



CT3010, CT3011, CT3012 CT3020, CT3021, CT3022, CT3023 250V/400V Random Phase 6-Pin Phototriac Optocoupler

Features

- High isolation 5000 VRMS
- Peak Breakdown Voltage
 - 250V – CT3010,3011,3012
 - 400V – CT3020,3021,3022,3023
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

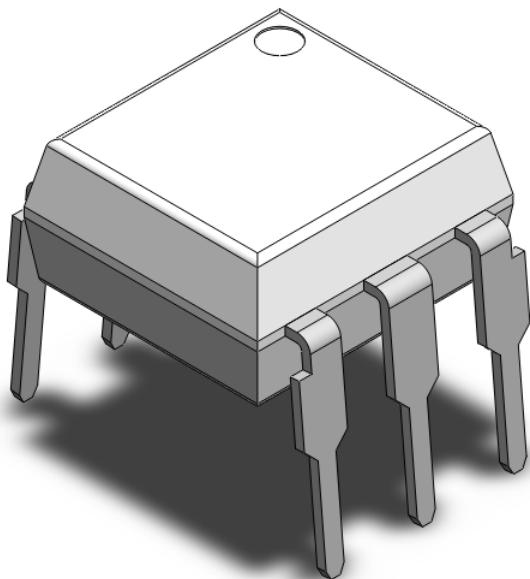
Applications

- Motor Controls
- Lamp ballasts
- Static AC Power Switch
- Solenoid/ Valve Control

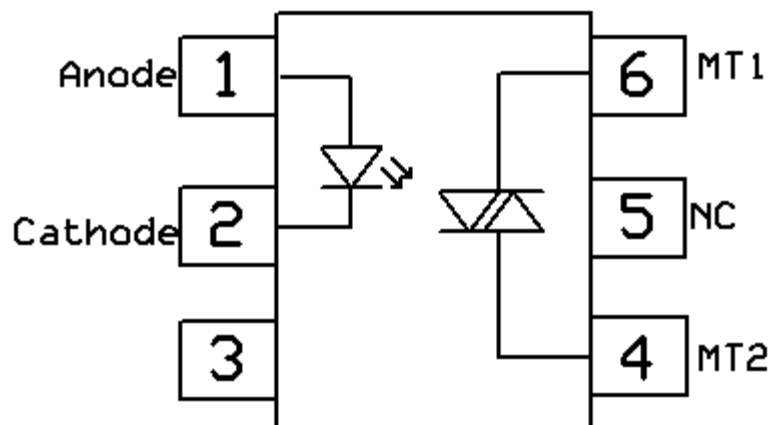
Description

The CT3010, CT3011, CT3012, CT3020, CT3021, CT3022 and CT3023 consists of a Random Phase Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 6-lead DIP package with different lead forming options.

Package Outline



Schematic



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



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Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes	
V _{ISO}	Isolation voltage	5000	V _{RMS}		
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	60	mA		
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1	A		
V _R	Reverse voltage	6	V		
P _D	Power dissipation	100	mW		
Detector					
P _D	Power dissipation	300	mW		
V _{DRM}	Off-State Output Terminal Voltage	CT3010,3011,3012	250	V	
		CT3020,3021,3022,3023	400	V	
I _{TSM}	Peak Repetitive Surge Current	1	A		



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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	$I_F = 10\text{mA}$	-	-	1.5	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	45	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{DRM}	Peak Blocking Current	$I_F = 0\text{mA}$, $V_{DRM} = \text{Rated } V_{DRM}$	-	-	100	nA	
V_{TM}	Peak On-State Voltage	$I_F = \text{Rated } I_{FT}$, $I_{TM} = 100\text{mA}$	-	-	2.5	V	
dv/dt	Critical Rate of Rise off-State Voltage	$V_{PEAK} = \text{Rated } V_{DRM}$	-	100	-	V/ μs	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Input Trigger Current	CT3020	Terminal Voltage = 3V	-	-	30	mA
		CT3010, CT3021		-	-	15	
		CT3011, CT3022		-	-	10	
		CT3012, CT3023		-	-	5	
I_H	Holding Current		-	250	-	μA	
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	1×10^{11}	-	-		
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF	



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Typical Characteristic Curve

