SGS-THOMSON MICROELECTRONICS

SMP100 Series

SURFACE MOUNT PRIMARY PROTECTION

MAIN APPLICATIONS

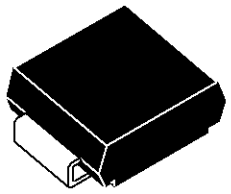
ANY SENSITIVE EQUIPMENT REQUIRING PROTECTION AGAINST LIGHTNING:

- ANALOG AND ISDN LINE CARDS
- MAIN DISTRIBUTION FRAMES
- ANY TERMINALS SUCH AS PHONES, FAX MACHINES AND MODEMS
- GAS-TUBES REPLACEMENT FOR PRIMARY PROTECTION

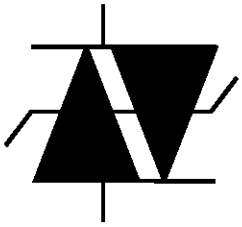
DESCRIPTION

The SMP100 series are transient surge arrestors used for primary protection in sensitive telecom equipments.

If destroyed by a surge exceeding the maximum ratings, the component will continue to guarantee a protection with a permanent short-circuit.



SMB
(Plastic)



FEATURES

- VOLTAGE RANGE SELECTED FOR TELECOM APPLICATIONS
- REPETITIVE PEAK PULSE CURRENT:
  I_{PP} = 100 A (10/1000 µs)
  I_{PP} = 500 A (2/10 µs)
- HIGH HOLDING CURRENT: I_H = 170 mA
- LOW CAPACITANCE: C = 150 pF max
- LOW LEAKAGE CURRENT: I_R = 5 µA max

BENEFITS

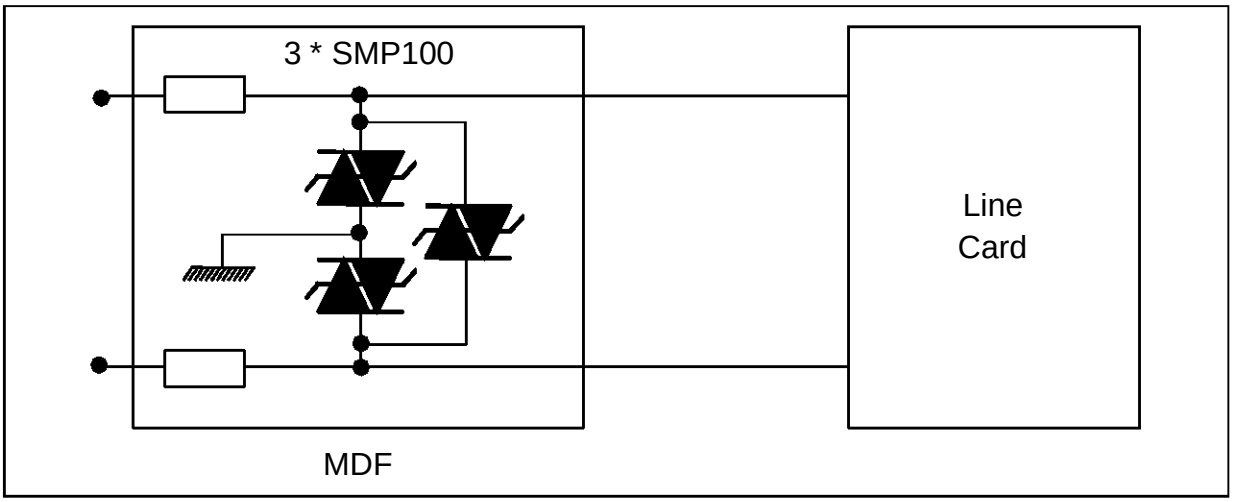
- GAS TUBES REPLACEMENT
- NO AGEING AND NO NOISE
- IF DESTROYED, THE SMP100 FAILS INTO A SHORT CIRCUIT, THUS STILL PROTECTING
- BOARD SPACE SAVING

COMPLIES WITH THE FOLLOWING STANDARDS :

