

QT-Brightek Optocoupler Series

4-PIN High Power Photodarlington Optocoupler

Part No.: QT852

Product: QT852	Date: February 12, 2018	Page 1 of 18
	Version# 1.0	

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Introduction

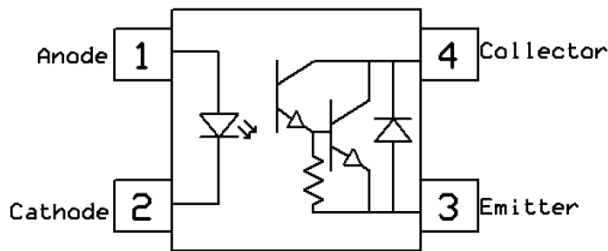
Feature:

- High Isolation voltage between input and output (Viso = 5000V rms)
- Operating Temperature up to 100 °C
- Available in Tube or Tape and reel
- Available with standard DIP-4, Gullwing lead bend, SMD lead bend, and SMD low profile options.

Certification & Compliance:

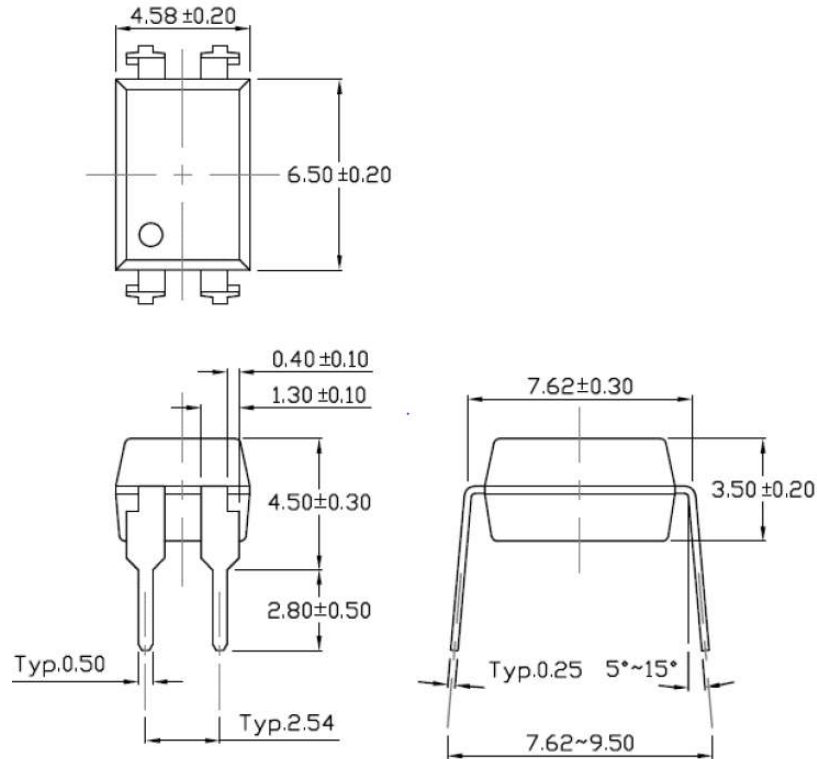
- Pb free and RoHS Compliant
- UL recognized (File #E338132)
- cUL recognized (File #E338132)
- VDE (Pending Approval)

Schematic:

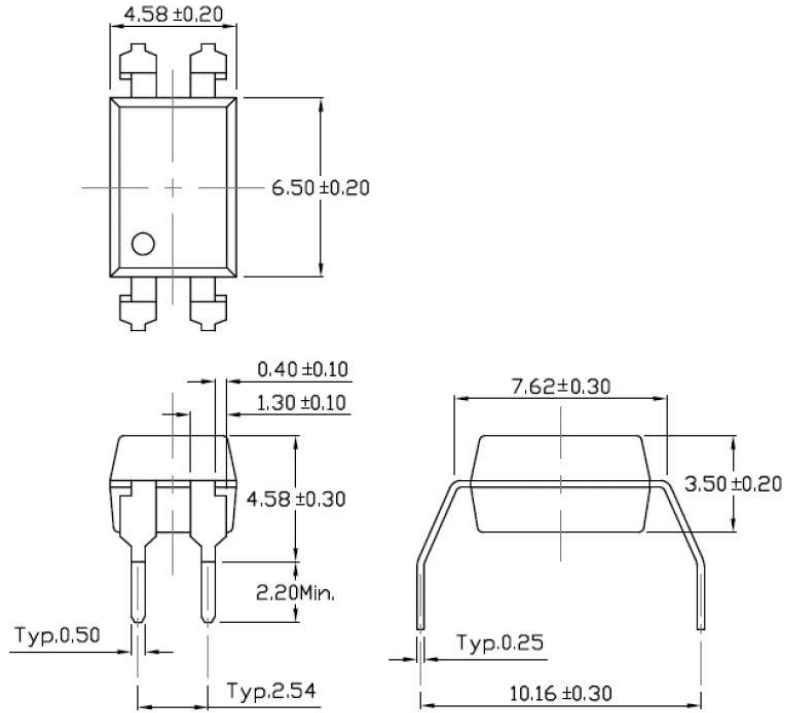


Dimension: (Dot location indicates pin 1)

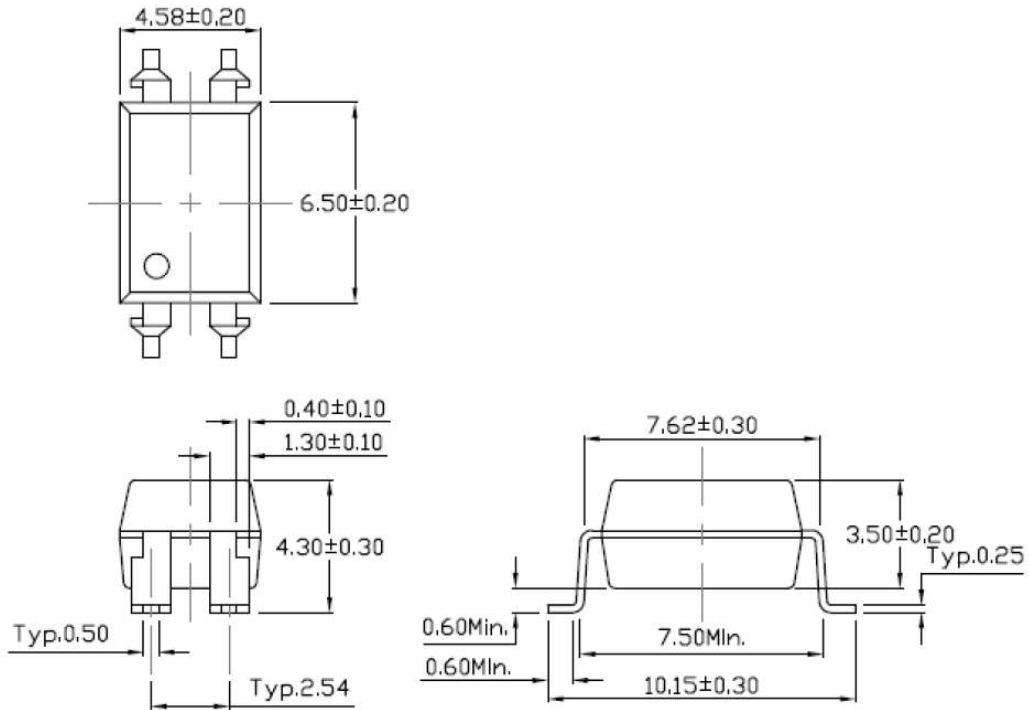
4-Pin Dip (standard):



