

QT-Brightek Optocoupler Series

4-PIN DC Input Phototransistor Optocoupler

Part No.: QT851



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Introduction

Feature:

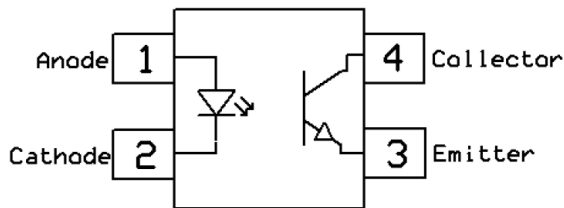
- High Isolation voltage between input and output (Viso = 5000V rms)
- Creepage distance $\geq 7.5\text{mm}$ (S/SL Type)
- Creepage distance $\geq 8.0\text{mm}$ (SLM Type)
- Operating Temperature up to $100\text{ }^\circ\text{C}$
- Available in Tube or Tape and reel
- Available with standard DIP-4, Gullwing lead bend, SMD lead bend, SMD low profile and SMD Gullwing options.

Certification & Compliance:

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

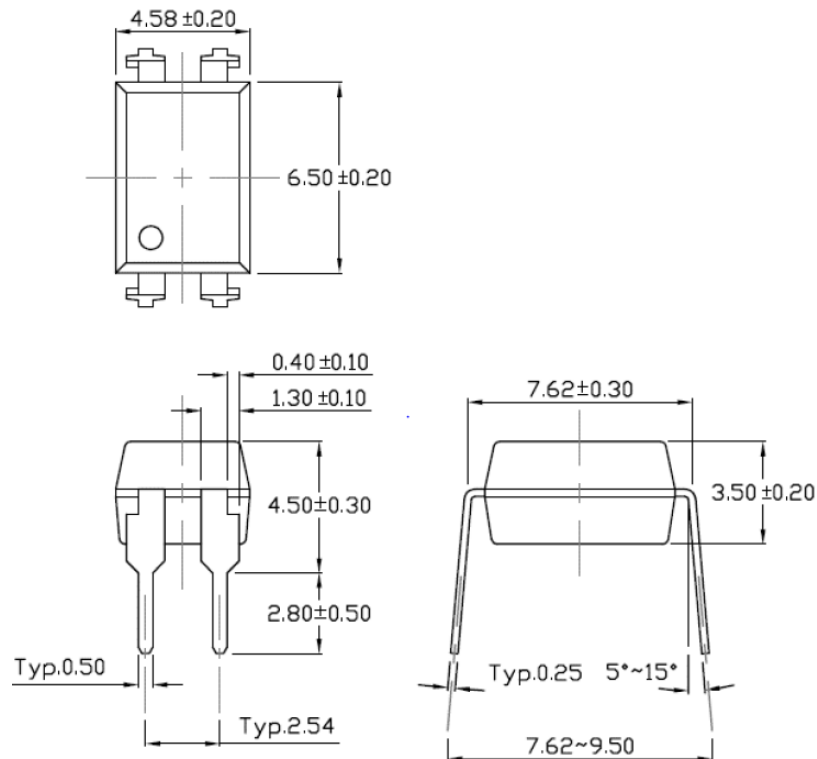


Schematic:

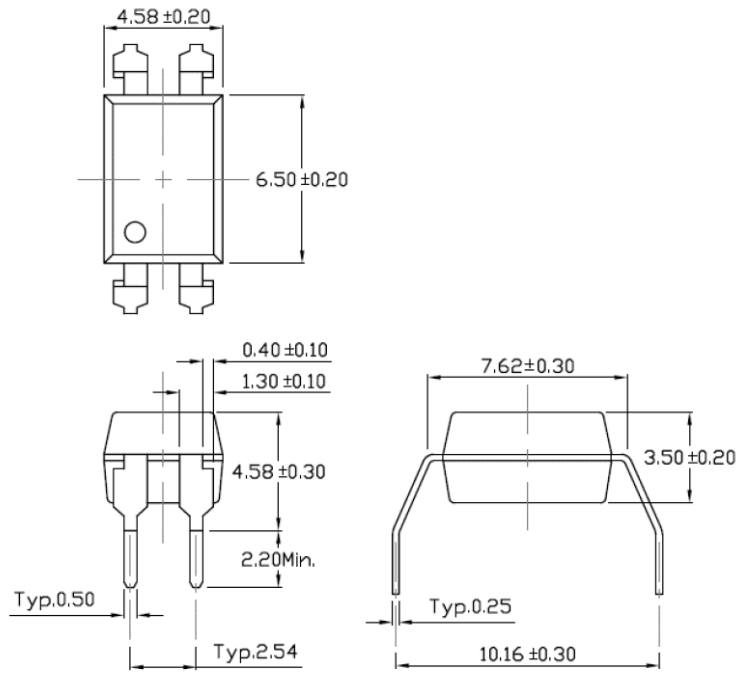


Dimension: (Dot location indicates pin 1)

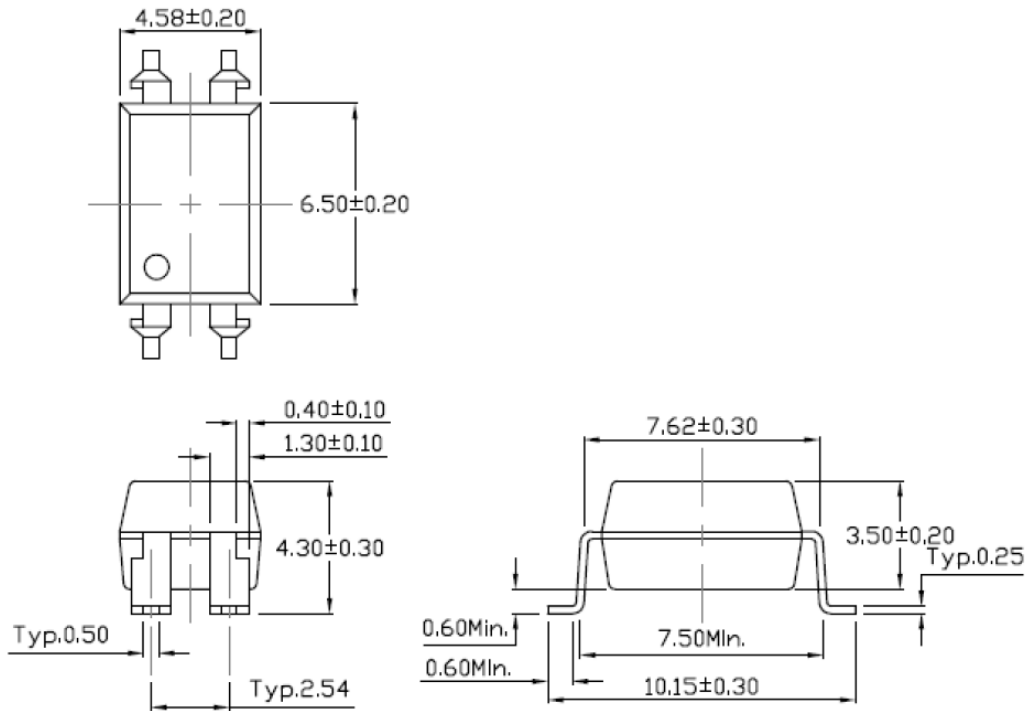
4-Pin Dip (standard):



