



Features

- High isolation 3750 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- RoHS compliance
- REACH compliance
- Halogen free compliance
- Operating temperature range - 55 °C to 100 °C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

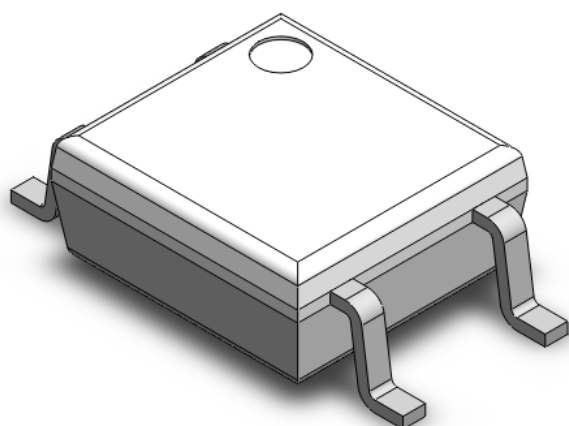
Description

The CT451 series consists of a high power transistor optically coupled to a gallium arsenide Infrared-emitting diode in a 4-lead Mini-Flat package.

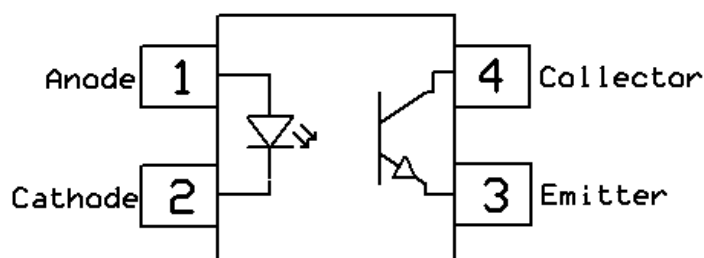
Applications

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

Package Outline



Schematic



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

**Absolute Maximum Rating at 25°C**

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	3750	V _{RMS}	
P _{TOT}	Total power dissipation	260	mW	
T _{OPR}	Operating temperature	-55 ~ +100	°C	
T _{STG}	Storage temperature	-55 ~ +150	°C	
T _{SOL}	Soldering temperature	260	°C	
Emitter				
I _F	Forward current	80	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A	
V _R	Reverse voltage	6	V	
P _D	Emitter power dissipation	150	mW	
Detector				
P _D	Detector power dissipation	300	mW	
B _{VCEO}	Collector-Emitter Breakdown Voltage	350	V	
B _{VECO}	Emitter-Collector Breakdown Voltage	7	V	
I _C	Collector Current	100	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	$I_F = 10\text{mA}$	-	1.2	1.4	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	30	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{CEO}}$	Collector-Emitter Breakdown	$I_C = 0.1\text{mA}$	350	-	-	V	
$B_{V_{ECO}}$	Emitter-Collector Breakdown	$I_E = 0.1\text{mA}$	7	-	-	V	
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 200\text{V}$, $I_F = 0\text{mA}$	-	-	100	nA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
CTR	Current Transfer Ratio	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$	50	-	600	%	
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F = 20\text{mA}$, $I_C = 1\text{mA}$	-	-	0.4	V	
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	5×10^{10}	-	-	Ω	
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	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	-	μs	
t_f	Fall Time		-	8	-		