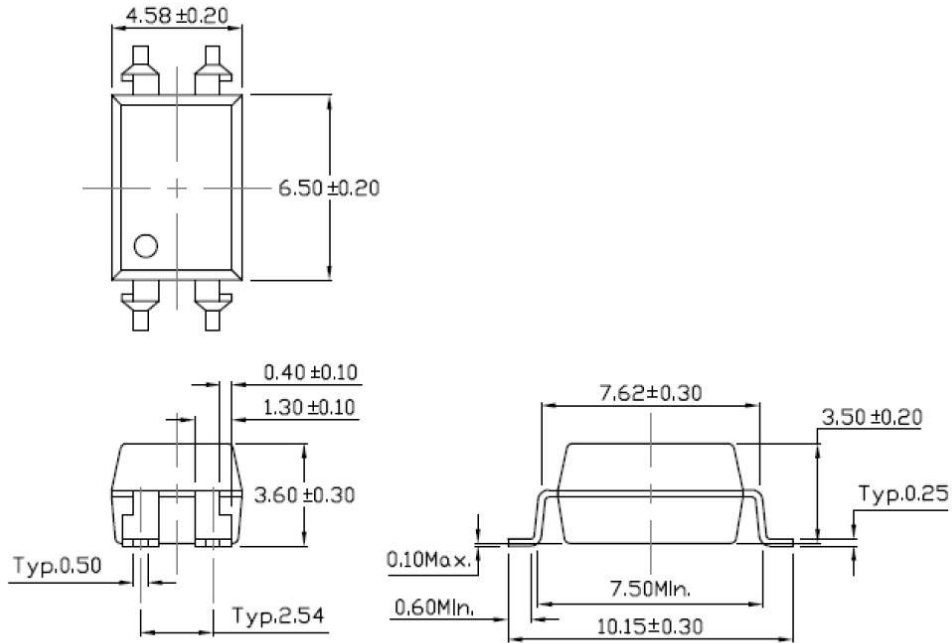
Gullwing (400mil) lead bend (Option M):



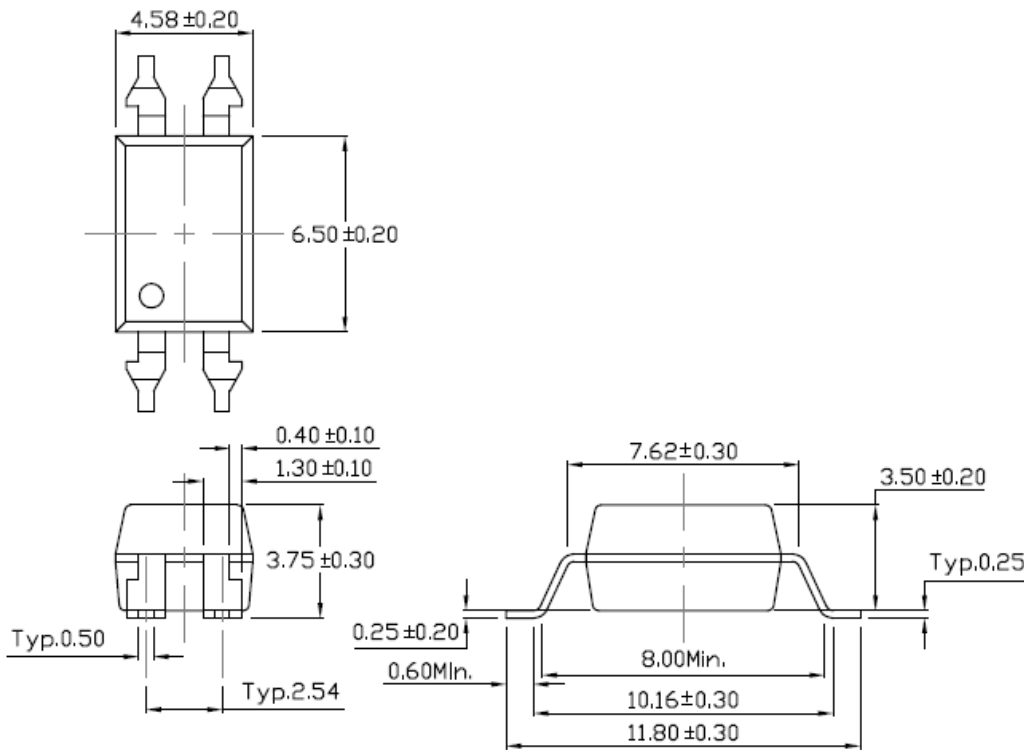
SMD lead bend (Option S):



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	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
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	0.1	V
I _C	Continuous Collector Current	150	mA
P _D	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 = 5V	-	-	5	μA
C _{IN}	Input Capacitance	f = 1MHz	-	45	-	pF

Detector

Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
I _{CEO}	Collector-Emitter Dark current	V _{CE} = 200V, I _F = 0mA	-	-	100	nA
B _{VCEO}	Collector-Emitter breakdown voltage	I _C = 100 μA	350	-	-	V
B _{VECO}	Emitter-Collector breakdown voltage	I _E = 100 μA	0.1	-	-	V

