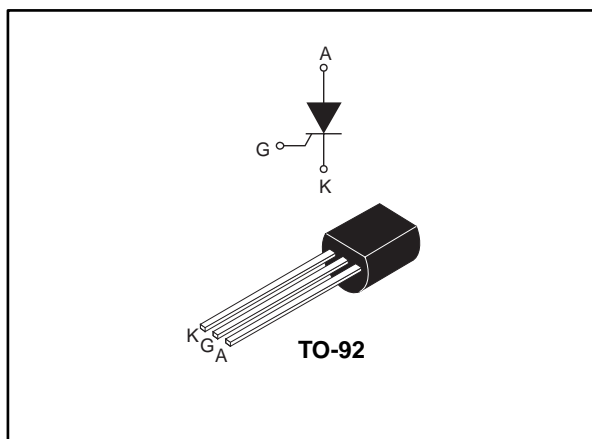


0.8 A asymmetric sensitive gate SCR

Datasheet - production data



Description

Thanks to highly sensitive triggering levels, the XL0840 is suitable for all applications where the available gate current is limited, such as Christmas lights control.

Table 1: Device summary

Symbol	Value	Unit
$I_{T(RMS)}$	0.8	A
V_{DRM}	400	V
I_{GT}	200	μA

Features

- High immunity: 75 V/ μs at 125 °C
- Sensitive gate: 200 μA at 25 °C
- Low leakage current: I_{DRM} max. 100 μA at 125 °C
- ECOPACK®2 ROHS - No exemption

Application

- Christmas lights control

1 Characteristics

Table 2: Absolute ratings (limiting values), limiting values

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (180 ° conduction angle)		0.8	A	
$I_{T(AV)}$	Average on-state current (180 ° conduction angle)				
I_{TSM}	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	8	A	
		$t_p = 10 \text{ ms}$			7
I^2t	I^2t value for fusing				
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100 \text{ ns}$	$f = 60 \text{ Hz}$	$T_j = 125 \text{ °C}$	30	A/ μs
I_{GM}	Peak forward gate current	$t_p = 20 \text{ }\mu\text{s}$	$T_j = 125 \text{ °C}$	1	A
V_{DRM}	Repetitive peak off-state voltage		Max.	400	V
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125 \text{ °C}$	0.1	W
T_{stg}	Storage junction temperature range			-40 to +150	°C
T_j	Operating junction temperature range			-40 to +125	

Table 3: Electrical characteristics ($T_j = 25 \text{ °C}$ unless otherwise specified)

Symbol	Test conditions		Value	Unit		
I_{GT}	$V_D = 12 \text{ V}$, $R_L = 140 \text{ }\Omega$		Max.	200	μA	
V_{GT}			Max.	0.8	V	
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3 \text{ k}\Omega$, $R_{GK} = 1 \text{ k}\Omega$	$T_j = 125 \text{ °C}$	Min.	0.1	V	
V_{RG}	$I_{RG} = 10 \text{ }\mu\text{A}$		Min.	8	V	
I_H	$I_T = 50 \text{ mA}$, $R_{GK} = 1 \text{ k}\Omega$		Max.	5	mA	
I_L	$I_G = 1 \text{ mA}$, $R_{GK} = 1 \text{ k}\Omega$	$T_j = 125 \text{ °C}$	Max.	6	mA	
$dV/dt^{(1)}$	$V_D = 67 \text{ \% } V_{DRM}$, $R_{GK} = 1 \text{ k}\Omega$		$T_j = 125 \text{ °C}$	Min.	75	V/ μs
V_{TM}	$I_{TM} = 1.6 \text{ A}$, $t_p = 380 \text{ }\mu\text{s}$		$T_j = 25 \text{ °C}$	Max.	1.95	V
V_{to}	Threshold voltage		$T_j = 125 \text{ °C}$	Max.	1.0	V
R_d	Dynamic resistance		$T_j = 125 \text{ °C}$	Max.	600	m Ω
I_{DRM}	V_{DRM} $R_{GK} = 1 \text{ k}\Omega$		$T_j = 25 \text{ °C}$	Max.	1	μA
			$T_j = 125 \text{ °C}$	Max.	100	

Notes:

⁽¹⁾for both polarities of A2 referenced to A1.