Typical Characteristic Curves

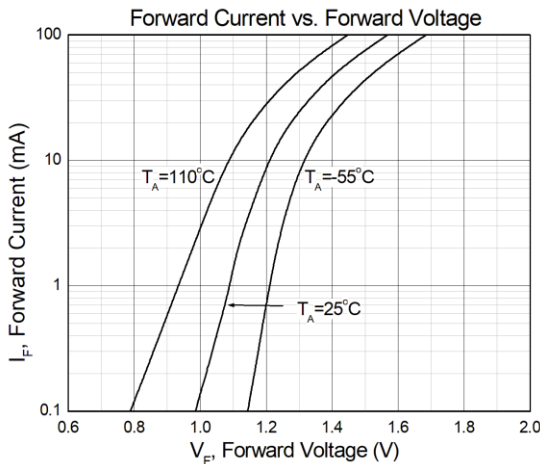


Figure 1

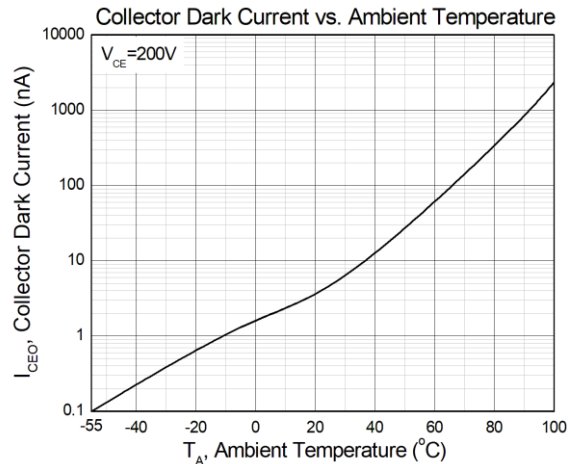


Figure 2

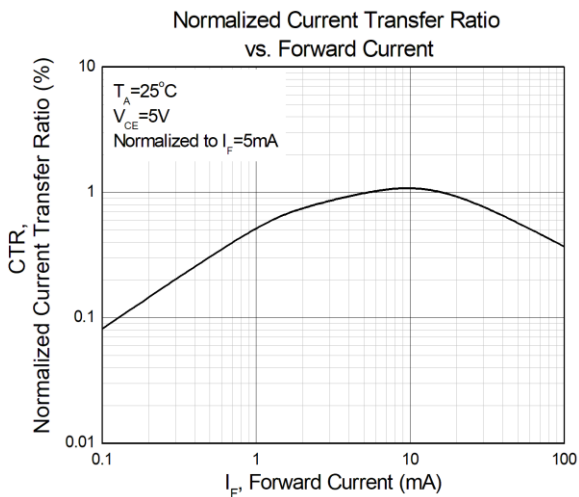


Figure 3

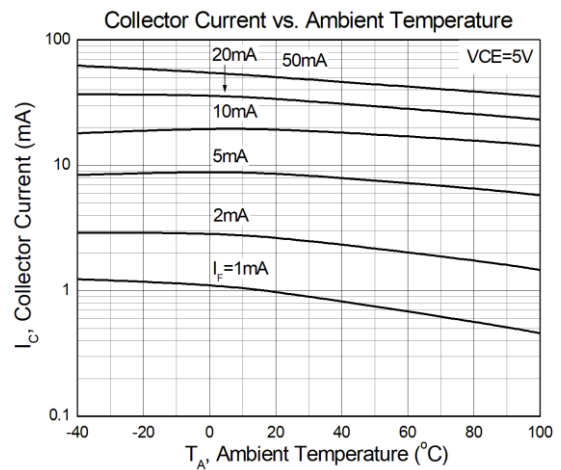


Figure 4

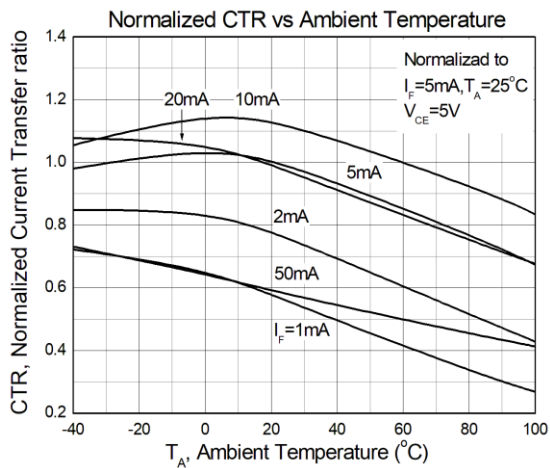


Figure 5

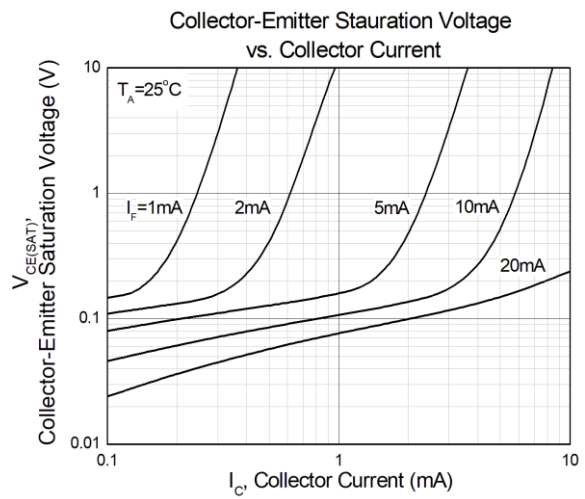


