



# CT827 Series DC Input 8-Pin DMC-Isolator® Phototransistor Optocoupler

## Features

- High isolation 5000 VRMS
- Patented coplanar structure DMC-Isolator®
- Various CTR selection available
- DC input with Transistor output
- Operating Temperature range - 55 °C to 110 °C
- External creepage distance  $\geq 7.0\text{mm}$
- Distance Through Isolation  $\geq 0.4\text{mm}$
- External Creepage  $\geq 8\text{mm}$  (S/SL Type)
- RoHS and REACH compliance
- Halogen Free compliance
- MSL class 1
- Regulatory Approvals
  - ✓ UL - UL1577 (E364000)
  - ✓ VDE - EN60747-5-5(VDE0884-5)
  - ✓ CQC – GB4943.1, GB8898 (14001104779)
  - ✓ IEC62368 (FI/41119)

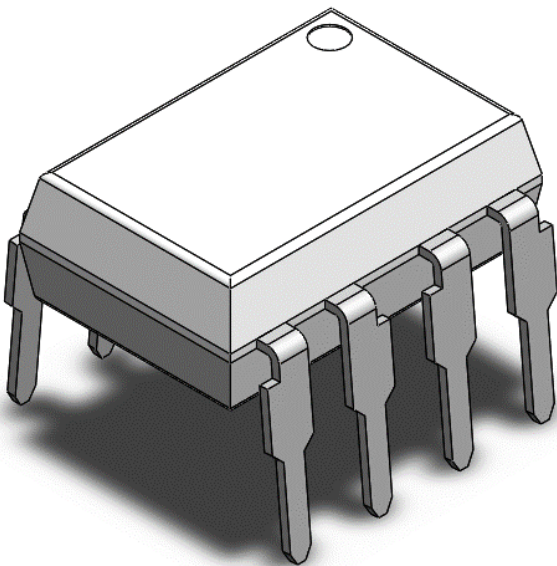
## Description

The CT827 series consists of dual channels each contains a photo transistor optically coupled to an Infrared-emitting diode in a 8-lead DIP package different lead forming options.

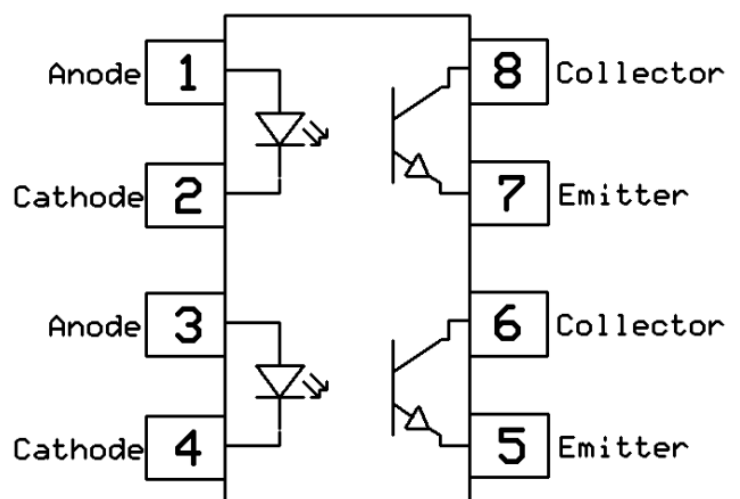
## Applications

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

## Package Outline



## Schematic



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



# CT827 Series

## DC Input 8-Pin DMC-Isolator®

### Phototransistor Optocoupler

#### 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 <sub>ISO</sub>	Isolation voltage (AC, 1 minute, 40 ~ 60% R.H.)	5000	V <sub>RMS</sub>	
P <sub>TOT</sub>	Total power dissipation	200	mW	
T <sub>OPR</sub>	Operating temperature	-55 ~ +110	°C	
T <sub>STG</sub>	Storage temperature	-55 ~ +150	°C	
T <sub>SOL</sub>	Soldering temperature (For 10 seconds)	260	°C	
<b>Emitter (1 circuit)</b>				
I <sub>F</sub>	Forward current	60	mA	
I <sub>F(TRANS)</sub>	Peak transient current ( $\leq 1\mu\text{s P.W, 300pps}$ )	1	A	
V <sub>R</sub>	Reverse voltage	6	V	
P <sub>D</sub>	Emitter power dissipation	100	mW	
<b>Detector (1 circuit)</b>				
P <sub>D</sub>	Detector power dissipation	150	mW	
B <sub>VCEO</sub>	Collector-Emitter Breakdown Voltage	80	V	
B <sub>VECO</sub>	Emitter-Collector Breakdown Voltage	7	V	
I <sub>C</sub>	Collector Current	50	mA	



