

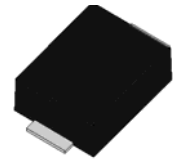


## SM1KxxCF Series Transient Voltage Suppressor

Rev.1.6

### FEATURES:

- ✧ Excellent clamping capability.
- ✧ Low profile package and low inductance.
- ✧ High peak pulse voltage capability at 1.2/50μs-8/20μs@2Ω waveform.
- ✧ Fast response time: typically less than 1.0ps from 0V to V<sub>BR</sub> min.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ High temperature soldering: 260°C/40s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ UL 497B item recognized. (File No.: E480698).
- ✧ UL 1449 item recognized. (File No.: E494389).
- ✧ IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).



SMBF

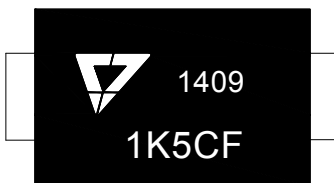


Bi-directional Symbol

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage temperature range	T <sub>STG</sub>	-55 to +150	°C
operating junction temperature range	T <sub>J</sub>	-55 to +150	°C
Steady state power dissipation at T <sub>L</sub> =75°C	P <sub>M(AV)</sub>	6.5	W
Peak pulse voltage at 1.2/50μs-8/20μs@2Ω waveform	V <sub>PP</sub>	2000	V

### MARKING



1K5CF : Device Marking Code  
 1409: In ninth week, 2014

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Part Number	Marking Code	V <sub>R</sub>	I <sub>R@V<sub>R</sub></sub>	V <sub>BR@I<sub>T</sub></sub>		I <sub>T</sub>	V <sub>C@V<sub>PP</sub></sub> <sup>①</sup>	V <sub>PP</sub> <sup>①</sup>
		V	max(μA)	min(V)	max(V)	mA	max(V)	V
SM1K5CF	1K5CF	5.0	300	6.40	7.10	10	20	2000
SM1K6CF	1K6CF	6.0	250	6.50	7.40	10	20	2000
SM1K6VCF	1K6VF	6.5	150	7.20	8.00	10	22	2000
SM1K7CF	1K7CF	7.0	100	7.70	8.60	10	22	2000
SM1K15CF	1K15CF	15	1	16.7	18.5	1	32	2000
SM1K16CF	1K16CF	16	1	17.8	19.7	1	34	2000
☆SM1K18CF	1K18CF	18	1	20.0	22.3	1	37	2000
☆SM1K20CF	1K20CF	20	1	22.0	24.5	1	40	2000
SM1K30CF	1K30CF	30	1	32.0	37.0	1	65	2000
SM1K33CF	1K33CF	33	1	36.0	41.0	1	70	2000
☆SM1K36CF	1K36CF	36	1	39.5	45.0	1	72	2000
☆SM1K40CF	1K40CF	40	1	44.0	49.1	1	75	2000

① Surge waveform: 1.2/50μs-8/20μs@2Ω

V<sub>R</sub>: Stand-off voltage -- Maximum voltage that can be applied

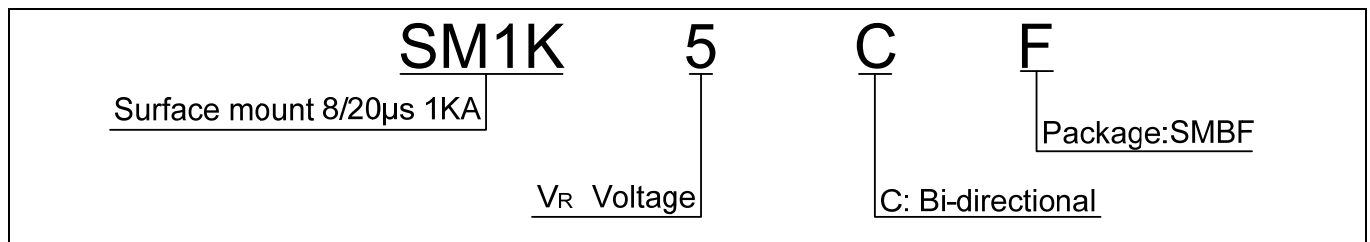
V<sub>BR</sub>: Breakdown voltage

V<sub>C</sub>: Clamping voltage -- Peak voltage measured across the suppressor at a specified V<sub>PP</sub>

I<sub>R</sub>: Reverse leakage current

☆: Products with negative resistance

## ORDERING INFORMATION



RATINGS AND V-I CHARACTERISTICS CURVES (T<sub>A</sub>=25°C, unless otherwise noted)

