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4 PIN SOP RANDOM-PHASE TRIAC PHOTOCOUPLER

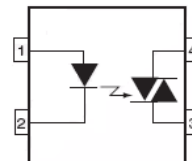
ELM302X Series
ELM305X Series

Features:

- EL302X V_{DRM} of 400V, EL305X V_{DRM} of 600V
- High isolation voltage between input and output ($V_{iso}=3750$ V rms)
- Compact dual-in-line package
- Pb free and RoHS compliant.
- cUL approved (No. E214129)
- VDE approved (No. 40028116))
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved



Schematic



Description

The ELM302X series and ELM305X 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.

They are designed for interfacing between electronic controls and power triacs to control resistive and inductive loads for 115 to 240 VAC operations.

Applications

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

Pin Configuration

1. Anode
2. Cathode
3. Terminal
4. Terminal



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Absolute Maximum Ratings (T_a=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I _F	60	mA
	Reverse voltage	V _R	6	V
	Power dissipation	P _D	100	mW
Output	Off-state Output Terminal Voltage	V _{DRM}	302X 400	V
			305X 600	
	On state RMS current	I _{T(RMS)}	70	mA(RMS)
	Peak Repetitive Surge Current	I _{TSM}	1	A
	Power dissipation	P _D	300	mW
Total power dissipation		P _{TOT}	200	mW
Isolation voltage ^{*1}		V _{iso}	3750	V rms
Operating temperature		T _{opr}	-40~+110	°C
Storage temperature		T _{stg}	-55~+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 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

*2 For 10 seconds.



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

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V _F	-	1.2	1.5	V	I _F = 10mA
Reverse Leakage current	I _R	-	-	10	μA	V _R = 6V

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Peak Blocking Current	I _{DRM}	-	-	100	nA	V _{DRM} = Rated V _{DRM} I _F = 0mA
Peak On-state Voltage	V _{TM}	-	-	2.5	V	I _{TM} =100mA peak
Critical Rate of Rise off-state Voltage	ELM302X	-	10	-	V/μs	I _F =0mA, Figure 8
	ELM305X	1000	-	-		

Transfer Characteristics

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
LED Trigger Current	3022 3052	-	-	10	mA	Main terminal Voltage=3V
	3023 3053	-	-	5		
	3024 3054	-	-	3		
Holding Current	I _H	-	3	5	mA	
Turn-on time	T _{on}	-	-	100	μS	V _D =6V, R _L =100ohm, I _F =20mA