Figure 6



DC Input 4-Pin Phototransistor Optocoupler

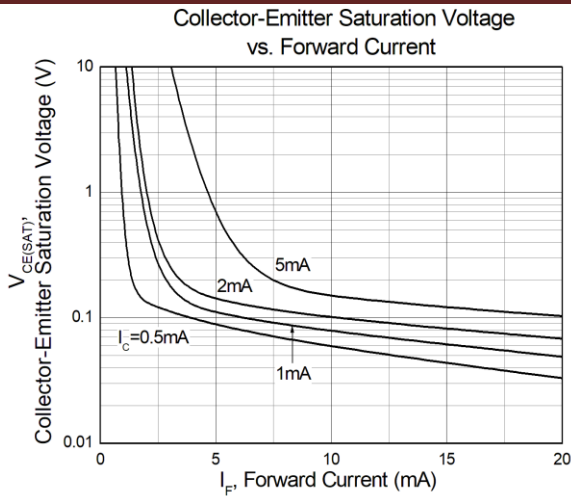


Figure 7

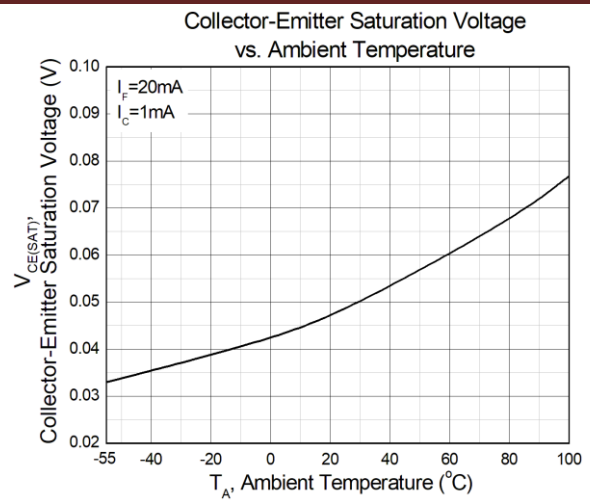


Figure 8

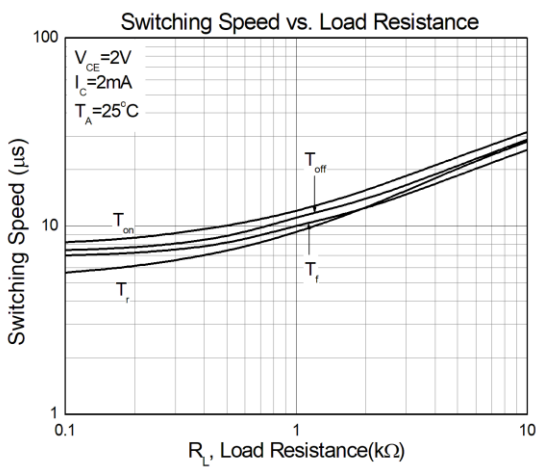


Figure 9



Test Circuit

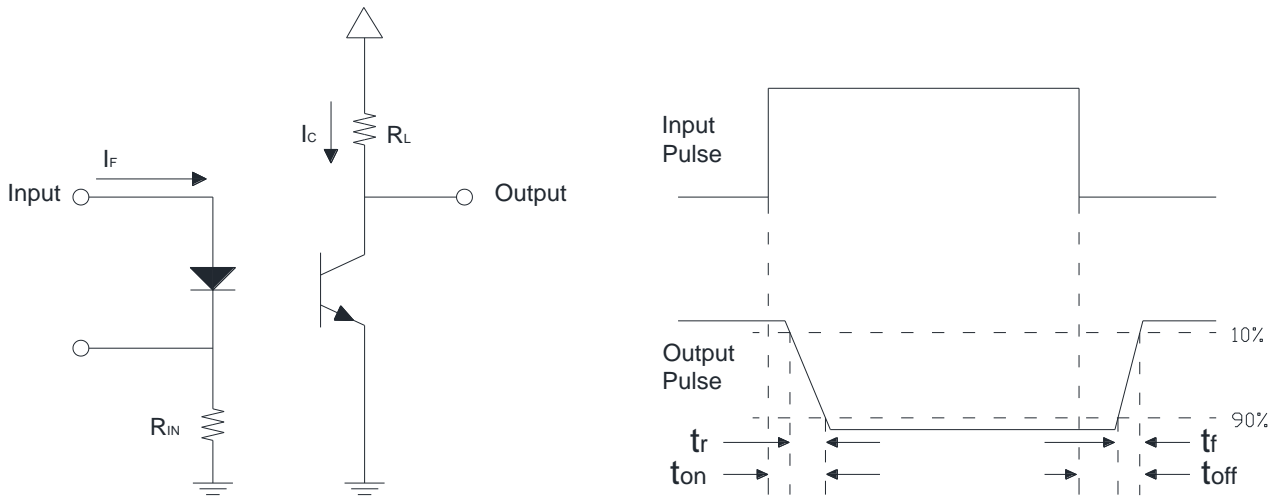
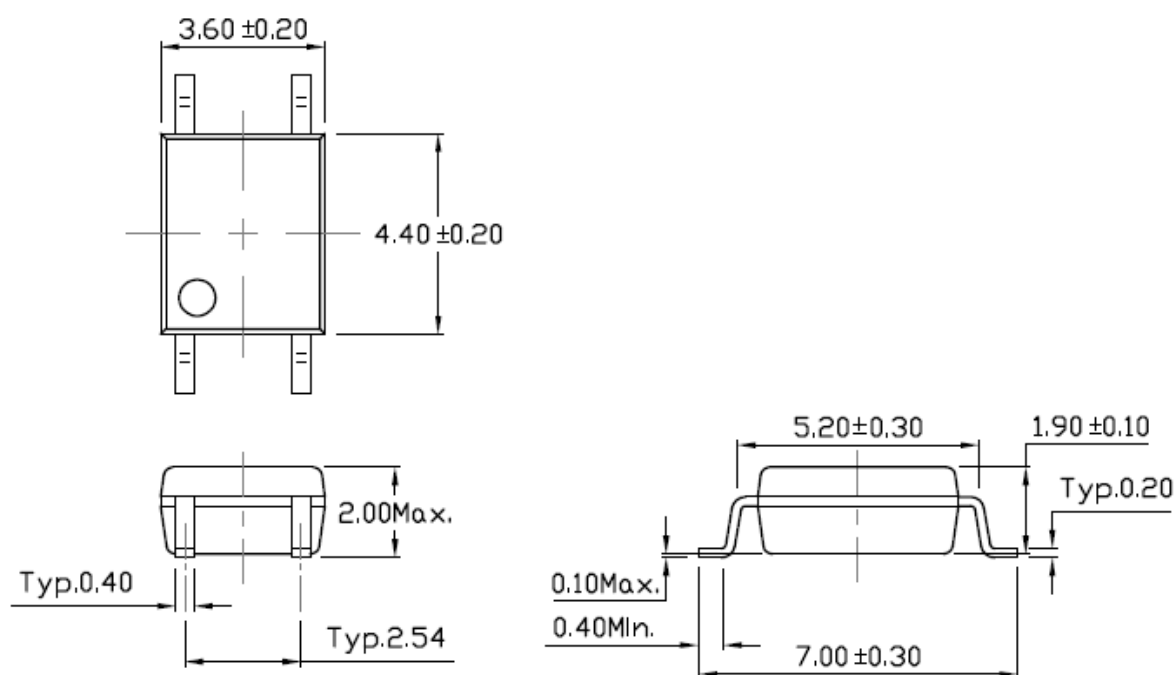


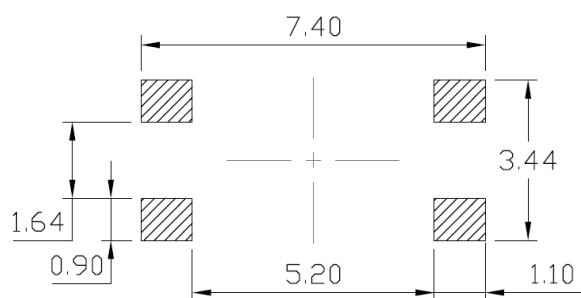
Figure 12: Switching Time Test Circuits



Package Dimension *Dimensions in mm unless otherwise stated*

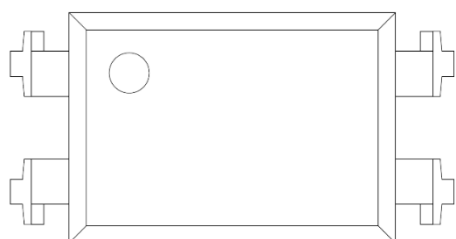


Recommended Solder Mask *Dimensions in mm unless otherwise stated*





Marking Information



CT
451
VYWWK

Note:

