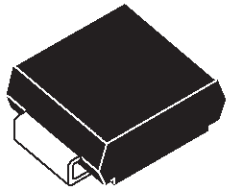
SMP100-xxx

COMMUNICATION EQUIPMENT PROTECTION: TRISIL TM

FEATURES

- BIDIRECTIONAL CROWBAR PROTECTION
- VOLTAGE RANGE : FROM 8V to 270V
- REPETITIVE PEAK PULSE CURRENT: I_{PP} = 100 A (10/1000 µs)
- HOLDING CURRENT: I_H = 150mA or 225mA
- LOW LEAKAGE CURRENT: I_R = 2 µA max



SMB
(JEDEC DO-214AA)

DESCRIPTION

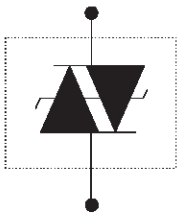
The SMP100 series are transient surge arrestors used for the protection of sensitive telecom equipment.

MAIN APPLICATIONS

Any sensitive equipment requiring protection against lightning strikes :

- ANALOG AND DIGITAL LINE CARDS
- MAIN DISTRIBUTION FRAMES
- TERMINALS AND TRANSMISSION EQUIPMENT
- GAS-TUBE REPLACEMENT

SCHEMATIC DIAGRAM



BENEFITS

- NO AGEING AND NO NOISE
- IF DESTROYED, THE SMP100 FALLS INTO SHORT CIRCUIT, STILL ENSURING PROTECTION
- BOARD SPACE SAVING

COMPLIES WITH THE FOLLOWING STANDARDS:	Peak Surge Voltage (V)	Voltage Waveform (µs)	Current Waveform (µs)	Admissible Ipp (A)	Necessary Resistor (Ω)
ITU K20	4000	10/700	5/310	100	-
VDE0433	4000	10/700	5/310	100	-
VDE0878	4000	1.2/50	1/20	100	-
IEC-1000-4-5	level 4 level 4	10/700 1.2/50	5/310 8/20	100 100	- -
FCC Part 68, lightning surge type A	1500 800	10/160 10/560	10/160 10/560	200 100	- -
FCC Part 68, lightning surge type B	100	9/720	5/320	25	-
BELLCORE TR-NWT-001089 First level	2500 1000	2/10 10/1000	2/10 10/1000	500 100	- -
BELLCORE TR-NWT-001089 Second level	5000	2/10	2/10	500	-
CNET I31-24	4000	0.5/700	0.8/310	100	-

THERMAL RESISTANCES

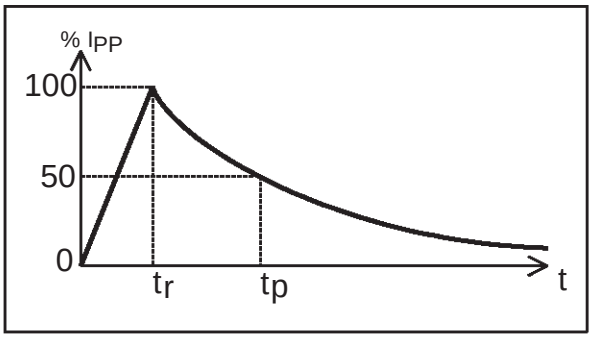
Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads	20	°C/W
$R_{th(j-a)}$	Junction to ambient on printed circuit (with standard footprint dimensions)	100	°C/W

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25°C)

Symbol	Parameter		Value	Unit
I_{pp}	Peak pulse current: 10/1000 µs (open circuit voltage waveform 1 kV 10/1000 µs) 5/310µs (open circuit voltage waveform 4 kV, 10/700µs) 8/20 µs (open circuit voltage waveform 4 kV 1.2/50 µs) 2/10 µs (open circuit voltage waveform 2.5kV 2/10 µs)		100 150 250 500	A A A A
I_{FS}	Fail-safe mode	8/20 µs	5	kA
I_{TSM}	Non repetitive surge peak on-state current One cycle	50Hz 60Hz	55 60	A A
	Non repetitive surge peak on-state current F = 50Hz	0.2s 2s	25 12	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

