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CTT0213, CTT1213, CTT2213, CTT3213

600V Zero Cross High Power Photo TRIAC

Features

- High isolation 5000 VRMS
- Supports 0.3 A, 0.6 A, 0.9 A and 1.2 A
- RoHS and REACH Compliance
- External creepage distance ≥ 7.0mm
- Distance Through Isolation ≥ 0.4mm
- External Creepage ≥ 8mm (S/SL Type)
- RoHS and REACH compliance
- Halogen Free compliance
- MSL class 1
- Regulatory Approvals
  - ✓ UL - UL1577 (E364000)
  - ✓ VDE - EN60747-5-5(40039590)
  - ✓ CQC – GB4943.1, GB8898 (14001104779)
  - ✓ IEC62368 (FI/41119)

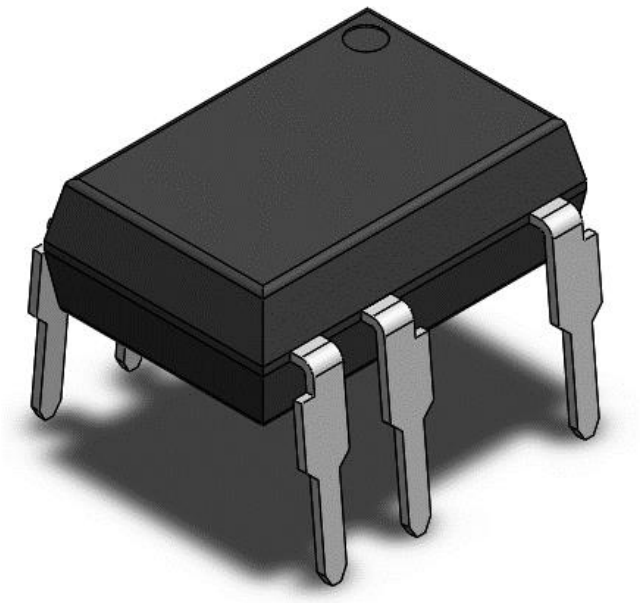
Description

The zero crossing power Triac consists of a Triac and a photo-Triac, which is optically coupled to an Infrared emitting diode, and house in a 7-lead DIP package. It also comes with different lead forming options.

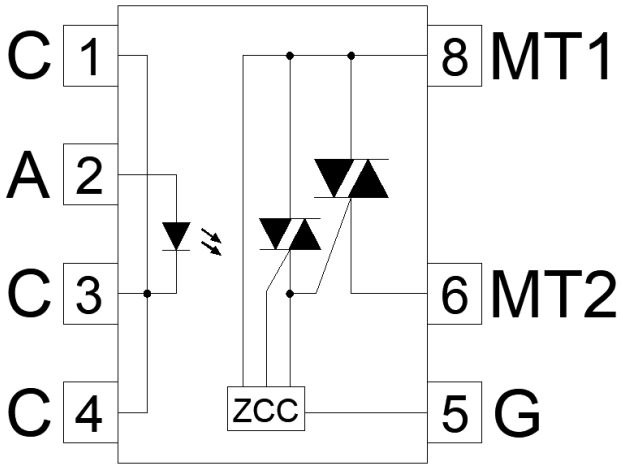
Applications

- Home appliances
- Industrial equipment
- Switching motors, fans, heaters, solenoids and valves.
- Power control such as lighting and temperature control

Package Outline



Schematic



Note: Different bending options available. See package dimension.

Absolute Maximum Ratings T_A = 25°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, R.H.=40~60%)		5000	Vrms	
T_{OPR}	Operating temperature		-40 ~+85	°C	
T_{STG}	Storage temperature		-40 ~+125	°C	
T_{SOL}	Soldering temperature (For 10 Seconds)		260	°C	
	Wave soldering temperature		260	°C	
Emitter					
I_F	LED forward current		50	mA	
I_{FP}	Peak transient current (≤1μs P.W,300pps)		1	A	
V_R	LED reverse voltage		6	V	
P_{in}	Power dissipation		75	mW	
Detector					
V_{DRM}	Repetitive peak OFF-state voltage		600	V	
$I_{T(RMS)}$	Continuous Current Load	CTT0213	0.3	A	
		CTT1213	0.6		
		CTT2213	0.9		
		CTT3213	1.2		
I_{TSM}	Peak Current Load (60Hz, 1 cycle)	CTT0213	3	A	
		CTT1213	6		
		CTT2213	9		
		CTT3213	12		
P_{out}	Power dissipation		800	mW	
P_T	Total power dissipation		850	mW	
RthJ-A	Thermal Resistance Junction-Ambient		120	°C/W	

