

SMP50-xxx

TELECOM EQUIPMENT PROTECTION: TRISIL™

FEATURES

- Bidirectional crowbar protection
- Voltage range from 62V to 270V
- Low capacitance from 15pF to 30pF typ. @ 50V
- Low leakage current: $I_R = 2\mu\text{A max.}$
- Holding current: $I_H = 150\text{ mA min.}$
- Repetitive peak pulse current:
 $I_{PP} = 50\text{ A (10/1000 }\mu\text{s)}$

MAIN APPLICATIONS

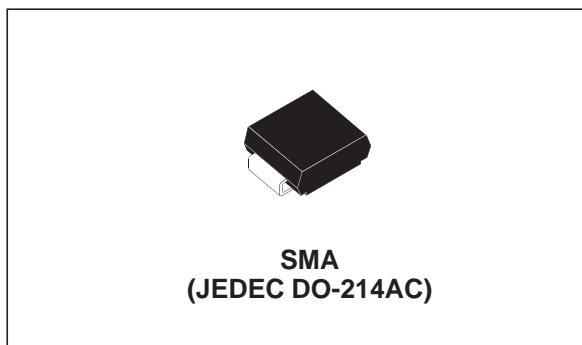
Telecommunication equipment such as

- Analog and digital line cards (xDSL, T1/E1, ISDN...).
- Terminals (phone, fax, modem...) and central office equipment.

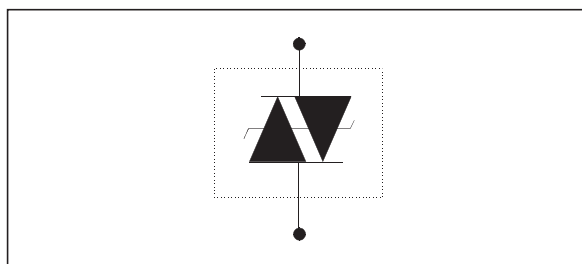
DESCRIPTION

The SMP50-xxx series has been designed to protect telecommunication equipment against lightning and transient induced by AC power lines.

The package / die size ratio has been optimized by using the SMA package.



SCHEMATIC DIAGRAM



BENEFITS

Trisils are not subject to ageing and provide a fail safe mode in short circuit for a better protection. Trisils are used to help equipment to meet various standards such as UL1950, IEC950 / CSA C22.2, UL1459 and FCC part 68. Trisils have UL94 V0 resin approved. SMA package is JEDEC registered. (Trisils are UL 497B approved - file: E136224).

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IN COMPLIANCES WITH THE FOLLOWING STANDARDS

Standard	Peak Surge Voltage (V)	Voltage Waveform (μs)	Required peak current (A)	Current Waveform (μs)	Minimum serial resistor to meet standard (Ω)
GR-1089 Core First level	2500	2/10	500	2/10	12
	1000	10/1000	100	10/1000	10
GR-1089 Core Second level	5000	2/10	500	2/10	24
GR-1089 Core Intra-building	1500	2/10	100	2/10	0
ITU-T-K20 / K21	6000	10/700	150	5/310	53
	1500		37.5		0
ITU-T-K20 (IEC61000-4-2)	6000	1/60 ns	ESD contact discharge		0
	8000		ESD air discharge		0
VDE0433	4000	10/700	100	5/310	21.5
	2000		50		0
VDE0878	4000	1.2/50	100	1/20	0
	2000		50		0
IEC61000-4-5	4000	10/700	100	5/310	21.5
	4000	1.2/50	100	8/20	0
FCC Part 68, lightning surge type A	1500	10/160	200	10/160	12.5
	800	10/560	100	10/560	6.5
FCC Part 68, lightning surge type B	1000	9/720	25	5/320	0

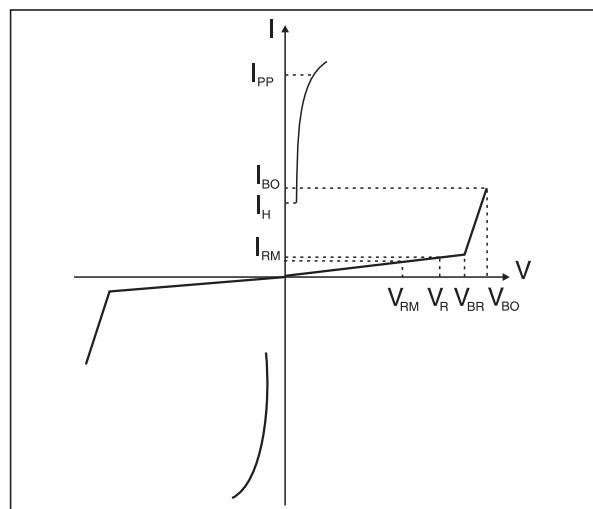
THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R _{th} (j-a)	Junction to ambient with recommended footprint	120	°C/W
R _{th} (j-l)	Junction to leads	30	°C/W