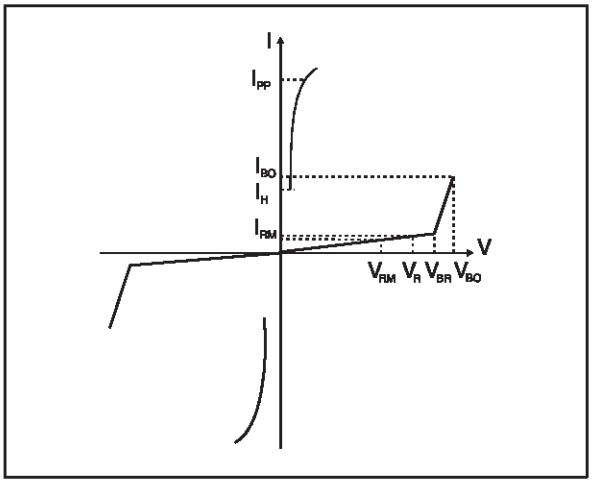
Note 1: Pulse waveform

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



ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C)

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



STATIC PARAMETERS

Type	I_{RM} @ V_{RM} max.		I_R @ V_R max. note 1		V_{BO} @ I_{BO} max. note 2		I_H min. note 3	C typ. note 4
	µA	V	µA	V	V	mA	mA	pF
SMP100-8	2	6	50	8	20	800	50(typ)	100
SMP100LC-35	2	32	50	35	55	800	150	90
SMP100-65	2	55	50	65	80	800	150	160
SMP100-120	2	110	50	120	160	800	150	140
SMP100-140	2	120	50	140	200	800	150	140
SMP100-200	2	170	50	200	265	800	150	130
SMP100-230	2	200	50	230	300	800	150	120
SMP100-270	2	230	50	270	350	800	150	120
SMP100-140H225	2	120	50	140	200	800	225	140
SMP100-200H225	2	170	50	200	265	800	225	130
SMP100-230H225	2	200	50	230	300	800	225	130
SMP100-270H225	2	230	50	270	350	800	225	120

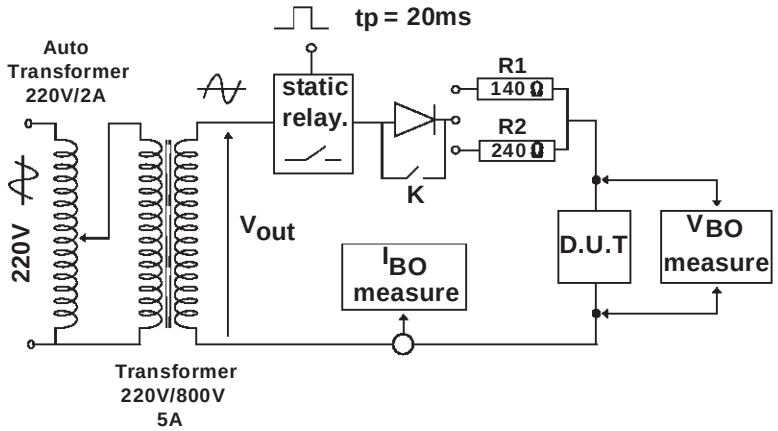
Note 1 : I_R measured at V_R guarantees V_{BR}>V_R
Note 2 : Measured at 50Hz, see test circuit 1. In any case $V_{BOmin} \geq V_{BR}$
Note 3 : See functional holding current test circuit 2.
Note 4 : V_R=1V bias, V_{RMS}=1V, F=1MHz.

DYNAMIC PARAMETERS

Symbol	Test conditions (see note 5)	Type	Max.	Unit
V_{BO}	**Test conditions 1** dV/dt = 100 V/µs, di/dt < 10 A/µs, I_{PP} = 100 A **Test conditions 2** dV/dt = 1 kV/µs, di/dt < 10 A/µs, I_{PP} = 10 A	SMP100-8	25	V
		SMP100LC-35	55	
		SMP100-65	95	
		SMP100-120	200	
		SMP100-140	220	
		SMP100-200	285	
		SMP100-230	320	
		SMP100-270	370	
		SMP100-140H225	220	
		SMP100-200H225	285	
		SMP100-230H225	320	
		SMP100-270H225	370	

Note 5 : V_{BO} parameters are given by a KeyTek 'System 2' generator with PN246I module.
See test circuits 3 for V_{BO} dynamic parameters.

