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CT852 Series

DC Input 4-Pin DMC-Isolator®

High BVceo Photodarlington Optocoupler

Features

- High isolation 5000 VRMS
- High $B_{VCE0} = 350V$
- Patented coplanar structure DMC-Isolator®
- Operating Temperature range - 55 °C to 100 °C
- External Creepage $\geq 7.4mm$
- Distance Through Isolation $\geq 0.4mm$
- Spatial Distance $\geq 7.5mm$ (S/SL Type)
- Spatial Distance $\geq 8.0mm$ (M/SLM Type)
- RoHS and REACH Compliance
- Halogen Free Compliance (Optional)
- MSL class 1
- Regulatory Approvals
 - ✓ UL - UL1577 (E364000)
 - ✓ VDE - EN60747-5-5(VDE0884-5)
 - ✓ CQC – GB4943.1, GB8898 (14001104781)
 - ✓ IEC62368 (FI/41119)

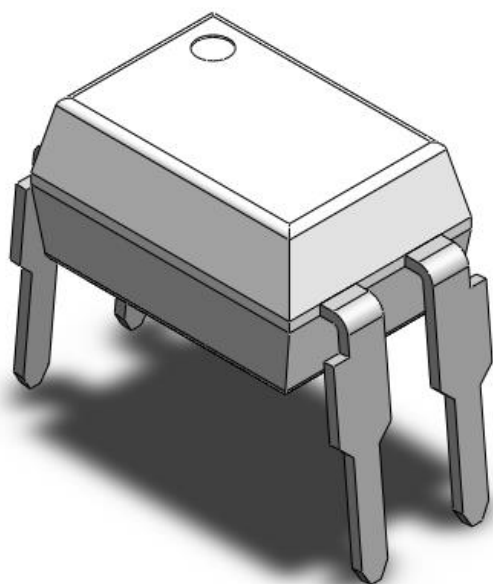
Description

The CT852 series consists of a high power photodarlington transistor optically coupled to an Infrared-emitting diode in a 4-lead DIP DMC-Isolator® package with different lead forming options.

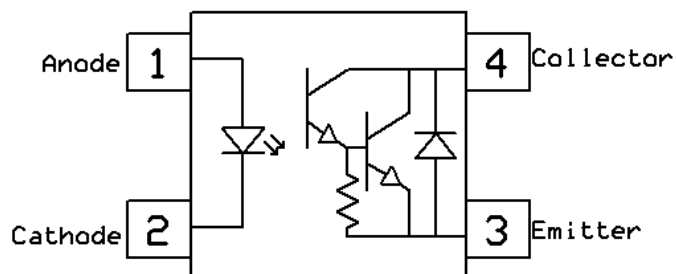
Applications

- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

Package Outline



Schematic



Note: Different lead forming options available. See package dimension.



Absolute Maximum Ratings $T_A = 25^{\circ}\text{C}$, unless otherwise specified

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameters	Ratings	Units	Notes
V_{ISO}	Isolation voltage (AC, 1 minute, 40 ~ 60% R.H.)	5000	V_{RMS}	
T_{OPR}	Operating temperature	-55 ~ +100	$^{\circ}\text{C}$	
T_{STG}	Storage temperature	-55 ~ +150	$^{\circ}\text{C}$	
T_{SOL}	Soldering temperature (For 10 seconds)	260	$^{\circ}\text{C}$	
Emitter				
I_{F}	Forward current	80	mA	
$I_{\text{F(TRANS)}}$	Peak transient current ($\leq 1\mu\text{s}$ P.W, 300pps)	1	A	
V_{R}	Reverse voltage	6	V	
P_{D}	Power dissipation	150	mW	
Detector				
P_{D}	Power dissipation	300	mW	
B_{VCEO}	Collector-Emitter Breakdown Voltage	350	V	
B_{VECO}	Emitter-Collector Breakdown Voltage	0.1	V	
I_{C}	Collector Current	150	mA	



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Electrical Characteristics *TA = 25°C (unless otherwise specified)*

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V _F	Forward voltage	I _F =10mA		1.24	1.4	V	
I _R	Reverse Current	V _R = 6V	-	-	5	μA	
C _{IN}	Input Capacitance	f= 1MHz	-	45	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
B _{VCEO}	Collector-Emitter Breakdown	I _C = 100μA	350	-	-	V	
B _{VECO}	Emitter-Collector Breakdown	I _E = 100μA	0.1	-	-	V	
I _{CEO}	Collector-Emitter Dark Current	V _{CE} = 200V, I _F =0mA	-	-	100	nA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
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	

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
t _r	Rise Time	I _C =2mA, V _{CE} = 2V, R _L = 100Ω	-	-	250	μs	
t _f	Fall Time		-	-	95		



Typical Characteristic Curves $T_A = 25^\circ\text{C}$, unless otherwise specified

