



Features

- High isolation 5000 VRMS
- Extra low coupling capacitance
- DC input with transistor output
- Temperature range - 55 °C to 125 °C
- External creepage distance > 8 mm
- Internal creepage distance > 4.6 mm
- Distances through insulation > 0.4 mm
- RoHS compliance
- REACH compliance
- Halogens free compliance
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

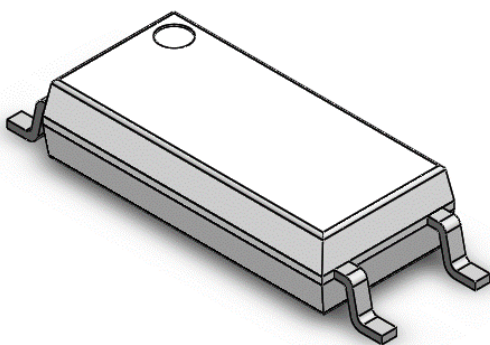
Description

The CT101XL-W series consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a 4-lead SOP package

Applications

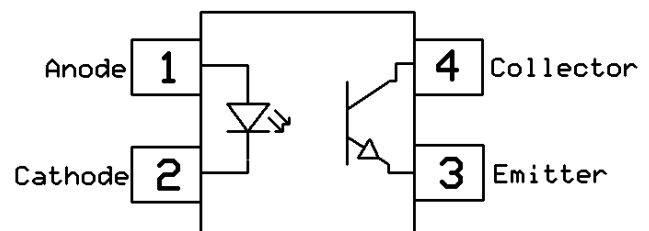
- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

Package Outline



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

Schematic



**Absolute Maximum Rating at 25°C**

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	5000	V _{RMS}	
T _{OPR}	Operating temperature	-55 ~ +125	°C	
T _{STG}	Storage temperature	-55 ~ +150	°C	
T _{SOL}	Soldering temperature	260	°C	
Emitter				
I _F	Forward current	50	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A	
V _R	Reverse voltage	6	V	
P _D	Emitter power dissipation	85	mW	
Detector				
P _D	Detector 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	



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	$I_F = 1\text{mA}$	-	1.3	1.4	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	15	-	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	CT1010L-W	$I_F = 1\text{mA}, V_{CE} = 5\text{V}$	50		600	%	
		CT1012L-W		63		125		
		CT1013L-W		100		200		
		CT1017L-W		80		160		
		CT1018L-W		130		260		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	CT1010L-W	$I_F = 1\text{mA}, I_C = 0.25\text{mA}$		0.2	0.4	V	
		CT1012L-W	$I_F = 1\text{mA}, I_C = 0.30\text{mA}$		0.2	0.4		
		CT1013L-W	$I_F = 1\text{mA}, I_C = 0.50\text{mA}$		0.2	0.4		
		CT1017L-W	$I_F = 1\text{mA}, I_C = 0.40\text{mA}$	-	0.2	0.4		
		CT1018L-W	$I_F = 1\text{mA}, I_C = 0.65\text{mA}$	-	0.2	0.4		
R_{IO}	Isolation Resistance	$V_{IO} = 500V_{DC}$	5×10^{10}	-	-	Ω		
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	1	pF		

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
t_r	Rise Time	$I_C = 2\text{mA}, V_{CC} = 5\text{V}, R_L = 100\Omega$	-	4.9	22	μs	
t_f	Fall Time		-	6.5	22		
t_{on}	Turn-on Time		-	8.6	18		
t_{off}	Turn-off Time		-	6.9	18		