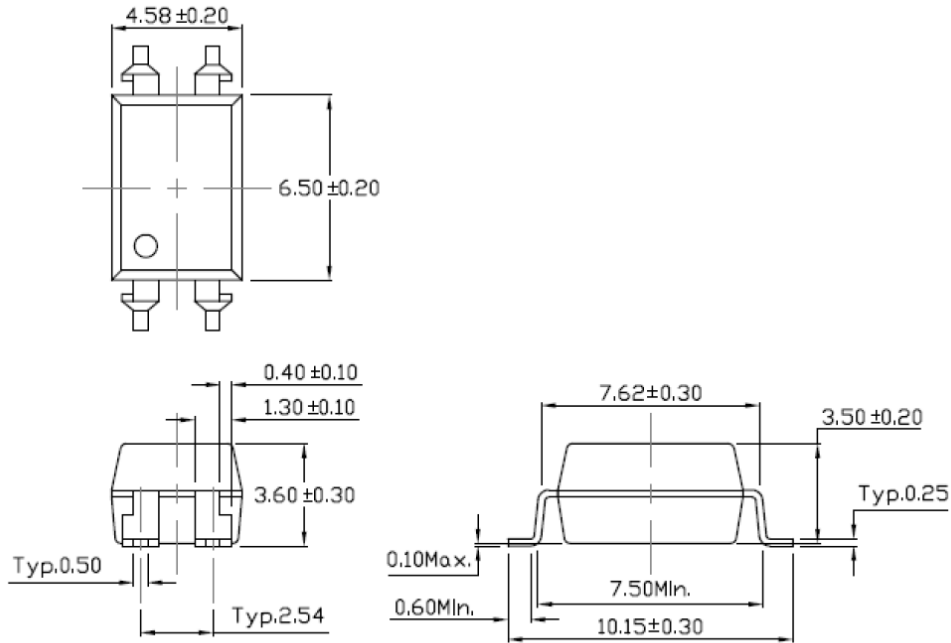
Gullwing (400mil) lead bend (Option M):



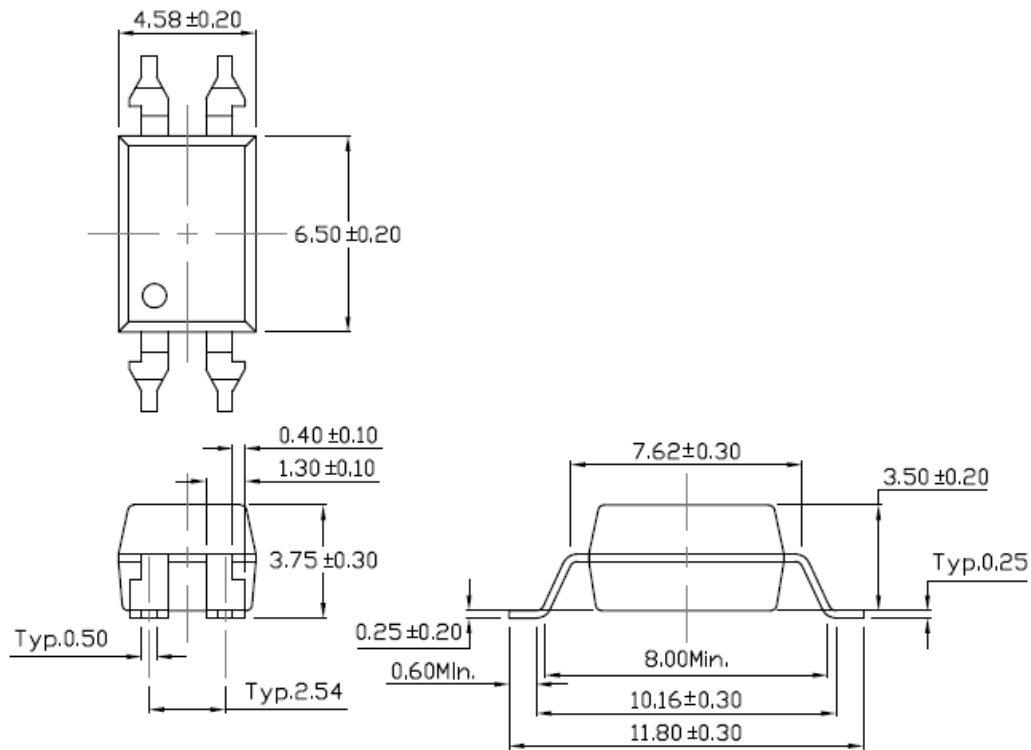
SMD lead bend (Option S):



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 ~ 100	°C
T _{SOL}	Lead Solder Temperature	260 for 10 sec	°C
P _{TOT}	Total Power Dissipation	260	mW
EMITTER			
I _F	Continuous Forward Current	80	mA
I _{FP}	Peak Forward Current (≤ 1us, 300pps)	1	A
V _R	Reverse Voltage	6	V
P _D	Power Dissipation	150	mW
DETECTOR			
B _{VCEO}	Collector–Emitter Breakdown Voltage	350	V
B _{VECO}	Emitter-Collector Breakdown Voltage	7	V
I _C	Continuous Collector Current	100	mA
P _C	Collector Power Dissipation	300	mW

Electrical Characteristic (T_A=25 °C)

Emitter

Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
V _F	Forward Voltage	I _F = 10mA	-	1.2	1.4	V
I _R	Reverse Current	V _R = 6V	-	-	10	μA
C _{IN}	Input Capacitance	f = 1MHz	-	30	-	pF

Detector

Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
I _{CEO}	Collector-Emitter Dark current	V _{CE} = 20V, I _F = 0mA	-	-	100	nA
BV _{CEO}	Collector-Emitter breakdown voltage	I _C = 100 μA	350	-	-	V
BV _{ECO}	Emitter-Collector breakdown voltage	I _E = 100 μA	7	-	-	V

