

Table 1: Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	0.25	A
V_{DRM}/V_{RRM}	100 and 200	V
I_{GT}	1 and 200	μA

DESCRIPTION

Thanks to highly sensitive triggering levels, the **P01xxxL** SCR series is suitable for all applications where the available gate current is limited such as stand-by mode power supplies, smoke and alarm detectors...

Available in SOT23-3L, it provides optimized space saving on high density printed circuit boards.

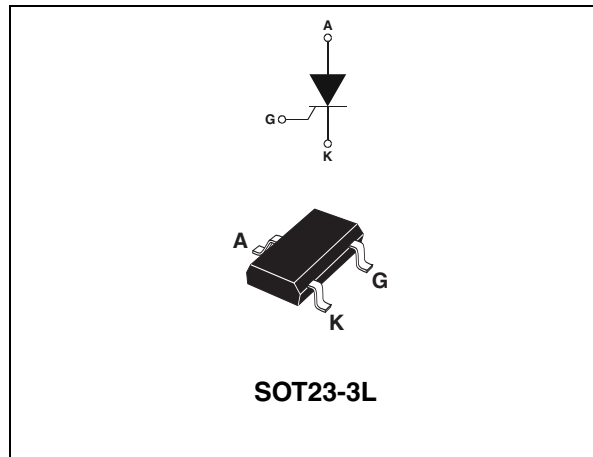


Table 2: Order Codes

Part Numbers	Marking
P0102AL 5AA4	P2A
P0102BL 5AA4	P2B
P0109AL 5AA4	P9A

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)		$T_{amb} = 36^{\circ}C$	0.25 A	
$I_{T(AV)}$	Average on-state current (180° conduction angle)		$T_{amb} = 36^{\circ}C$	0.16 A	
I_{TSM}	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	$T_j = 25^{\circ}C$	7	A
		$t_p = 10 \text{ ms}$		6	
I^2t	I^2t Value for fusing	$t_p = 10 \text{ ms}$	$T_j = 25^{\circ}C$	0.18	A^2s
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100 \text{ ns}$	$F = 60 \text{ Hz}$	$T_j = 125^{\circ}C$	50	$A/\mu s$
I_{GM}	Peak gate current	$t_p = 20 \mu s$	$T_j = 125^{\circ}C$	0.5	A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125^{\circ}C$	0.02	W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	$^{\circ}C$

Tables 4: Electrical Characteristics ($T_j = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Test Conditions		P0102xL	P0109AL	Unit
I_{GT}	$V_D = 12\text{ V}$ $R_L = 140\ \Omega$	MAX.	200	1	μA
V_{GT}		MAX.	0.8		V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3\ \text{k}\Omega$ $R_{GK} = 1\ \text{k}\Omega$	$T_j = 125^\circ\text{C}$	MIN.	0.1	
V_{RG}	$I_{RG} = 10\ \mu\text{A}$		MIN.	8	
I_H	$I_T = 50\ \text{mA}$ $R_{GK} = 1\ \text{k}\Omega$		MAX.	6	
I_L	$I_G = 1\ \text{mA}$ $R_{GK} = 1\ \text{k}\Omega$		MAX.	7	
dV/dt	$V_D = 67\ \% V_{DRM}$ $R_{GK} = 1\ \text{k}\Omega$	$T_j = 125^\circ\text{C}$	MIN.	200	100
V_{TM}	$I_{TM} = 0.4\ \text{A}$ $t_p = 380\ \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.7	
V_{t0}	Threshold voltage		$T_j = 125^\circ\text{C}$	MAX.	1.0
R_d	Dynamic resistance		$T_j = 125^\circ\text{C}$	MAX.	1000
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX.	1	
		$T_j = 125^\circ\text{C}$		100	
					μA

Table 5: Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient (mounted on FR4 with recommended pad layout)	400	$^\circ\text{C}/\text{W}$