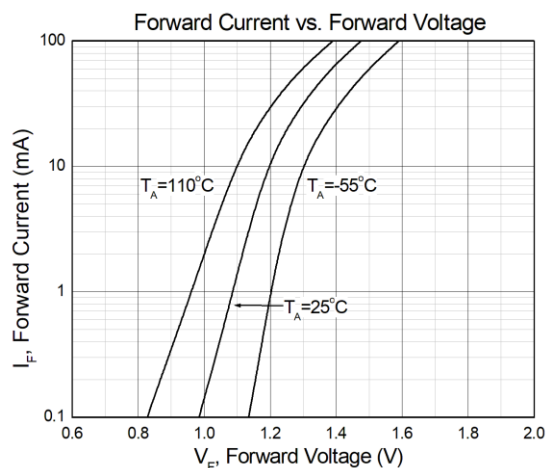


Figure 1

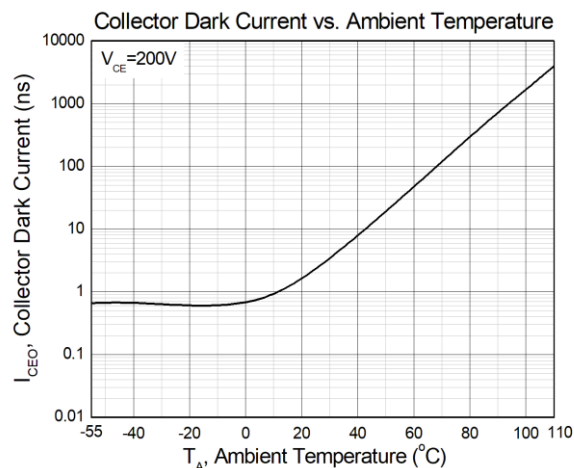


Figure 2

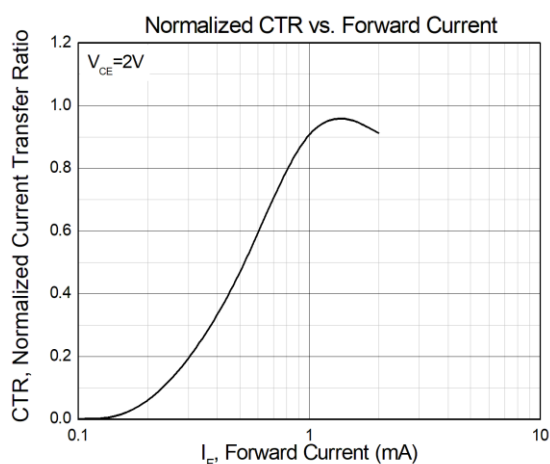


Figure 3

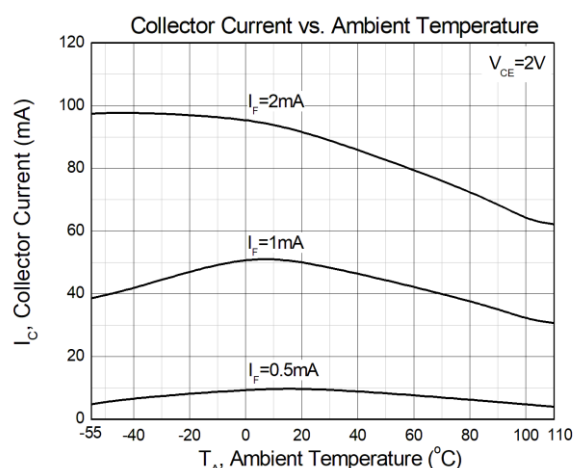


Figure 4

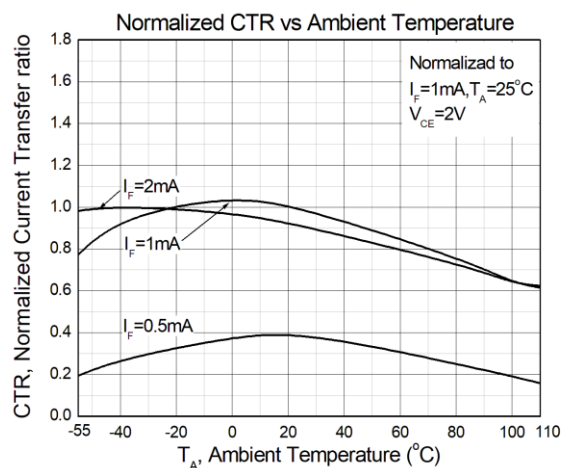


Figure 5

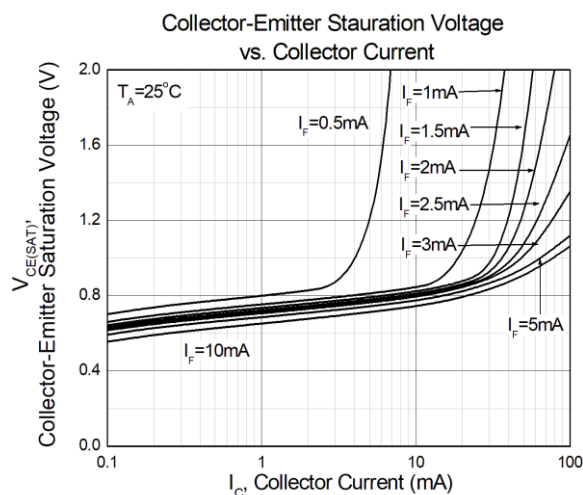


Figure 6



Typical Characteristic Curves $T_A = 25^\circ\text{C}$, unless otherwise specified