ELECTRICAL CHARACTERISTICS

(T_{amb} = 25°C)

Symbol	Parameter
V _{RM}	Stand-off voltage
I _{RM}	Leakage current at V _{RM}
V _R	Continuous reverse voltage
V _{BR}	Breakdown voltage
V _{BO}	Breakover voltage
I _H	Holding current
I _{BO}	Breakover current
I _{PP}	Peak pulse current
C	Capacitance



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ABSOLUTE RATINGS ($T_{amb} = 25^{\circ}C$)

Symbol	Parameter	Value	Unit
I _{PP}	Repetitive peak pulse current:	10/1000 μ s	50
		8/20 μ s	100
		10/560 μ s	55
		5/310 μ s	65
		10/160 μ s	75
		1/20 μ s	100
		2/10 μ s	150
I _{FS}	Fail safe mode: maximum current (note 1)	8/20 μ s	2.5
I _{TSM}	Non repetitive surge peak on-state current (Sinusoidal)	t = 20ms	25
		t = 16.6ms	28
		t = 0.2s	16
		t = 2s	8.5
I ² t	I ² t value for fusing	t = 16.6ms	6.5
		t = 20ms	6.3
T _L	Maximum lead temperature for soldering during 10 s.	260	$^{\circ}C$
T _{stg} T _j	Storage temperature range Maximum junction temperature	- 55 to + 150 150	$^{\circ}C$ $^{\circ}C$

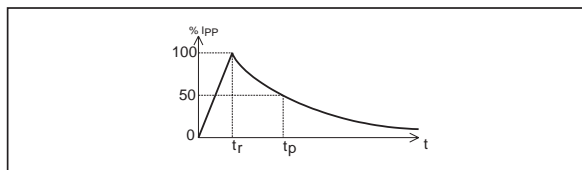
Repetitive peak pulse current

tr: rise time (μ s)

tp: pulse duration time (μ s)

ex: Pulse waveform 10/1000 μ s

tr = 10 μ s tp = 1000 μ s



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ELECTRICAL PARAMETERS (Tamb = 25°C)

Type	I _{RM} @ V _{RM} max		I _R @ V _R MAX		DYNAMIC V _{BO} @ I _{BO} max		STATIC V _{BO} @ I _{BO} max		I _H min	C typ.	C typ.
	μA	V	μA	V	V	mA	V	mA	mA	pF	pF
SMP50-62	2	56	50	62	85	800	82	800	150	30	50
SMP50-68		61		68	93		90		150	30	45
SMP50-100		90		100	135		133		150	20	40
SMP50-120		108		120	160		160		150	20	40
SMP50-130		117		130	173		173		150	20	35
SMP50-180		162		180	235		240		150	15	30
SMP50-200		180		200	262		267		150	15	30
SMP50-220		198		220	285		293		150	15	30
SMP50-240		216		240	300		320		150	15	30
SMP50-270		243		270	350		360		150	15	30

- Note 1:** I_R measured at V_R guarantee V_{BRmin} ≥ V_R
- Note 2:** See functional breakover voltage test circuit 1.
- Note 3:** See test circuit 2.
- Note 4:** See functional holding current test circuit 3.
- Note 5:** V_R = 50V bias, V_{RMS} = 1V, F = 1MHz.
- Note 6:** V_R = 2V bias, V_{RMS} = 1V, F = 1MHz