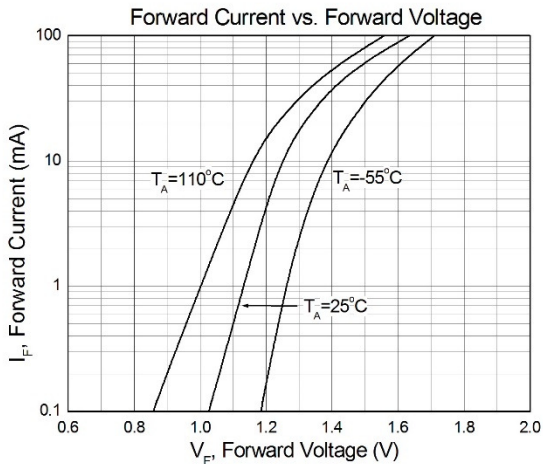


Figure 1

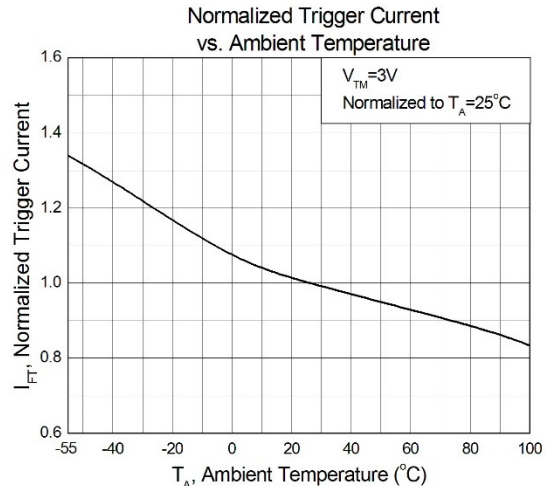


Figure 2

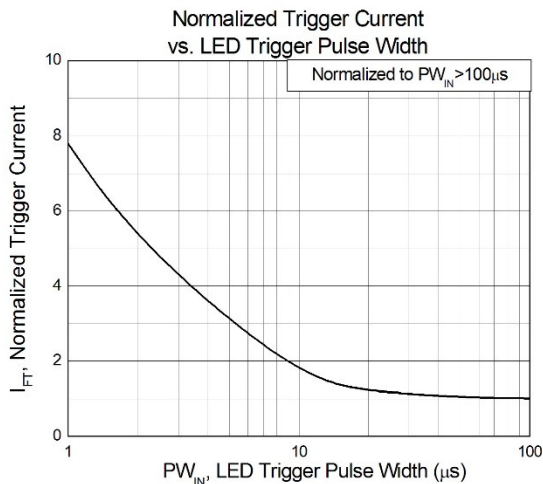


Figure 3

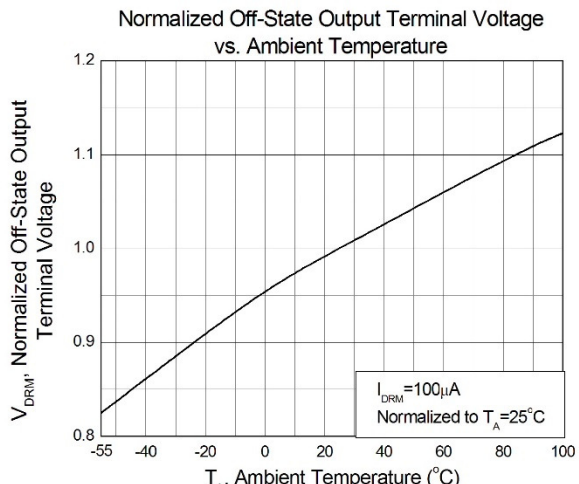


Figure 4

