瞬变电压抑制二极管 Transient Voltage Suppressor Diodes

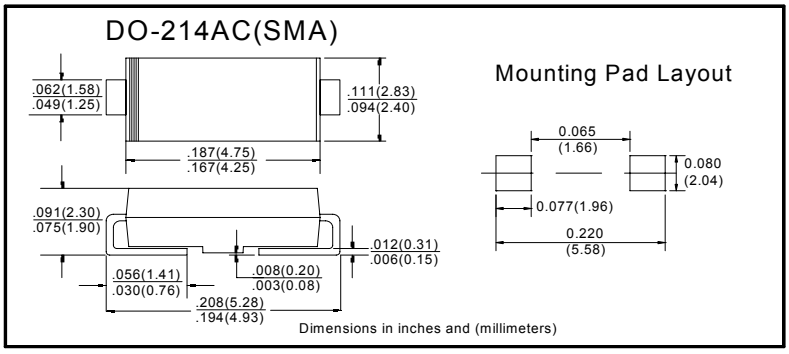
■特征 Features

- P_{PP} 400W
- V_{BR} 5.0V-188V

■用途 Applications

- 箝位电压用 Clamping Voltage

■外形尺寸和印记 Outline Dimensions and Mark



■极限值（绝对最大额定值）
Limiting Values (Absolute Maximum Rating)

参数名称 Item	符号 Symbol	单位 Unit	条件 Conditions	最大值 Max
最大损耗功率(1)(2)(Fig.1) Peak power dissipation	P_{PPM}	W	在10/1000us 波形下测试 with a 10/1000us waveform	400
最大脉冲电流(1) Peak pulse current	I_{PPM}	A	在10/1000us 波形下测试 with a 10/1000us waveform	见下面表格 See Next Table
最大正向浪涌电流(2) Peak forward surge current	I_{FSM}	A	8.3ms正弦半波，仅单向型 8.3 ms single half sine-wave unidirectional only	40
工作结温和存储温度范围 Operating junction and storage temperature range	T_J,T_{STG}	℃		-55 to +150

■电特性 （T_a=25℃ 除非另有规定）
Electrical Characteristics（T_a=25℃ Unless otherwise specified）

参数名称 Item	符号 Symbol	单位 Unit	条件 Conditions	最大值 Max
最大瞬间正向电压 Maximum instantaneous forward Voltage	V_F	V	在25A下测试，仅单向型 at 25A for unidirectional only	3.5
典型热阻 Thermal resistance	$R_{\theta JL}$	℃/W	结到引线 junction to lead	30
	$R_{\theta JA}$	℃/W	结到环境，均引线10mm处 junction to ambient， L_{Lead} = 10 mm	120

备注：Notes:

(1) 不重复脉冲电流，如图3，在T_A= 25℃下功率降额曲线如图2。78V以上额定功率为300W

Non-repetitive current pulse, per Fig. 3 and derated above T_A= 25℃per Fig.2. Rating is 300 W above 78V

(2) 每个端子安装在 0.2 x 0.2" (5.0 x 5.0 mm)铜焊盘上

Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal

■电性参数 (T_A=25℃ 除非另有规定)

Electrical Characteristics (T_A=25℃ unless otherwise noted)

