



CT3031, CT3032, CT3033

CT3041, CT3042, CT3043

## 250V/400V Zero Cross 6-Pin Phototriac Optocoupler

### Features

- High isolation 5000 VRMS
- Peak Breakdown Voltage
  - 250V – CT3031,3032,3033
  - 400V – CT3041,3042,3043
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950

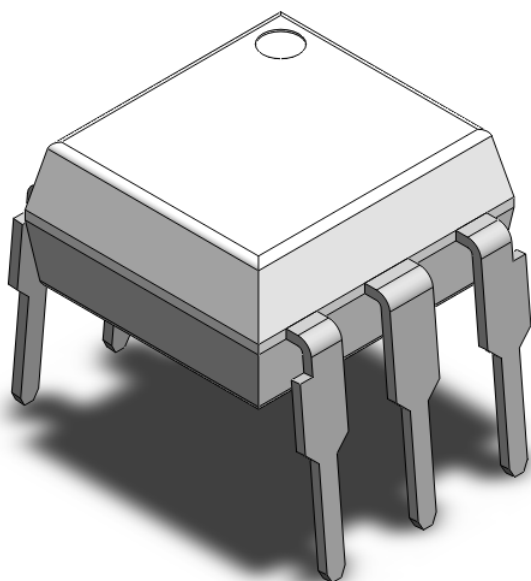
### Description

The CT3031, CT3032, CT3033, CT3041, CT3042 and CT3043 consists of a Zero Cross Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 6-Pin DIP package with different lead forming options.

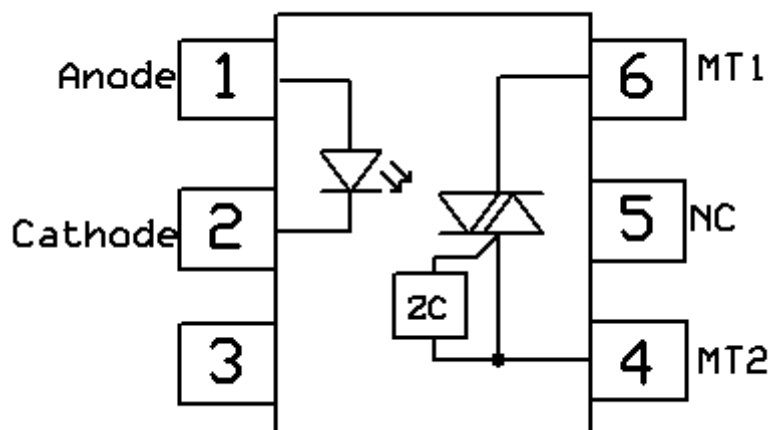
### Applications

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

### 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 <sub>ISO</sub>	Isolation voltage	5000	V <sub>RMS</sub>	
T <sub>OPR</sub>	Operating temperature	-55 ~ +100	°C	
T <sub>STG</sub>	Storage temperature	-55 ~ +150	°C	
T <sub>SOL</sub>	Soldering temperature	260	°C	
<b>Emitter</b>				
I <sub>F</sub>	Forward current	60	mA	
I <sub>F(TRANS)</sub>	Peak transient current (≤1μs P.W,300pps)	1	A	
V <sub>R</sub>	Reverse voltage	6	V	
P <sub>D</sub>	Power dissipation	100	mW	
<b>Detector</b>				
P <sub>D</sub>	Power dissipation	300	mW	
V <sub>DRM</sub>	Off-State Output Terminal Voltage	CT3031,3032,3033	250	V
		CT3041,3042,3043	400	V
I <sub>TSM</sub>	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	$\mu\text{A}$	
$C_{IN}$	Input Capacitance	$f = 1\text{MHz}$	-	45	-	pF	

#### Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$I_{DRM1}$	Peak Blocking Current	$I_F = 0\text{mA}$ , $V_{DRM} = \text{Rated } V_{DRM}$	-	-	100	nA	
$I_{DRM2}$	Inhibit Leakage Current	$I_F = \text{Rated } I_{FT}$ , $V_{DRM} = \text{Rated } V_{DRM}$	-	-	500	$\mu\text{A}$	
$V_{INH}$	Inhibit Voltage	$I_F = \text{Rated } I_{FT}$	-	-	20	V	
$V_{TM}$	Peak On-State Voltage	$I_F = \text{Rated } I_{FT}$ , $I_{TM} = 100\text{mA}$	-	-	3	V	
$dv/dt$	Critical Rate of Rise off-State Voltage	$V_{PEAK} = \text{Rated } V_{DRM}$	1000	-	-	$\text{V}/\mu\text{s}$	