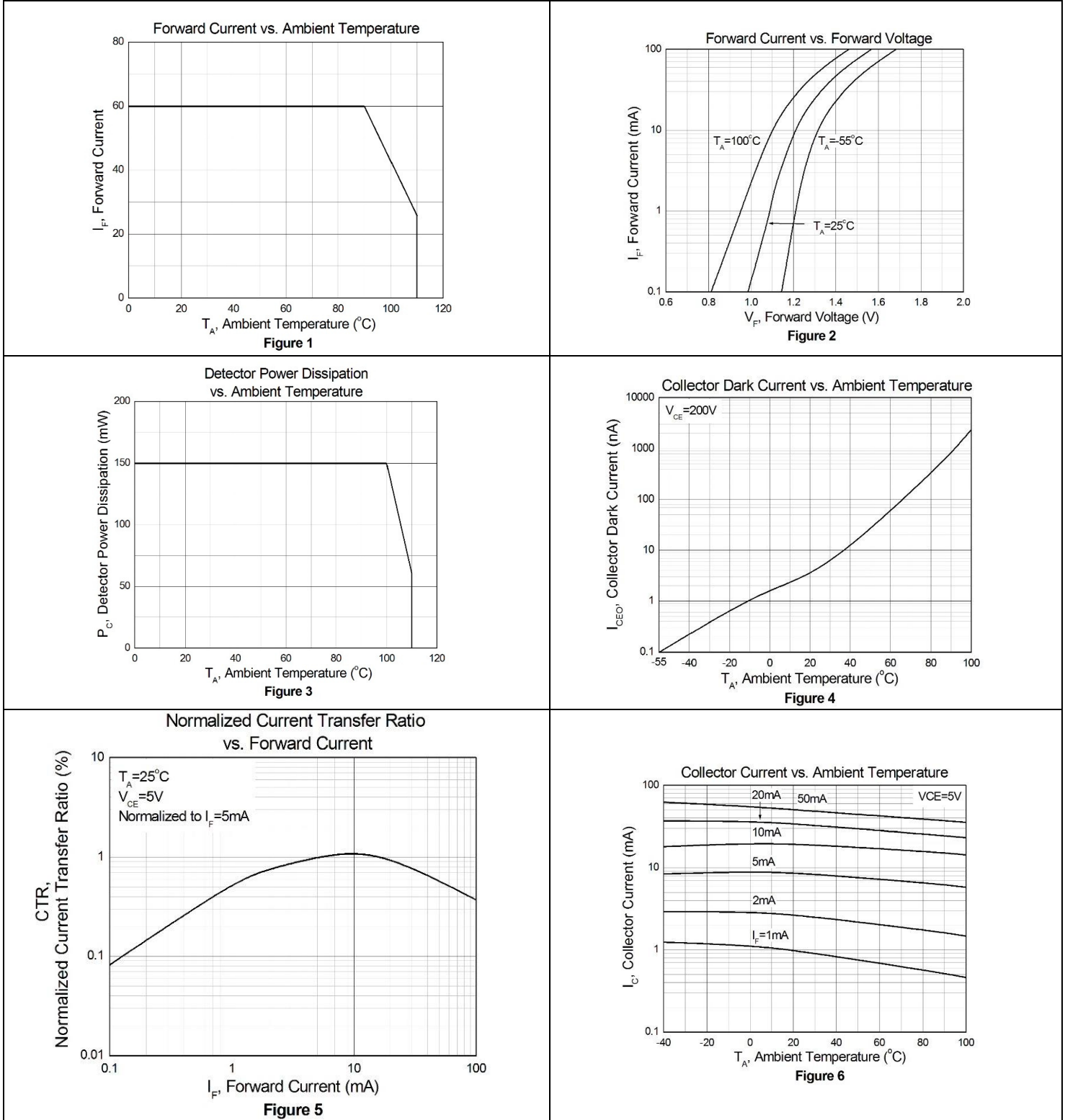
DC Transfer Characteristic

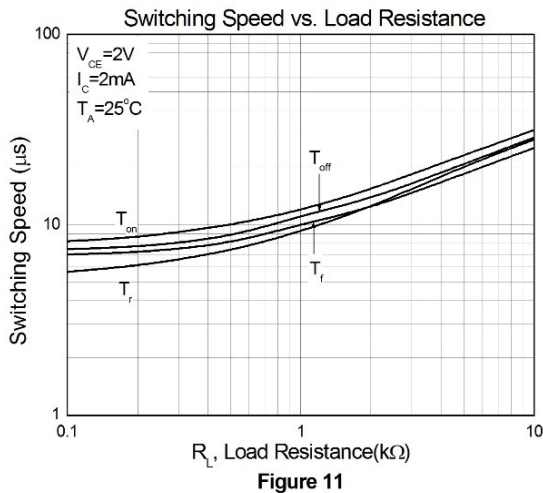
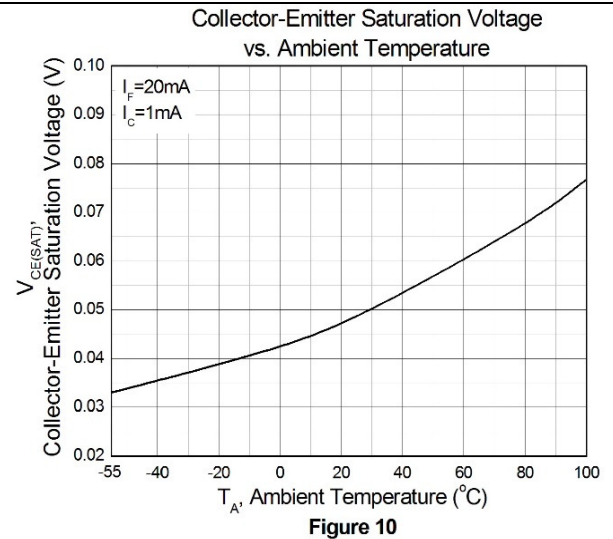
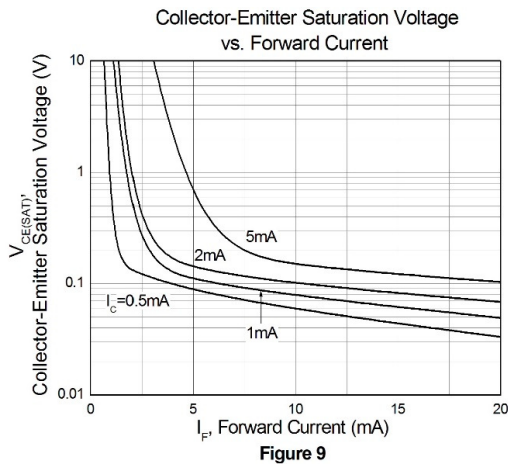
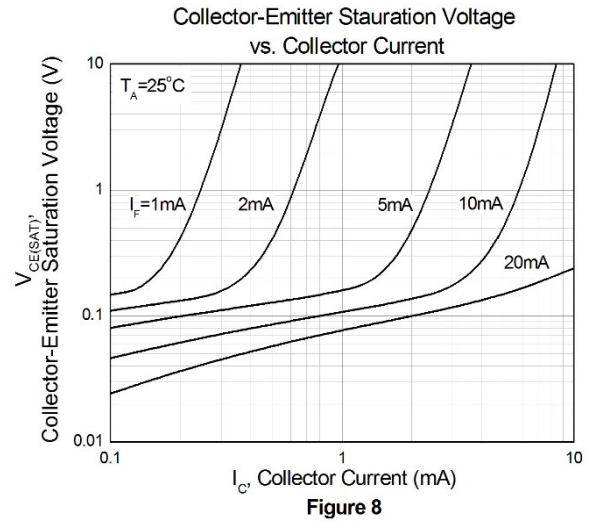
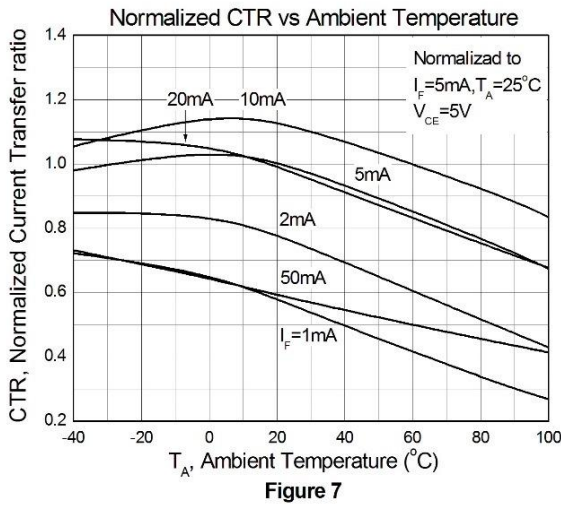
Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
CTR	Current Transfer Ratio	I _F = 5mA, V _{CE} = 5V	50	-	600	%
V _{CE(Sat)}	Collector- Emitter saturation voltage	I _F = 20mA, I _C = 1mA	-	-	0.4	V
R _{IO}	Isolation Resistance	V _{IO} = 500V _{DC}	5X10 ¹⁰	-	-	Ω
C _{IO}	Isolation Capacitance	f = 1MHz	-	0.5	1.0	pF

