400W, 6.8V - 200V Surface Mount Transient Voltage Suppressor

FEATURES

- AEC-Q101 qualified
- Ideal for automated placement
- Glass passivated chip junction
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps
- Typical I_R less than 1μA above 10V
- Meets ISO 7637-2 (Pulse 1/2a/2b/3a/3b)
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	5.5 - 171	V
V_{BR}	6.12 - 210	V
P_{PPM} t_p = 10/1000μs waveform	400	W
$T_{J\ MAX}$	150	°C
Package	DO-214AC (SMA)	
Configuration	Single die	

Pb-Free RoHS COMPLIANT HALOGEN FREE

APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter

MECHANICAL DATA

- Case: DO-214AC (SMA)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.060g (approximately)

DO-214AC (SMA)

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

PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation at T_A = 25°C, tp = 1ms (Note 1)	P_{PK}	400	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load	I_{FSM}	40	A
Maximum instantaneous forward voltage at 25A for unidirectional only	V_F	3.5	V
Operating junction temperature range	T_J	-55 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Notes:

1. Non-repetitive current pulse per Fig.5 and derated above T_A = 25°C per Fig.2

Devices for Bipolar Applications

1. For bidirectional use CH or CAH suffix for types P4SMA6.8H - types P4SMA200AH
2. Electrical characteristics apply in both directions