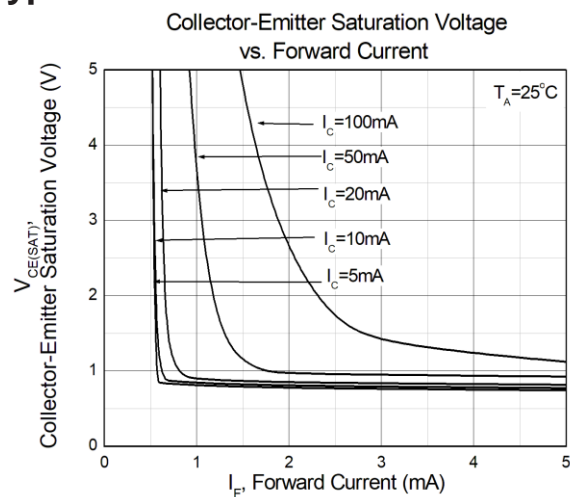


Figure 7

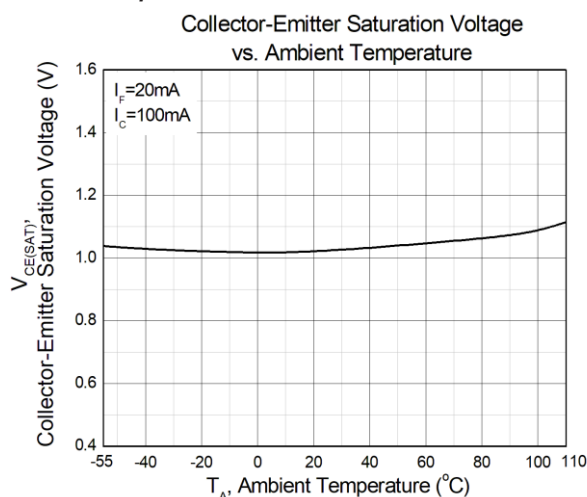


Figure 8

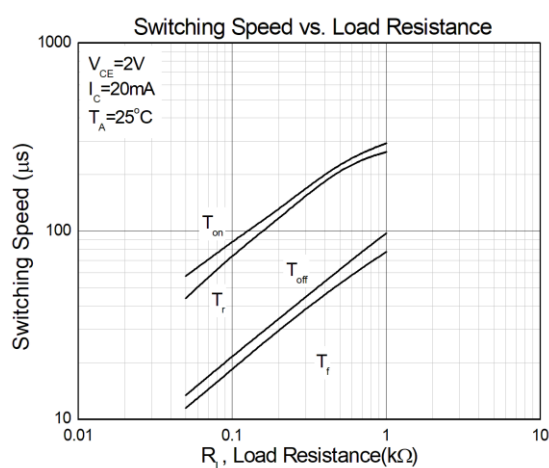


Figure 9

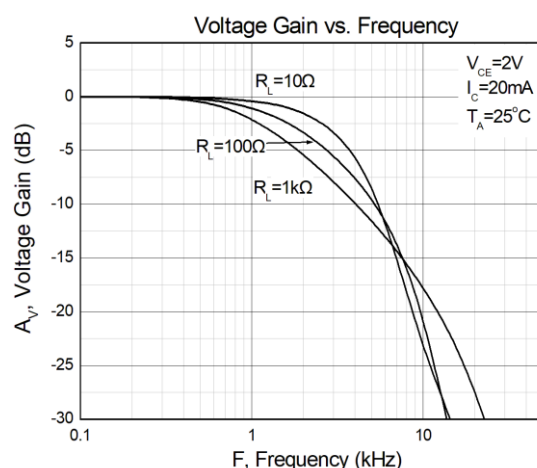


Figure 10



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Test Circuit

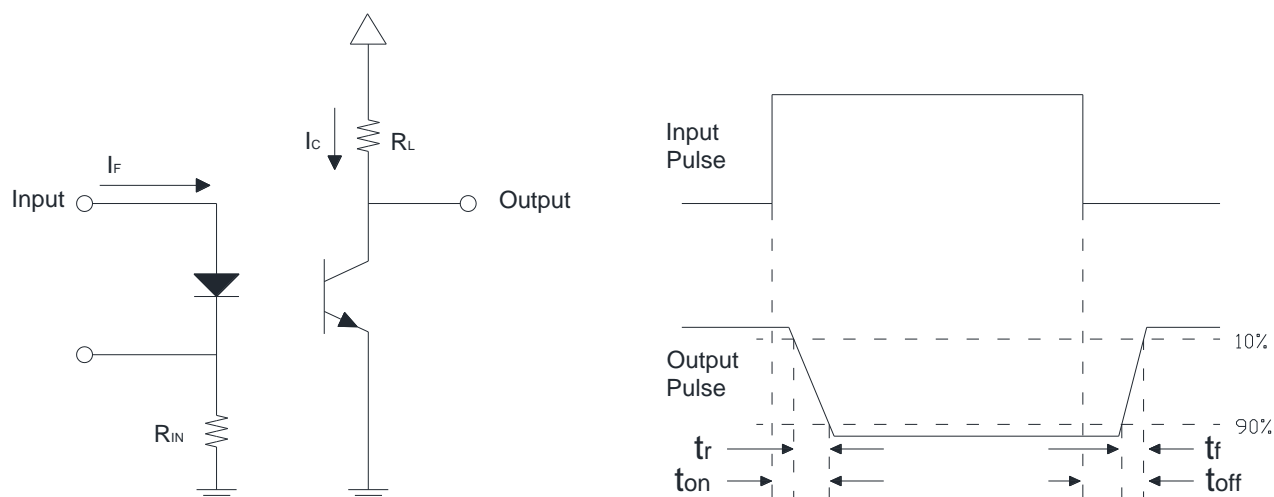


Figure 11: Switching Time Test Circuits



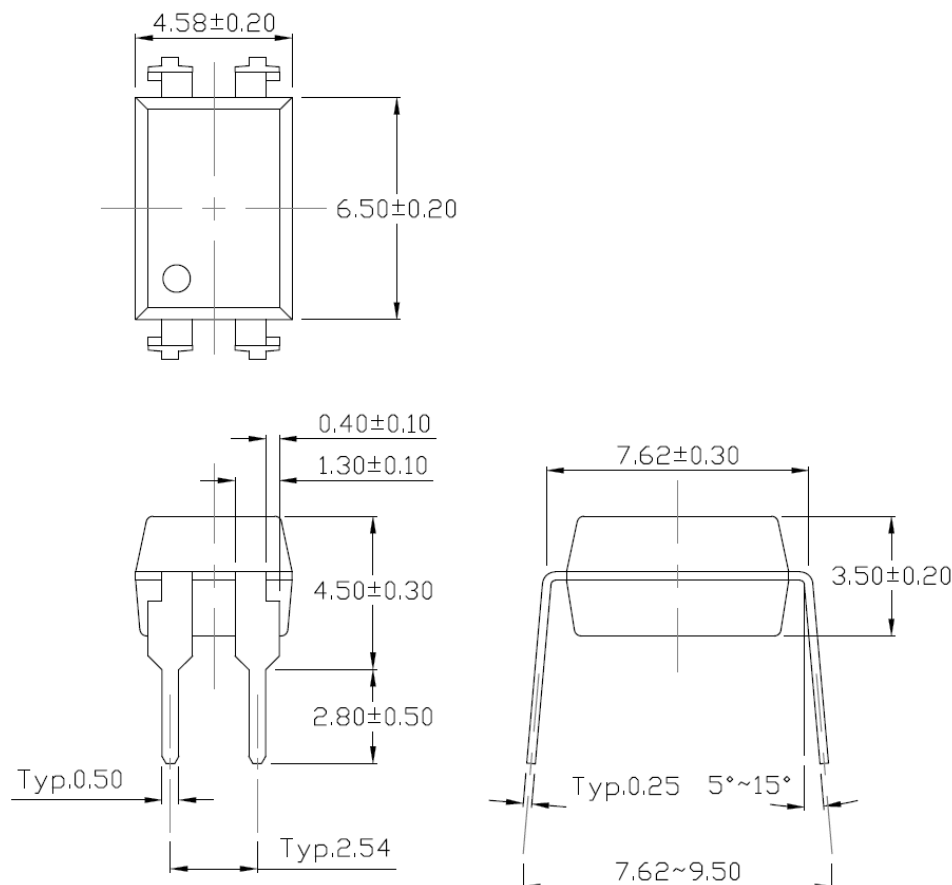
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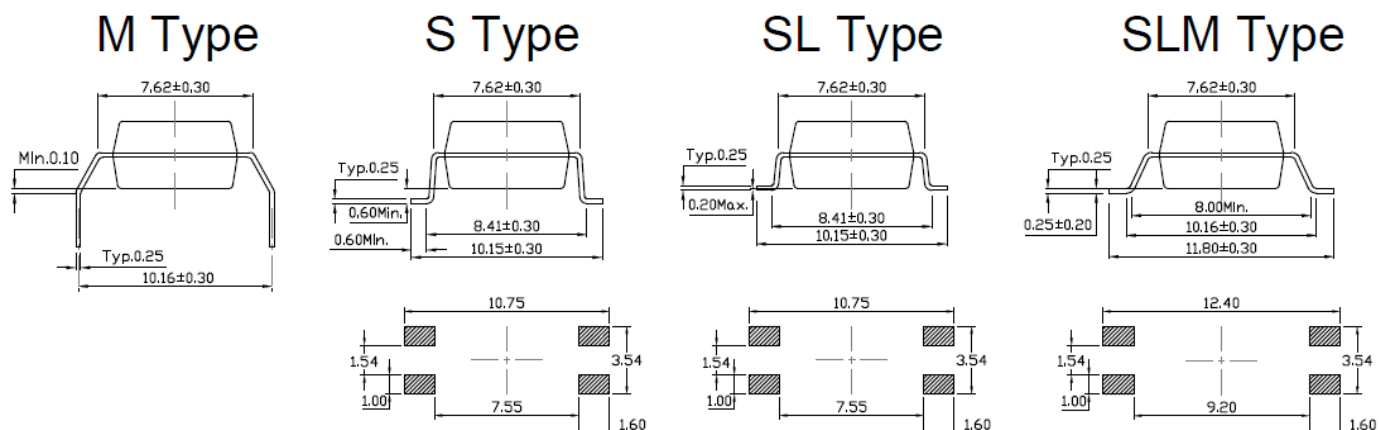
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Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole



Forming Option



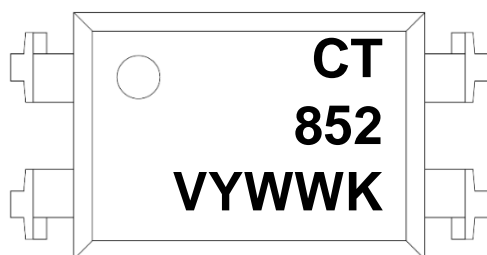


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Marking Information



Note:

CT : Denotes “CT Micro”
852 : Part Number
V : VDE Safety Mark Option (Blank or V)
Y : One Digit Year Code
WW : Two Digit Work Week
K : Manufacturing Code

Ordering Information

CT852 (V)(Y)(Z)-G

CT = Denotes “CT Micro”
852 = Part Number
V = VDE Safety Mark Option (Blank or V)
Y = Lead Form Option (S, SL, M, SLM or Blank)
Z = Tape and Reel Option (Blank, T1 or T2)
G = Material Option (G: Halogen Free, Blank: Non-Halogen Free)

Option	Description	Quantity
None	Standard 4 Pin Dip	100 Units/Tube
M	Gullwing (400mil) Lead Forming	100 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1500 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1500 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1500 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1500 Units/Reel
SLM(T1)	Surface Mount (Gullwing) Lead Forming– With Option 1 Taping	1500 Units/Reel
SLM(T2)	Surface Mount (Gullwing) Lead Forming – With Option 2 Taping	1500 Units/Reel