Electrical Characteristics T_A = 25°C (unless otherwise specified)

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	I_F=10mA	-	-	1.4	V	
I_R	Reverse Current	V_R = 6V	-	-	5	μA	
C_{IN}	Input Capacitance	f= 1MHz	-	45	-	pF	

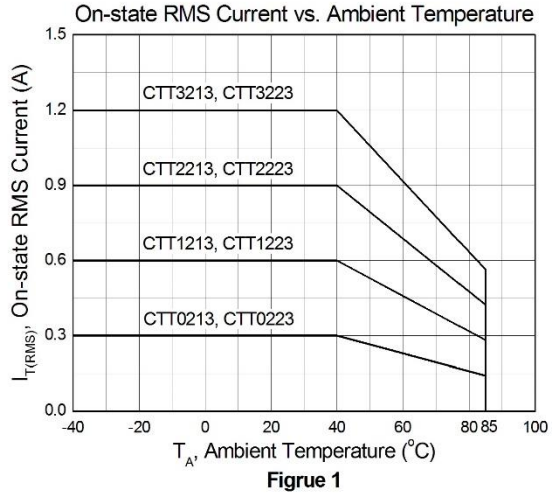
Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{DRM1}	Peak Blocking Current	I_F= 0mA, V_{DRM}= Rated V_{DRM}	-	-	100	uA	
I_{DRM2}	Inhibit Leakage Current	I_F = Rated I_{FT}, V_{DRM}= Rated V_{DRM}	-	-	500	uA	
V_{INH}	Inhibit Voltage	I_F= Rated I_{FT}	-	-	50	V	
V_{TM}	Peak On-State Voltage	I_F= Rated I_{FT}, I_{TM}= Max.	-	-	2.5	V	
dv/dt	Critical Rate of Rise off-State Voltage	V_{PEAK}= Rated V_{DRM}	200	-	-	V/μs	

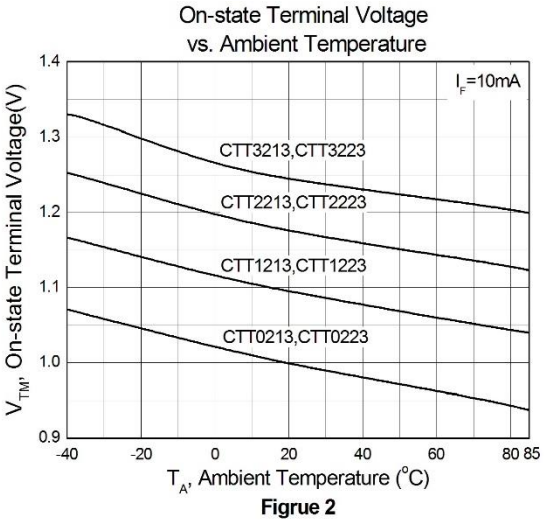
Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Input Trigger Current	Terminal Voltage = 3V	-	-	10	mA	
I_H	Holding Current	Terminal Voltage from “ON” to “OFF” “ON” state I_F=0mA	-	-	25	mA	
T_{on}	Turn On Time	I_F= 20mA, V_D= 6V, R_L= 100 Ω	-	10	100	μs	
R_{IO}	Isolation Resistance	V_{IO}= 500V_{DC}, R.H.=40~60%	$1x10^{11}$	-	-	Ω	
C_{IO}	Isolation Capacitance	f= 1MHz	-	0.25	-	pF	

