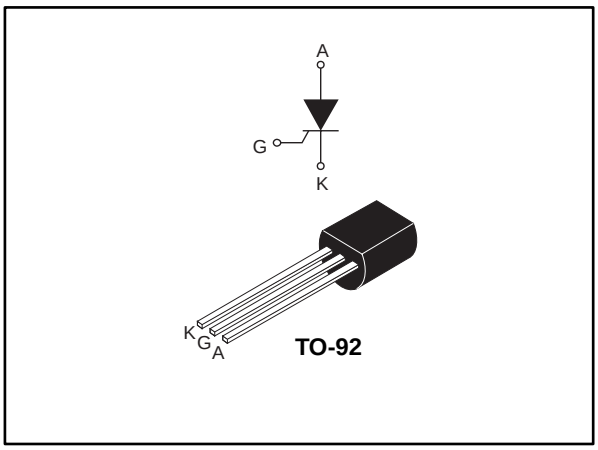
XL0840

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)		T_C = 55 °C	0.8	A
$I_{T(AV)}$	Average on-state current (180 ° conduction angle)			0.5	
I_{TSM}	Non repetitive surge peak on-state current	t_p = 8.3 ms	T_j = 25 °C	8	A
		t_p = 10 ms		7	
I^2t	I^2t value for fusing			0.24	A^2s
dI/dt	Critical rate of rise of on-state current I_G = 2 x I_{GT} , tr ≤ 100 ns	f = 60 Hz	T_j = 125 °C	30	A/µs
I_{GM}	Peak forward gate current	t_p = 20 µs	T_j = 125 °C	1	A
V_{DRM}	Repetitive peak off-state voltage		Max.	400	V
$P_{G(AV)}$	Average gate power dissipation		T_j = 125 °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 °C unless otherwise specified)

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

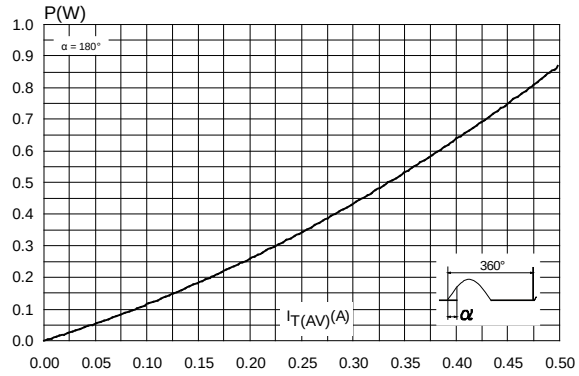


Figure 2: Average and D.C. on-state current versus lead temperature

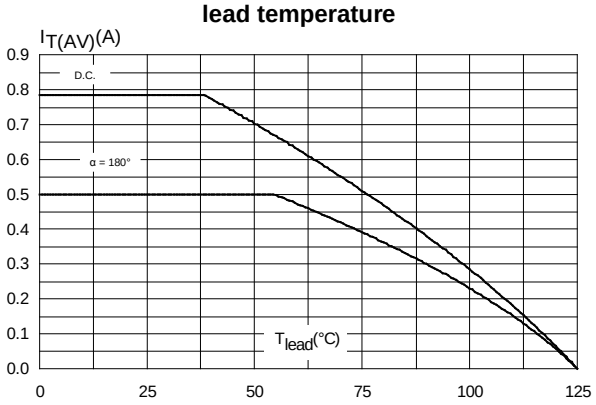


Figure 3: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout)

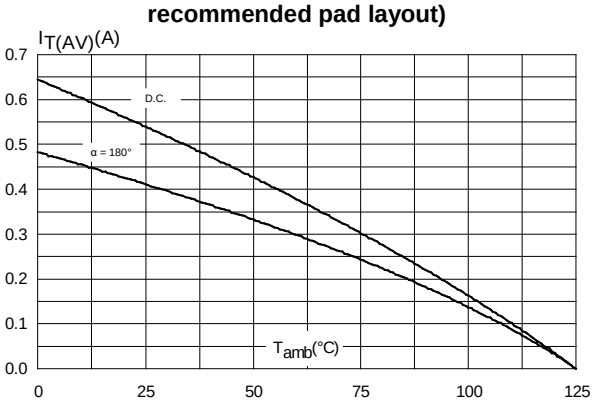


Figure 4: Relative variation of thermal impedance junction to ambient versus pulse duration

