



CT3031-5L, CT3032-5L, CT3033-5L

CT3041-5L, CT3042-5L, CT3043-5L

## 250V/400V Zero Cross 5-Pin Phototriac Optocoupler

### Features

- High isolation 5000 VRMS
- Peak Breakdown Voltage
  - 250V – CT3031-5L,CT3032-5L,CT3033-5L
  - 400V – CT3041-5L,CT3042-5L,CT3043-5L
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950

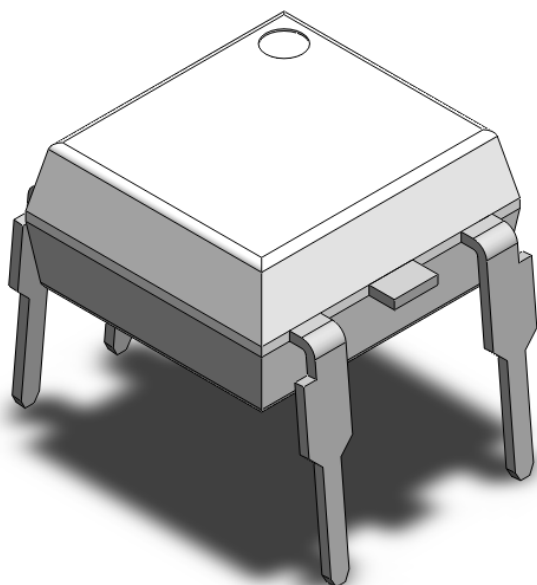
### Description

The CT3031-5L, CT3032-5L, CT3033-5L, CT3041-5L, CT3042-5L and CT3043-5L consists of a Zero Cross Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 5-lead DIP package.

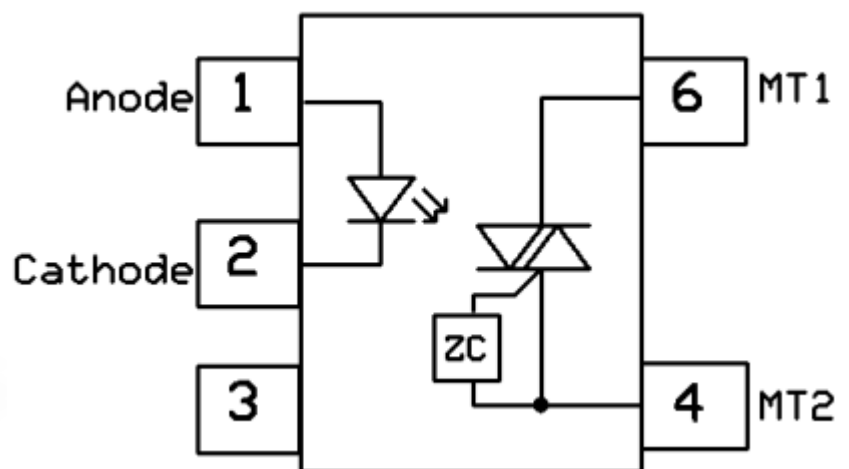
### Applications

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

### Package Outline



### Schematic



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



CT3031-5L, CT3032-5L, CT3033-5L

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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	CT3031-5L,CT3032-5L,CT3033-5L	250	V	
		CT3041-5L,CT3042-5L,CT3043-5L	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	-	-	V/ $\mu\text{s}$	

