

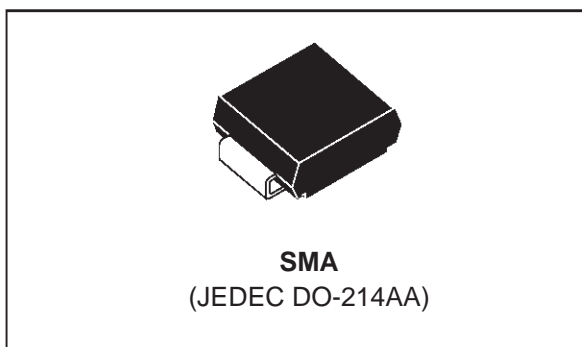


# SMP30-xxx Series

TRISIL™

## FEATURES

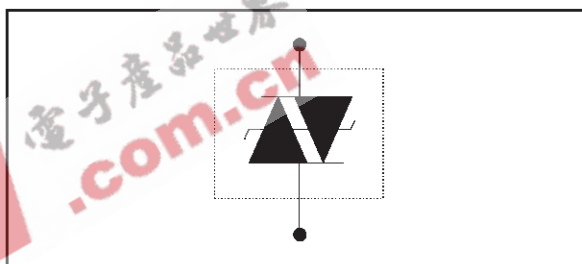
- BIDIRECTIONAL CROWBAR PROTECTION.
- VOLTAGE RANGE: FROM 62 V TO 270 V.
- HOLDING CURRENT :  
 $I_H = 150 \text{ mA min.}$
- REPETITIVE PEAK PULSE CURRENT :  
 $I_{PP} = 30 \text{ A, } 10/1000 \mu\text{s.}$
- JEDEC REGISTERED PACKAGE OUTLINE



## DESCRIPTION

The SMP30-xxx series has been designed to protect telecommunication equipments against lightning surges and overvoltages induced by AC power lines.

## SCHEMATIC DIAGRAM



COMPLIES WITH THE FOLLOWING STANDARDS:	Peak Surge Voltage (V)	Voltage Waveform ( $\mu\text{s}$ )	Current Waveform ( $\mu\text{s}$ )	Admissible $I_{pp}$ (A)	Necessary Resistor ( $\Omega$ )
(CCITT) ITU-K20	1000	10/700	5/310	25	-
(CCITT) ITU-K17	1500	10/700	5/310	38	-
VDE0433	2000	10/700	5/310	40	10
VDE0878	2000	1.2/50	1/20	50	-
IEC-1000-4-5	level 2	10/700	5/310	25	-
	level 3	1.2/50	8/20	50	-
FCC Part 68, lightning surge type A	1500	10/160	10/160	65	15.5
	800	10/560	10/560	50	8.0
FCC Part 68, lightning surge type B	1000	9/720	5/320	25	-
BELLCORE TR-NWT-001089 First level	2500	2/10	2/10	125	15.0
	1000	10/1000	10/1000	30	23.3
BELLCORE TR-NWT-001089 Second level	5000	2/10	2/10	125	15.0
BELLCORE TR-NWT-001089 Intra building lightning	1500	2/10	2/10	100	-
CNET I31-24	1000	0.5/700	0.8/310	25	-

## SMP30-xxx Series

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

Symbol	Parameter	Value	Unit
P	Power dissipation on infinite heatsink	$T_{amb} = 50^{\circ}\text{C}$	3 W
$I_{PP}$	Peak pulse current	10/1000 $\mu\text{s}$ 8/20 $\mu\text{s}$	30 A 60 A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 20 \text{ ms}$	15 A
$I^2t$	$I^2t$ value for fusing	$t_p = 20 \text{ ms}$	1 $\text{A}^2\text{s}$
dV/dt	Critical rate of rise of off-state voltage	$V_{RM}$	5 $\text{kV}/\mu\text{s}$
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature	- 55 to + 150 150	$^{\circ}\text{C}$ $^{\circ}\text{C}$
$T_L$	Maximum lead temperature for soldering during 10s at 5mm for case	260	$^{\circ}\text{C}$