* Typical values at T_a = 25°C

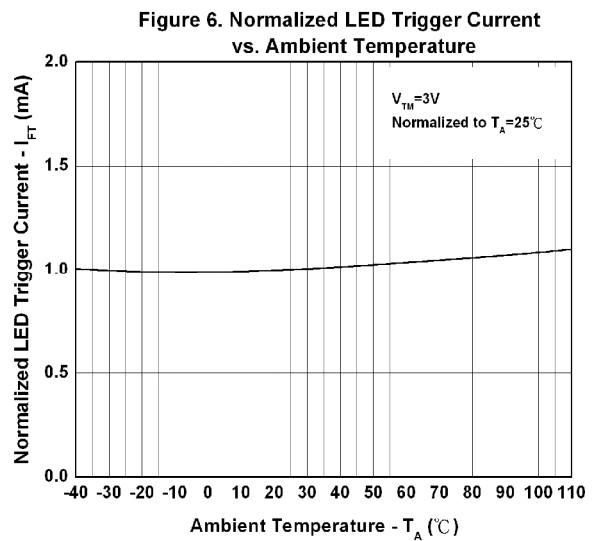
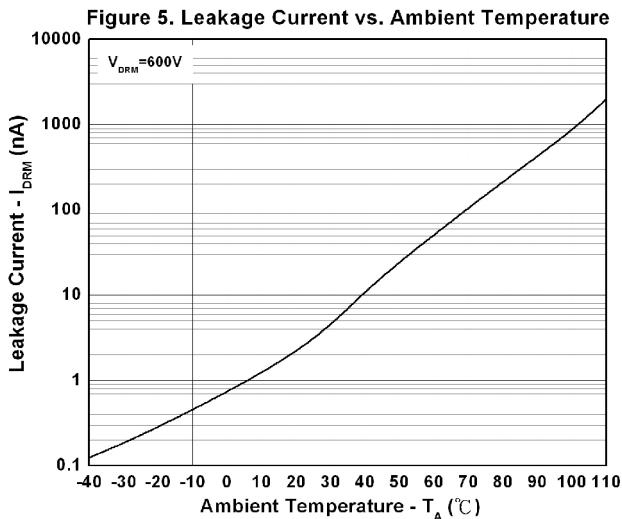
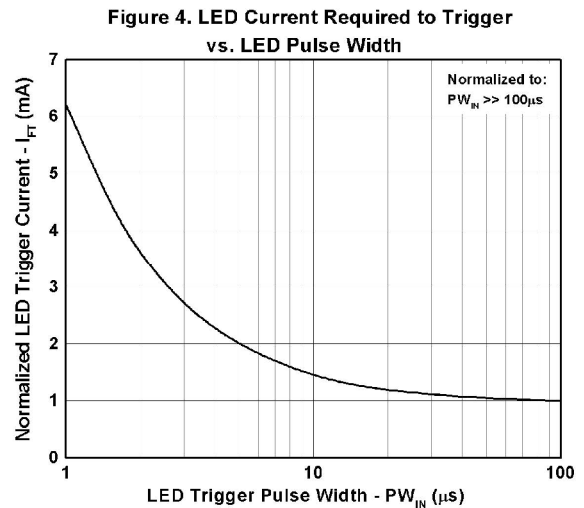
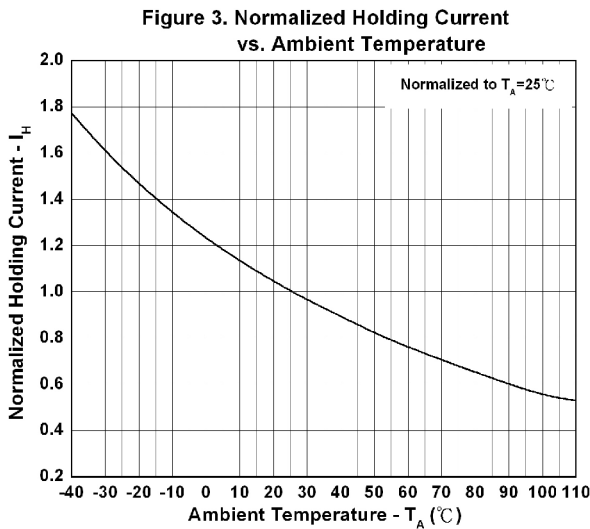
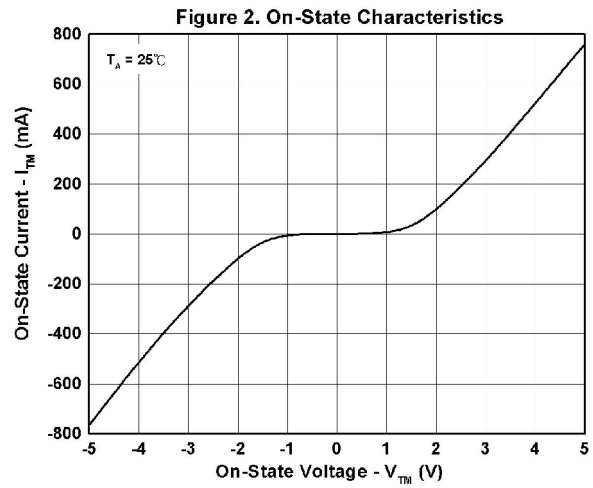
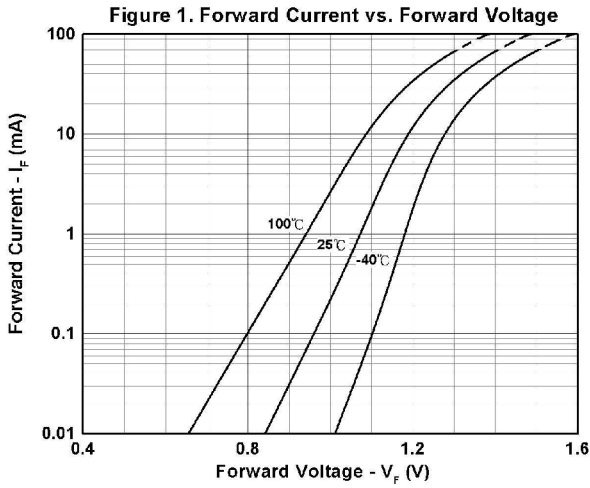


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ELM302X Series ELM305X Series

Typical Performance Curves



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Figure 7. Off-State Output Terminal Voltage vs. Ambient Temperature