Table 4: Thermal parameters

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient (DC)	150	°C/W
$R_{th(j-l)}$	Junction to lead (DC)	80	

1.1 Characteristics (curves)

Figure 1: Maximum average power dissipation versus average on-state current

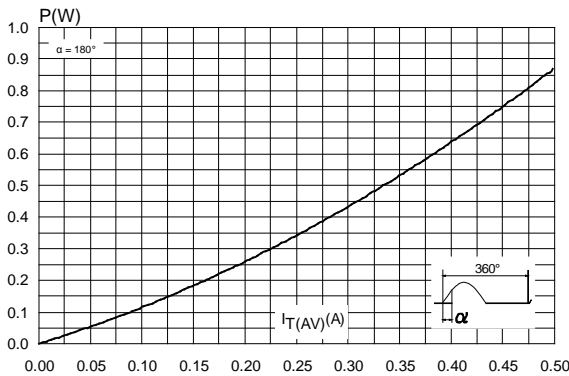


Figure 2: Average and D.C. on-state current versus lead temperature

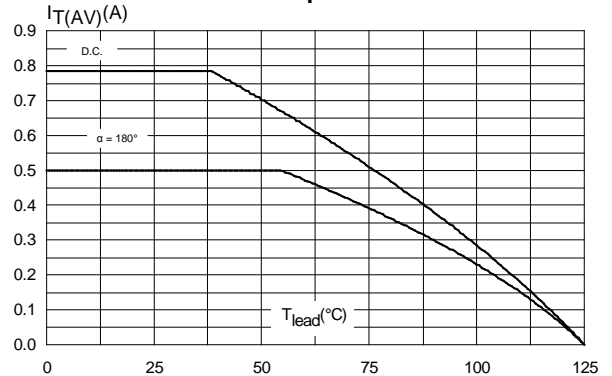


Figure 3: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout)

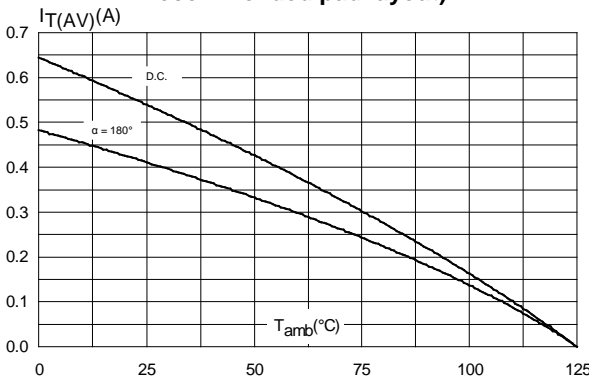


Figure 4: Relative variation of thermal impedance junction to ambient versus pulse duration

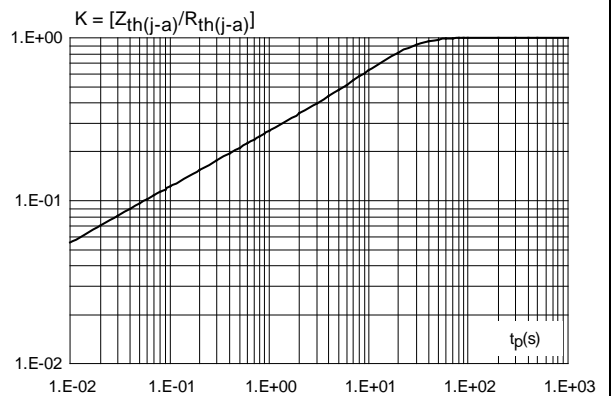


Figure 5: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

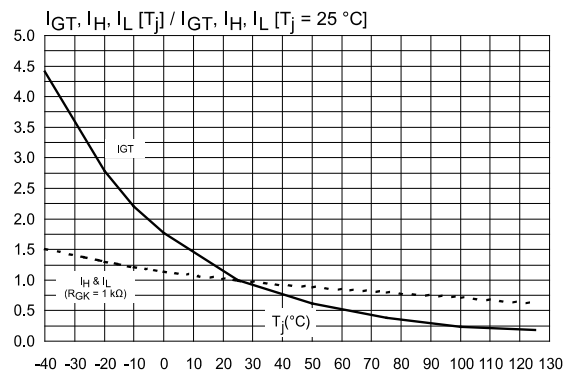


Figure 6: Relative variation of holding current versus gate-cathode resistance (typical values)

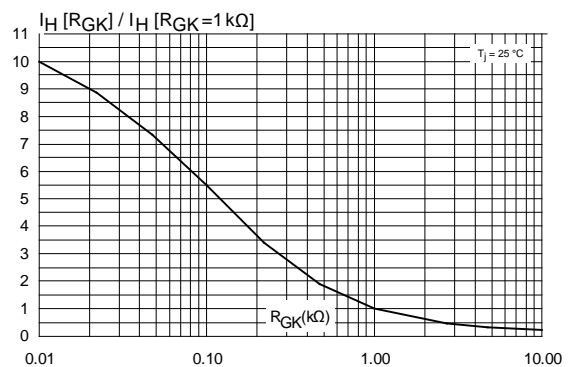


Figure 7: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values)