#### Transfer Characteristics

Symbol	Parameters		Test Conditions	Min	Typ	Max	Units	Notes
$I_{FT}$	Input	CT3031, CT3041	Terminal Voltage = 3V $I_{TM} = 100\text{mA}$	-	-	15	mA	
	Trigger	CT3032, CT3042		-	-	10		
	Current	CT3033, CT3043		-	-	5		
$I_H$	Holding Current			-	270	-	$\mu\text{A}$	
$R_{IO}$	Isolation Resistance		$V_{IO} = 500\text{V}_{DC}$	$1 \times 10^{11}$	-	-	$\Omega$	
$C_{IO}$	Isolation Capacitance		$f = 1\text{MHz}$	-	0.25	-	pF	



### Typical Characteristic Curve

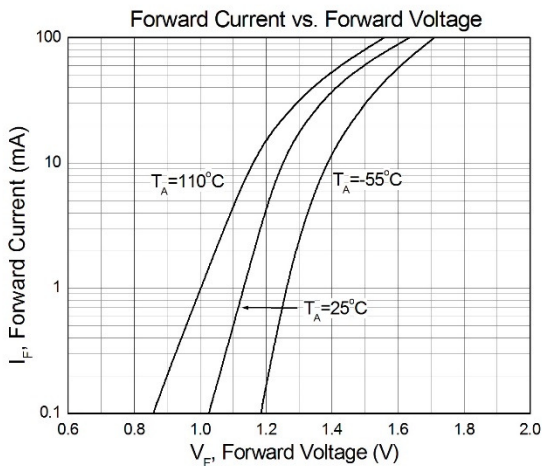


Figure 1

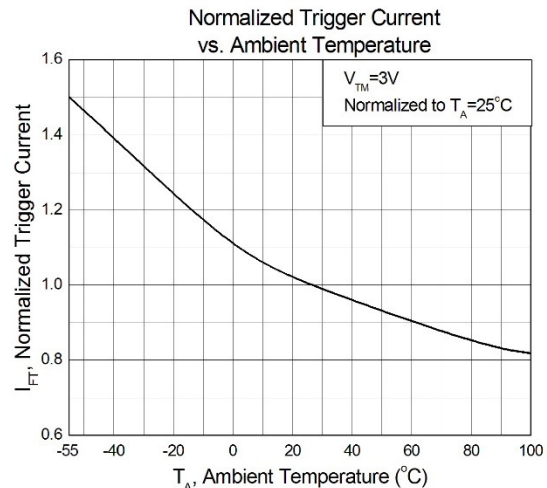


Figure 2

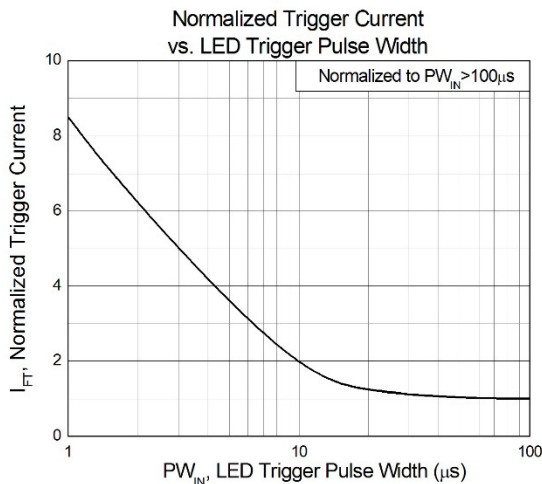


Figure 3

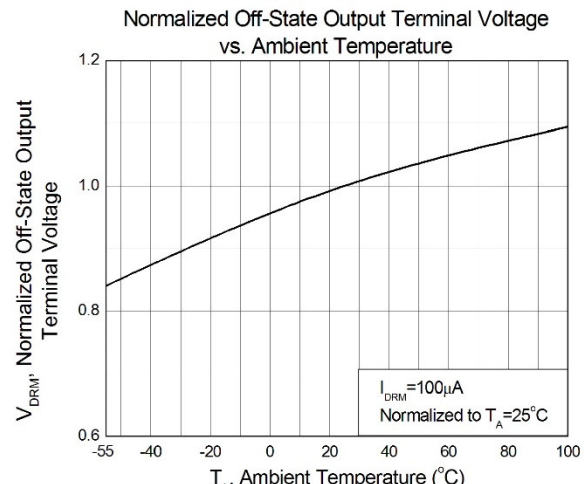


Figure 4

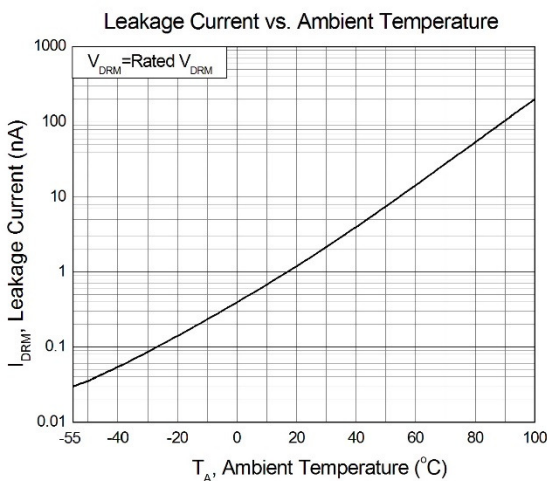


Figure 5

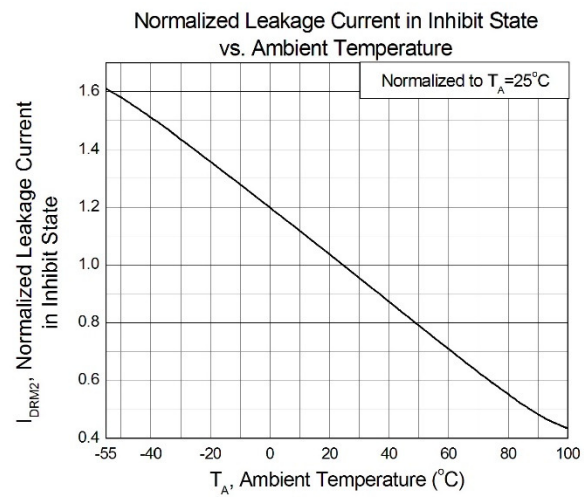


Figure 6



