



CT3010-5L, CT3011-5L, CT3012-5L CT3020-5L, CT3021-5L, CT3022-5L, CT3023-5L 250V/400V Random Phase 5-Pin Phototriac Optocoupler

Features

- High isolation 5000 VRMS
- Peak Breakdown Voltage
 - 250V – CT3010-5L,CT3011-5L,CT3012-5L
 - 400V – CT3020-5L,3021-5L,3022-5L,3023-5L
- Temperature range - 55 °C to 100 °C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

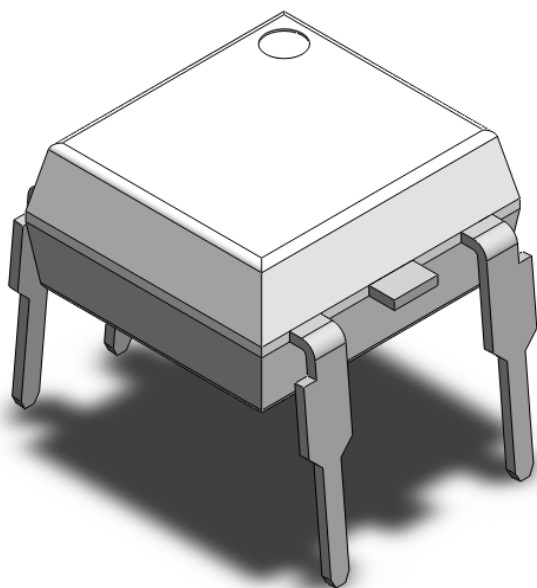
Applications

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

Description

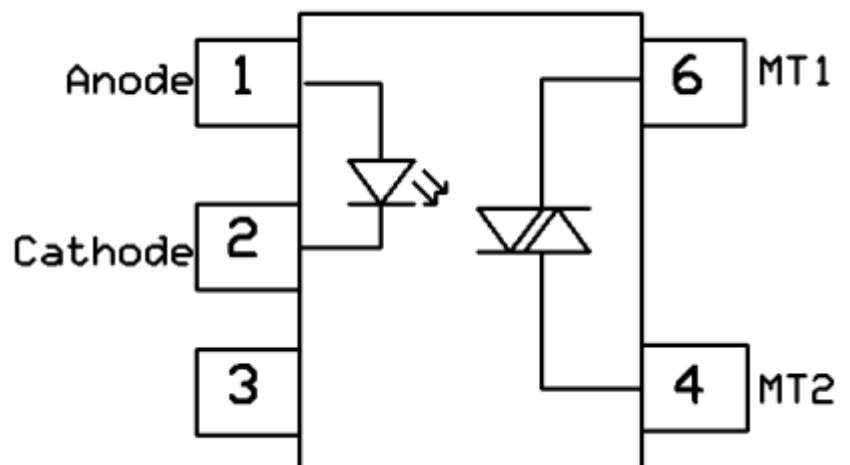
The CT3010-5L, CT3011-5L, CT3012-5L, CT3020-5L, CT3021-5L, CT3022-5L and CT3023-5L consists of a Random Phase Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 5-lead DIP package.

Package Outline



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

Schematic





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CT3020-5L, CT3021-5L, CT3022-5L, CT3023-5L
250V/400V Random Phase 5-Pin Phototriac Optocoupler

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	CT3010-5L,3012-5L,3022-5L	250	V	
	Terminal Voltage	CT3020-5L,3021-5L,3022-5L,3023-5L	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	-	$\text{V}/\mu\text{s}$	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Input Trigger Current	CT3020-5L	Terminal Voltage = 3V	-	-	30	mA
		CT3010-5L, CT3021-5L		-	-	15	
		CT3011-5L, CT3022-5L		-	-	10	
		CT3012-5L, CT3023-5L		-	-	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

