Description

The CYMOC302X,CYMOC305X series of devices each consists of a GaAs infrared emitting diode optically coupled to a monolithic silicon photo Triac.

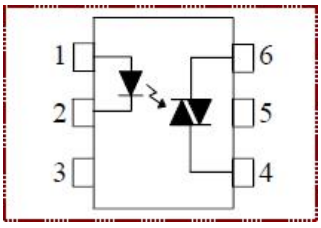
Features

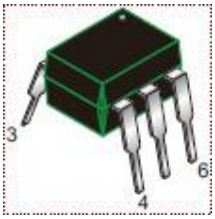
- Peak breakdown voltage,
  - 400V: CYMOC302X
  - 600V: CYMOC305X
- High isolation voltage between input and output (Viso=5000V rms)
- Compact dual-in-line package
- Pb free and RoHS compliant.

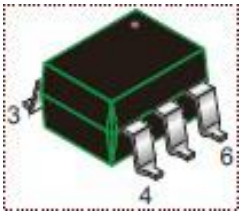
Applications

- Isolated Line Receiver
- Solenoid/valve controls
- Light controls
- Static power switch
- AC motor drivers
- E.M. contactors
- Temperature controls
- AC Motor starters
- Solid state relays

Block Diagram and Package







Absolute Maximum Ratings (Ta=25°C)

Parameter			Symbol	Rating	Unit
Input	Forward Current		IF	60	mA
	Reverse Voltage		VR	6	V
	Power Dissipation		PD	100	mW
	Derating Factor (above Ta = 85°C)			3.8	mW/°C
Output	Off-state Output Terminal Voltage	CYMOC302X	VDRM	400	V
		CYMOC305X		600	
	Peak Repetitive Surge Current (pw=100μs,120pps)		ITSM	1	A
	On-State RMS Current		IT(RMS)	100	mA
	Power Dissipation		PC	300	mW
	Derating Factor (above Ta = 85°C)			7.4	mW/°C
Total Power Dissipation			Ptot	330	mW
Isolation Voltage *			Viso	5000	Vrms
Operating Temperature			Topr	-55~+100	°C
Storage Temperature			Tstg	-55~+125	°C
Soldering Temperature （10s）			Tsol	260	°C

* AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

Electrical Characteristics (Ta=25° C, unless specified otherwise)

Characteristics			Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage		VF	IF=20mA		1.18	1.5	V
	Reverse Current		IR	VR=6V			10	μA
Output	Peak Blocking Current		IDRM	VDRM=Rated VDRM, IF=0mA			100	nA
	Peak On-state Voltage		VTM	ITM=100mA peak, IF=Rated IFT			2.5	V
	Critical Rate of Rise off-state Voltage	CYMOC302X	dv/dt	VPEAK =Rated VDRM, IF=0	-	100	-	V/μs
		CYMOC305X		VPEAK =400V, IF=0	1000			
	Inhibit Voltage (MT1-MT2 voltage above which device will not trigger)		VINH	IF= Rated IFT			20	V
	Leakage in Inhibited State		IDRM2	IF= Rated IFT, VDRM=Rated, VDRM, off state			500	μA
Transfer mA Characteristics	LED Trigger Current	CYMOC3021	IFT	Main terminal Voltage=3V			15	mA
		CYMOC3051						
		CYMOC3022					10	
		CYMOC3052						
		CYMOC3023					5	
		CYMOC3053						
	Holding Current		IH			250		μA