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

Part number	Marking code	Breakdown voltage V_{BR}@I_T[1] (V)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum reverse leakage current I_R@V_{WM}[1] (μA)	Maximum peak impulse current I_{PPM} (A) t_p =10/1000 μs	Maximum clamping voltage V_C@I_{PPM} (V) t_p =10/1000 μs	Maximum Temperature Coefficient of V_{BR} (%/°C)
		Min	Max						
P4SMA6.8H	ADJ	6.12	7.48	10	5.50	1000	38.0	10.8	0.057
P4SMA6.8AH	AEJ	6.46	7.14	10	5.80	1000	40.0	10.5	0.057
P4SMA7.5H	AFJ	6.75	8.25	10	6.05	500	35.0	11.7	0.061
P4SMA7.5AH	AGJ	7.13	7.88	10	6.40	500	37.0	11.3	0.061
P4SMA8.2H	AHJ	7.38	9.02	10	6.63	200	33.0	12.5	0.065
P4SMA8.2AH	AKJ	7.79	8.61	10	7.02	200	34.0	12.1	0.065
P4SMA9.1H	ALJ	8.19	10.00	1.0	7.37	50	30.0	13.8	0.068
P4SMA9.1AH	AMJ	8.65	9.55	1.0	7.78	50	31.0	13.4	0.068
P4SMA10H	ANJ	9.00	11.00	1.0	8.10	10	28.0	15.0	0.073
P4SMA10AH	APJ	9.50	10.50	1.0	8.55	10	29.0	14.5	0.073
P4SMA11H	AQJ	9.90	12.10	1.0	8.92	1	26.0	16.2	0.075
P4SMA11AH	ARJ	10.50	11.60	1.0	9.40	1	27.0	15.6	0.075
P4SMA12H	ASJ	10.80	13.20	1.0	9.72	1	24.0	17.3	0.078
P4SMA12AH	ATJ	11.40	12.60	1.0	10.2	1	25.0	16.7	0.078
P4SMA13H	AUJ	11.70	14.30	1.0	10.5	1	22.0	19.0	0.081
P4SMA13AH	AVJ	12.40	13.70	1.0	11.1	1	23.0	18.2	0.081
P4SMA15H	AWJ	13.50	16.50	1.0	12.1	1	19.0	22.0	0.084
P4SMA15AH	AXJ	14.30	15.80	1.0	12.8	1	20.0	21.2	0.084
P4SMA16H	AYJ	14.40	17.60	1.0	12.9	1	17.8	23.5	0.086
P4SMA16AH	AZJ	15.20	16.80	1.0	13.6	1	18.6	22.5	0.086
P4SMA18H	BDJ	16.20	19.80	1.0	14.5	1	16.0	26.5	0.088
P4SMA18AH	BEJ	17.10	18.90	1.0	15.3	1	16.5	25.5	0.088
P4SMA20H	BFJ	18.00	22.00	1.0	16.2	1	14.0	29.1	0.090
P4SMA20AH	BGJ	19.00	21.00	1.0	17.1	1	15.0	27.7	0.090
P4SMA22H	BHJ	19.80	24.20	1.0	17.8	1	13.0	31.9	0.092
P4SMA22AH	BKJ	20.90	23.10	1.0	18.8	1	13.7	30.6	0.092
P4SMA24H	BLJ	21.60	26.40	1.0	19.4	1	12.0	34.7	0.094
P4SMA24AH	BMJ	22.80	25.20	1.0	20.5	1	12.6	33.2	0.094
P4SMA27H	BNJ	24.30	29.70	1.0	21.8	1	10.7	39.1	0.096
P4SMA27AH	BPJ	25.70	28.40	1.0	23.1	1	11.0	37.5	0.096
P4SMA30H	BQJ	27.00	33.00	1.0	24.3	1	9.6	43.5	0.097
P4SMA30AH	BRJ	28.50	31.50	1.0	25.6	1	10.0	41.4	0.097
P4SMA33H	BSJ	29.70	36.30	1.0	26.8	1	8.8	47.7	0.098
P4SMA33AH	BTJ	31.40	34.70	1.0	28.2	1	9.0	45.7	0.098
P4SMA36H	BUJ	32.40	39.60	1.0	29.1	1	8.0	52.0	0.099
P4SMA36AH	BVJ	34.20	37.80	1.0	30.8	1	8.4	49.9	0.099
P4SMA39H	BWJ	35.10	42.90	1.0	31.6	1	7.4	56.4	0.100
P4SMA39AH	BXJ	37.10	41.00	1.0	33.3	1	7.7	53.9	0.100
P4SMA43H	BYJ	38.70	47.30	1.0	34.8	1	6.7	61.9	0.101
P4SMA43AH	BZJ	40.90	45.20	1.0	36.8	1	7.0	59.3	0.101
P4SMA47H	CDJ	42.30	51.70	1.0	38.1	1	6.2	67.8	0.101
P4SMA47AH	CEJ	44.70	49.40	1.0	40.2	1	6.4	64.8	0.101
P4SMA51H	CFJ	45.90	56.10	1.0	41.3	1	5.7	73.5	0.102
P4SMA51AH	CGJ	48.50	53.60	1.0	43.6	1	6.0	70.1	0.102
P4SMA56H	CHJ	50.40	61.60	1.0	45.4	1	5.2	80.5	0.103
P4SMA56AH	CKJ	53.20	58.80	1.0	47.8	1	5.4	77.0	0.103
P4SMA62H	CLJ	55.8	68.2	1.0	50.2	1	4.7	89.0	0.104
P4SMA62AH	CMJ	58.9	65.1	1.0	53.0	1	5.0	85.0	0.104