# CT827 Series DC Input 8-Pin DMC-Isolator® Phototransistor Optocoupler

## Electrical Characteristics $T_A = 25^\circ\text{C}$ (unless otherwise specified)

### Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$V_F$	Forward voltage	$I_F = 10\text{mA}$	-	1.24	1.4	V	
$I_R$	Reverse Current	$V_R = 6\text{V}$	-	--	5	$\mu\text{A}$	
$C_{IN}$	Input Capacitance	$f = 1\text{MHz}$	-	10	30	pF	

### Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{CEO}}$	Collector-Emitter Breakdown	$I_C = 100\mu\text{A}$	80	-	-	V	
$B_{V_{ECO}}$	Emitter-Collector Breakdown	$I_E = 100\mu\text{A}$	7	-	-	V	
$I_{CEO}$	Collector-Emitter Dark Current	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$	-	-	100	nA	

### Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes	
CTR	Current Transfer Ratio	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	CT827	50	-	600	%	
			CT827A	80	-	160		
			CT827B	130	-	260		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F = 20\text{mA}, I_C = 1\text{mA}$	-	0.1	0.2	V		
$R_{IO}$	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}, 40 \sim 60\% \text{ R.H.}$	$5 \times 10^{10}$	-	-	$\Omega$		
$C_{IO}$	Isolation Capacitance	$f = 1\text{MHz}$	-	0.5	1	pF		

### Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$t_r$	Rise Time	$I_C = 2\text{mA}, V_{CE} = 2\text{V}$ $R_L = 100\Omega$	-	6	18	$\mu\text{s}$	
$t_f$	Fall Time		-	8	18		