TEST CIRCUIT 1 FOR I_{BO} and V_{BO} parameters :

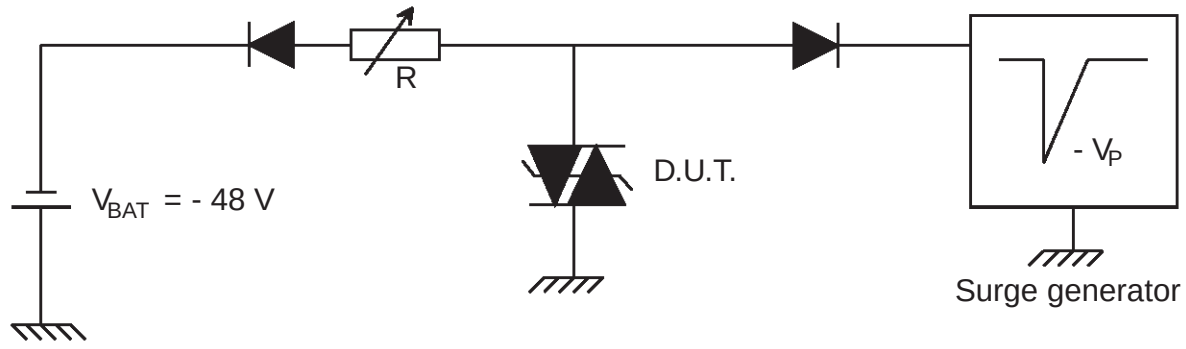


TEST PROCEDURE :

Pulse Test duration (tp = 20ms):
- For Bidirectional devices = Switch K is closed
- For Unidirectional devices = Switch K is open.

V_{OUT} Selection
- Device with V_{BO} < 200 Volt
  - V_{OUT} = 250 V_{RMS}, R_1 = 140 Ω.
- Device with V_{BO} ≥ 200 Volt
  - V_{OUT} = 480 V_{RMS}, R_2 = 240 Ω.

TEST CIRCUIT 2 for I_H parameter.



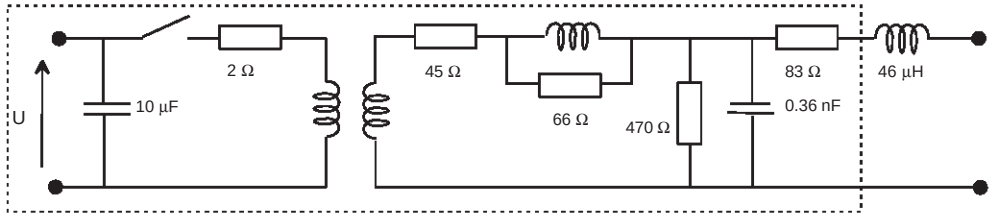
This is a GO-NO GO test which allows to confirm the holding current (I_H) level in a functional test circuit.

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 50 ms max.

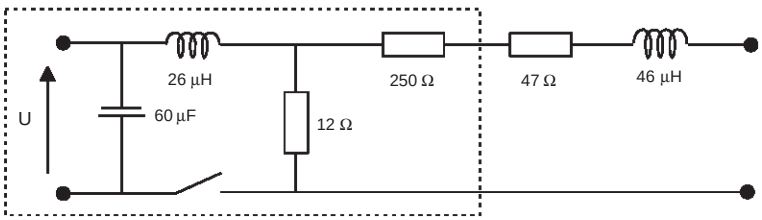
TEST CIRCUITS 3 FOR V_{BO} DYNAMIC PARAMETERS