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

Ordering Information

CT451(V)(Z)

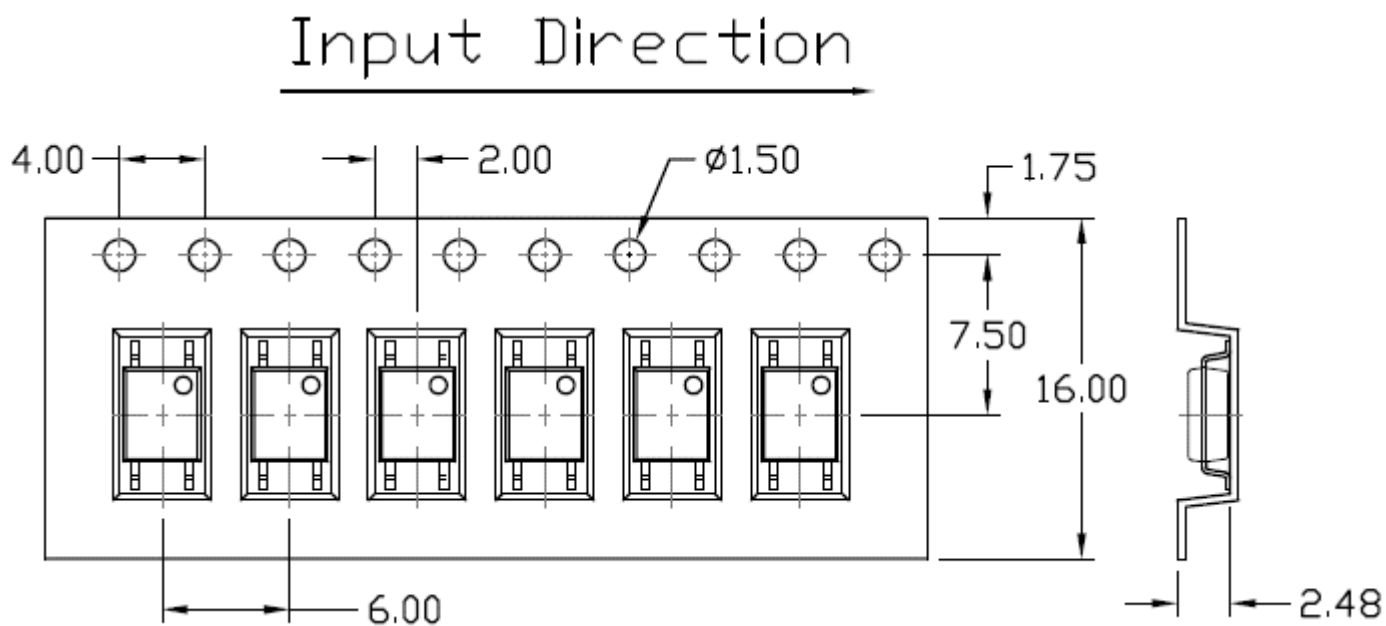
- CT =Denotes “CT Micro”
- 451 =Part Number
- V = VDE Option (V or None)
- Z = Tape and reel option (T1, T2)