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

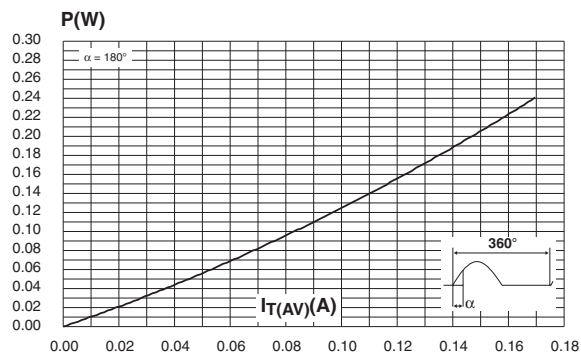


Figure 2: Average and D.C. on-state current versus case temperature

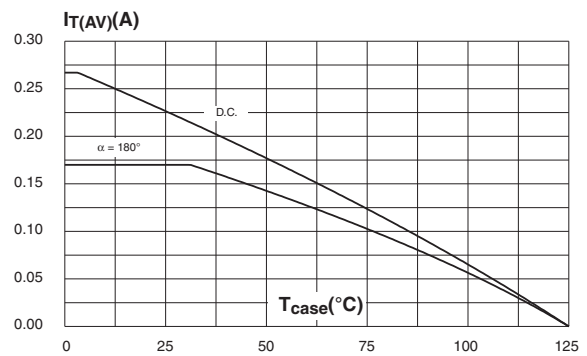


Figure 3: Relative variation of thermal impedance junction to ambient versus pulse duration

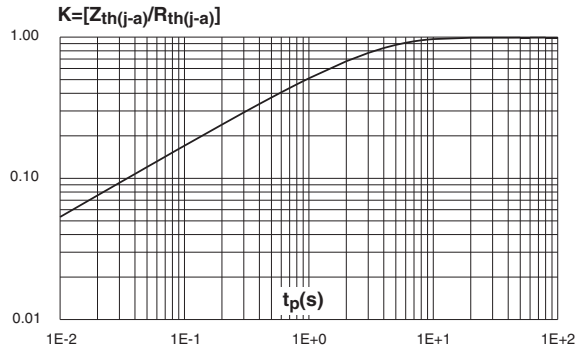


Figure 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

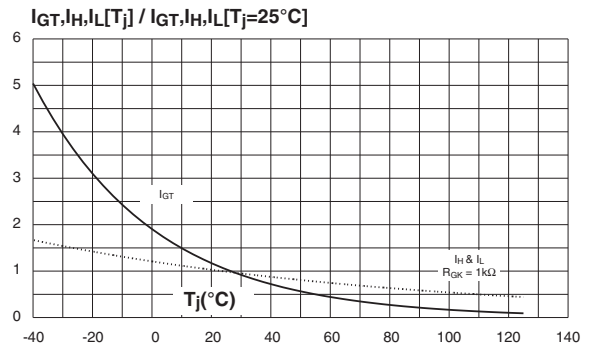


Figure 5: Relative variation of holding current versus gate-cathode resistance (typical values)

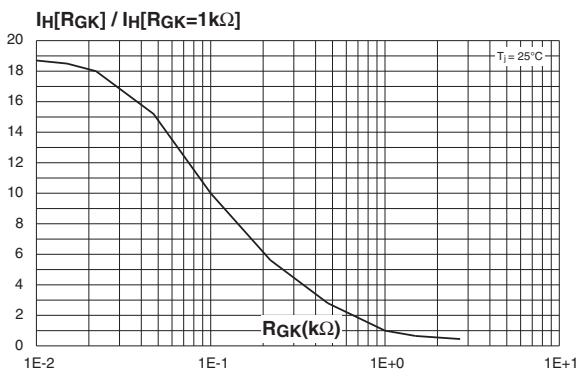


Figure 6: Relative variation of dV/dt immunity versus gate-cathode resistance (typical values)

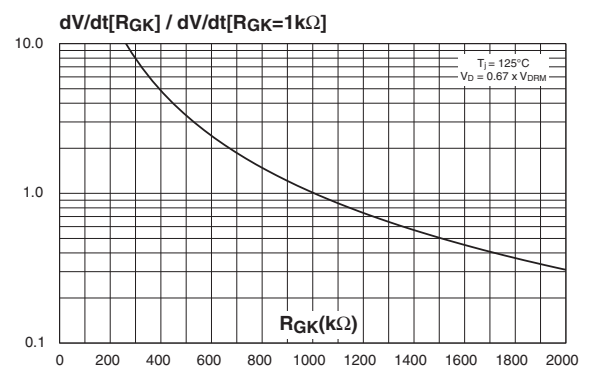


Figure 7: Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values)