Typical Performance Curves

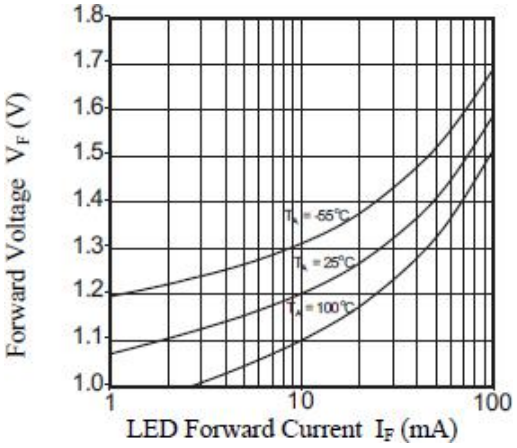


Fig.1 Forward Voltage VS Forward Current

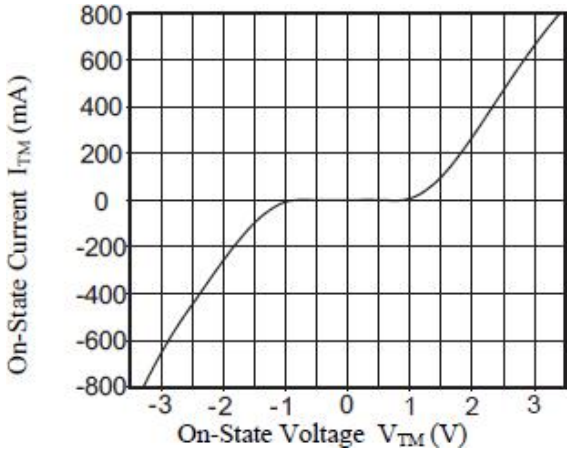


Fig.2 On-State Characteristics

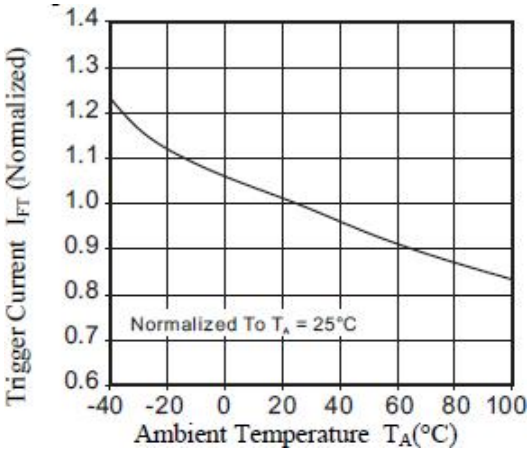


Fig.3 Trigger Current VS Temperature

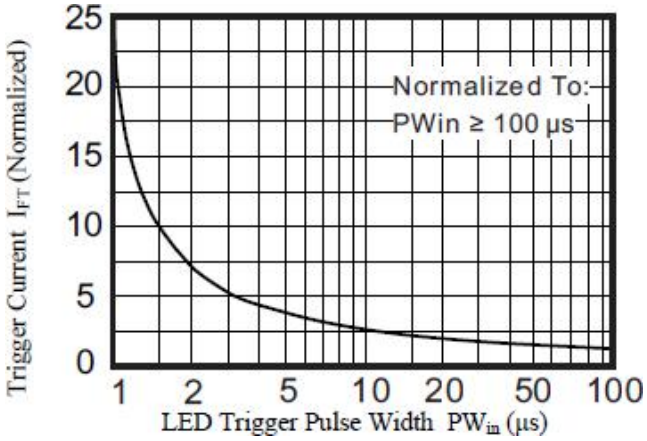


Fig.4 Current Required to Trigger VS Pulse Width

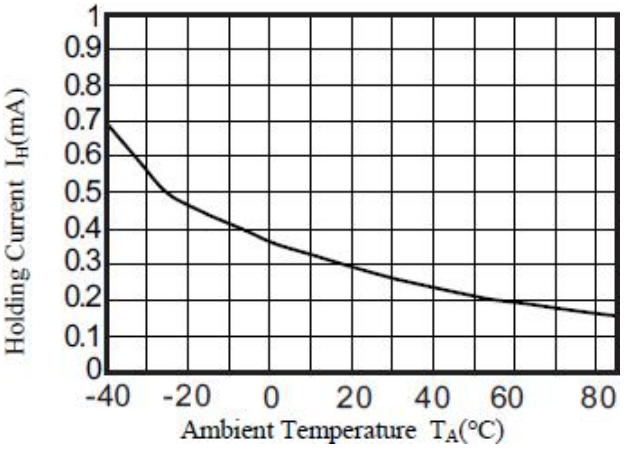