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

Part number	Marking code	Breakdown voltage V_{BR}@I_T[1] (V)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum reverse leakage current I_R@V_{WM}[1] (μA)	Maximum peak impulse current I_{PPM} (A) t_p =10/1000 μs	Maximum clamping voltage V_C@I_{PPM} (V) t_p =10/1000 μs	Maximum Temperature Coefficient of V_{BR} (%/°C)
		Min	Max						
P4SMA68H	CNJ	61.2	74.8	1.0	55.1	1	4.2	98.0	0.104
P4SMA68AH	CPJ	64.6	71.4	1.0	58.1	1	4.5	92.0	0.104
P4SMA75H	CQJ	67.5	82.5	1.0	60.7	1	3.8	108	0.105
P4SMA75AH	CRJ	71.3	78.8	1.0	64.1	1	4.0	103	0.105
P4SMA82H	CSJ	73.8	90.2	1.0	66.4	1	3.5	118	0.105
P4SMA82AH	CTJ	77.9	86.1	1.0	70.1	1	3.7	113	0.105
P4SMA91H	CUJ	81.9	100	1.0	73.7	1	3.2	131	0.106
P4SMA91AH	CVJ	86.5	95.5	1.0	77.8	1	3.3	125	0.106
P4SMA100H	CWJ	90	110	1.0	81.0	1	2.9	144	0.106
P4SMA100AH	CXJ	95	105	1.0	85.5	1	3.0	137	0.106
P4SMA110H	CYJ	99	121	1.0	89.2	1	2.6	158	0.107
P4SMA110AH	CZJ	105	116	1.0	94.0	1	2.7	152	0.107
P4SMA120H	RDJ	108	132	1.0	97.2	1	2.4	173	0.107
P4SMA120AH	REJ	114	126	1.0	102	1	2.5	165	0.107
P4SMA130H	RFJ	117	143	1.0	105	1	2.2	187	0.107
P4SMA130AH	RGJ	124	137	1.0	111	1	2.3	179	0.107
P4SMA150H	RHJ	135	165	1.0	121	1	1.9	215	0.108
P4SMA150AH	RKJ	143	158	1.0	128	1	2.0	207	0.108
P4SMA160H	RLJ	144	176	1.0	130	1	1.8	230	0.108
P4SMA160AH	RMJ	152	168	1.0	136	1	1.9	219	0.108
P4SMA170H	RNJ	153	187	1.0	138	1	1.7	244	0.108
P4SMA170AH	RPJ	162	179	1.0	145	1	1.8	234	0.108
P4SMA180H	RQJ	162	198	1.0	146	1	1.6	258	0.108
P4SMA180AH	RRJ	171	189	1.0	154	1	1.7	246	0.108
P4SMA200H	RSJ	180	220	1.0	162	1	1.4	287	0.108
P4SMA200AH	RTJ	190	210	1.0	171	1	1.51	274	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.5 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 CH or CAH suffix for types PS4MA6.8H through P4SMA200AH.
5. All terms and symbols are consistent with ANSI/IEEE C62.35.

ORDERING INFORMATION

ORDERING CODE[1]	PACKAGE	PACKING
P4SMAxH	DO-214AC (SMA)	7,500 / Tape & Reel

Notes:

1. "x" defines voltage from 6.8V(P4SMA6.8H) to 200V(P4SMA200AH)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Peak Pulse Power Rating Curve

