UMW MOC306x

Zero-Crossing Bidirectional Triac-Driven Photocoupler

1.Description

The UMW MOC306x series devices are optocouplers composed of a GaAs infra-red light emitting diode and a singlecrystal silicon chip random phase photoelectric bidirectional thyristor.

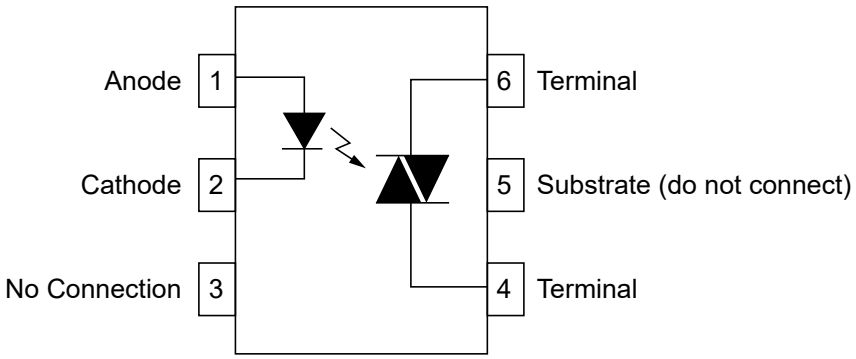
2.Application

- Solenoid valve / Valve control
- Lighting control
- Static power switches
- AC motor drives
- Electromagnetic contactors (or Relay switches)
- Solid-state relays (SSR)

3.Features

- Peak breakdown voltage 600V
- High isolation voltage between input and output(V_{ISO}=5000 Vrms)
- Zero-voltage crossing
- Compact DIP (Dual In-line Package) housing
- Compliant with RoHS standards
- UL approved: UL1577, file No.E547318

4.Pinning information



DIP-6/SOP-6

5.Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Input				
Forward Current		I_F	60	mA
Backward Voltage		V_R	6	V
Power Dissipation		P_D	100	mW
Power dissipation Derating factor (above Ta=85°C)			3.0	mW/°C
Output				
Off-state output terminal voltage	UMW MOC306x	V_{DRM}	600	V
Peak repetitive surge current (pw=100μs,120pps)		I_{TSM}	1	A
On-state current (root mean square value)		$I_{T(RMS)}$	100	mA
Power Dissipation		P_C	150	mW
Power dissipation Derating factor (above Ta=85°C)			2.0	mW/°C
Total Power Dissipation		P_{TOT}	250	mW
Isolation Voltage		V_{ISO}	5000	V
Operating Temperature		T_{OPR}	-55 to 110	°C
Storage Temperature		T_{STG}	-55 to 125	°C
Soldering Temperature (10s)		T_{SOL}	260	°C

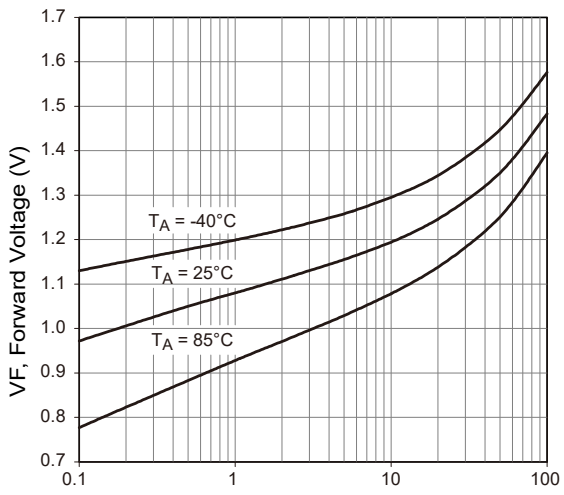
Notes:

Conduct AC test at 40% ~60% relative humidity. At this time, pins 1, 2 and 3 are short-circuited, and pins 4, 5 and 6 are short-circuited.

6.Electro-optical Characteristics(T_A=25°C)

