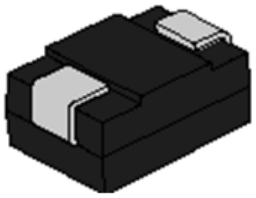
SM6P Series Transient Voltage Suppressor

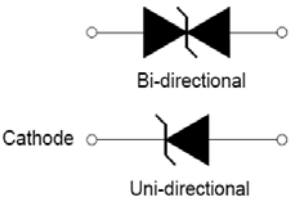
Rev.3.3

APPLICATIONS:

- ✧ Auto power systems
- ✧ Can bus
- ✧ Audio、video and GPS
- ✧ ABS powers



SMC



Symbol

FEATURES:

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ High temperature to reflow soldering: 260℃/40s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD020, LF maximum peak of 260℃.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ AEC-Q101 qualified.

IEC COMPATIBILITY:

- ✧ ISO16750-2 P5A 12V system (87V/2Ω/150ms 10c)
- ✧ ISO16750-2 P5A 24V system (123V/8Ω/150ms 10c)

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage and operating junction temperature range	T_{STG}/ T_J	-55 to +150	℃
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	6.5	W
Peak pulse power dissipation on 10/1000μs waveform	P_{PP}	5000	W
Maximum instantaneous forward voltage at 100A for unidirectional only	V_F	5.0	V
Peak forward surge current, 8.3ms single half sine wave(Note 1)	I_{FSM}	300	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	℃/W

Notes：

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

MARKING

P15C: Device Marking Code
1409: In ninth week, 2014

ELECTRICAL CHARACTERISTICS(T_A=25℃)

Part Number		Marking		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
SM6P15A	SM6P15C	P15A	P15C	15	5	16.70	18.50	5	24.4	205
SM6P16A	SM6P16C	P16A	P16C	16	5	17.80	19.70	5	26.0	192
SM6P18A	SM6P18C	P18A	P18C	18	5	20.00	22.10	5	29.2	171
SM6P20A	SM6P20C	P20A	P20C	20	5	22.20	24.50	5	32.4	154
☆SM6P22A	SM6P22C	P22A	P22C	22	5	24.40	26.90	5	35.5	141
SM6P24A	SM6P24C	P24A	P24C	24	5	26.70	29.50	5	38.9	129
☆SM6P26A	SM6P26C	P26A	P26C	26	5	28.90	31.90	5	42.1	119
SM6P28A	SM6P28C	P28A	P28C	28	5	31.10	34.40	5	45.4	110
SM6P30A	SM6P30C	P30A	P30C	30	5	33.30	36.80	5	48.4	103
SM6P33A	SM6P33C	P33A	P33C	33	5	36.70	40.60	5	53.3	94
☆SM6P36A	SM6P36C	P36A	P36C	36	5	40.00	44.20	5	58.1	86
SM6P40A	SM6P40C	P40A	P40C	40	5	44.40	49.10	5	64.5	78
SM6P43A	SM6P43C	P43A	P43C	43	5	47.80	52.80	5	69.4	72

① Surge waveform:10/1000μs

V_R: Stand-off voltage -- Maximum voltage that can be applied

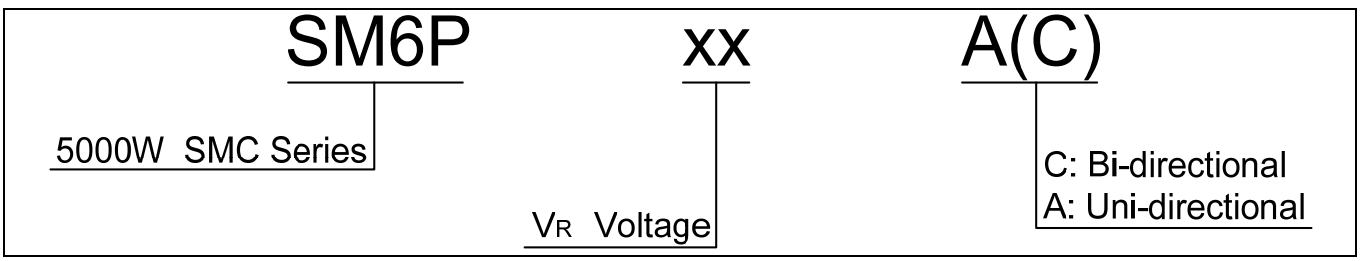
V_{BR}: Breakdown voltage

V_C: Clamping voltage -- Peak voltage measured across the suppressor at a specified I_{PP}

