

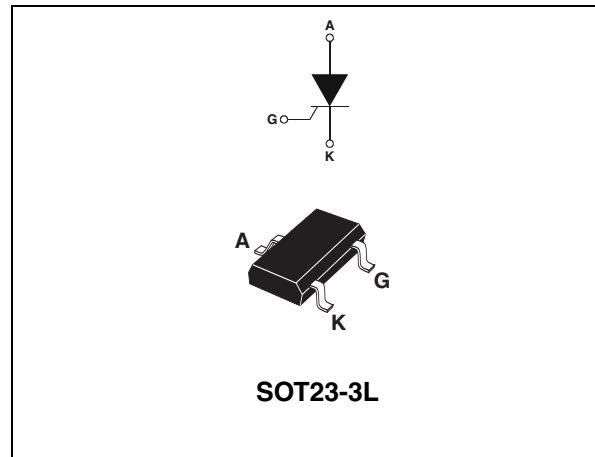
**Table 1: Main Features**

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

**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 A
$I^2t$	$I^2t$ Value for fusing	$t_p = 10 \text{ ms}$	$T_j = 25^{\circ}C$	0.18 A <sup>2</sup> s
$di/dt$	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 °C

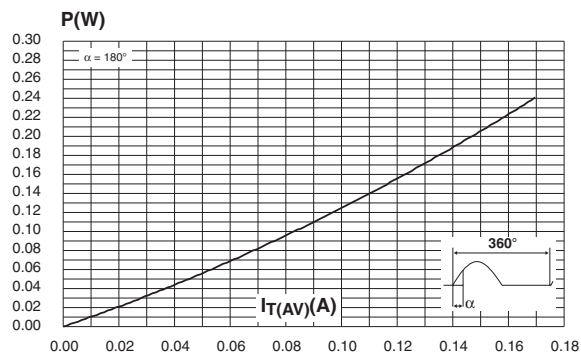
**Tables 4: Electrical Characteristics** ( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

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

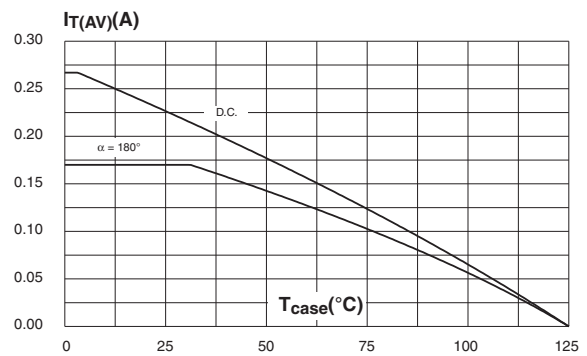
**Table 5: Thermal resistance**

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

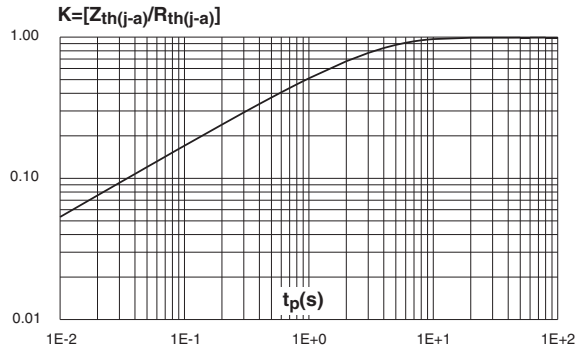
**Figure 1: Maximum average power dissipation versus average on-state current**



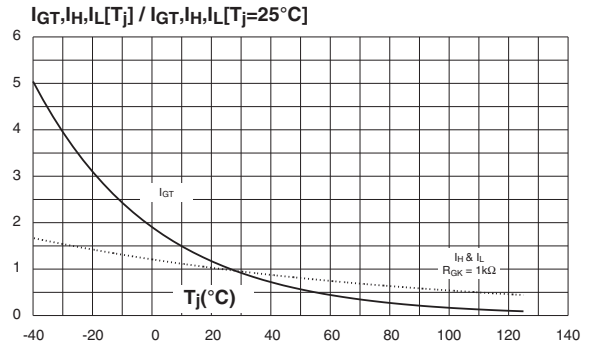
**Figure 2: Average and D.C. on-state current versus case temperature**



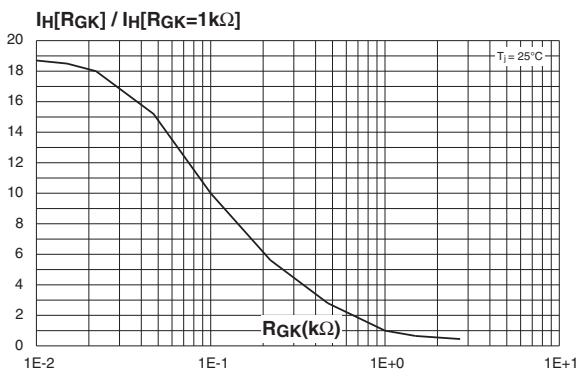
**Figure 3: Relative variation of thermal impedance junction to ambient versus pulse duration**