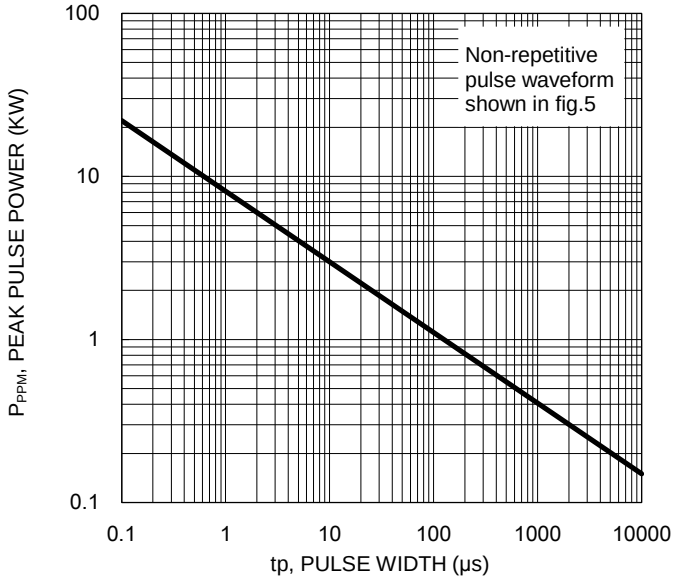


Fig.2 Pulse Derating Curve

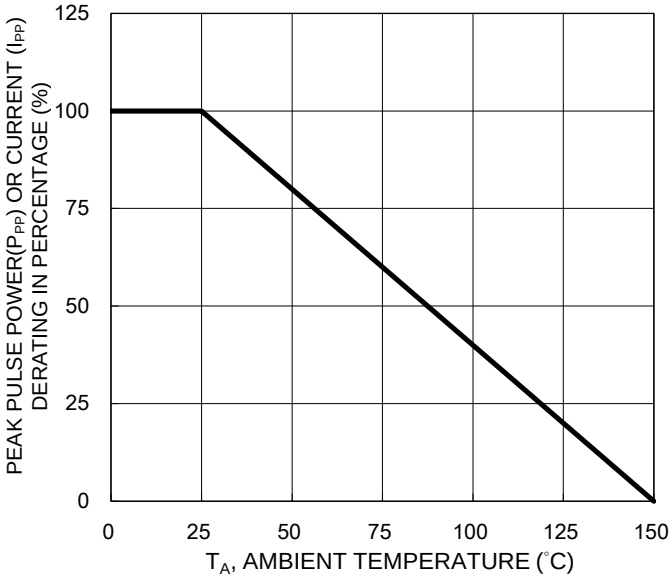


Fig.3 Typical Junction Capacitance

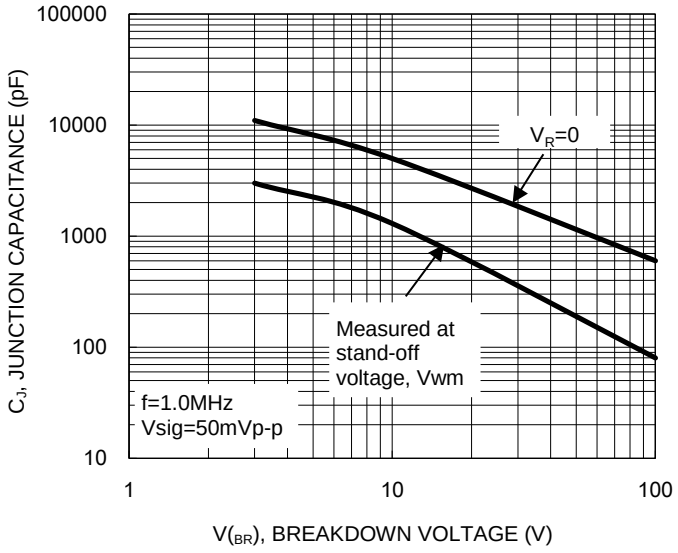
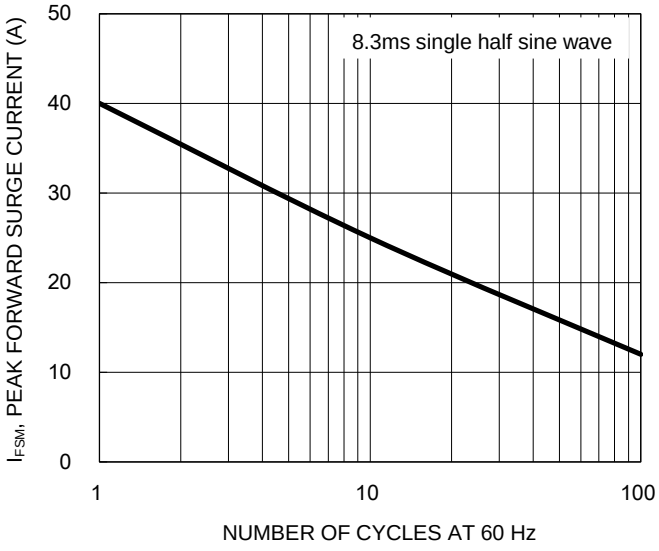