Typical Characteristic Curves

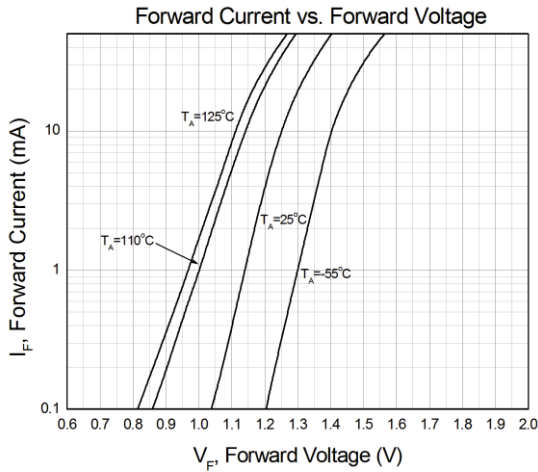


Figure 1

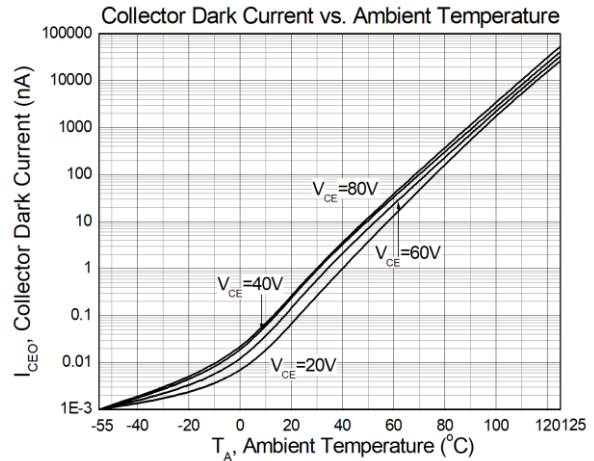


Figure 2

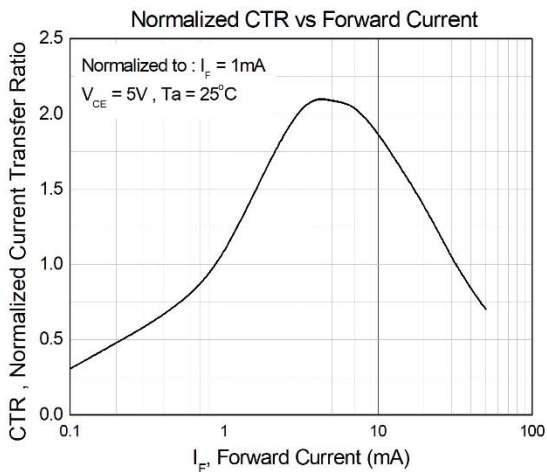


Figure 3

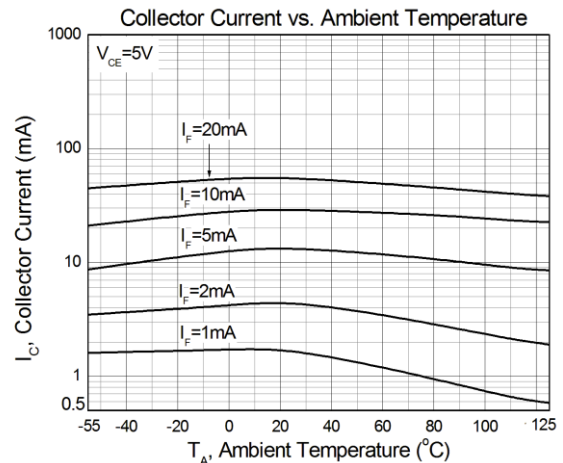


Figure 4