AC Characteristic

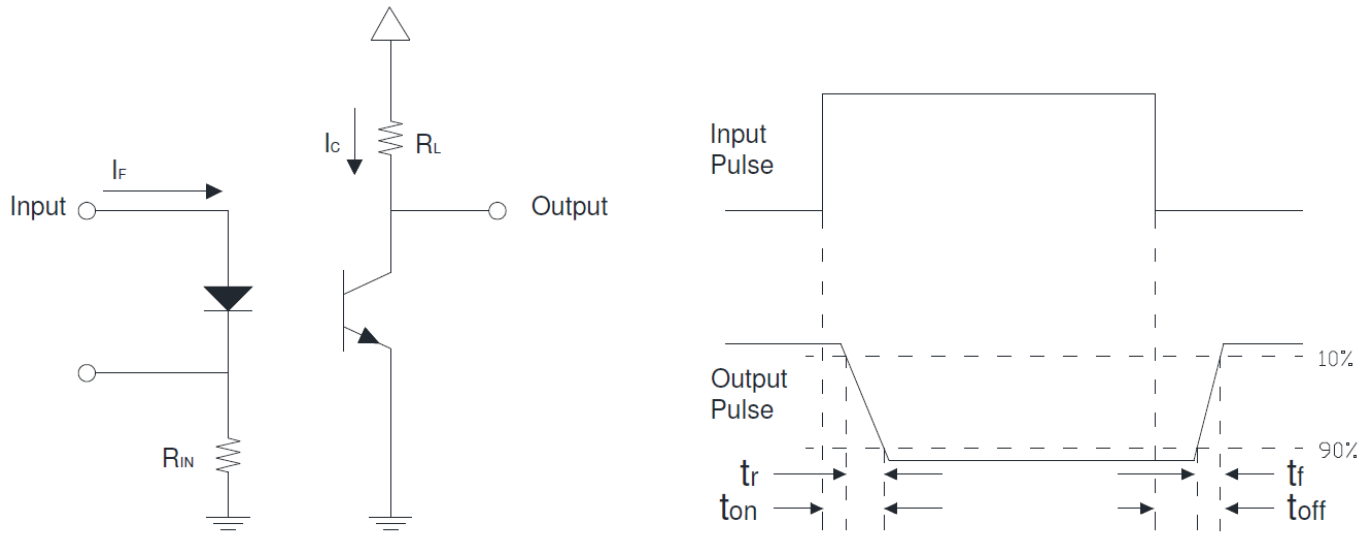
Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
t _r	Rise time	V _{CE} = 2V, I _C = 2mA, R _L = 100Ω	-	6	-	μs
t _f	Fall time		-	8	-	