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

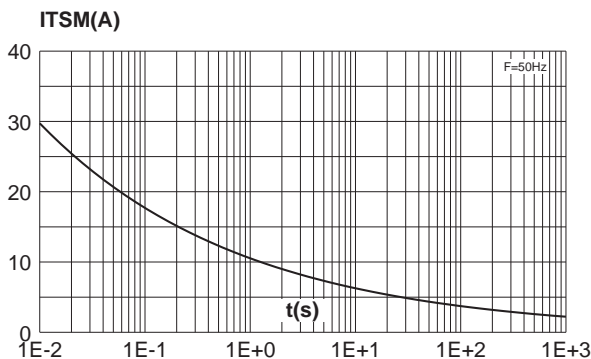
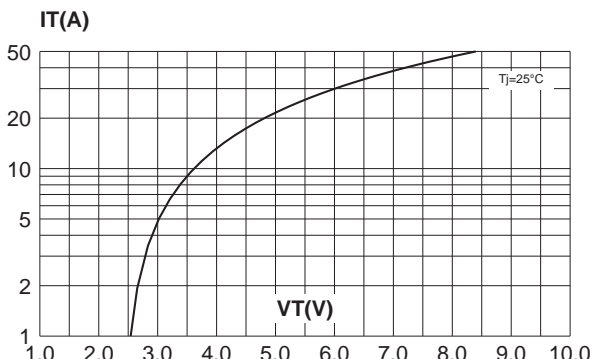
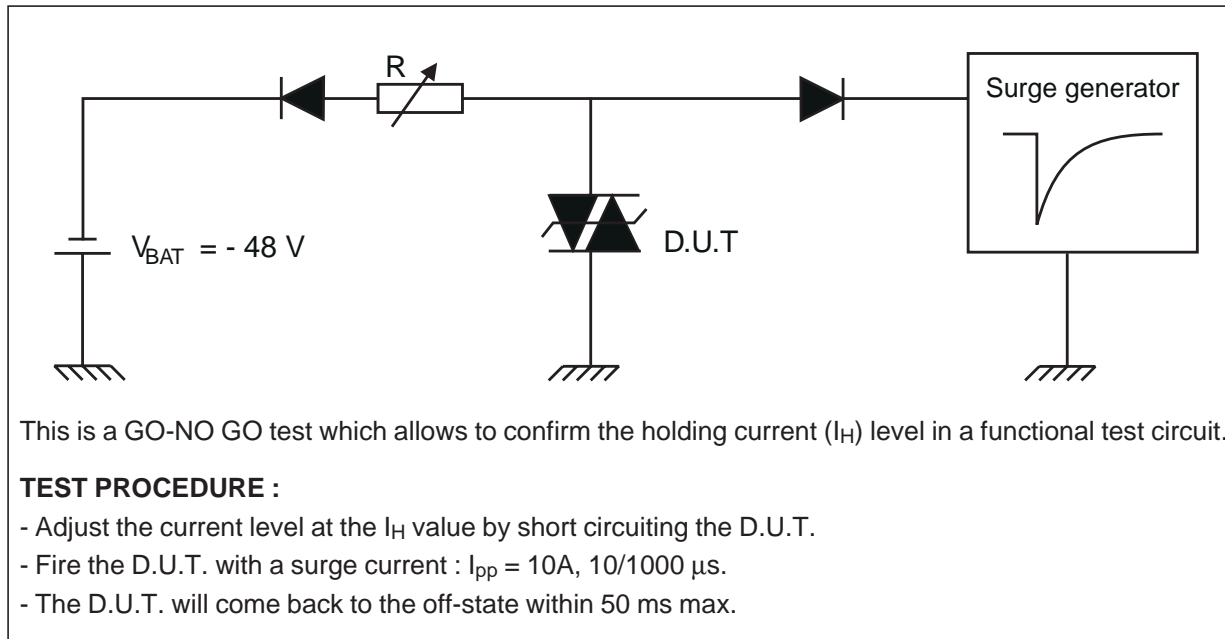


Fig. 2: On-state voltage versus on-state current (typical values).



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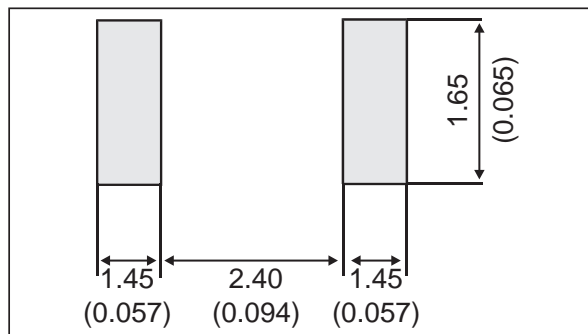
TEST CIRCUIT 3 for I_H PARAMETERS.



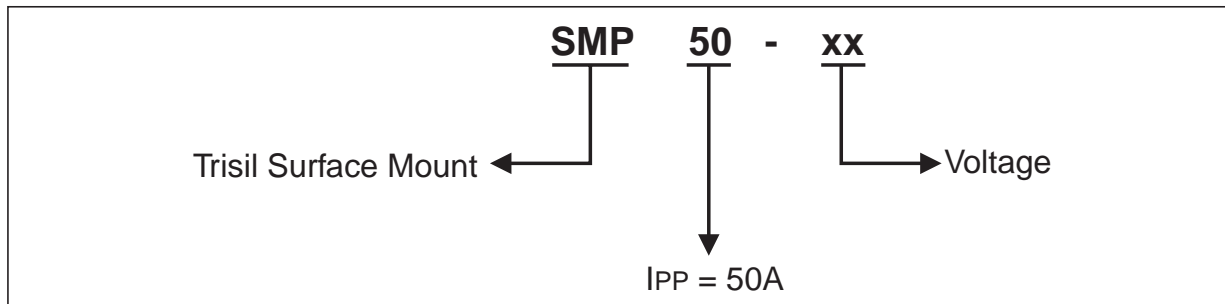
PACKAGE MECHANICAL DATA
SMA (JEDEC DO-214AC)

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

FOOT PRINT in millimeters (in inches)



ORDER CODE



ORDERING INFORMATION

Part number	Marking	Package	Weight	Base qty	Delivery mode
SMP50-62	V06	SMA	0.068 g	5000	Tape & reel
SMP50-68	V07				
SMP50-100	V10				
SMP50-120	V12				
SMP50-130	V13				
SMP50-180	V18				
SMP50-200	V20				
SMP50-220	V22				
SMP50-240	V24				
SMP50-270	V27				