



CT0600, CT0601, CT0611 10M Bit/s High Speed Logic Gate DMC-Isolator[®] Optocoupler

Features

- High speed 10M Bit/s
- High isolation voltage between input and output (Viso=3750 Vrms)
- Wide operating temperature range of -40°C to 85°C
- RoHS compliance
- REACH compliance
- Halogen free compliance
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(40039590)
 - CQC – GB4943.1, GB8898 (17001167067)
 - IEC62368 (FI/41119)

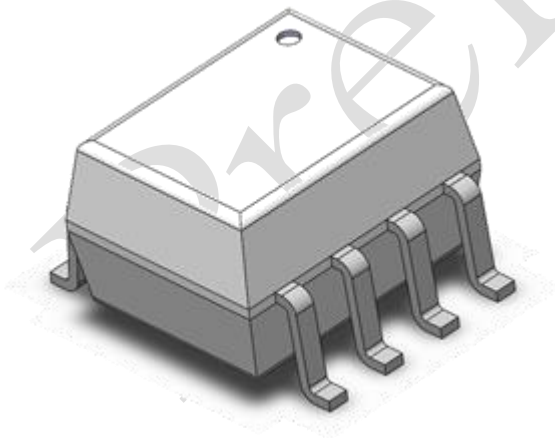
Description

The CT0600, CT0601, CT0611 optocouplers consist of a 850 nm LED, optically coupled to a very high speed integrated photo-detector logic gate with a strobable output. This output features an open collector, there by permitting wired OR outputs. The switching parameters are guaranteed over the temperature range of -40°C to +85°C. A maximum input signal of 5mA will provide a minimum output sink current of 13mA.

Applications

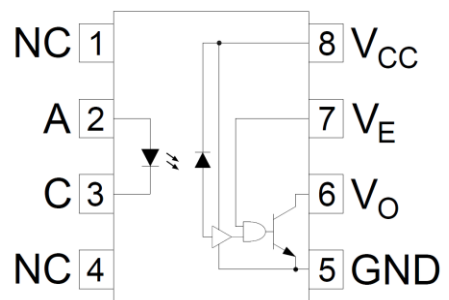
- Line receivers
- Telecommunication equipment
- High speed logic ground isolation
- Feedback loop in switch-mode power supplies
- Home appliances

Package Outline



Note: Different bending options available. See package dimension.

Schematic



Truth Table

Input	Enable	Output
H	H	L
L	H	H
H	L	H
L	L	H
H	NC	L
L	NC	H



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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	3750	V _{RMS}	1
T _{OPR}	Operating temperature	-40 ~ +85	°C	
T _{STG}	Storage temperature	-55 ~ +125	°C	
T _{SOL}	Soldering temperature	260	°C	2
Emitter				
I _F	Forward current	50	mA	
V _R	Reverse voltage	5	V	
P _I	Power dissipation	100	mW	
Detector				
P _O	Power dissipation	85	mW	
I _O	Average Output current	50	mA	
V _O	Output voltage	7.0	V	1min(Max.)
V _{CC}	Supply voltage	7.0	V	
VE	Enable Input Voltage Not to Exceed VCC by more than 500mV	5.5	V	

Notes

1. AC for 1 minute, RH = 40 ~ 60%.
2. For reflow process



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Electrical Characteristics

$T_A = -40 - 85^{\circ}\text{C}$ (unless otherwise specified). Typical values are measured at $T_A = 25^{\circ}\text{C}$ and $V_{CC}=5\text{V}$