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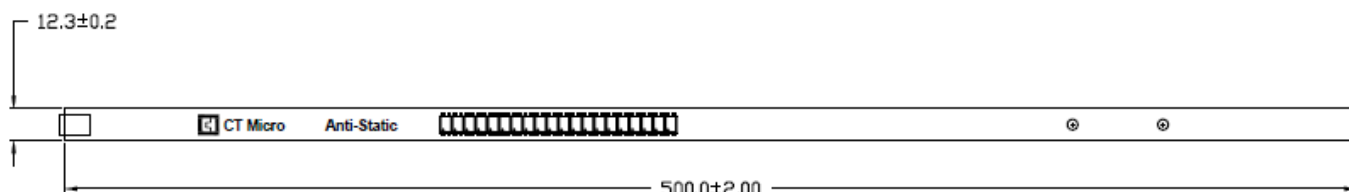
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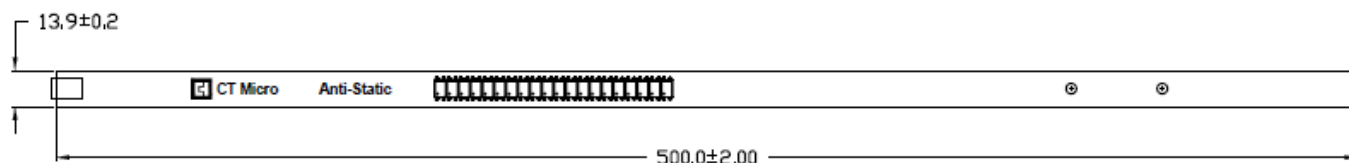
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Carrier Specifications *Dimensions in mm unless otherwise stated*

Tube Option Standard DIP

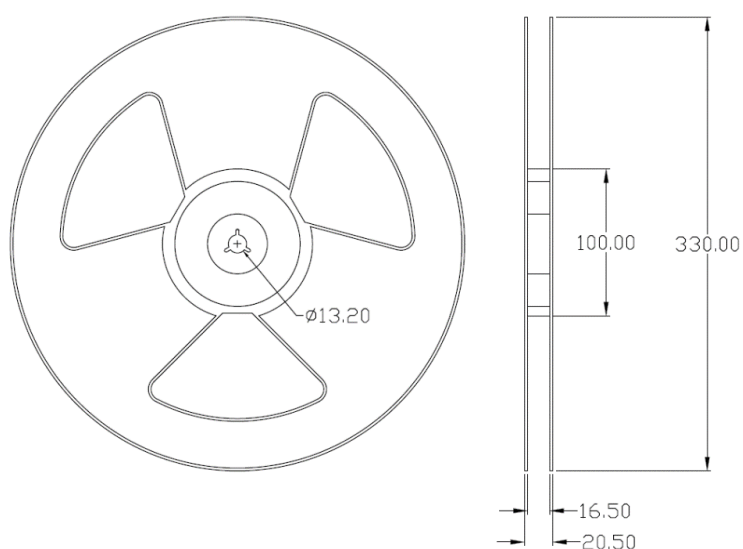


Tube Option M Type

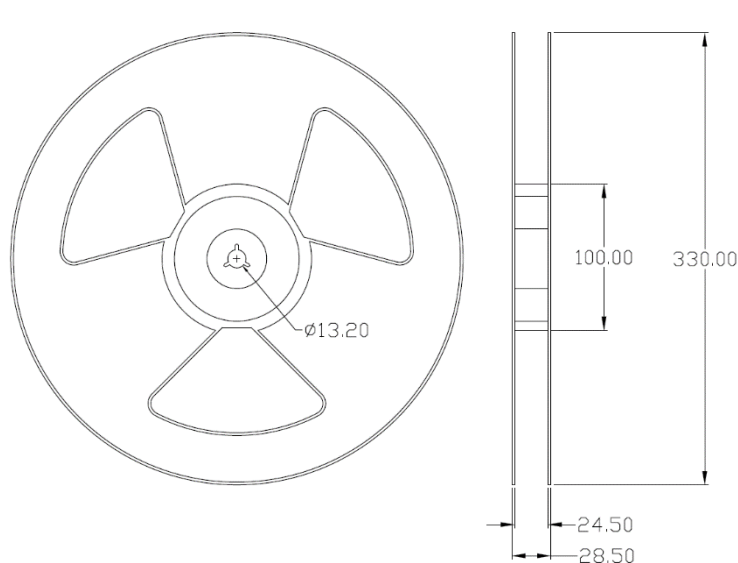


Reel Dimension *All dimensions are in mm, unless otherwise stated*

Option S(T1/T2) & SL(T1/T2)



Option SLM(T1/T2)





