UNISONIC TECHNOLOGIES CO., LTD

UMOC305X/UMOC307X   Preliminary   *PHOTOCOUPLER*

6-PIN DIP RANDOM-PHASE OPTOISOLATORS TRIAC DRIVERS

DIP-6

■ DESCRIPTION

The UTC **UMOC305X/UMOC307X** Series consists of a GaAs infrared LED optically coupled to a non–Zero–crossing silicon bilateral AC switch (triac). The **UMOC305X/UMOC307X** Series isolates low voltage logic from 115 and 240 Vac lines to provide random phase control of high current triacs or thyristors. The **UMOC305X/UMOC307X** Series features greatly enhanced static dv/dt capability to ensure stable switching performance of inductive loads.
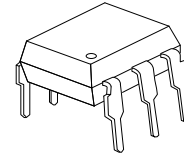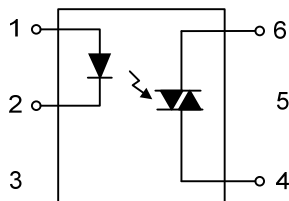
■ FEATURES

* Peak off-state voltage
  600V: UMOC305X
  800V: UMOC307X
* Interfacing Microprocessors to 115 and 240 Vac Peripherals
* Incandescent Lamp Dimmers
* Lamp Ballasts
* Motor Controls
* Solid State Relays
* Static AC Power Switch
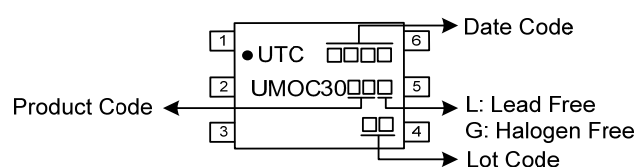* Solenoid / Valve Controls
* Temperature Controls

■ SYMBOL

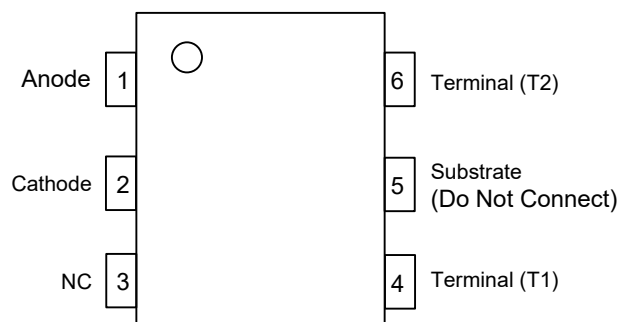QW-R231-028.a

■ **ORDERING INFORMATION**

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UMOC305XL-D06-T	UMOC305XG-D06-T	DIP-6	Tube
UMOC307XL-D06-T	UMOC307XG-D06-T	DIP-6	Tube

UMOC305XG-D06-T

(1)Packing Type

(2)Package Type

(3)Green Package

(4)Trigger LED Current

(1) T: Tube

(2) D06: DIP-6

(3) G: Halogen Free and Lead Free, L: Lead Free

(4) refer to ELECTRICAL CHARACTERISTICS of I_{FT}

■ **MARKING**

Date Code

• UTC □□□□

UMOC30□□□

Product Code

L: Lead Free
G: Halogen Free

Lot Code

■ **PIN CONFIGURATION**

Anode	1	6	Terminal (T2)
Cathode	2	5	Substrate (Do Not Connect)
NC	3	4	Terminal (T1)

■ **ABSOLUTE MAXIMUM RATING** (T_A=25°C, unless otherwise specified)