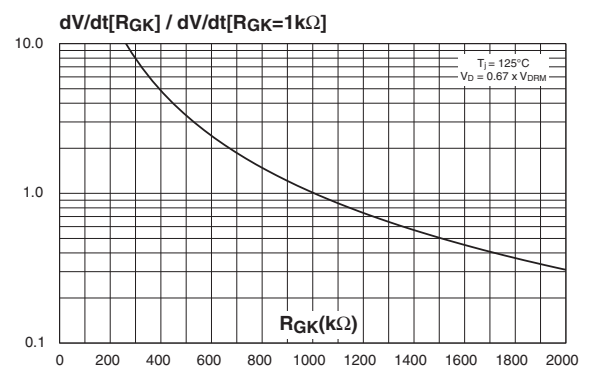
**Figure 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)**



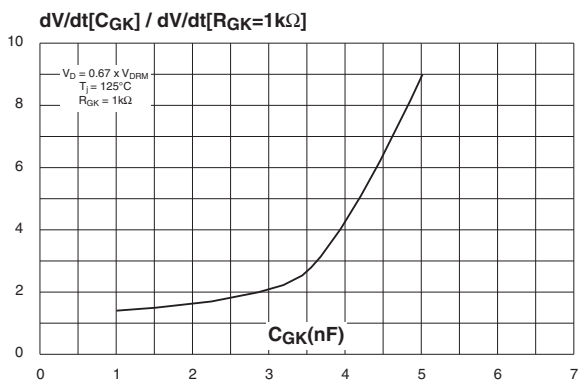
**Figure 5: Relative variation of holding current versus gate-cathode resistance (typical values)**



**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**

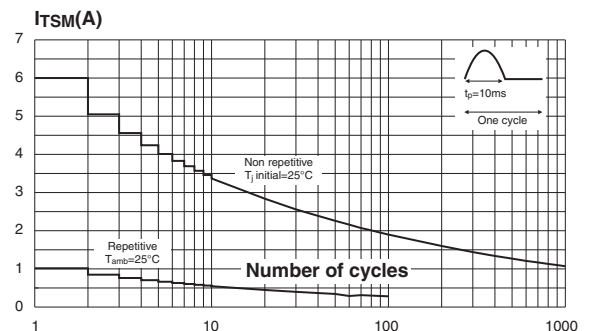


Figure 9: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$

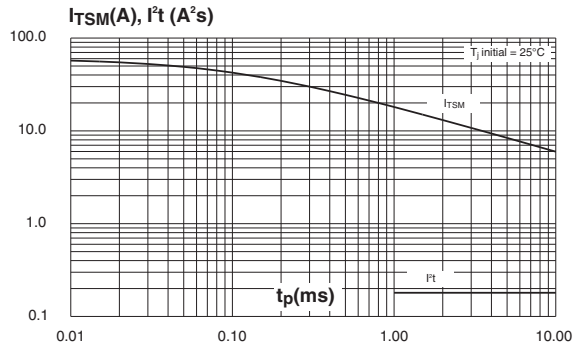


Figure 10: On-state characteristics (maximum values)

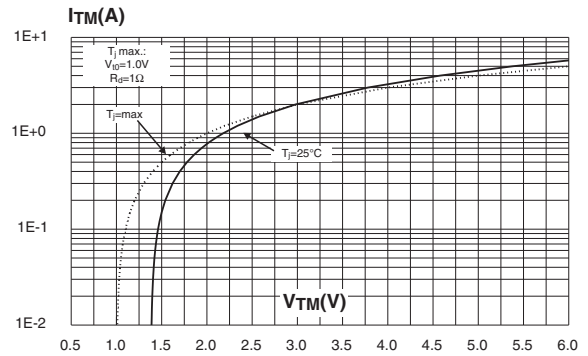


Figure 11: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 mm)