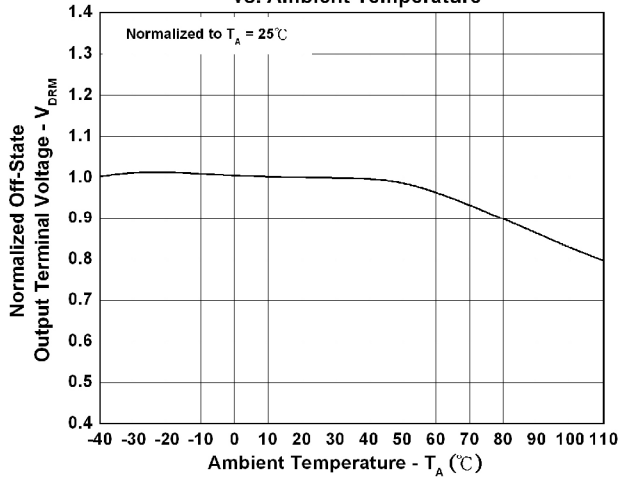
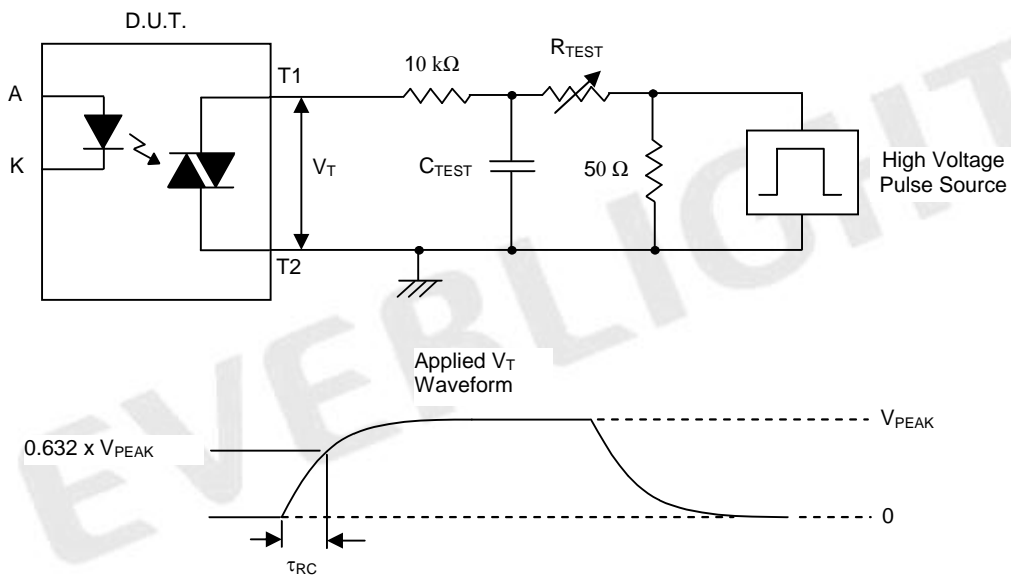


Figure 8. Static dv/dt Test Circuit & Waveform



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.

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



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For example, $V_{PEAK} = 400V$ for EL302X series. The dv/dt value is calculated as follows:

$$dv/dt = \frac{0.63 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

Order Information

Part Number

ELM302X(Z)-V

or

ELM305X(Z)-V

Note

X = Part No. (2 for $I_{FT}=10mA$, 3 for $I_{FT}=5mA$, 4 for $I_{FT}=3mA$)

Z = Tape and reel option (TA, TB or none).

