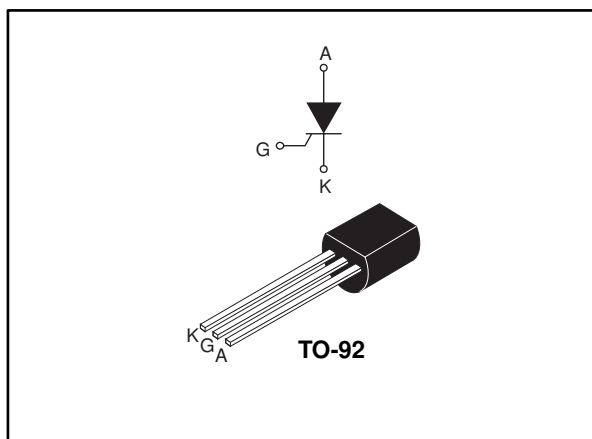


## 0.8 A asymmetric sensitive gate SCR

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	$\mu A$

### Features

- High immunity: 75 V/ $\mu s$  at 125 °C
- Sensitive gate: 200  $\mu A$  at 25 °C
- Low leakage current:  $I_{DRM}$  max. 100  $\mu A$  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
$I_{\theta t}$	$I_{\theta t}$ 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/ $\mu\text{s}$
$I_{GM}$	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	$\mu\text{A}$
$V_{GT}$			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/ $\mu\text{s}$
$V_{TM}$	$I_{TM} = 1.6 \text{ A}$ , $t_p = 380 \text{ }\mu\text{s}$	$T_j = 25 \text{ °C}$	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 $\Omega$
$I_{DRM}$	$V_{DRM}$ $R_{GK} = 1 \text{ k}\Omega$	$T_j = 25 \text{ °C}$	Max.	1	$\mu\text{A}$
		$T_j = 125 \text{ °C}$	Max.	100	

**Notes:**

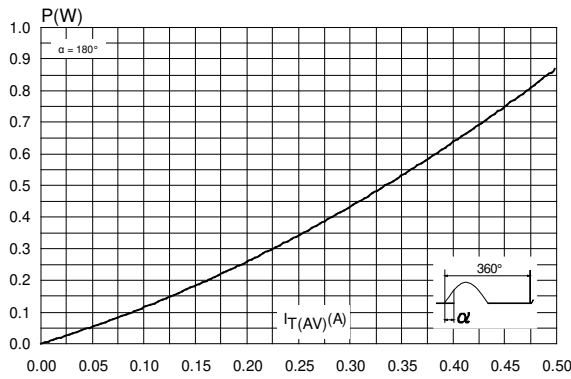
<sup>(1)</sup>for both polarities of A2 referenced to A1.

**Table 4: Thermal parameters**

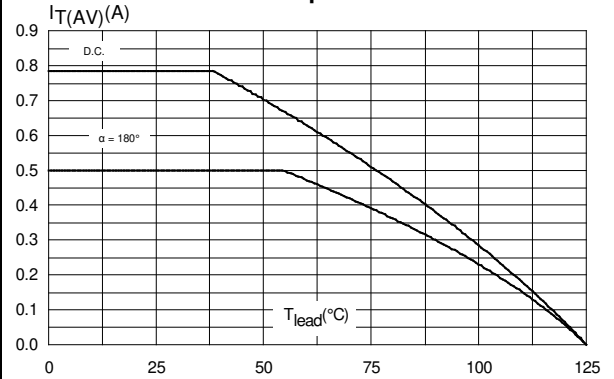
Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient (DC)	150	°C/W
$R_{th(j-l)}$	Junction to lead (DC)	80	

