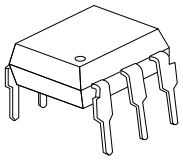
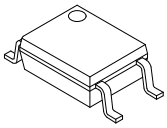
UMOC302X/UMOC305X/UMOC307X Preliminary *PHOTOCOUPLER*

DIP-6/SOP-4 RANDOM-PHASE OPTOISOLATORS TRIAC DRIVERS



DIP-6



SOP-4

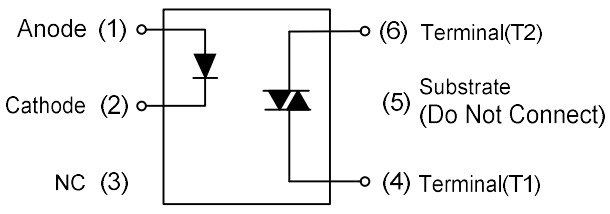
■ DESCRIPTION

The UTC **UMOC302X/UMOC305X/UMOC307X** Series consists of a GaAs infrared LED optically coupled to a non–Zero–crossing silicon bilateral AC switch (triac).The **UMOC302X/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 **UMOC302X/UMOC305X/UMOC307X** Series features greatly enhanced static dv/dt capability to ensure stable switching performance of inductive loads.

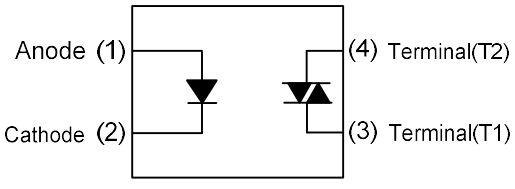
■ FEATURES

* Peak off-state voltage
  400V: UMOC302X
  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



DIP-6



SOP-4

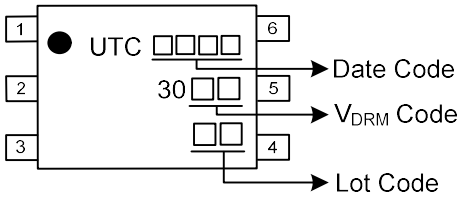
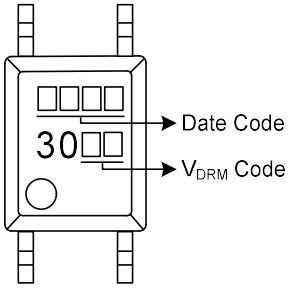
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■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UMOC302XL-D06-T	UMOC302XG-D06-T	DIP-6	A	K	NC	T1	NC	T2	Tube
UMOC305XL-D06-T	UMOC305XG-D06-T	DIP-6	A	K	NC	T1	NC	T2	Tube
UMOC307XL-D06-T	UMOC307XG-D06-T	DIP-6	A	K	NC	T1	NC	T2	Tube
UMOC302XL-S04-R	UMOC302XG-S04-R	SOP-4	A	K	T1	T2	-	-	Tape Reel
UMOC305XL-S04-R	UMOC305XG-S04-R	SOP-4	A	K	T1	T2	-	-	Tape Reel
UMOC307XL-S04-R	UMOC307XG-S04-R	SOP-4	A	K	T1	T2	-	-	Tape Reel

UMOC302XG-D06-T (1)Packing Type (2)Package Type (3)Green Package (4)Trigger LED Current	(1) T: Tube, R: Tape Reel (2) D06: DIP-6, S04: SOP-4 (3) G: Halogen Free and Lead Free, L: Lead Free (4) refer to ELECTRICAL CHARACTERISTICS of I_{FT}

■ MARKING

PACKAGE	MARKING
DIP-6	
SOP-4	

■ 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	SOP-4	P_D	70	mW
		DIP-6		100	mW
	Junction Temperature		T_J	125	°C
Output	Off-State Output Terminal Voltage	UMOC302X	V_{DRM}	400	V
		UMOC305X		600	V
		UMOC307X		800	V
	ON-State RMS Current		$I_{T(RMS)}$	100	mA
	Peak Repetitive Surge Current (P_W=100μs, 120pps)		I_{TSM}	1	A
	Collector Power Dissipation	SOP-4	P_C	150	mW
		DIP-6		300	mW
I/O Isolation Voltage			V_{ISO}	3750	V/AC
Power Dissipation		SOP-4	P_D	170	mW
		DIP-6		330	mW
Operating Temperature			T_{OPR}	-40 ~ +100	°C
Storage Temperature			T_{STG}	-40 ~ +150	°C

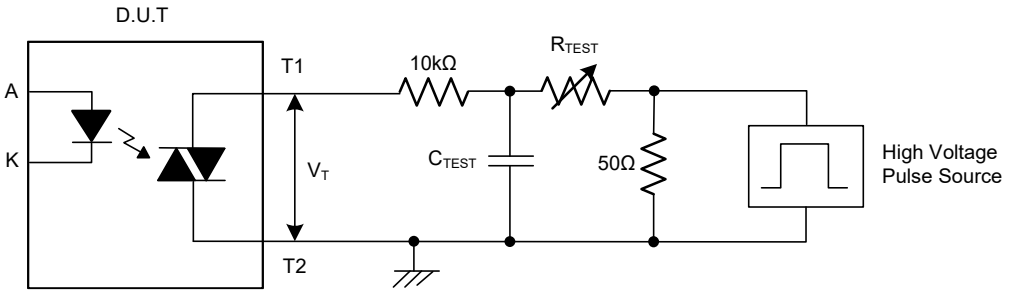
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. AC for 1 minute, R.H.= 40~60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

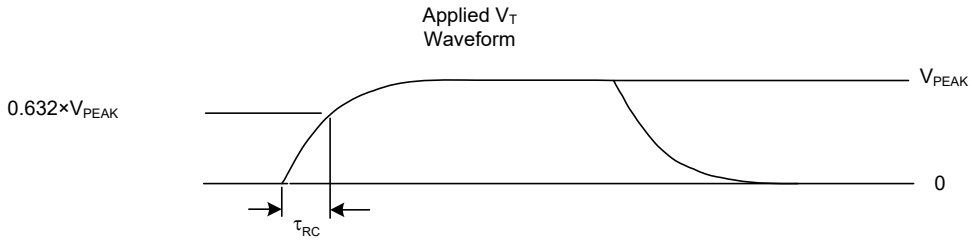
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
INPUT LED							
LED Dropout Voltage	V_F	I_F=20mA			1.15	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)	UMOC3021 UMOC3051 UMOC3071			15	mA
			UMOC3022 UMOC3052 UMOC3072			10	mA
			UMOC3023 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 UMOC3021/UMOC3051/UMOC3071; 10mA for UMOC3022/UMOC3052/UMOC3072; 5mA for UMOC3023/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:

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

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