Typical Characteristic Curves *T_A = 25°C, unless otherwise specified*



Figrue 1



Figrue 2

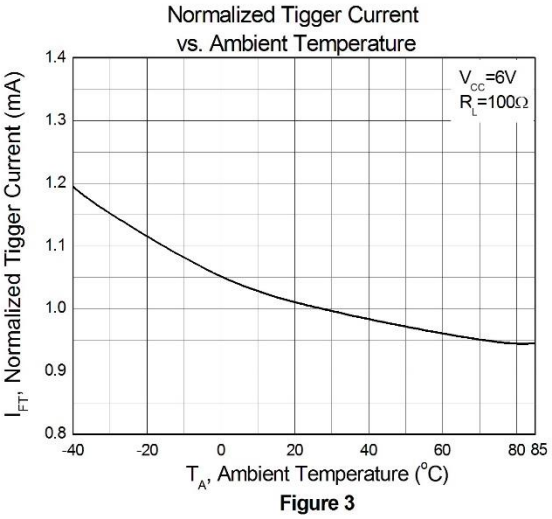


Figure 3

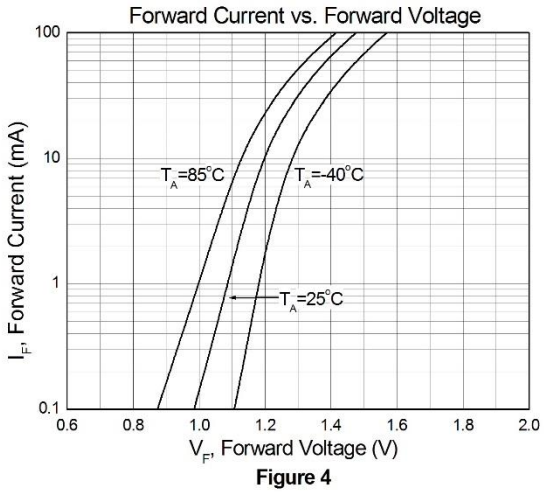


Figure 4

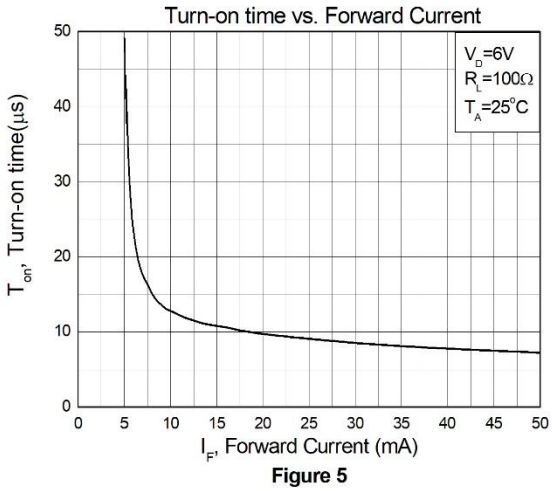


Figure 5

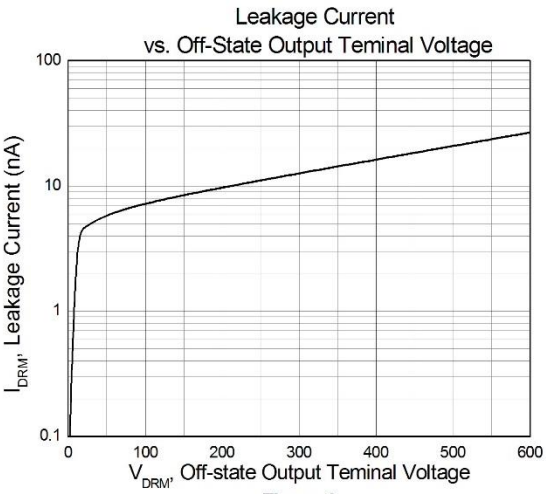


Figure 6

Typical Characteristic Curves *T_A = 25°C, unless otherwise specified (Continued)*