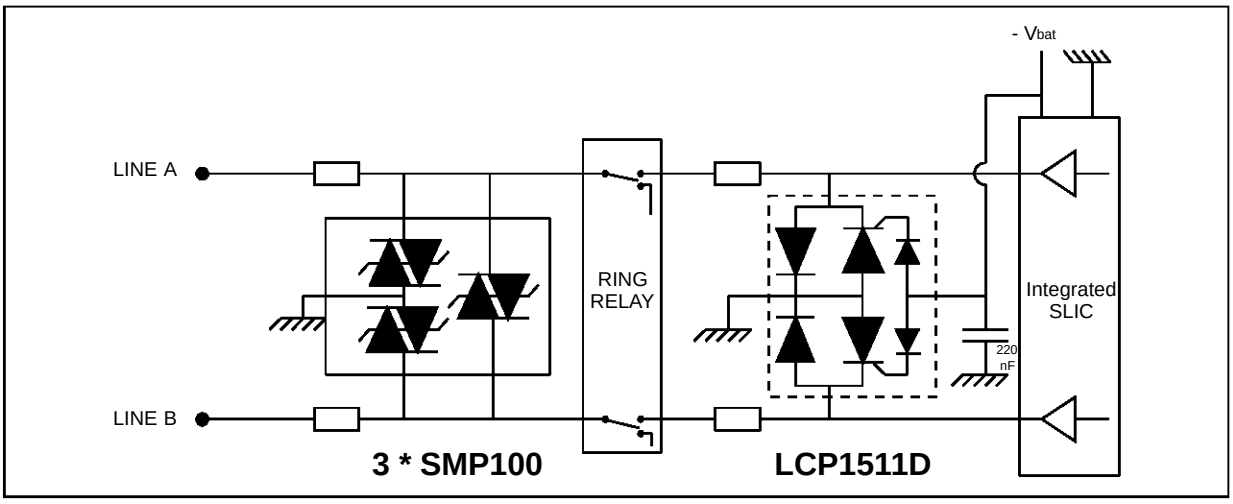
- BELLCORE TR-NWT-000974:	10/1000 µs 10/1000 µs	1 kV 100 A
- CCITT K20:	10/700 µs 5/310 µs	4 kV 100 A
- VDE 0433:	10/700 µs 5/310 µs	4 kV 100 A
- VDE 0878:	1.2/50 µs 1/20 µs	4 kV 100 A
- FCC Part 68:	2/10 µs	2.5 kV
- BELLCORE TR-NWT-001089:	2/10 µs	500 A

TYPICAL APPLICATIONS

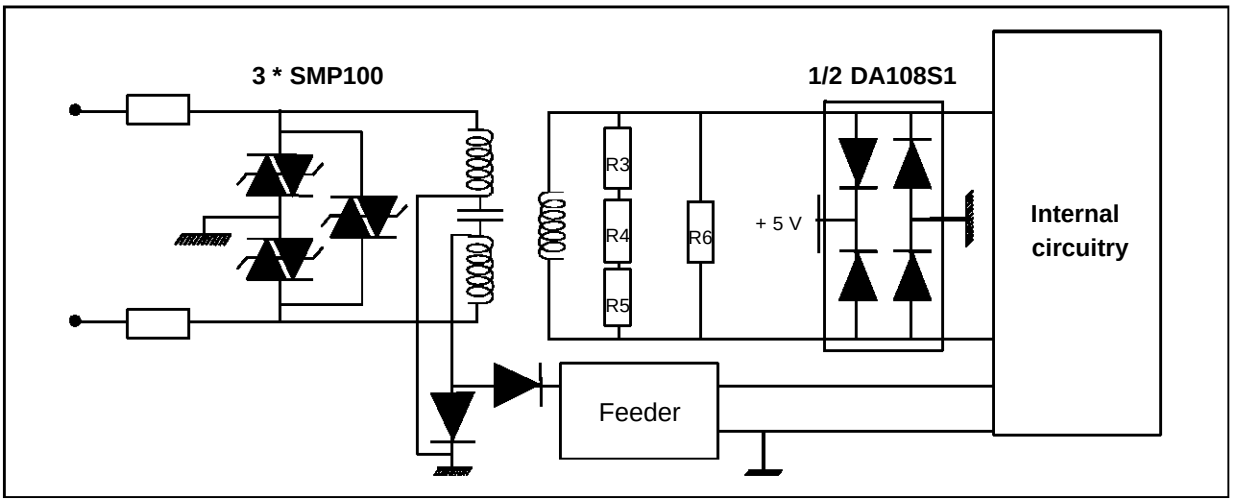
Primary protection module



Line card protection



ISDN: U interface protection

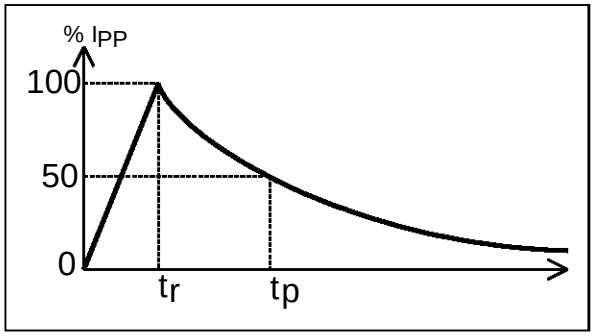


ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25°C, unless otherwise specified)