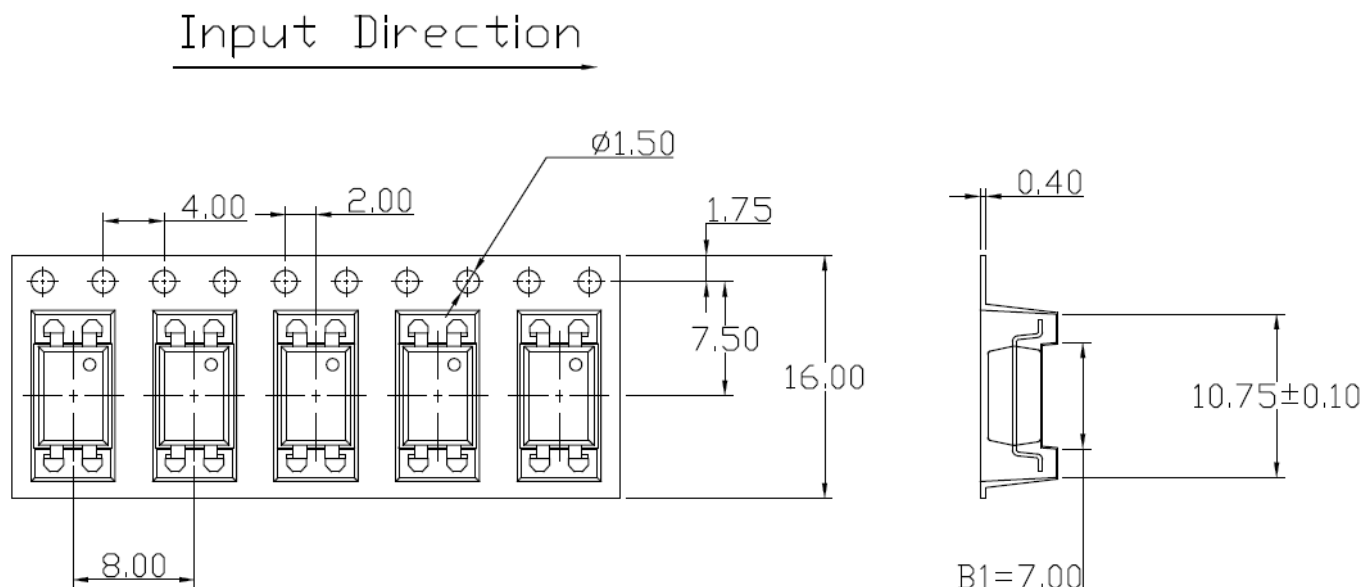
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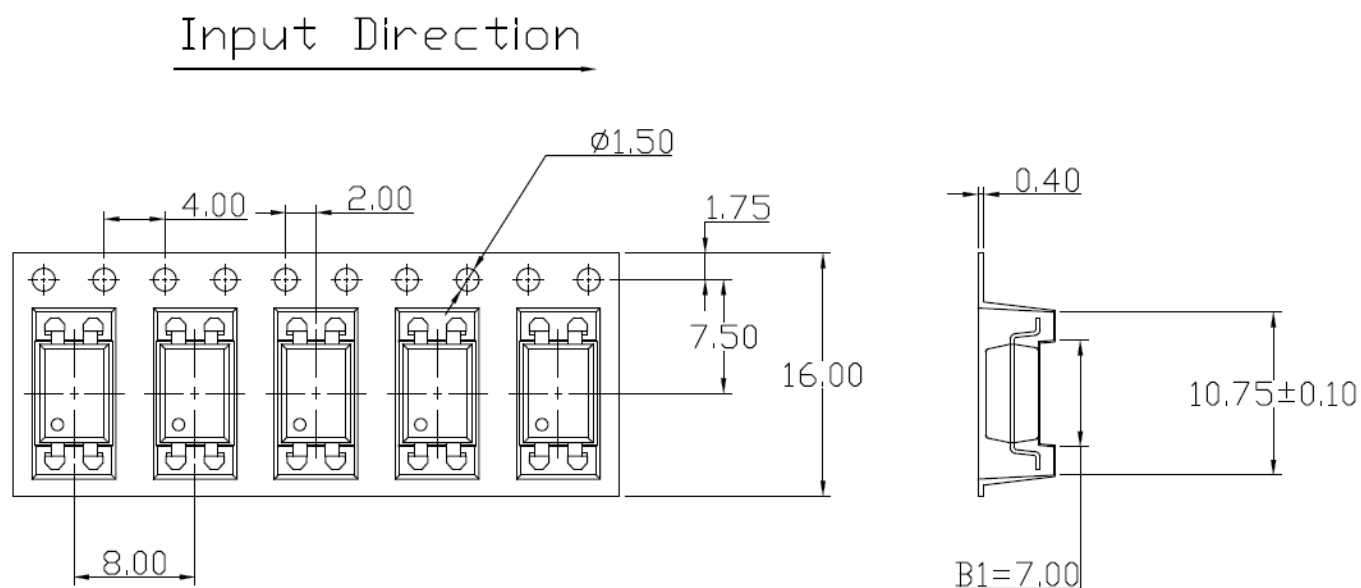
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S(T1) & SL(T1)