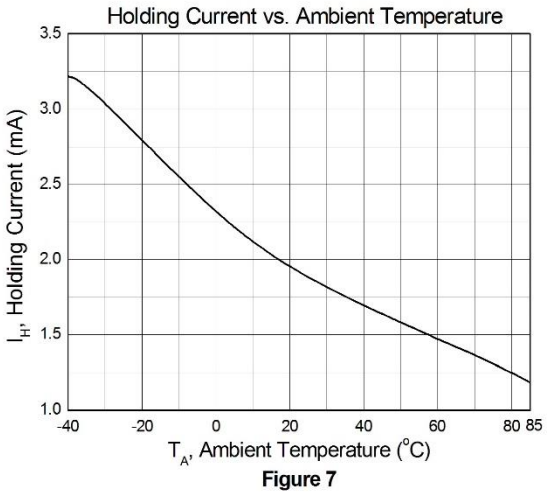


Figure 7

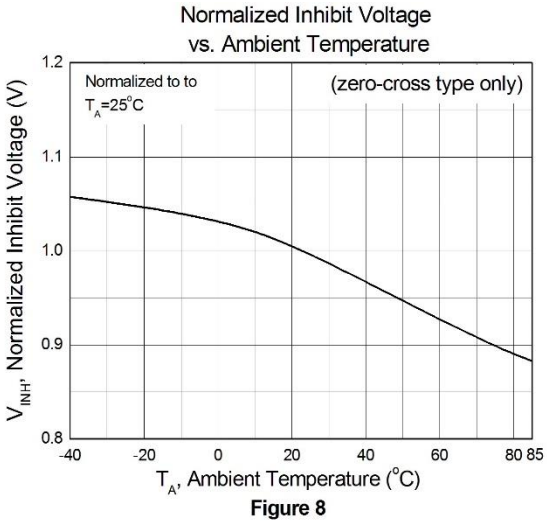


Figure 8

Test Circuit

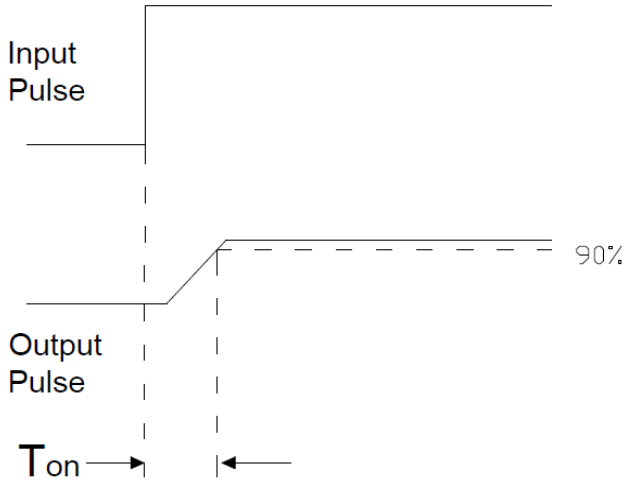
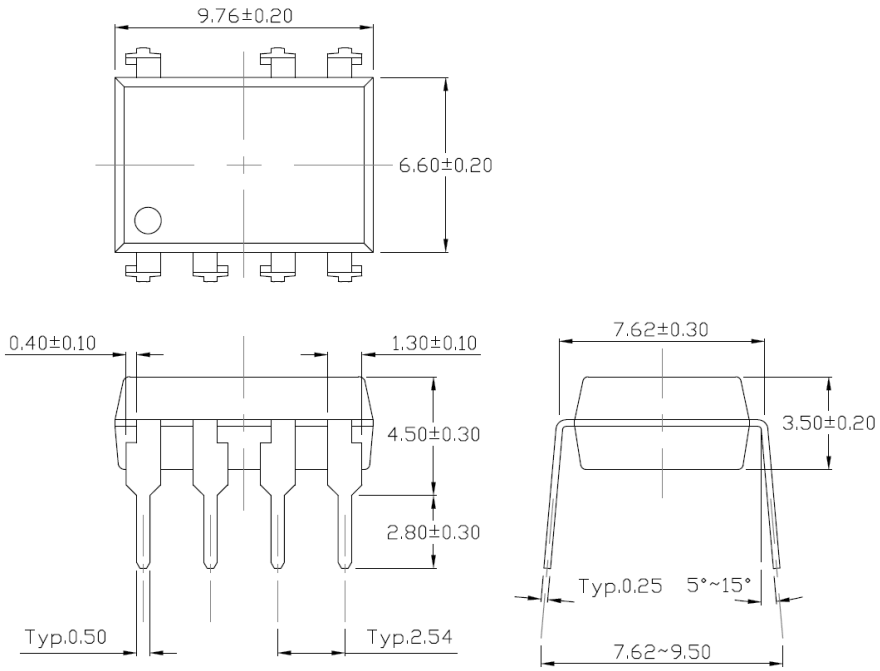


