

# 1 Characteristics

**Table 1. In compliance with the following standards**

Standard	Peak surge voltage (V)	Waveform voltage	Required peak current (A)	Current waveform	Minimum serial resistor to meet standard ( $\Omega$ )
GR-1089 Core First level	2500 1000	2/10 $\mu$ s 10/1000 $\mu$ s	500 100	2/10 $\mu$ s 10/1000 $\mu$ s	5 3.3
GR-1089 Core Second level	5000	2/10 $\mu$ s	500	2/10 $\mu$ s	10
GR-1089 Core Intra-building	1500	2/10 $\mu$ s	100	2/10 $\mu$ s	0
ITU-T-K20/K21	6000 1500	10/700 $\mu$ s	150 37.5	5/310 $\mu$ s	10 0
ITU-T-K20 (IEC61000-4-2)	8000 15000	1/60 ns	ESD contact discharge ESD air discharge		0 0
VDE0433	4000 2000	10/700 $\mu$ s	100 50	5/310 $\mu$ s	0 0
VDE0878	4000 2000	1.2/50 $\mu$ s	100 50	1/20 $\mu$ s	0 0
IEC61000-4-5	4000 4000	10/700 $\mu$ s 1.2/50 $\mu$ s	100 100	5/310 $\mu$ s 8/20 $\mu$ s	0 0
FCC Part 68, lightning surge type A	1500 800	10/160 $\mu$ s 10/560 $\mu$ s	200 100	10/160 $\mu$ s 10/560 $\mu$ s	2.5 0
FCC Part 68, lightning surge type B	1000	9/720 $\mu$ s	25	5/320 $\mu$ s	0

**Table 2. Absolute ratings ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

Symbol	Parameter		Value	Unit
$I_{PP}$	Repetitive peak pulse current	10/1000 $\mu\text{s}$ 8/20 $\mu\text{s}$ 10/560 $\mu\text{s}$ 5/310 $\mu\text{s}$ 10/160 $\mu\text{s}$ 1/20 $\mu\text{s}$ 2/10 $\mu\text{s}$	75 250 100 120 150 250 250	A
$I_{FS}$	Fail-safe mode : maximum current <sup>(1)</sup>	8/20 $\mu\text{s}$	5	kA
$I_{TSM}$	Non repetitive surge peak on-state current (sinusoidal)	t = 0.2 s t = 1 s t = 2 s t = 15 mn	14 8 6.5 2	A
$I^2t$	$I^2t$ value for using	t = 16.6 ms t = 20 ms	12 12.2	A <sup>2</sup> s
$T_{stg}$	Storage temperature range		-55 to + 150	$^{\circ}\text{C}$
$T_j$	Maximum junction temperature		150	$^{\circ}\text{C}$
$T_L$	Maximum lead temperature for soldering during 10 s.		260	$^{\circ}\text{C}$

1. In fail safe mode, the device acts as a short circuit.

**Table 3. Thermal resistances**

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient (with recommended footprint)	100	$^{\circ}\text{C}/\text{W}$
$R_{th(j-l)}$	Junction to leads	20	$^{\circ}\text{C}/\text{W}$

**Table 4. Electrical characteristics - definitions ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

Symbol	Parameter	
$V_{RM}$	Stand-off voltage	
$V_{BR}$	Breakdown voltage	
$V_{BO}$	Breakover voltage	
$I_{RM}$	Leakage current	
$I_{PP}$	Peak pulse current	
$I_{BO}$	Breakover current	
$I_H$	Holding current	
$V_R$	Continuous reverse voltage	
$I_R$	Leakage current at $V_R$	
$C$	Capacitance	

Table 5. Electrical characteristics - values ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )

Order code	$I_{RM} @ V_{RM}$		$I_R^{(1)} @ V_R$		Dynamic $V_{BO}$	Static $V_{BO} @ I_{BO}$		$I_H$	$C^{(2)}$
	max.		max.		max.	max.	max.	typ.	max.
	$\mu A$	V	$\mu A$	V	V	V	mA	mA	pF
SMP75-8	2	6	5	8	20	15	800	50	60