I_R: Reverse leakage current

☆: Commonly used models

ORDERING INFORMATION



RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25℃, unless otherwise noted)

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

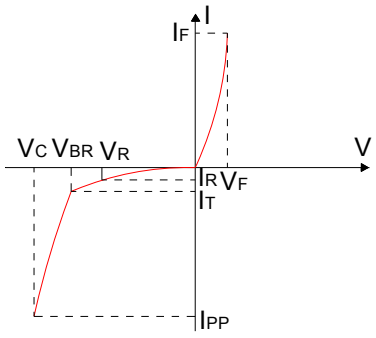


FIG.2:V- I curve characteristics (Bi-directional)

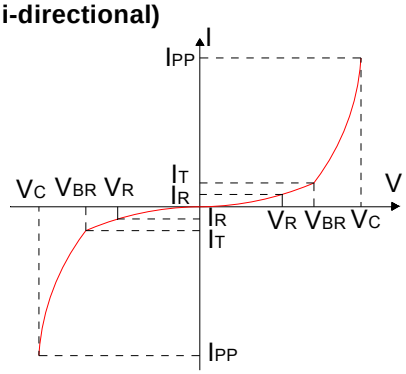


FIG.3: Pulse waveform

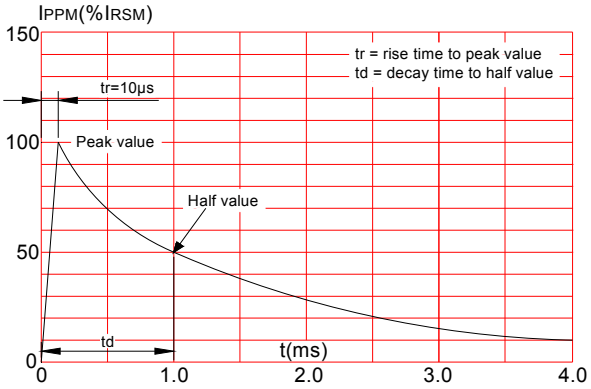


FIG.4: Pulse derating curve

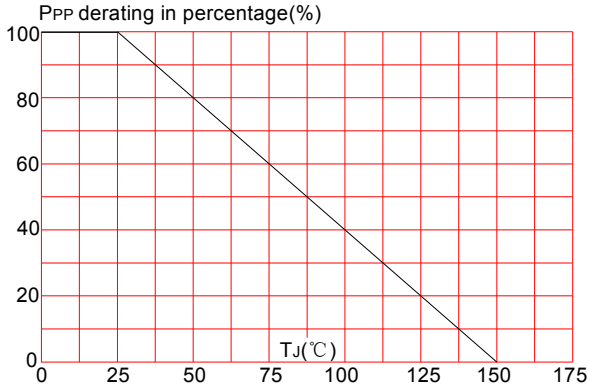


FIG.5: ISO16750 -2 test pulse 5A

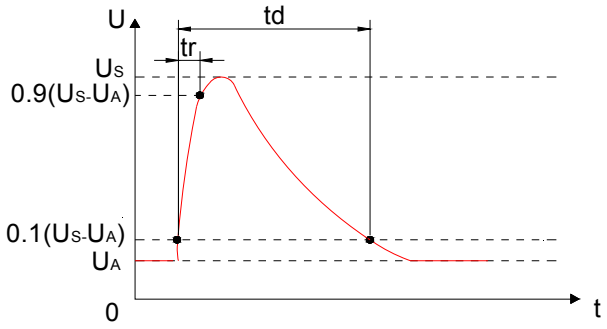


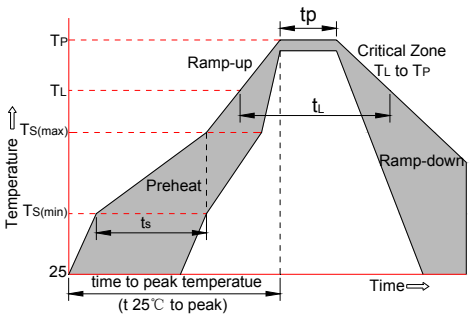
FIG.6: Parameters for test pulse 5a

Parameter	12V system	24V system
Us	79V to 101V	151V to 202V
Ri	0.5Ω to 4Ω	1 Ω to 8Ω
td	40ms to 400ms	100ms to 350ms
tr	5-10ms	5-10ms