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	$I_F = 10\text{mA}$	-	1.6	1.8	V	
V_R	Reverse Voltage	$I_R = 10\mu\text{A}$	5.0	-	-	V	
$\Delta V_F/\Delta T_A$	Temperature coefficient of forward voltage	$I_F = 10\text{mA}$	-	-1.8	-	mV/ $^{\circ}\text{C}$	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{CCL}	Logic Low Supply Current	$I_F=10\text{mA}$, $V_E=0.5\text{V}$, $V_{CC}=5.5\text{V}$	-	9	13	mA	
I_{CCH}	Logic High Supply Current	$I_F=0\text{mA}$, $V_E=0.5\text{V}$, $V_{CC}=5.5\text{V}$	-	6	10	mA	
V_{EH}	High Level Enable Voltage	$I_F=10\text{mA}$, $V_{CC}=5.5\text{V}$	2.0	-	-	V	
V_{EL}	Low Level Enable Voltage	$I_F=10\text{mA}$, $V_{CC}=5.5\text{V}$	-	-	0.8	V	
I_{EH}	High Level Enable Current	$V_E=2.0\text{V}$, $V_{CC}=5.5\text{V}$	-	-0.53	-1.6	mA	
I_{EL}	Low Level Enable Current	$V_E=0.5\text{V}$, $V_{CC}=5.5\text{V}$	-	-0.75	-1.6	mA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{OH}	Logic High Output Current	$I_F=250\mu\text{A}$, $V_O=V_{CC}=5.5\text{V}$, $V_E=2.0\text{V}$	-	2	100	μA	
I_{FT}	Input Threshold Current	$V_{CC}=5.5\text{V}$, $V_O=0.6\text{V}$, $V_E=2.0\text{V}$ $I_O=13\text{mA}$	-	3.3	5	mA	
V_{OL}	Logic Low Output Voltage	$I_F=5\text{mA}$, $V_{CC}=5.5\text{V}$, $V_E=2.0\text{V}$, $I_O=13\text{mA}$	-	0.35	0.6	V	



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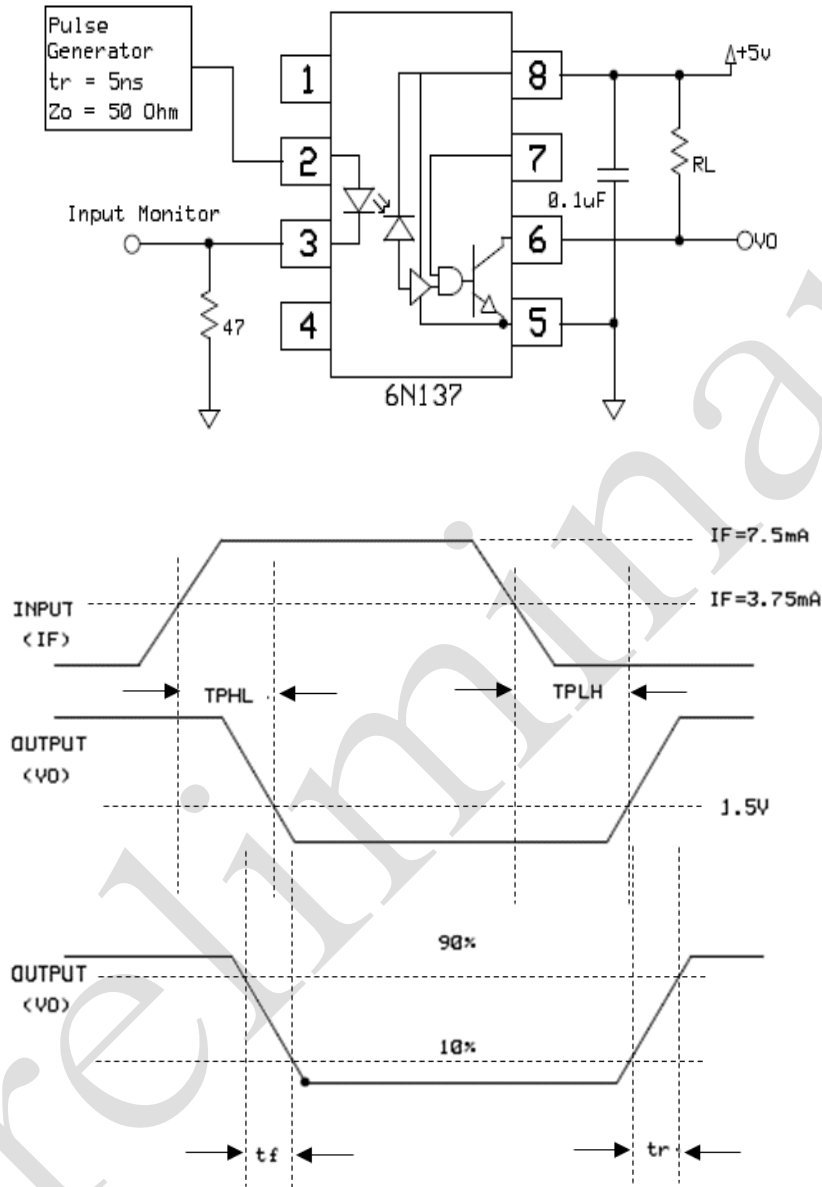
Switching Characteristics