Fig.5 Holding Current VS Temperature

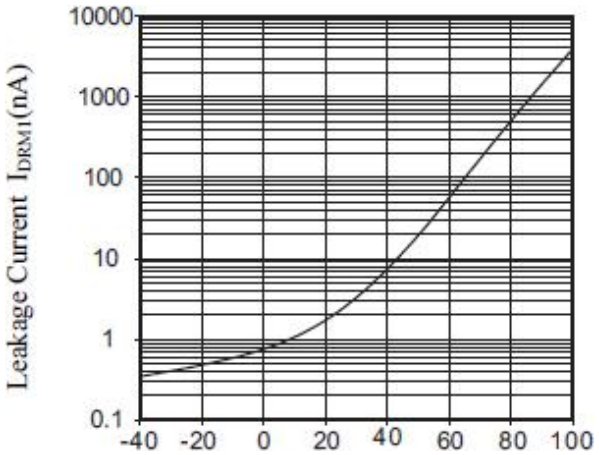


Fig.6 Leakage Current VS Temperature

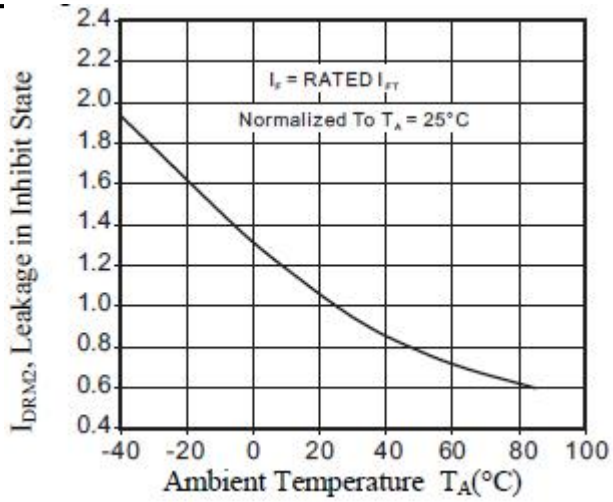


Fig.7 I_{DRM2}, Leakage in Inhibit State VS Temperature

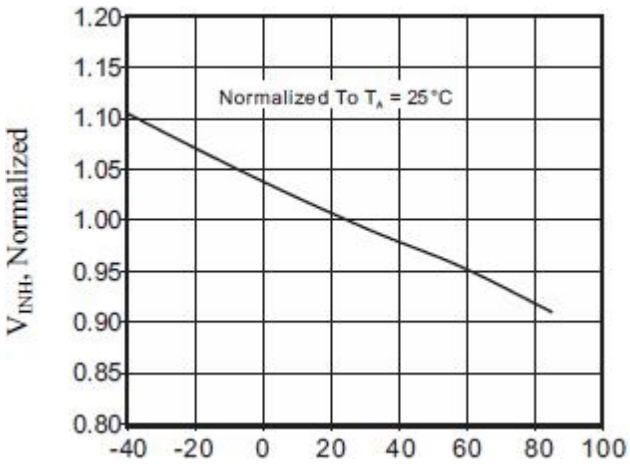


Fig.8 Inhibit Voltage vs. Temperature

Test Circuits

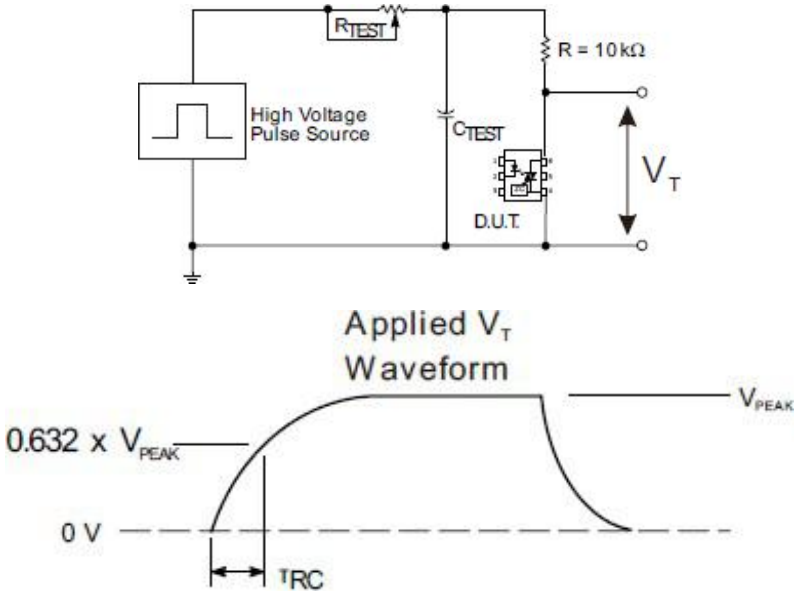


Fig. 12. Static dv/dt Test Circuit & Waveform.