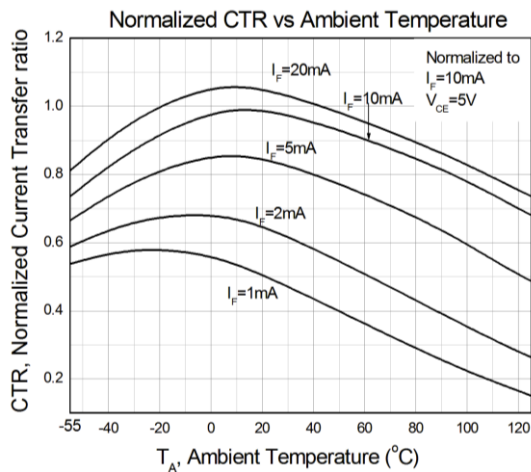


Figure 5

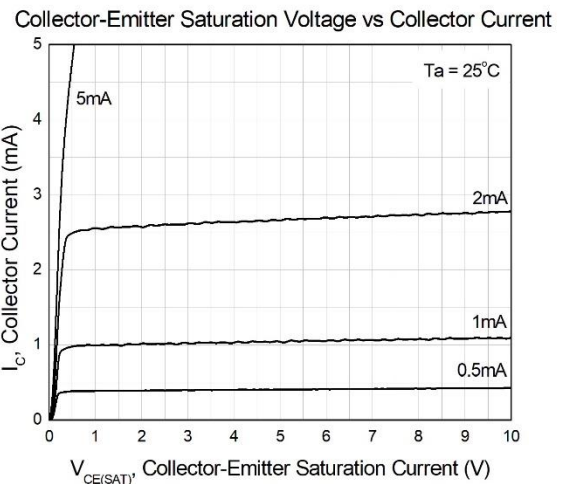
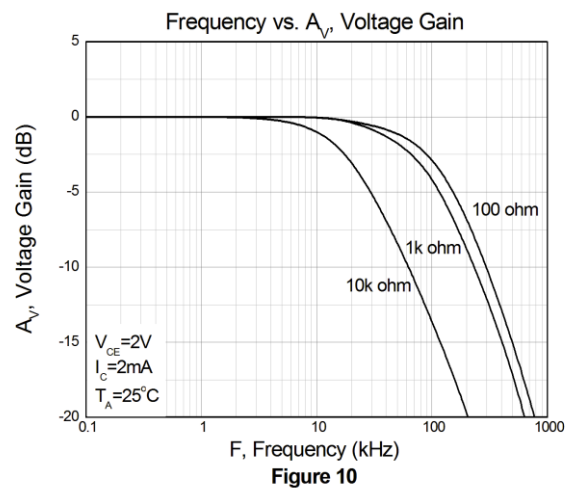
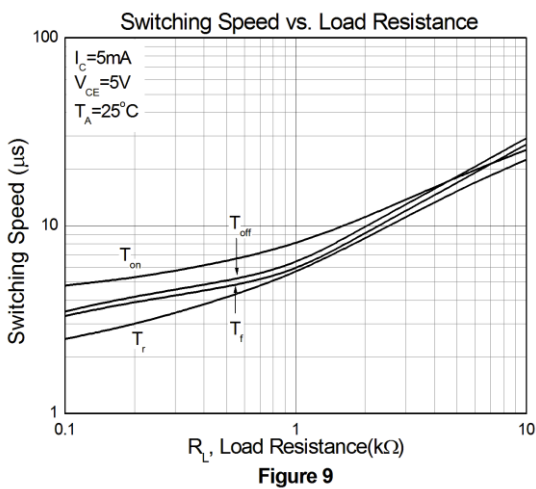
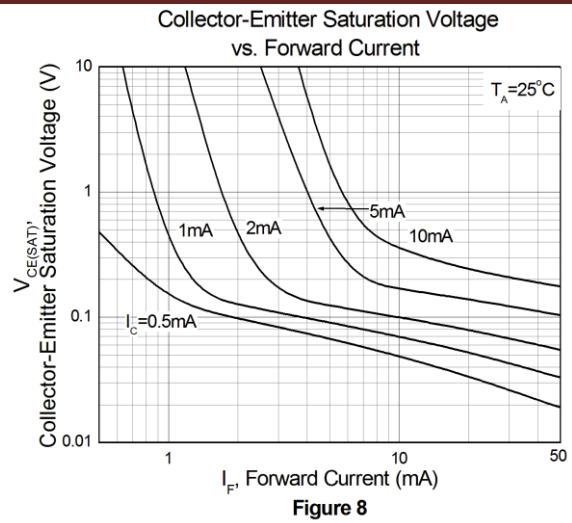
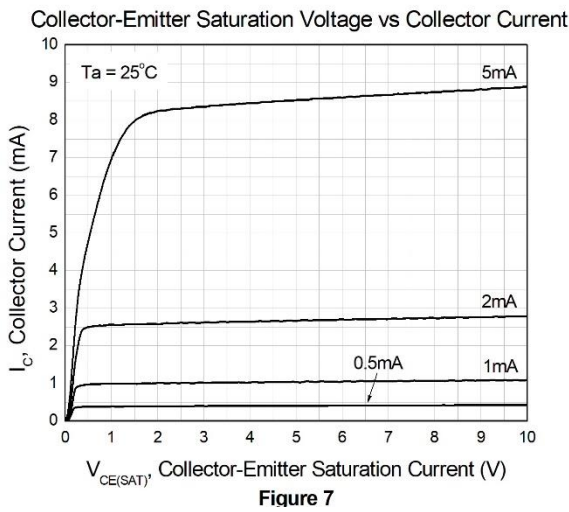


