

PHOTOCOUPLER

Product features

- Halogens Free
(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- Peak breakdown voltage
EXM305X: 600V
- High isolation voltage between inputs and output
(Viso=3750 V rms)
- Compact dual-in-line package
- Pb free and RoHS compliant
- Compliance with EU REACH

Product Description

- The EXM305X series are optically isolated triac driver devices.
- These devices contain a GaAs infrared emitting diode and a light activated silicon bilateral switch, which functions like a triac.
- It is designed for interfacing between electronic controls and power triacs to control resistive and inductive loads for 115 to 240 VAC operations.

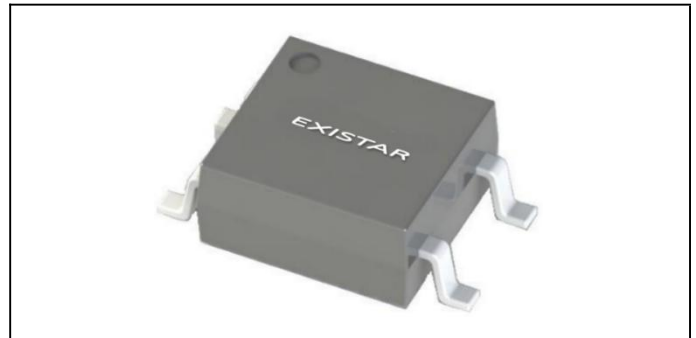
Product Applications

- Solenoid/valve controls
- Temperature controls
- Motor controls
- Static AC power switch
- Interfacing microprocessors to 115 to 240Vac peripherals
- Incandescent lamp dimmers
- Lamp ballasts

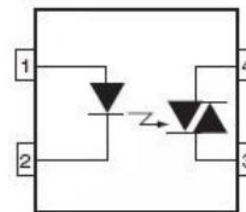
Ordering Information

Part Number	Package	Packing quantity
EXM305X	SOP4	3000 / Reel

SOP4



Schematic



PinConfiguration

1. Anode
2. Cathode
3. Termina
4. Termina

Electrical-Optical characteristics

Absolute Maximum Ratings(Ta=25°C)

Parameter		Symbol	Rated Value	Unit
Input	Forward current	I_F	60	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	100	mW
	Derating factor (above Ta = 85°C)		-	mW /°C
Output	Off-state Output Terminal Voltage	V_{DRM}	600	V
	Peak Repetitive Surge Current (pw=100μs,120pps)	I_{TSM}	1	A
	On-State RMS Current	$I_{T(RMS)}$	70	mA(RMS)
	Power dissipation	P_c	300	mW
	Derating factor (above Ta = 85°C)		-	mW /°C
Total Consume Power		P_{TOT}	200	mW
Isolation Voltage(1*)		V_{iso}	3750	Vrms
Operating temperature		T_{OPR}	-40 to +110	°C
Storage temperature		T_{STG}	-55 to +150	°C
Soldering temperature(2*)		T_{SOL}	260	°C

Notes:

1* 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.

2* Soldering time is 10 seconds

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
In put	Forward voltage	V_F	-	1.2	1.5	V	$I_F=10\text{mA}$
	Reverse current	I_R	-	-	10	μA	$V_R=6\text{V}$
Out put	Peak Blocking Current	I_{DRM}	-	-	100	nA	$V_{DRM} = \text{Rated } V_{DRM}$ $I_F = 0 \text{ mA}$
	Peak On-state Voltage	V_{TM}	-	-	2.5	V	$I_{TM}=100 \text{ mA}$ peak, $I_F=\text{Rated } I_{FT}$
	Critical Rate of Rise off-state Voltage	dv/dt	1000	-	-	V/ μs	$V_{PEAK}=\text{Rated } V_{DRM}$, $I_F=0\text{mA}$