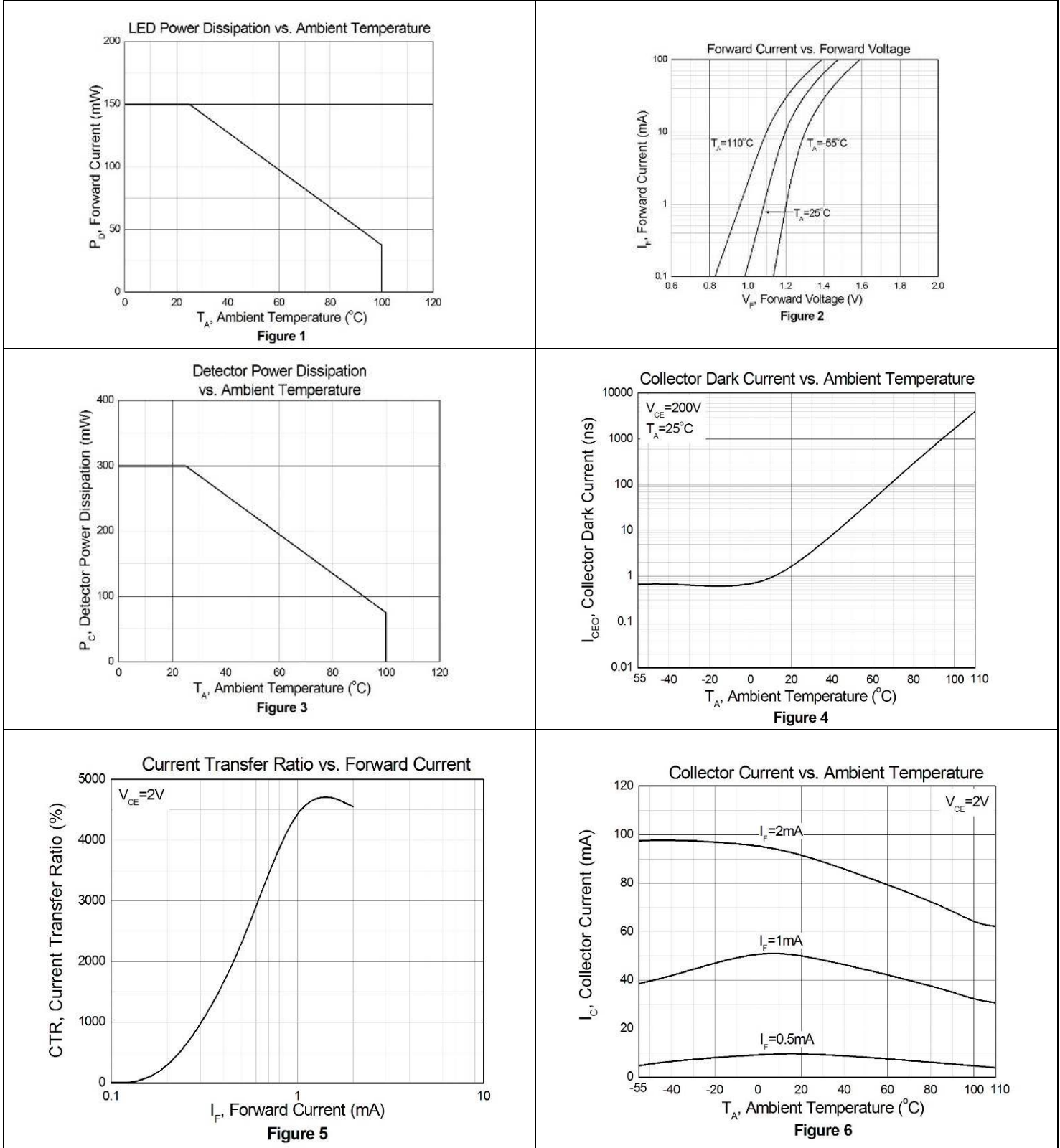
DC Transfer Characteristic

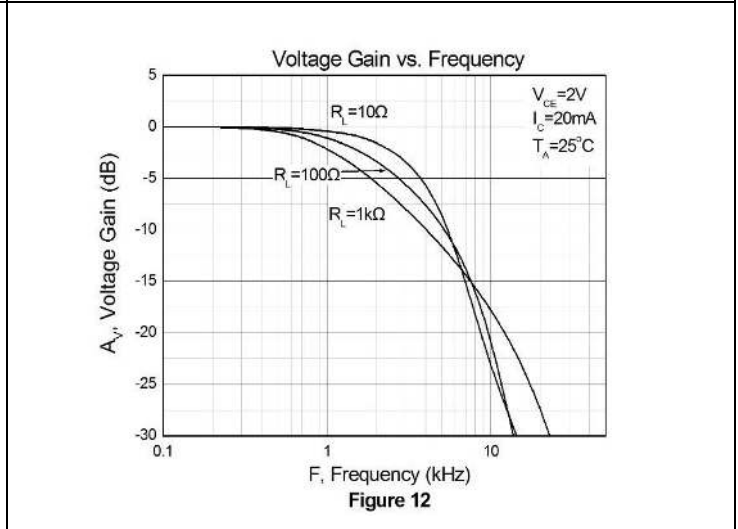
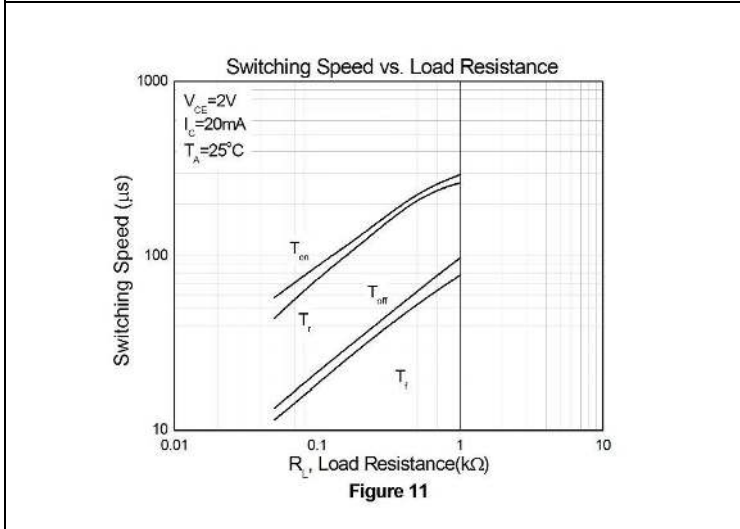
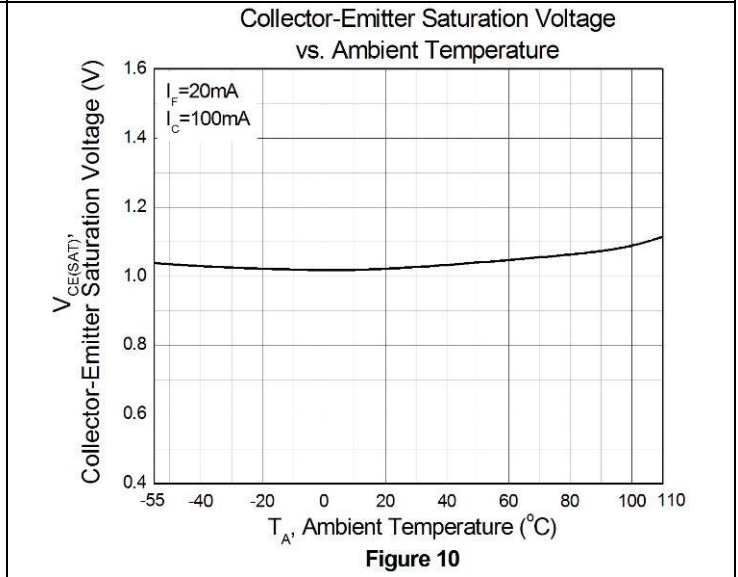
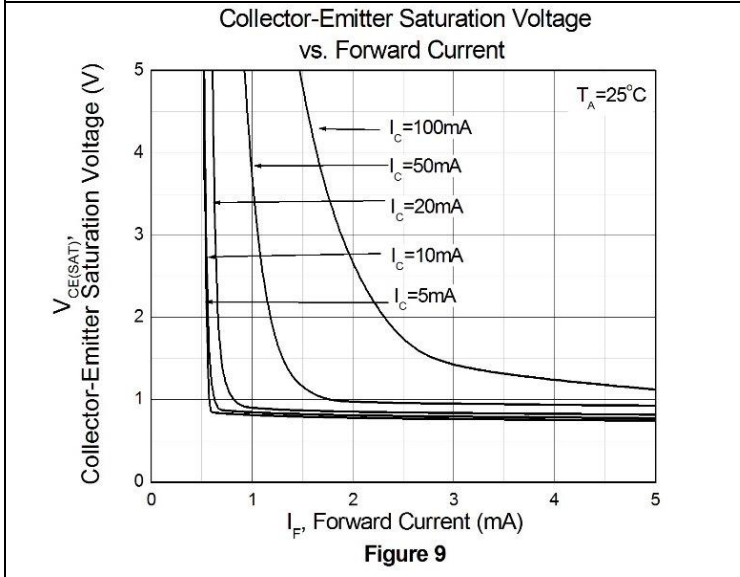
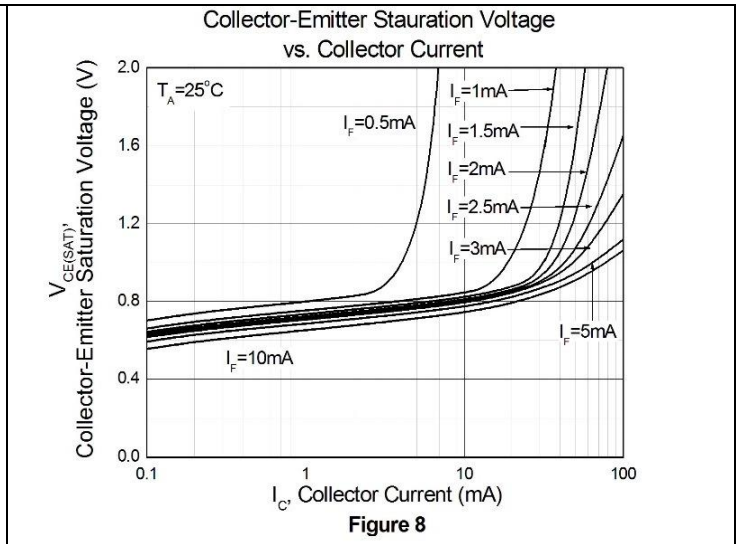
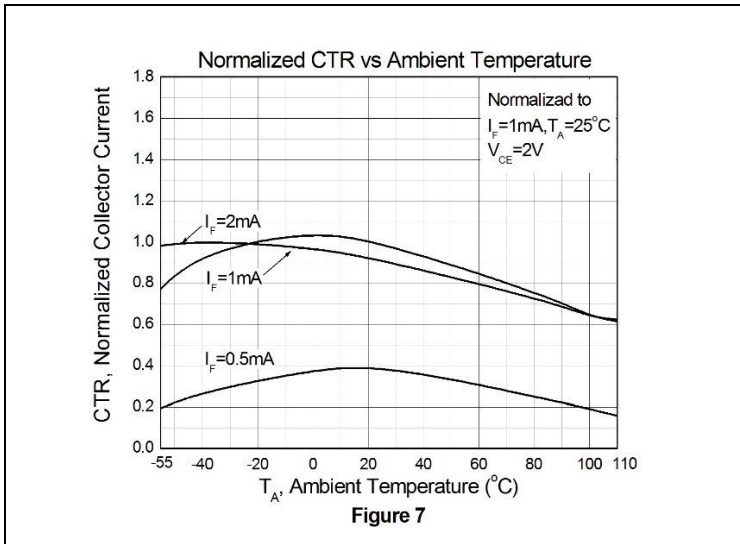
Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
CTR	Current Transfer Ratio	I _F = 1mA, V _{CE} = 2V	1000	-	15000	%
V _{CE(Sat)}	Collector-Emitter saturation voltage	I _F = 20mA, I _C = 100mA	-	-	1.2	V
R _{IO}	Isolation Resistance	V _{IO} = 500V _{DC}	5X10 ¹⁰	-	-	Ω
C _{IO}	Isolation Capacitance	f = 1MHz	-	0.6	-	pF