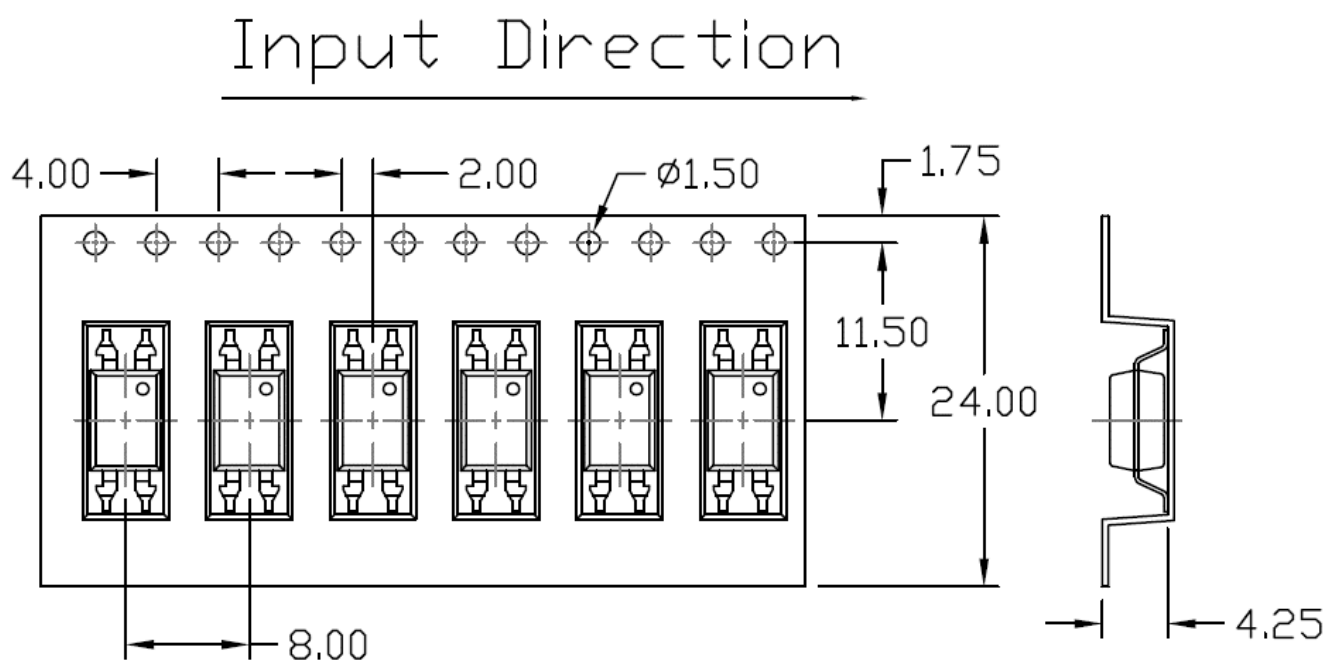


Option S(T2) & SL(T2)

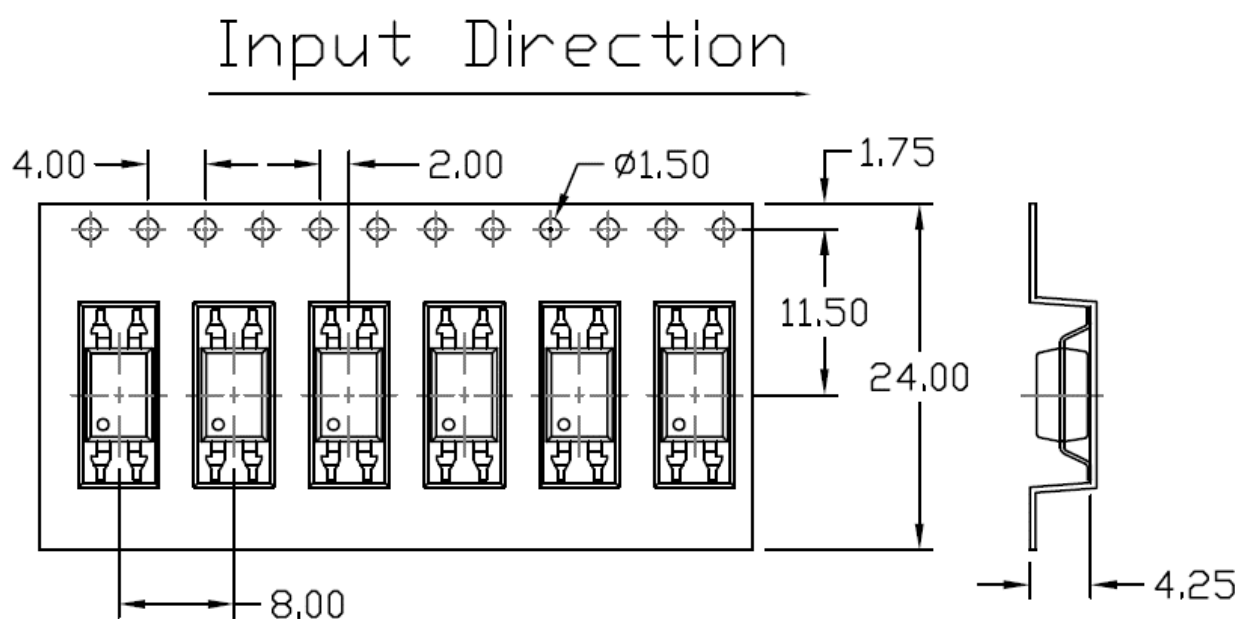




Option SLM(T1)



Option SLM(T2)





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Solderability spec (Follow the JEDEC standard JESD22-B102)

Reflow Soldering: Immersed surface, other than the end of pin as cut-surface, must be covered by solder.

Solder-Bath: More than 95% of the electrode must be covered with solder.

Wave soldering (Follow the JEDEC standard JESD22-A111)