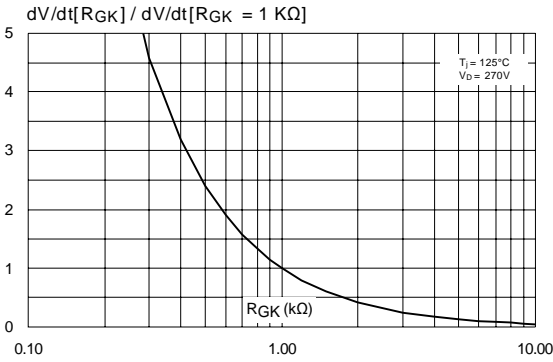


Figure 8: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values)

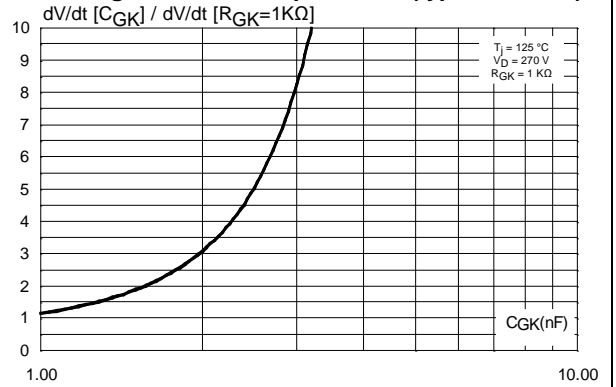


Figure 9: Surge peak on-state current versus number of cycles

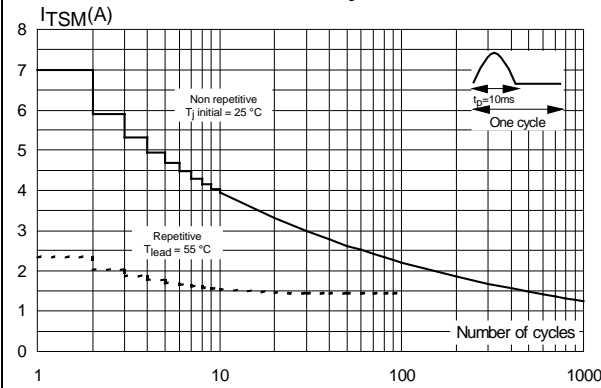


Figure 10: Non repetitive surge peak on-state current for a sinusoidal pulse with width t_p < 10ms

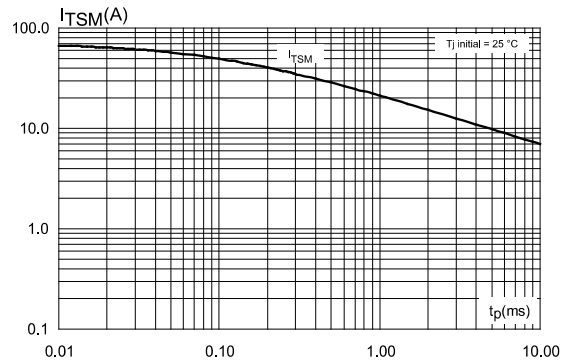
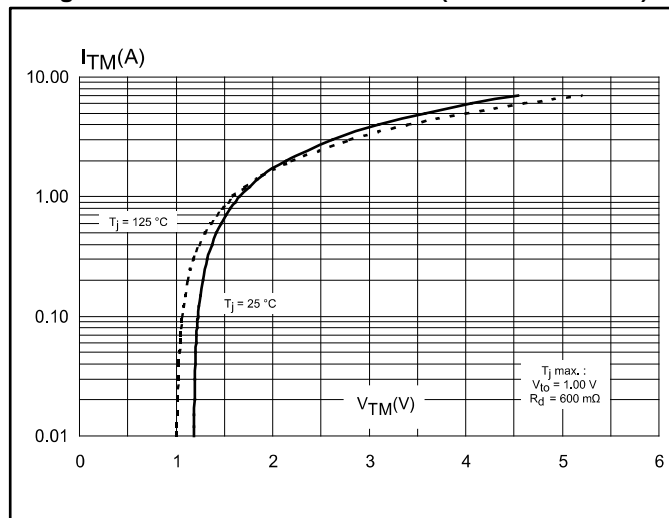


Figure 11: On-state characteristics (maximum values)