AC Characteristic

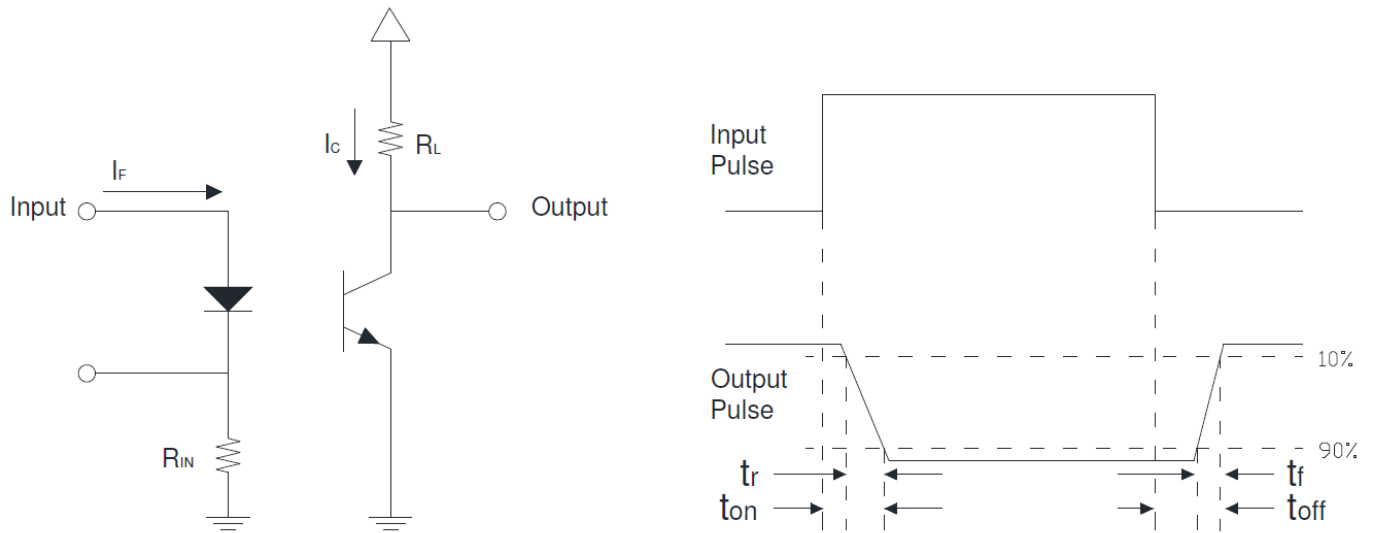
Symbol	Characteristic	Test Condition	Range			Unit
			Min	Typ	Max	
t _r	Rise time	V _{CE} = 2V, I _C = 2mA, R _L = 100Ω	-	-	250	μs
t _f	Fall time		-	-	95	

