600W, 6.8V - 220V Surface Mount Transient Voltage Suppressor

FEATURES FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Built-in strain relief
- Excellent clamping capability
- Typical I_R less than 1μA above 10V
- Fast response time: Typically less than 1.0ps from 0 volt to BV min
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	5.5 - 185	V
V_{BR} (uni-directional)	6.8 - 220	V
P_{PPSM}	600	W
$T_{J\ MAX}$	150	°C
Package	DO-214AA (SMB)	
Configuration	Single die	

Pb-Free RoHS COMPLIANT



DO-214AA (SMB)

APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- TV
- Monitor

MECHANICAL DATA

- Case: DO-214AA (SMB)
- Molding compound meets UL 94V-0 flammability rating
- Moisture sensitivity level: level 1, per J-STD-020
- Part no. with suffix "H" means AEC-Q101 qualified
- Packing code with suffix "G" means green compound (halogen-free)
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
  Weight: 0.09 g (approximately)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

PARAMETER	SYMBOL	PART NUMBER	UNIT
Non-repetitive peak impulse power dissipation with 10/1000μs waveform	P_{PPSM}	600	W
Steady state power dissipation at T_A=25°C (1)	P_{tot}	3	W
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100	A
Forward Voltage @ I_F=50A for Uni-directional only (2)	V_F	3.5/5.0	V
Junction temperature	T_J	-55 to +150	°C
Storage temperature	T_{STG}	-55 to +150	°C

Notes:

1. Non-repetitive Current Pulse Per Fig. 3 and Derated above T_A=25°C Per Fig. 2
2. V_F=3.5V on P6SMB6.8 - P6SMB91 Devices and V_F=5.0V on P6SMB100 - P6SMB220 Device.

Devices for Bipolar Applications

1. For bidirectional use C or CA suffix for types P6SMB6.8 - types P6SMB220A
2. Electrical characteristics apply in both directions

THERMAL PERFORMANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-case thermal resistance	$R_{\Theta JC}$	10	°C/W
Junction-to-ambient thermal resistance	$R_{\Theta JA}$	55	°C/W