Symbol	Parameter		Value	Unit
I_{pp}	Peak pulse current: 10/1000 µs (open circuit voltage wave shape 10/1000 µs) 8/20 µs (open circuit voltage wave shape 4kV 1.2/50 µs) 5/310 µs (open circuit voltage wave shape 4kV 10/700 µs) 1/20 µs (open circuit voltage wave shape 4kV 1.2/50 µs) 2/10 µs (open circuit voltage wave shape 2/10 µs)		 100 100 100 100 500	 A A A A A
I_{FS}	Fail-safe mode: maximum current	8/20 µs	5	kA
I_{TSM}	Non repetitive surge peak on-state current One cycle	50Hz 60Hz	50 60	A A
	Non repetitive surge peak on-state current F = 50Hz	0.2s 2s	25 10	A A
T_l	Maximum lead temperature for soldering during 10s		260	°C
T_{stg} Tj	Storage temperature range Maximum junction temperature		- 55 to + 150 150	°C °C

Note 1: Pulse waveform

10 / 1000 µs	tr = 10 µs	tp = 1000 µs
8 / 20 µs	tr = 8 µs	tp = 20 µs
5 / 310 µs	tr = 5 µs	tp = 310 µs
1 / 20 µs	tr = 1 µs	tp = 20 µs
2 / 10 µs	tr = 2 µs	tp = 10 µs



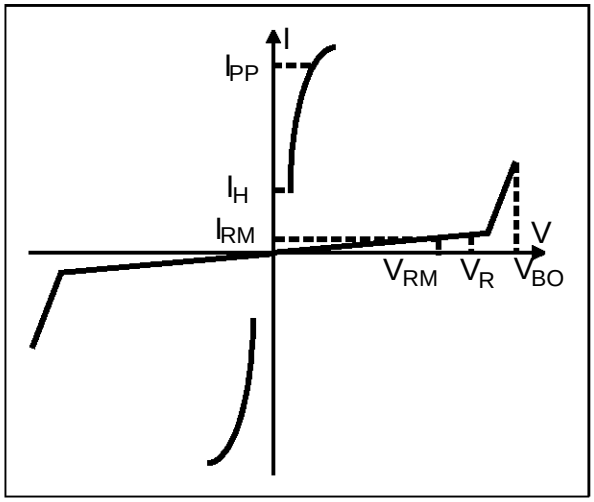
THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient on printed circuit (with standard footprint dimensions)	60	°C/W
$R_{th(j-l)}$	Junction to leads	25	°C/W

ELECTRICAL CHARACTERISTICS

(T_{amb}=25°C, unless otherwise specified)

Symbol	Parameter
V_{RM}	Stand-off voltage
V_R	Reverse voltage
V_{BO}	Breakover voltage
I_H	Holding current
I_{RM}	Leakage current at V_{RM}
I_{PP}	Peak pulse current
C	Capacitance



STATIC PARAMETERS

Type	I_{RM} @ V_{RM} max.		I_R @ V_R max.		V_{BO} max. note 1	I_H min. note 2	C max. note 3	C max. note 4
	µA	V	µA	V	V	mA	pF	pF
SMP100-65	5	55	50	65	80	170	200	85
SMP100-140	5	120	50	140	200	170	150	65
SMP100-200	5	170	50	200	265	170	150	65
SMP100-270	5	230	50	270	350	170	150	65

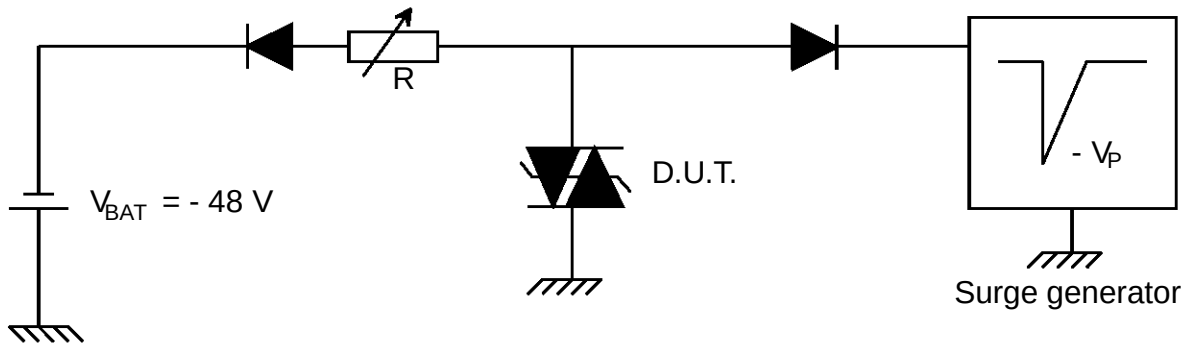
Note 1 : Measured at 50Hz.
Note 2 : See functional holding current test circuit.
Note 3 : V_R=0V bias, V_{RMS}=1V, F=1MHz.
Note 4 : V_R=50V bias, V_{RMS}=1V, F=1MHz.