Characteristic Curves





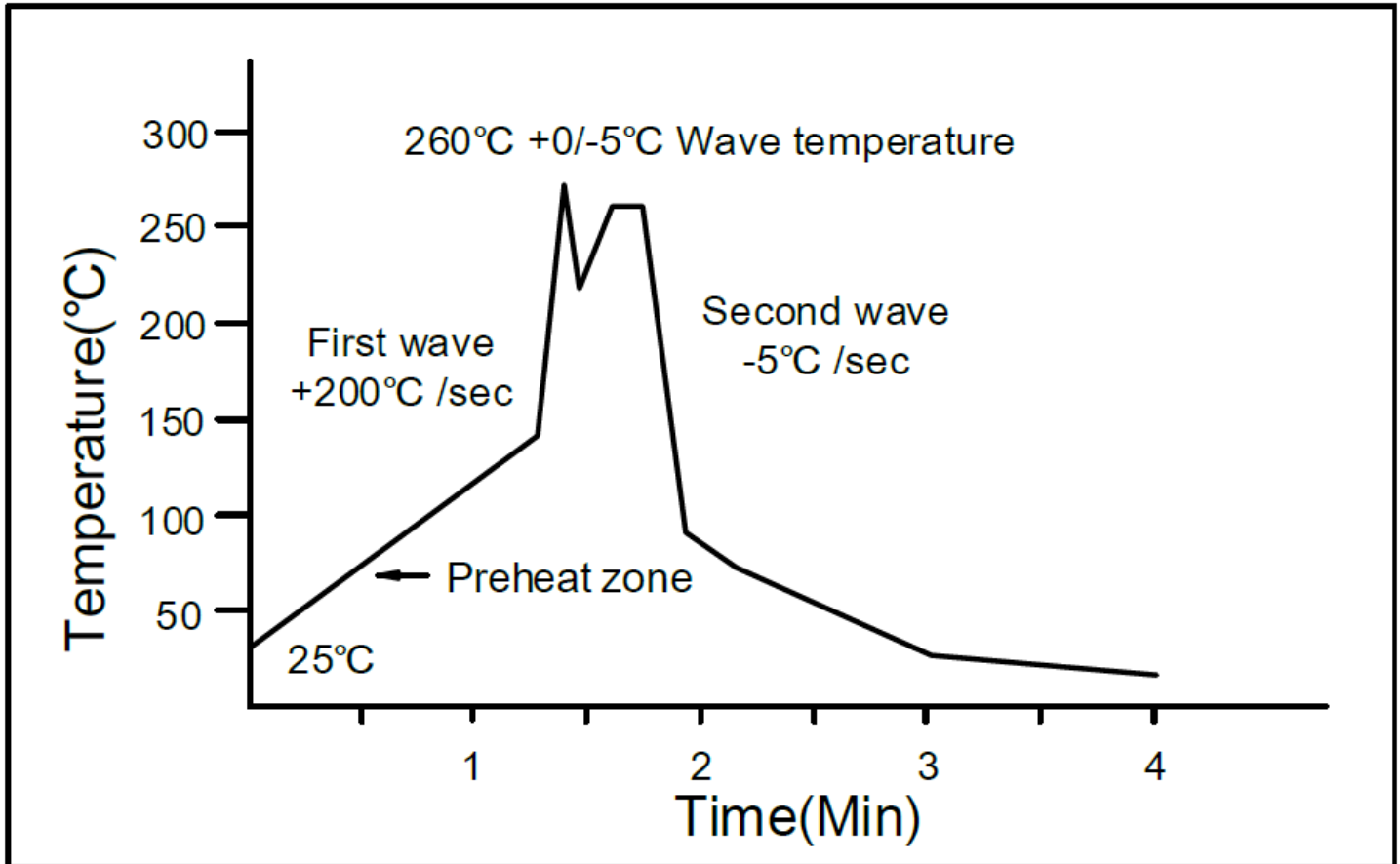
Test Circuit for Response Time



Switching Time Test Circuits

Solder Profile & Footprint

Wave soldering



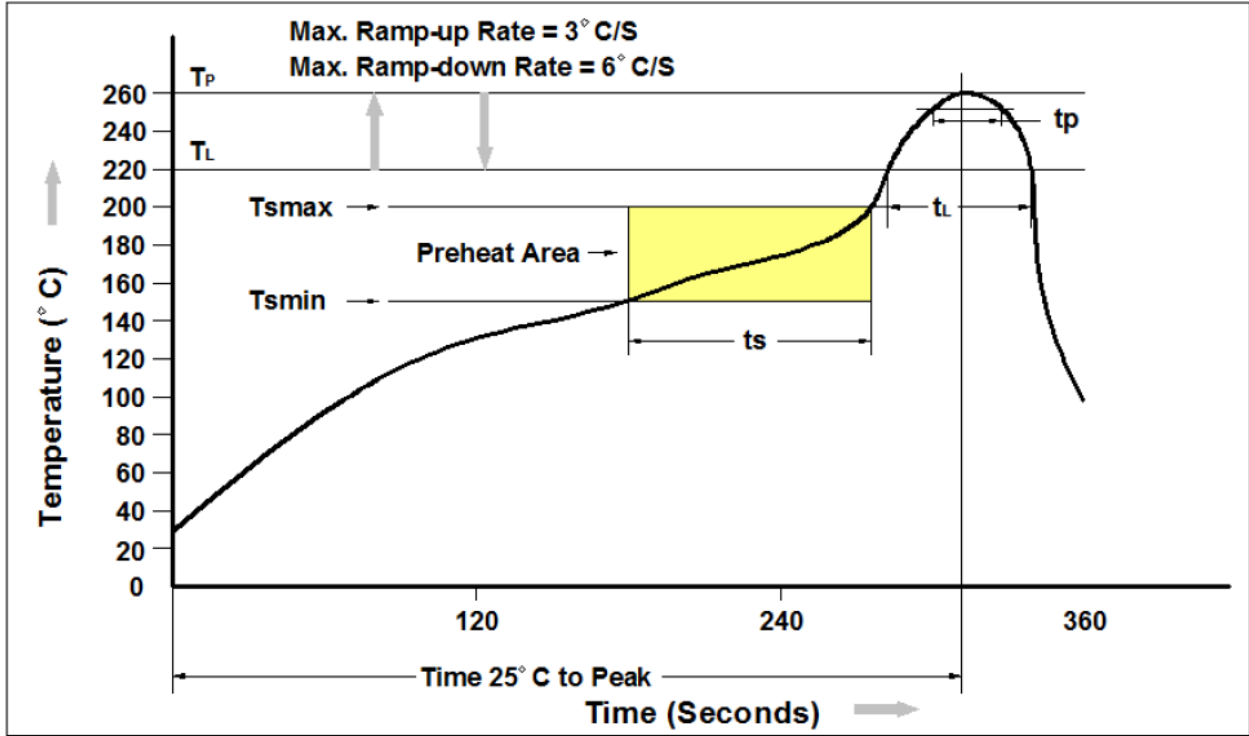
Temperature: 260 +0/-5 °C

Time: 10 Sec

Preheat temperature: 25 to 140 °C

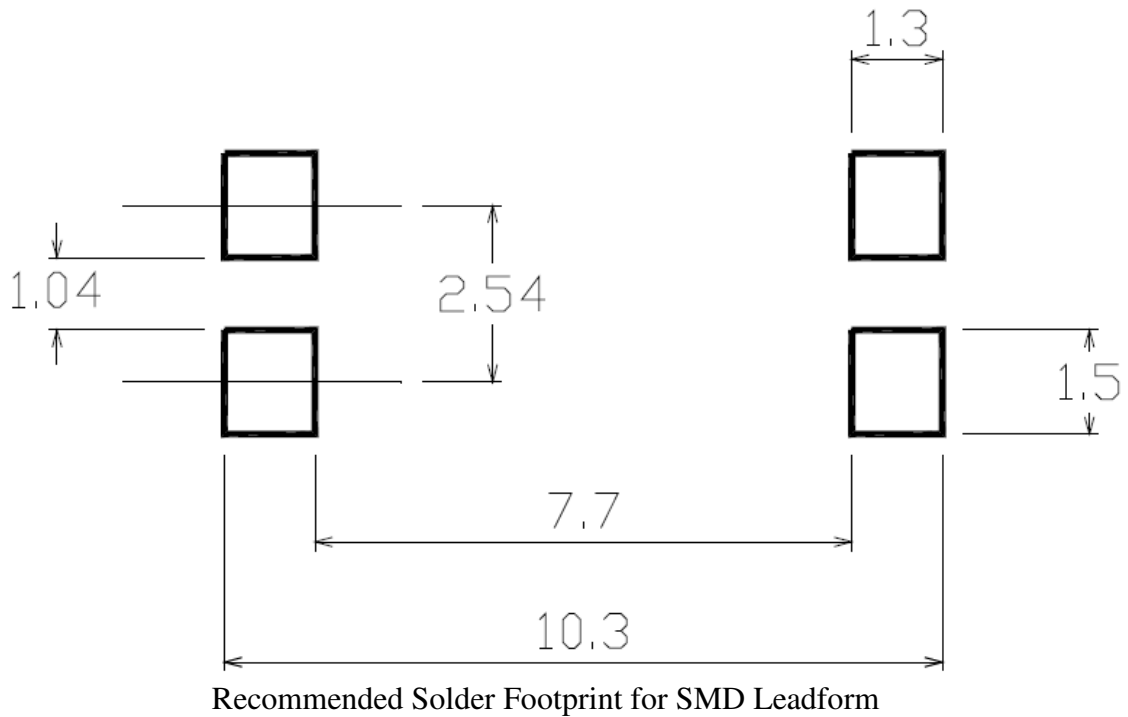
Preheat time: 30 to 80 sec.