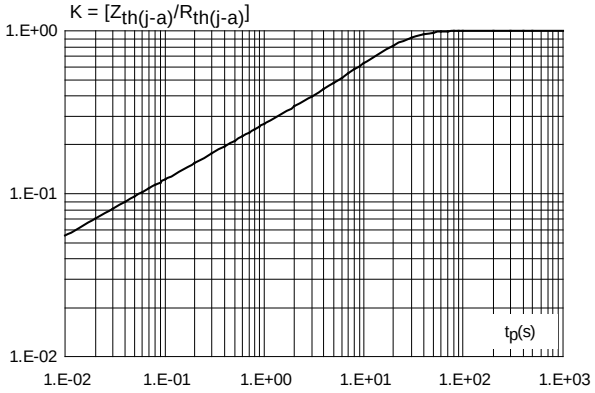


Figure 5: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

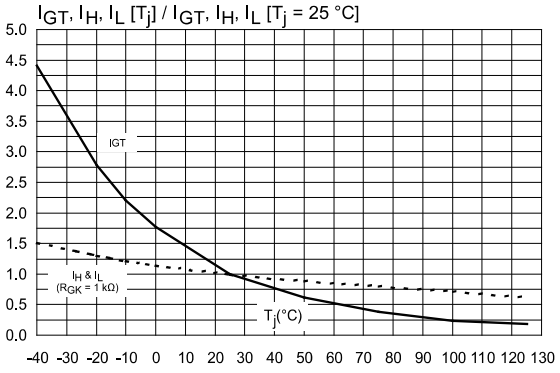


Figure 6: Relative variation of holding current versus gate-cathode resistance (typical values)

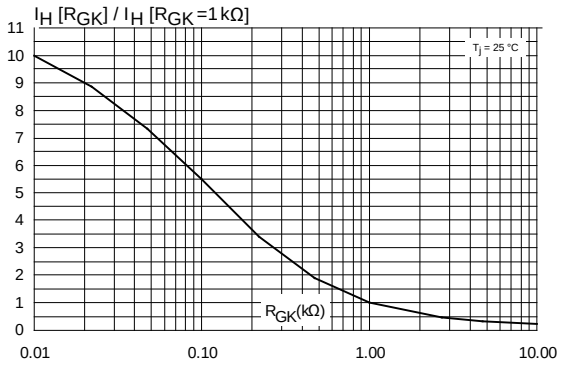


Figure 7: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values)

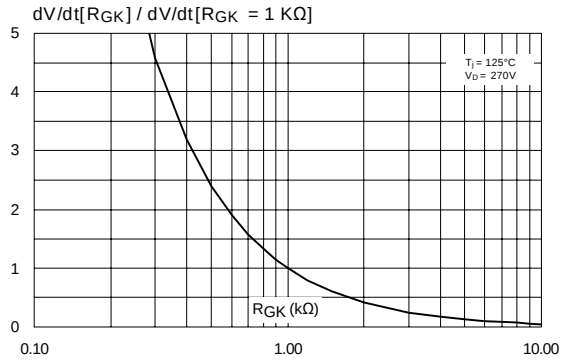


Figure 8: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values)

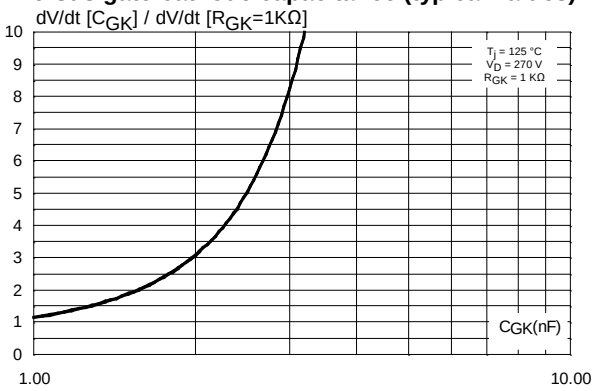


Figure 9: Surge peak on-state current versus number of cycles

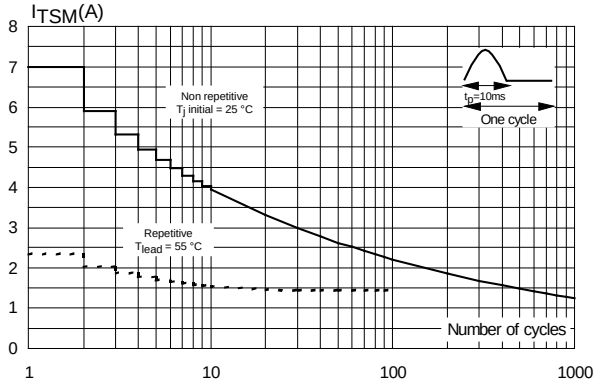


Figure 10: Non repetitive surge peak on-state current for a sinusoidal pulse with width t_p<10ms

