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CT1018(V)(T1)-W(NP) & CT1019(V)(T1)-W(NP)

DC Input 4-Pin LSOP DMC-Isolator®

Phototransistor Optocoupler

Features

- High isolation 5000 VRMS
- Patented coplanar structure DMC-Isolator®
- DC input with transistor output
- Operating Temperature range - 55 °C to 125 °C
- External creepage distance > 8.0 mm
- Clearance distance > 8.2mm
- Distances through insulation > 0.4 mm
- RoHS and REACH Compliance
- Halogen Free Compliance
- MSL class 1
- Regulatory Approvals
 - ✓ UL - UL1577 (E364000)
 - ✓ VDE - EN60747-5-5 (VDE0884-5)
 - ✓ CQC - GB4943.2022 (19001231775)
 - ✓ IEC62368 (FI/41119)

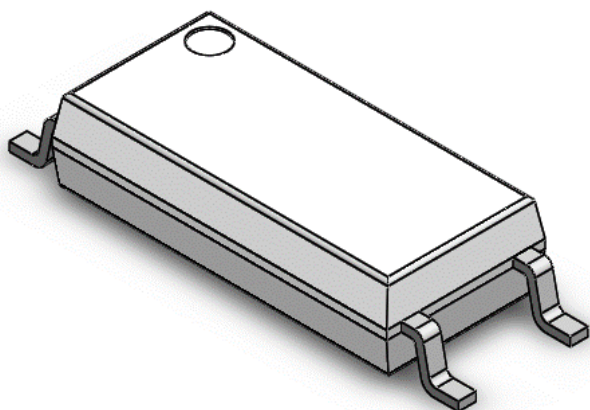
Description

The CT1018(V)(T1)-W(NP) and CT1019(V)(T1)-W(NP) consists of a photo transistor optically coupled to an Infrared-emitting diode in a 4-lead LSOP DMC-Isolator® Package.

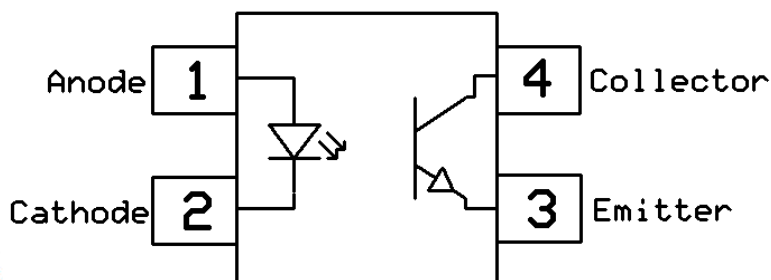
Applications

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

Package Outline



Schematic





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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}	
V_{IORM}	Maximum repetitive peak isolation voltage	890	V_{peak}	
V_{PR}	Input-to-Output Test Voltage, Method b, $V_{IORM} \times 1.875 = V_{PR}$, 100% Production Test with $t_m = 1$ sec, Partial Discharge < 5 pC	1669	V_{peak}	1
V_{PR}	Input-to-Output Test Voltage, Method a, $V_{IORM} \times 1.6 = V_{PR}$, Type and Sample Test, $t_m = 10$ sec, Partial Discharge < 5 pC	1424	V_{peak}	1
V_{IOTM}	Maximum transient isolation voltage	6000	V_{peak}	
T_{OPR}	Operating temperature	-55 ~ +125	$^\circ\text{C}$	
T_{STG}	Storage temperature	-55 ~ +150	$^\circ\text{C}$	
T_{SOL}	Soldering temperature (For 10 seconds)	260	$^\circ\text{C}$	
T_J	Junction temperature	125	$^\circ\text{C}$	
Emitter				
I_F	Forward current	50	mA	
$I_{F(TRANS)}$	Peak transient current ($\leq 1\mu\text{s P.W, 300pps}$)	1	A	
V_R	Reverse voltage	6	V	
P_D	Power dissipation	85	mW	
Detector				
P_C	Power dissipation	150	mW	
B_{VCEO}	Collector-Emitter Breakdown Voltage	80	V	
B_{VECO}	Emitter-Collector Breakdown Voltage	7	V	
I_C	Collector Current	50	mA	

Note **1** : Refer to the front of the optocoupler section of the current catalog, under Product Safety Regulations section, IEC/EN/DIN EN 60747-5-5, for a detailed description.