Symbol	Parameters		Test Conditions	Min	Typ	Max	Units	Notes
T _{PHL}	Propagation Delay Time Logic High to Logic Low		C _L =15pF,R _L =350Ω	-	34	75	ns	
T _{PLH}	Propagation Delay Time Logic Low to Logic High			-	39	75	ns	
P _{WD}	Pulse Width Distortion			-	5	34	ns	
T _r	Output Rise Time			-	40	-	ns	
T _f	Output Fall Time			-	10	-	ns	
T _{ELH}	Enable Propagation Delay Low To High		V _{EH} = 3.5V, C _L = 15pF, R _L = 350Ω	-	15	-	ns	
T _{EHL}	Enable Propagation Delay High To Low			-	15	-	ns	
CM _H	Common Mode Transient Immunity at Logic High	CT0600	I _F = 0mA , V _{OH} =2.0V, R _L =350Ω, T _A =25°C, V _{CM} =10Vp-p	-	-	-	V/μs	
		CT0601	I _F = 0mA , V _{OH} =2.0V, R _L =350Ω, T _A =25°C, V _{CM} =50Vp-p	5000	-	-		
		CT0611	I _F = 0mA , V _{OH} =2.0V, R _L =350Ω, T _A =25°C, V _{CM} =1000Vp-p	15000	-	-		
CML	Common Mode Transient Immunity at Logic Low	CT0600	I _F = 7.5mA , V _{OL} =0.8V, R _L =350Ω, T _A =25°C, V _{CM} =10Vp-p	-	-	-	V/μs	
		CT0601	I _F = 7.5mA , V _{OL} =0.8V, R _L =350Ω, T _A =25°C, V _{CM} =50Vp-p	5000	-	-		
		CT0611	I _F = 7.5mA , V _{OL} =0.8V, R _L =350Ω, T _A =25°C, V _{CM} =1000Vp-p	15000	-	-		



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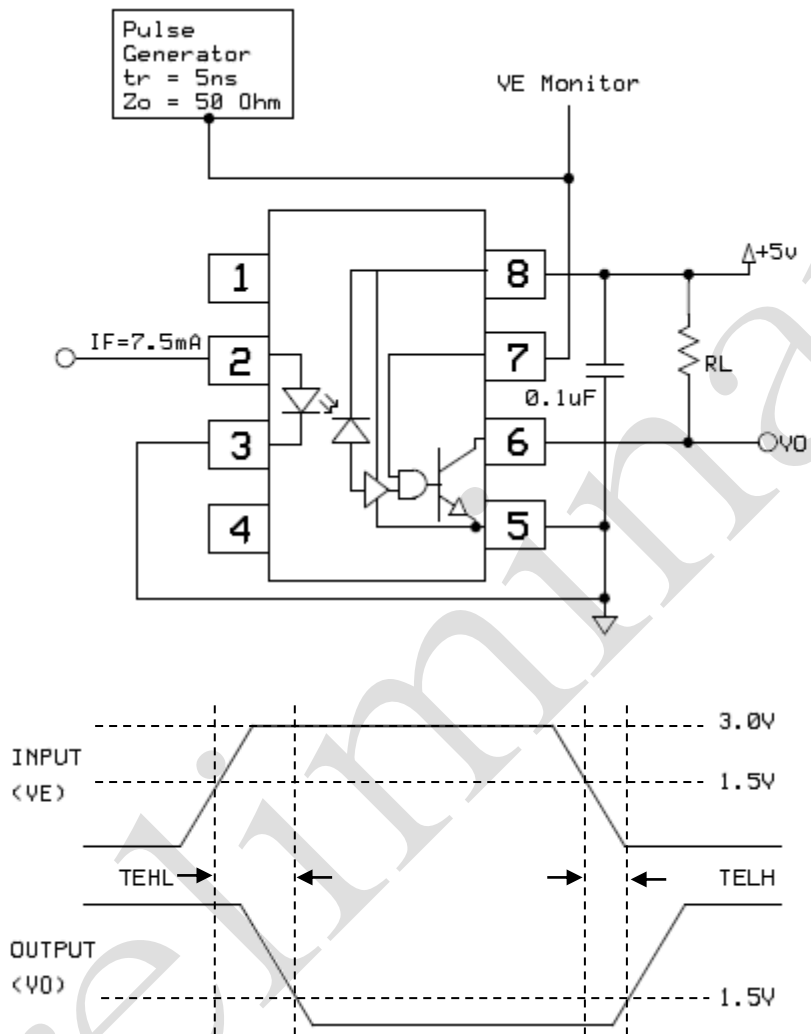
Test Circuit



