

1.Description

The UMW MOC302x series devices are optocouplers composed of a GaAs infra-red light emitting diode and a singlecrystal silicon chip random phase photoelectric bidirectional thyristor.

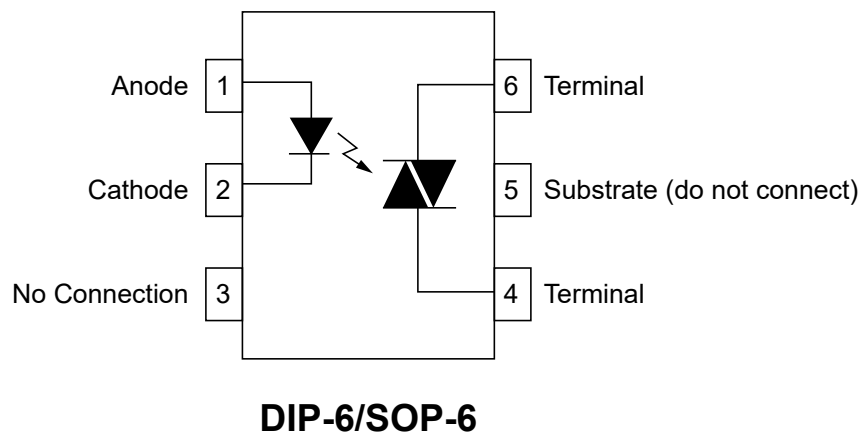
2.Features

- Peak breakdown voltage 400V
- High isolation voltage between input and output($V_{ISO}=5000$ Vrms)
- Operating Temperature: $-55^{\circ}\text{C} \sim 110^{\circ}\text{C}$
- Meet reinforced insulation standards
- 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 MOC302x	V _{DRM}	400	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.

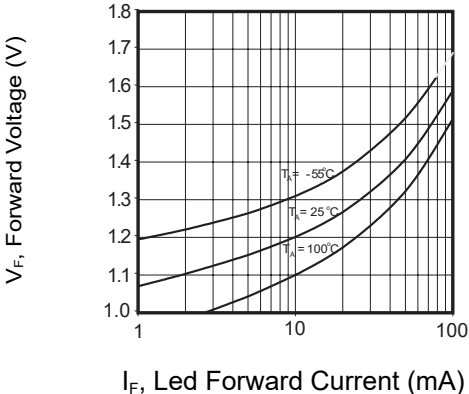
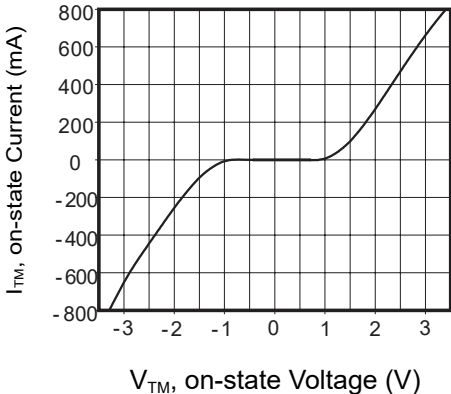
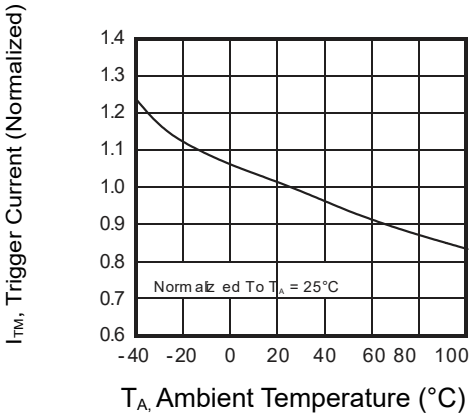
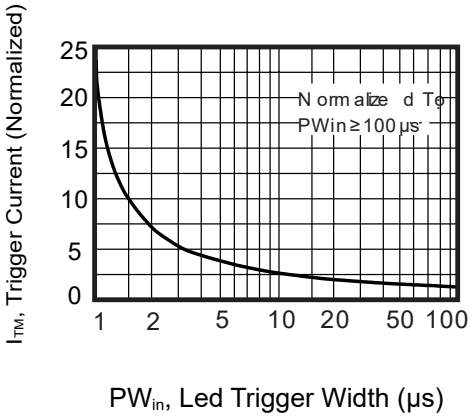
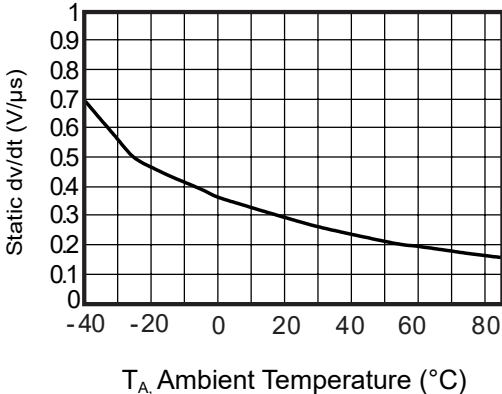
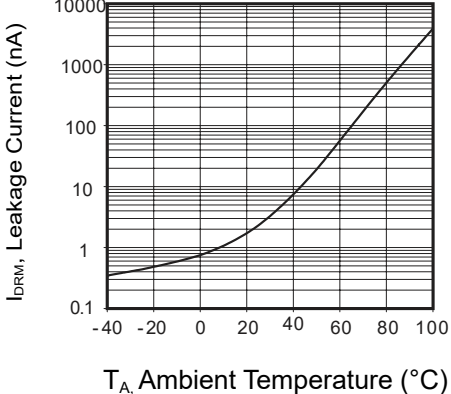