Figure 6



Test Circuit

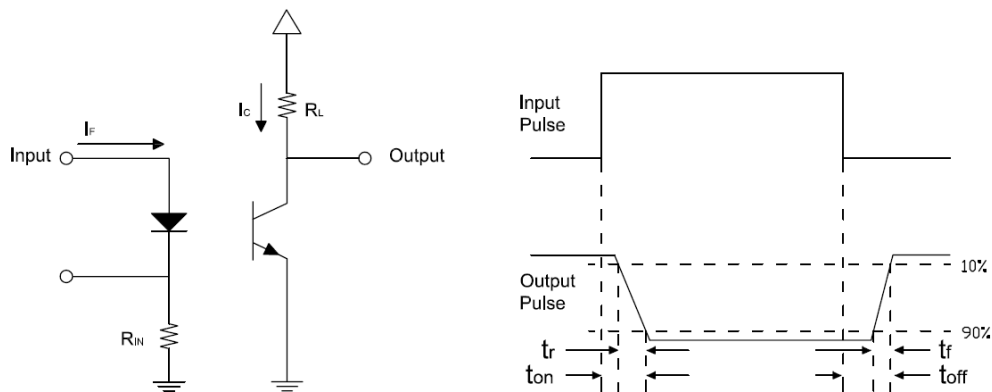
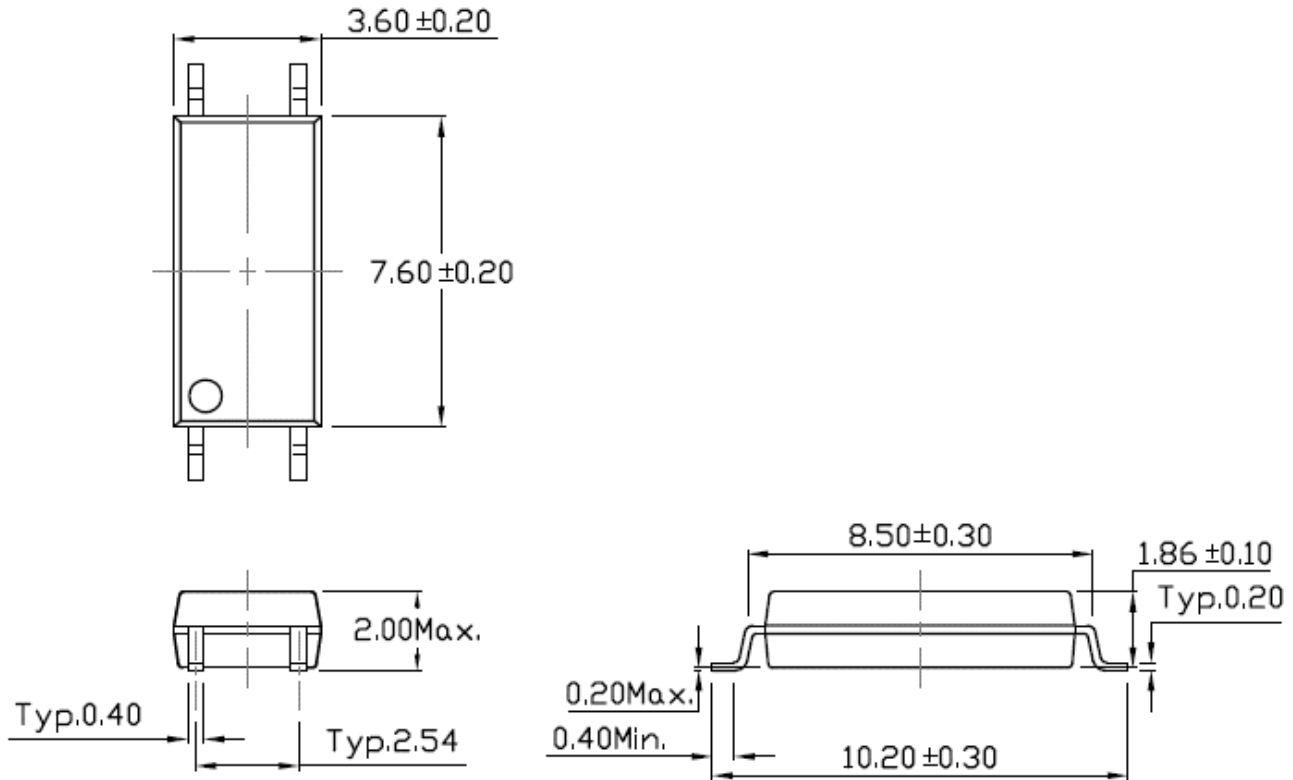