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Device	Device Marking Code	Breakdown voltage V_{BR} (V) (Note 1)		Test Current I_T (mA)	Stand-Off Voltage @V_{WM} (V)	Maximum Reverse Leakage @V_{WM} I_D(μA)	Maximum Peak Pulse Current I_{PPM}(A) (Note 2)	Maximum clamping voltage V_C@I_{PP} (V)	Maximum Temperature Coefficient of V_{BR}(%/°C)
		Min.	Max.						
P6SMB6.8	KDJ	6.12	7.48	10	5.50	1000	58	10.8	0.057
P6SMB6.8A	KEJ	6.46	7.14	10	5.80	1000	60	10.5	0.057
P6SMB7.5	KFJ	6.75	8.25	10	6.05	500	53	11.7	0.061
P6SMB7.5A	KGJ	7.13	7.88	10	6.40	500	55	11.3	0.061
P6SMB8.2	KHJ	7.38	9.02	10	6.63	200	50	12.5	0.065
P6SMB8.2A	KKJ	7.79	8.61	10	7.02	200	52	12.1	0.065
P6SMB9.1	KLJ	8.19	10.00	1.0	7.37	50	45	13.8	0.068
P6SMB9.1A	KMJ	8.65	9.55	1.0	7.78	50	47	13.4	0.068
P6SMB10	KNJ	9.00	11.00	1.0	8.10	10	42	15.0	0.073
P6SMB10A	KPJ	9.50	10.5	1.0	8.55	10	43	14.5	0.073
P6SMB11	KQJ	9.90	12.1	1.0	8.92	1	38	16.2	0.075
P6SMB11A	KRJ	10.5	11.6	1.0	9.40	1	40	15.6	0.075
P6SMB12	KSJ	10.8	13.2	1.0	9.72	1	36	17.3	0.078
P6SMB12A	KTJ	11.4	12.6	1.0	10.2	1	37	16.7	0.078
P6SMB13	KUJ	11.7	14.3	1.0	10.5	1	33	19.0	0.081
P6SMB13A	KVJ	12.4	13.7	1.0	11.1	1	34	18.2	0.081
P6SMB15	KWJ	13.5	16.5	1.0	12.1	1	28	22.0	0.084
P6SMB15A	KXJ	14.3	15.8	1.0	12.8	1	29	21.2	0.084
P6SMB16	KYJ	14.4	17.6	1.0	12.9	1	26	23.5	0.086
P6SMB16A	KZJ	15.2	16.8	1.0	13.6	1	28	22.5	0.086
P6SMB18	LDJ	16.2	19.8	1.0	14.5	1	23	26.5	0.088
P6SMB18A	LEJ	17.1	18.9	1.0	15.3	1	25	25.5	0.088
P6SMB20	LFJ	18.0	22.0	1.0	16.2	1	21	29.1	0.090
P6SMB20A	LGJ	19.0	21.0	1.0	17.1	1	22	27.7	0.090
P6SMB22	LHJ	19.8	24.2	1.0	17.8	1	19	31.9	0.092
P6SMB22A	LKJ	20.9	23.1	1.0	18.8	1	20	30.6	0.092
P6SMB24	LLJ	21.6	26.4	1.0	19.4	1	18	34.7	0.094
P6SMB24A	LMJ	22.8	25.2	1.0	20.5	1	19	33.2	0.094
P6SMB27	LNJ	24.3	29.7	1.0	21.8	1	16	39.1	0.096
P6SMB27A	LPJ	25.7	28.4	1.0	23.1	1	16.8	37.5	0.096
P6SMB30	LQJ	27.0	33.0	1.0	24.3	1	14.0	43.5	0.097
P6SMB30A	LRJ	28.5	31.5	1.0	25.6	1	15.0	41.4	0.097
P6SMB33	LSJ	29.7	36.3	1.0	26.8	1	13.0	47.7	0.098
P6SMB33A	LTJ	31.4	34.7	1.0	28.2	1	13.8	45.7	0.098
P6SMB36	LUJ	32.4	39.6	1.0	29.1	1	12.0	52.0	0.099
P6SMB36A	LVJ	34.2	37.8	1.0	30.8	1	12.6	49.9	0.099
P6SMB39	LWJ	35.1	42.9	1.0	31.6	1	11.1	56.4	0.100
P6SMB39A	LXJ	37.1	41.0	1.0	33.3	1	11.6	53.9	0.100
P6SMB43	LYJ	38.7	47.3	1.0	34.8	1	10.0	61.9	0.101
P6SMB43A	LZJ	40.9	45.2	1.0	36.8	1	10.6	59.3	0.101
P6SMB47	MDJ	42.3	51.7	1.0	38.1	1	9.2	67.8	0.101
P6SMB47A	MEJ	44.7	49.4	1.0	40.2	1	9.7	64.8	0.101
P6SMB51	MFJ	45.9	56.1	1.0	41.3	1	8.5	73.5	0.102