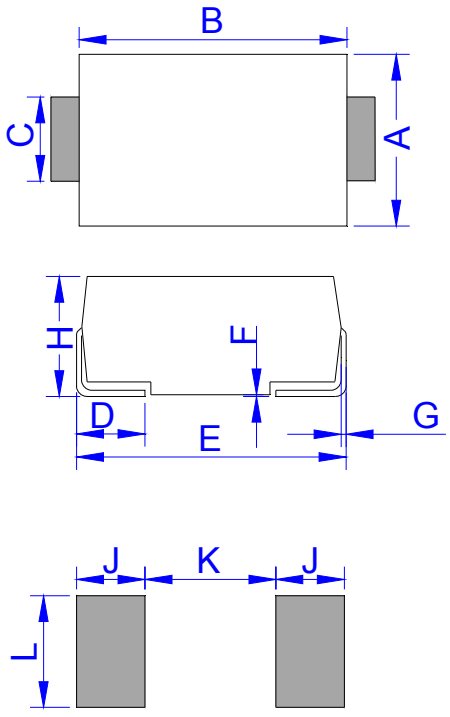
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see FIG.7)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃of actual Peak Temp (t_p)		20-40secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG.7: Reflow condition



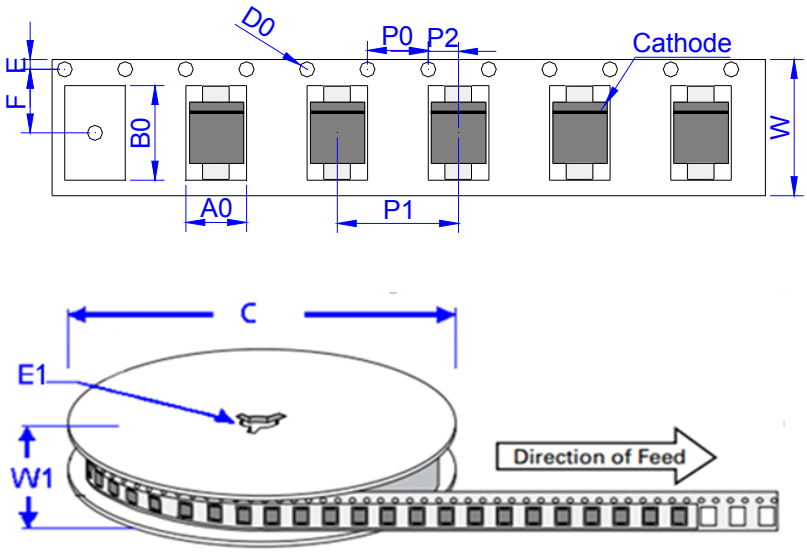
PACKAGE MECHANICAL DATA



DO-214AB (SMC)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	5.75	6.25	0.226	0.246
B	6.90	7.40	0.272	0.291
C	2.75	3.25	0.108	0.128
D	0.95	1.52	0.037	0.060
E	7.70	8.20	0.303	0.323
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.15	2.62	0.085	0.103
J	2.40		0.094	
K		4.20		0.165
L	3.30		0.130	

TAPE AND REEL SPECIFICATION-SMC



Ref.	Dimensions	
	Millimeters	Inches
A0	6.05 ± 0.3	0.238 ± 0.012
B0	8.31 ± 0.3	0.327 ± 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	7.50 ± 0.2	0.295 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.3145 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	16.0 ± 0.2	0.630 ± 0.008
W1	19.7 ± 2.0	0.776 ± 0.079

PART No.	UNIT WEIGHT (g/PCS) typ.	REEL (PCS)	PER CARTON (PCS)	REEL DIAMETERS (mm)
SM6PxxA/C	0.342	3,000	48,000	330