# 250V/400V Zero Cross 6-Pin Phototriac Optocoupler

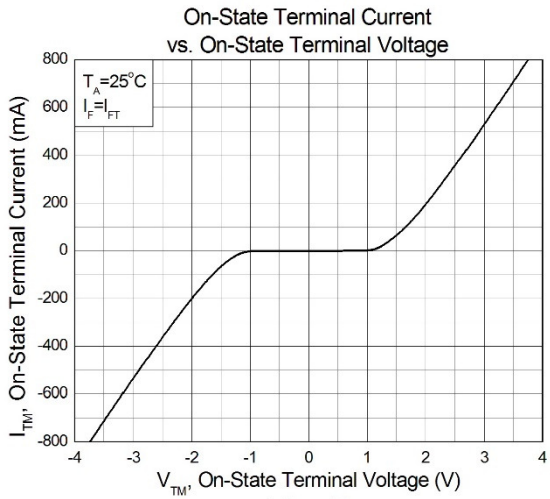


Figure 7

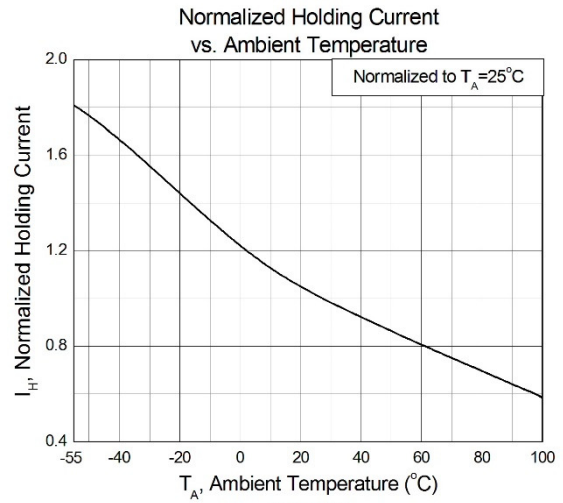


Figure 8

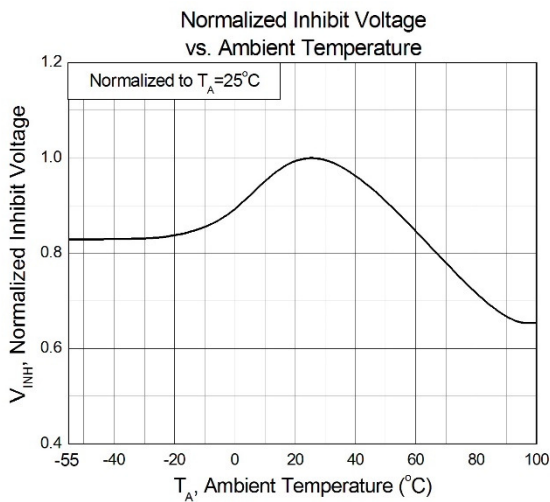


Figure 9



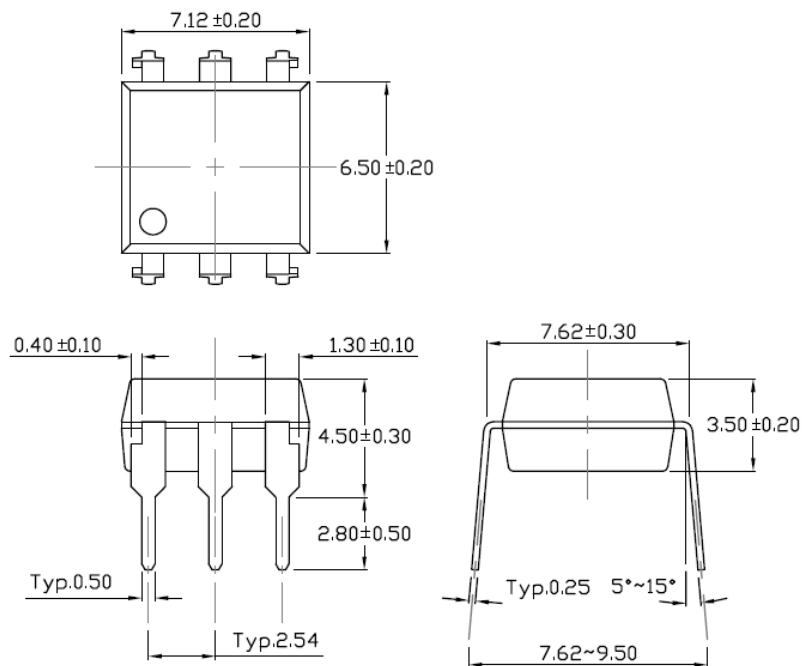
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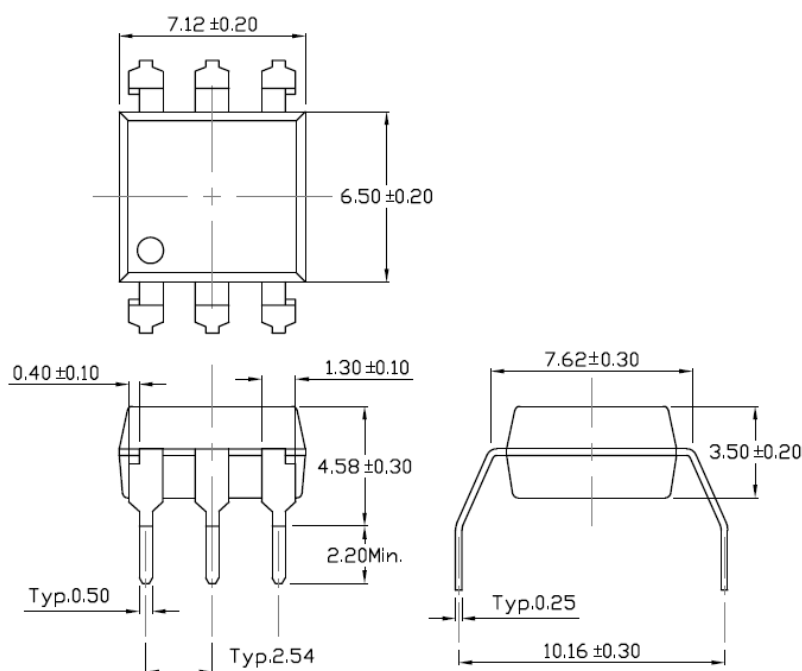
## 250V/400V Zero Cross 6-Pin Phototriac Optocoupler