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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	$I_F = 10\text{mA}$	-	1.26	1.4	V	
		$I_F = 50\text{mA}$	-	1.42	1.5	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{kHz}$	-	45	-	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	CT1018-W	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$	130	-	260	%	
		CT1019-W		200	-	400		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		$I_F = 10\text{mA}$, $I_C = 1\text{mA}$	-	-	0.4	V	
R_{IO}	Isolation Resistance		$V_{IO} = 500\text{V}_{DC}$	5×10^{10}	-	-	Ω	
C_{IO}	Isolation Capacitance		$f = 1\text{MHz}$	-	-	1	pF	

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
T_{ON}	Turn On Time	$I_C = 5\text{mA}$, $V_{CE} = 5\text{V}$, $R_L = 100\Omega$	-	4.8	22	μs	
T_{OFF}	Turn Off Time		-	4.2	22		
t_r	Rise Time		-	2.7	18		
t_f	Fall Time		-	4	18		



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

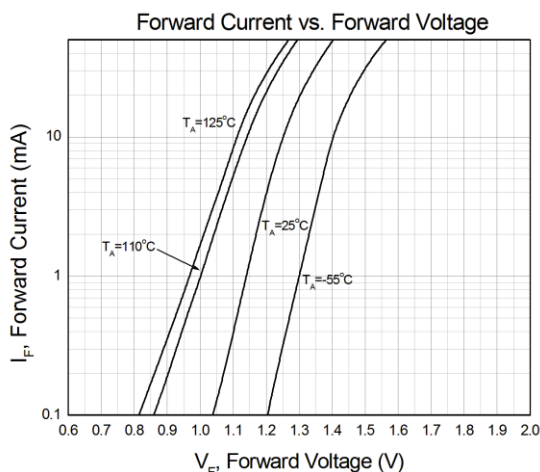


Figure 1

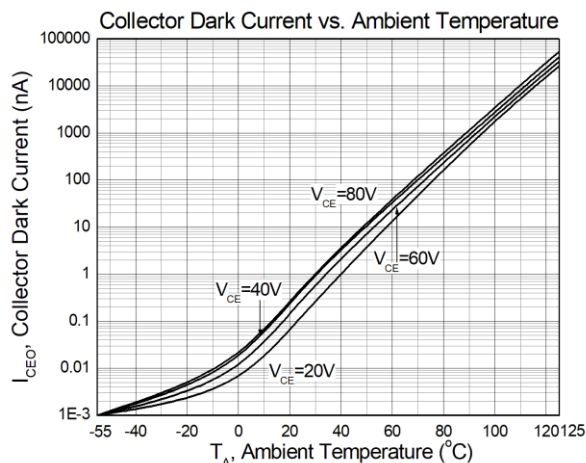


Figure 2

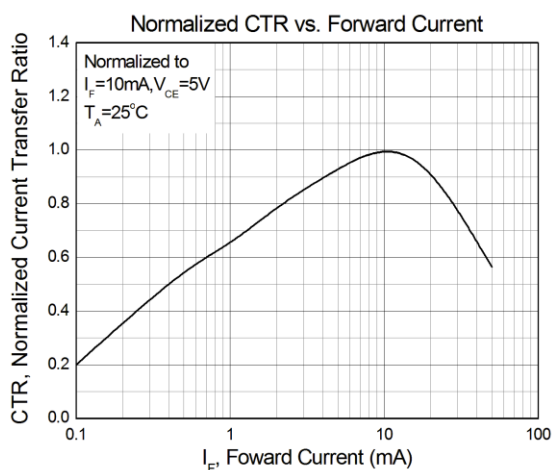


Figure 3

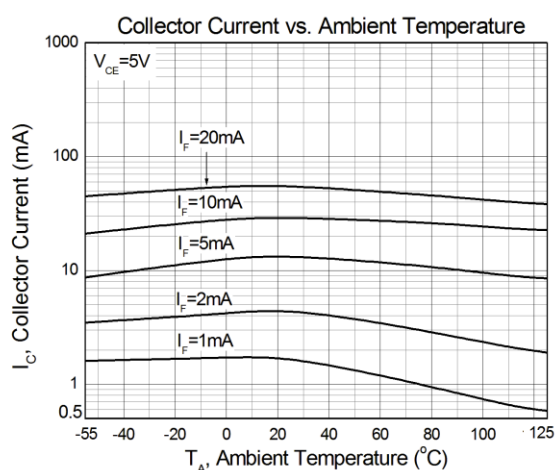


Figure 4

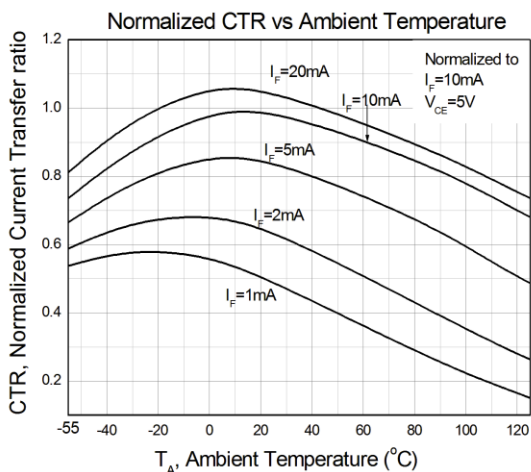


Figure 5

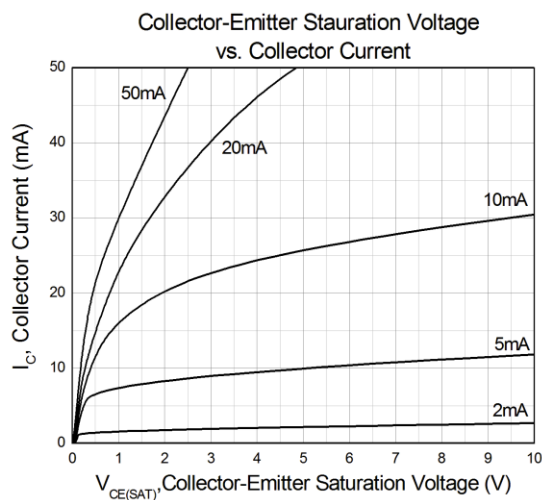


Figure 6