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

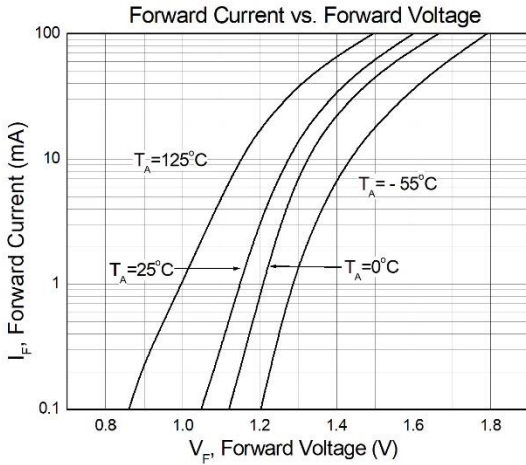


Figure 2

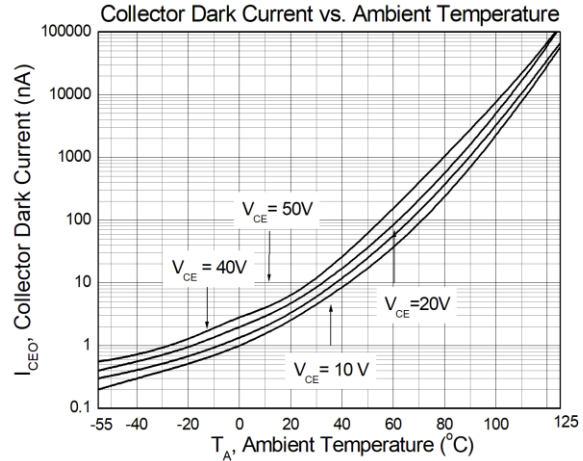


Figure 3

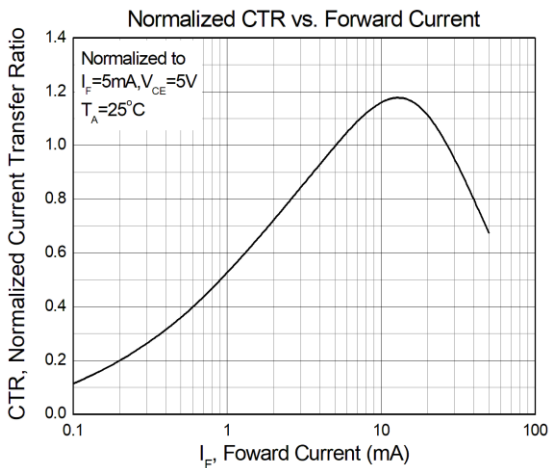


Figure 4

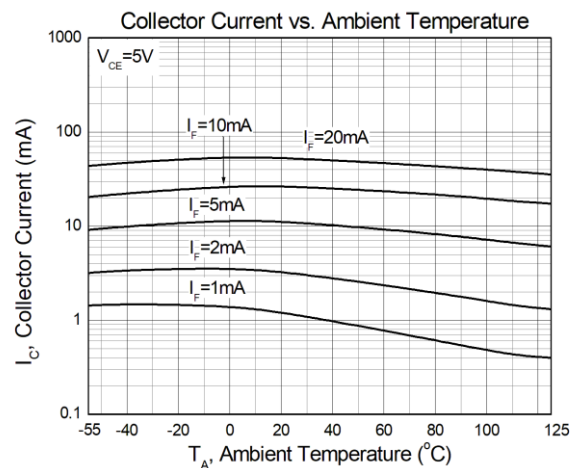


Figure 5

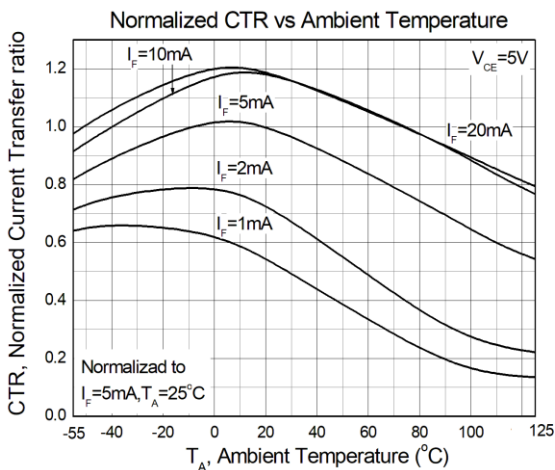


Figure 6

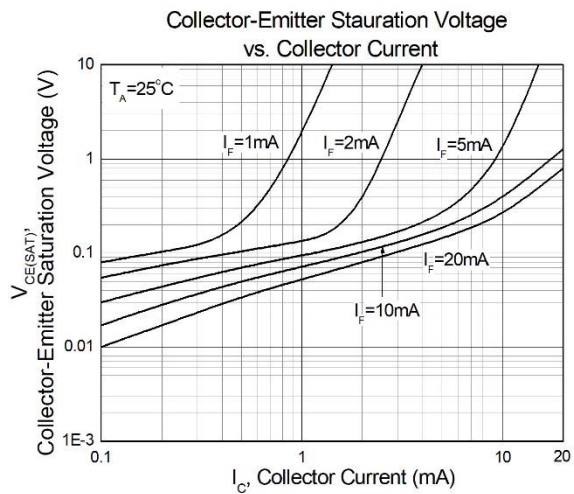


Figure 7



# CT827 Series DC Input 8-Pin DMC-Isolator® Phototransistor Optocoupler

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