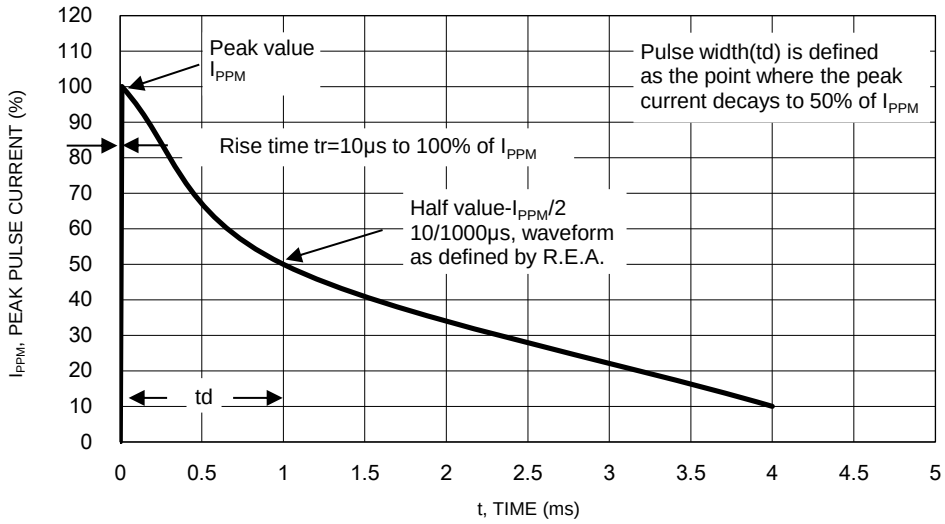
Fig.4 Maximum Non-repetitive Forward Surge Current



CHARACTERISTICS CURVES

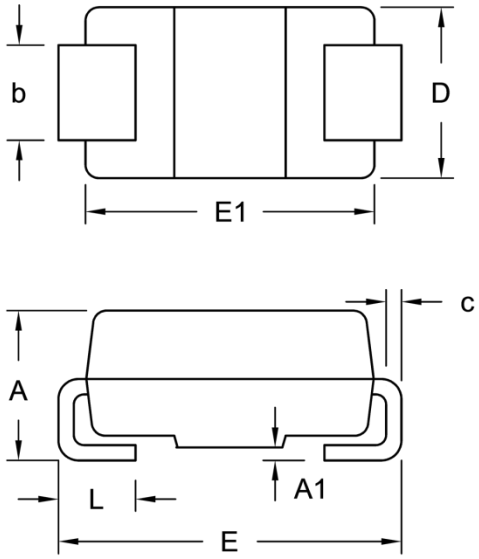
(T_A = 25°C unless otherwise noted)

Fig.5 Clamping Power Pulse Waveform



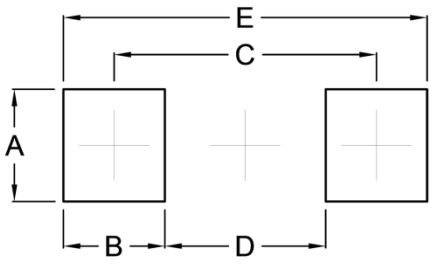
PACKAGE OUTLINE DIMENSIONS

DO-214AC (SMA)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	1.99	2.50	0.078	0.098
A1	0.10	0.20	0.004	0.008
b	1.27	1.58	0.050	0.062
c	0.15	0.31	0.006	0.012
D	2.29	2.83	0.090	0.111
E	4.95	5.33	0.195	0.210
E1	4.06	4.60	0.160	0.181
L	0.90	1.41	0.035	0.056

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	1.68	0.066
B	1.52	0.060
C	3.93	0.155
D	2.41	0.095
E	5.45	0.215

MARKING DIAGRAM

Cathode band for uni-directional products only

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