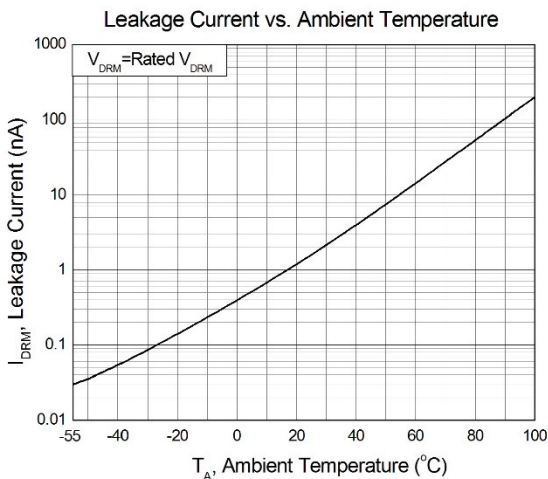


Figure 5

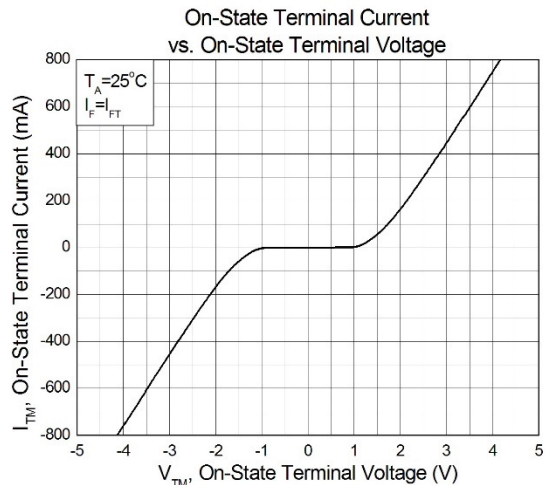
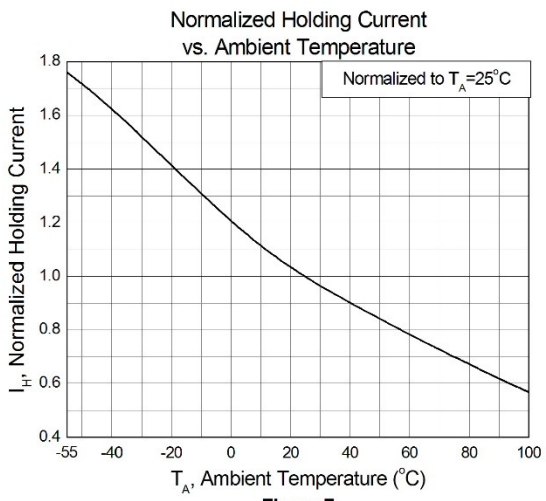


Figure 6



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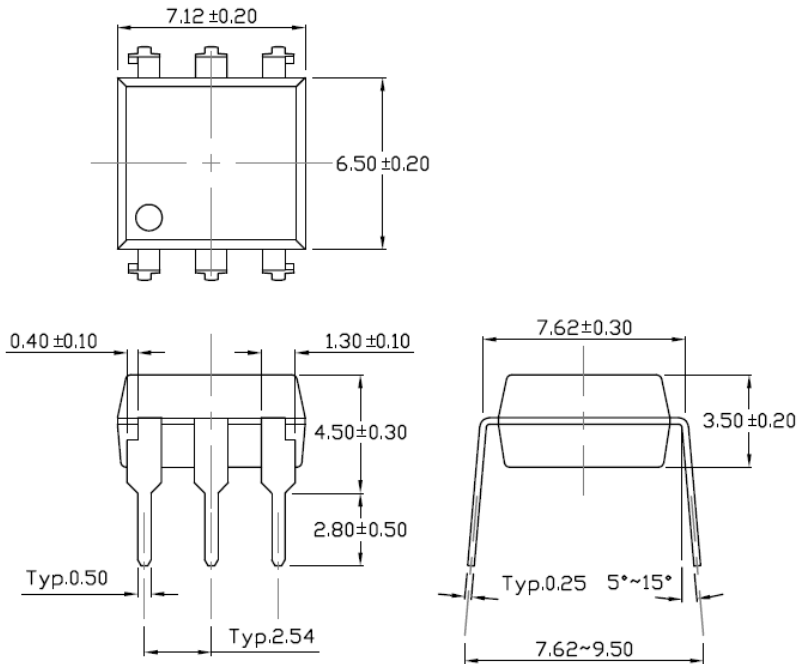