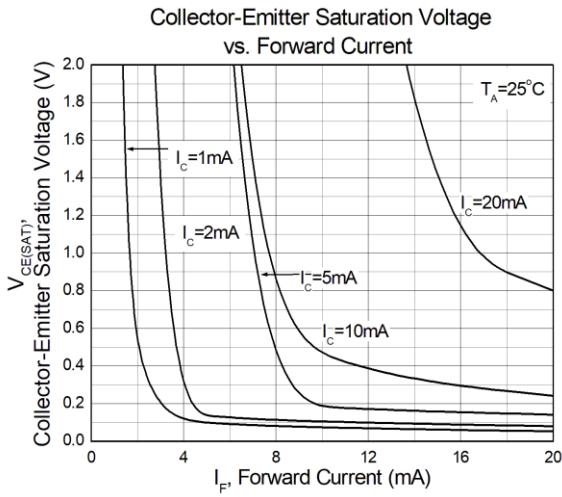


Figure 8

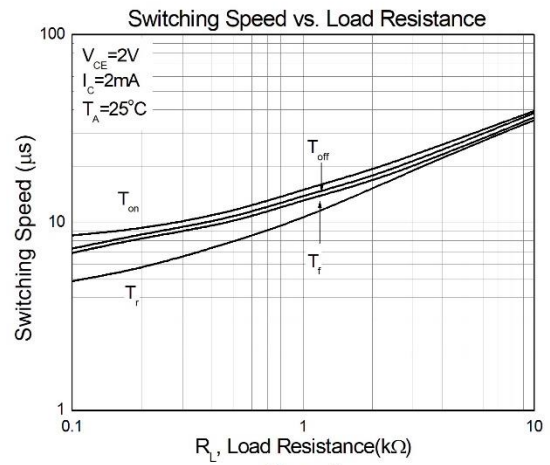


Figure 9

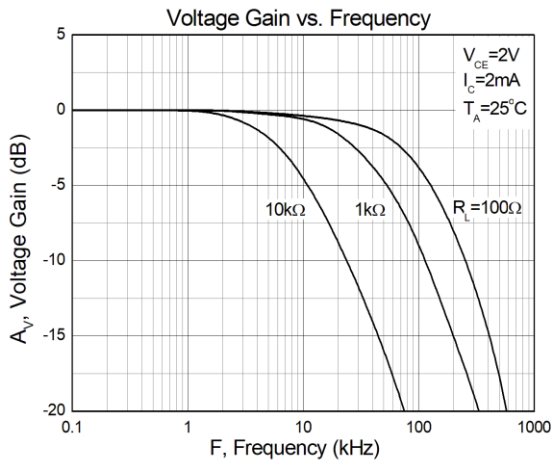


Figure 10



## Test Circuit

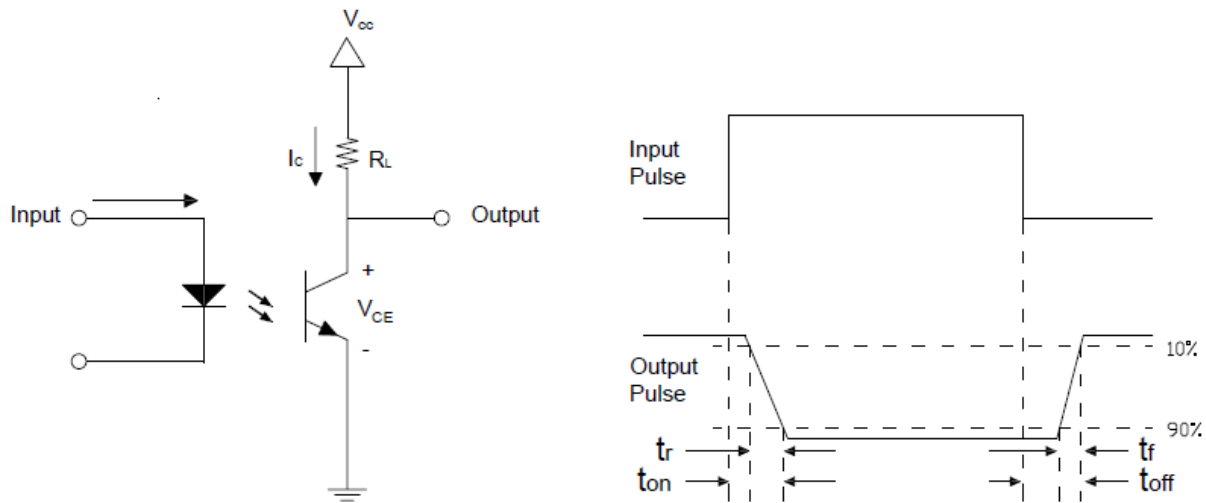
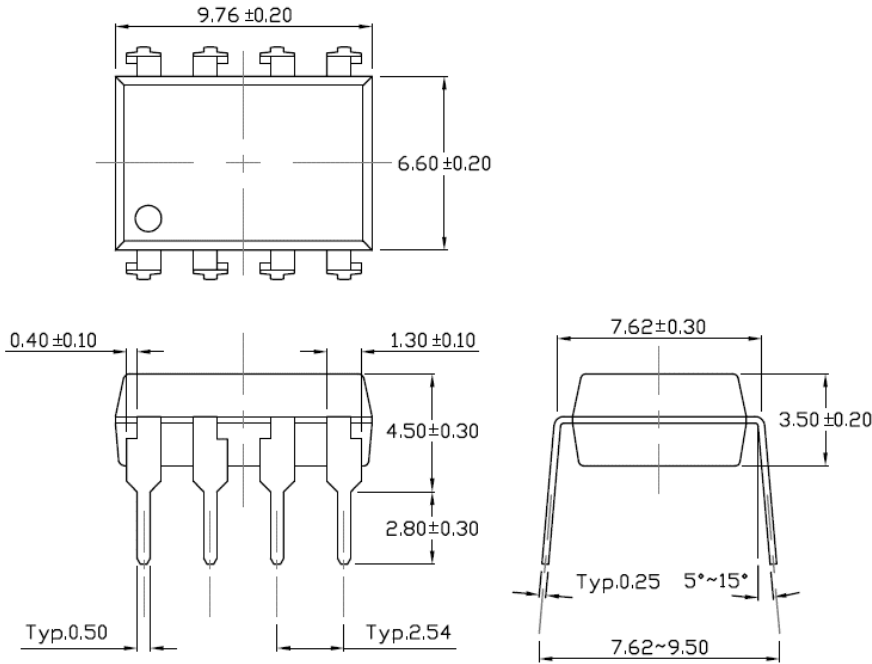


Figure 11: Switching Time Test Circuits



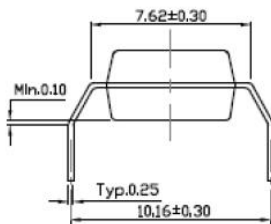
## Package Dimension *Dimensions in mm unless otherwise stated*