FIG.1:V- I curve characteristics (Bi-directional)

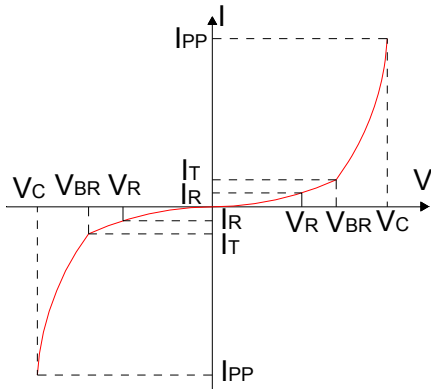


FIG.2:V- I curve characteristics (Bi-directional with negative resistance)

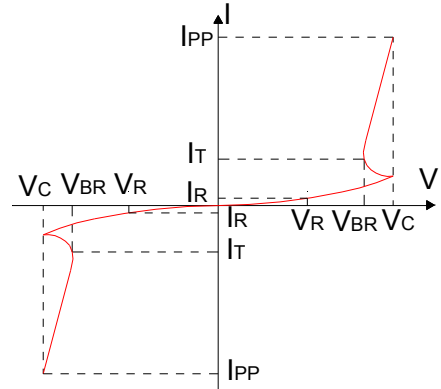


FIG.3: Pulse waveform

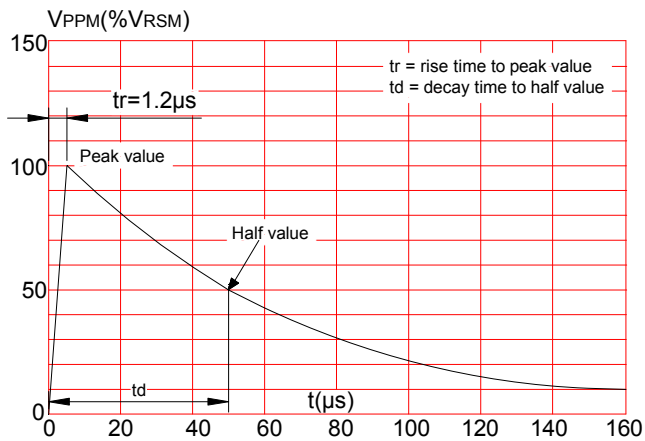


FIG.4: Pulse waveform

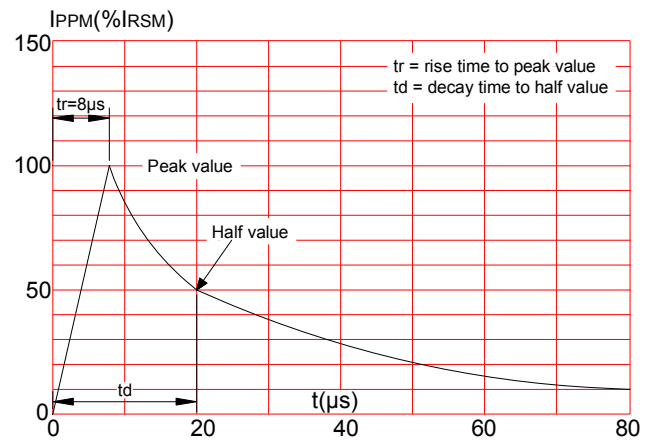
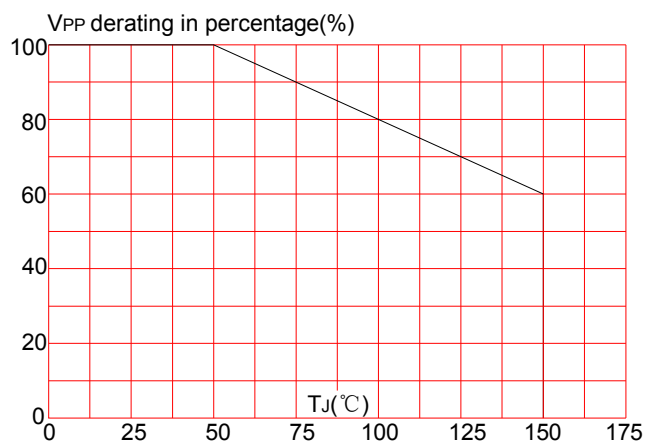
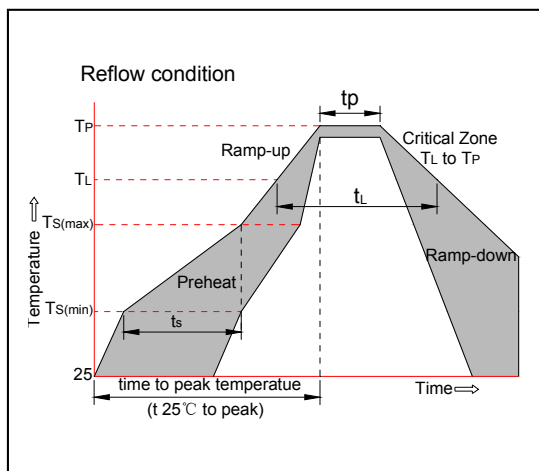