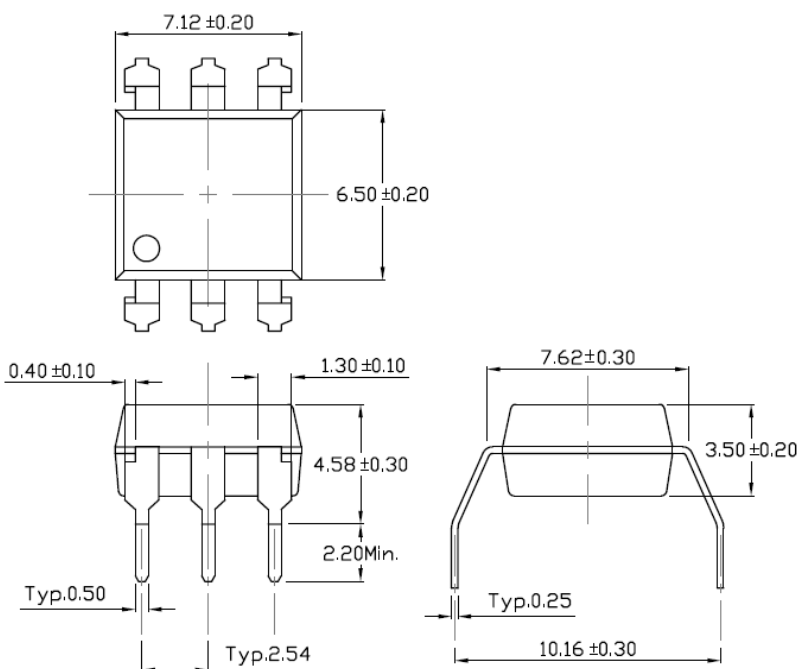
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Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole



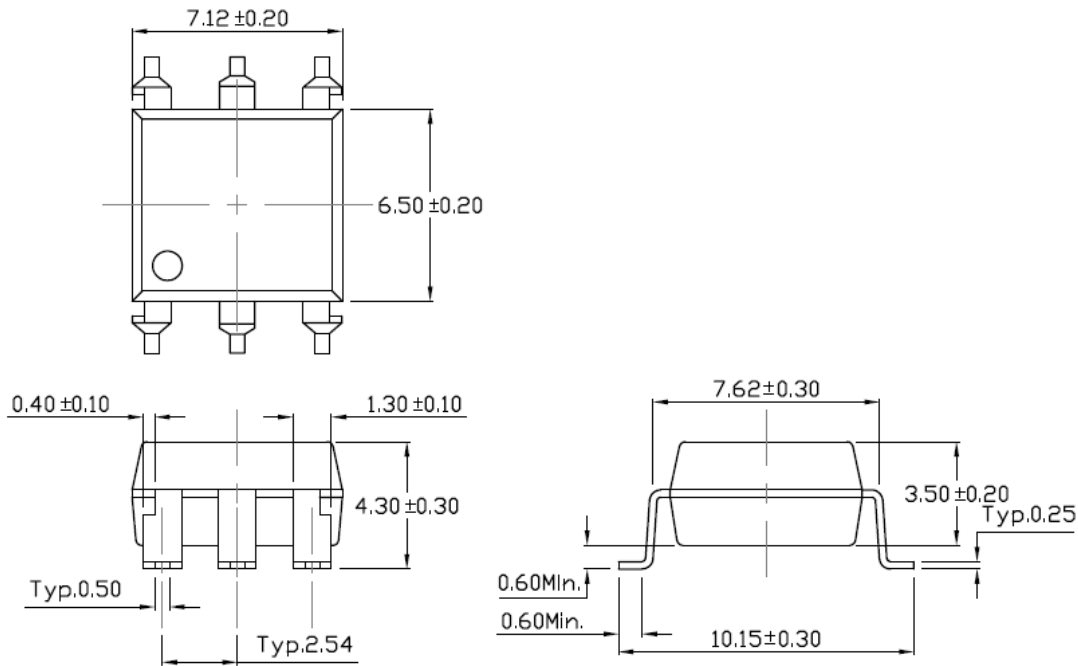
Wide Lead Forming – Through Hole (M Type)