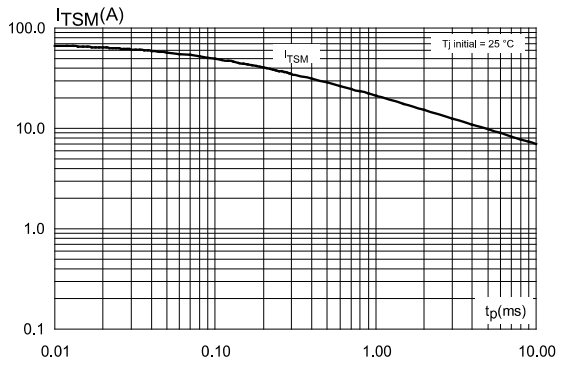
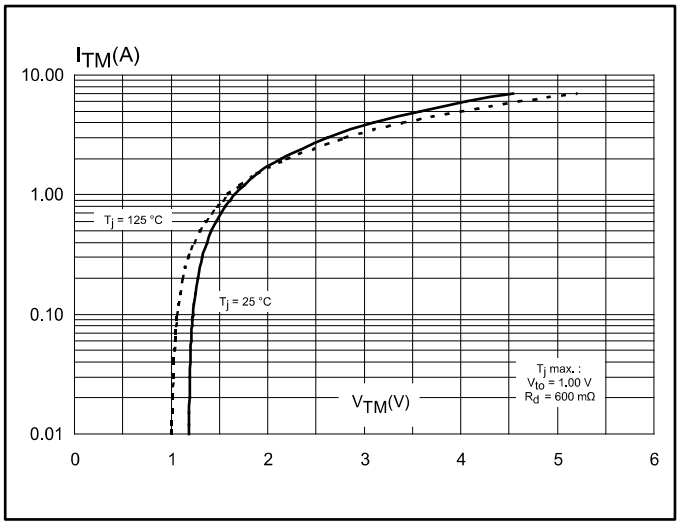


Figure 11: On-state characteristics (maximum values)



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)

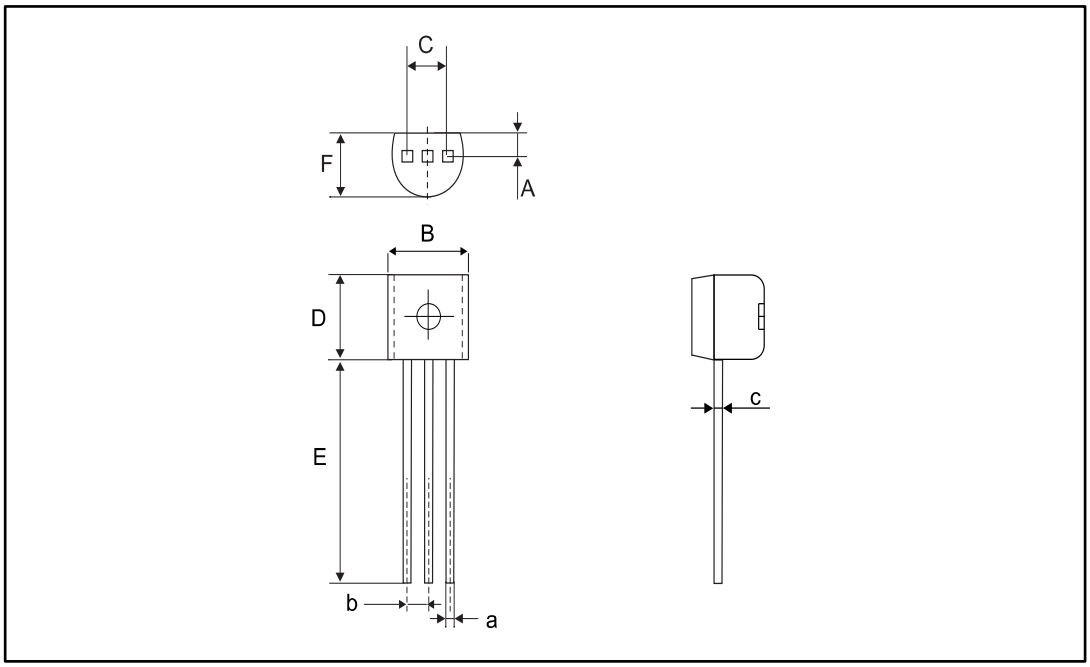


Table 5: TO-92 package mechanical data (for bag version)

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 ammopack and tape and reel versions)

