



## UPT30XX

Preliminary

PHOTOCOUPLER

### DIP ZERO-CROSSING TRIAC DRIVER PHOTOCOUPLER

#### DESCRIPTION

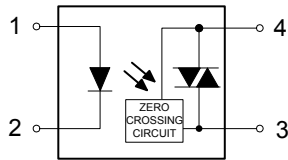
The **UPT30XX** devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon zero voltage crossing photo triac.

They are designed for use with a discrete power triac in the interface of logic systems to equipment powered from 110 to 380 VAC lines, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances.

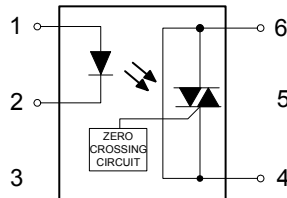
#### FEATURES

- \* Peak off-state voltage  
400V: UPT304X  
600V: UPT306X  
800V: UPT308X
- \* On-state current: 100mA (max)
- \* Isolation voltage: 5000 Vrms (min)
- \* Zero crossing Function

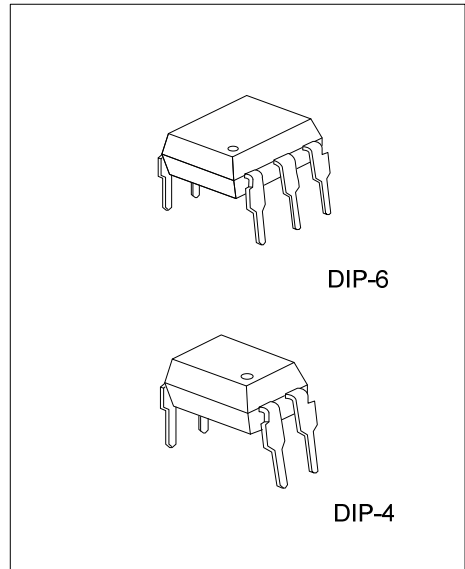
#### SYMBOL



DIP-4



DIP-6



#### ORDERING INFORMATION

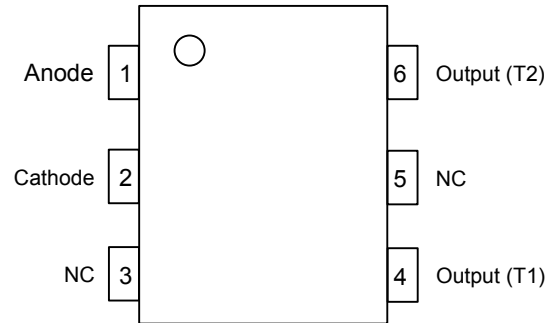
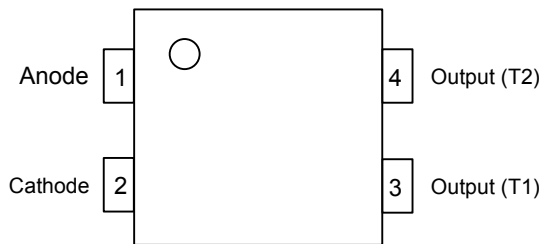
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UPT304XL-D04-T	UPT304XG-D04-T	DIP-4	Tube
UPT306XL-D04-T	UPT306XG-D04-T	DIP-4	Tube
UPT308XL-D04-T	UPT308XG-D04-T	DIP-4	Tube
UPT304XL-D06-T	UPT304XG-D06-T	DIP-6	Tube
UPT306XL-D06-T	UPT306XG-D06-T	DIP-6	Tube
UPT308XL-D06-T	UPT308XG-D06-T	DIP-6	Tube

<p>UPT304XG-D04-T</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Green Package</li> <li>(4)Trigger LED Current</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube</li> <li>(2) D04: DIP-4, D06: DIP-6</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> <li>(4) refer to ELECTRICAL CHARACTERISTICS of I<sub>FT</sub></li> </ul>
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### MARKING

PRODUCT NAME	DIP-4	DIP-6
UPT304X		
UPT306X		
UPT308X		

### PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Input	LED Forward Current	I <sub>F</sub>	60	mA
	LED Reverse Voltage	V <sub>R</sub>	6	V
	Power dissipation	P <sub>D</sub>	100	mW
Output	Repetitive Peak OFF-State Voltage	UPT304X	400	V
		UPT306X	600	V
		UPT308X	800	V
	ON-State RMS Current	I <sub>T(RMS)</sub>	0.1	A
	Non-Repetitive Surge Current (60Hz, 1 Cycle)	I <sub>TSM</sub>	1	A
I/O Isolation Voltage		V <sub>ISO</sub>	5000	V/AC
Power dissipation		P <sub>D</sub>	300	mW
Operating Temperature		T <sub>OPR</sub>	-40 ~ +100	°C
Storage Temperature		T <sub>STG</sub>	-40 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. AC for 1 minute, R.H.= 40~60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