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

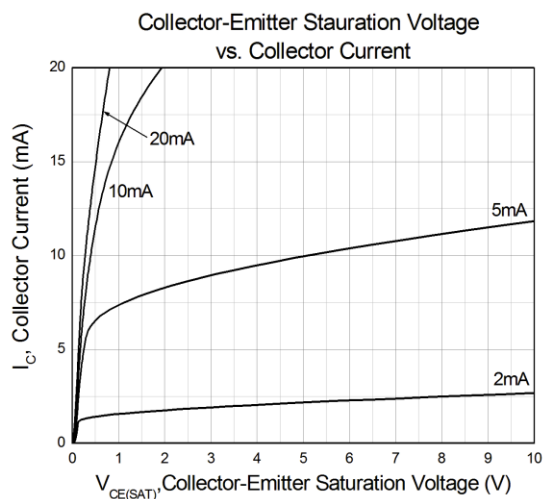


Figure 7

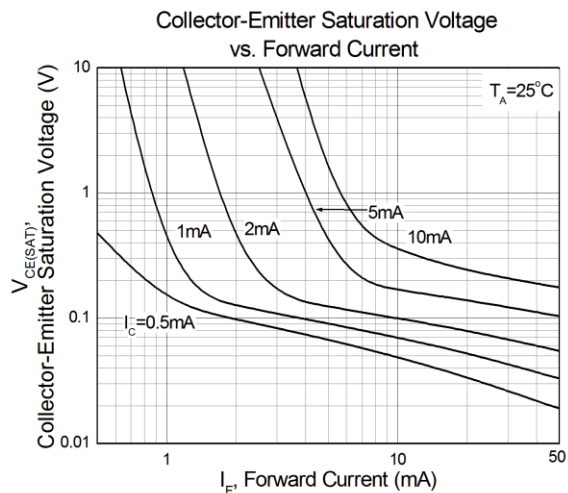


Figure 8

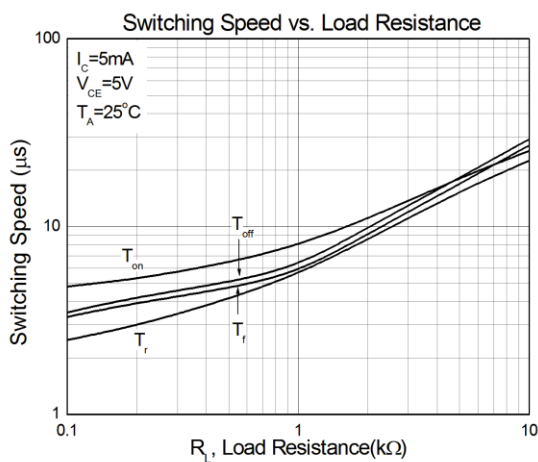


Figure 9

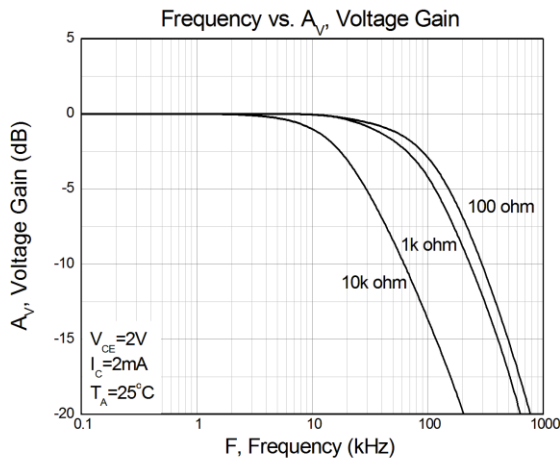


Figure 10



Test Circuit

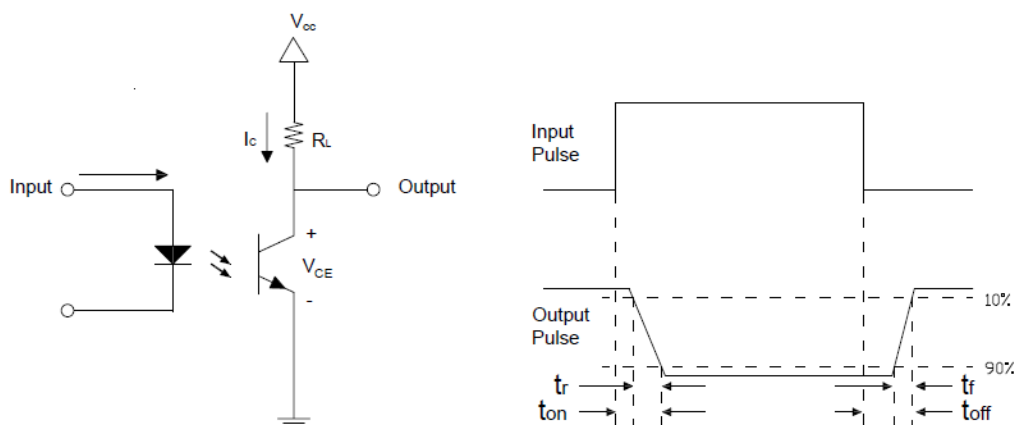


Figure 11: Switching Time Test Circuits



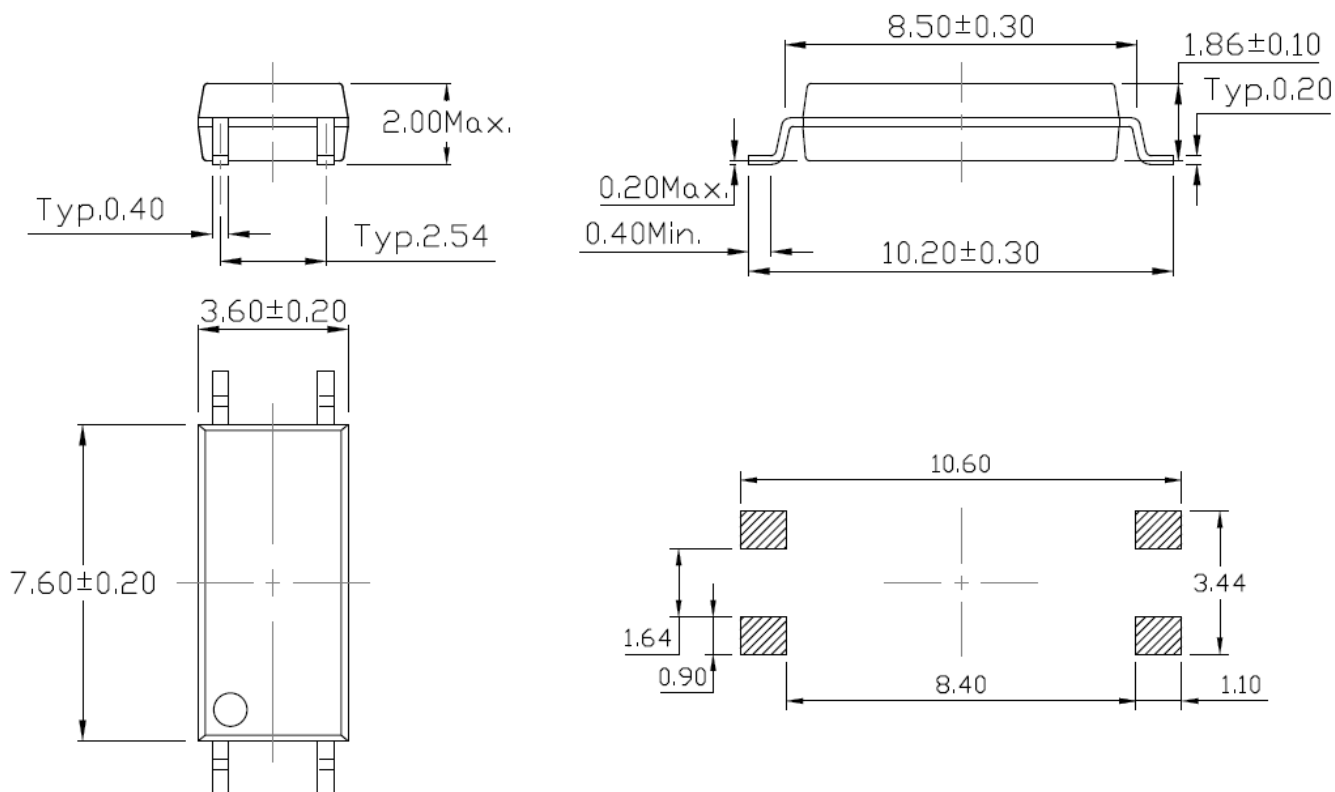
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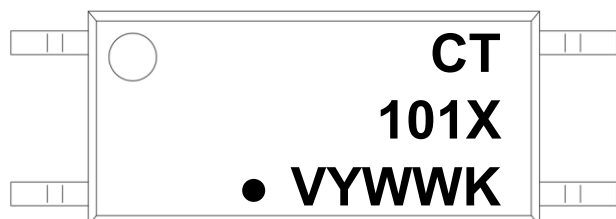
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Package Dimension *Dimensions in mm unless otherwise stated*



Marking Information