Characteristic Curves





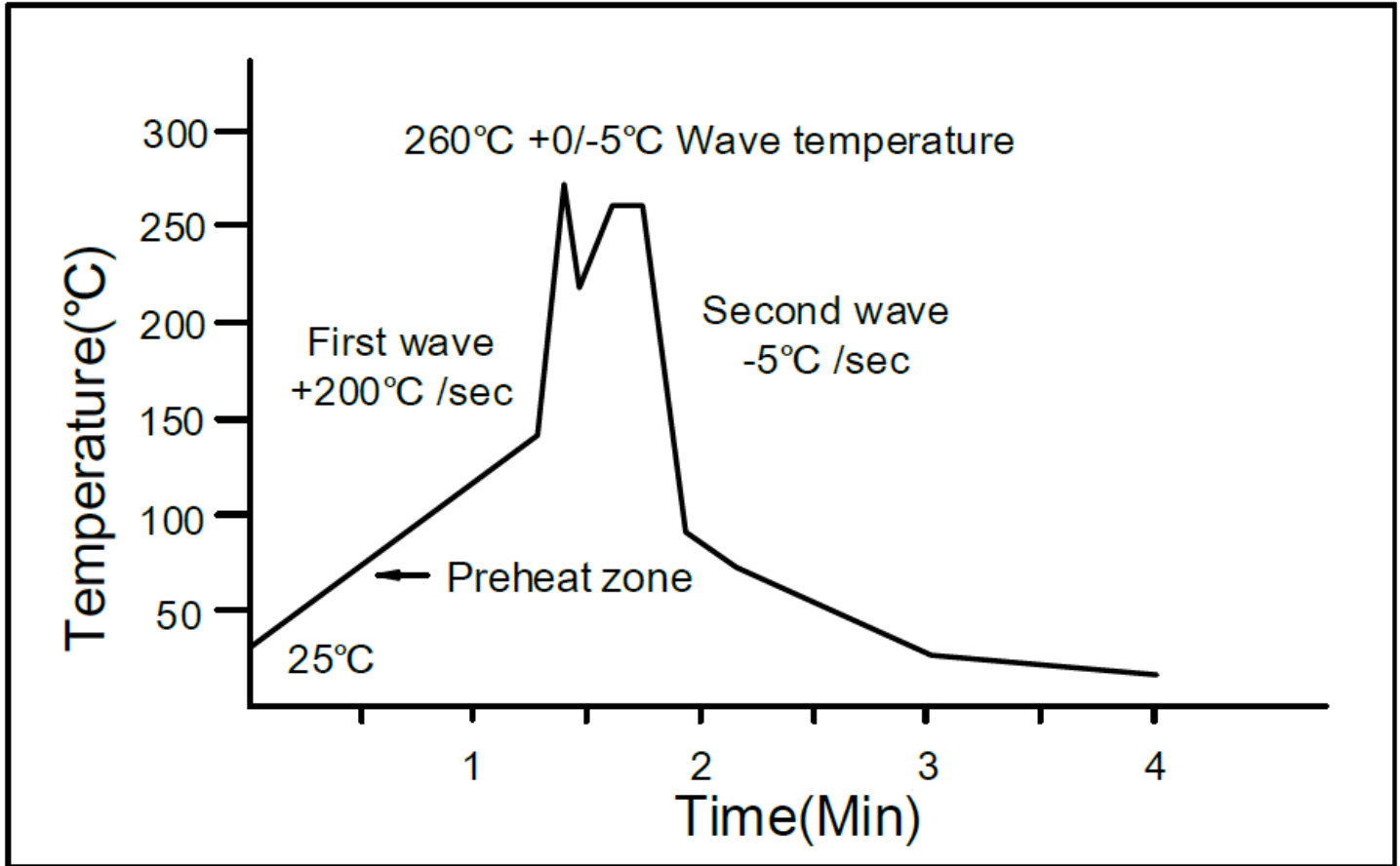
Test Circuit for Response Time



Switching Time Test Circuits

Solder Profile & Footprint

Wave soldering



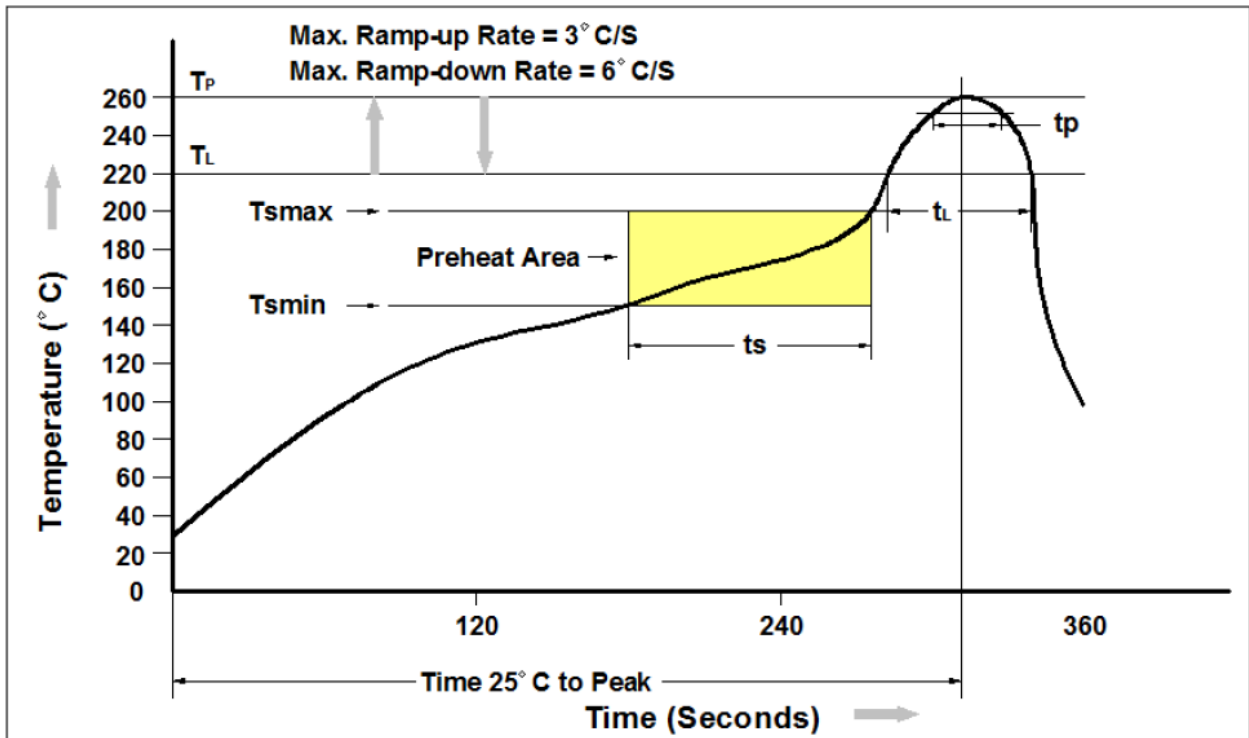
Temperature: 260 +0/-5 °C

Time: 10 Sec

Preheat temperature: 25 to 140 °C

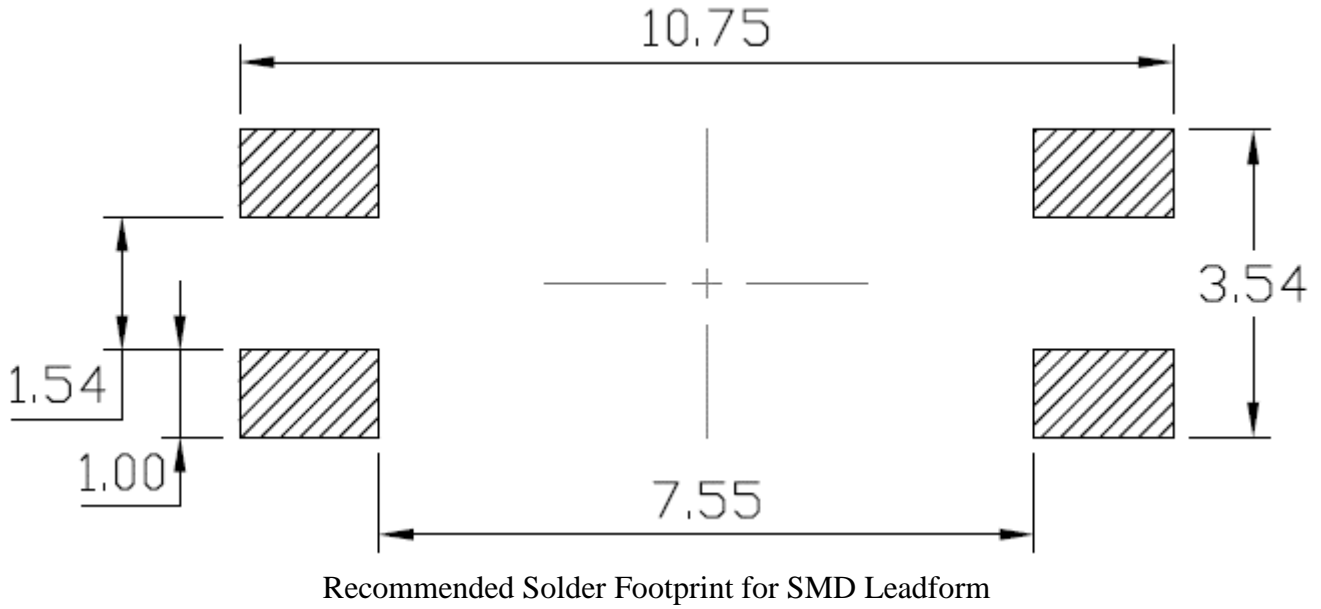
Preheat time: 30 to 80 sec.