1.  $I_R$  measured at  $V_R$  guaranteed  $V_{BR} \min \geq V_R$

2.  $V_R = 2\text{ V}$  bias,  $V_{RMS} = 1\text{ V}$ ,  $F = 1\text{ MHz}$

Figure 2. Pulse waveform

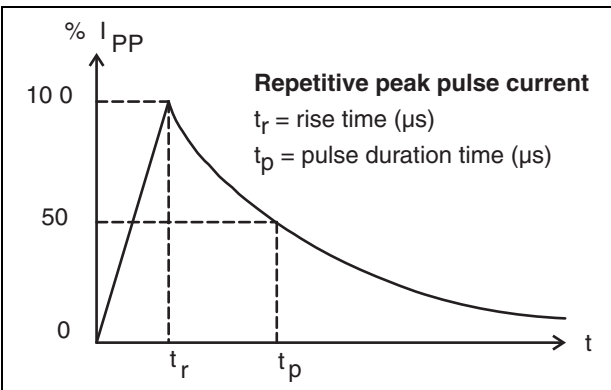


Figure 3. Non repetitive surge peak on-state current versus overload duration

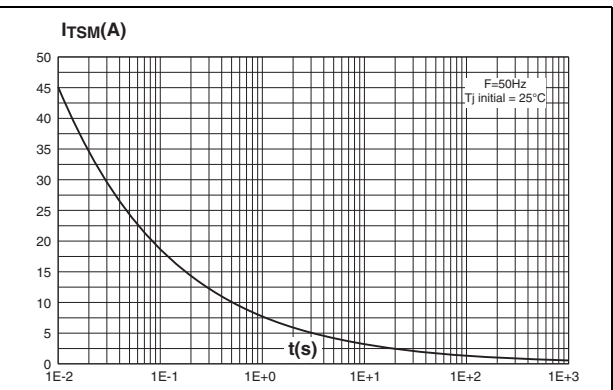


Figure 4. On-state voltage versus on-state current (typical values)

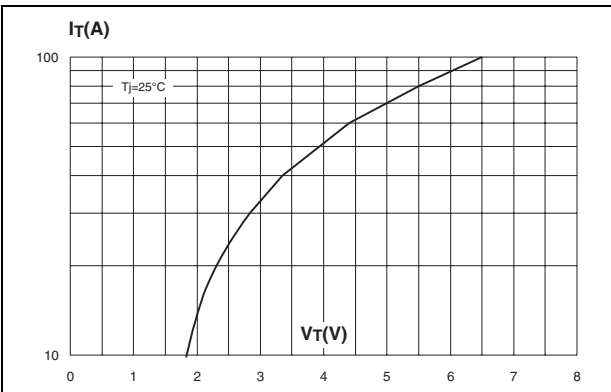


Figure 5. Relative variation of holding current versus junction temperature

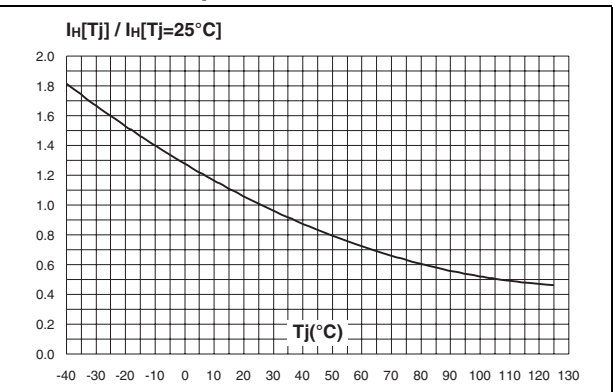


Figure 6. Relative variation of breakover voltage versus junction temperature

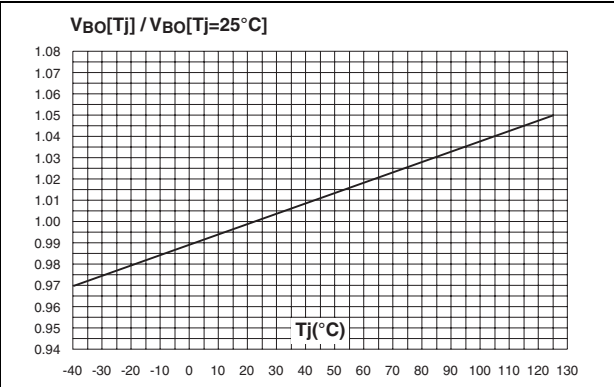


Figure 7. Relative variation of leakage current versus reverse voltage applied (typical values)