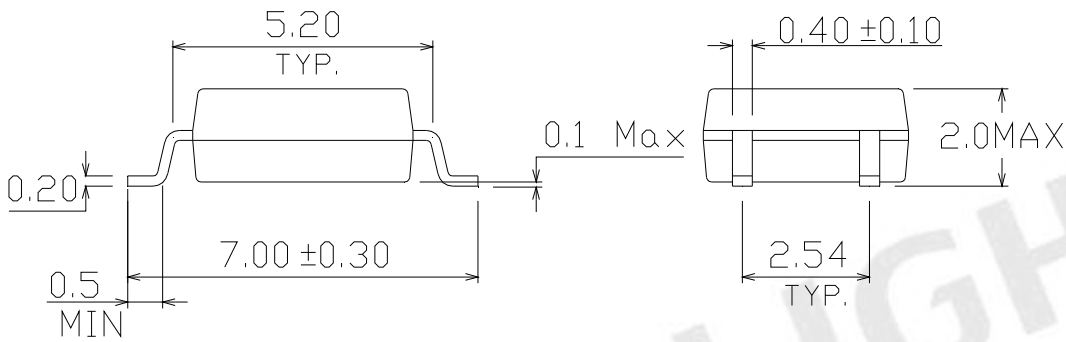
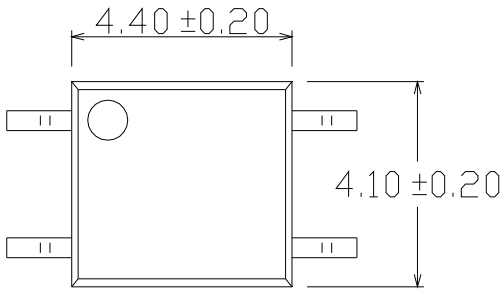
V = VDE safety (optional)

Option	Description	Packing quantity
None	Standard	100 units per tube
None	Standard + VDE safety optional	100 units per tube
(TA)	TA tape & reel option	3000 units per reel
(TB)	TB tape & reel option	3000 units per reel
(TA)-V	TA tape & reel option + VDE safety optional	3000 units per reel
(TB)-V	TB tape & reel option + VDE safety optional	3000 units per reel

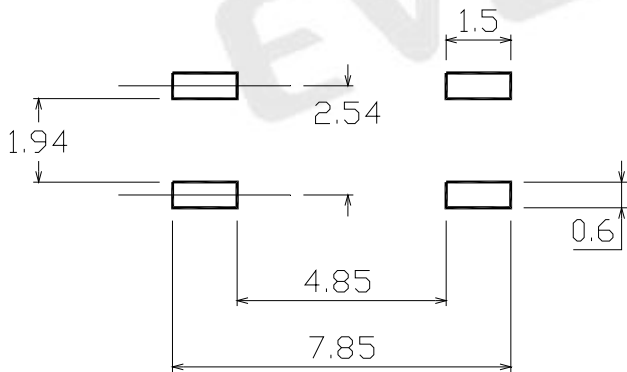
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**Package Drawings
(Dimensions in mm)**



Recommended pad layout for surface mount leadform





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ELM305X Series

Device Marking



Notes

- EL denotes Everlight
- M3054 denotes Device Number
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code
- V denotes VDE safety option (optional)

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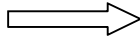
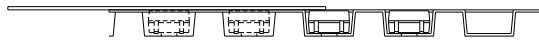
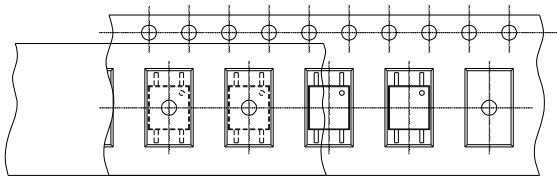
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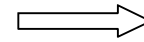
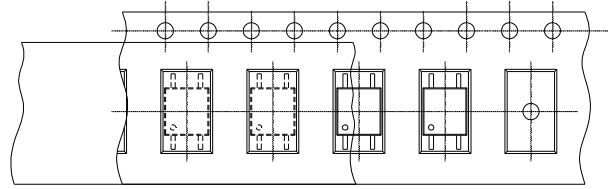
Tape & Reel Packing Specifications