产品型号（单向）Part Number(Uni)	产品型号（双向）Part Number(Bi)	击穿电压 V_{BR}@I_T Breakdown Voltage V_{BR}@I_T			最大反向漏电流 I_R @V_{WM} Maximum Reverse Leakage I_R (3) (μA)	最大工作电压 V_{RWM} Working Peak Reverse Voltage V_{RWM} (V)	最大反向浪涌电流 IPP Maximum Reverse Surge Current IPP(2) (A)	最大箝位电压 Maximum Clamping Voltage Vc @ I_{PP} (V)
		最小 Min(V)	最大 Max (V)	测试电流 IT(1)(mA)				
SMAJ5.0	SMAJ5.0C	6.40	7.82	10	800	5.0	41.7	9.6
SMAJ5.0A	SMAJ5.0CA(4)	6.40	7.07	10	800	5.0	43.5	9.2
SMAJ6.0	SMAJ6.0C	6.67	8.15	10	800	6.0	35.1	11.4
SMAJ6.0A	SMAJ6.0CA	6.67	7.37	10	800	6.0	38.8	10.3
SMAJ6.5	SMAJ6.5C	7.22	8.82	10	500	6.5	32.5	12.3
SMAJ6.5A	SMAJ6.5CA	7.22	7.98	10	500	6.5	35.7	11.2
SMAJ7.0	SMAJ7.0C	7.78	9.51	10	200	7.0	30.1	13.3
SMAJ7.0A	SMAJ7.0CA	7.78	8.60	10	200	7.0	33.3	12.0
SMAJ7.5	SMAJ7.5C	8.33	10.2	1.0	100	7.5	28.0	14.3
SMAJ7.5A	SMAJ7.5CA	8.33	9.21	1.0	100	7.5	31.0	12.9
SMAJ8.0	SMAJ8.0C	8.89	10.9	1.0	50	8.0	26.7	15.0
SMAJ8.0A	SMAJ8.0CA	8.89	9.83	1.0	50	8.0	29.4	13.6
SMAJ8.5	SMAJ8.5C	9.44	11.5	1.0	10	8.5	25.2	15.9
SMAJ8.5A	SMAJ8.5CA	9.44	10.4	1.0	10	8.5	27.8	14.4
SMAJ9.0	SMAJ9.0C	10.0	12.2	1.0	5.0	9.0	23.7	16.9
SMAJ9.0A	SMAJ9.0CA	10.0	11.1	1.0	5.0	9.0	26.0	15.4
SMAJ10	SMAJ10C	11.1	13.6	1.0	1.0	10	21.3	18.8
SMAJ10A	SMAJ10CA	11.1	12.3	1.0	1.0	10	23.5	17.0
SMAJ11	SMAJ11C	12.2	14.9	1.0	1.0	11	19.9	20.1
SMAJ11A	SMAJ11CA	12.2	13.5	1.0	1.0	11	22.0	18.2
SMAJ12	SMAJ12C	13.3	16.3	1.0	1.0	12	18.2	22.0
SMAJ12A	SMAJ12CA	13.3	14.7	1.0	1.0	12	20.1	19.9
SMAJ13	SMAJ13C	14.4	17.6	1.0	1.0	13	16.8	23.8
SMAJ13A	SMAJ13CA	14.4	15.9	1.0	1.0	13	18.6	21.5
SMAJ14	SMAJ14C	15.6	19.1	1.0	1.0	14	15.5	25.8
SMAJ14A	SMAJ14CA	15.6	17.2	1.0	1.0	14	17.2	23.2
SMAJ15	SMAJ15C	16.7	20.4	1.0	1.0	15	14.9	26.9
SMAJ15A	SMAJ15CA	16.7	18.5	1.0	1.0	15	16.4	24.4
SMAJ16	SMAJ16C	17.8	21.8	1.0	1.0	16	13.9	28.8
SMAJ16A	SMAJ16CA	17.8	19.7	1.0	1.0	16	15.4	26.0
SMAJ17	SMAJ17C	18.9	23.1	1.0	1.0	17	13.1	30.5
SMAJ17A	SMAJ17CA	18.9	20.9	1.0	1.0	17	14.5	27.6
SMAJ18	SMAJ18C	20.0	24.4	1.0	1.0	18	12.4	32.2
SMAJ18A	SMAJ18CA	20.0	22.1	1.0	1.0	18	13.7	29.2
SMAJ20	SMAJ20C	22.2	27.1	1.0	1.0	20	11.2	35.8
SMAJ20A	SMAJ20CA	22.2	24.5	1.0	1.0	20	12.3	32.4

■电性参数 (T_A =25℃ 除非另有规定)

Electrical Characteristics (T_A =25℃ unless otherwise noted)