6. Electro-optical Characteristics ($T_A=25^{\circ}\text{C}$)

Parameter		Symbol	Conditions	Min	Typ	Max	Units
Input							
Forward Voltage		V_F	$I_F=20\text{mA}$		1.18	1.5	V
Back current		I_R	$V_R=6\text{V}$			10	μA
Output							
Off-state peak current		I_{DRM}	$V_{\text{DRM}}=\text{Rated } V_{\text{DRM}}, I_F=0\text{mA}$			100	nA
On-state peak voltage		V_{TM}	$I_{\text{TM}}=100\text{mA peak}, I_F=\text{Rated } I_{\text{FT}}$			2.5	V
Critical rise rate of off-state voltage		dv/dt	$V_{\text{PEAK}}=\text{Rated } V_{\text{DRM}}, I_F=0$		100		V/ μs
Transfer Characteristics							
LED trigger current	UMW MOC3020	I_{FT}	Main terminal Voltage =3V			30	mA
	UMW MOC3021					15	mA
	UMW MOC3022					10	mA
	UMW MOC3023					5	mA
Maintain current		I_H			250		μA

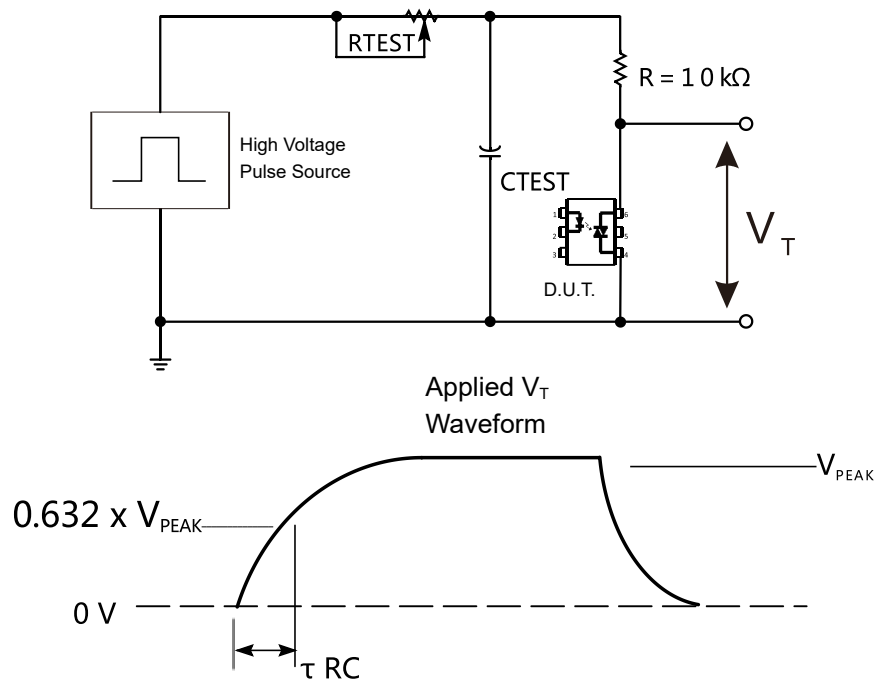


7. Typical Characteristic

	
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 .