Option TA



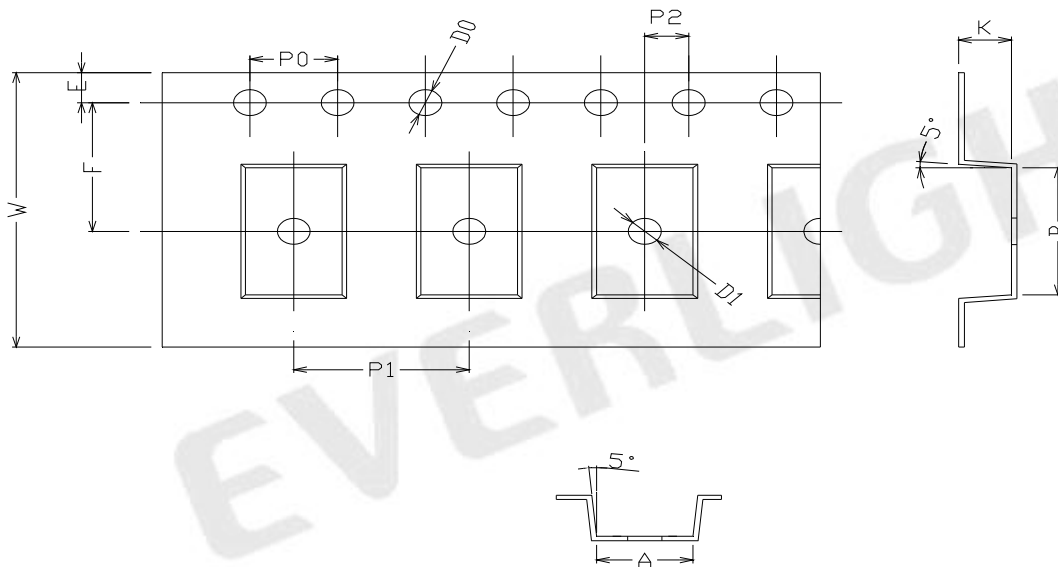
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.4 ± 0.1	7.4 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.15	8.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	16.0 ± 0.2	2.4 ± 0.1

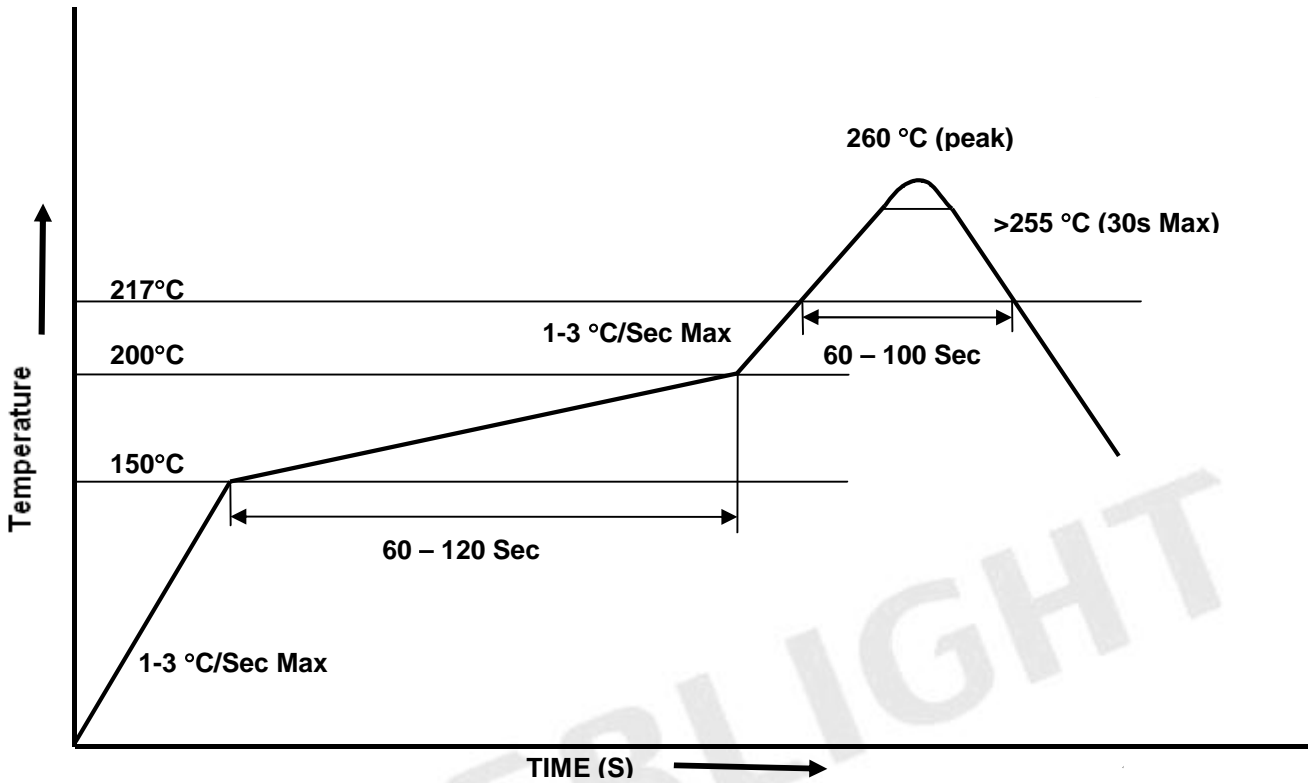


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Solder Reflow Temperature Profile





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