Reflow soldering



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.

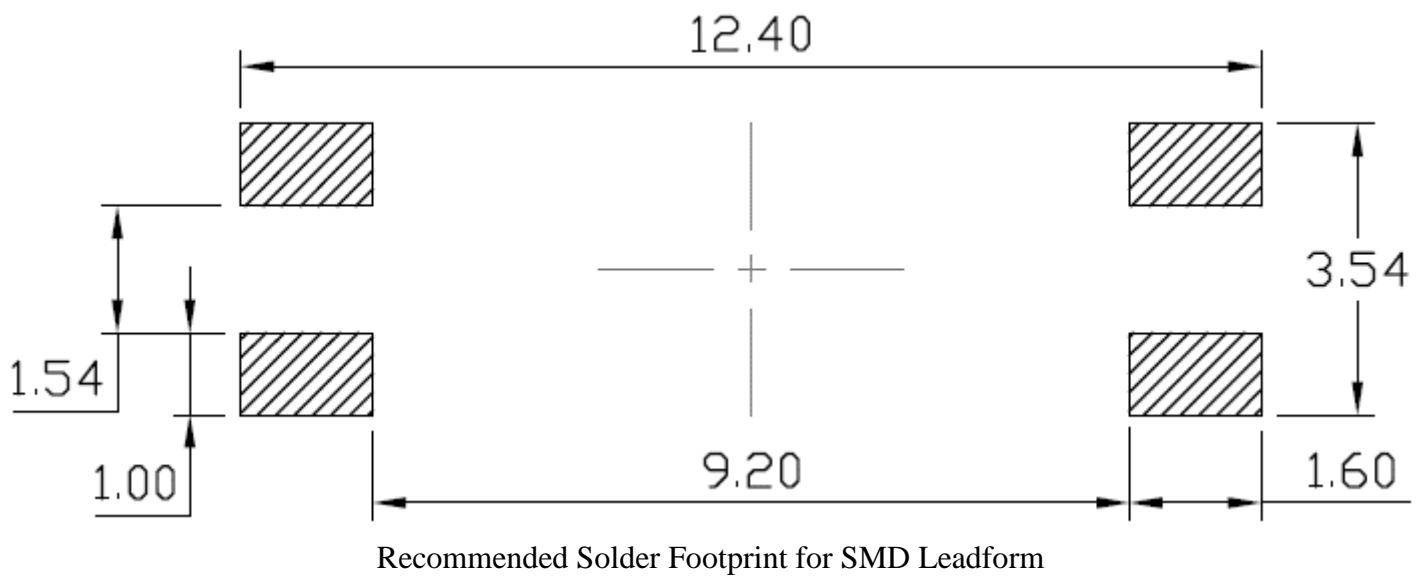
SMD lead bend (Option S) & SMD (Low Profile) bend (Option SL):



Units: mm

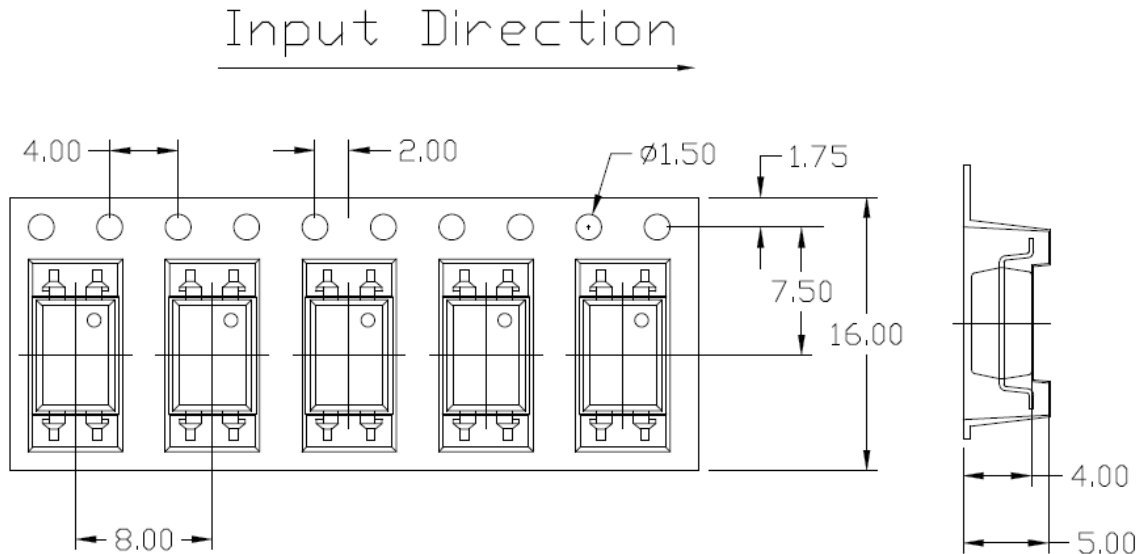
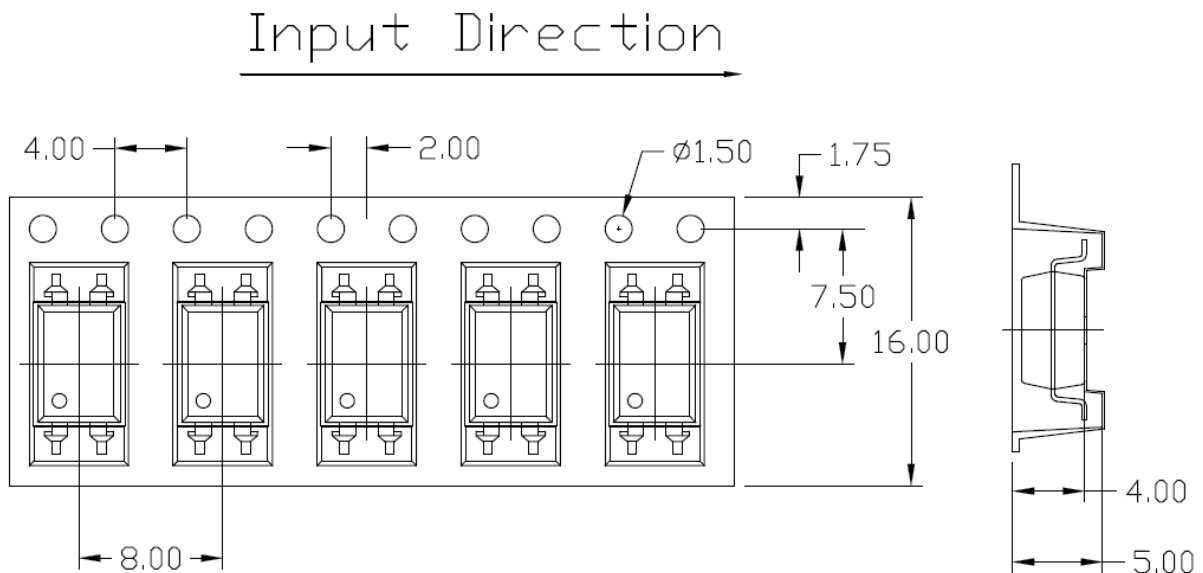
tolerance: +/- 0.1mm