Transfer Characteristics level table (Ta=25°C unless specified otherwise)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
LED Trigger Current	EXM3052	I_{FT}	-	-	10	mA	Main terminal Voltage=3V
	EXM3053		-	-	5		
	EXM3054		-	-	3		
Holding Current		I_H	-	3	5	mA	
Turn-on time		T_{on}	-	-	100	μs	$V_D = 6\text{V}$, $I_F=20\text{mA}$, $R_L = 100\Omega$

Characteristic Curves

Figure1. Forward Current VS Forward Voltage

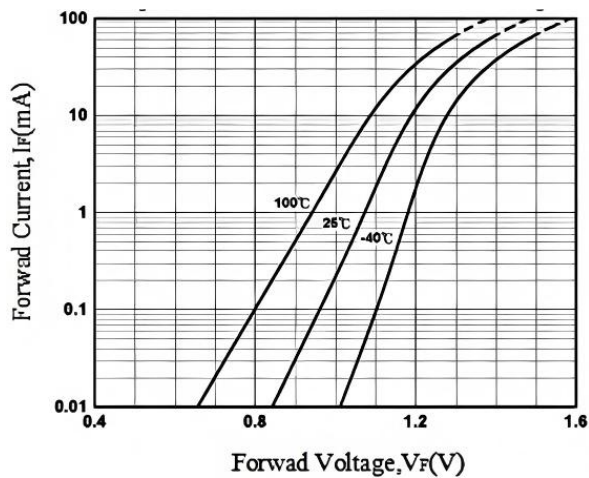


Figure2. On-State Characteristics

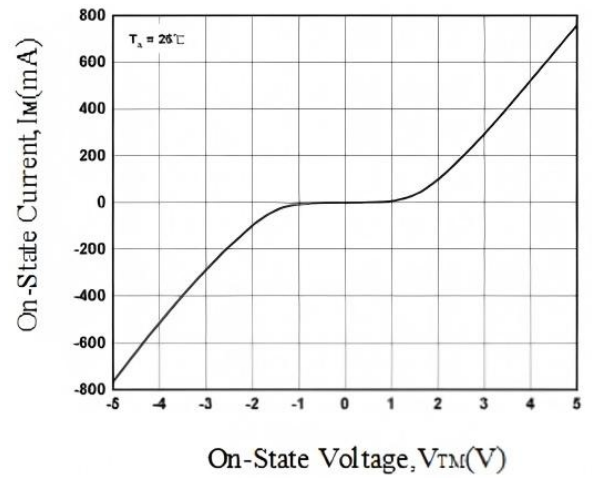