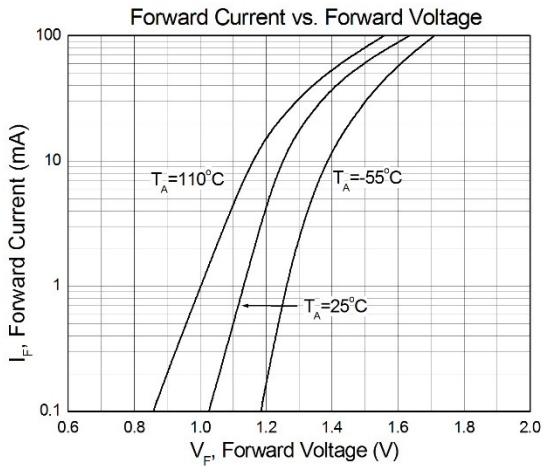


Figure 1

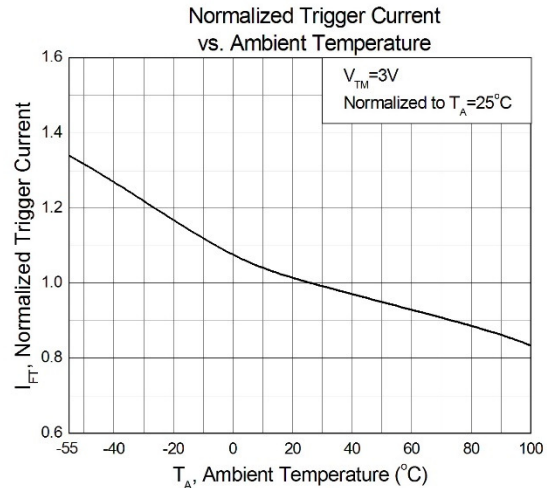


Figure 2

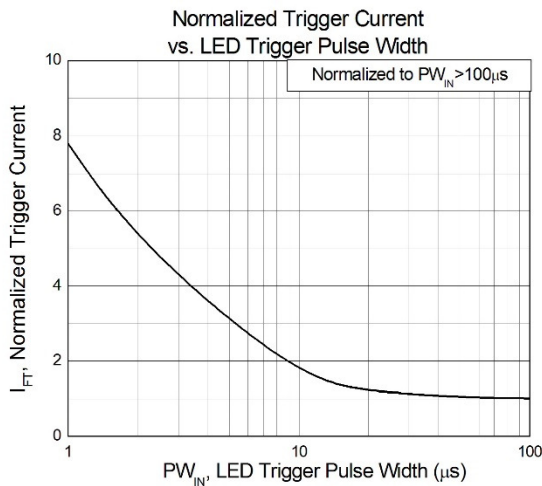


Figure 3

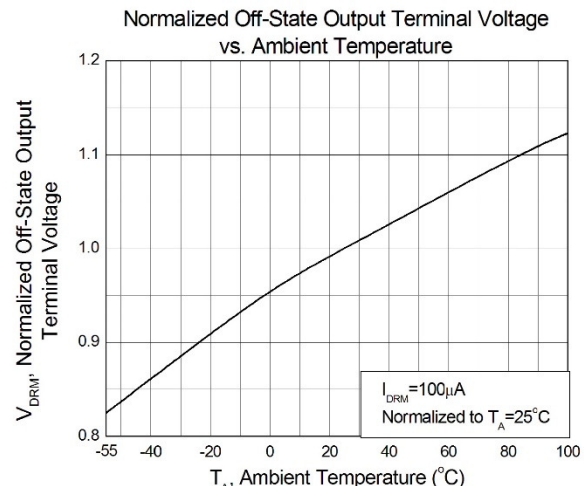


Figure 4

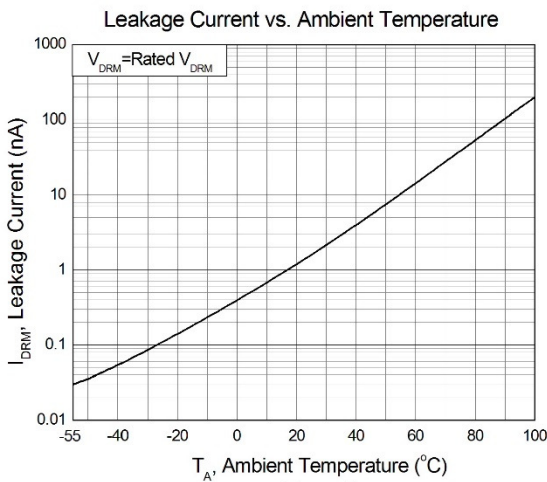