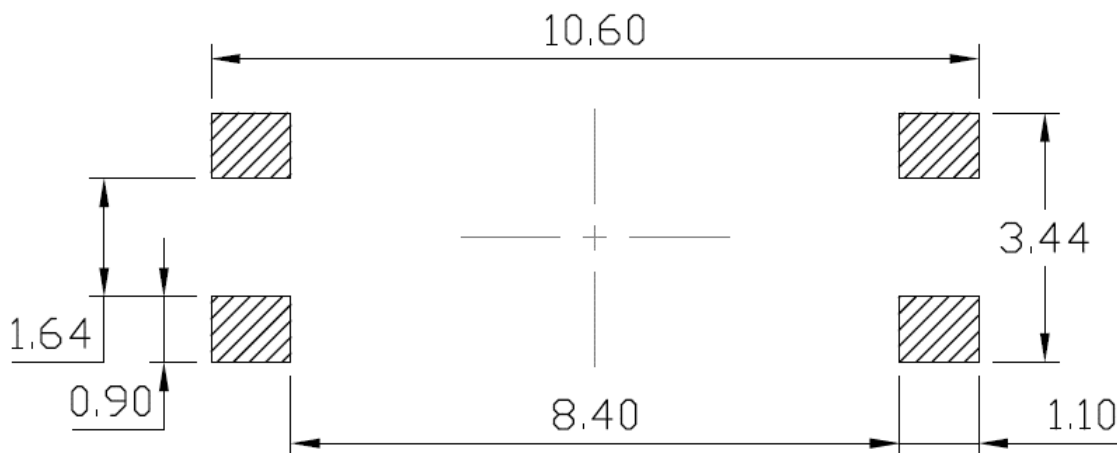
Figure 10: Switching Time Test Circuits



Package Dimension *Dimensions in mm unless otherwise stated*



Recommended Solder Mask *Dimensions in mm unless otherwise stated*





CT101XL-W Series

DC Input 4-Pin Long Mini-Flat Phototransistor Optocoupler

Marking Information



Note:

- CT : Denotes “CT Micro”
- 1017L : Part Number
- V : VDE Safety Mark Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code

Ordering Information

CT101XL(V)(Y) - W

X = Part No. (7,8,9)

L = Low current test condition

V = VDE safety mark option (V or none)

Y = Tape and reel option (T1 or T2)

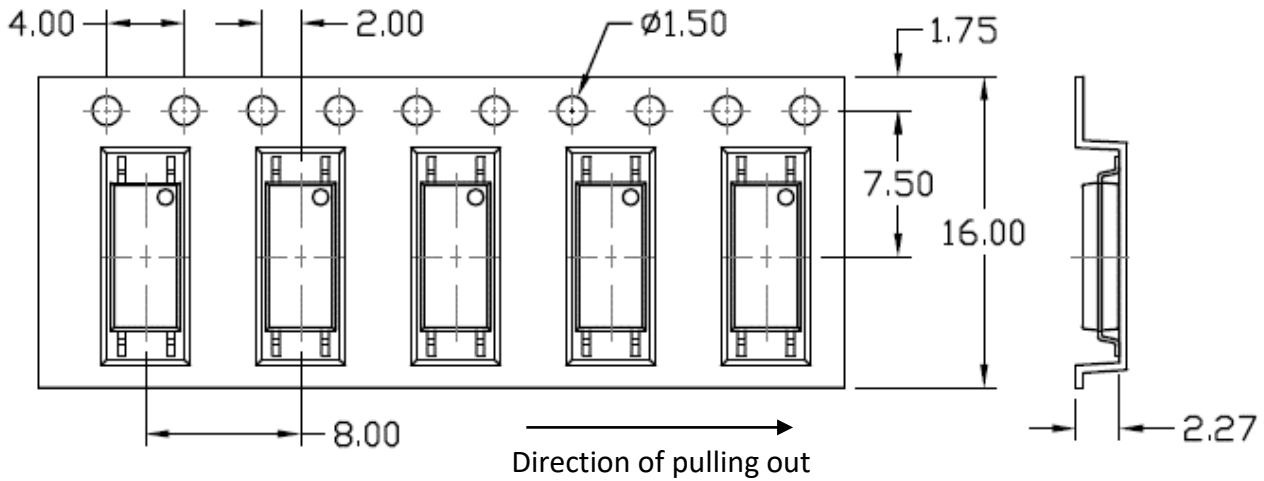
W = Outline Color (W, White)