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



KeyTek 'System 2' generator with PN246I module

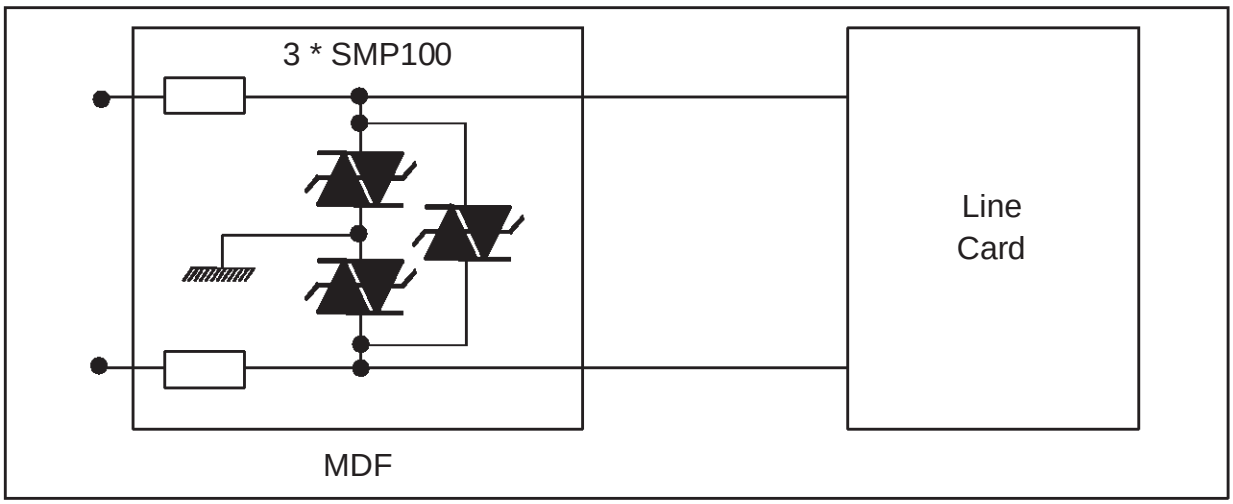
1 kV / µs, di/dt < 10 A / µs, Ipp = 10 A



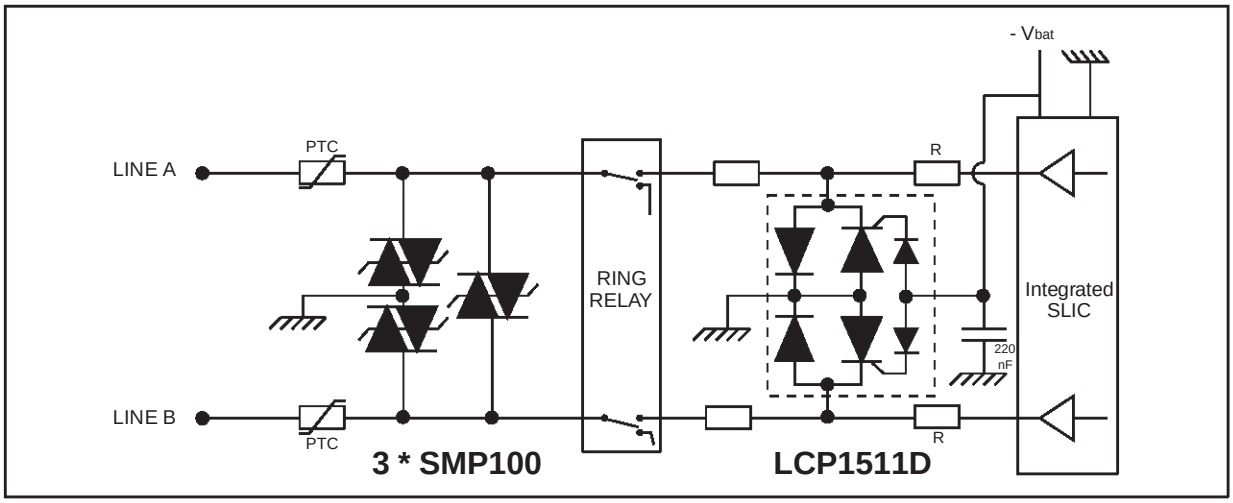
KeyTek 'System 2' generator with PN246I module