Figure 5

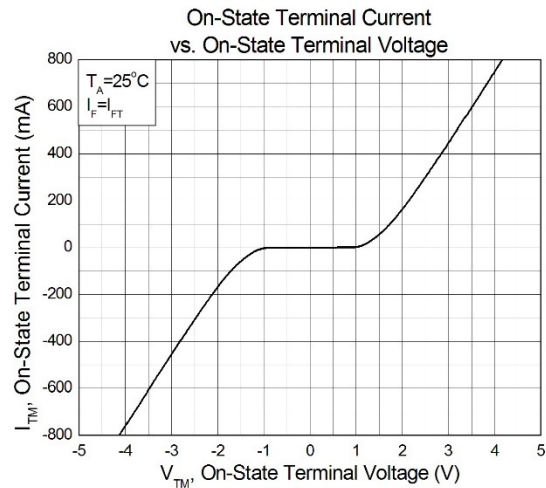
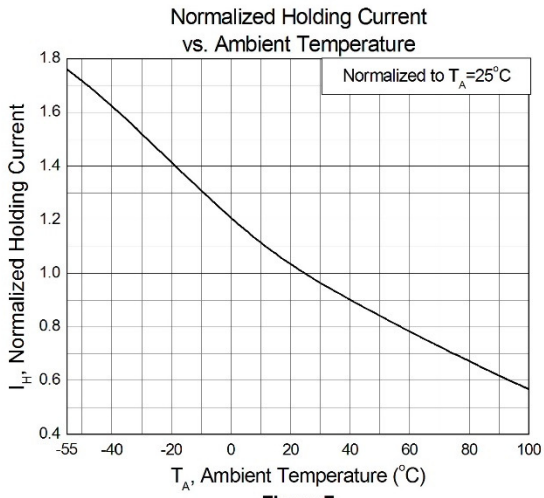


Figure 6

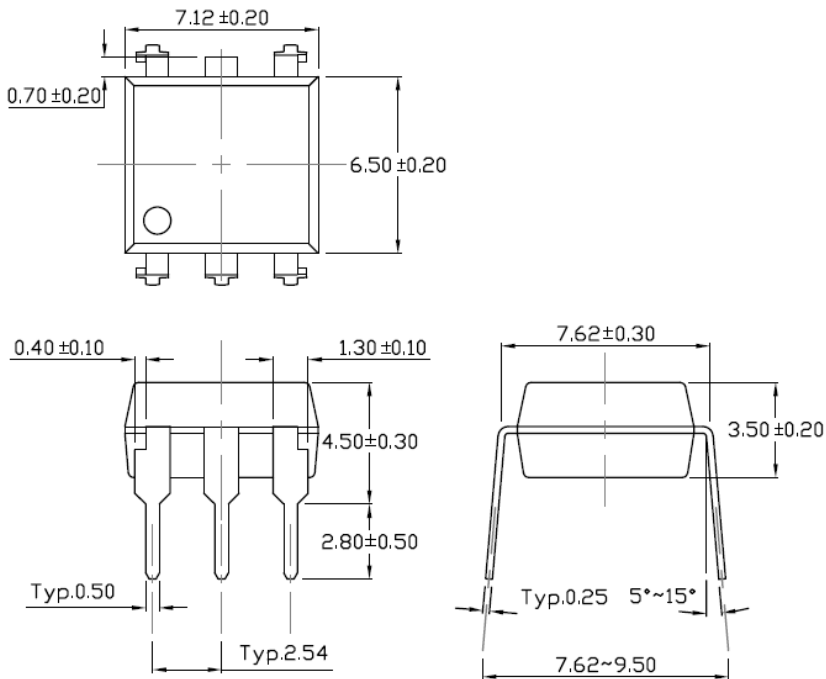


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Package Dimension *Dimensions in mm unless otherwise stated*