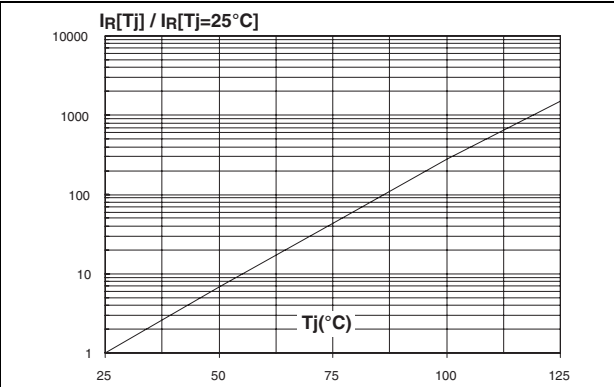


Figure 8. Variation of thermal impedance junction to ambient versus pulse duration

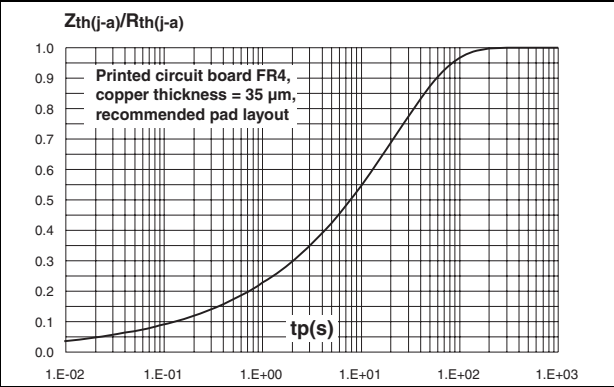
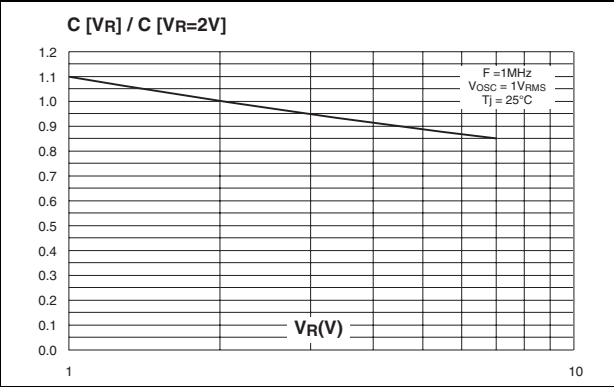
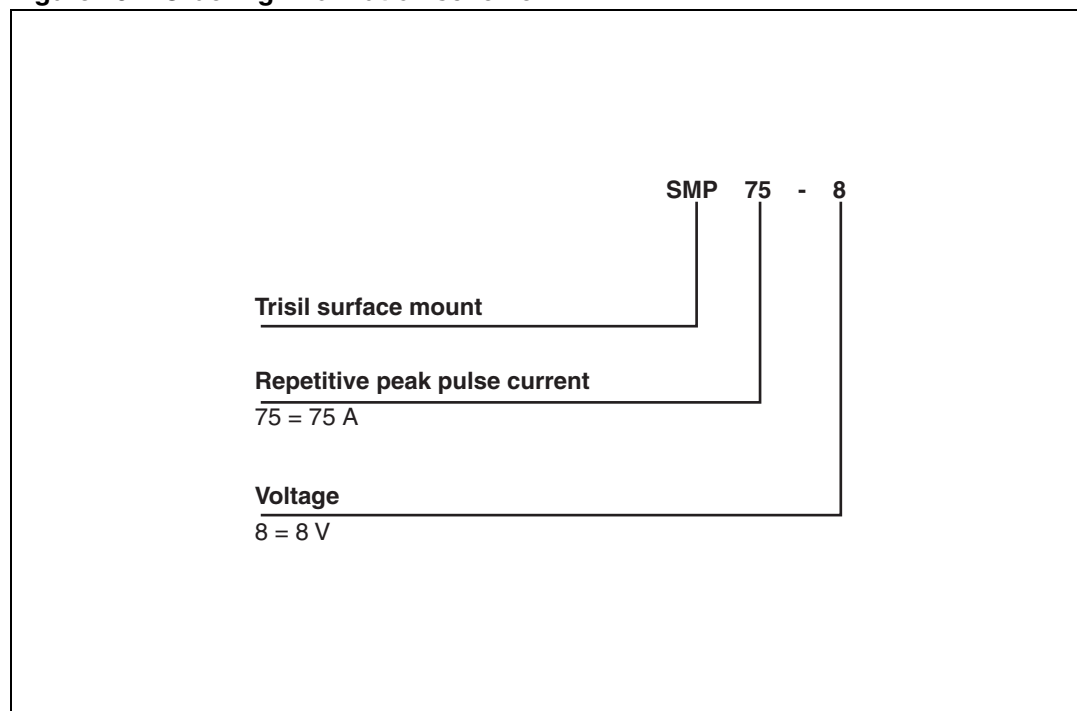


