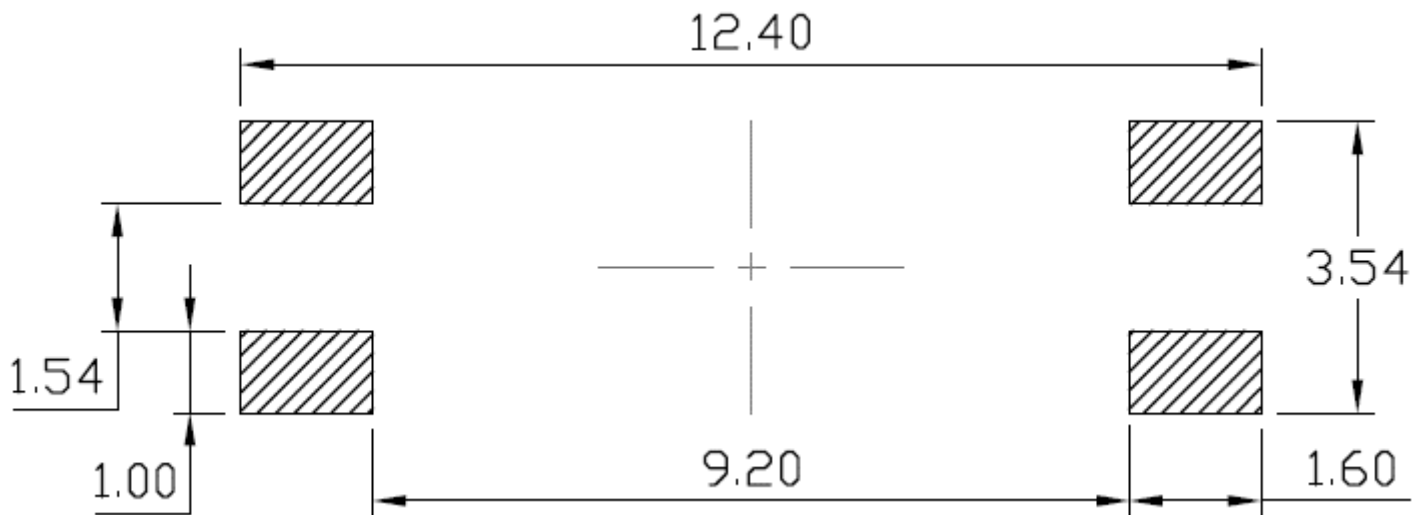
Recommended Solder Footprint for SMD



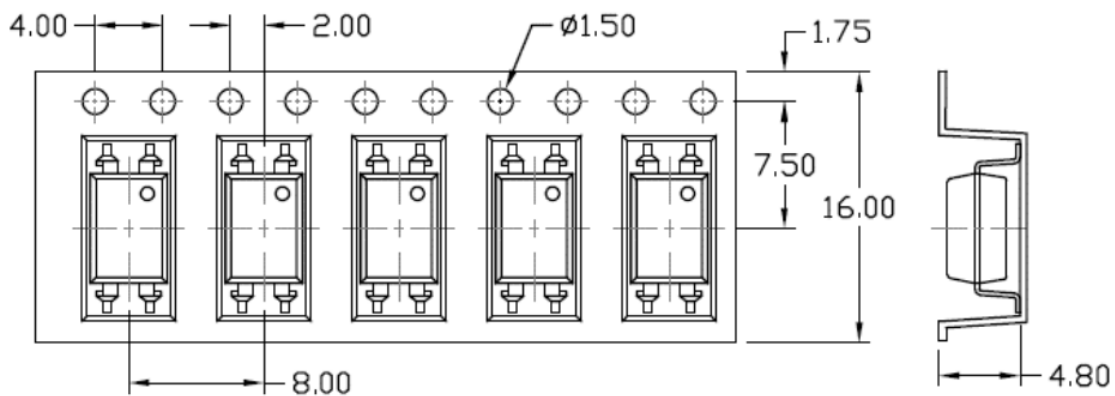
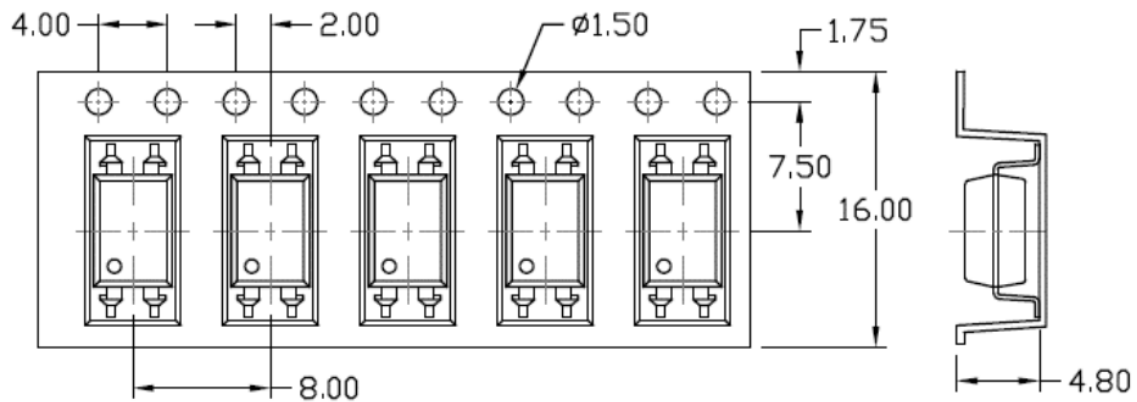
Units: mm