### Package Dimension *Dimensions in mm unless otherwise stated*

#### Standard DIP – Through Hole



#### Wide Lead Forming – Through Hole (M Type)



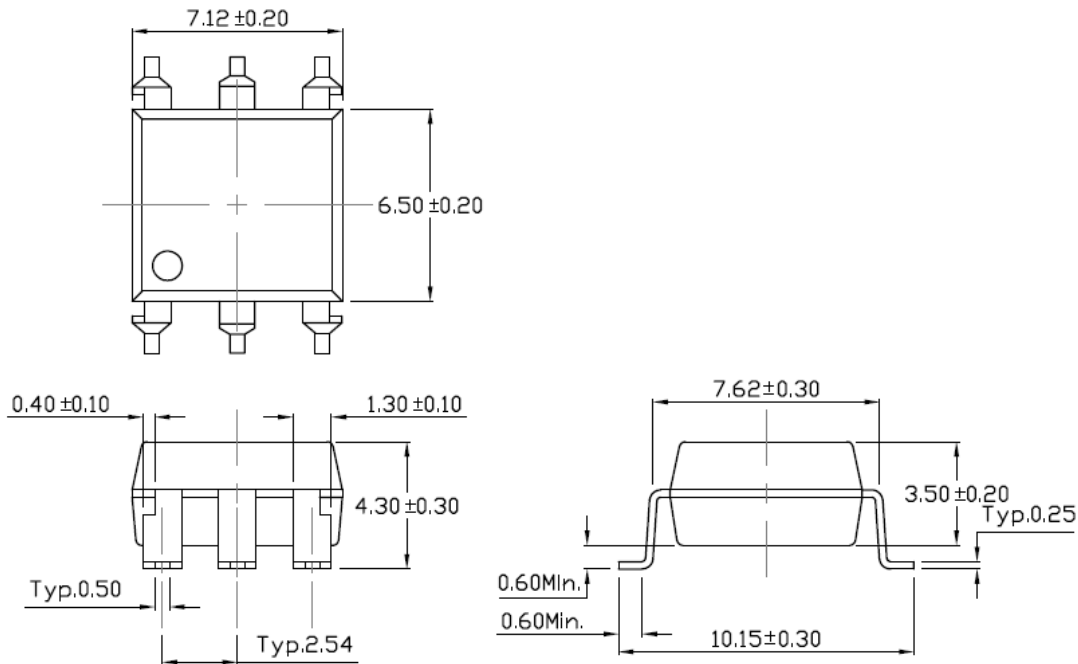


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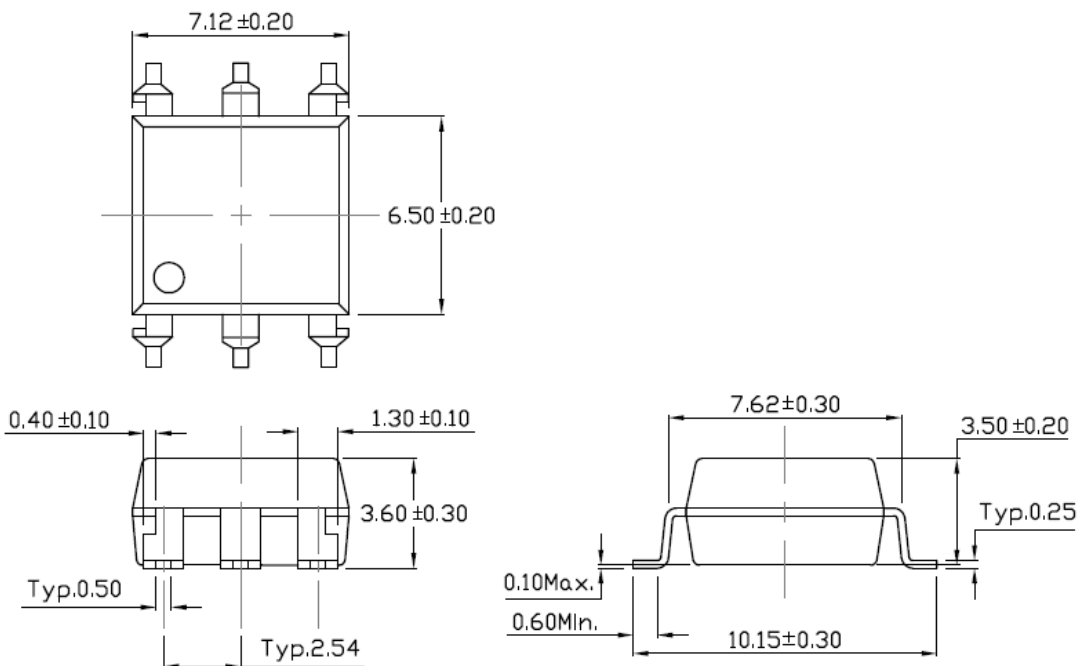
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## 250V/400V Zero Cross 6-Pin Phototriac Optocoupler

### Surface Mount Forming (S Type)



### Surface Mount Forming (Low Profile) (SL Type)



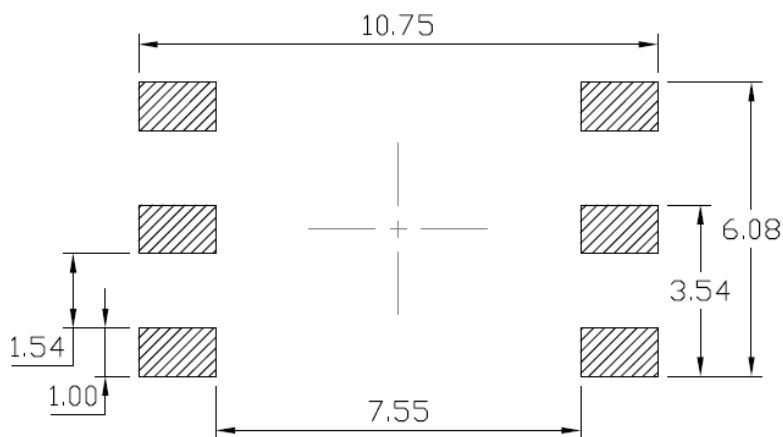


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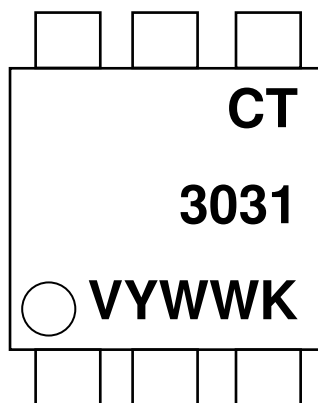
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## 250V/400V Zero Cross 6-Pin Phototriac Optocoupler

### Recommended Solder Mask *Dimensions in mm unless otherwise stated*



### Marking Information



#### Note:

- CT : Denotes "CT Micro"
- 3031 : Part Number
- V : VDE Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code





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### Ordering Information

CT303X(V)(Y)(Z)-G, CT304X(V)(Y)(Z)-G

X = Part No. (X=1,2,3)

V = VDE Option (V or None)

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)

<b>Option</b>	<b>Description</b>	<b>Quantity</b>
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