TYPICAL APPLICATIONS

1 - Primary protection module



2 - Line card protection



3 - ISDN: U interface protection

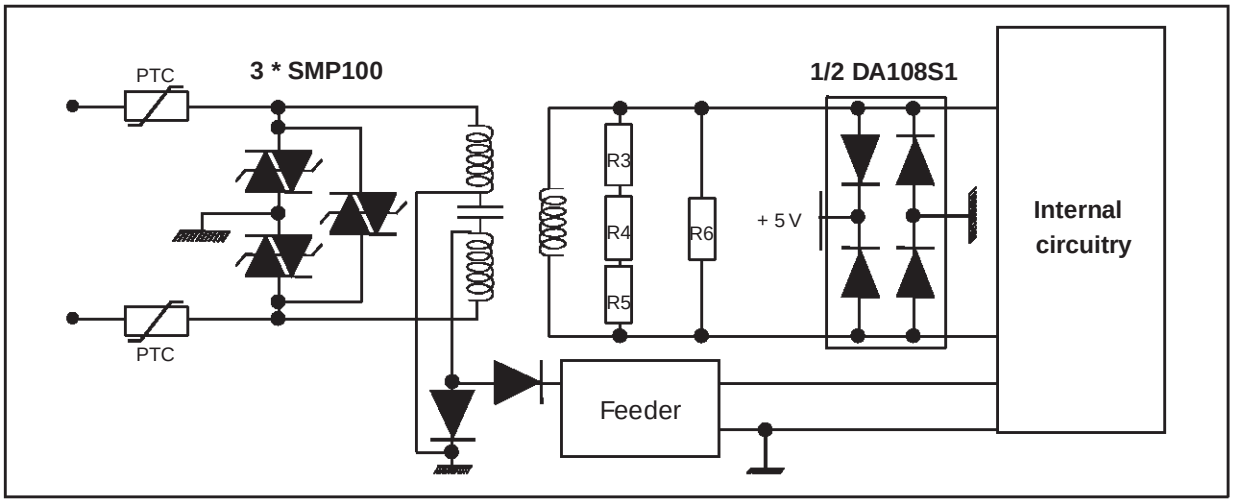


Fig 1 : Non repetitive surge peak on-state current versus overload duration (T_j initial = 25 °C).

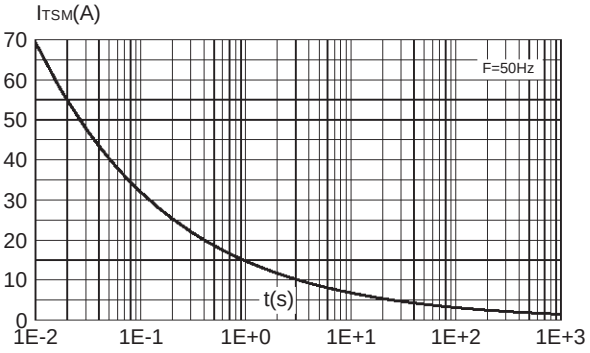


Fig 2 : On-state voltage versus on-state current (typical values).

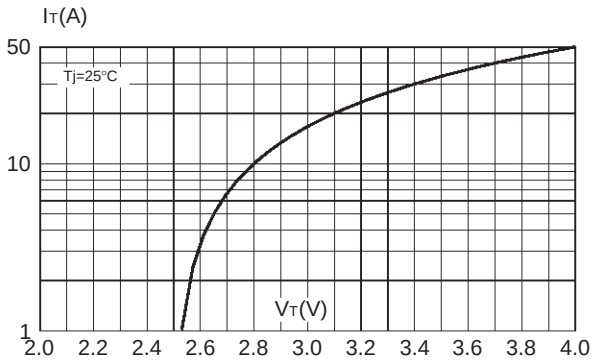


Fig 3 : Relative variation of holding current versus junction temperature.

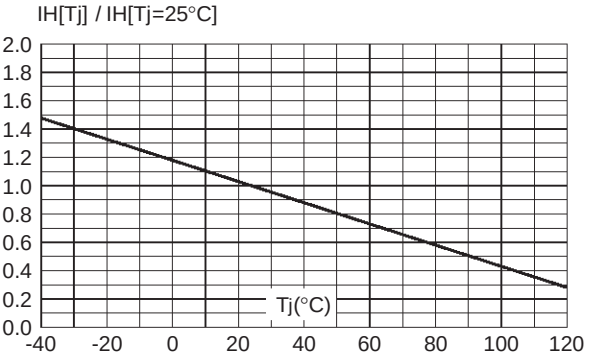


Fig 4 : Variation of thermal impedance junction to ambient versus pulse duration.

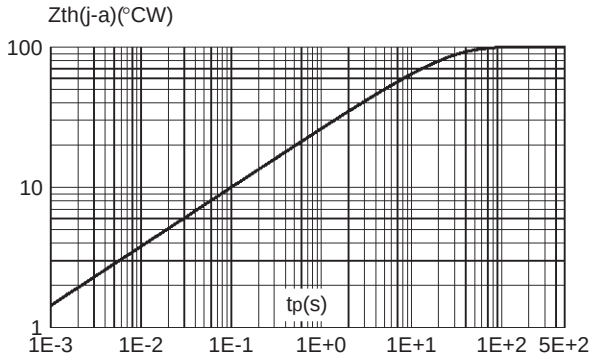
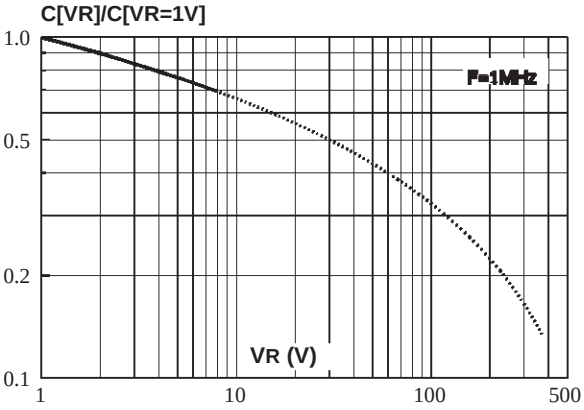