#### Transfer Characteristics

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



Typical Characteristic Curve

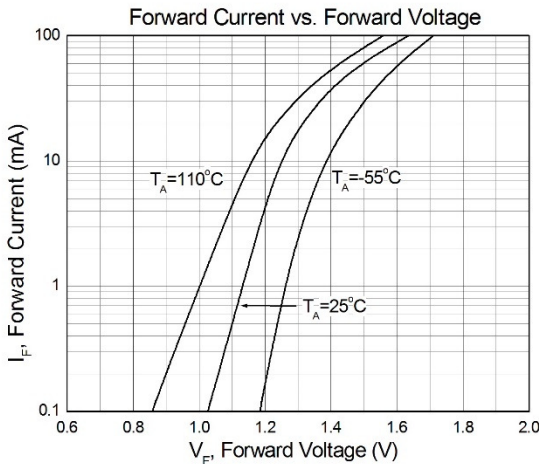


Figure 1

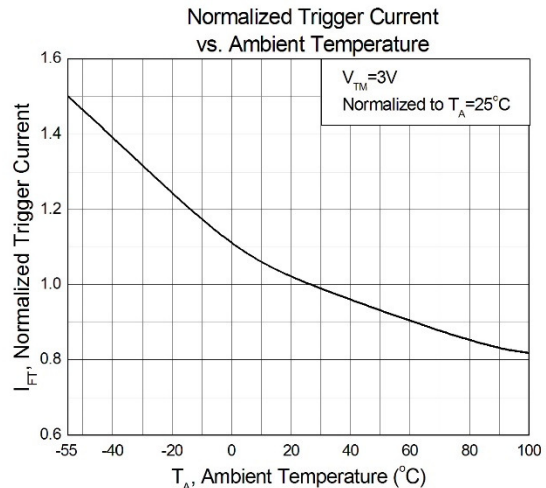


Figure 2

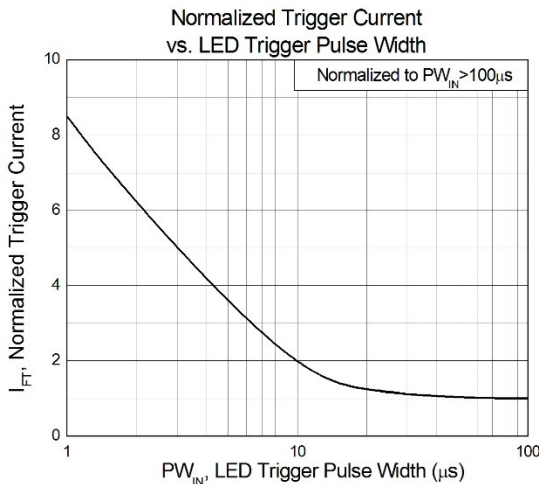


Figure 3

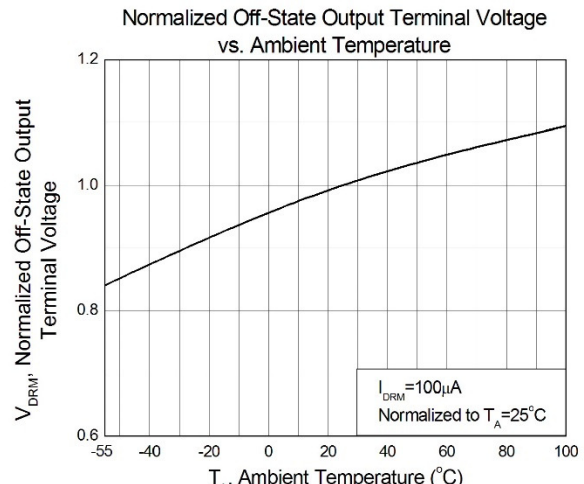


Figure 4

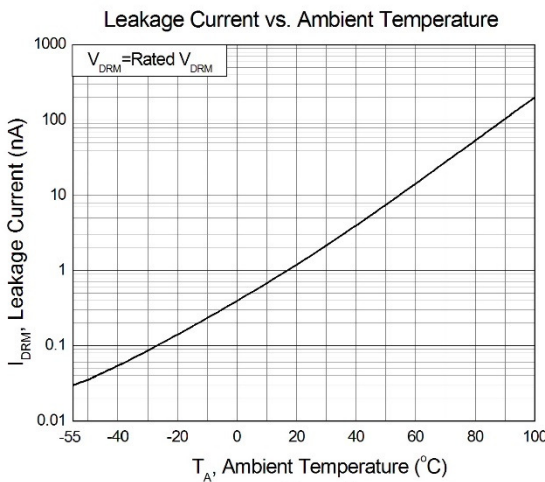


Figure 5

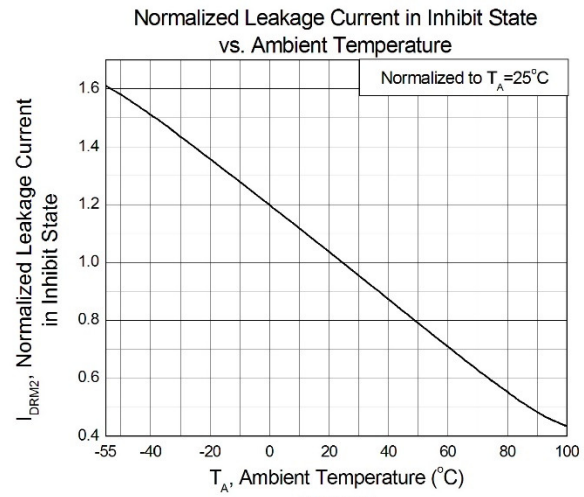


Figure 6



CT3031-5L, CT3032-5L, CT3033-5L