2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

2.1 TO-92 package information (for bag version)

Figure 12: TO-92 package outline (for bag version)

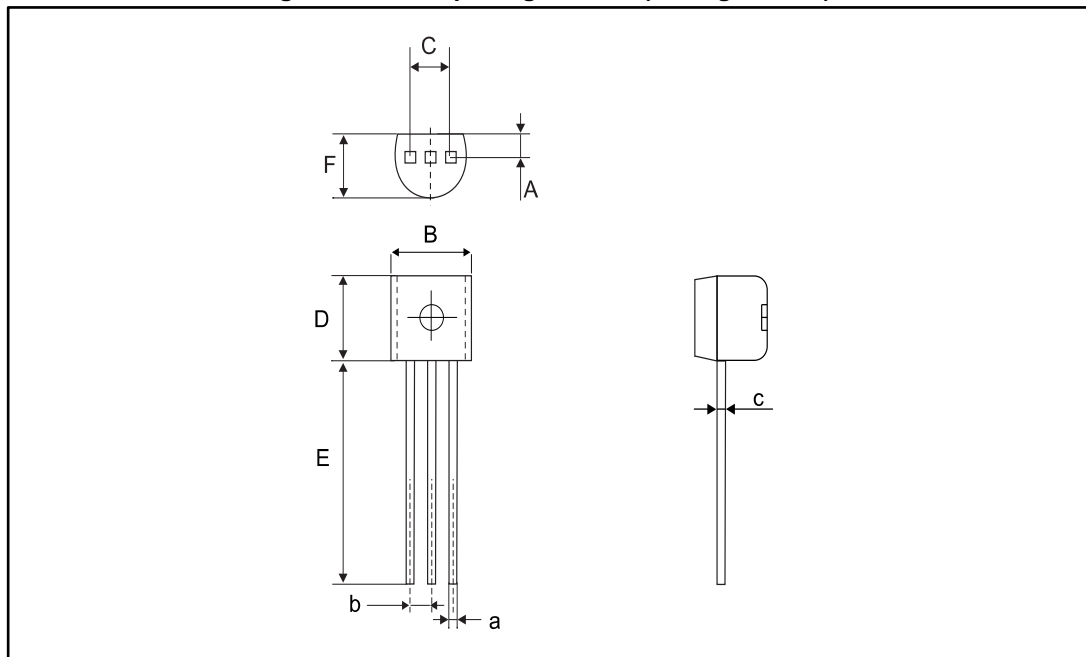


Table 5: TO-92 package mechanical data (for bag version)

Ref.	Dimensions					
	Millimeters			Inches ⁽¹⁾		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		1.35			0.0531	
B			4.70			0.1850
C		2.54			0.1000	
D	4.40			0.1732		
E	12.70			0.5000		
F			3.70			0.1457
a			0.50			0.0197
b		1.27			0.0500	
c			0.48			0.0189

Notes:

⁽¹⁾Inches given for reference only

2.2 TO-92 package information (for ammpack and tape and reel versions)

Figure 13: TO-92 package outline (for ammpack and tape and reel versions)