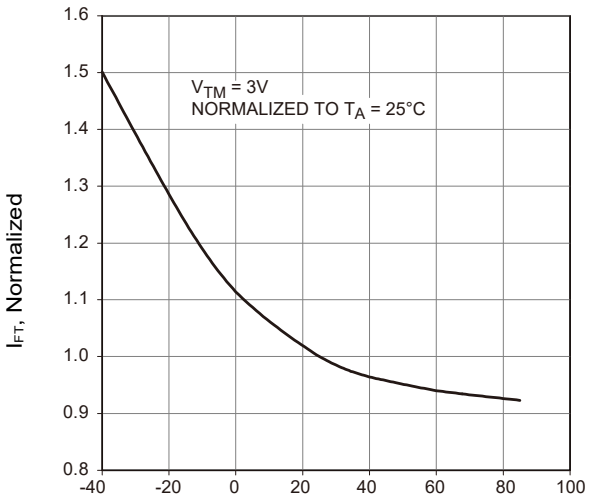
Parameter		Symbol	Conditions	Min	Typ	Max	Units
Input							
Forward Voltage		V_F	I_F=30mA			1.5	V
Back current		I_R	V_R=6V			10	μA
Output							
Off-state peak current	UMW MOC306x	I_{DRM1}	V_{DRM}=Rated V_{DRM}, I_F=0mA			500	nA
Peak on-state voltage		V_{TM}	I_{TM}=100mA peak, I_F=Rated I_{FT}			3	V
Critical rate of rise of off-state voltage		dv/dt	V_{PEAK}=Rated	600			V/μs
Blocking voltage		V_{Inh}	I_F=Rated I_{FT}			20	V
Leakage current in blocking state		I_{DRM2}	I_F=Rated I_{FT} V_{DRM}=Rated Value V_{DRM}, Off-State			1	mA
Transfer Characteristics							
LED trigger current	UMW MOC3061	I_{FT}	Main terminal Voltage =3V			15	mA
	UMW MOC3062					10	mA
	UMW MOC3063					5	mA
Maintain current		I_H			280		μA

7.1 Typical Characterisitics



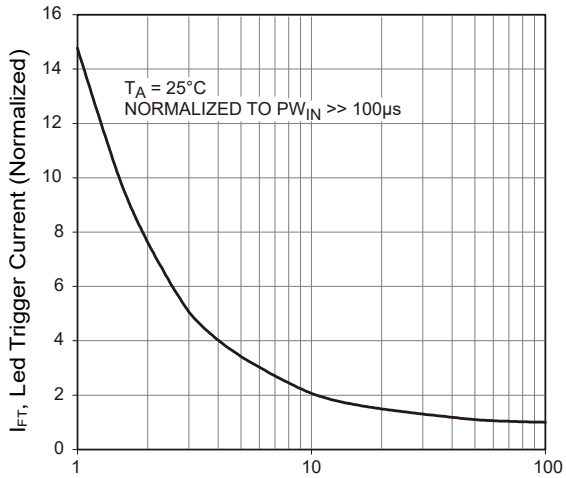
I_F, Led Forward Current (mA)

Figure 1: LED Forward Voltage vs. Forward Current



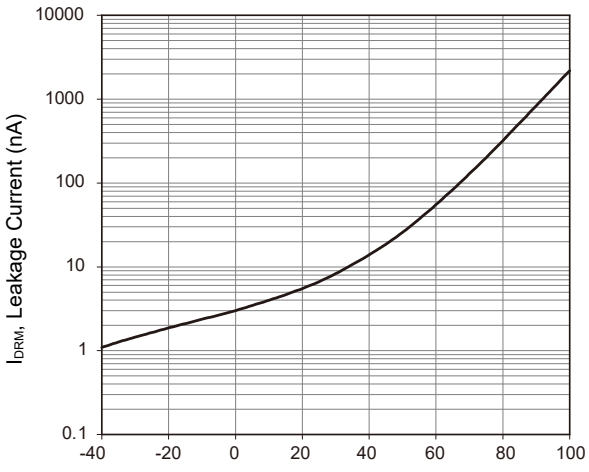
T_A, Ambient Temperature (°C)

Figure 2: Trigger Current Vs. Temperature



PW_{IN}, Led Trigger Pulse Width (µs)

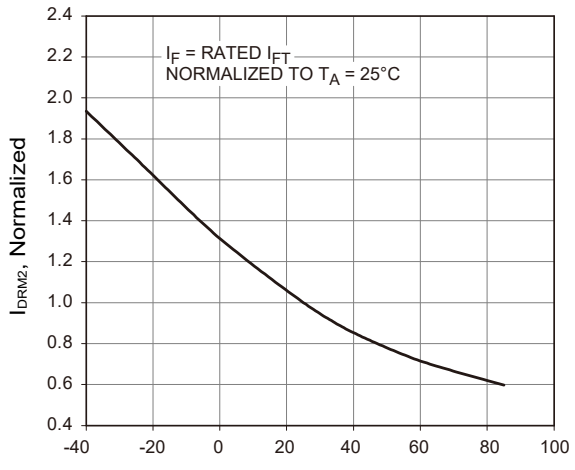
Figure 3: LED Current Required to Trigger vs. LED Pulse Width



T_A, Ambient Temperature (°C)