CT3041-5L, CT3042-5L, CT3043-5L

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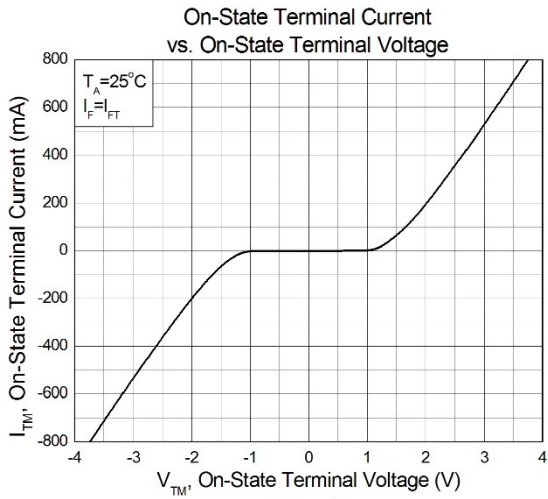


Figure 7

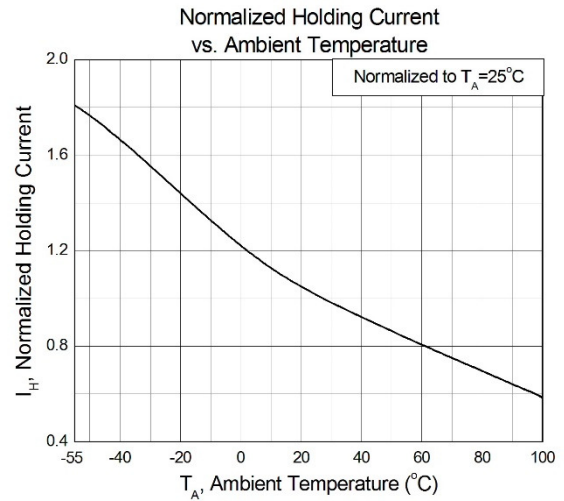


Figure 8

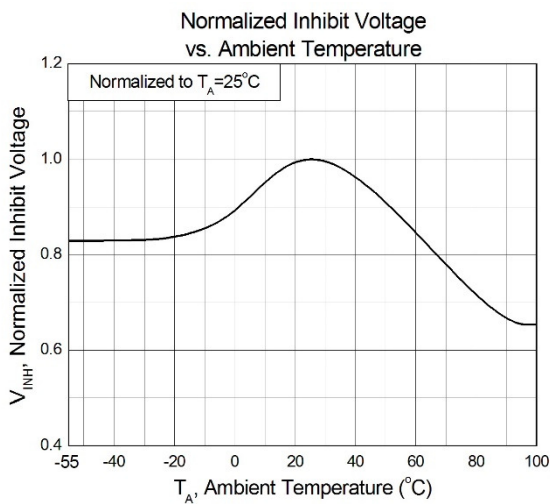


Figure 9



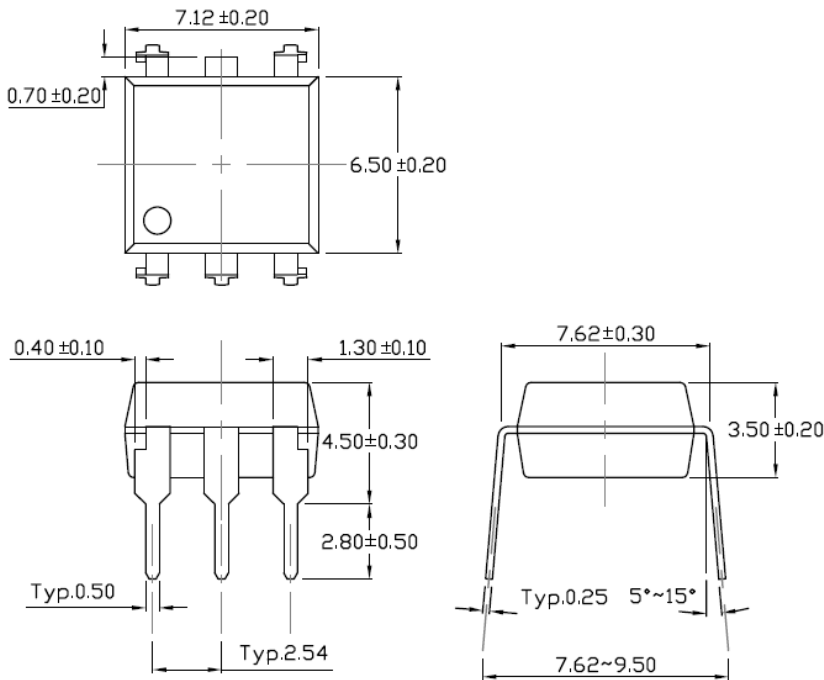
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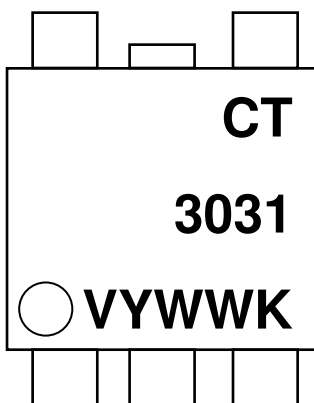
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### Package Dimension *Dimensions in mm unless otherwise stated*