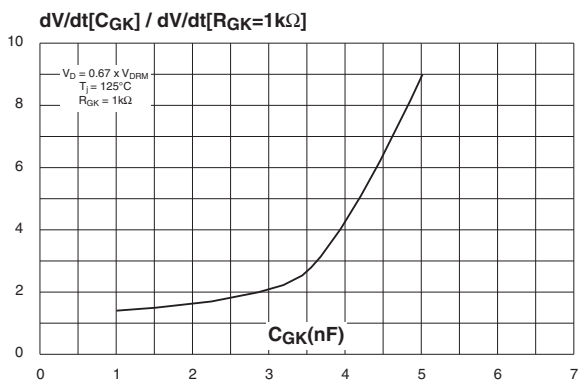


Figure 8: Surge peak on-state current versus number of cycles

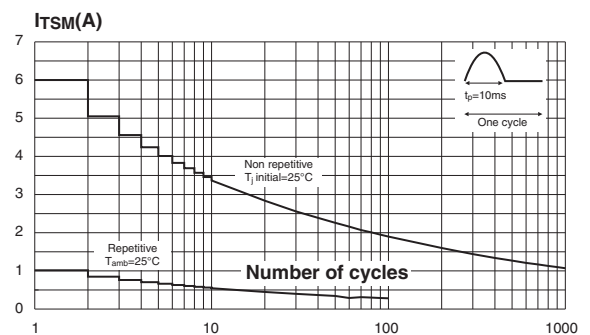


Figure 9: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t

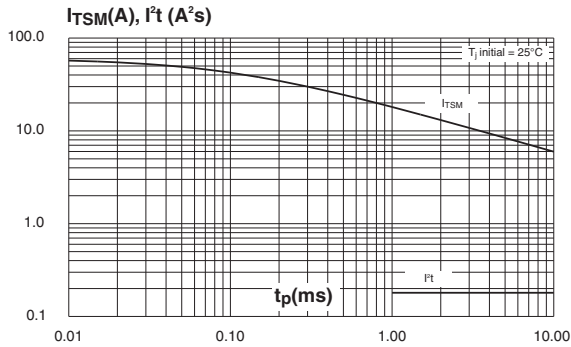


Figure 10: On-state characteristics (maximum values)

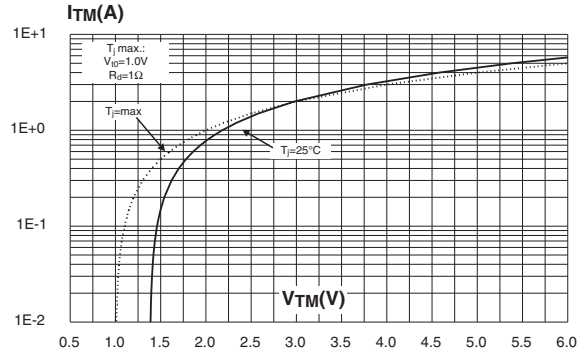


Figure 11: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 mm)