Switching Time Test Circuit



Test Circuit

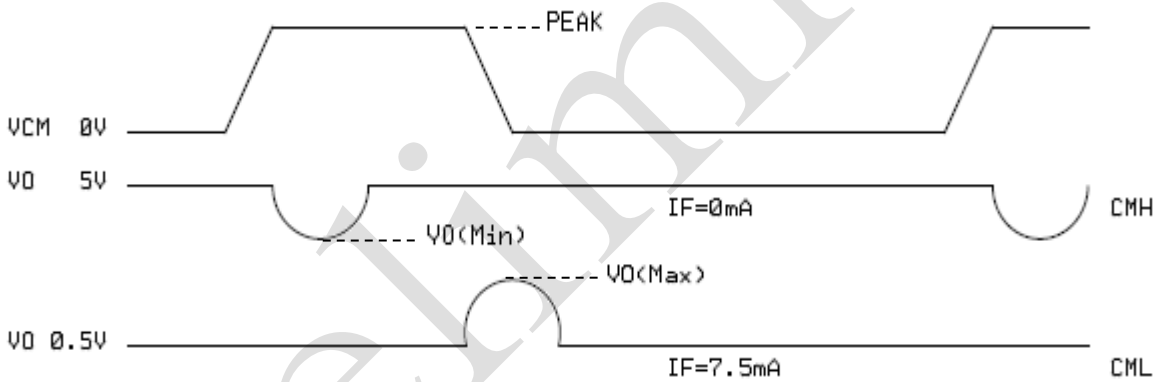
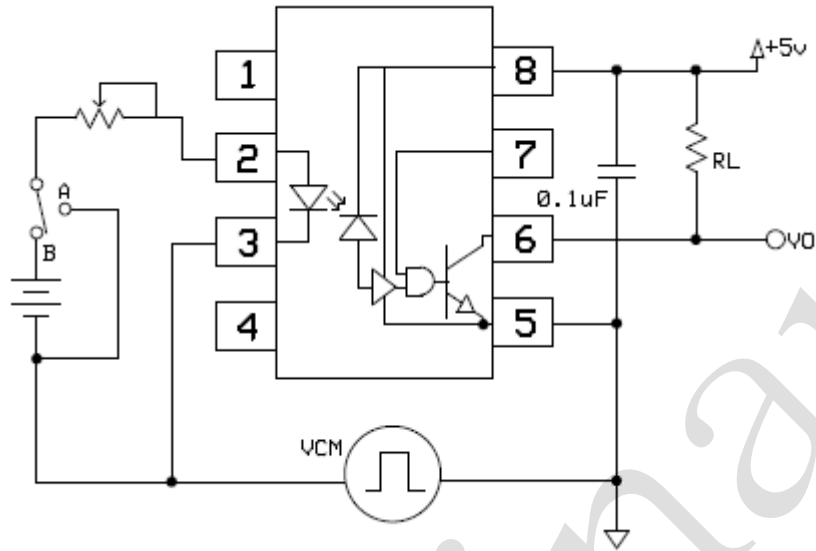