Option	Description	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

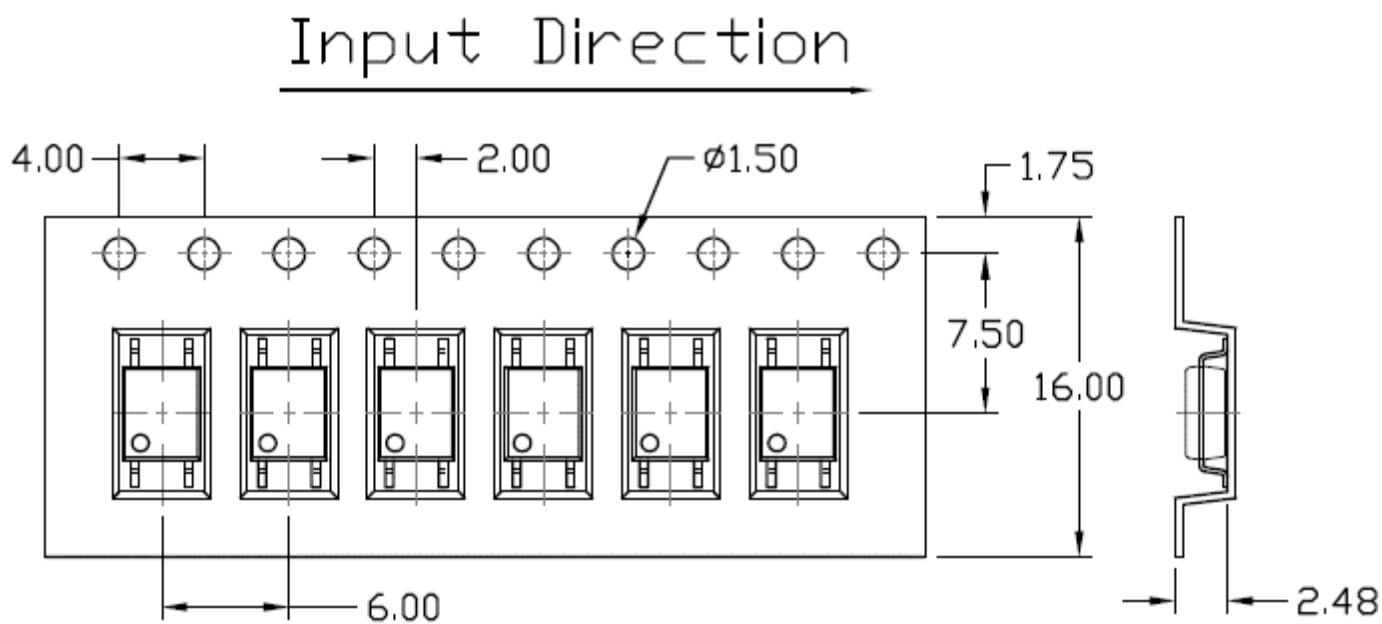


Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



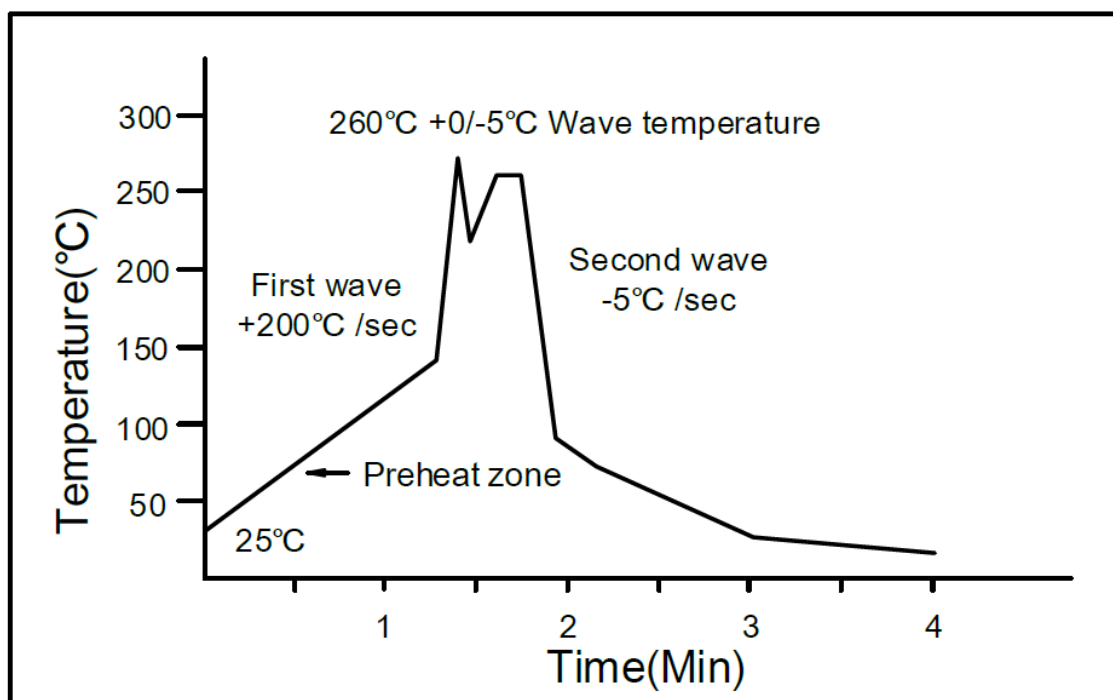
Option T2





Wave soldering (follow the JEDEC standard JESD22-A111)