### Standard DIP – Through Hole

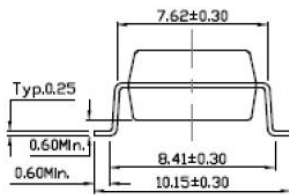


### Forming Option

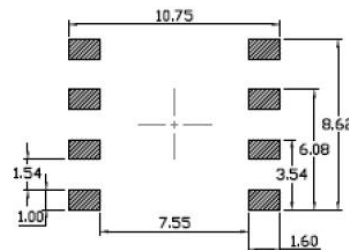
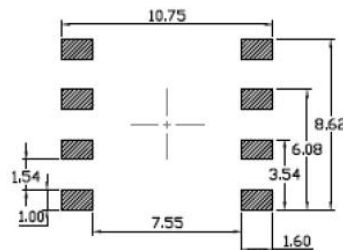
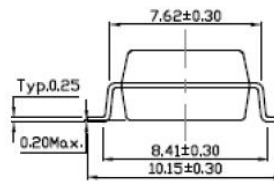
#### M Type



#### S Type



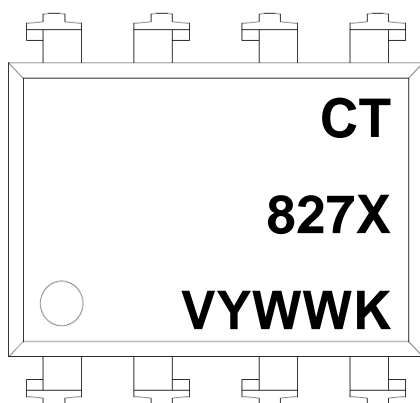
#### SL Type





# CT827 Series DC Input 8-Pin DMC-Isolator® Phototransistor Optocoupler

## Marking Information



### Note:

- CT : Denotes “CT Micro”
- 827 : Part Number
- X : CTR Rank Option (Blank, A or B)
- V : VDE Safety Mark Option (Blank or V)
- Y : One Digit Year Code
- WW : Two Digit Work Week
- K : Manufacturing Code

## Ordering Information

### CT827X(V)(Y)(Z)

- CT = Denotes “CT Micro”
- 827 = Part Number
- X = CTR Rank Option (Blank, A or B)
- V = VDE Safety Mark Option (Blank or V)
- Y = Lead Form Option (Blank, S, SL or M)
- Z = Tape and Reel Option (Blank, T1 or T2)

<b>Option</b>	<b>Description</b>	<b>Quantity</b>
None	Standard 8 Pin Dip	40 Units/Tube
M	Gullwing (400mil) Lead Forming	40 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming– With Option 2 Taping	1000 Units/Reel



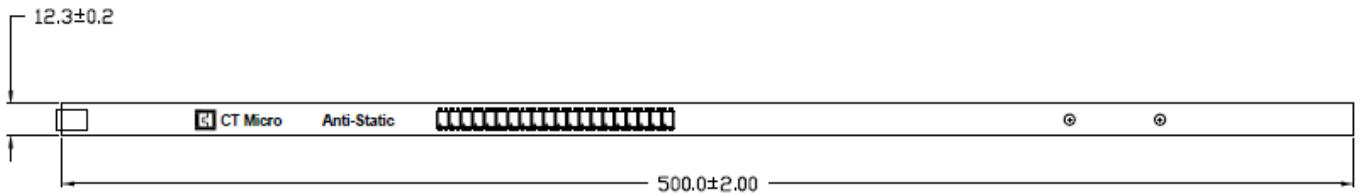


www.ct-micro.com

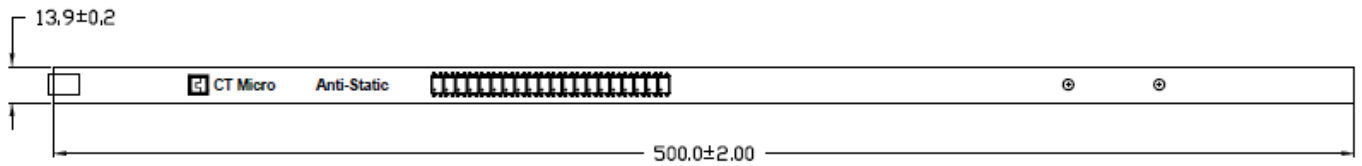
# CT827 Series DC Input 8-Pin DMC-Isolator® Phototransistor Optocoupler