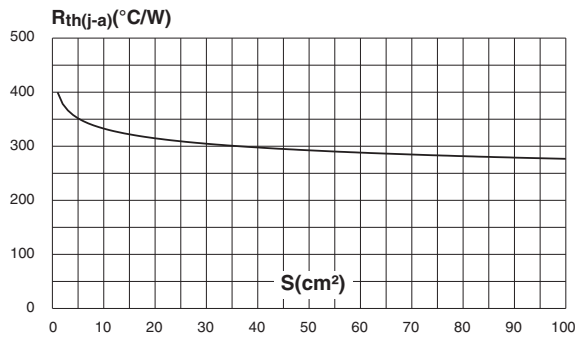


Figure 12: Ordering Information Scheme

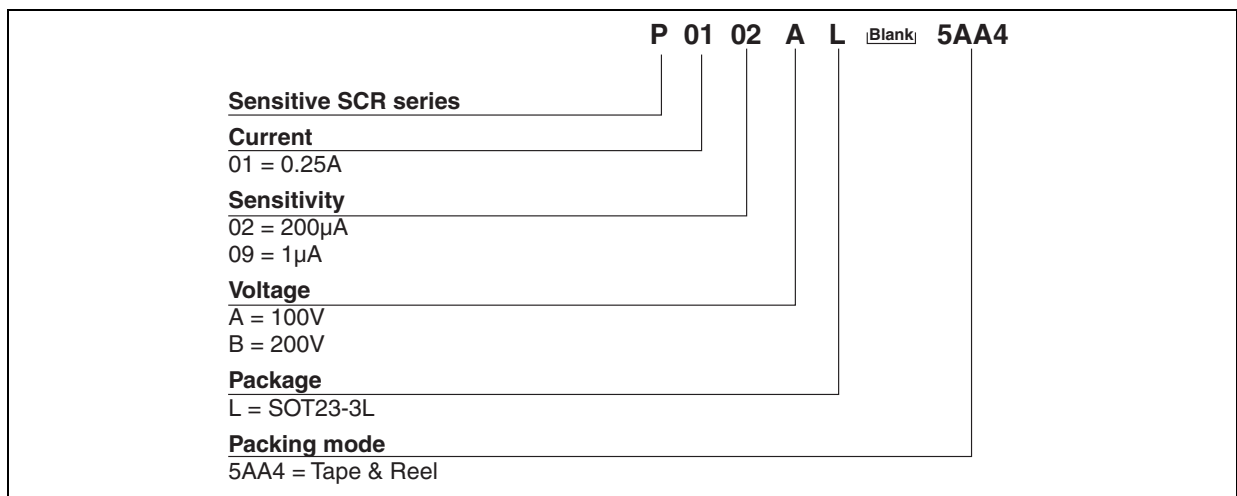


Table 6: Product Selector

Part Number	Voltage	Sensitivity	Package
P0102AL 5AA4	100 V	200 μ A	SOT23-3L
P0102BL 5AA4	200 V	200 μ A	
P0109AL 5AA4	100 V	1 μ A	

Figure 13: SOT23-3L Package Mechanical Data

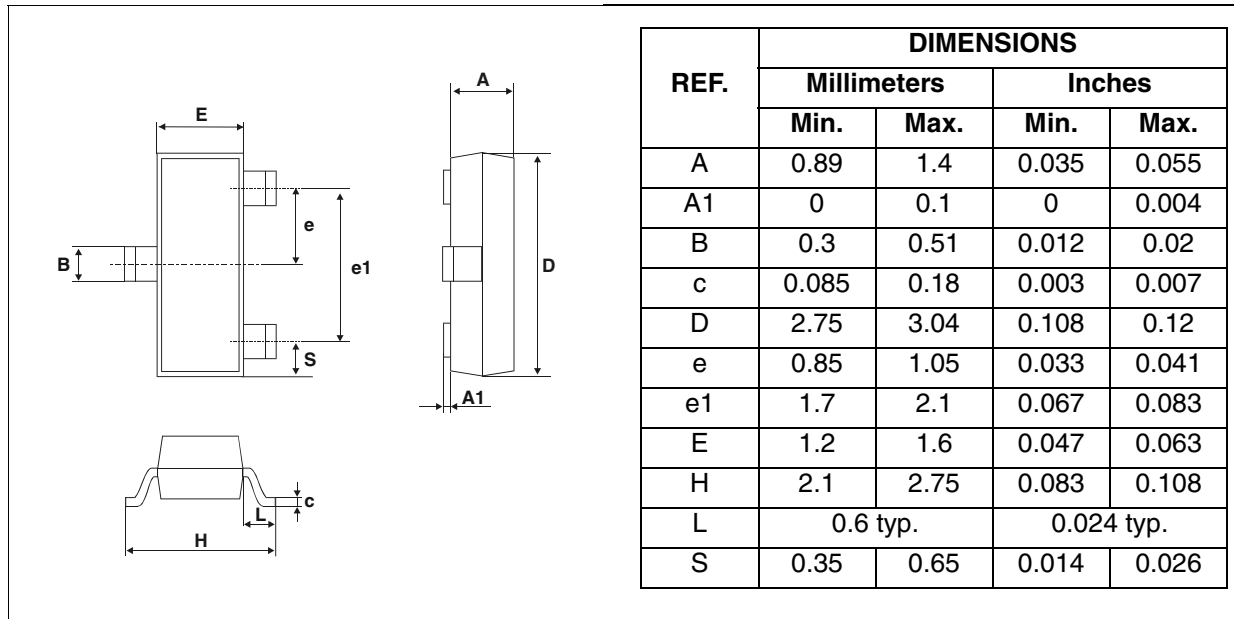
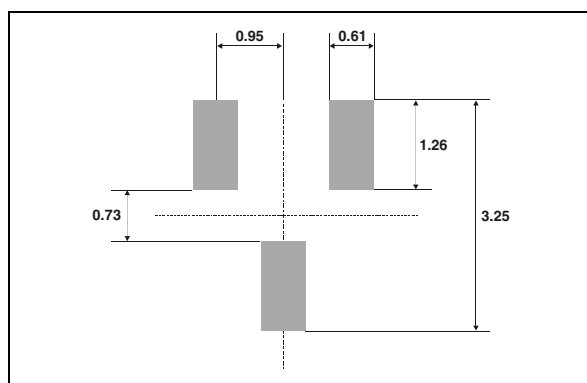


Figure 14: Foot Print Dimensions (in millimeters)



P01xxxL

Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
P0102AL 5AA4	P2A	SOT23-3L	0.01 g	3000	Tape & reel
P0102BL 5AA4	P2B				
P0109AL 5AA4	P9A				

Table 8: Revision History

Date	Revision	Description of Changes
Sep-2000	3	Last update.
11-Apr-2005	4	P0102AL and P0109AL added.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
All other names are the property of their respective owners

© 2005 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America
www.st.com

