

1. Description

The UMW MOC305x series devices are optocouplers composed of a GaAs infra-red light emitting diode and a singlecrystal silicon chip random phase photoelectric bidirectional thyristor.

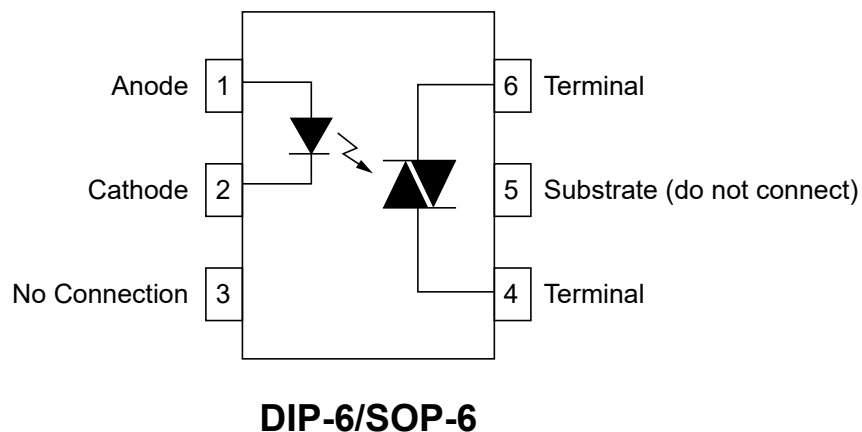
2. Features

- Peak breakdown voltage 600V
- High isolation voltage between input and output($V_{ISO}=5000\text{ Vrms}$)
- Compact DIP (Dual In-line Package) housing
- Lead-free, RoHS compliant
- UL approved: UL1577, file No.E547318

3. Application

- Solenoid valve control
- Ballast
- Static AC power switch
- Incandescent lamp dimmer
- Microprocessor 115-240VAC peripheral interface
- Temperature control
- Motor control

4. Pinning information





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)			3.8	mW/°C
Output				
Off-state output terminal voltage	UMW MOC305x	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	300	mW
Power dissipation Derating factor (above Ta=85°C)			7.4	mW/°C
Total Power Dissipation		P _{TOT}	330	mW
Isolation Voltage		V _{ISO}	5000	Vrms
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.

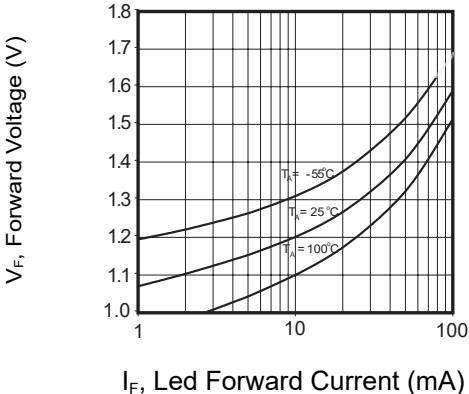
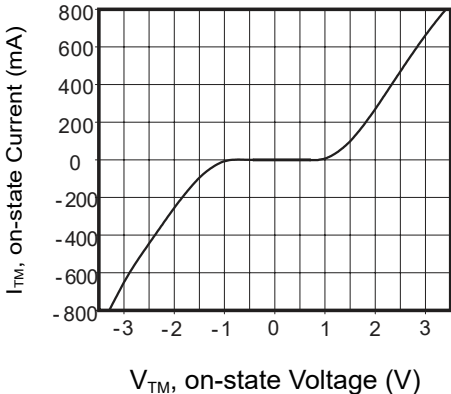
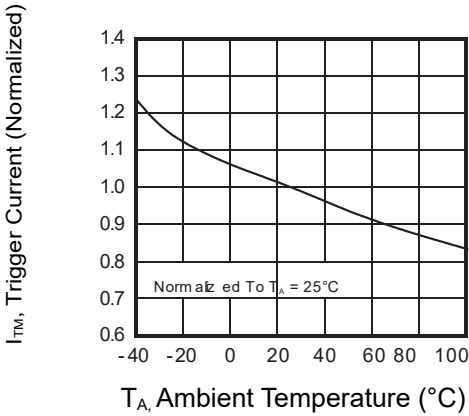
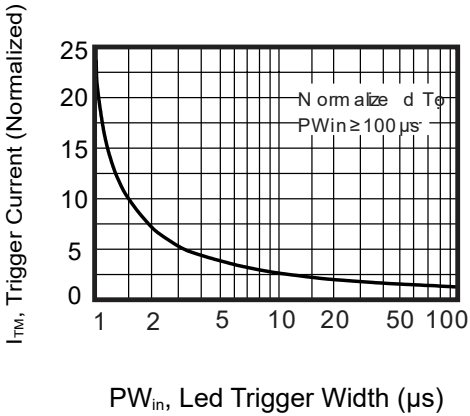
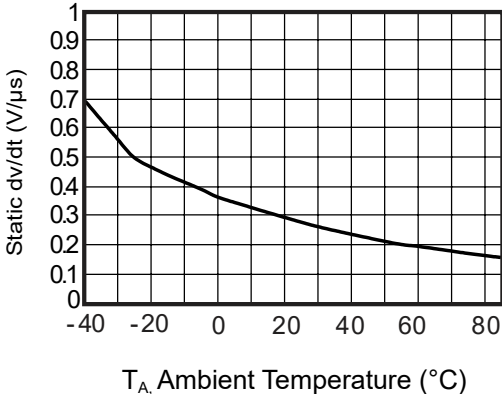
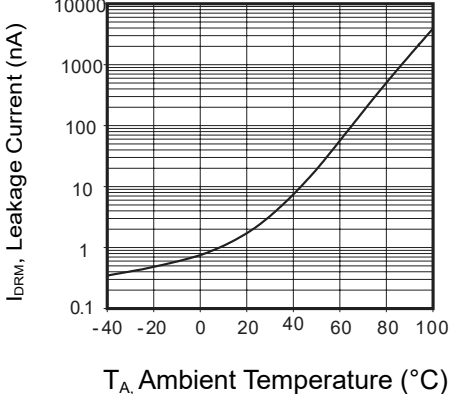