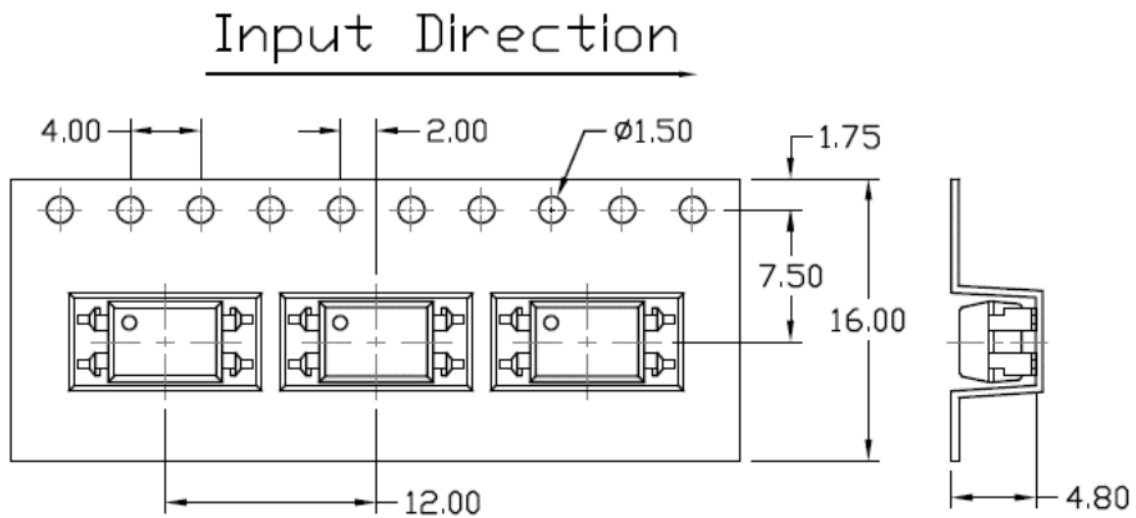
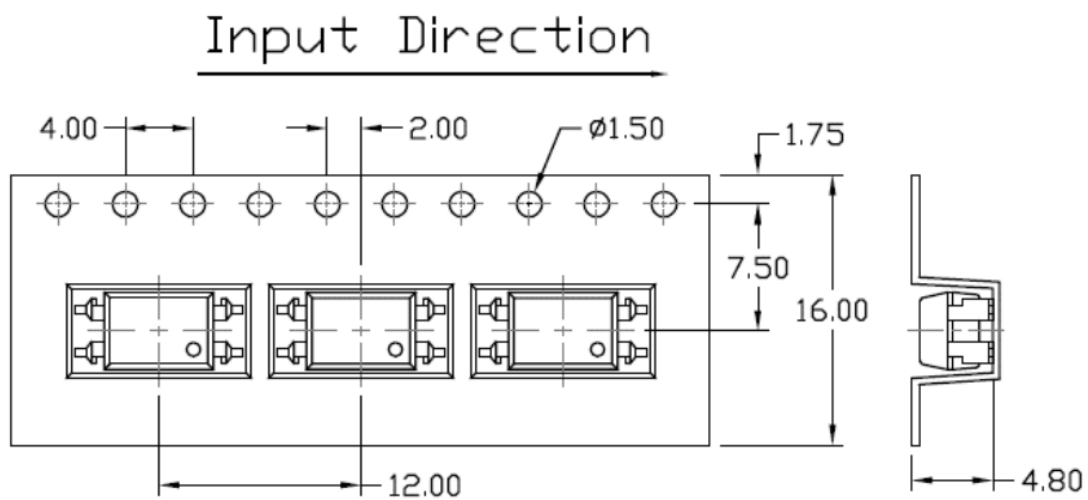
SMD (Gullwing) Bend (Option SLM):