DYNAMIC PARAMETERS

Symbol	Type	Test conditions (see note 1)	Maximum	Unit
V_{BO}	SMP100-65	V_{RISE} = 100 V/µs, di/dt < 10 A/µs, I_{PP} = 100 A V_{RISE} = 1 kV/µs, di/dt < 10 A/µs, I_{PP} = 10 A	95 95	V V
	SMP100-140	V_{RISE} = 100 V/µs, di/dt < 10 A/µs, I_{PP} = 100 A V_{RISE} = 1 kV/µs, di/dt < 10 A/µs, I_{PP} = 10 A	230 230	V V
	SMP100-200	V_{RISE} = 100 V/µs, di/dt < 10 A/µs, I_{PP} = 100 A V_{RISE} = 1 kV/µs, di/dt < 10 A/µs, I_{PP} = 10 A	280 280	V V
	SMP100-270	V_{RISE} = 100 V/µs, di/dt < 10 A/µs, I_{PP} = 100 A V_{RISE} = 1 kV/µs, di/dt < 10 A/µs, I_{PP} = 10 A	370 370	V V

Note 1: V_{BO} parameters are given by a KeyTek 'System 2' generator with PN2461 module.
See test circuits for V_{BO} dynamic parameters.

FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT : GO-NO GO TEST



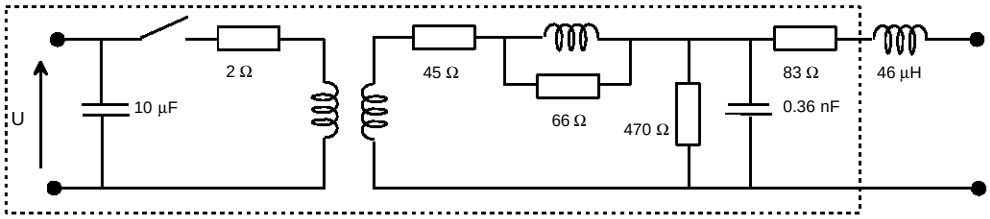
This is a GO-NO GO test which allows to confirm the holding current (I_H) level in a functional test circuit.

TEST PROCEDURE :

- Adjust the current level at the I_H value by short circuiting the D.U.T.
- Fire the D.U.T. with a surge current : I_{pp} = 10A, 10/1000 µs.
- The D.U.T. will come back to the OFF-state within a duration of 50 ms max.

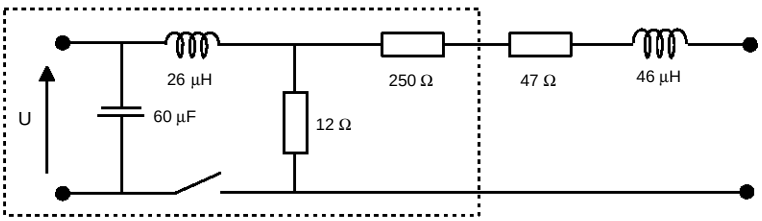
TEST CIRCUITS FOR V_{BO} DYNAMIC PARAMETERS

100 V / µs, di/dt < 10 A / µs, Ipp = 100 A



KeyTek 'System 2' generator with PN246I module

1 kV / µs, di/dt < 10 A / µs, Ipp = 10 A



KeyTek 'System 2' generator with PN246I module

Fig. 1: Maximum non repetitive surge peak on-state current.