Note:

- CT : Denotes "CT Micro"
- 101X : Part Number(X=8 or 9)
- V : VDE Safety Mark Only
- Y : One Digit Year Code
- WW : Two Digit Work Week
- K : Manufacturing Code
- : Lead Frame Material Option
(Blank : Copper ; • : Iron)



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Ordering Information

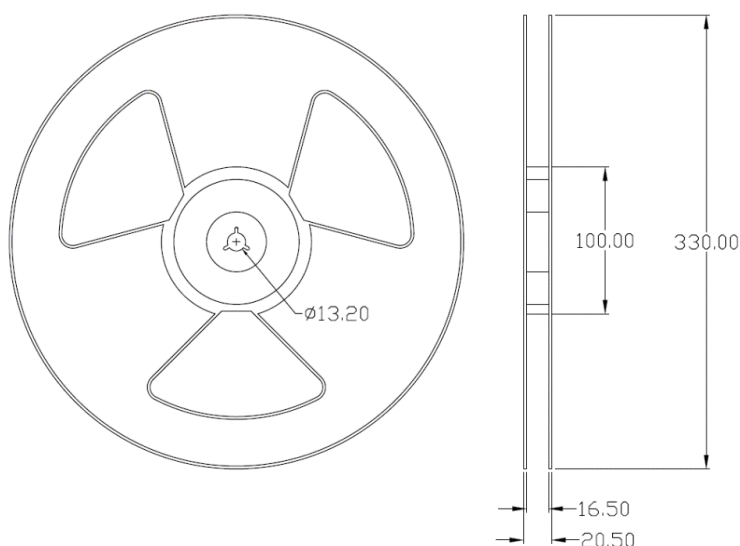
CT101X (V)(T1) -W

CT	= Denotes "CT Micro"
101X	= Part Numbers (X= 8 or 9)
V	= VDE Safety Mark Only
T1	= Tape and Reel Packaging Only
W	= Outline Color (W, White)
NP	= Customer Code

Option	Description	Quantity
T1	Surface Mount Lead Forming – With Option 1 Taping	3000Units/Reel