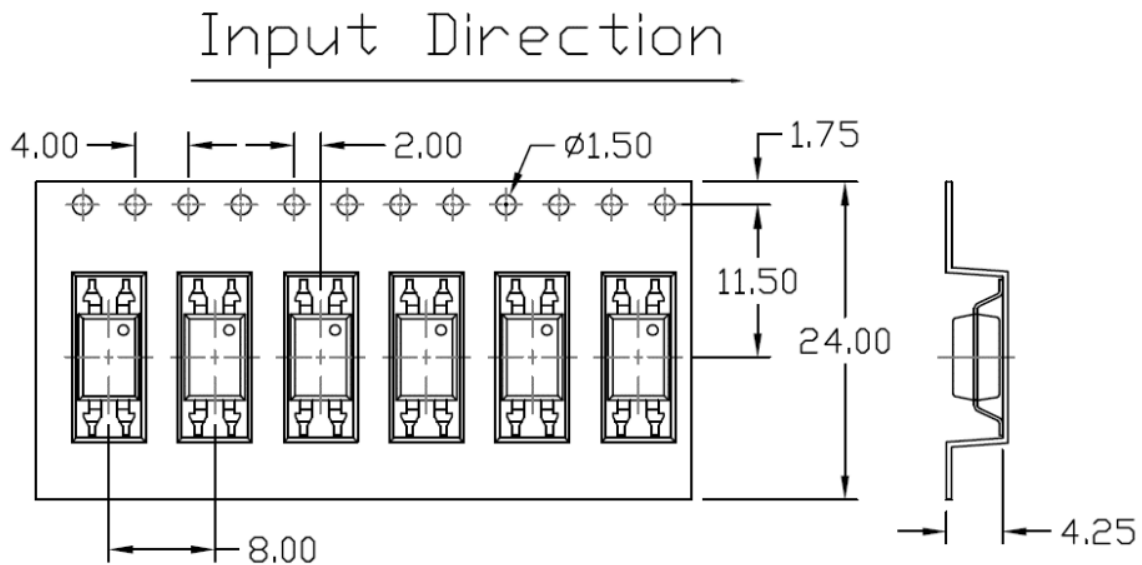
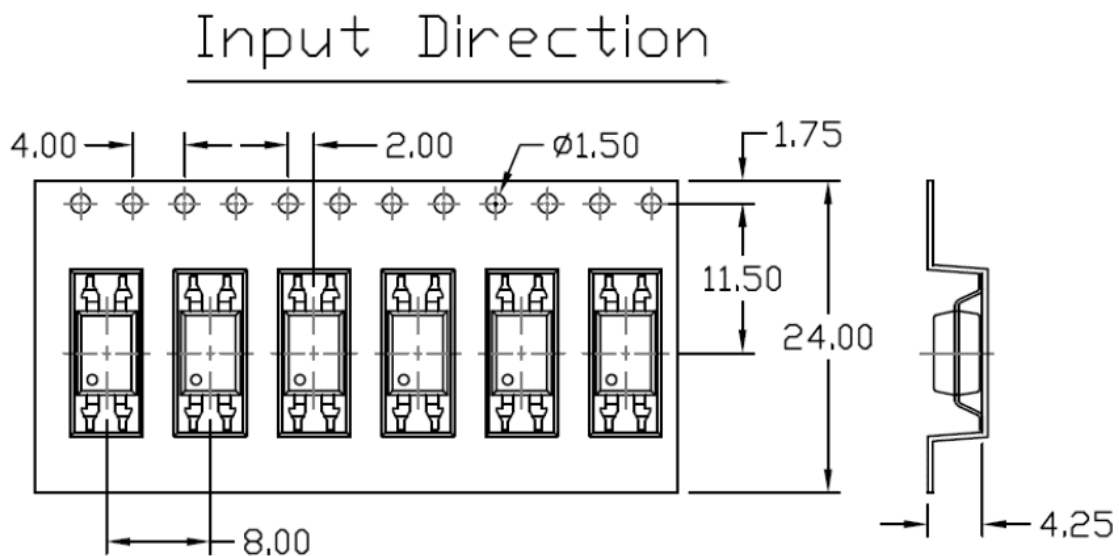
Recommended Solder Footprint for SMD