SMD (Gullwing) bend (Option SLM):

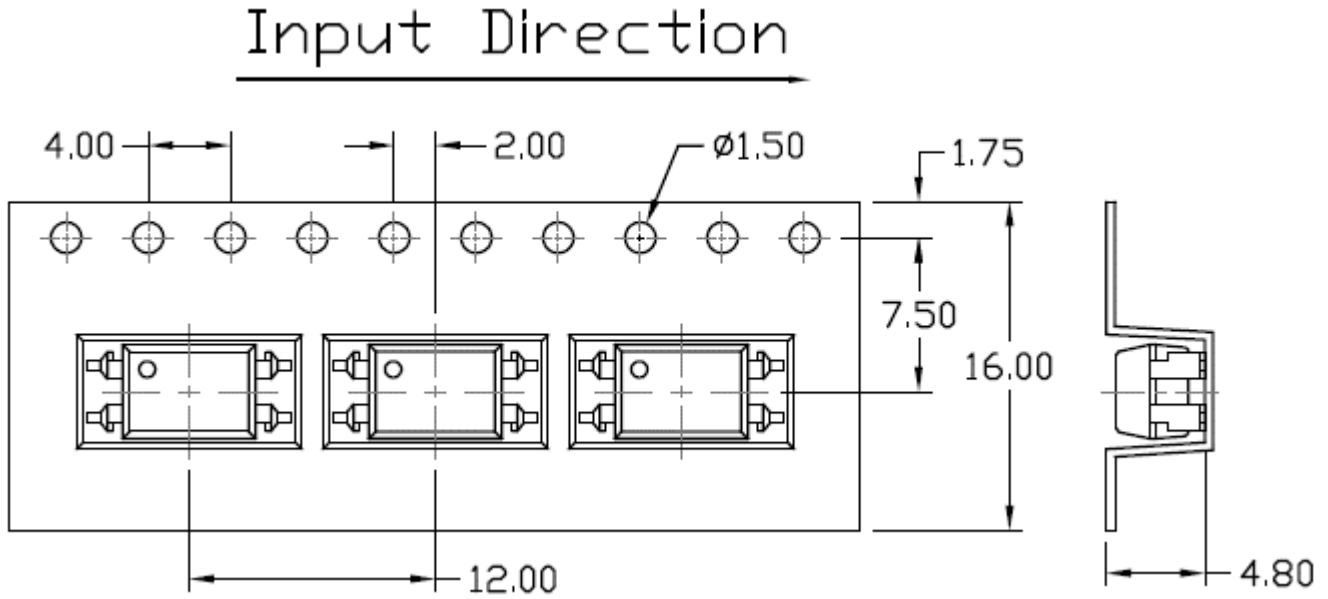


Units: mm

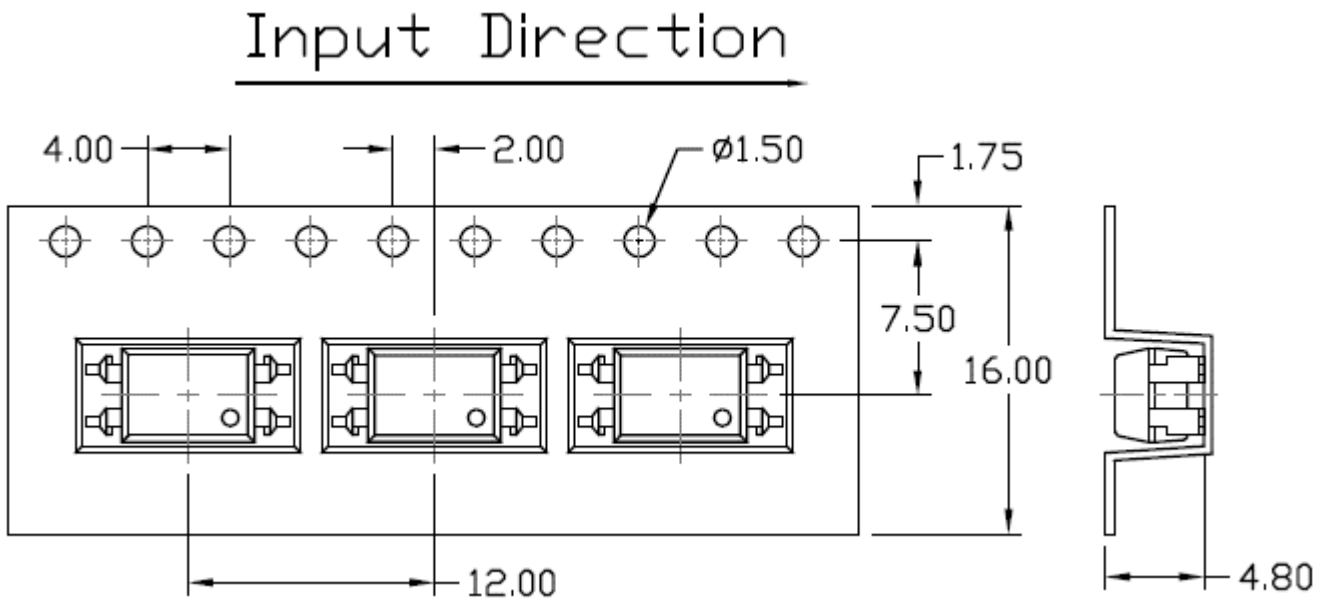
tolerance: +/- 0.1mm

Packing & Labeling**Option S(T1) & SL(T1)****Option S(T2) & SL(T2)**

Option S(T3) & SL(T3)