Enable Switching Time Test Circuit



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Test Circuit



CMR Test Circuit

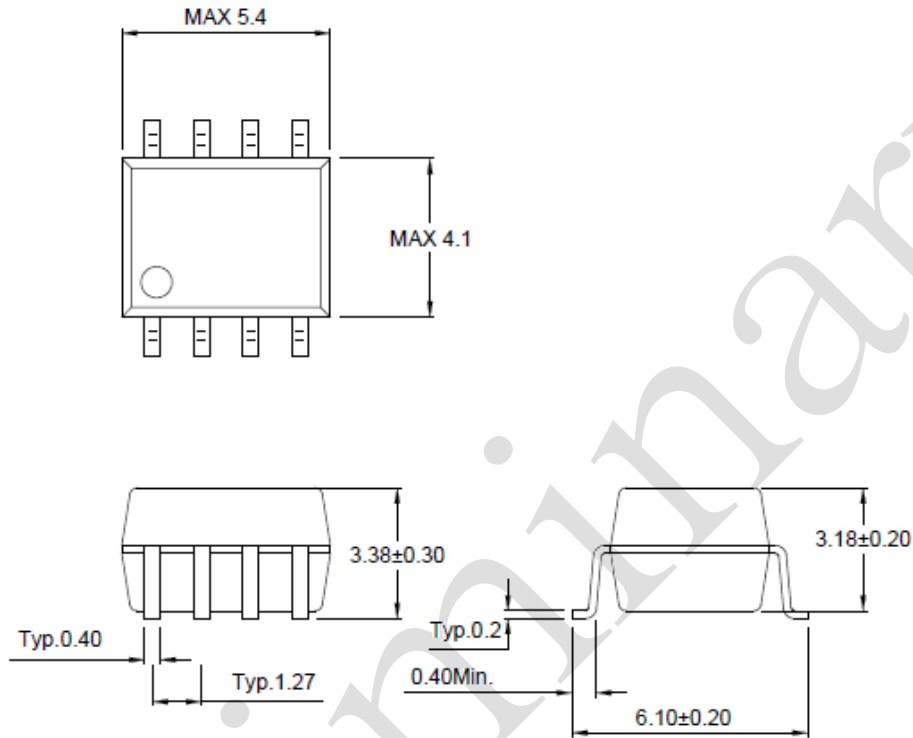


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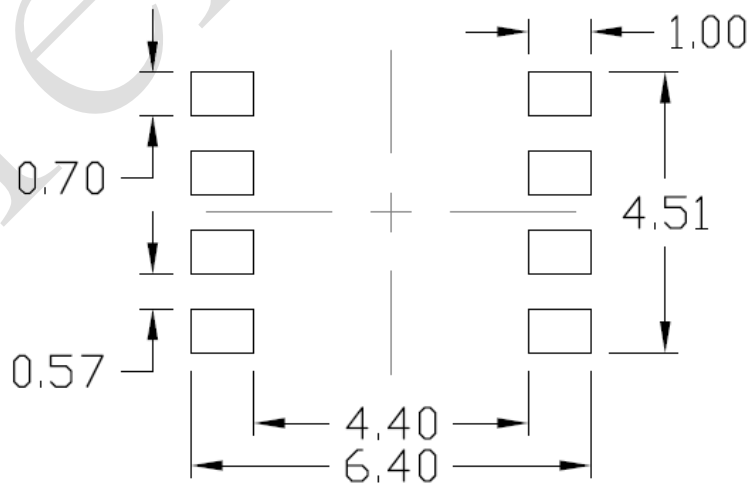
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Package Dimension *Dimensions in mm unless otherwise stated*

Surface Mount Lead Forming

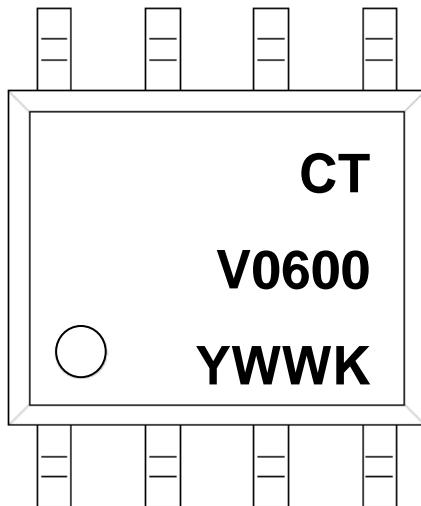


Recommended Solder Mask *Dimensions in mm unless otherwise stated*





Marking Information



Note :