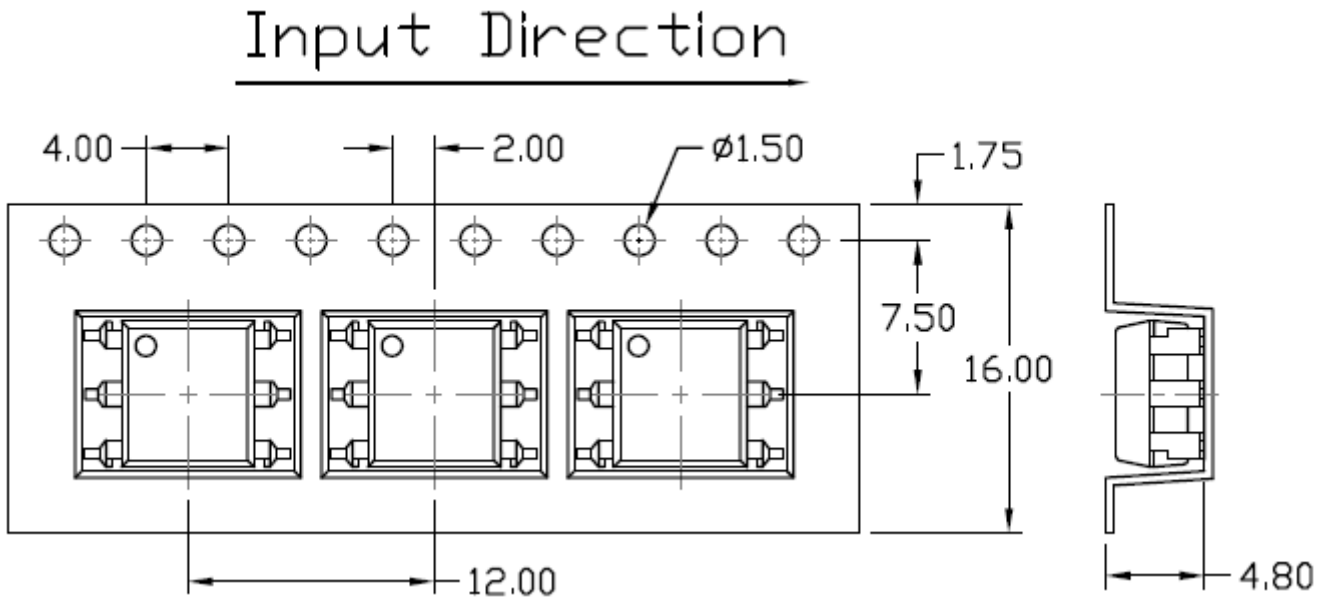
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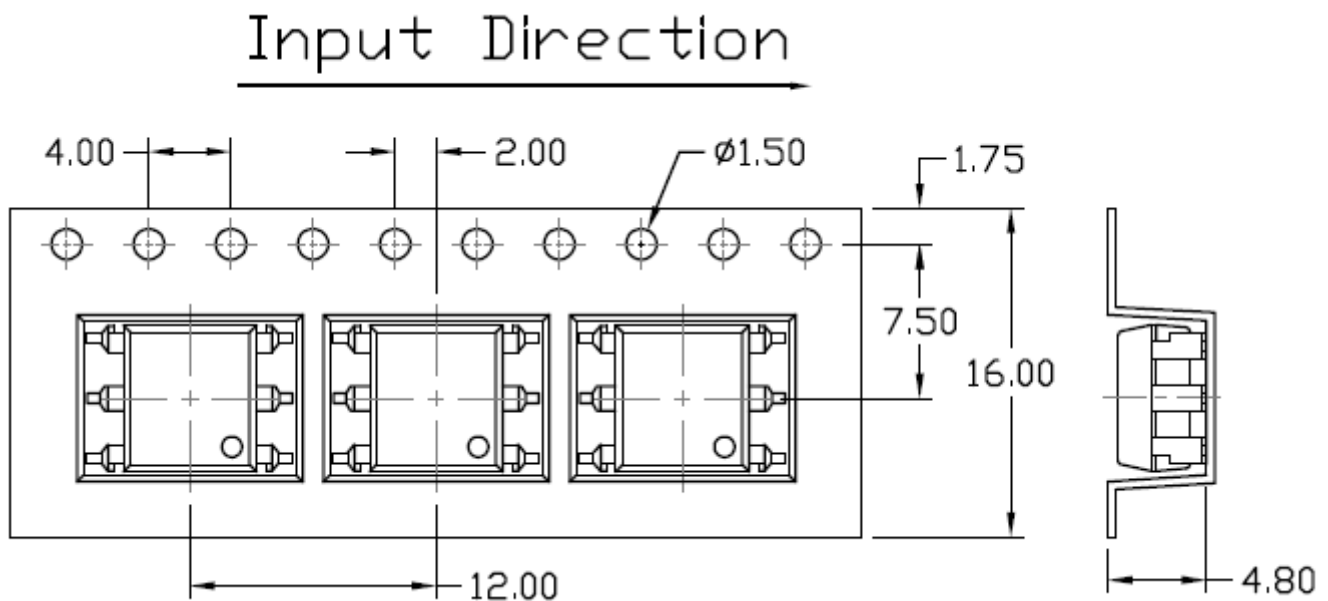
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### Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