6.Electro-optical Characteristics(T_A=25°C)

Parameter		Symbol	Conditions	Min	Typ	Max	Units
Input							
Forward Voltage		V _F	I _F =20mA		1.18	1.5	V
Back current		I _R	V _R =6V			10	μA
Output							
Off-state peak current		I _{DRM}	V _{DRM} =Rated V _{DRM} , I _F =0mA			100	nA
On-state peak voltage		V _{TM}	I _{TM} =100mA peak, I _F =Rated I _{FT}			2.5	V
Critical rise rate of off-state voltage		dv/dt	V _{PEAK} =400V, I _F =0	1000			V/μs
Transfer Characteristics							
LED trigger current	UMW MOC3051	I _{FT}	Main terminal Voltage =3V			15	mA
	UMW MOC3052					10	mA
	UMW MOC3053					5	mA
Maintain current		I _H			250		μA

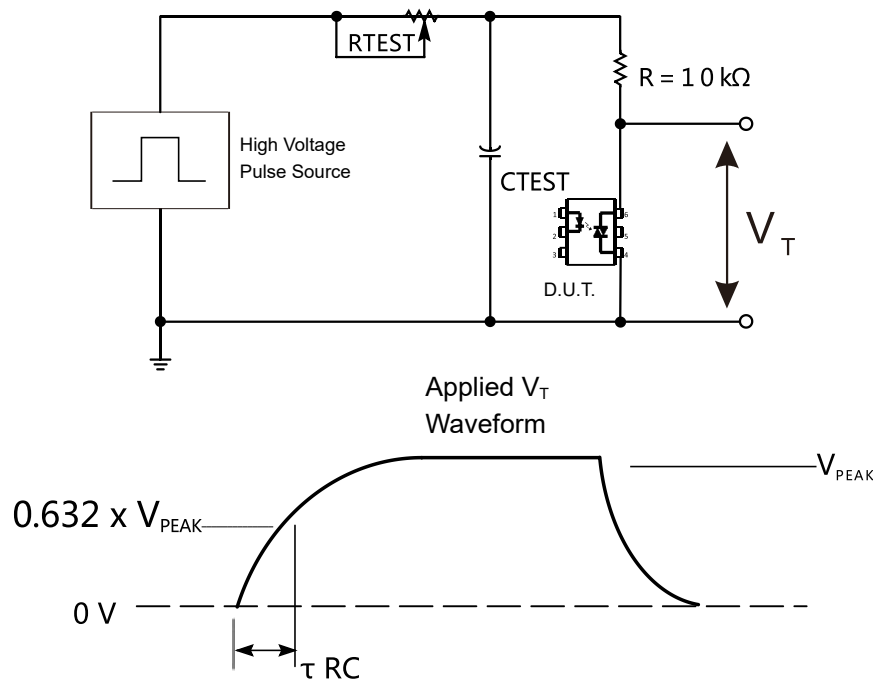


7. Typical Characteristic

	
Figure 1: LED Forward Voltage vs. Forward Current	Figure 2: On-State Characteristics
	
Figure 3: Trigger Current vs. Ambient Temperature	Figure 4: LED Current Required to Trigger vs. LED Pulse Width
	
Figure 5: dv/dt vs. Temperature	Figure 6: Leakage Current, I_{DRM} 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 V_T is monitored with X100 probe. By adjusting the R_{TEST} value, dv/dt (slope) increases until the device under test is 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 .