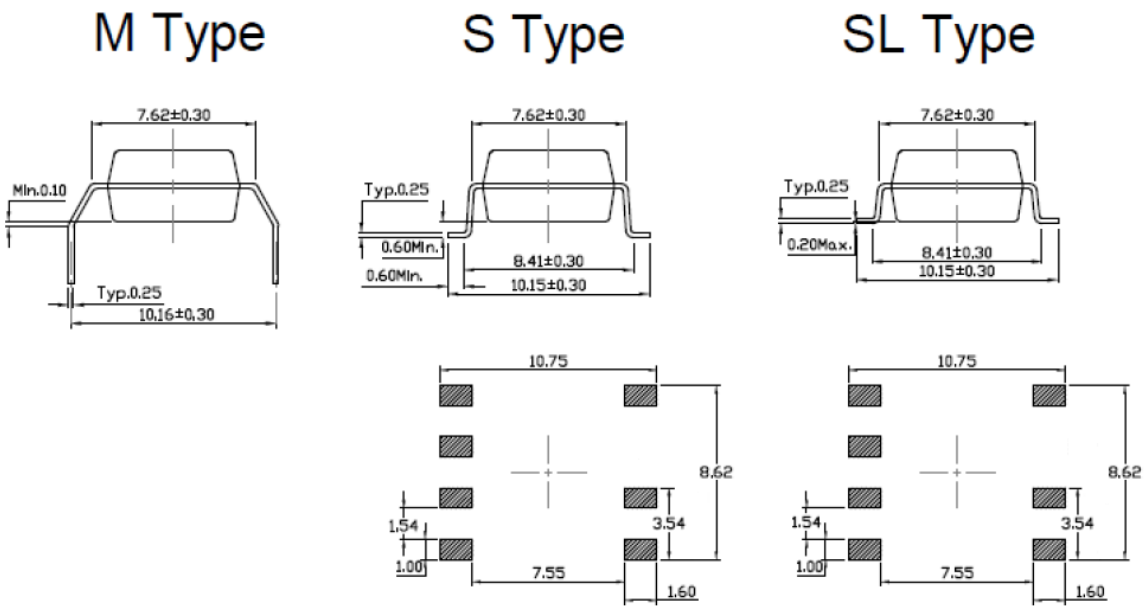
Figure 9: Turn On Time

Package Dimension *Dimensions in mm unless otherwise stated*

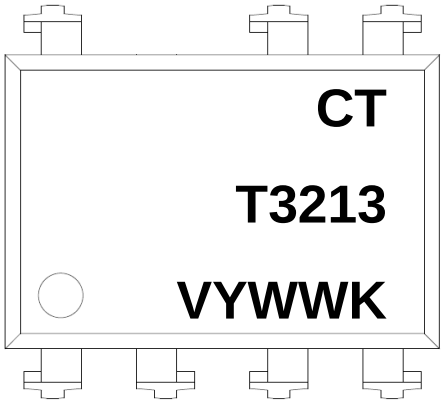
Standard DIP – Through Hole



Forming Option



Marking Information



Note:

CT : Denotes “CT Micro”
T3213 : 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

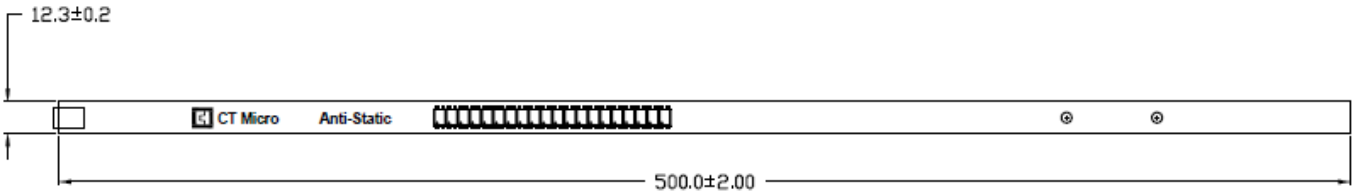
CTTX213(V)(Y)(Z)

CT = Denotes “CT Micro”
TX213 = Product Number (Current Rating Option X=0, 1, 2, or 3)
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)

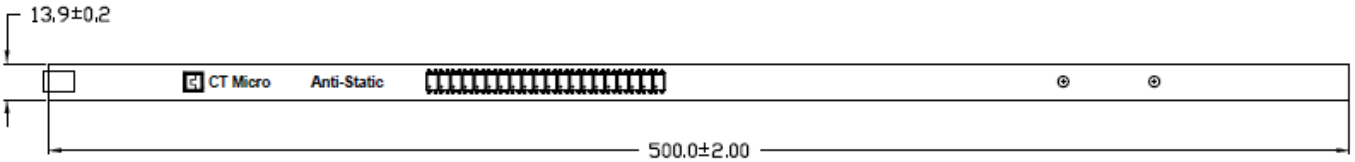
Option	***Description***	***Quantity***
None	Standard 8 Pin Dip	40 Units/Tube
M	Gullwing (400mil) Lead Forming	40 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile)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