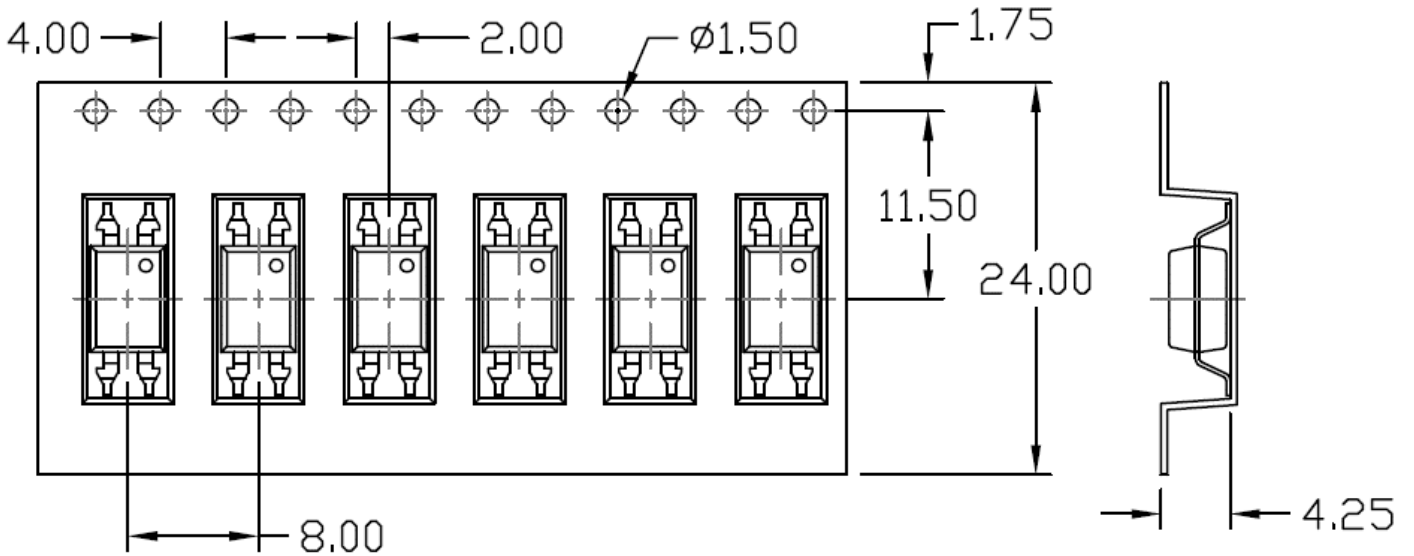


Option S(T4) & SL(T4)



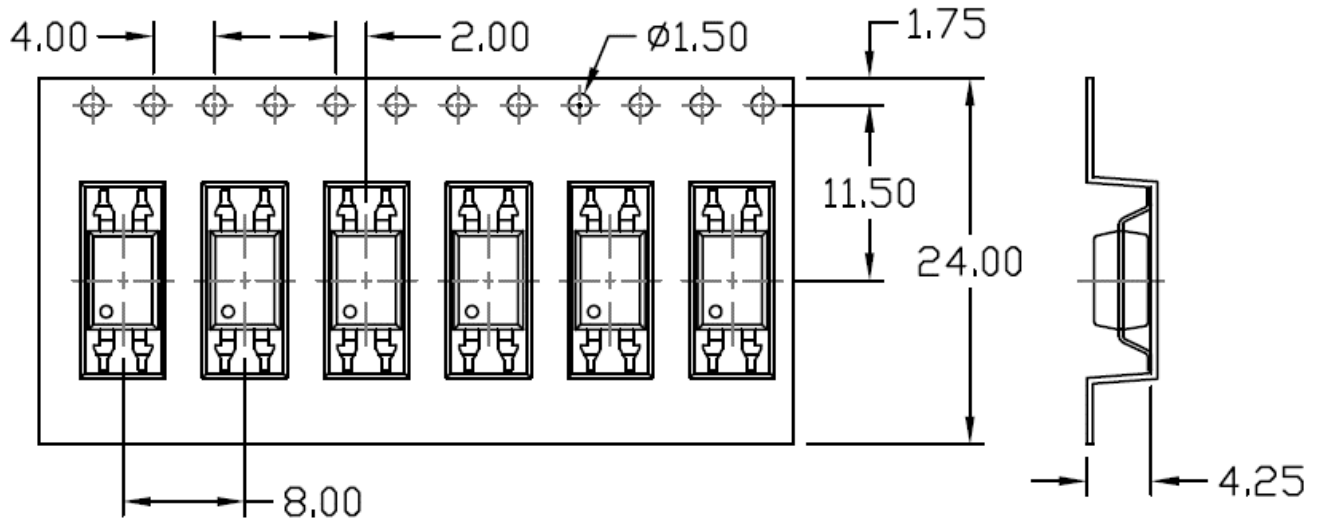
Option SLM(T1)

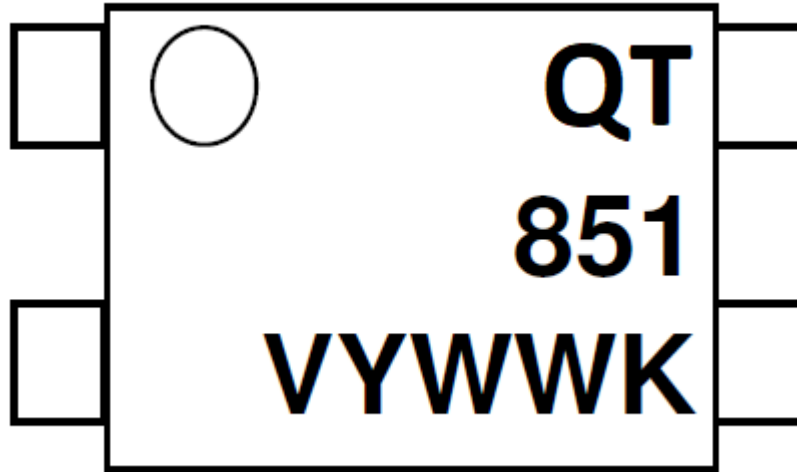
Input Direction



Option SLM(T2)

Input Direction



Device Marking

QT = QT-Brightek Corporation

851 = part number

Y = Year

WW = Week

V = VDE Option

K = Manufacturing code

Ordering Information

QT851(V)(Y)(Z)

V = VDE option (V or None)

Y = Lead form option (S, SL, M, SLM)

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

Option	Description	Quantity
None	Standard 4-Pin DIP	100 Units/Tube
M	Gullwing	100 Units/Tube
S(T1)	Surface Mount Lead Forming – with Option 1 Taping	1500 pcs/ reel
S(T2)	Surface Mount Lead Forming – with Option 2 Taping	1500 pcs/ reel
S(T3)	Surface Mount Lead Forming – with Option 3 Taping	1000 pcs/ reel
S(T4)	Surface Mount Lead Forming – with Option 4 Taping	1000 pcs/ reel
SL(T1)	SMD (Low Profile) Lead Forming – with Option 1 Taping	1500 pcs/ reel
SL(T2)	SMD (Low Profile) Lead Forming – with Option 2 Taping	1500 pcs/ reel
SL(T3)	SMD (Low Profile) Lead Forming – with Option 3 Taping	1000 pcs/ reel
SL(T4)	SMD (Low Profile) Lead Forming – with Option 4 Taping	1000 pcs/ reel
SLM(T1)	SMD (Gullwing) Lead Forming – with Option 1 Taping	1500 pcs/ reel
SLM(T2)	SMD (Gullwing) Lead Forming – with Option 2 Taping	1500 pcs/ reel



Revision History

Description:	Revision #	Revision Date
Initial release of QT851	1.0	02/12/2018

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.