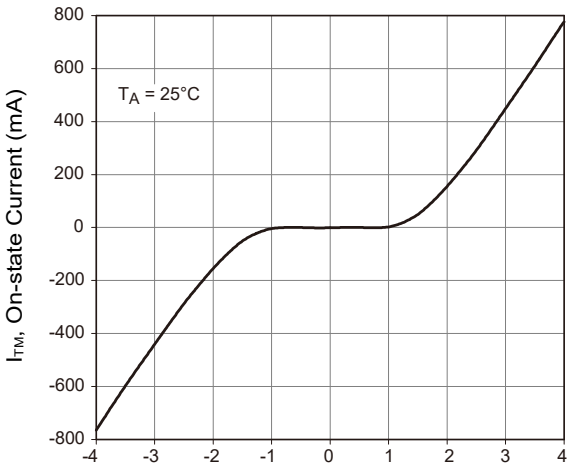
Figure 4: Leakage Current, IDRM vs. Temperature

7.2 Typical Characterisitics



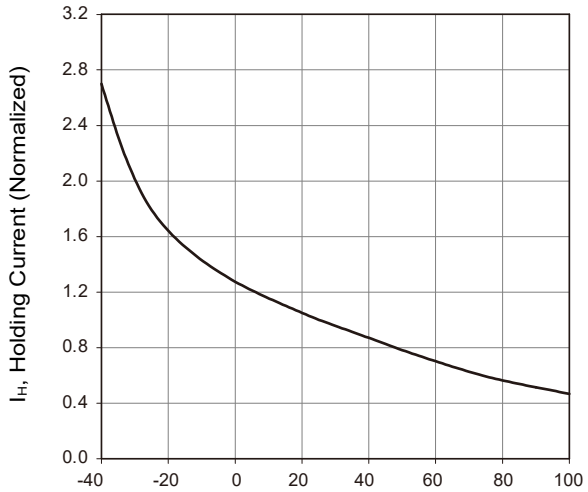
T_A, Ambient Temperature (°C)

Figure 5: I_{DRM2}, Leakage in Inhibit State vs. Temperature



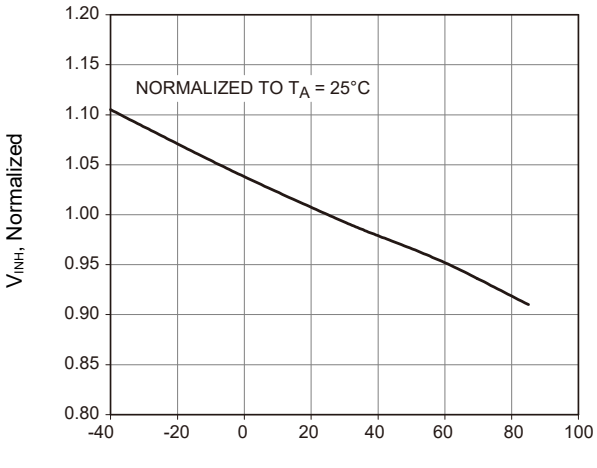
V_{TM}, On-state Voltage (Volts)

Figure 6: On-State Characteristics



T_A, Ambient Temperature (°C)

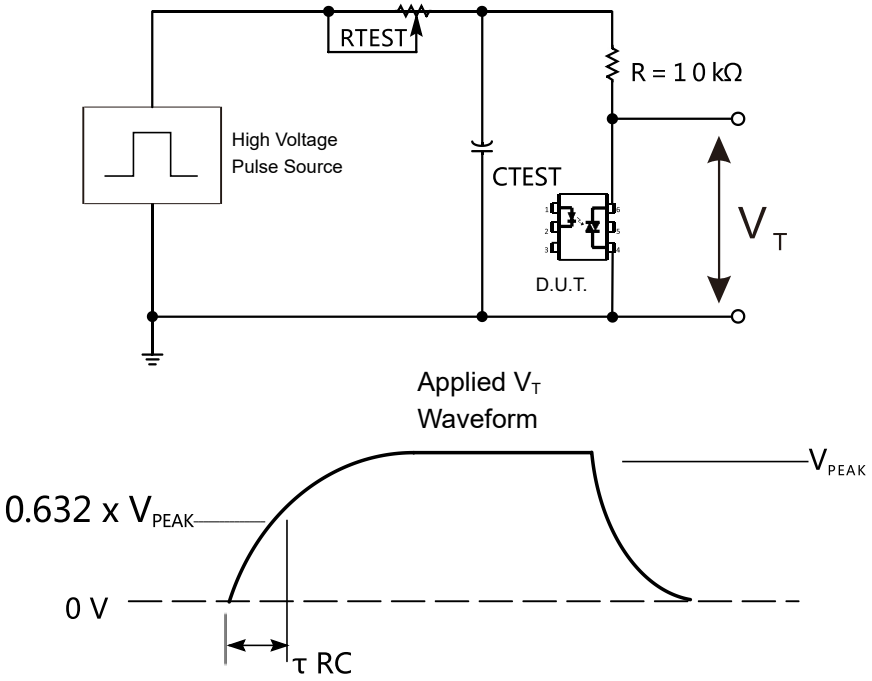
Figure 7: I_H, Holding Current vs. Temperature