Fig 5 : Relative variation of junction capacitance versus reverse voltage applied (typical values).

Note : For other types than SMP100-8, the curve can be extrapolated (dotted line)

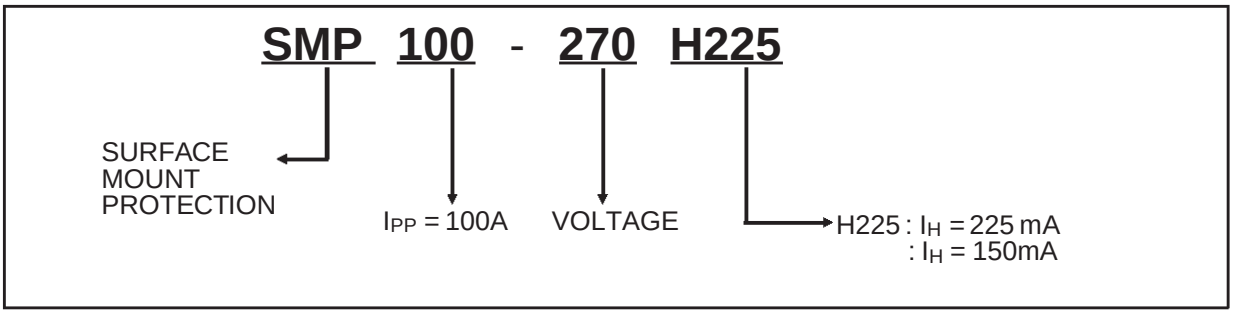


MARKING

Type	Marking	Package	Weight	Base qty	Delivery mode
SMP100-8	PL8	SMB	0.107g	2500	Tape & Reel
SMP100LC-35	L35	SMB	0.107g	2500	Tape & Reel
SMP100-65	P06	SMB	0.107g	2500	Tape & Reel
SMP100-120	P12	SMB	0.107g	2500	Tape & Reel
SMP100-140	P14	SMB	0.107g	2500	Tape & Reel
SMP100-200	P20	SMB	0.107g	2500	Tape & Reel
SMP100-230	P23	SMB	0.107g	2500	Tape & Reel
SMP100-270	P27	SMB	0.107g	2500	Tape & Reel
SMP100-140H125	P16	SMB	0.107g	2500	Tape & Reel
SMP100-200H225	P22	SMB	0.107g	2500	Tape & Reel
SMP100-230H225	P24	SMB	0.107g	2500	Tape & Reel
SMP100-270H225	P29	SMB	0.107g	2500	Tape & Reel

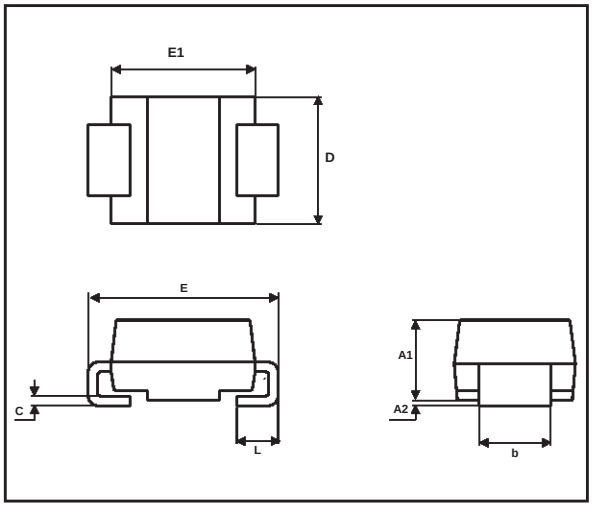
■ Epoxy meets UL94, V0

ORDER CODE



PACKAGE MECHANICAL DATA

SMB (Plastic)



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	0.41	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.60	0.030	0.063

FOOT PRINT (in millimeters)