# 1.1 Characteristics (curves)

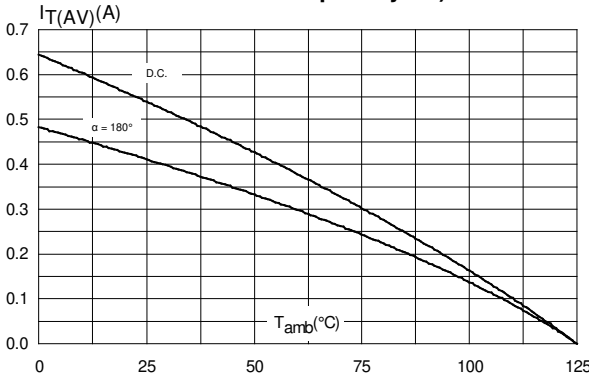
**Figure 1: Maximum average power dissipation versus average on-state current**



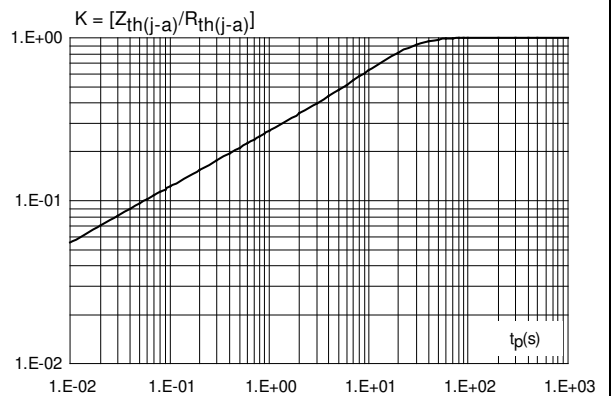
**Figure 2: Average and D.C. on-state current versus lead temperature**



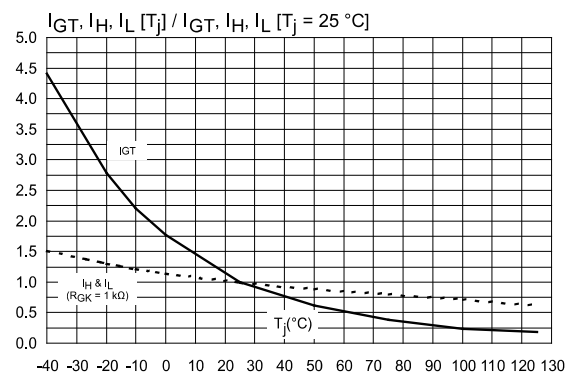
**Figure 3: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout)**



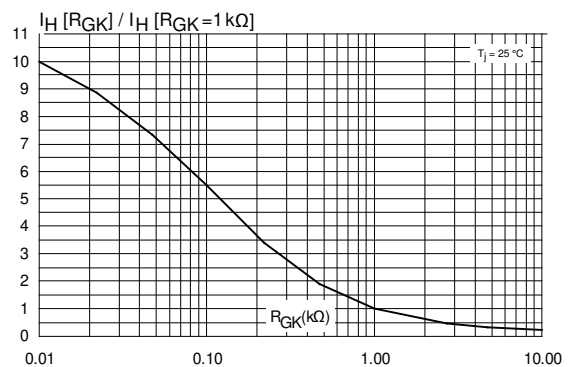
**Figure 4: Relative variation of thermal impedance junction to ambient versus pulse duration**



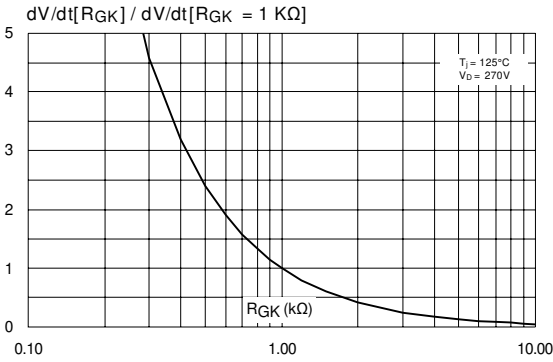
**Figure 5: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)**