T_A, Ambient Temperature (°C)

Figure 8: Inhibit Voltage vs. Temperature

8.Static dv/dt test circuit and waveform



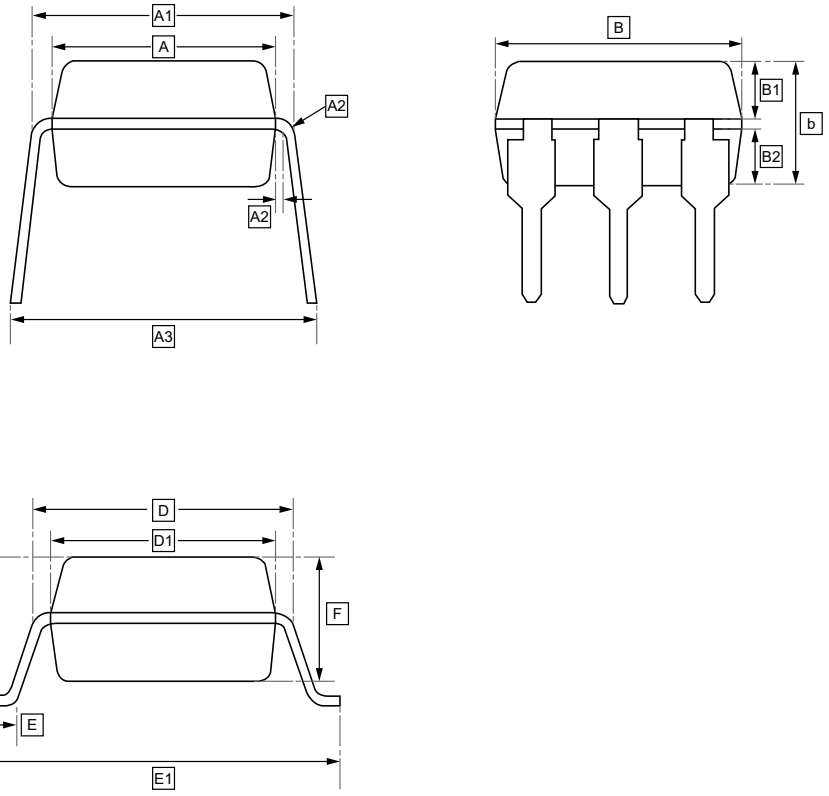
The high voltage pulse applied to the output end of the device under test through the RC circuit is set to the desired V_{PEAK} value. LED current does not need to be added. Waveform VT is monitored with X100 probe. By adjusting the RTEST value, dv/dt (slope) increases until the device under testis observed to be triggered (waveform collapse). Dv/dt then drops until the device under test stops being triggered. At this time, dv/dt can be calculated by recording the value of τRC.

$$dv/dt = \frac{0.632x600}{\tau RC} = \frac{252}{\tau RC}$$

For example, the voltage peak of UMW MOC306x series V_{PEAK}=600V. Then the dv/dt value can be calculated as follows:

$$dv/dt = \frac{0.632x600}{\tau RC} = \frac{252}{\tau RC}$$

9.DIP-6/SOP-6 Package Outline Dimensions

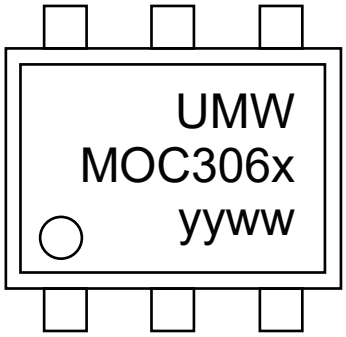


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	B2	b	c	D	D1	E
Min	6.45	7.45	0.2	8.7	7.07	1.625	1.595	3.45	4.2	7.45	6.45	0.76
Max	6.55	7.75	(typ.)	9.1	7.14	(typ.)	1.655	3.55	4.4	7.75	6.55	(typ.)

Symbol	E1	F
Min	10.0	3.45
Max	10.4	3.55

10.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW MOC3061M	DIP-6	3250	Tube and box
UMW MOC3062M	DIP-6	3250	Tube and box
UMW MOC3062SM	SOP-6	1000	Tape and reel
UMW MOC3063M	DIP-6	3250	Tube and box
UMW MOC3063SM	SOP-6	1000	Tape and reel

11.Disclaimer

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