Figure3. Normalized Holding Current vs Ambient Temperature

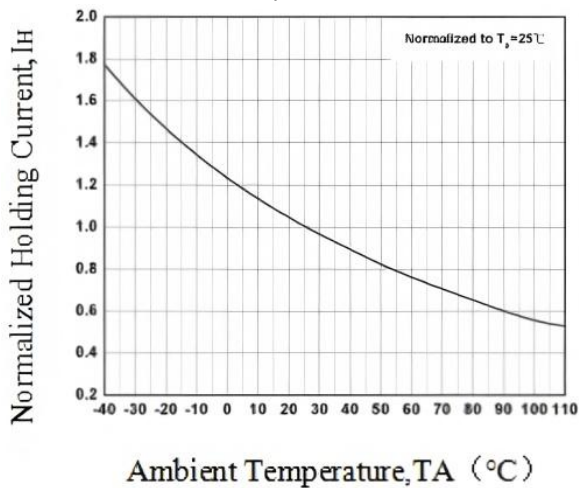


Figure4. Leakage Current vs Ambient Temperature

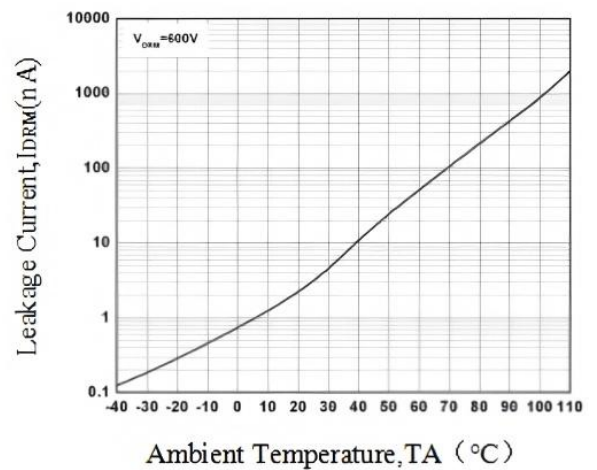


Figure5. LED Current Required trigger vs LED Pulse Width

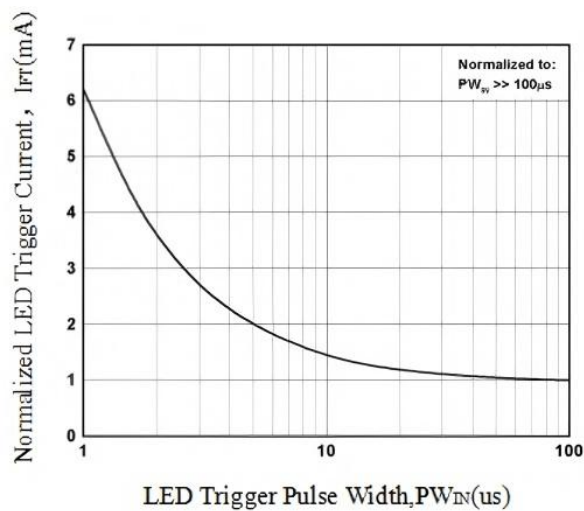


Figure6. Normalized LED Trigger Current vs Ambient Temperature

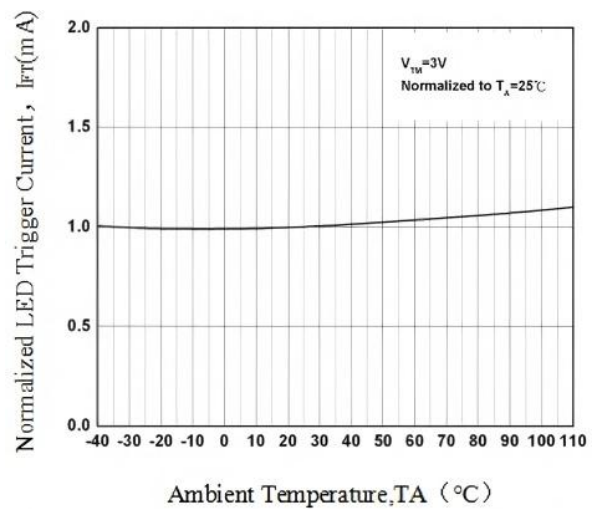


Figure7. Off-State Output Terminal Voltage vs Ambient Temperature

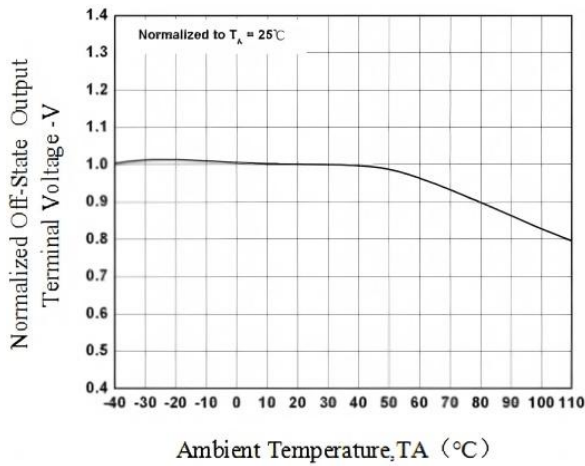
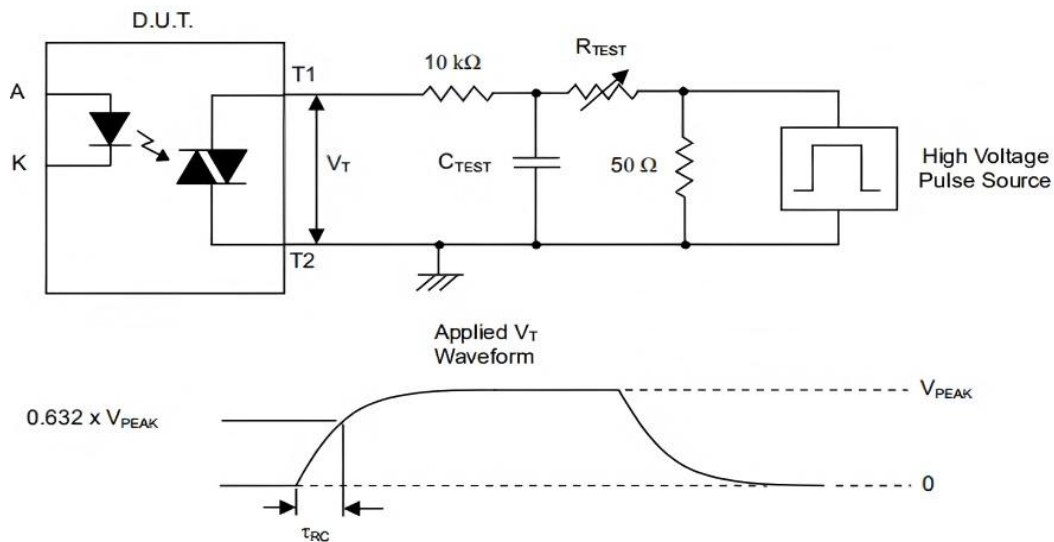