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

Option T1





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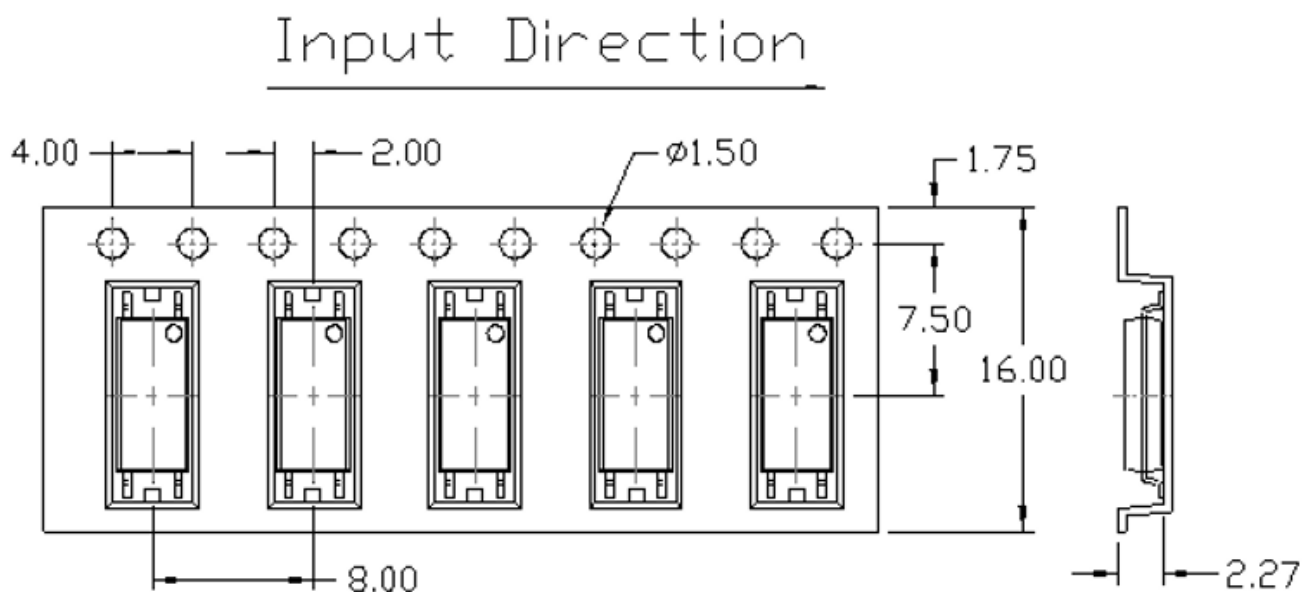
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1





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)

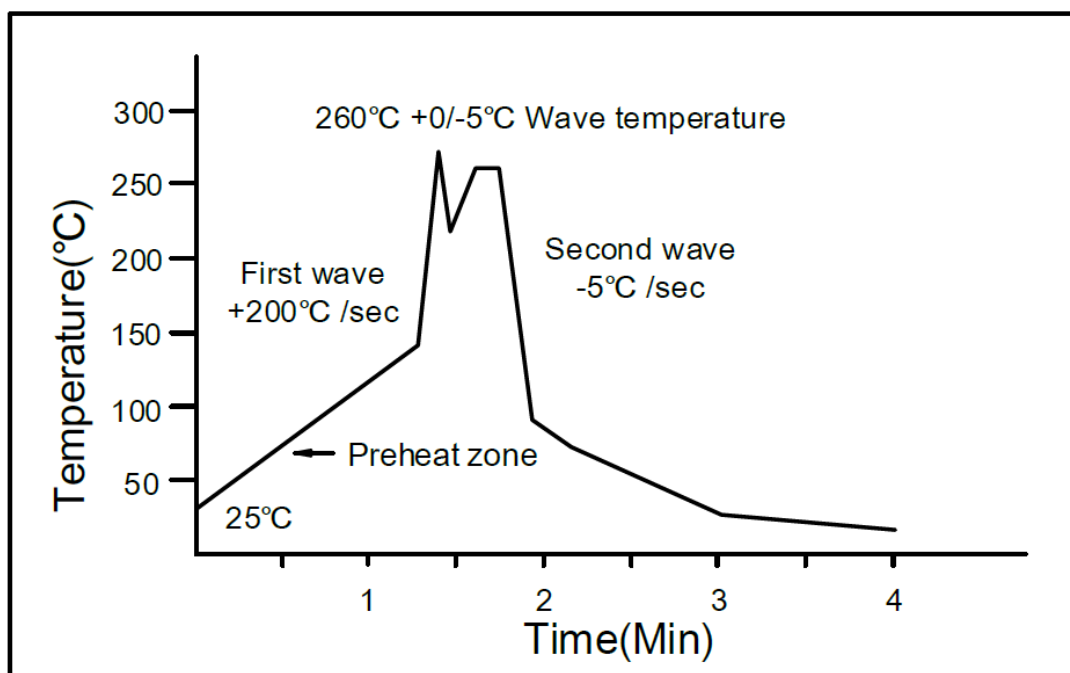
One time soldering is recommended within the condition of temperature.