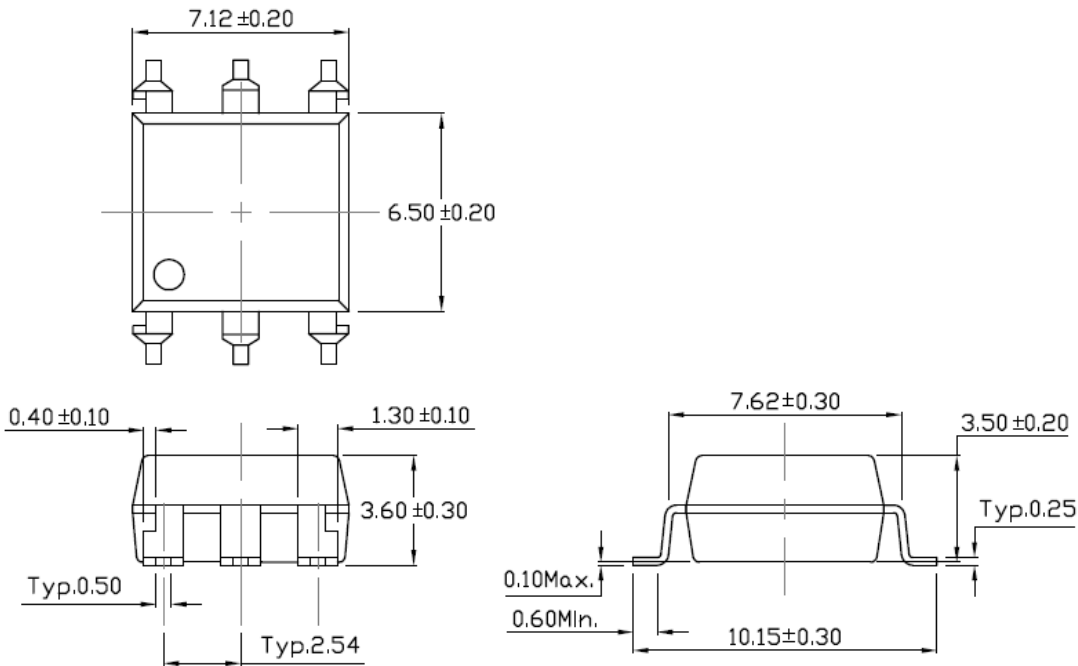


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Surface Mount Forming (S Type)



Surface Mount Forming (Low Profile) (SL Type)

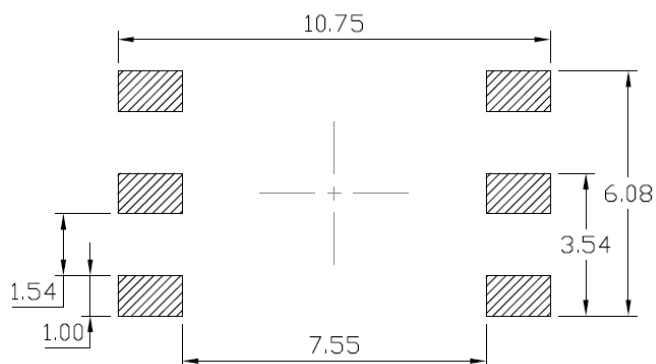




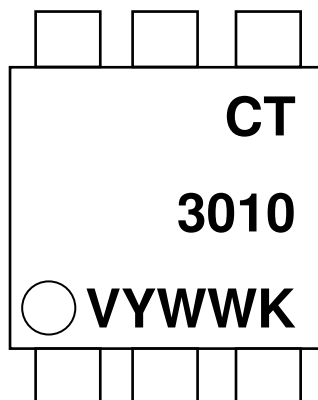
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Recommended Solder Mask *Dimensions in mm unless otherwise stated*



Marking Information



Note:

- CT : Denotes "CT Micro"
- 3010 : Part Number
- V : VDE Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code



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Ordering Information

CT301X(Y)(Z)-G, CT302X(Y)(Z)-G

X = Part No. (CT301X:0,1,2), (CT302X : 0,1,2,3)

Y = Lead form option (S, SL, M or none)

Z = Tape and reel option (T1, T2 or none)

G= Material option (G: Green, None: Non-green)