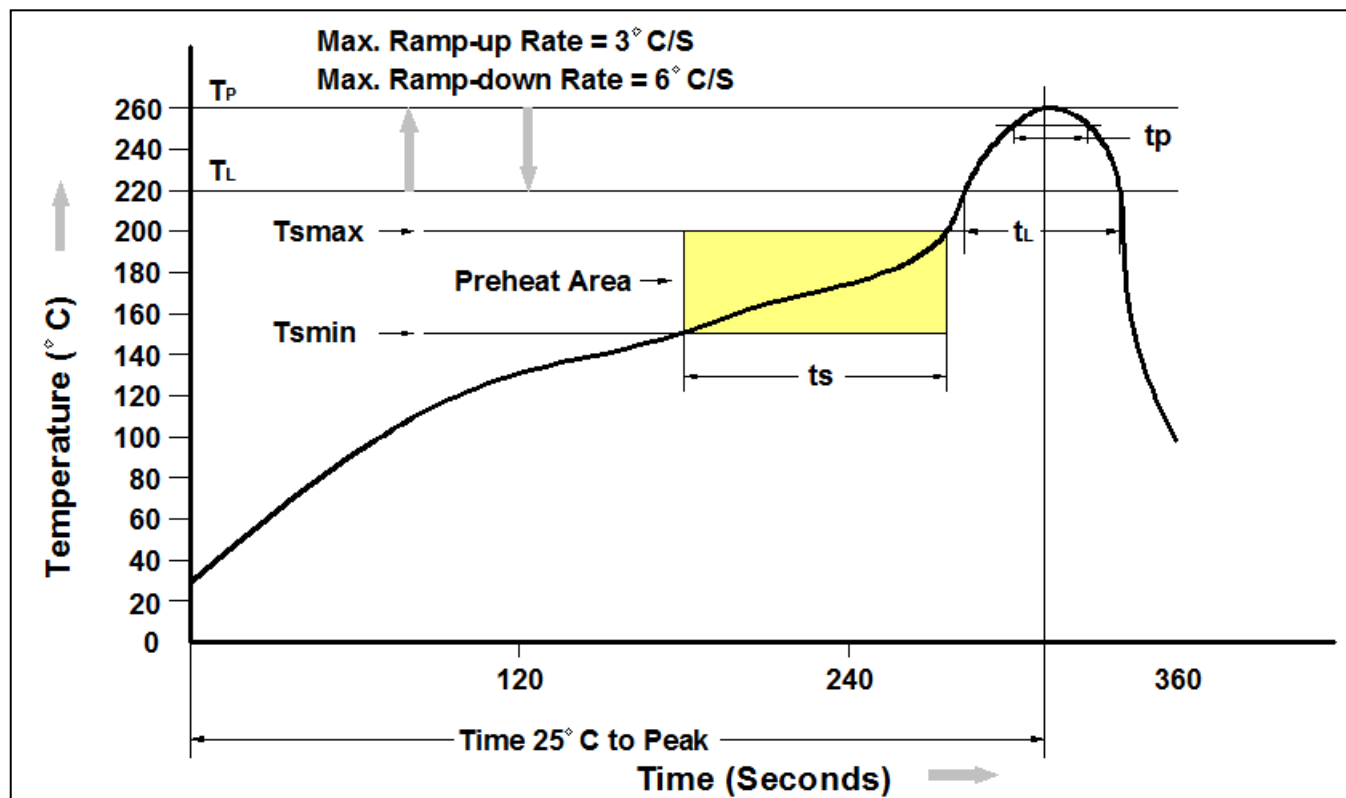
- One time soldering is recommended within the condition of temperature.
- Temperature: $260 \pm 5^\circ\text{C}$.
- Time: 10 sec.
- Preheat temperature: 25 to 140°C .
- Preheat time: 30 to 80 sec.
-



- **Hand soldering by soldering iron**
- Allow single lead soldering in every single process.
- One time soldering is recommended. Temperature: $380 \pm 5^\circ\text{C}$
- Time: 3 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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