## Carrier Specifications *Dimensions in mm unless otherwise stated*

### Tube Option Standard DIP

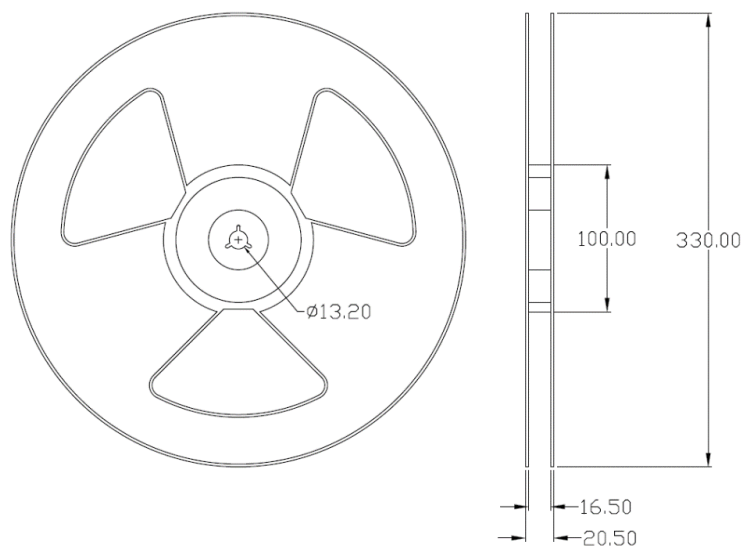


### Tube Option M Type



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

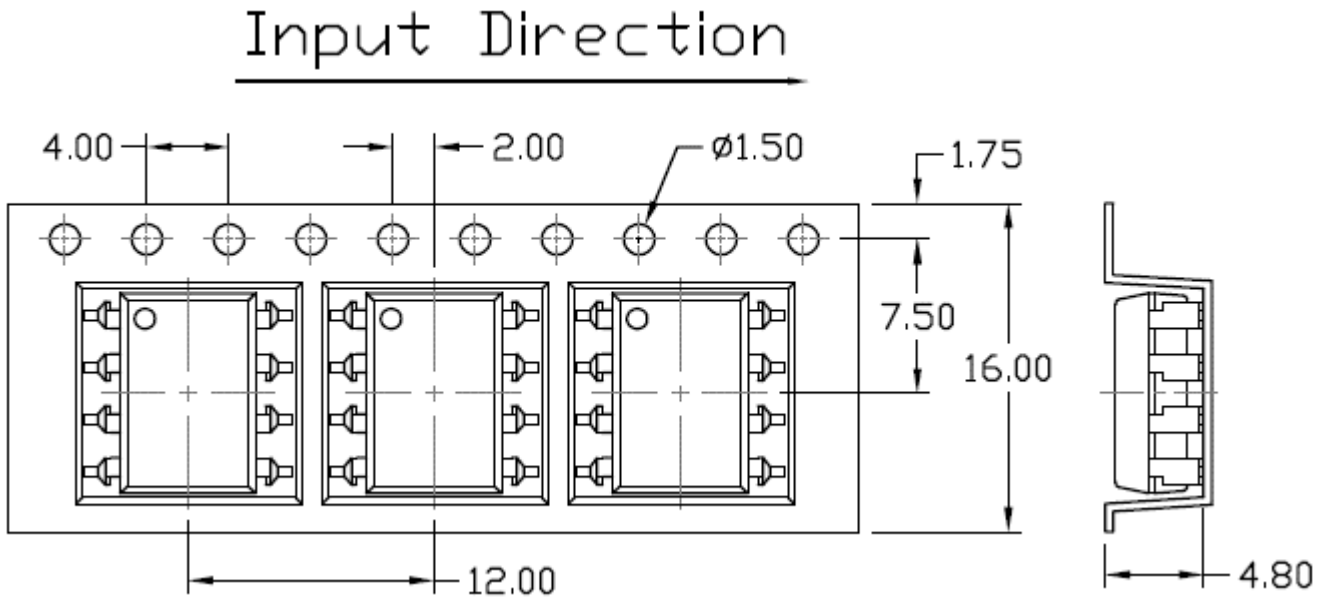
### Option S(T1/T2) & SL(T1/T2)