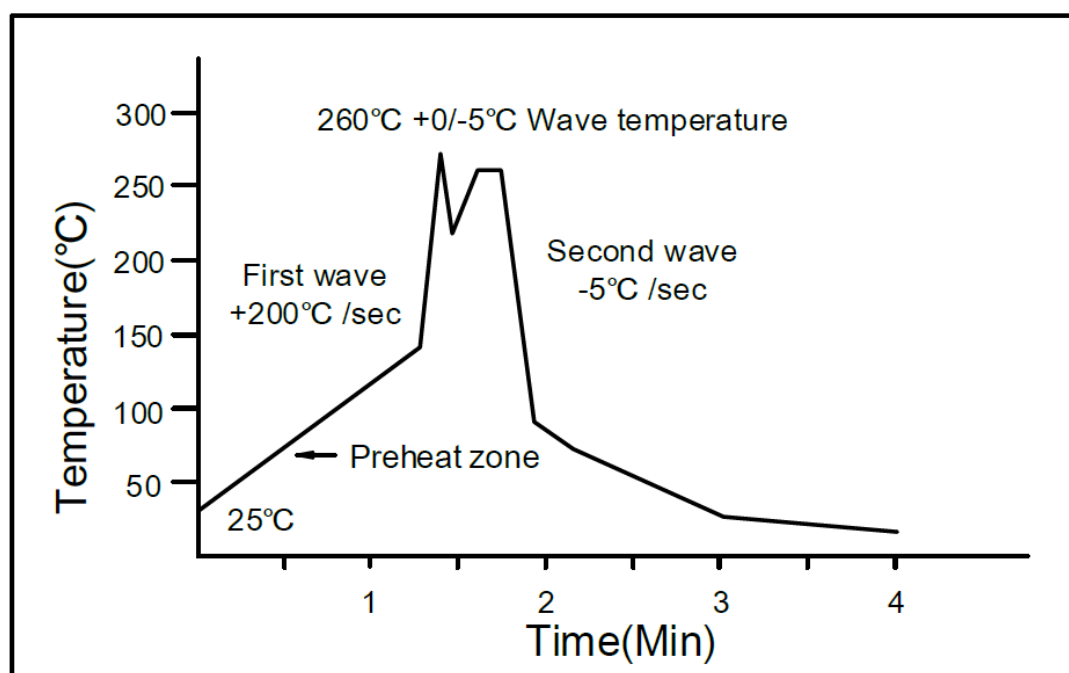
One time soldering is recommended within the condition of temperature.

Temperature: $260 \pm 0/-5^{\circ}\text{C}$.

Time: 10 sec.

Preheat temperature: 25 to 140°C .

Preheat time: 30 to 80 sec.



Iron soldering (Follow the standard MIL-STD 202G, Method 210F)

Allow single lead soldering in every single process.

One time soldering is recommended. Temperature: $350 \pm 10^{\circ}\text{C}$

Time: 5 sec max.

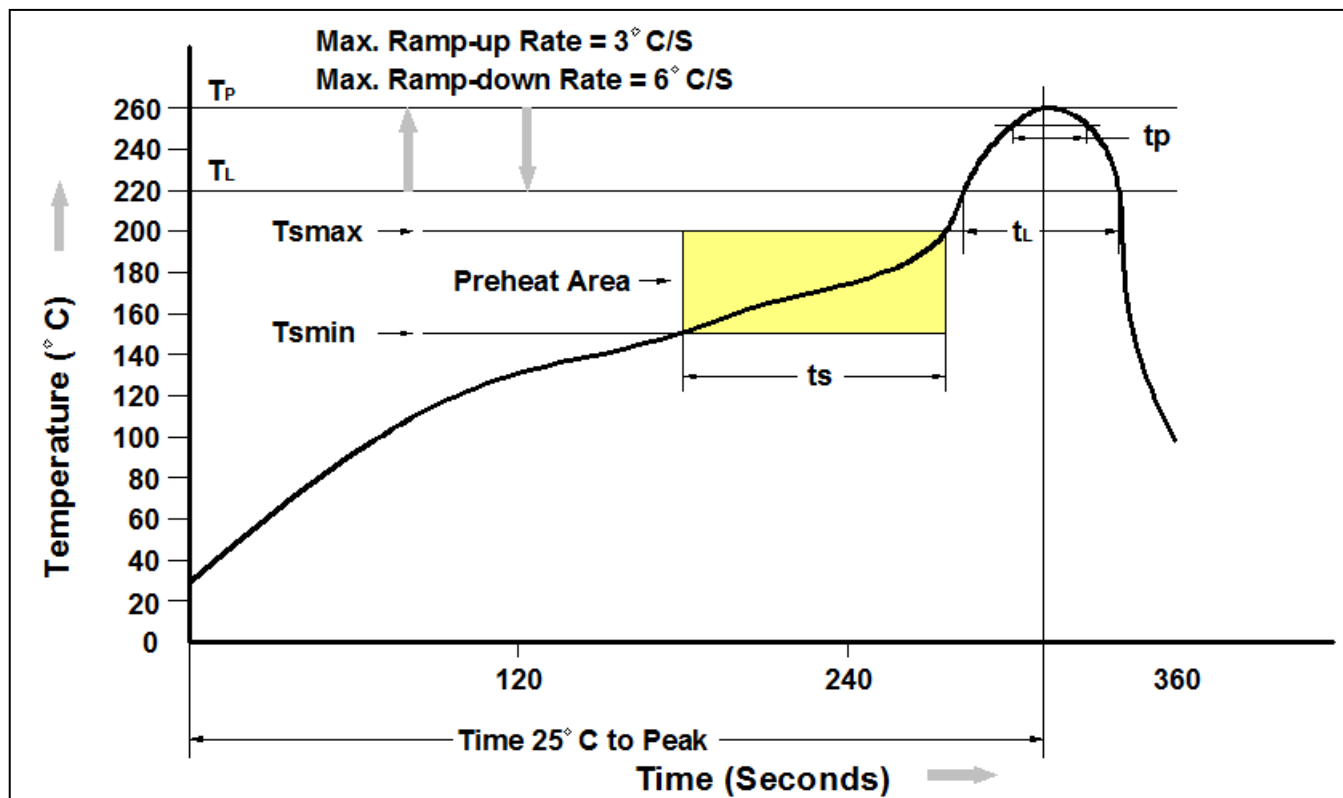


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Reflow Profile (Follow the JEDEC standard J-STD-020)



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin 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.



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