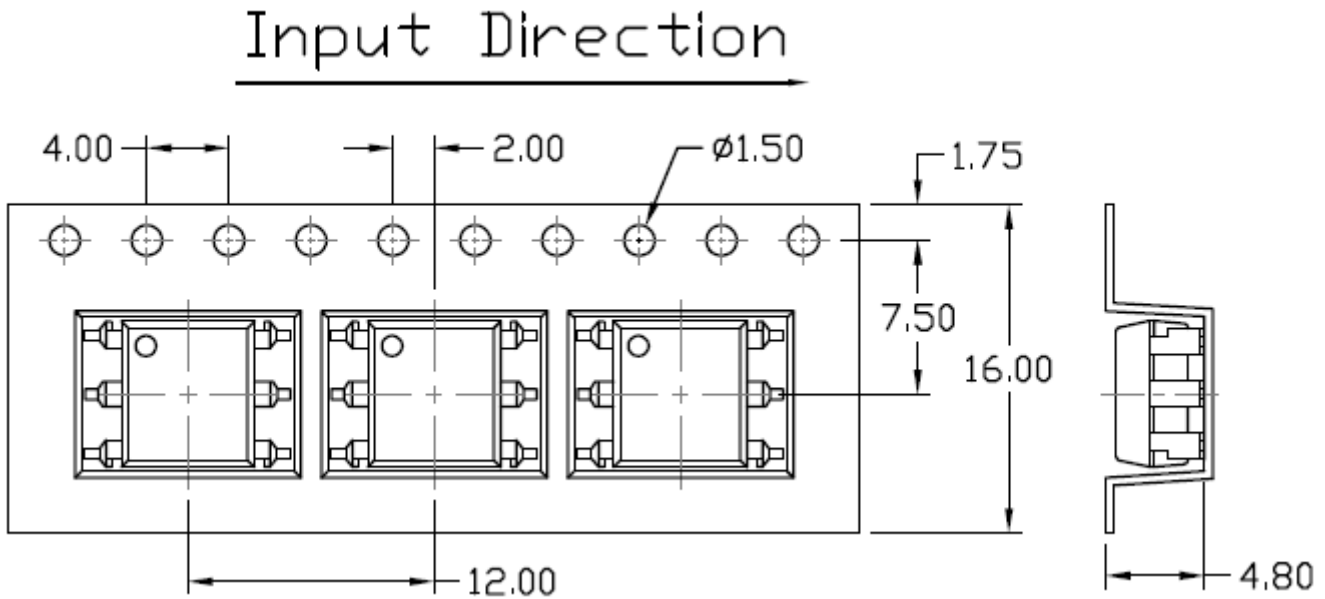
Option	Description	Quantity
None	Standard 6 Pin Dip	50Units/Tube
M	Gullwing (400mil) Lead Forming	50Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming – With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1000 Units/Reel



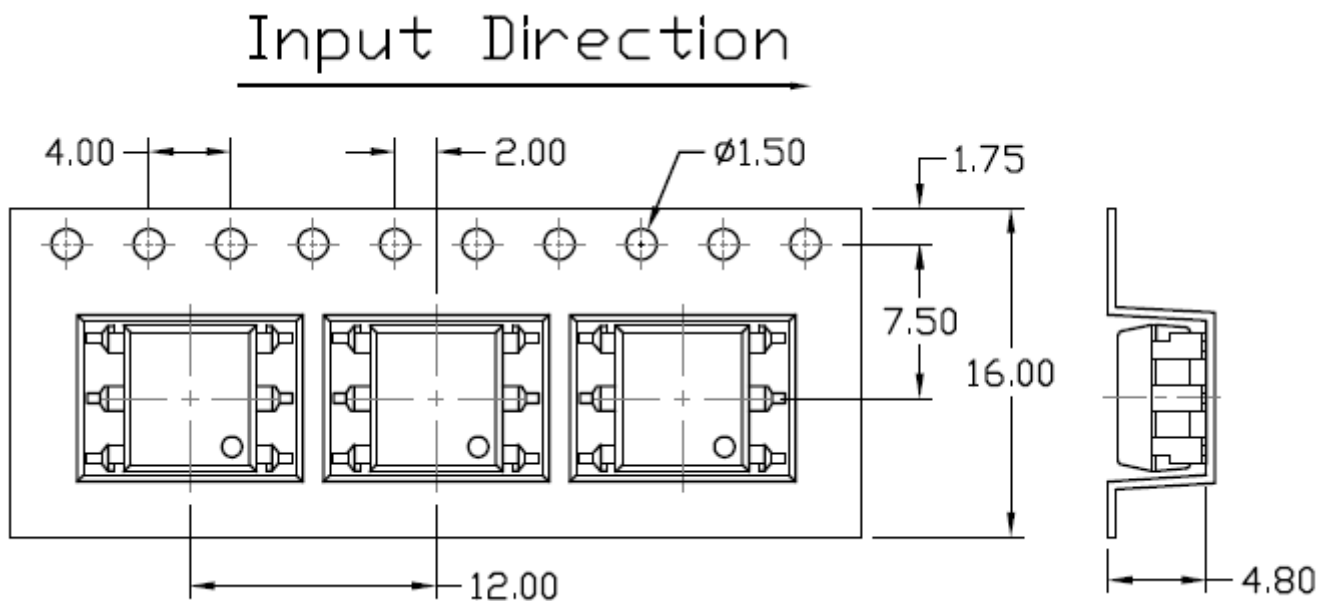
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S(T1) & SL(T1)