Carrier Specifications *Dimensions in mm unless otherwise stated*

Tube Option Standard DIP

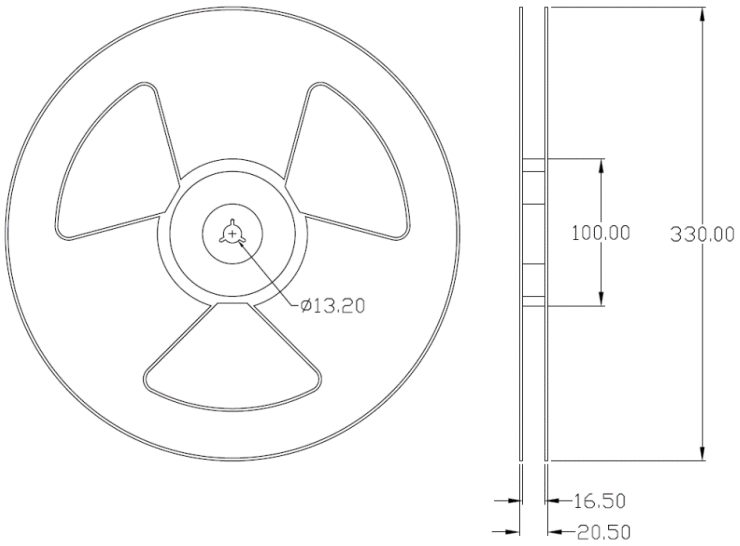


Tube Option M Type



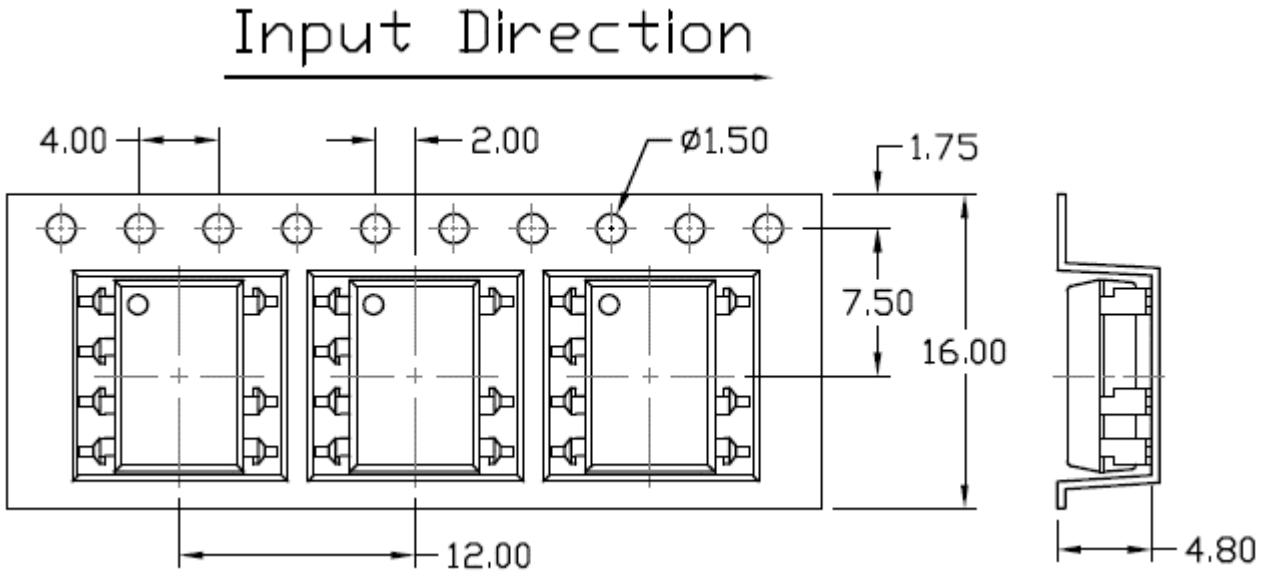
Reel Dimension *All dimensions are in mm, unless otherwise stated*