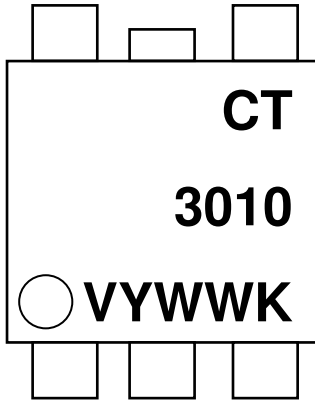
Standard DIP – Through Hole





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Marking Information



Note:

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

Ordering Information

CT301X-5L-G, CT302X-5L-G

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

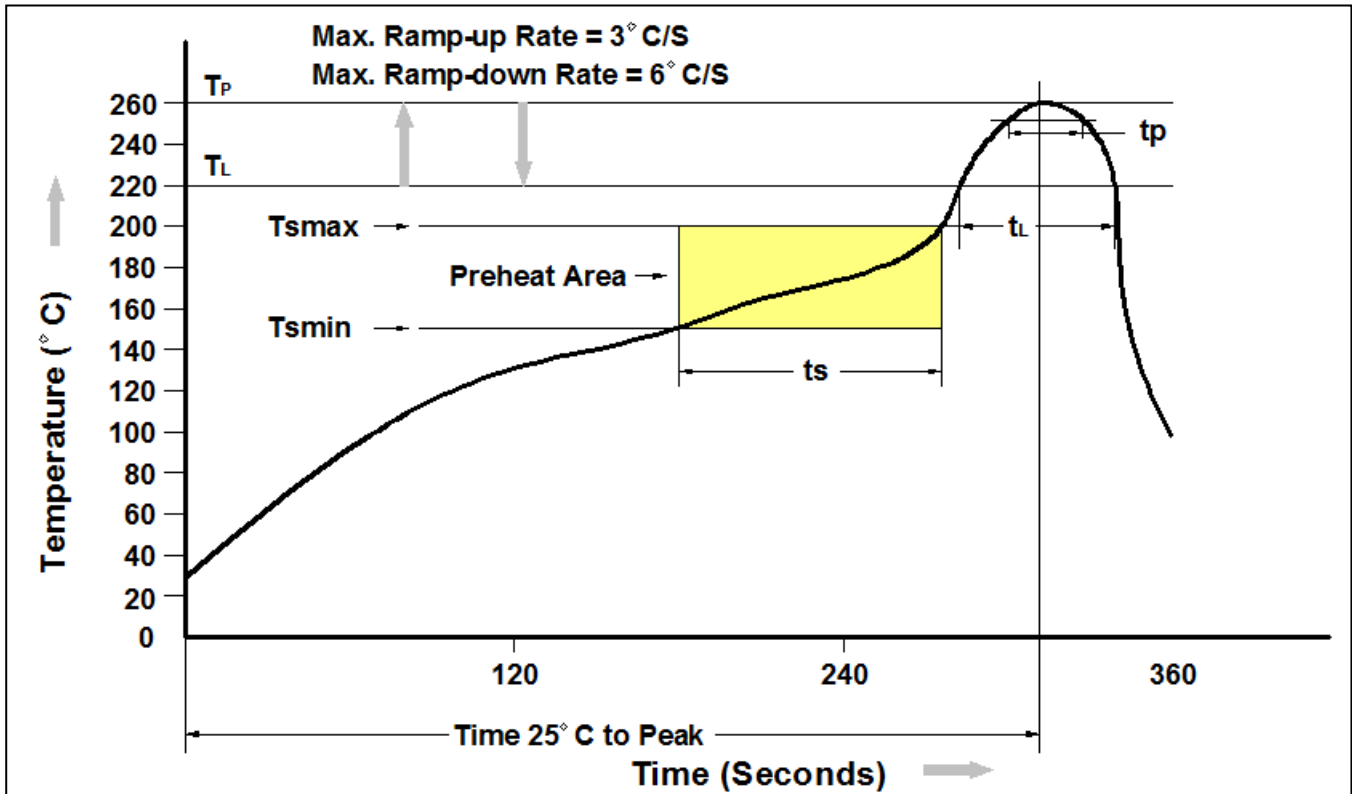
G= Material option (G: Green, None: Non-green)

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



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Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmín)	150 °C
Temperature Max. (Tsmáx)	200 °C
Time (ts) from (Tsmín to Tsmáx)	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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