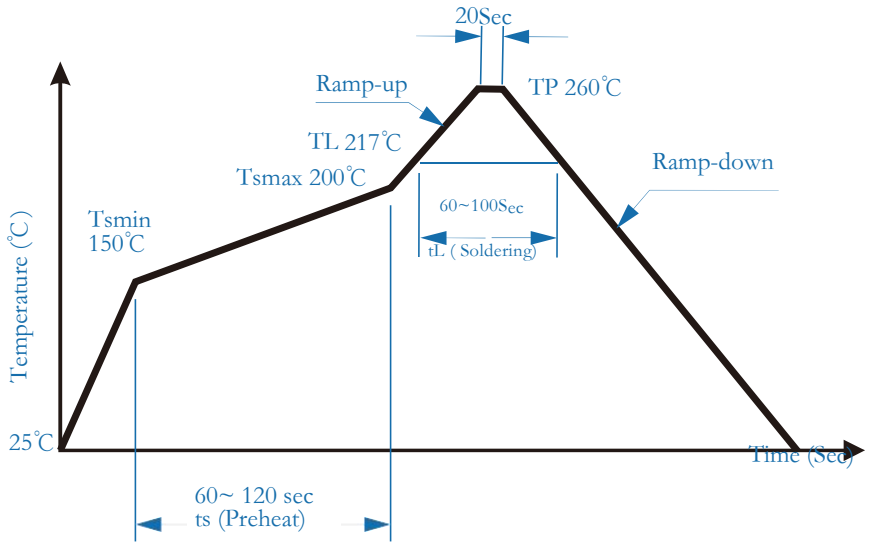
The high voltage pulse is set to the required VPEAK value and applied to the D.U.T. output side through the RC circuit above. LED current is not applied. The waveform VT is monitored using an x100 scope probe. By varying RTEST, the dv/dt (slope) is increased, until the D.U.T. is observed to trigger (waveform collapses). The dv/dt is then decreased until the D.U.T. stops triggering. At this point, τRC is recorded and the dv/dt calculated.

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

For example, VPEAK = 400V for HK304X series. The dv/dt value is calculated as follows:

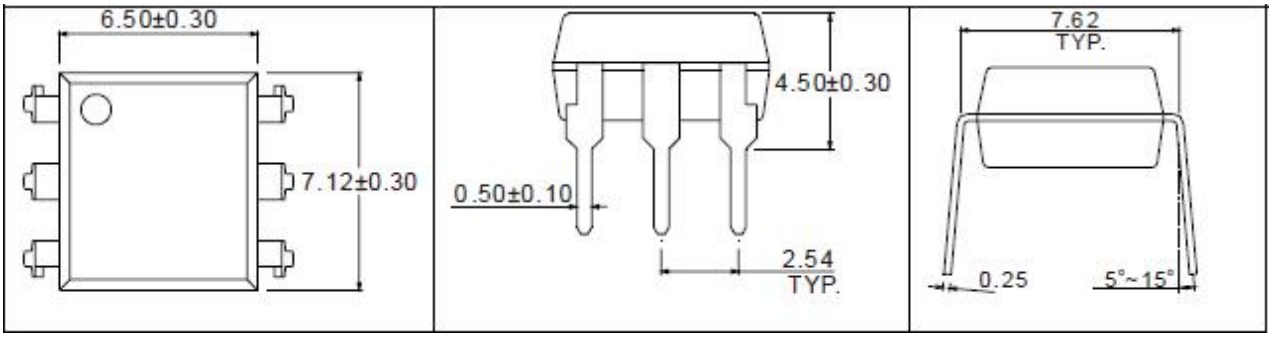
$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

Solder Reflow Profile

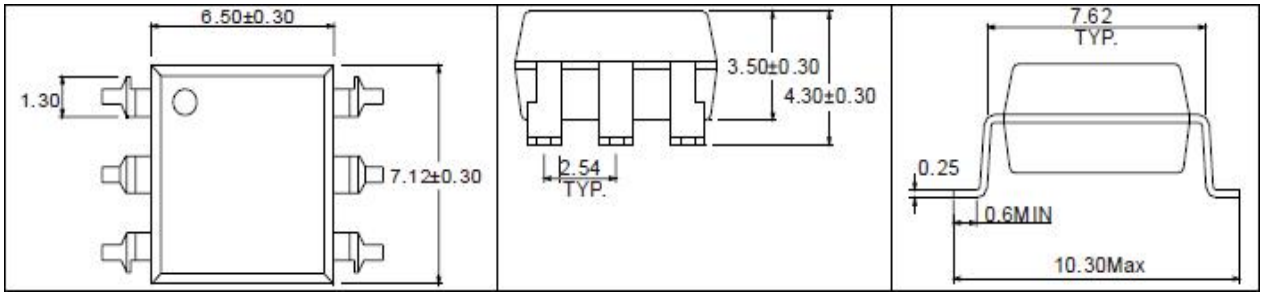


Outline Dimensions

Unit: mm



6-pin DIP



6-pin SMD