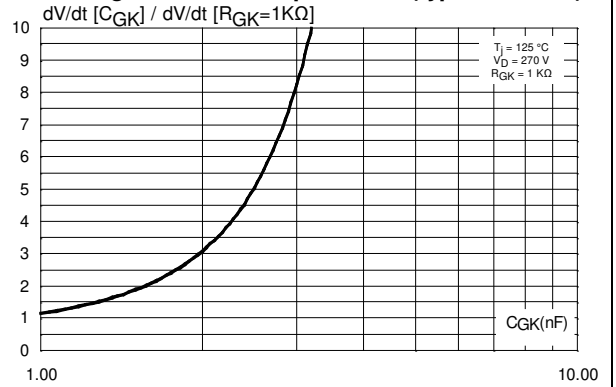
**Figure 6: Relative variation of holding current versus gate-cathode resistance (typical values)**



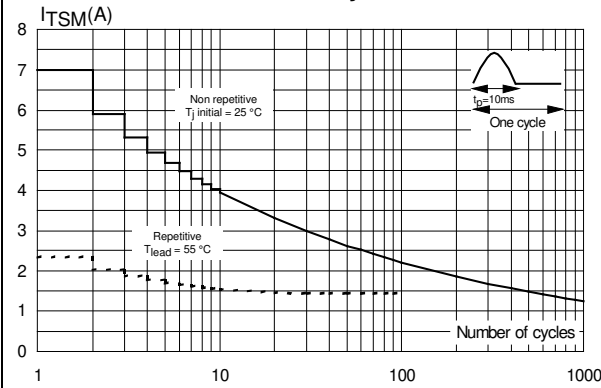
**Figure 7: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values)**



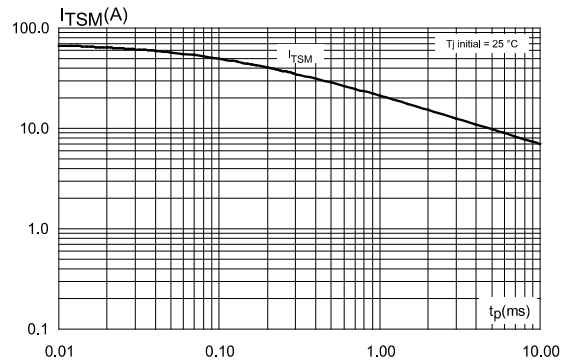
**Figure 8: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values)**



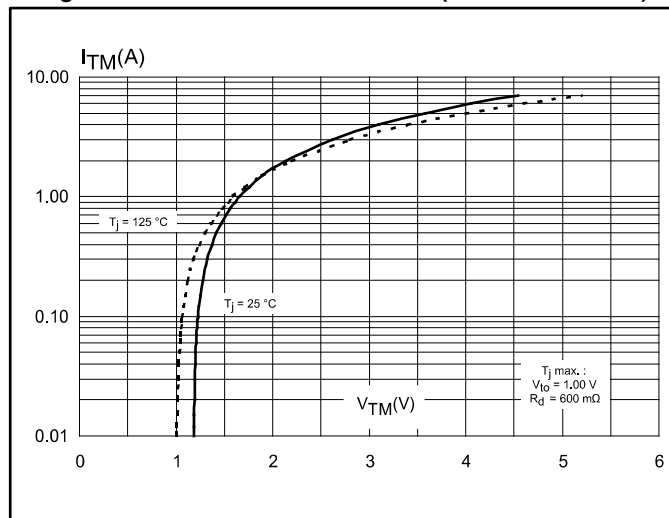
**Figure 9: Surge peak on-state current versus number of cycles**