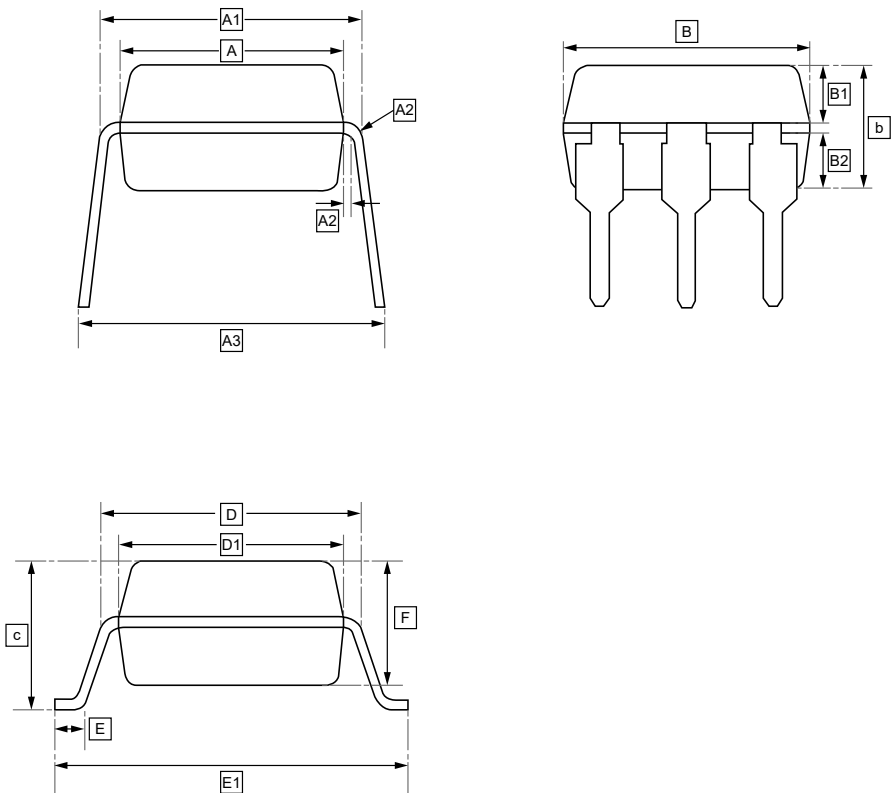
$$dv/dt = \frac{0.632 \times 400}{\tau RC} = \frac{252}{\tau RC}$$

For example, the voltage peak of UMW MOC302x series $V_{PEAK}=400V$. Then the dv/dt value can be calculated as follows:

$$dv/dt = \frac{0.632 \times 400}{\tau RC} = \frac{252}{\tau RC}$$



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



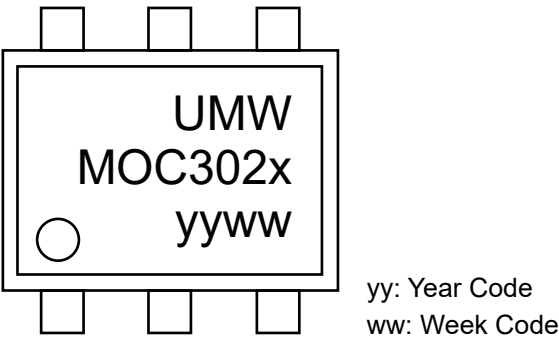
DIMENSIONS (mm are the original dimensions)

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



Order Code	Package	Base QTY	Delivery Mode
UMW MOC3020M	DIP-6	3250	Tube and box
UMW MOC3020SM	SOP-6	1000	Tape and reel
UMW MOC3021M	DIP-6	3250	Tube and box
UMW MOC3021SM	SOP-6	1000	Tape and reel
UMW MOC3022M	DIP-6	3250	Tube and box
UMW MOC3022SM	SOP-6	1000	Tape and reel
UMW MOC3023M	DIP-6	3250	Tube and box
UMW MOC3023SM	SOP-6	1000	Tape and reel



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