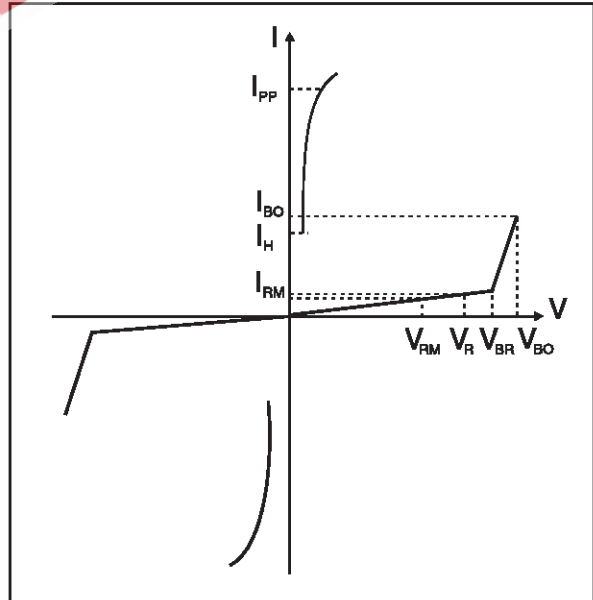
### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads	30	$^{\circ}\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient on printed circuit with standard footprint dimension	120	$^{\circ}\text{C}/\text{W}$

### ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter
$V_{RM}$	Stand-off voltage
$I_{RM}$	Leakage current at stand-off voltage
$V_R$	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