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

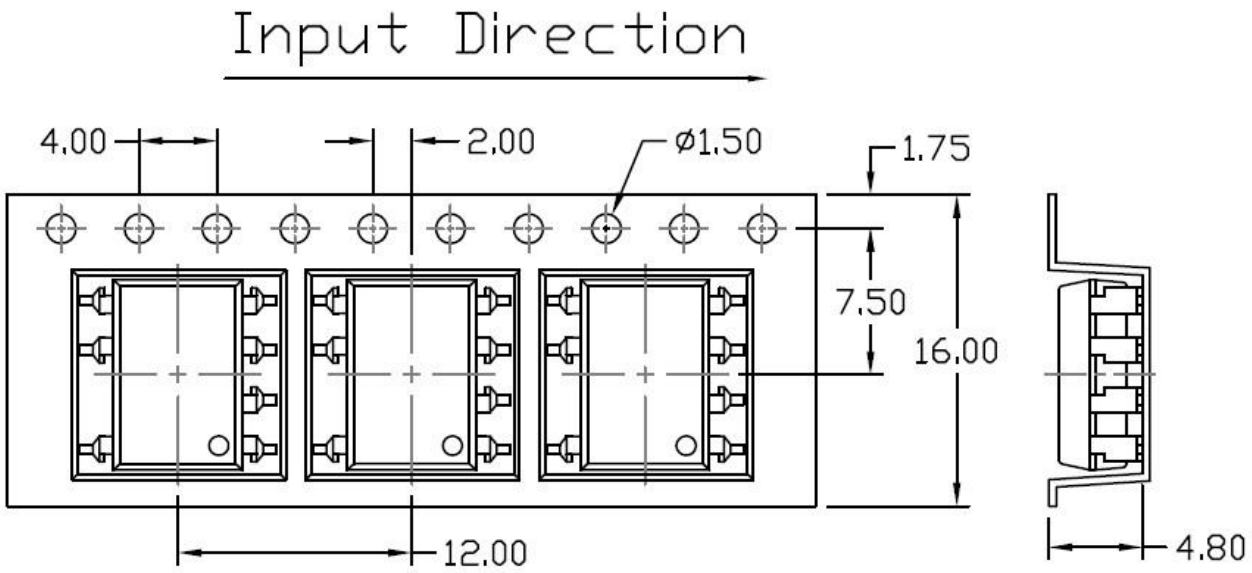


Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S(T1) & SL(T1)



Option S(T2) & SL(T2)

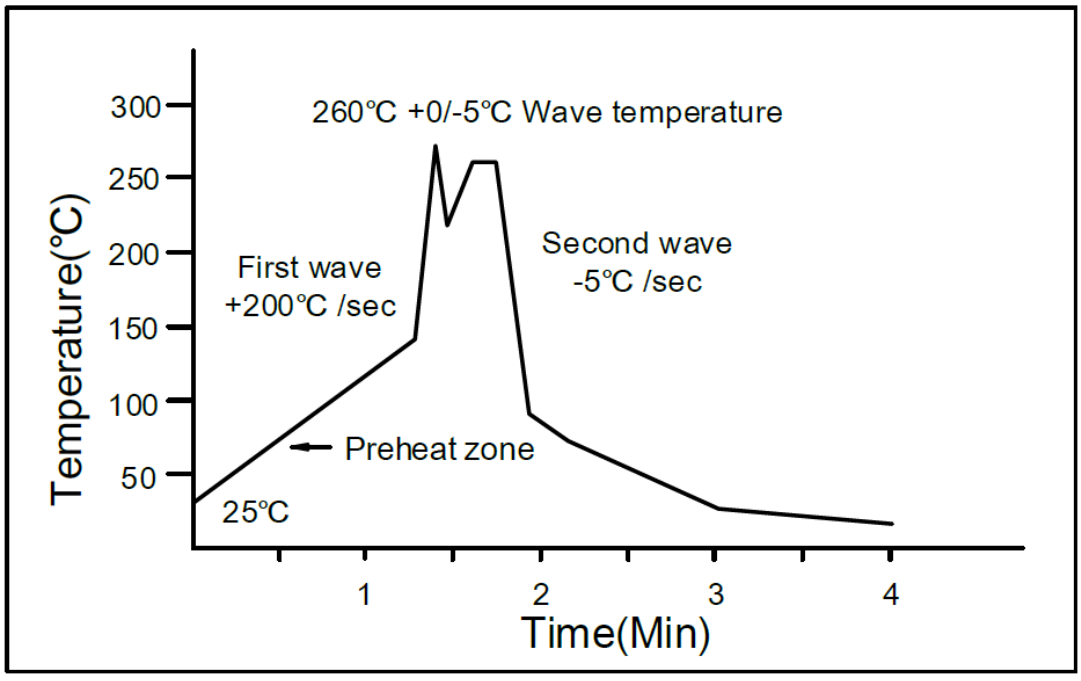


Solderability spec (Follow the JEDEC standard JESD22-B102)