Figure8. Static dv/dt Test Circuit & Waveform



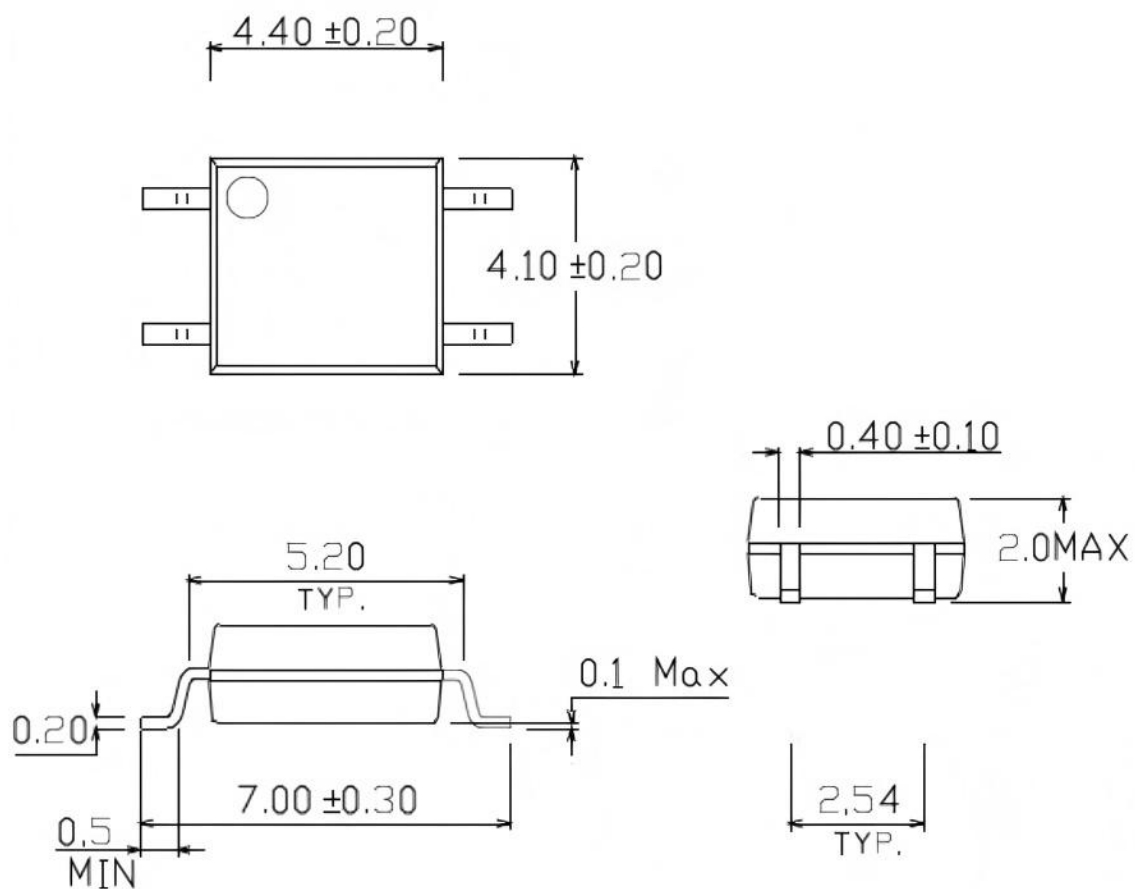
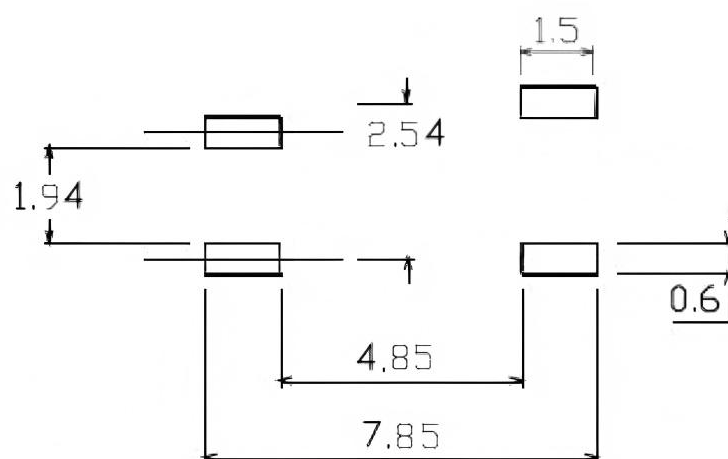
Measurement Method

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 R_{TEST}, 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, τ_{RC} is recorded and the dv/dt calculated.

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

For example, V_{PEAK} = 600 V for EXM305X series. The dv/dt value is calculated as follows:

$$dv/dt = 0.632 \cdot 400 / \tau_{RC}$$

Package Drawing(Unit:mm)

Surface patch type PIN foot pad layout


Legal Disclaimer

The information given in this document shall be for illustrative purposes only and shall in no event be regarded as a guarantee of conditions or characteristics. Existar Technologies reserves the right to change any information herein. With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Existar Technologies or its affiliates hereby make no representation or warranty of any kind, expressed or implied, as to any information provided hereunder, including without limitation as to the accuracy, completeness or non-infringement of intellectual property rights of any third party, and they assume no liability for the consequences of use of such information. In addition, any information given in this document is subject to customer's compliance with its obligations stated herein and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Existar Technologies in customer's applications. The information contained herein is exclusively intended for technically trained staff. No license is granted by implication under any patent right, copyright, mask work right, or other intellectual property right. It is customer's sole responsibility to evaluate the suitability of the product for the intended application and the completeness of the product information given herein with respect to such application. In no event shall Existar Technologies or its affiliates be liable to any party for any direct, indirect, special, punitive, incidental or consequential damages of any nature whatsoever, including but not limited to loss of profits and loss of goodwill, whether or not such damages are based on tort or negligence, warranty, breach of contract or any other legal theory.