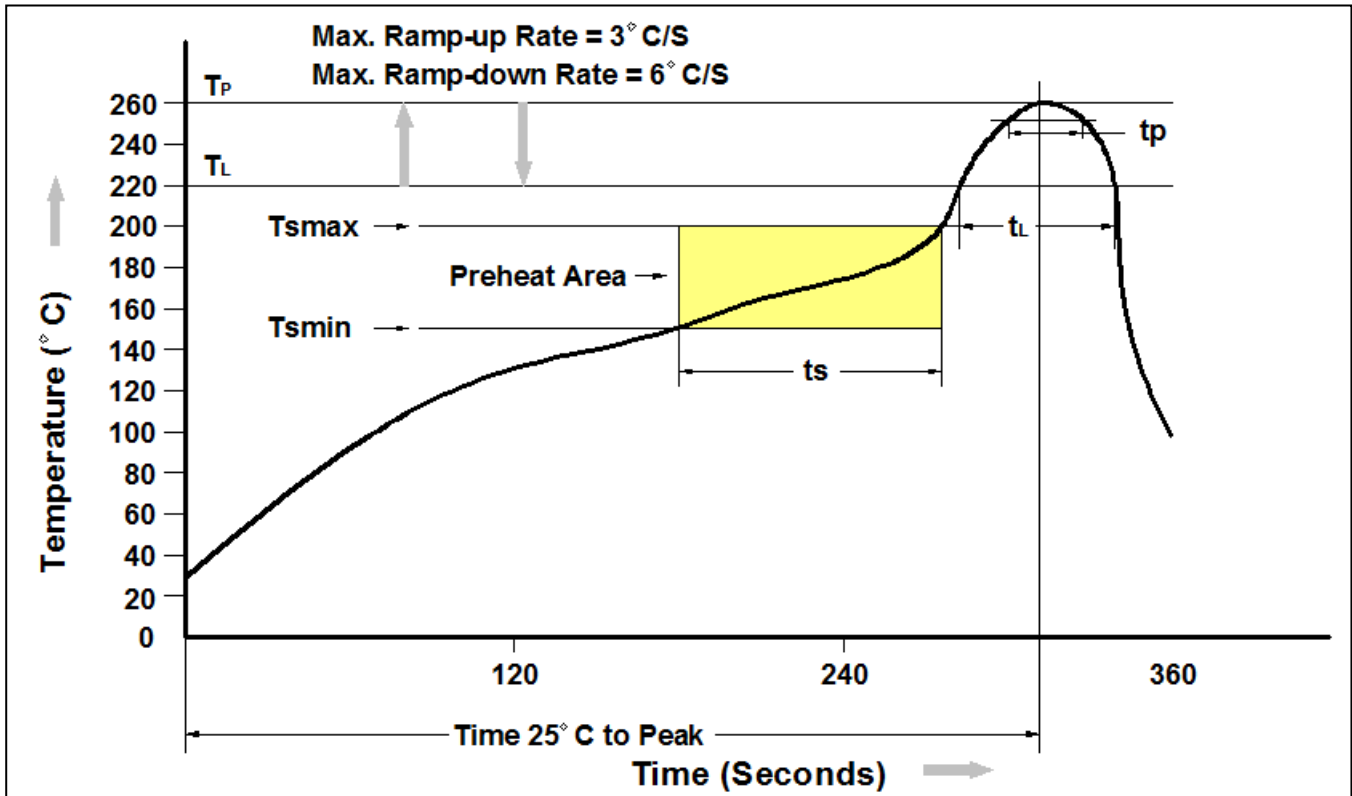
Option S(T2) & SL(T2)





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Reflow Profile



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