- CT : Denotes "CT Micro"
- 0600 : Part Number (0600, 0601, 0611)
- V : VDE Safety Mark Option (Blank or V)
- Y : One Digit Year Code
- WW : Two Digit Work Week
- K : Manufacturing Code



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Ordering Information

CT06XX(V)(Z)

- CT = Denotes "CT Micro"
- 06XX = Part Number (XX= 00, 01, or 11)
- V = VDE Option (V or none)
- Z = Tape and Reel Option (T1 or T2)

Option	Description	Quantity
T1	Surface Mount Lead Forming – With Option 1 Taping	1,200 Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Taping	1,200 Units/Reel

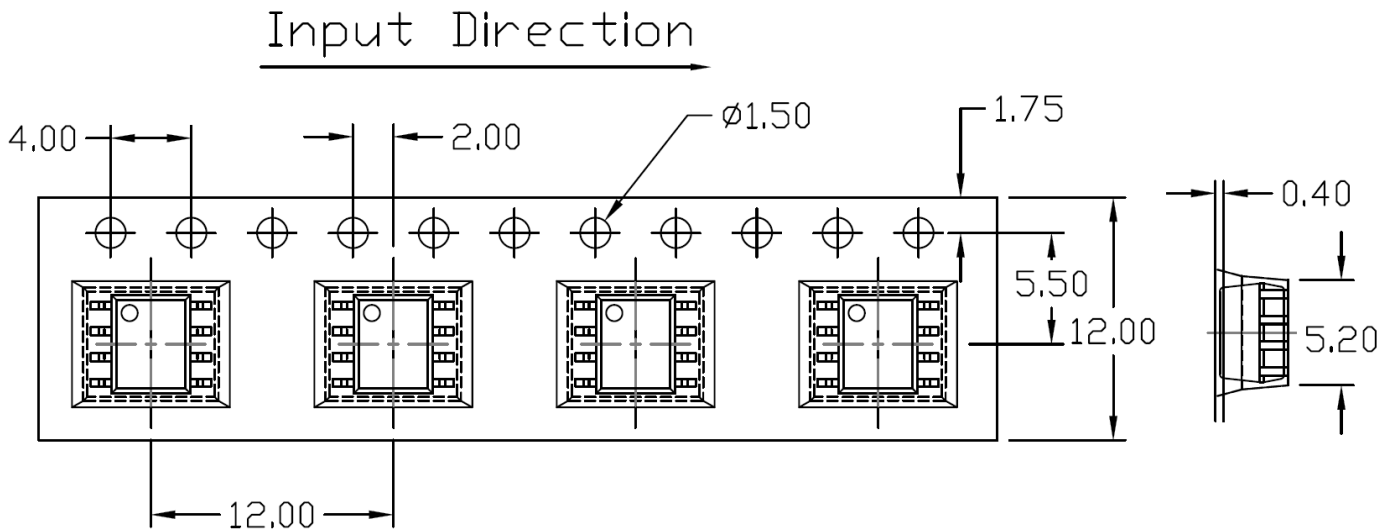


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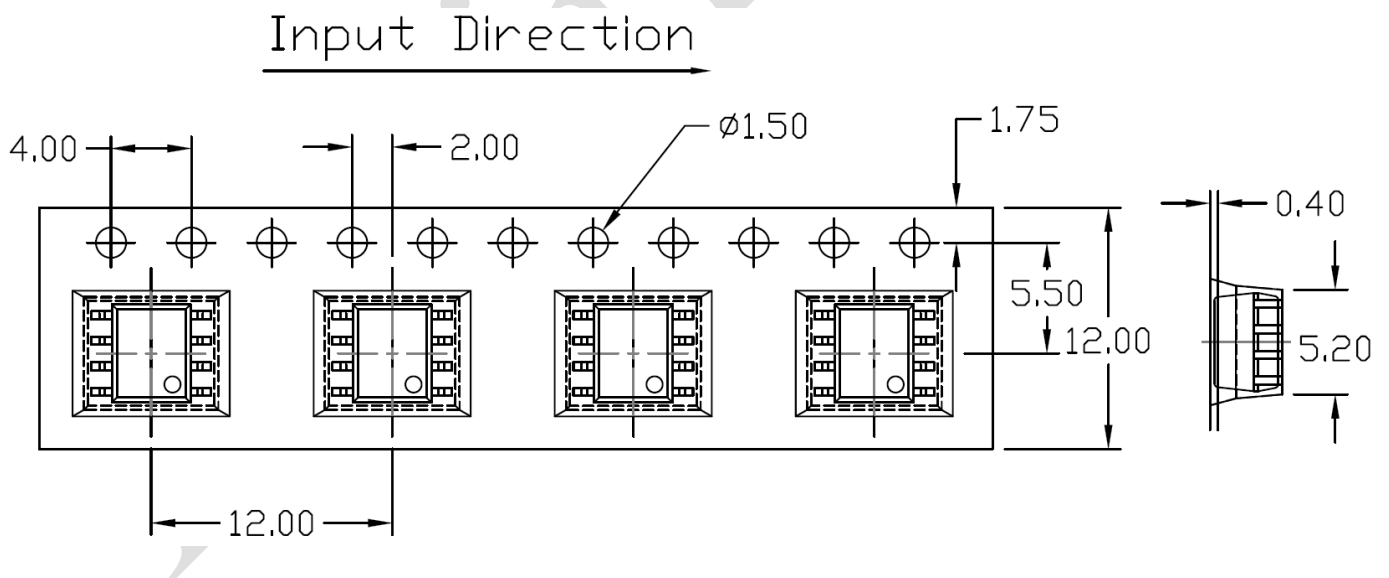
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option T1



Option T2





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Solderability Specification (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)

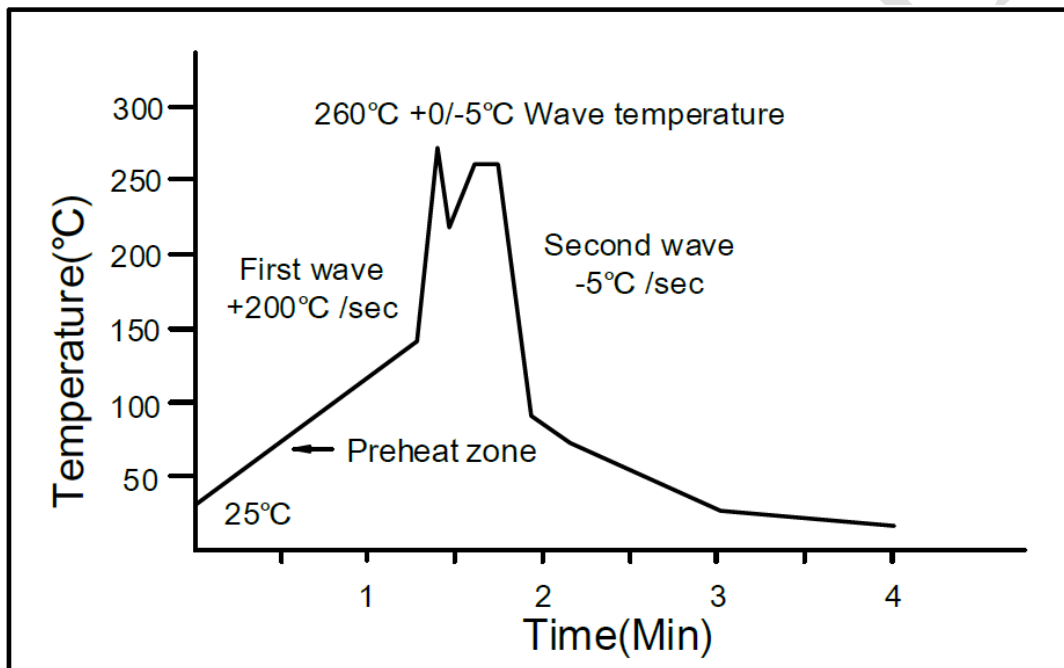
One time soldering is recommended within the condition of temperature.