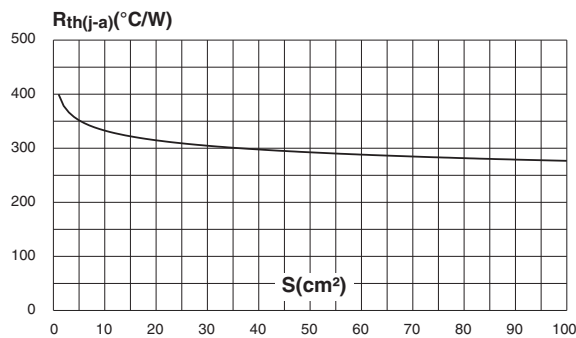
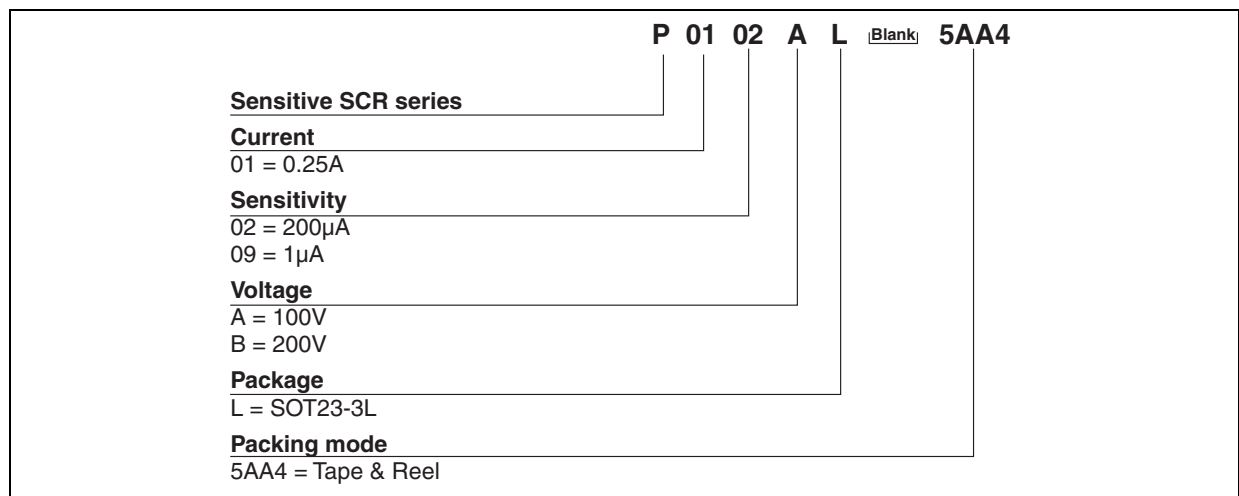


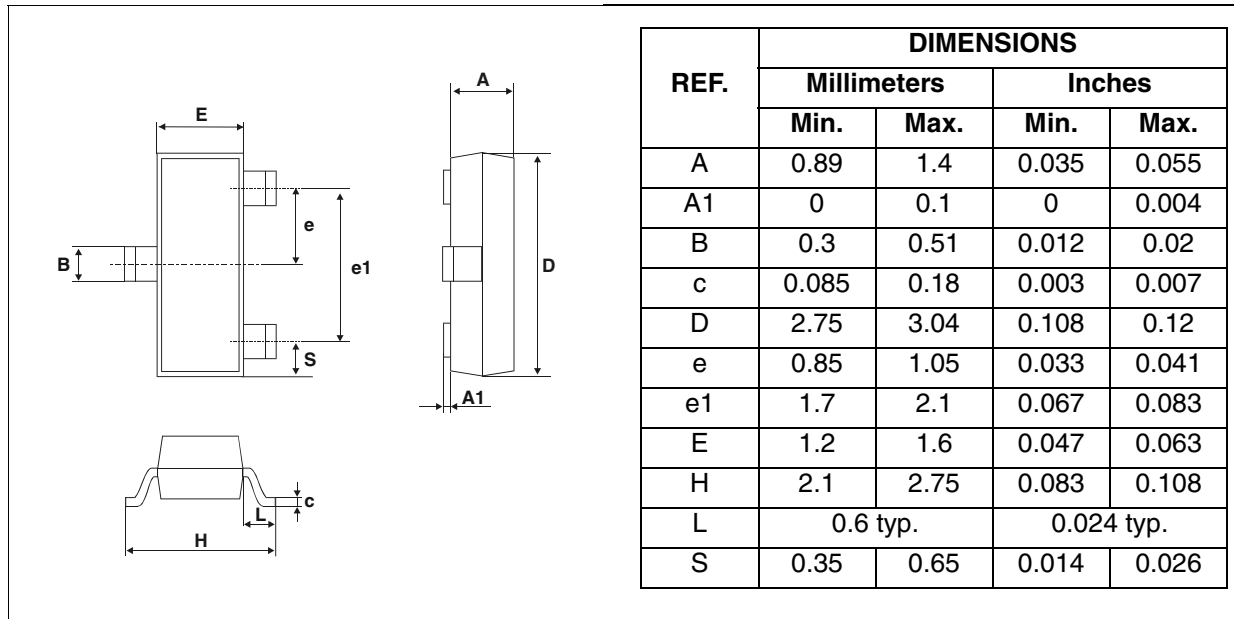
Figure 12: Ordering Information Scheme



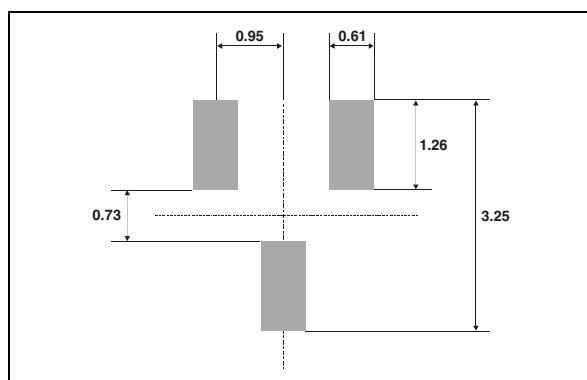
**Table 6: Product Selector**

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

**Figure 13: SOT23-3L Package Mechanical Data**



**Figure 14: Foot Print Dimensions (in millimeters)**



## P01xxxL

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**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.

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