Figure 9. Relative variation of junction capacitance versus reverse voltage applied (typical values)



## 2 Ordering information scheme

Figure 10. Ordering information scheme



### 3 Package information

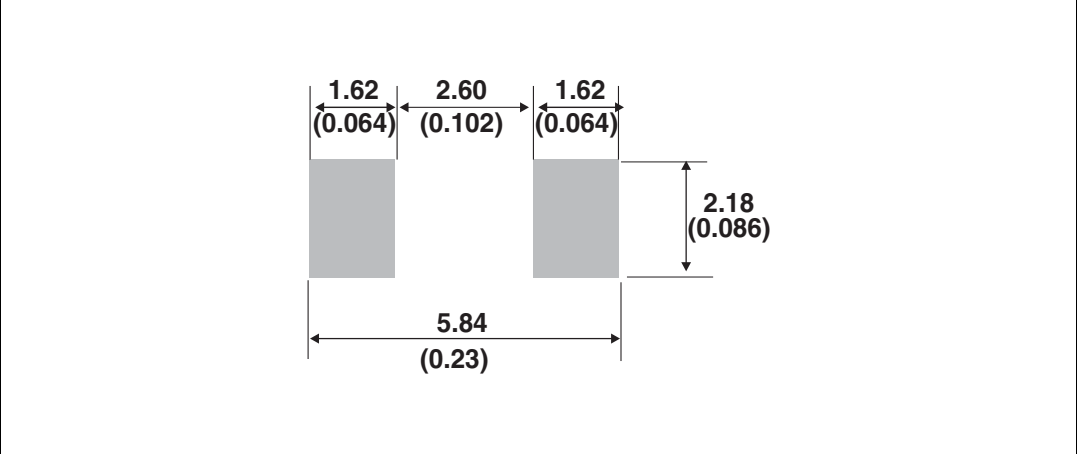
- Epoxy meets UL94, V0
- Lead-free package

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**Table 6. SMB Dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
D	3.30	3.95	0.130	0.156
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
L	0.75	1.50	0.030	0.059

**Figure 11. Footprint (dimensions in mm)**



## 4 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
SMP75-8	L08	SMB	0.11 g	2500	Tape and reel

## 5 Revision history

Table 8. Document revision history

Date	Revision	Changes
19-July-2005	3	Previous issue
02-Jan-2006	4	Added ECOPACK statement and changed page layout. Minor updates to technical values in Tables 1, 2, and 4.
19-Oct-2010	5	Updated ECOPACK statement. Updated trademark statement. Updated <a href="#">Figure 11</a> . Removed Section 2 Test circuits.

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