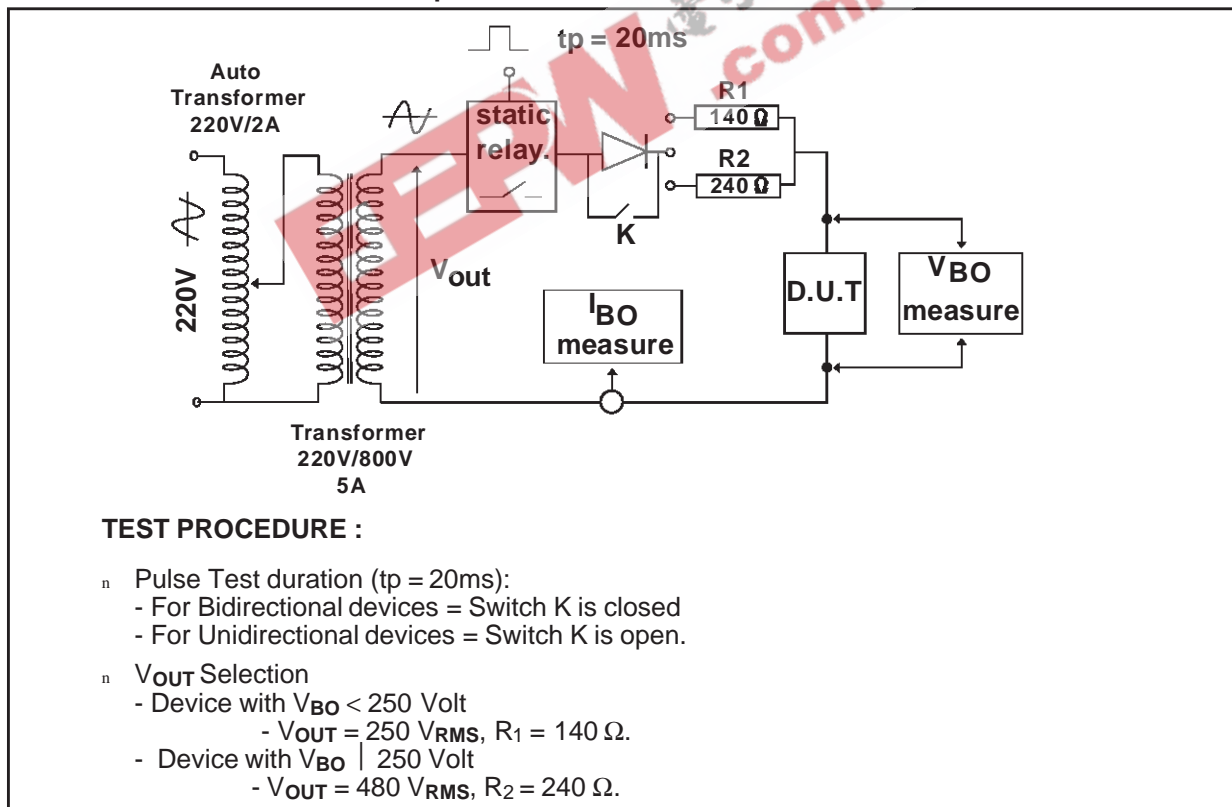


## SMP30-xxx Series

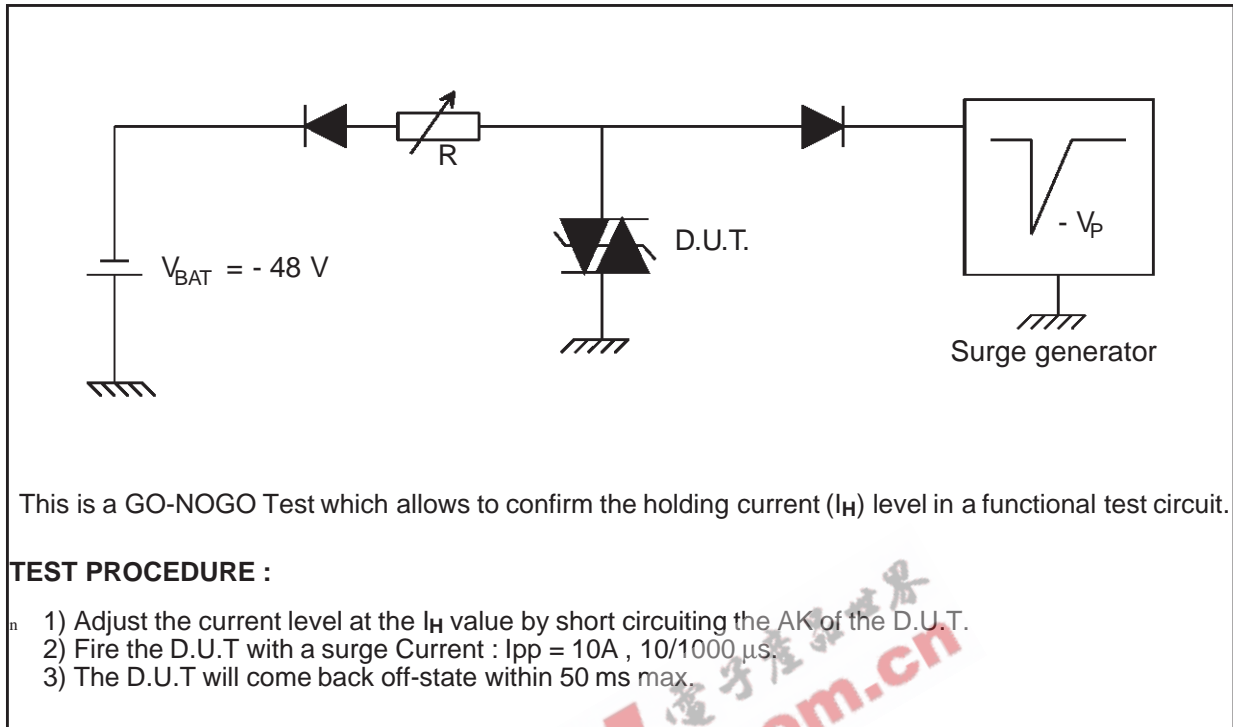
Type	Marking	$I_{RM}$ @ $V_{RM}$		$I_R$ @ $V_R$		$V_{BO}$ @ $I_{BO}$		$I_H$ min note 3 mA	C	
		max		max note 1		max note 2			typ note 4	typ note 5
		$\mu A$	V	$\mu A$	V	V	mA			
SMP30-62	QAA	2	56	50	62	82	800	150	50	20
SMP30-68	QAB	2	61	50	68	90	800	150	50	20
SMP30-100	QAC	2	90	50	100	133	800	150	40	16
SMP30-120	QAD	2	108	50	120	160	800	150	40	16
SMP30-130	QAE	2	117	50	130	173	800	150	35	14
SMP30-180	QAF	2	162	50	180	240	800	150	35	14
SMP30-200	QAG	2	180	50	200	267	800	150	30	12
SMP30-220	QAH	2	198	50	220	293	800	150	30	12
SMP30-240	QAI	2	216	50	240	320	800	150	30	12
SMP30-270	QAJ	2	243	50	270	360	800	150	30	12

- Note 1:**  $I_R$  measured at  $V_R$  guarantee  $V_{BRmin} \mid V_R$   
**Note 2:** Measured at 50 Hz (1 cycle) - See test circuit 1.  
**Note 3:** See test circuit 2.  
**Note 4:**  $V_R = 1V, F = 1MHz$ .  
**Note 5:**  $V_R = 50V, F = 1MHz$

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



TEST CIRCUIT 2 for  $I_H$  parameter.