Code Y	Lead form	Quantity
T1	Surface Mount Lead Forming – With Option 1 Taping	3000 Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Taping	3000 Units/Reel

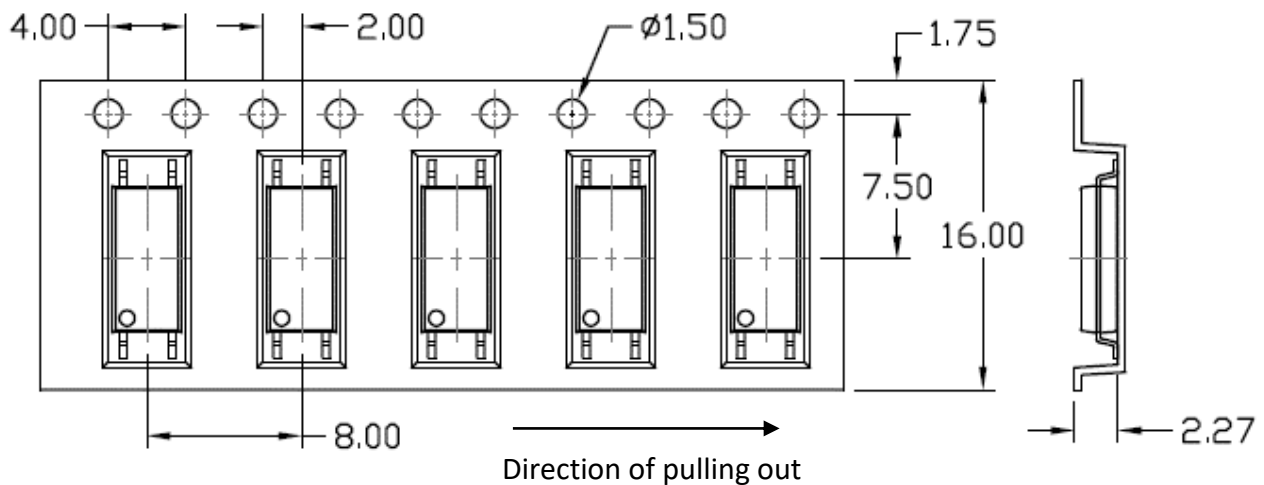


Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



Option T2





Wave soldering (follow the JEDEC standard JESD22-A111)