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)

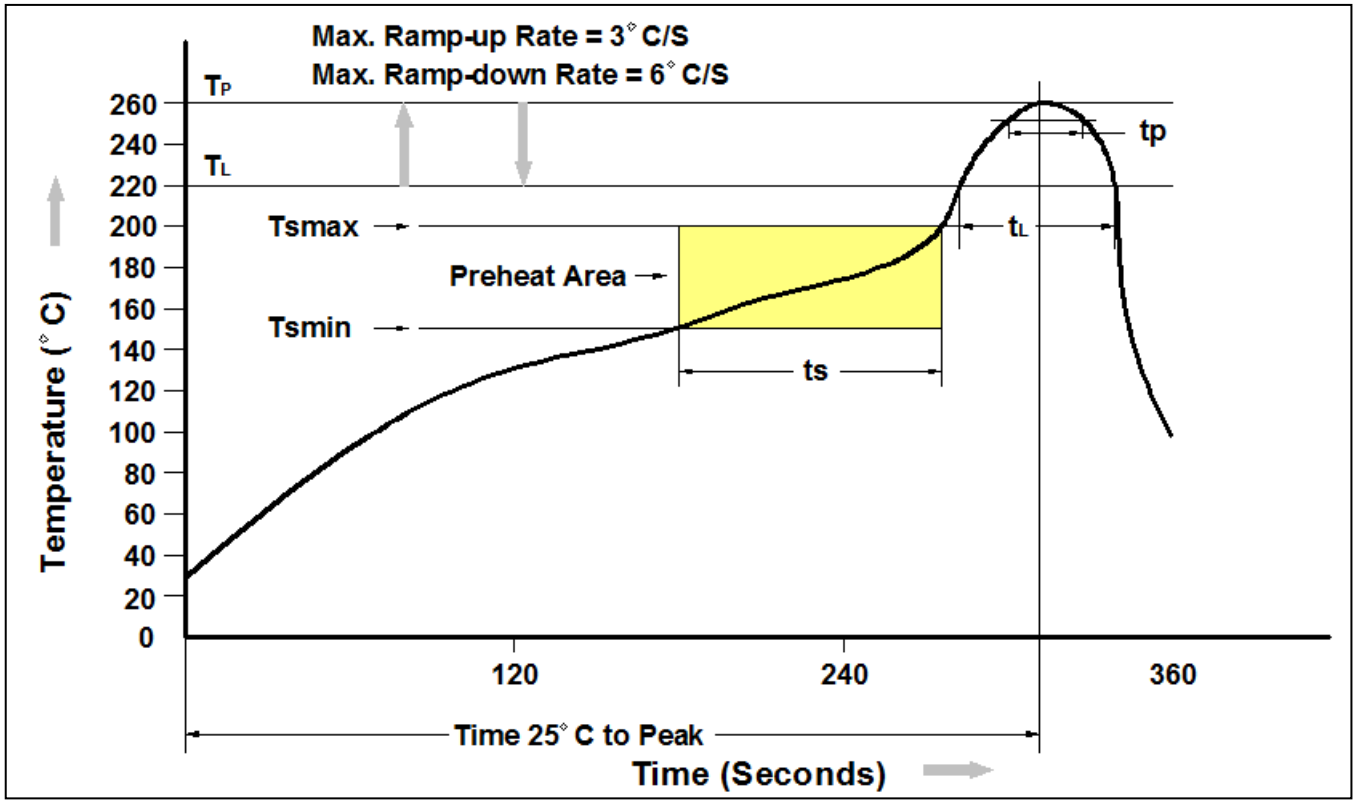
One time soldering is recommended within the condition of temperature.
Temperature: 260+0/-5˚C.
Time: 10 sec.
Preheat temperature: 25 to 140˚C.
Preheat time: 30 to 80 sec.



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±10˚C
Time: 5 sec max.

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 (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.

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