	PARAMETER		SYMBOL	RATINGS	UNIT
Input	LED Reverse Voltage		V_R	6	V
	LED Forward Current		I_F	50	mA
	Power Dissipation		P_D	100	mW
Output	Off-State Output Terminal Voltage	UMOC305X	V_{DRM}	600	V
		UMOC307X		800	V
	ON-State RMS Current		$I_{T(RMS)}$	100	mA
	Peak Repetitive Surge Current (PW=100μs, 120pps)		I_{TSM}	1	A
	Collector Power Dissipation		P_C	300	mW
Isolation Surge Voltage (Note 1)			V_{ISO}	5000	V/AC
Total Power Dissipation			P_{tot}	330	mW
Operating Temperature			T_{OPR}	-40 ~ +100	°C
Storage Temperature			T_{STG}	-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_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
INPUT LED							
LED Dropout Voltage	V_F	I_F=10mA			1.2	1.5	V
LED Reverse Voltage	I_R	V_R=6V				10	μA
OUTPUT DETECTOR (I_F=0 UNLESS OTHERWISE SPECIFIED)							
Peak Blocking Current, Either Direction (Rated V_{DRM}, Note 1) @ I_{FT} Per Device	I_{DRM}	V_{DRM}=Rated V_{DRM}, I_F=0mA (Note 2)				100	nA
Peak On–State Voltage, Either Direction	V_{TM}	I_{TM}=100mA Peak I_F=Rated I_{FT}				3.0	V
Critical Rate of Rise of Off–State Voltage (Note 2)	dv/dt	V_{PEAK}=Rated V_{DRM}, I_{FT}=0		1000			V/μs
TRANSFER CHARACTERISTICS							
Led Trigger Current, Current Required to Latch Output, Either Direction	I_{FT}	Main terminal Voltage=3V (Note 3)	UMOC3051 UMOC3071			15	mA
			UMOC3052 UMOC3072			10	mA
			UMOC3053 UMOC3073			5	mA
Holding Current, Either Direction	I_H				250		μA

Notes: 1. Test voltage must be applied within dv/dt rating.
2. This is static dv/dt. Commutating dv/dt is a function of the load-driving thyristor(s) only.
3. All devices are guaranteed to trigger at an I_F value less than or equal to max I_{FT}. Therefore, recommended operating I_F lies between max. (15mA for UMOC3051/UMOC3071; 10mA for UMOC3052/UMOC3072; 5mA for UMOC3053/UMOC3073) and absolute maximum I_F (60 mA).

■ **BASIC DRIVER CIRCUIT**
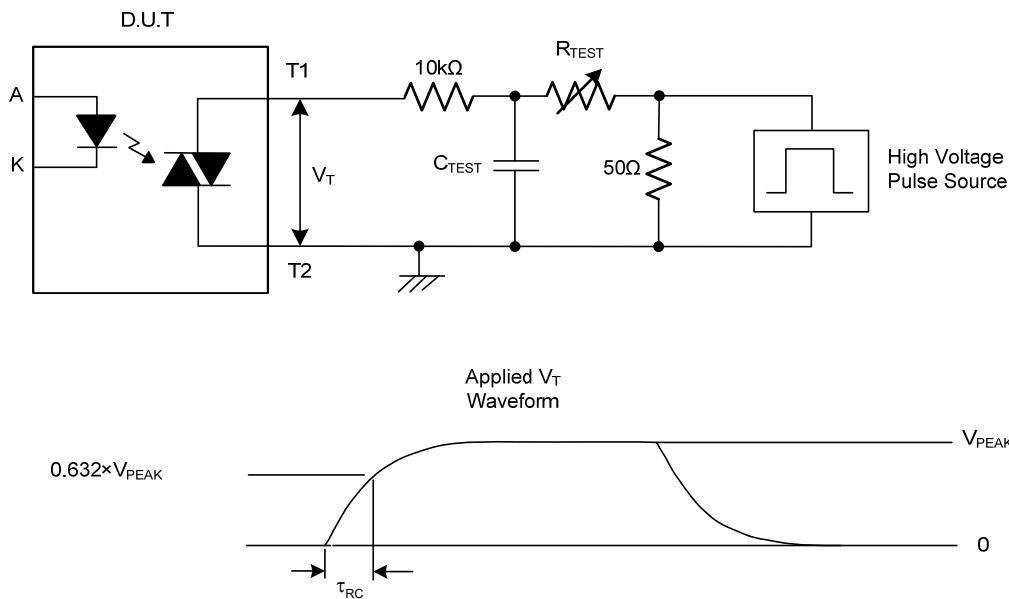
■ **MEASUREMENT METHOD**

    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 RTEST, 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, tRC 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:

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