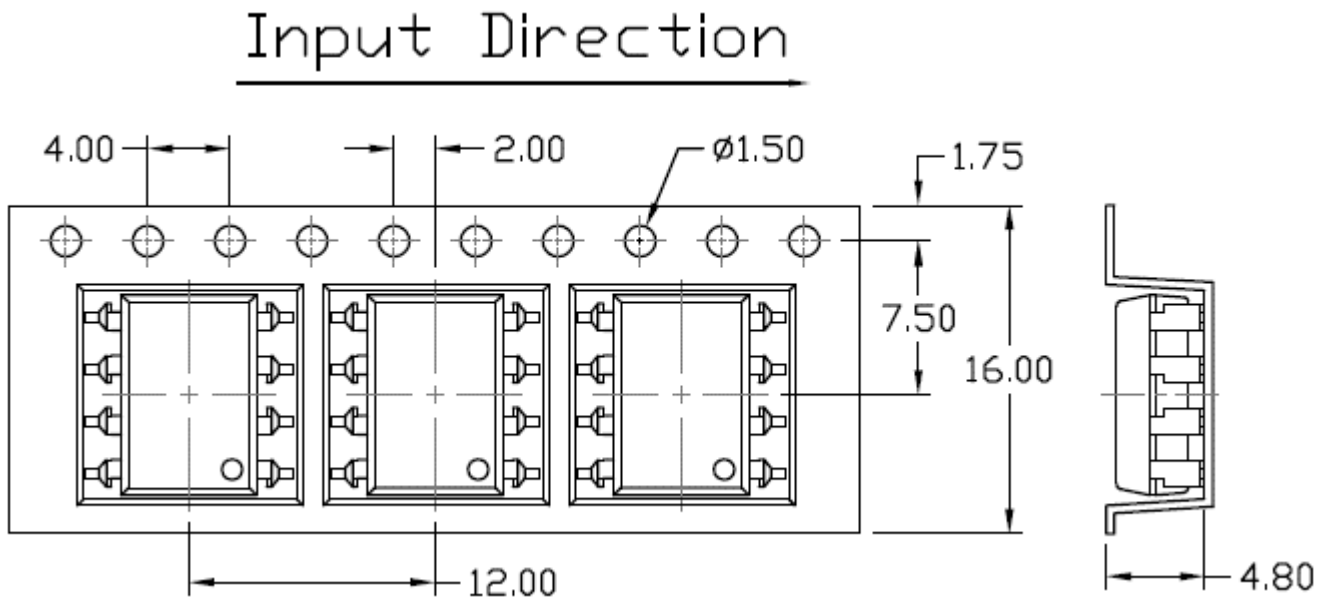


### Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

#### Option S(T1) & SL(T1)



#### Option S(T2) & SL(T2)





**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)**

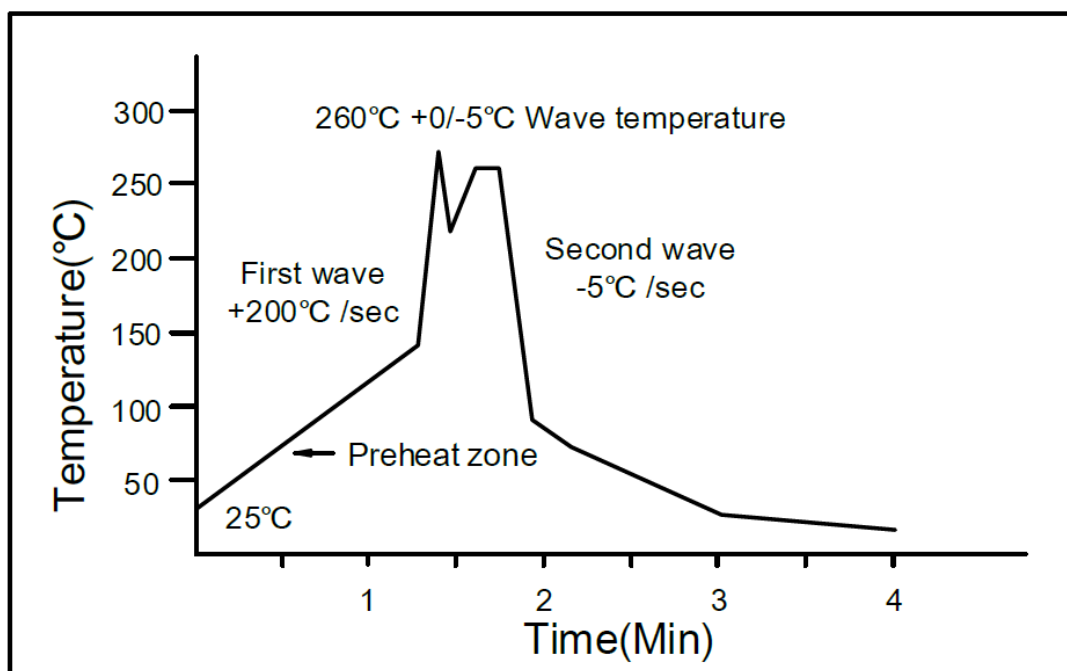
One time soldering is recommended within the condition of temperature.

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

Time: 10 sec.

Preheat temperature: 25 to  $140^\circ\text{C}$ .

Preheat time: 30 to 80 sec.