#### Standard DIP – Through Hole



#### Marking Information



#### Note:

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



**CT3031-5L, CT3032-5L, CT3033-5L**

**CT3041-5L, CT3042-5L, CT3043-5L**

**250V/400V Zero Cross 5-Pin Phototriac Optocoupler**

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## Ordering Information

CT303X-5L-G, CT304X-5L-G

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

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

<i>Option</i>	<i>Description</i>	<i>Quantity</i>
None	Standard 5 Pin Dip	50Units/Tube

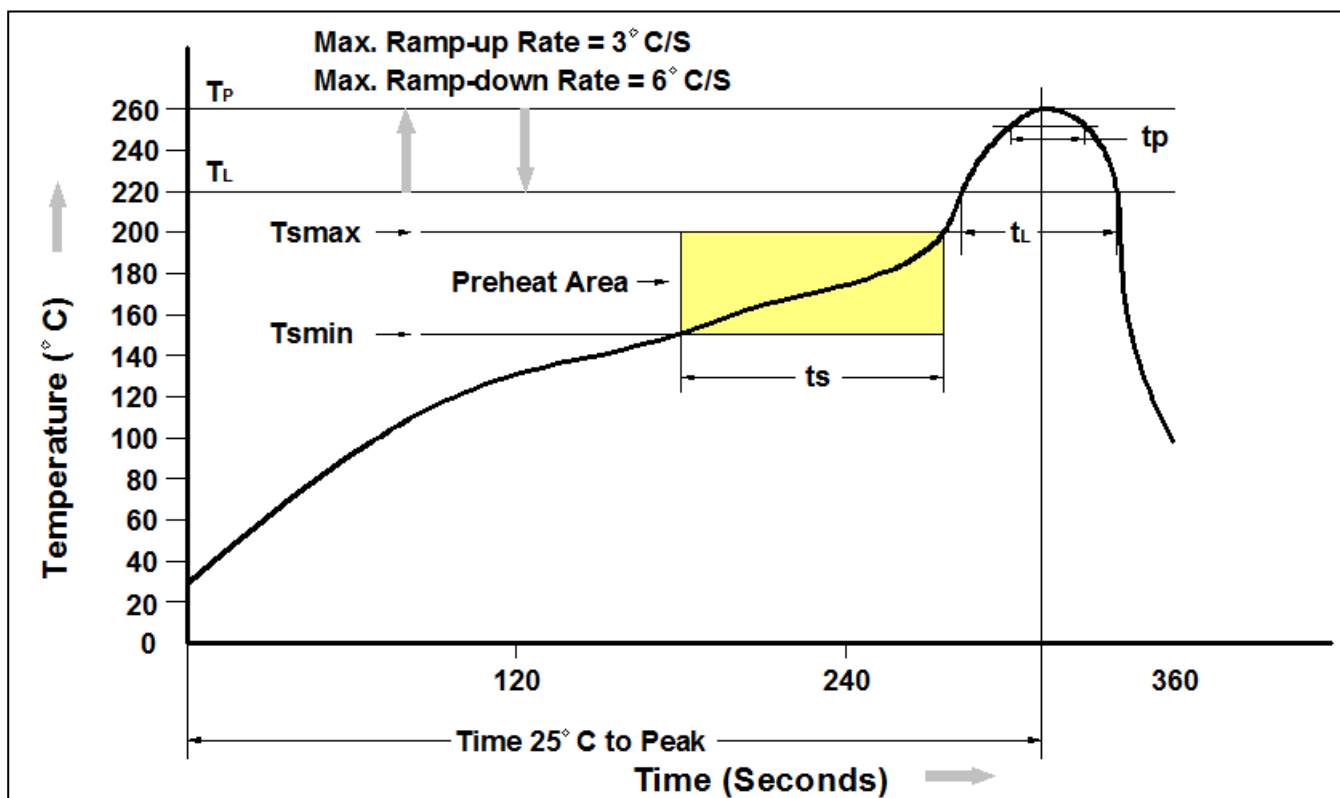


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### Reflow Profile



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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