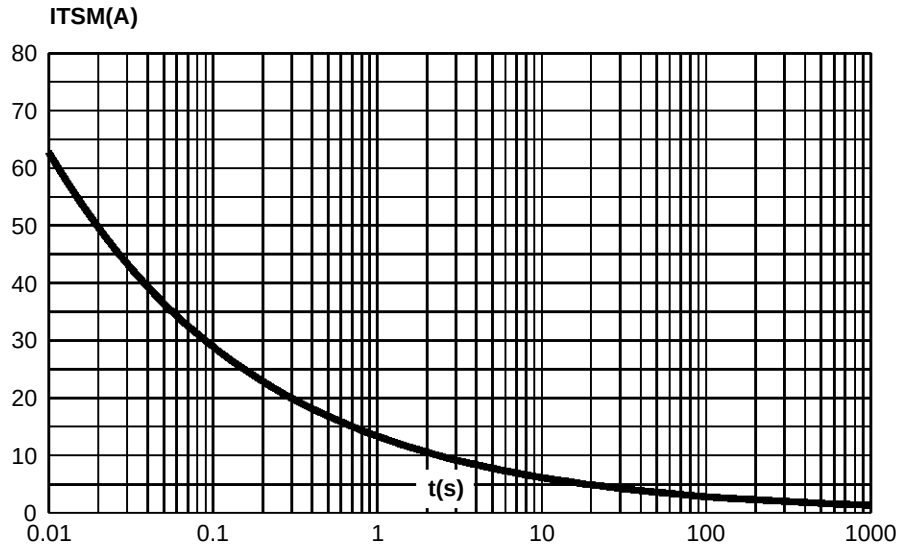
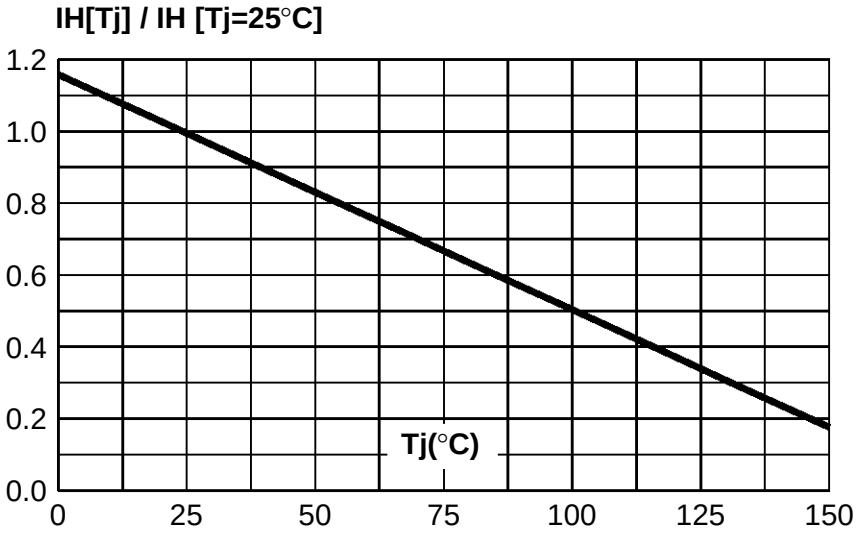


Fig. 2: Relative variation of holding current I_H versus temperature (typical values).

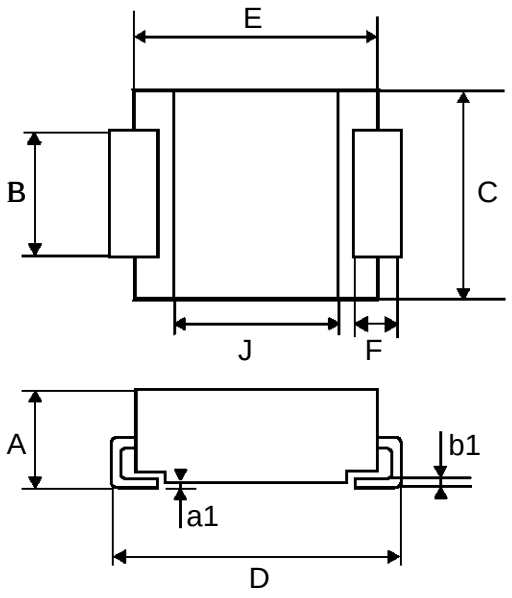


MARKING

Package	Type	Marking
SMB	SMP100-65 SMP100-140 SMP100-200 SMP100-270	P06 P14 P20 P27

PACKAGE MECHANICAL DATA

SMB (Plastic)



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.33	2.41	0.092	0.095
a1	0.1	0.2	0.004	0.008
B	1.96	2.11	0.077	0.083
b1	0.25	0.35	0.010	0.014
C	3.65	3.93	0.143	0.155
D	5.39	5.59	0.212	0.220
E	4.15	4.3	0.163	0.170
F	1	1.27	0.039	0.050
J	2.05	2.13	0.080	0.084