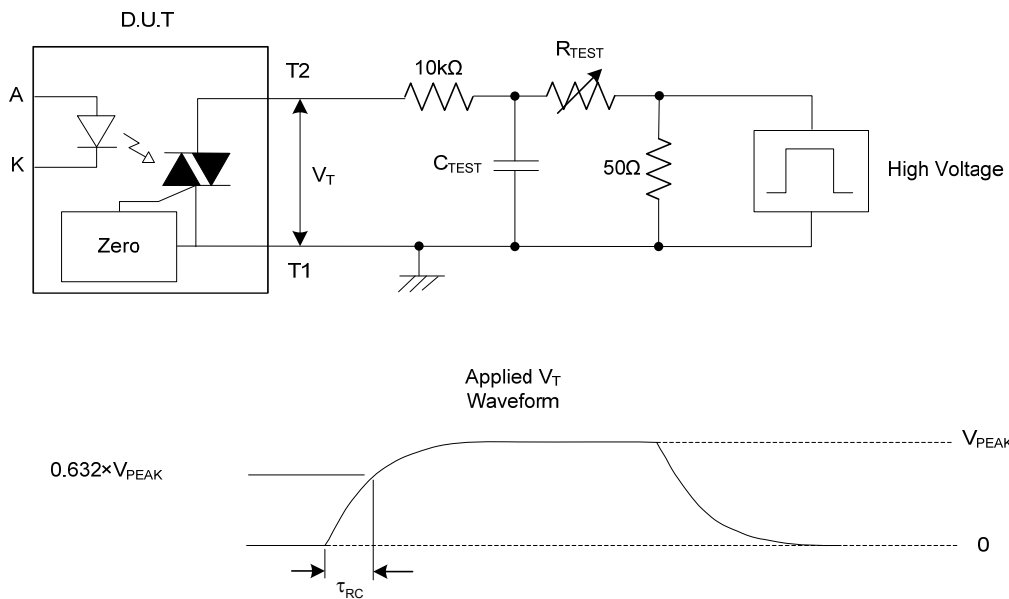
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
LED Dropout Voltage	V <sub>F</sub>	I <sub>F</sub> =30mA			1.5	V
LED Reverse Voltage	I <sub>R</sub>	V <sub>R</sub> =6V			10	μA
<b>OUTPUT</b>						
Peak OFF-State Current	I <sub>DRM</sub>	I <sub>F</sub> =0mA, V <sub>DRM</sub> =Rated V <sub>DRM</sub>			0.5	μA
Peak ON-State Voltage	V <sub>TM</sub>	I <sub>F</sub> = Rated I <sub>FT</sub> , I <sub>TM</sub> =100mA			2.5	V
Inhibit Voltage (T1–T2 Voltage above which device will not trigger.)	V <sub>INH</sub>	I <sub>F</sub> =Rated I <sub>FT</sub>			20	V
Critical Rate of Rise of OFF-State Voltage	dv/dt	V <sub>DRM</sub> =Rated V <sub>DRM</sub> ×1.414	600			V/μs
<b>TRANSFER CHARACTERISTICS</b>						
Trigger LED Current	I <sub>FT</sub>	Main terminal Voltage=3V (Note 3)	UPT3041		15	mA
			UPT3061		15	
			UPT3081		15	
			UPT3042		10	
			UPT3062		10	
			UPT3082		10	
			UPT3043		5	
			UPT3063		5	
UPT3083		5				
Holding Current	I <sub>H</sub>			60		μA

Notes: 1. Typical values at T<sub>A</sub>=25°C

2. Test voltage must be applied within dv/dt rating.

3. All devices are guaranteed to trigger at an I<sub>F</sub> value less than or equal to max I<sub>FT</sub>. Therefore, recommended operating I<sub>F</sub> lies between max I<sub>FT</sub> 15mA for UPT3041, UPT3061, UPT3081; 10 mA for UPT3041, UPT3061, UPT3082; 5mA for UPT3041, UPT3061, UPT3083 and absolute maximum I<sub>F</sub> (60 mA).

■ STATIC dv/dt TEST CIRCUIT & WAVEFORM



■ MEASUREMENT METHOD

The high voltage pulse is set to the required  $V_{PEAK}$  value and applied to the D.U.T. output side through the RC circuit above. LED current is not applied. The waveform  $V_T$  is monitored using a x100 scope probe. By varying  $R_{TEST}$ , the  $dv/dt$  (slope) is increased, until the D.U.T. is observed to trigger (waveform collapses). The  $dv/dt$  is then decreased until the D.U.T. stops triggering. At this point,  $t_{RC}$  is recorded and the  $dv/dt$  calculated

$$dv / dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

For example,  $V_{PEAK} = 600V$ . The  $dv/dt$  value is calculated as follows:

$$dv / dt = \frac{0.63 \times 600}{\tau_{RC}} = \frac{378}{\tau_{RC}}$$

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