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Device	Device Marking Code	Breakdown voltage V_{BR} (V) (Note 1)		Test Current I_T (mA)	Stand-Off Voltage @V_{WM} (V)	Maximum Reverse Leakage @V_{WM} I_D(μA)	Maximum Peak Pulse Current I_{PPM}(A) (Note 2)	Maximum clamping voltage V_C@I_{PP} (V)	Maximum Temperature Coefficient of V_{BR}(%/°C)
		Min.	Max.						
P6SMB51A	MGJ	48.5	53.6	1.0	43.6	1	8.9	70.1	0.102
P6SMB56	MHJ	50.4	61.6	1.0	45.4	1	7.8	80.5	0.103
P6SMB56A	MKJ	53.2	58.8	1.0	47.8	1	8.1	77.0	0.103
P6SMB62	MLJ	55.8	68.2	1.0	50.2	1	7.0	89.0	0.104
P6SMB62A	MMJ	58.9	65.1	1.0	53.0	1	7.4	85.0	0.104
P6SMB68	MNJ	61.2	74.8	1.0	55.1	1	6.4	98.0	0.104
P6SMB68A	MPJ	64.6	71.4	1.0	58.1	1	6.8	92.0	0.104
P6SMB75	MQJ	67.5	82.5	1.0	60.7	1	5.8	108	0.105
P6SMB75A	MRJ	71.3	78.8	1.0	64.1	1	6.1	103	0.105
P6SMB82	MSJ	73.8	90.2	1.0	66.4	1	5.3	118	0.105
P6SMB82A	MTJ	77.9	86.1	1.0	70.1	1	5.5	113	0.105
P6SMB91	MUJ	81.9	100	1.0	73.7	1	4.8	131	0.106
P6SMB91A	MVJ	86.5	95.5	1.0	77.8	1	5.0	125	0.106
P6SMB100	MWJ	90	110	1.0	81.0	1	4.3	144	0.106
P6SMB100A	MXJ	95	105	1.0	85.5	1	4.5	137	0.106
P6SMB110	MYJ	99	121	1.0	89.2	1	3.9	158	0.107
P6SMB110A	MZJ	105	116	1.0	94.0	1	4.1	152	0.107
P6SMB120	NDJ	108	132	1.0	97.2	1	3.6	173	0.107
P6SMB120A	NEJ	114	126	1.0	102.0	1	3.8	165	0.107
P6SMB130	NFJ	117	143	1.0	105.0	1	3.3	187	0.107
P6SMB130A	NGJ	124	137	1.0	111.0	1	3.5	179	0.107
P6SMB150	NHJ	135	165	1.0	121.0	1	2.9	215	0.108
P6SMB150A	NKJ	143	158	1.0	128.0	1	3.0	207	0.108
P6SMB160	NLJ	144	176	1.0	130.0	1	2.7	230	0.108
P6SMB160A	NMJ	152	168	1.0	136.0	1	2.8	219	0.108
P6SMB170	NNJ	153	187	1.0	138.0	1	2.5	244	0.108
P6SMB170A	NPJ	162	179	1.0	145.0	1	2.6	234	0.108
P6SMB180	NQJ	162	198	1.0	146.0	1	2.4	258	0.108
P6SMB180A	NRJ	171	189	1.0	154.0	1	2.5	246	0.108
P6SMB200	NSJ	180	220	1.0	162.0	1	2.1	287	0.108
P6SMB200A	NTJ	190	210	1.0	171.0	1	2.2	274	0.108
P6SMB220	NUJ	198	242	1.0	175.0	1	1.8	342	0.108
P6SMB220A	NVJ	209	231	1.0	185.0	1	1.9	328	0.108

Notes:

1. V_{BR} measure after I_T applied for 300μs, I_T=square wave pulse or equivalent.
2. Surge current waveform per Figure. 3 and derate per Figure. 2.
3. For bipolar types having V_{WM} of 10 volts and under, the I_D limit is doubled.
4. For bidirectional use C or CA suffix for types P6SMB6.8 - P6SMB220A.
5. All terms and symbols are consistent with ANSI/IEEE C62.35.

ORDERING INFORMATION

PART NO.	PART NO. SUFFIX	PACKING CODE	PACKING CODE SUFFIX(*)	PACKAGE	PACKING
P6SMBxxxx (Note 1)	H	R5	G	SMB	850 / 7" Plastic reel
		R4		SMB	3,000 / 13" Paper reel
		M4		SMB	3,000 / 13" Plastic reel

Note:
1. "xxxx" defines voltage from 6.8V (P6SMB6.8) to 220V (P6SMB220A)

*: Optional available

EXAMPLE P/N

EXAMPLE P/N	PART NO.	PART NO. SUFFIX	PACKING CODE	PACKING CODE SUFFIX	DESCRIPTION
P6SMB20AHR5G	P6SMB20A	H	R5	G	AEC-Q101 qualified Green compound

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig1. Peak Pulse Power Rating Curve