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):

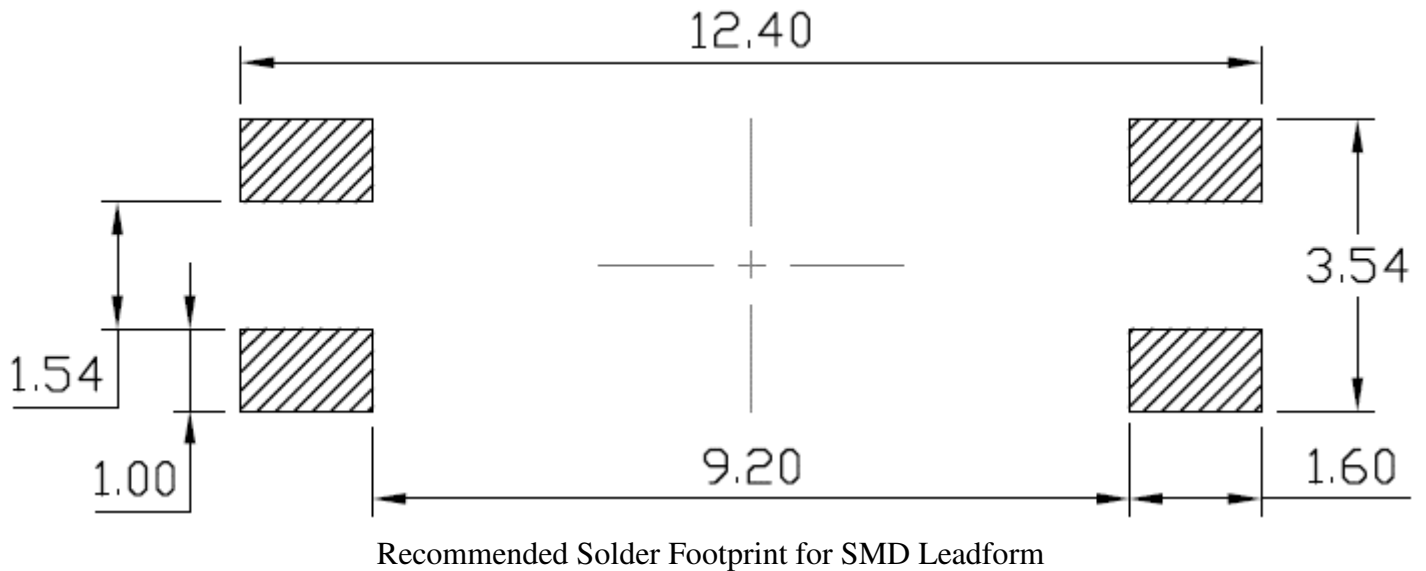


Recommended Solder Footprint for SMD Leadform

Units: mm

tolerance: +/- 0.1mm

SMD (Gullwing) bend (Option SLM):



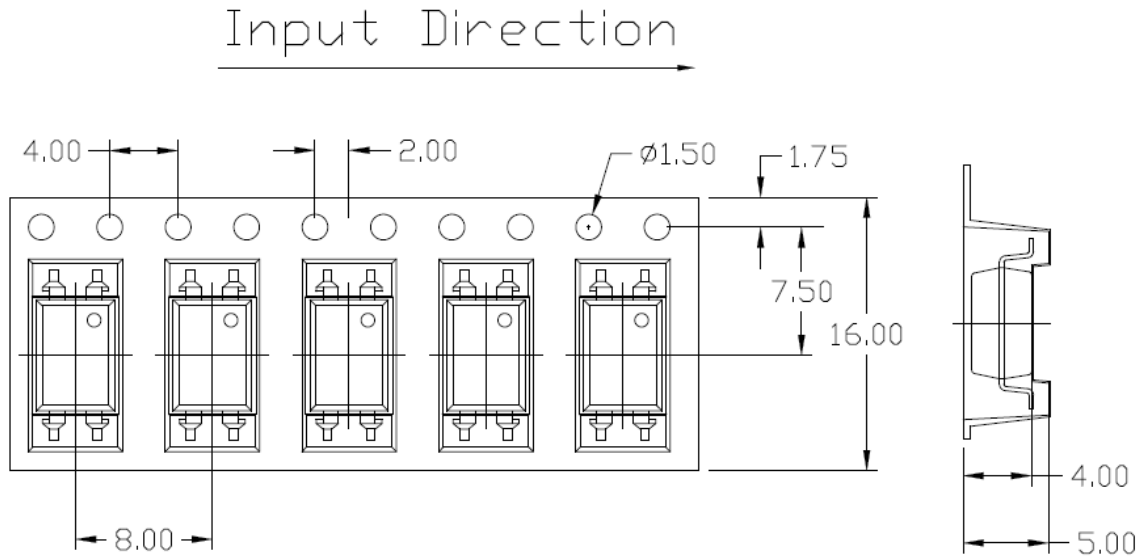
Recommended Solder Footprint for SMD Leadform

Units: mm

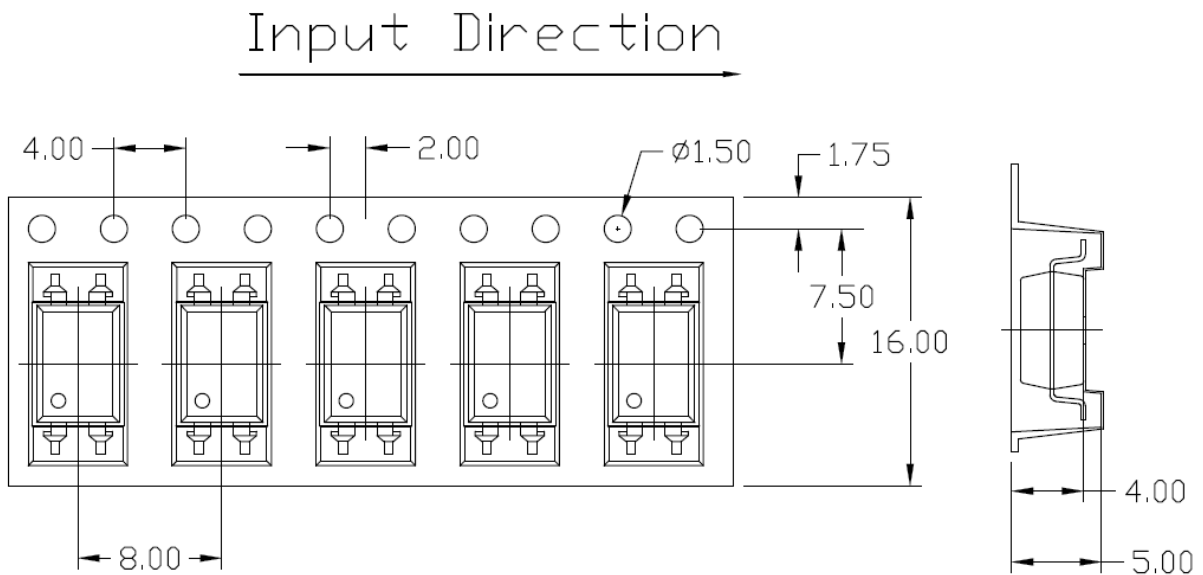
tolerance: +/- 0.1mm

Packing & Labeling

Option S(T1) & SL(T1)