**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](http://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)

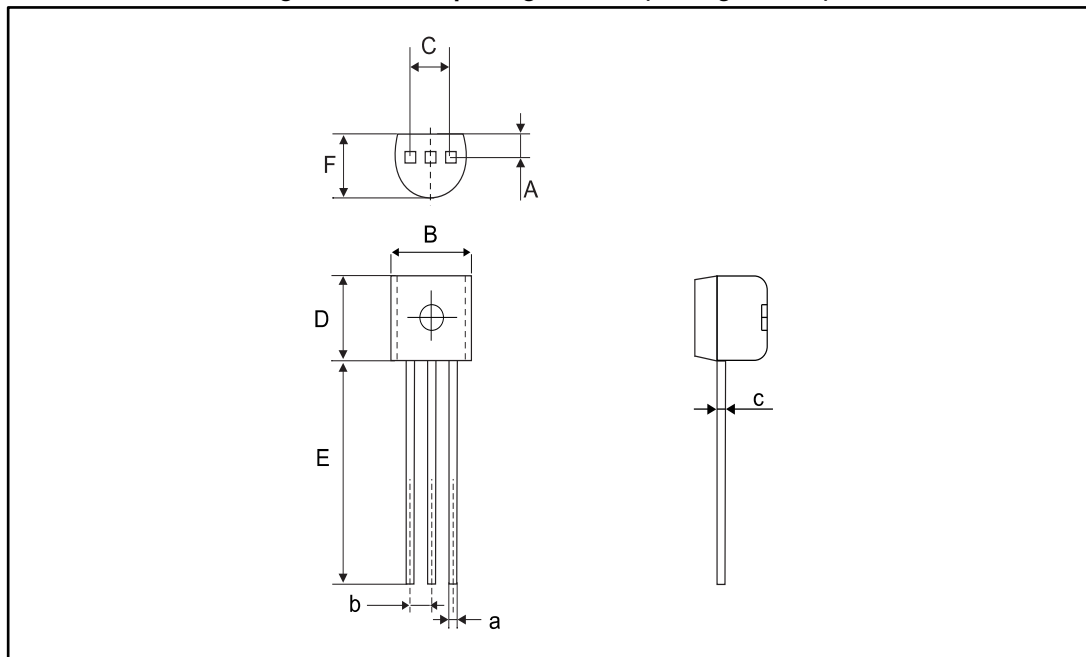


Table 5: TO-92 package mechanical data (for bag version)

Ref.	Dimensions					
	Millimeters			Inches <sup>(1)</sup>		
	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:**

<sup>(1)</sup>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)