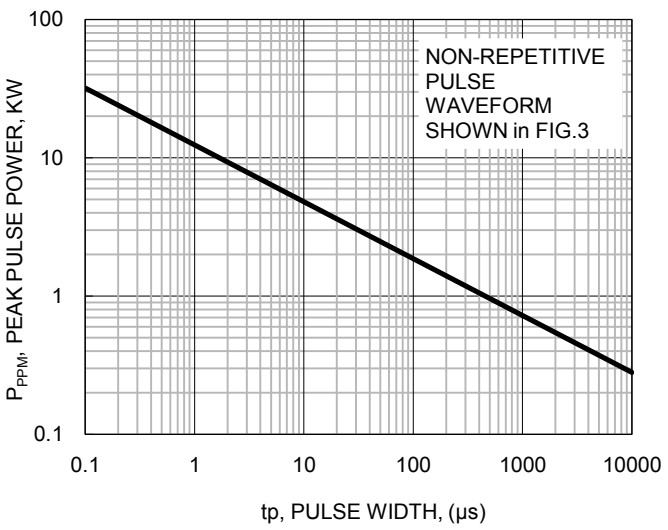


Fig2. Pulse Derating Curve

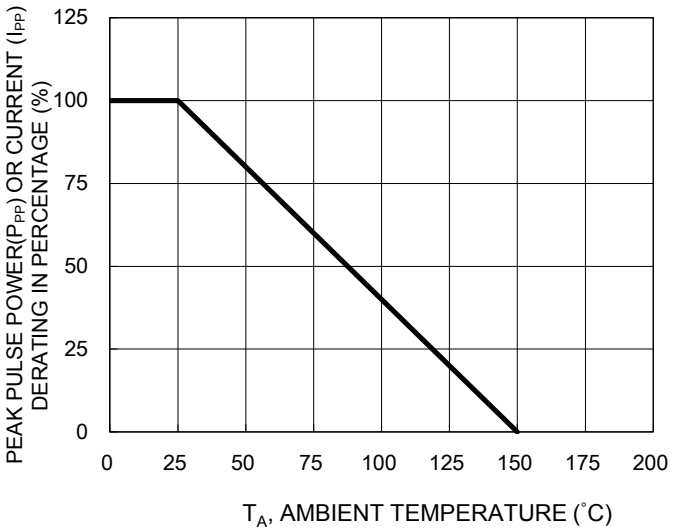


Fig3. Clamping Power Pulse Waveform

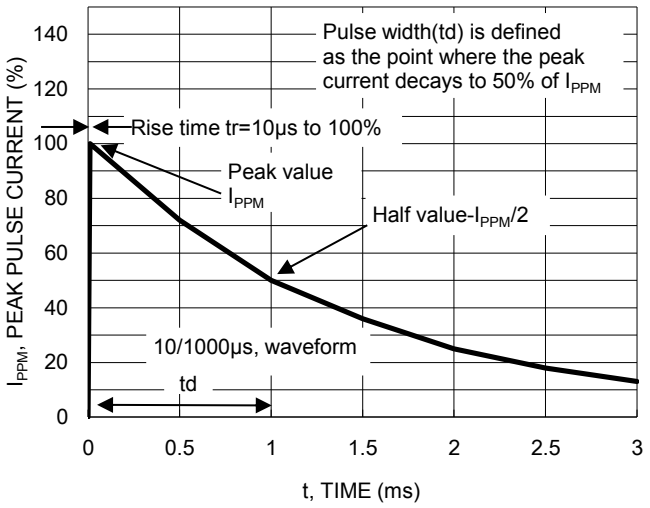


Fig4. Maximum Non-Repetitive Forward Surge Current Unidirectional Only

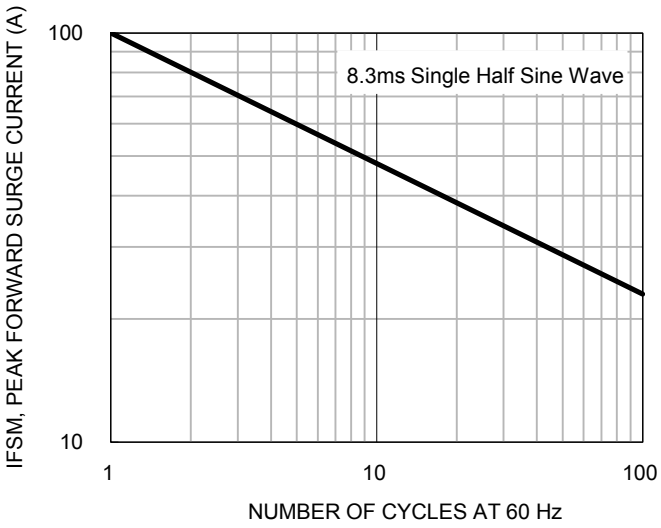
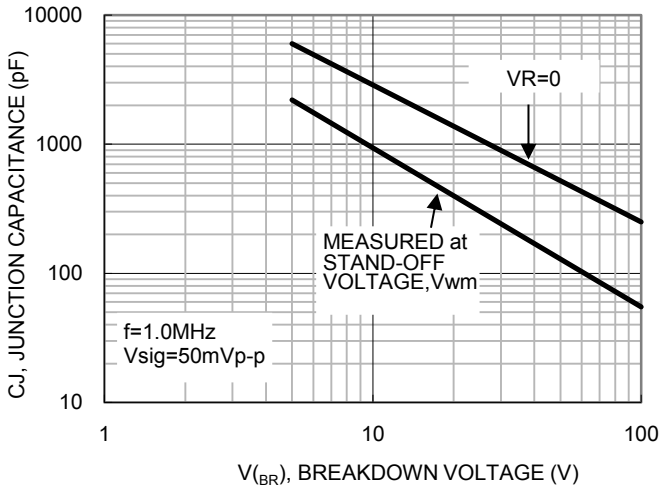
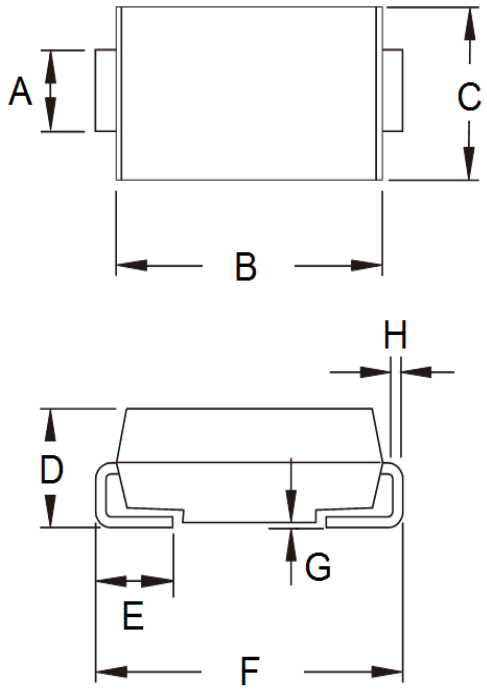


Fig5. Typical Junction Capacitance



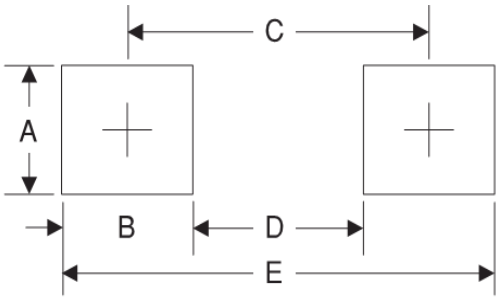
PACKAGE OUTLINE DIMENSIONS

DO-214AA (SMB)



DIM.	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	1.95	2.20	0.077	0.087
B	4.05	4.60	0.159	0.181
C	3.30	3.95	0.130	0.156
D	1.95	2.65	0.077	0.104
E	0.75	1.60	0.030	0.063
F	5.10	5.60	0.201	0.220
G	0.05	0.20	0.002	0.008
H	0.15	0.31	0.006	0.012

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	2.3	0.091
B	2.5	0.098
C	4.3	0.169
D	1.8	0.071
E	6.8	0.268

MARKING DIAGRAM



P/N = Marking Code
G = Green Compound
YW = Date Code
F = Factory Code

Note: Cathode band for uni-directional products only

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