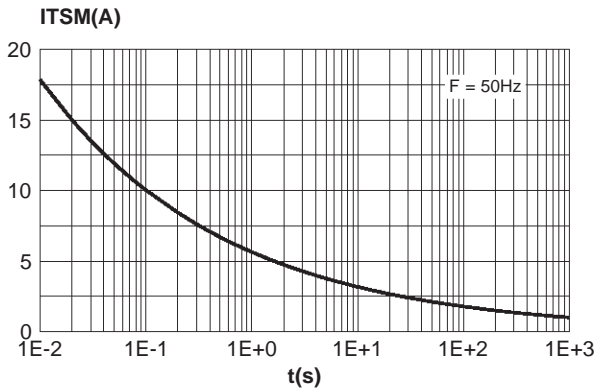


This is a GO-NOGO Test which allows to confirm the holding current ( $I_H$ ) level in a functional test circuit.

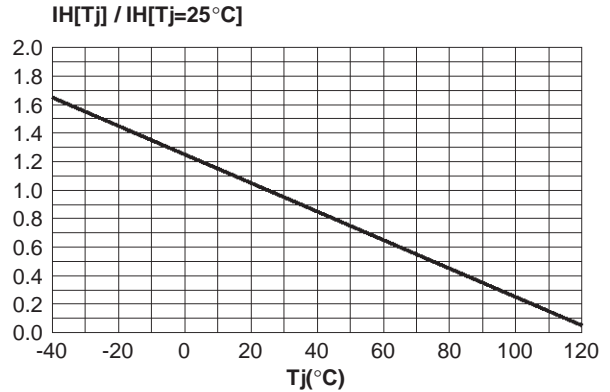
TEST PROCEDURE :

- 1) Adjust the current level at the  $I_H$  value by short circuiting the AK of the D.U.T.
- 2) Fire the D.U.T with a surge Current :  $I_{pp} = 10\text{A}$  ,  $10/1000\ \mu\text{s}$ .
- 3) The D.U.T will come back off-state within 50 ms max.

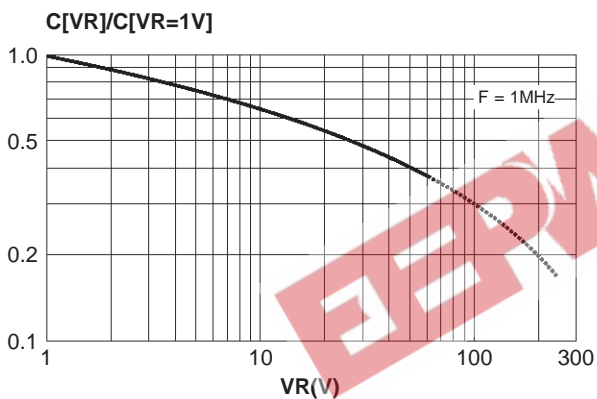
**Fig. 1:** Non repetitive surge peak on-state current versus overload duration ( $T_j$  initial=25°C).



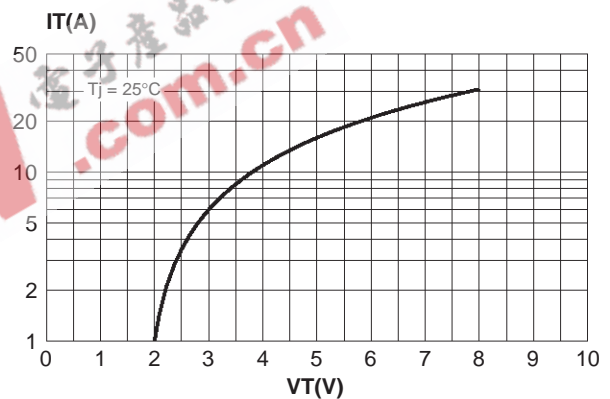
**Fig. 2:** Relative variation of holding current versus junction temperature.