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

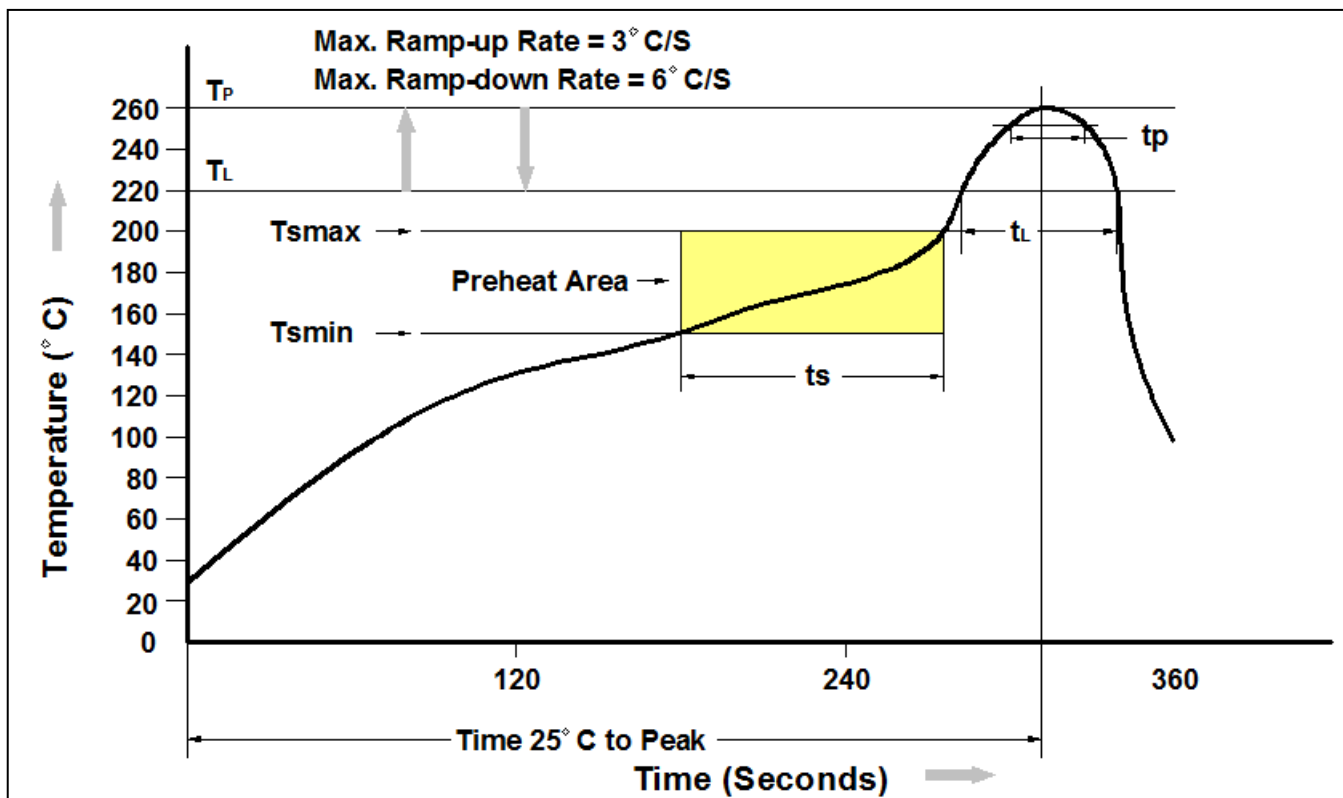
Allow single lead soldering in every single process.

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

Time: 5 sec max.



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



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T <sub>smin</sub> )	150°C
Temperature Max. (T <sub>smax</sub> )	200°C
Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	60-120 seconds
Ramp-up Rate (t <sub>L</sub> to t <sub>P</sub> )	3°C/second max.
Liquidous Temperature (T <sub>L</sub> )	217°C
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t <sub>P</sub> ) within 5°C of 260°C	30 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



# CT827 Series DC Input 8-Pin DMC-Isolator® Phototransistor Optocoupler

---

## DISCLAIMER

**DMC-Isolator® IS A TRADEMARK OF CT MICRO INTERNATIONAL CORPORATION AND/OR ITS SUBSIDIARIES. CT MICRO OWNS THE RIGHTS TO A NUMBER OF PATENTS, TRADEMARKS, COPYRIGHTS AND OTHER INTELLECTUAL PROPERTY.**

---

**CT MICRO RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. CT MICRO DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.**

---

**DISCOLORATION MIGHT OCCUR ON THE PACKAGE SURFACE AFTER SOLDERING, REFLOW OR LONG TERM USE. THIS DOES NOT IMPACT THE PRODUCT PERFORMANCE NOR THE PRODUCT RELIABILITY.**

---

**CT MICRO ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT EXPRESS WRITTEN APPROVAL OF CT MICRO INTERNATIONAL CORPORATION.**

- 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, or (c) whose failure to perform when properly used in accordance with instruction for use provided in the labelling, can be reasonably expected to result in significant injury to the user.*
- 2. A critical component is 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.*