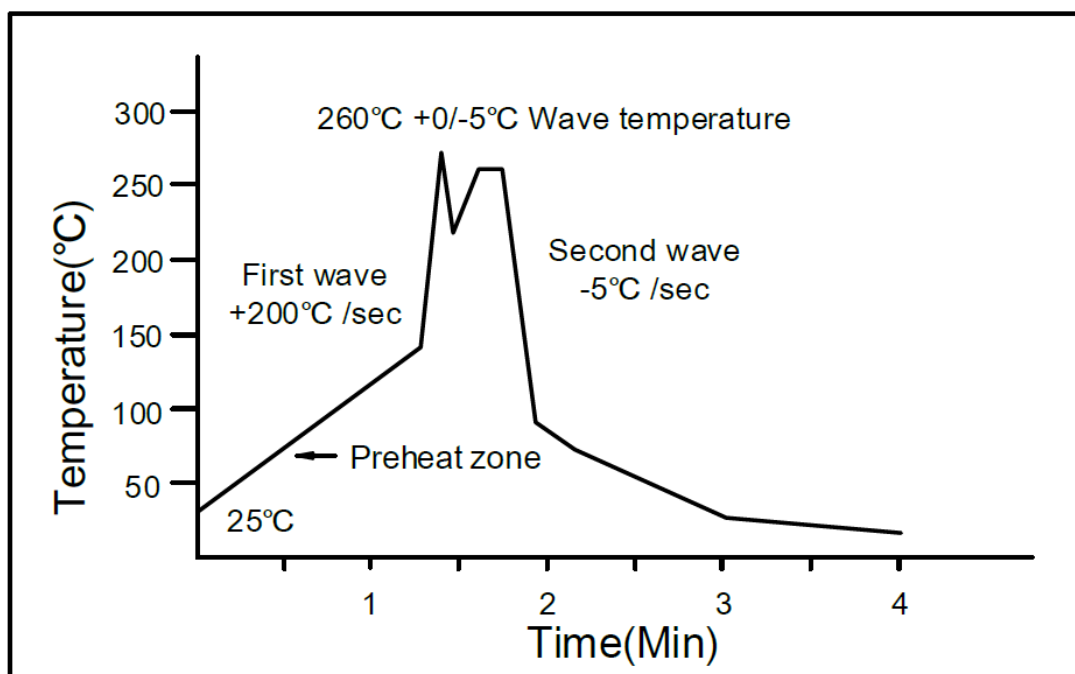
One time soldering is recommended within the condition of temperature.

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)

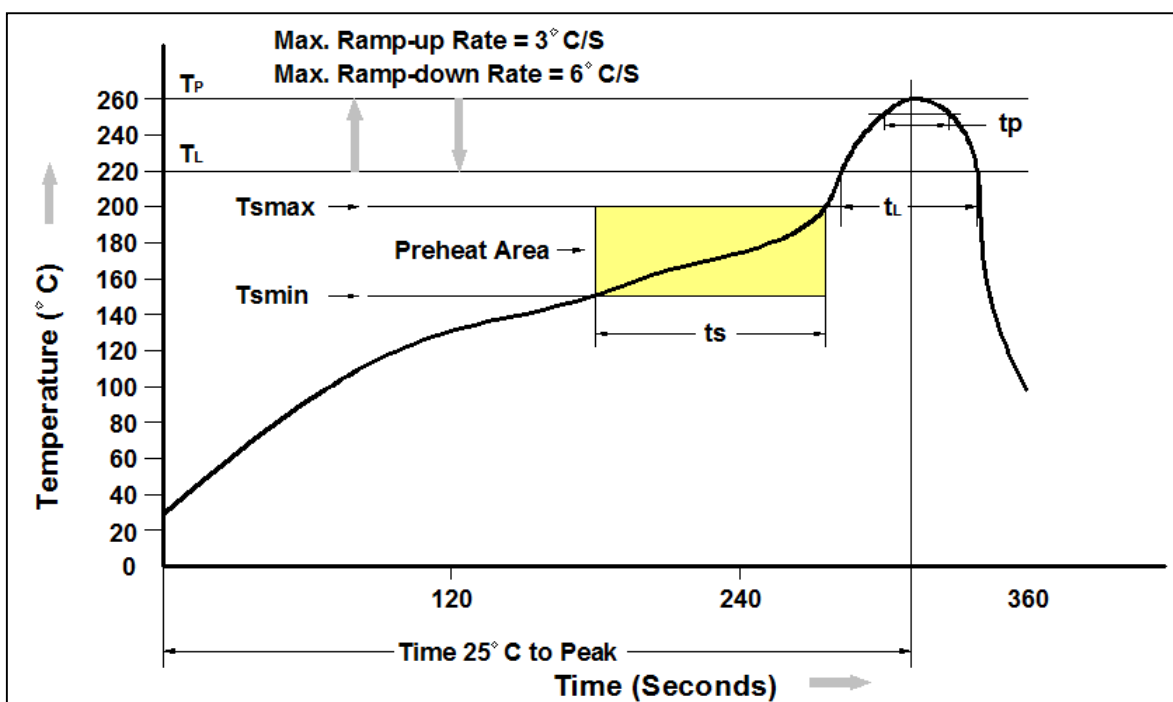
Allow single lead soldering in every single process.

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

Time: 5 sec max.



Reflow Profile



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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