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

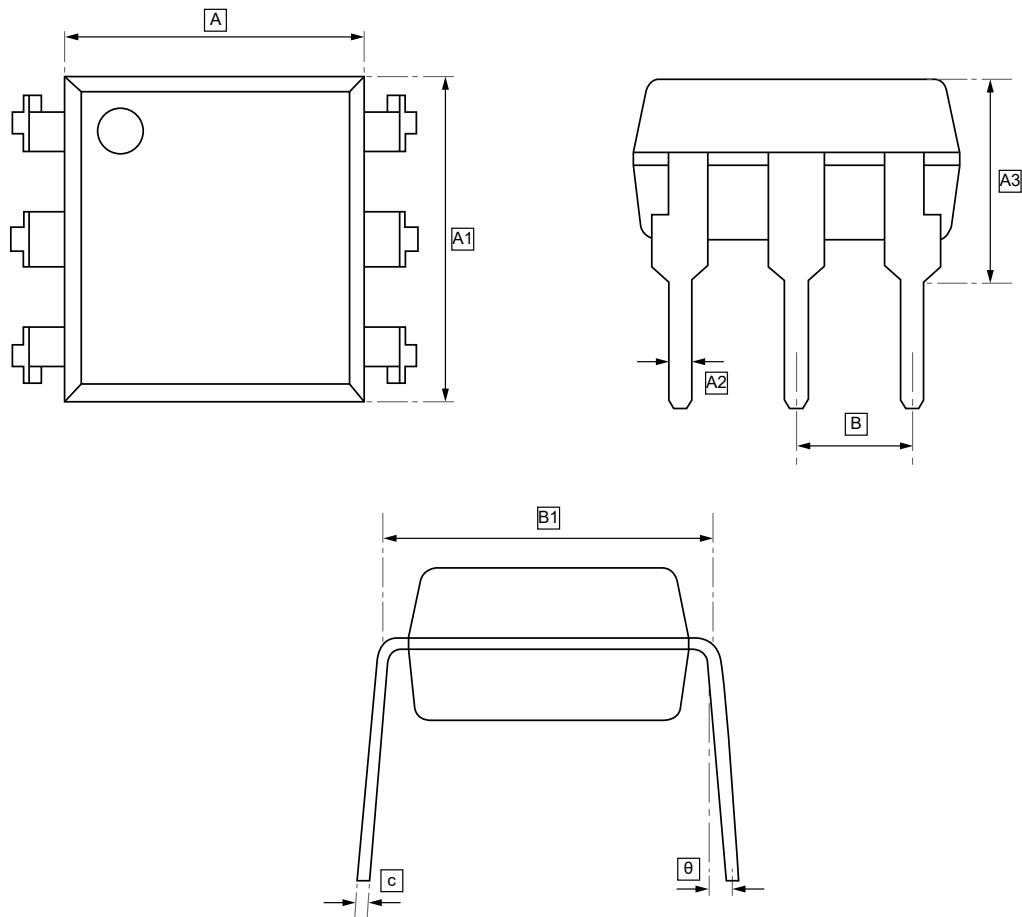
For example, the voltage peak of UMW MOC305x series $V_{PEAK}=600V$. Then the dv/dt value can be calculated as follows:

$$dv/dt = \frac{0.632 \times 600}{\tau RC} = \frac{379}{\tau RC}$$



Random-phase triac-driven optocoupler

9.1DIP-6 Package Outline Dimensions

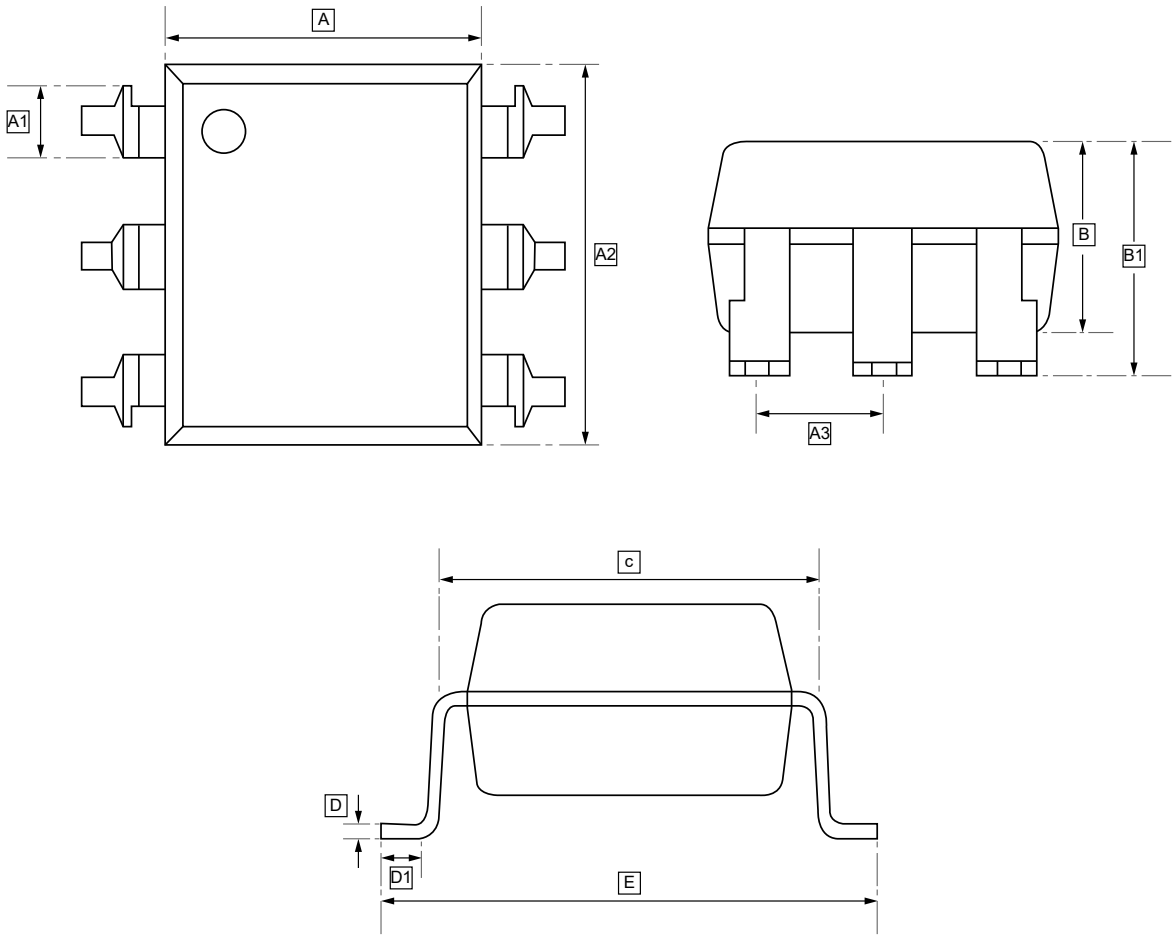


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	c	θ
Min	6.20	6.82	0.40	4.20	2.54	7.62	0.25	5°
Max	6.80	7.42	0.60	4.80	TYP	TYP		15°



9.2SOP-6 Package Outline Dimensions

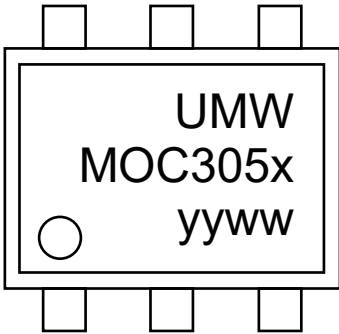


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	c	D	D1	E
Min	6.20	1.30	6.82	2.54	3.20	4.00	7.62	0.25	0.60	-
Max	6.80		7.42	TYP	3.80	4.60	TYP		-	10.30



10.Ordering information



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW MOC3051M	MOC3051	DIP-6	3250	Tape and reel
UMW MOC3052M	MOC3052	DIP-6	3250	Tape and reel
UMW MOC3052SM	MOC3052	SOP-6	1000	Tape and reel
UMW MOC3053M	MOC3053	DIP-6	3250	Tape and reel
UMW MOC3053SM	MOC3053	SOP-6	1000	Tape and reel



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