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

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)

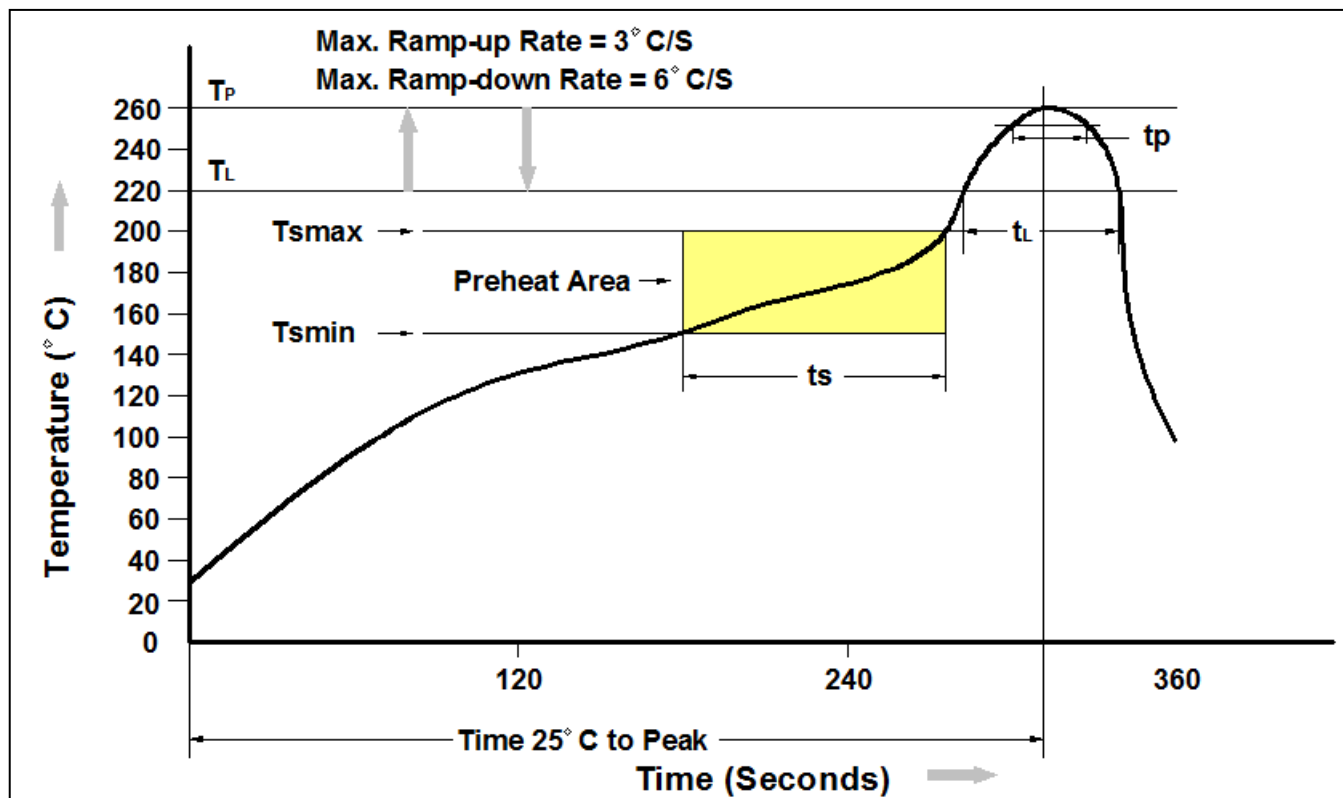
Allow single lead soldering in every single process.

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

Time: 5 sec max.



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



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.



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- 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.*