#### Option S(T1) & SL(T1)



#### Option S(T2) & SL(T2)



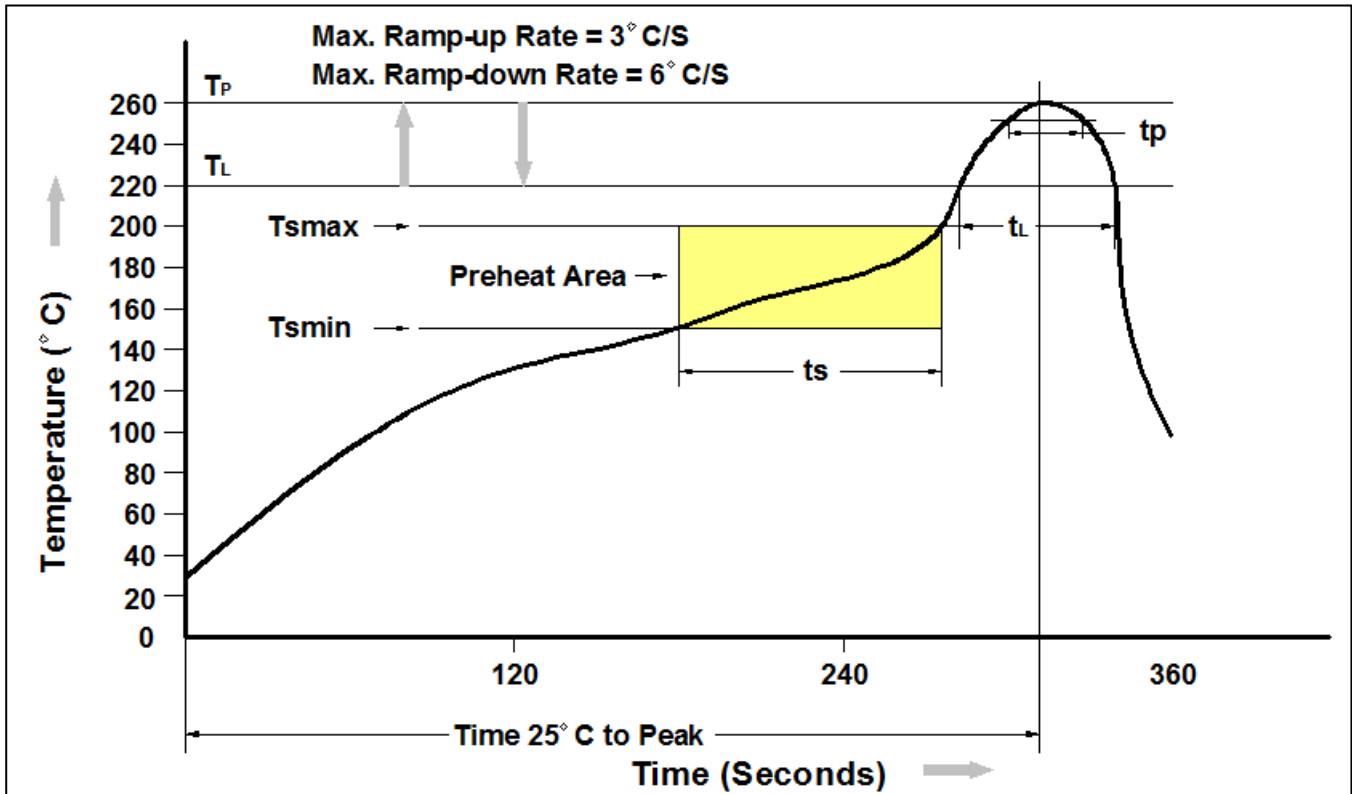


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## 250V/400V Zero Cross 6-Pin Phototriac Optocoupler

### Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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