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

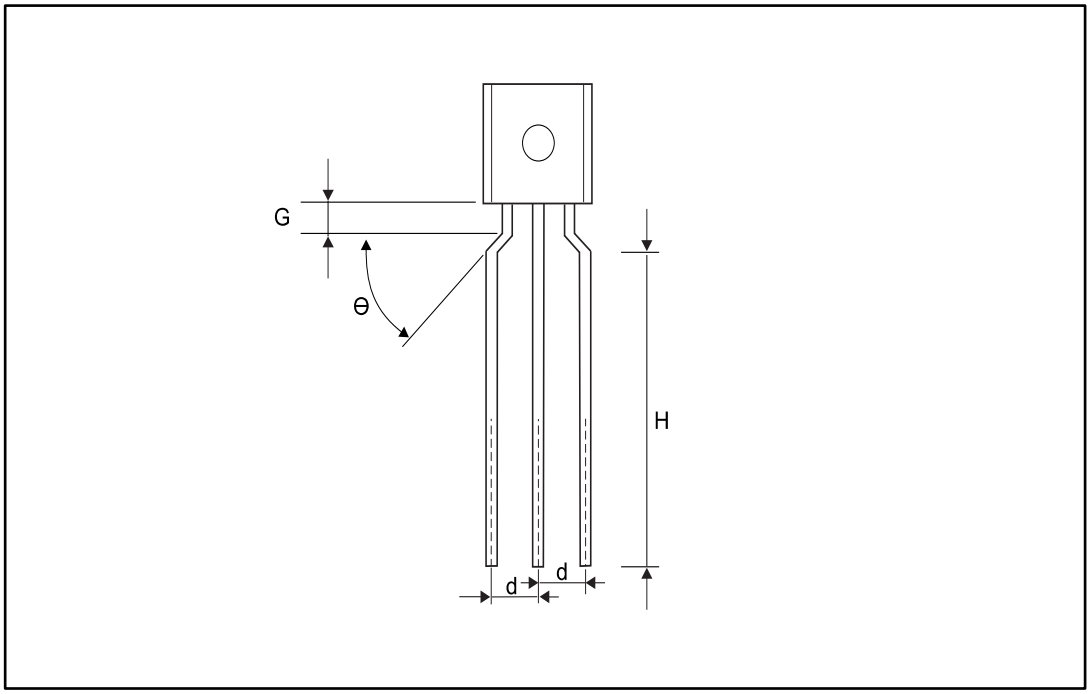


Table 6: TO-92 package mechanical data (for ammopack and tape and reel versions)

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

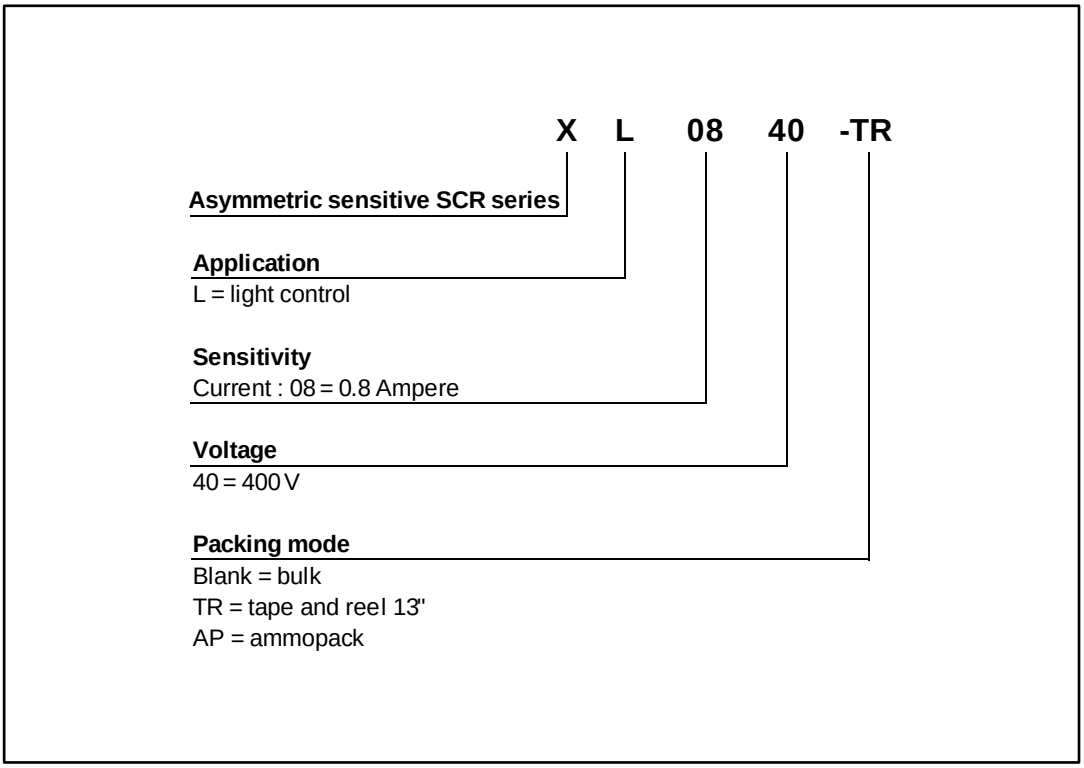


Table 7: Ordering information

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