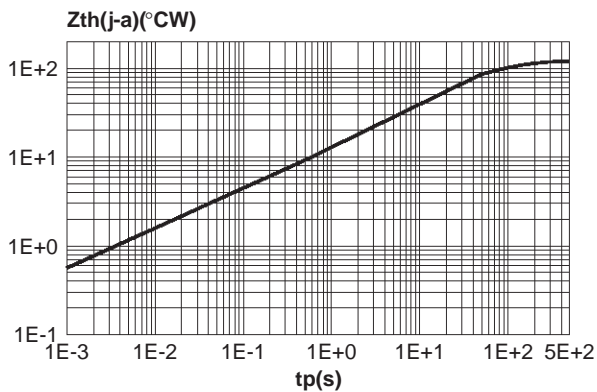
**Fig. 3:** Relative variation of junction capacitance versus reverse applied voltage (typical values)



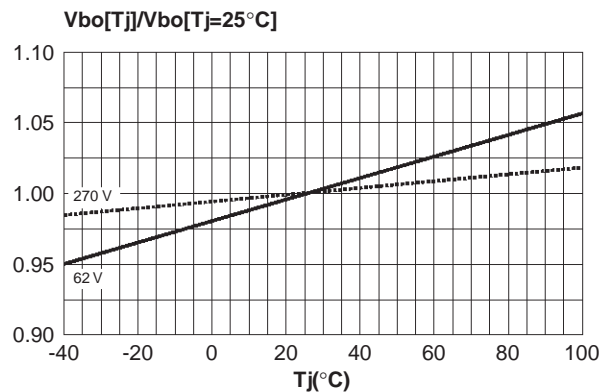
**Fig. 4:** On-state voltage versus on-state current (typical values).



**Fig. 5:** Variation of thermal impedance junction to ambient versus pulse duration.

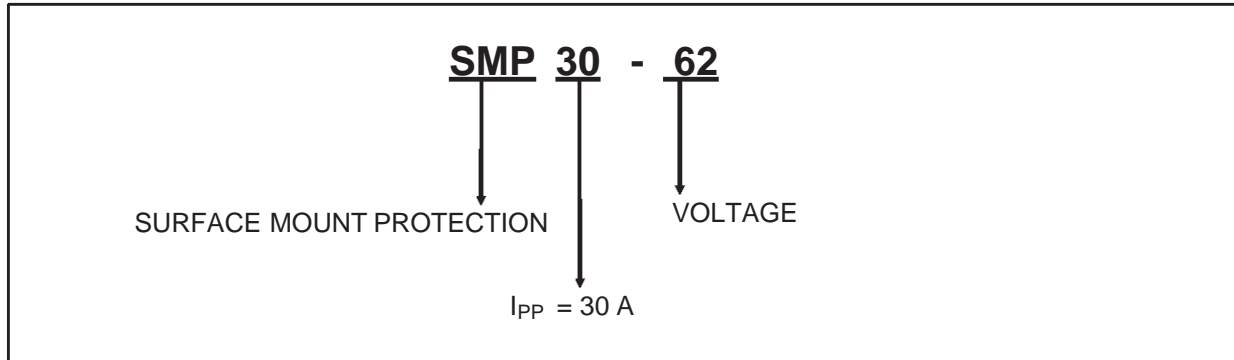


**Fig. 6:** Relative variation of  $V_{BO}$  voltage versus junction temperature.



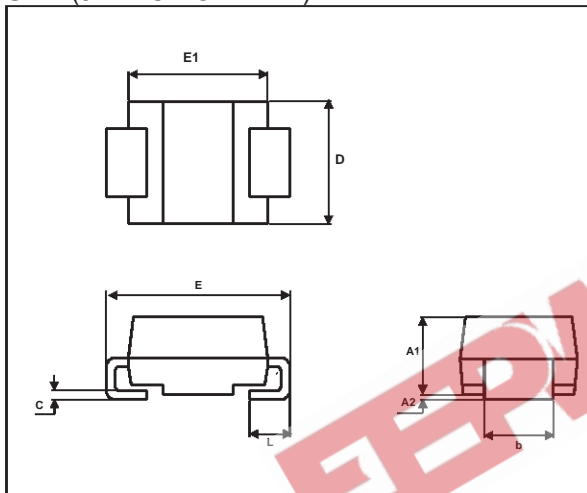
**SMP30-xxx Series**

**ORDER CODE**



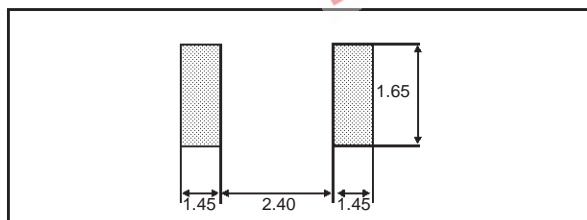
**MARKING** : Logo, Date Code, Part Number.

**PACKAGE MECHANICAL DATA**  
SMA (JEDEC DO-214AA)



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)**



**Weight:** 0.06 g

**Packaging :** Tape and reel.

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