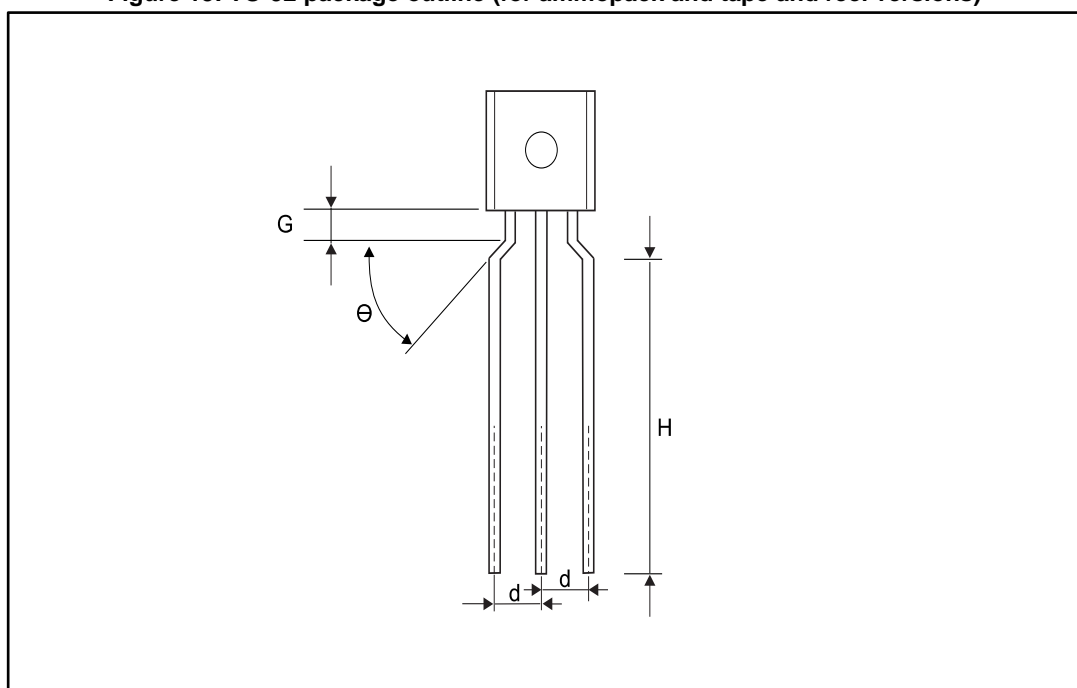


Table 6: TO-92 package mechanical data (for ammpack and tape and reel versions)

Ref.	Dimensions					
	Millimeters			Inches ⁽¹⁾		
	Min.	Typ.	Max.	Min.	Typ.	Max.
G	1.30	1.70	2.00	0.0511	0.0669	0.0787
H	7.69		9.69	0.3028		0.3815
d	2.40		2.90	0.0945		0.1142
θ	30°	40°	50°	30°	40°	50°

Notes:

⁽¹⁾Inches given for reference only

3 Ordering information

Figure 14: Ordering information scheme

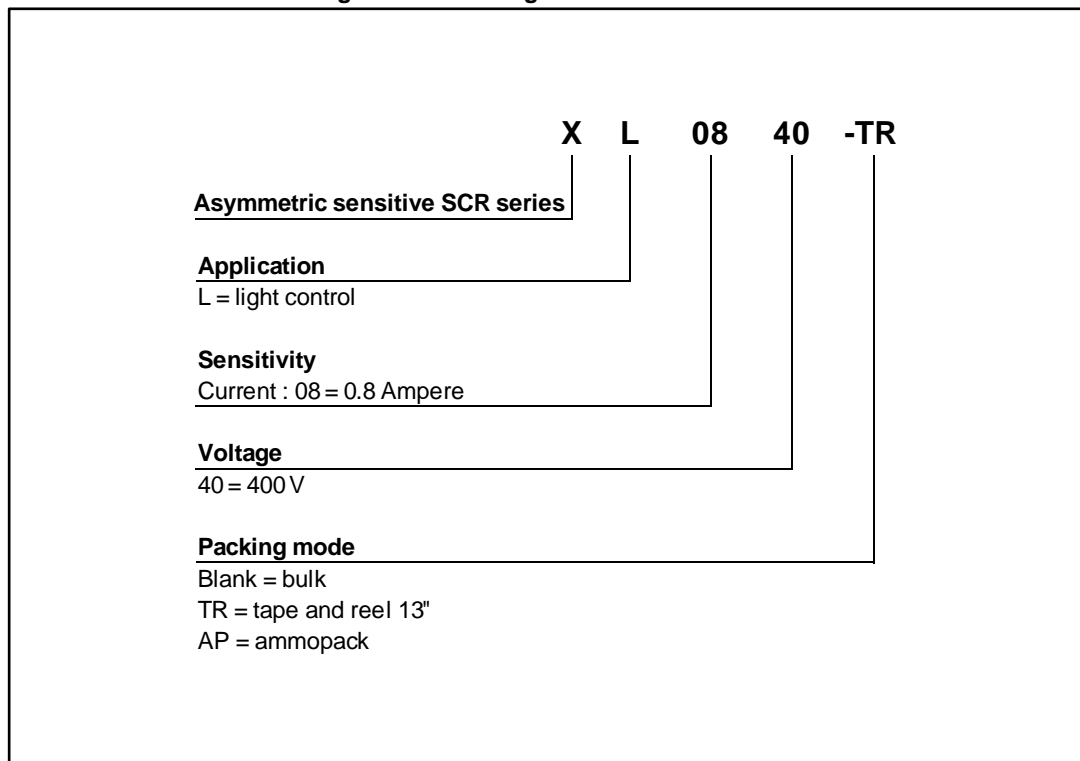


Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
XL0840	XL0840	TO-92	0.2 g	2500	Bag
XL0840-AP	XL0840			2000	Ampopack not in dry bag
XL0840-TR	XL0840			2000	Tape and Reel 13 inches

4 Revision history

Table 8: Document revision history

Date	Revision	Changes
Jan-2002	1	Initial release
07-Sep-2017	2	Updated package information section.

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