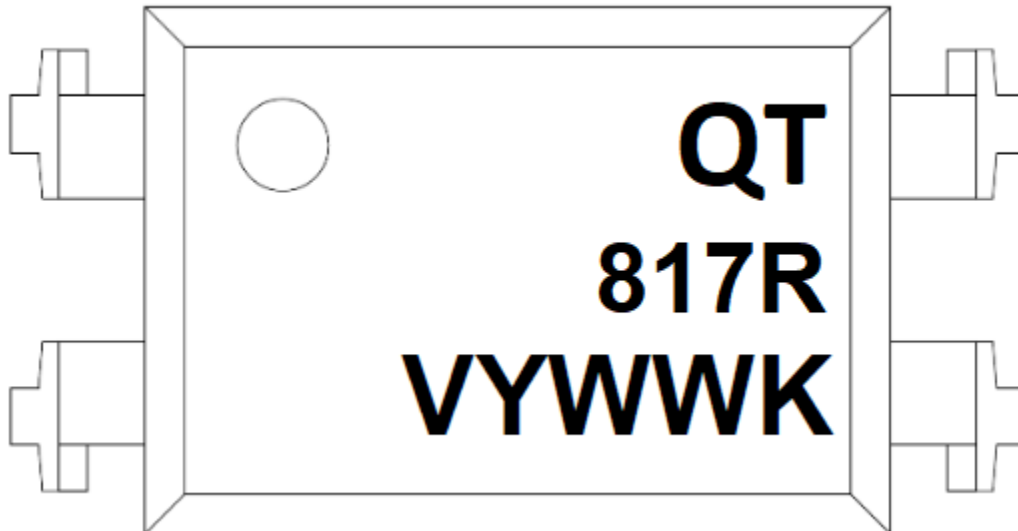


Units: mm

Packing & Labeling**ST & SLT Options****Option 1: ST1 & SLT1**Input Direction
→**Option 2: ST2 & SLT2**Input Direction
→

Option 3: ST3 & SLT3**Option 4: ST4 & SLT4**

SLM Option**Option 1: SLMT1****Option 2: SLMT2**

Device Marking**Example**

QT = QT-Brightek Corporation

817 = Part Number

R= CTR Rank

V = VDE Option

Y = Year

WW = Week

K= Manufacturing code

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Ordering Information

Q817XVYZ

X = Part number (X=A, B, C, D, or None)

V = VDE option (V or None)

Y = Lead form option (S, SL, M, SLM or none)

Z=Tape and reel option (T1, T2, T3, T4 or none)

Option	Description	Quantity
None	Standard 4-Pin DIP	100 pcs/tube
M	Gullwing Lead Bend	100 pcs/tube
ST1	Surface Mount Lead Forming – with Option 1 Taping	1500 pcs/ reel
ST2	Surface Mount Lead Forming – with Option 2 Taping	1500 pcs/ reel
ST3	Surface Mount Lead Forming – with Option 3 Taping	1000 pcs/ reel
ST4	Surface Mount Lead Forming – with Option 4 Taping	1000 pcs/ reel
SLT1	SMD (Low Profile) Lead Forming – with Option 1 Taping	1500 pcs/ reel
SLT2	SMD (Low Profile) Lead Forming – with Option 2 Taping	1500 pcs/ reel
SLT3	SMD (Low Profile) Lead Forming – with Option 3 Taping	1000 pcs/ reel
SLT4	SMD (Low Profile) Lead Forming – with Option 4 Taping	1000 pcs/ reel
SLMT1	SMD (Gullwing) Lead Forming – with Option 1 Taping	1500 pcs/ reel
SLMT2	SMD (Gullwing) Lead Forming – with Option 2 Taping	1500 pcs/ reel

Revision History

Description:	Revision #	Revision Date
Initial release of	1.0	01/04/2018
Add CTR rank binning option and VDE number	1.1	7/28/2010
Feature, certification & compliance and ordering information updates	1.2	02/01/2011
Update to new format	1.3	12/13/2012
Add carton/tube information to packing spec	1.4	12/18/2012
Add new bin option	1.5	11/04/2016
Update Spec and ordering options	2.0	03/09/2018

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