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

Time: 10 sec.

Preheat temperature: 25 to 140°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: $350 \pm 10^\circ\text{C}$

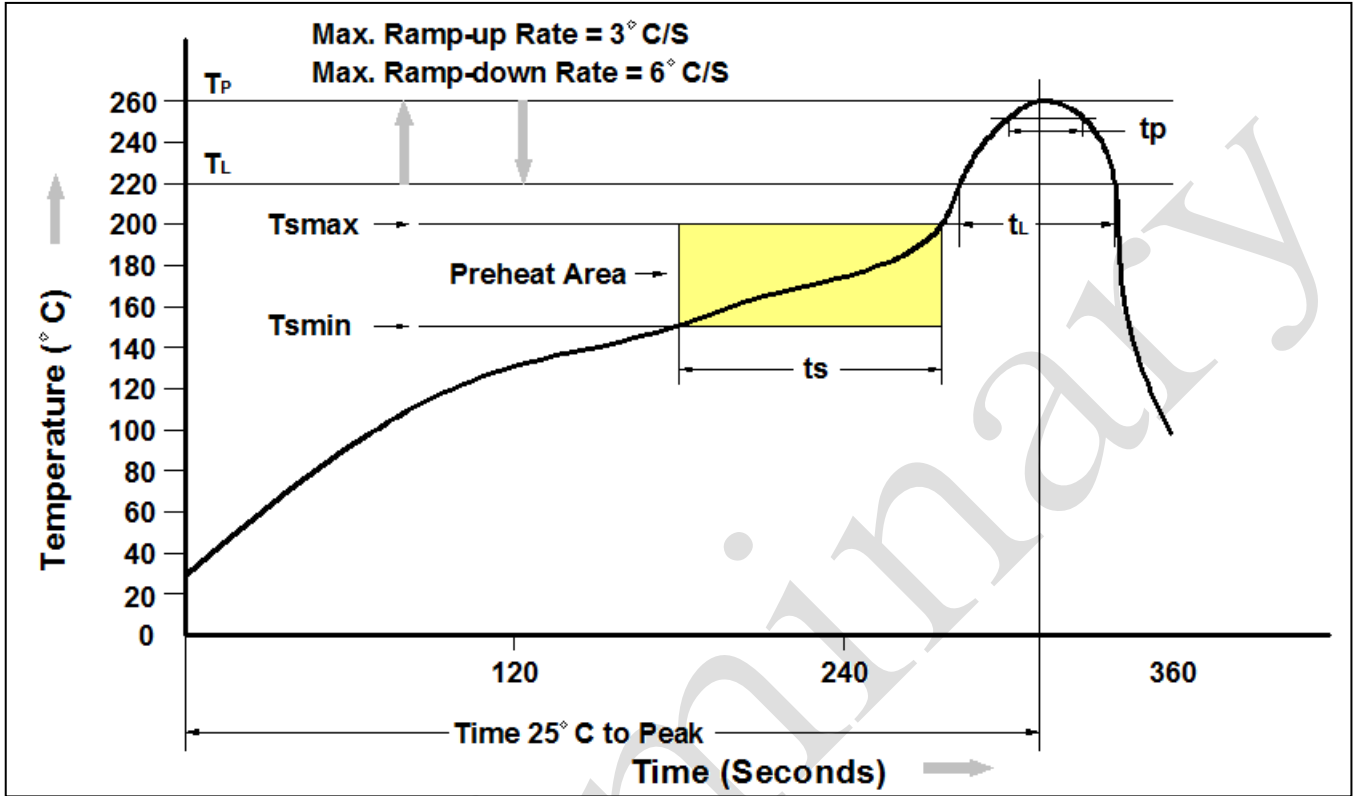
Time: 5 sec max.



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



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{min})	150°C
Temperature Max. (T _{max})	200°C
Time (t _s) from (T _{min} to T _{max})	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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