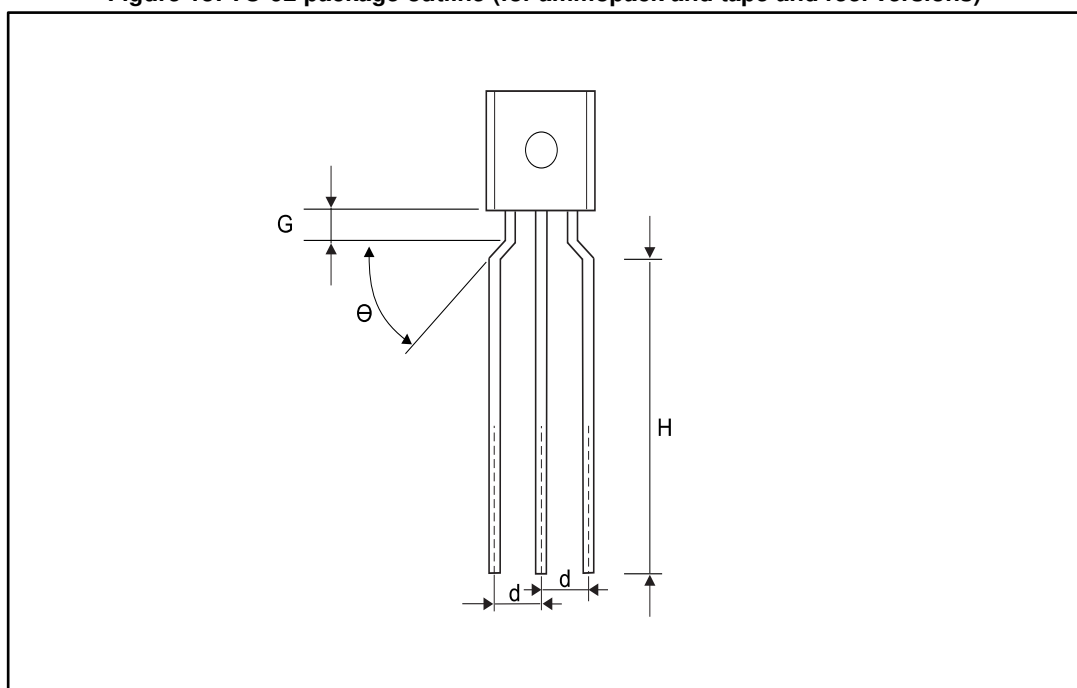


Table 6: TO-92 package mechanical data (for ammpack and tape and reel versions)

Ref.	Dimensions					
	Millimeters			Inches <sup>(1)</sup>		
	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:**

<sup>(1)</sup>Inches given for reference only

### 3 Ordering information

Figure 14: Ordering information scheme

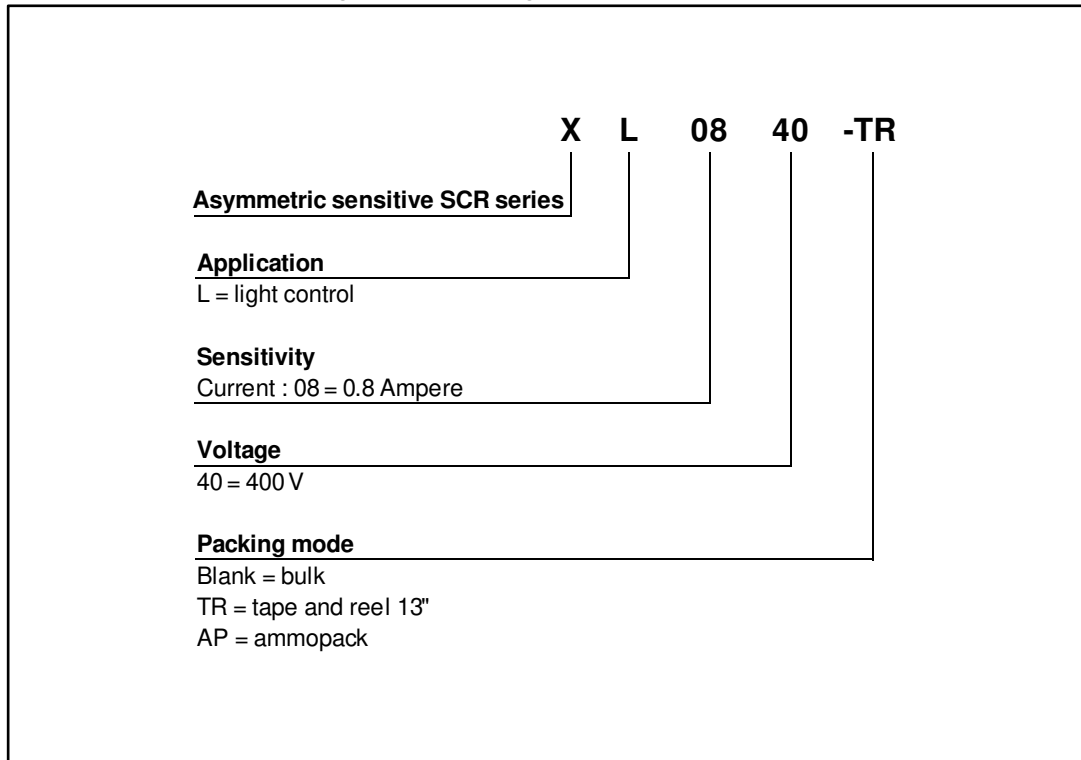


Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
XL0840	XL0840	TO-92	0.2 g	2500	Bag
XL0840-AP	XL0840			2000	Ampmpack 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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