FIG.5: Pulse derating curve(1.2/50μs)

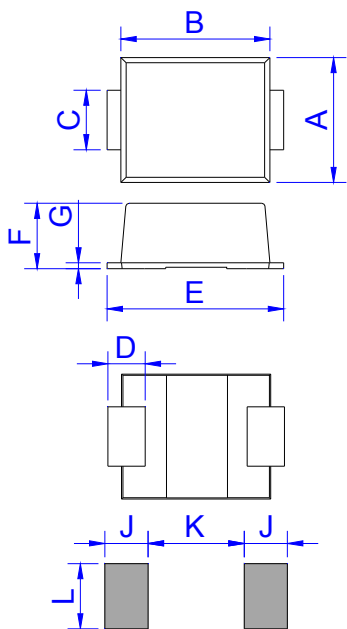


**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquidus)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_P$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260°C



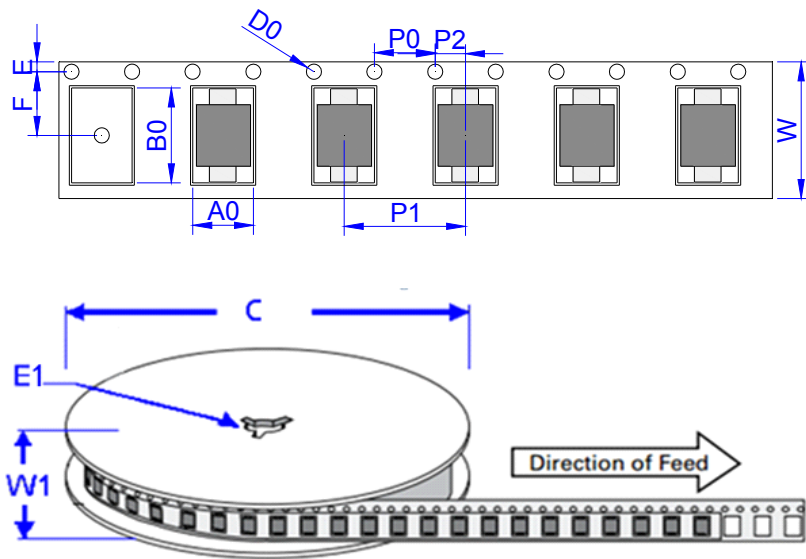
**PACKAGE MECHANICAL DATA**



SMBF

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.90	4.50	0.154	0.177
B	4.65	5.15	0.183	0.203
C	1.85	2.15	0.073	0.085
D	0.60		0.024	
E	5.60	6.00	0.220	0.236
F	2.05	2.35	0.081	0.093
G	0.12	0.28	0.005	0.011
J	2.00		0.079	
K		3.20		0.126
L	2.30		0.091	

TAPE AND REEL SPECIFICATION-SMBF



Ref.	Dimensions	
	Millimeters	Inches
A0	4.50±0.3	0.177 ± 0.012
B0	6.10±0.3	0.240 ± 0.012
C	330.0	13.0
D0	1.55±0.1	0.061 ± 0.004
E	1.75±0.2	0.069 ± 0.008
E1	13.3±0.3	0.524± 0.012
F	5.5±0.2	0.217 ± 0.008
P0	4.00±0.2	0.157 ± 0.008
P1	8.00±0.2	0.315 ± 0.008
P2	2.00±0.2	0.079 ± 0.008
W	12.0±0.2	0.472 ± 0.008
W1	15.7±2.0	0.618 ± 0.079

PART No.	UNIT WEIGHT (g/PCS) typ.	REEL (PCS)	PER CARTON (PCS)	DESCRIPTION
SM1KxxCF	0.13	3,000	48,000	13 inch reel pack

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