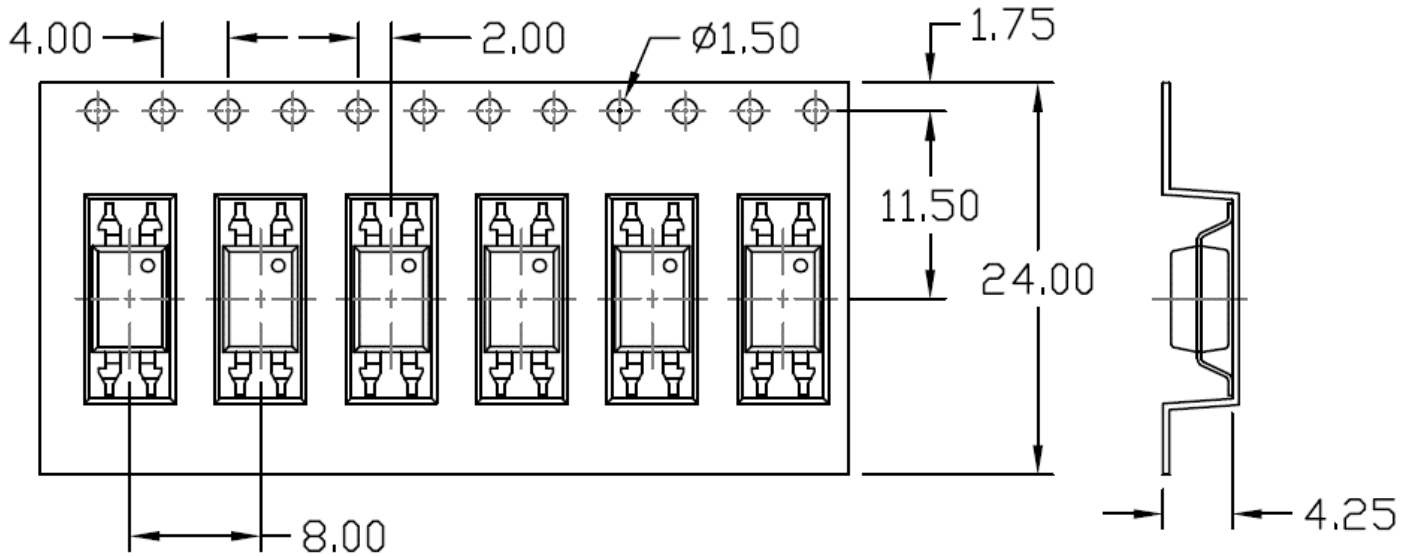


Option S(T2) & SL(T2)



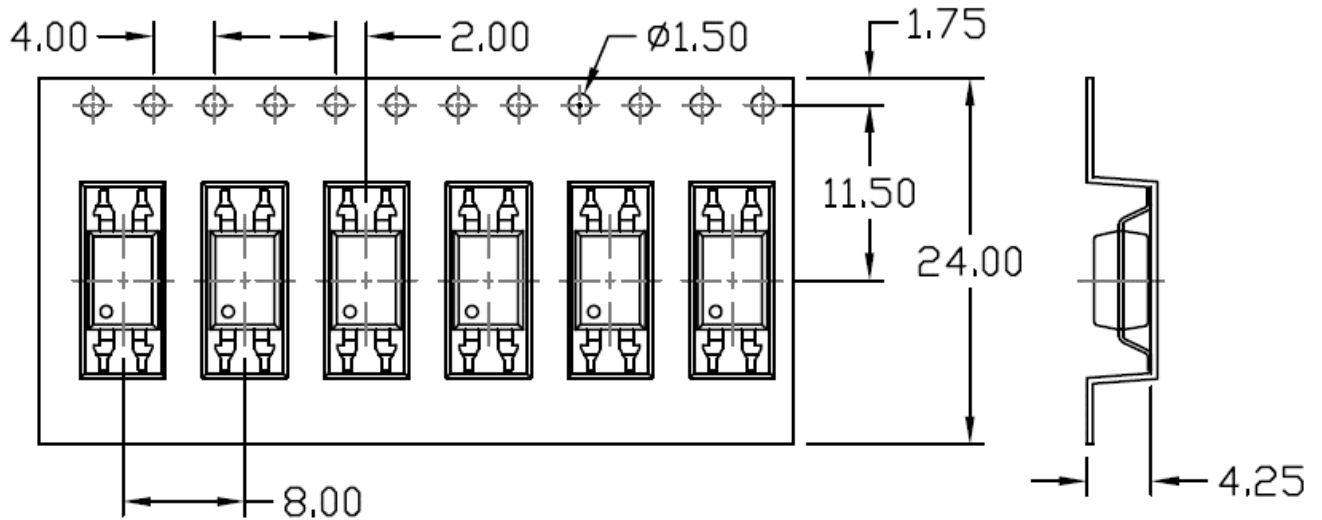
Option SLM(T1)

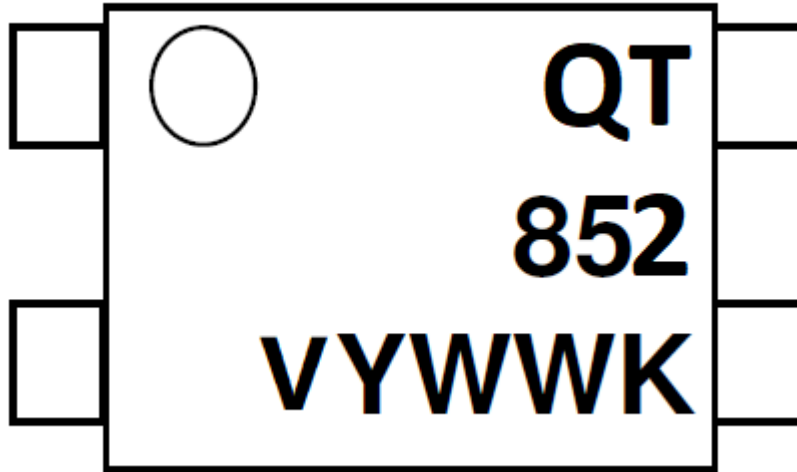
Input Direction
→



Option SLM(T2)

Input Direction
→



Device Marking

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

Ordering Information

QT852(V)(Y)(Z)

V = VDE option (V or None)

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

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
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
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 QT852	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.