产品型号（单向） Part Number(Uni)	产品型号（双向） Part Number(Bi)	击穿电压 V_{BR}@I_T Breakdown Voltage V_{BR}@I_T			最大反向漏电流 I_R @V_{WM} Maximum Reverse Leakage I_R (3) (μA)	最大工作电压 V_{RWM} Working Peak Reverse Voltage V_{RWM} (V)	最大反向浪涌电流 IPP Maximum Reverse Surge Current IPP(2) (A)	最大箝位电压 Maximum Clamping Voltage Vc @ I_{PP} (V)
		最小 Min(V)	最大 Max (V)	测试电流 IT(1)(mA)				
SMAJ22	SMAJ22C	24.4	29.8	1.0	1.0	22	10.2	39.4
SMAJ22A	SMAJ22CA	24.4	26.9	1.0	1.0	22	11.3	35.5
SMAJ24	SMAJ24C	26.7	32.6	1.0	1.0	24	9.3	43.0
SMAJ24A	SMAJ24CA	26.7	29.5	1.0	1.0	24	10.3	38.9
SMAJ26	SMAJ26C	28.9	35.3	1.0	1.0	26	8.6	46.6
SMAJ26A	SMAJ26CA	28.9	31.9	1.0	1.0	26	9.5	42.1
SMAJ28	SMAJ28C	31.1	38.0	1.0	1.0	28	8.0	50.0
SMAJ28A	SMAJ28CA	31.1	34.4	1.0	1.0	28	8.8	45.4
SMAJ30	SMAJ30C	33.3	40.7	1.0	1.0	30	7.5	53.5
SMAJ30A	SMAJ30CA	33.3	36.8	1.0	1.0	30	8.3	48.4
SMAJ33	SMAJ33C	36.7	44.9	1.0	1.0	33	6.8	59.0
SMAJ33A	SMAJ33CA	36.7	40.6	1.0	1.0	33	7.5	53.3
SMAJ36	SMAJ36C	40.0	48.9	1.0	1.0	36	6.2	64.3
SMAJ36A	SMAJ36CA	40.0	44.2	1.0	1.0	36	6.9	58.1
SMAJ40	SMAJ40C	44.4	54.3	1.0	1.0	40	5.6	71.4
SMAJ40A	SMAJ40CA	44.4	49.1	1.0	1.0	40	6.2	64.5
SMAJ43	SMAJ43C	47.8	58.4	1.0	1.0	43	5.2	76.7
SMAJ43A	SMAJ43CA	47.8	52.8	1.0	1.0	43	5.8	69.4
SMAJ45	SMAJ45C	50.0	61.1	1.0	1.0	45	5.0	80.3
SMAJ45A	SMAJ45CA	50.0	55.3	1.0	1.0	45	5.5	72.7
SMAJ48	SMAJ48C	53.3	65.1	1.0	1.0	48	4.7	85.5
SMAJ48A	SMAJ48CA	53.3	58.9	1.0	1.0	48	5.2	77.4
SMAJ51	SMAJ51C	56.7	69.3	1.0	1.0	51	4.4	91.1
SMAJ51A	SMAJ51CA	56.7	62.7	1.0	1.0	51	4.9	82.4
SMAJ54	SMAJ54C	60.0	73.3	1.0	1.0	54	4.2	96.3
SMAJ54A	SMAJ54CA	60.0	66.3	1.0	1.0	54	4.6	87.1
SMAJ58	SMAJ58C	64.4	78.7	1.0	1.0	58	3.9	103
SMAJ58A	SMAJ58CA	64.4	71.2	1.0	1.0	58	4.3	93.6
SMAJ60	SMAJ60C	66.7	81.5	1.0	1.0	60	3.7	107
SMAJ60A	SMAJ60CA	66.7	73.7	1.0	1.0	60	4.1	96.8
SMAJ64	SMAJ64C	71.1	86.9	1.0	1.0	64	3.5	114
SMAJ64A	SMAJ64CA	71.1	78.6	1.0	1.0	64	3.9	103
SMAJ70	SMAJ70C	77.8	95.1	1.0	1.0	70	3.2	125
SMAJ70A	SMAJ70CA	77.8	86.0	1.0	1.0	70	3.5	113
SMAJ75	SMAJ75C	83.3	102	1.0	1.0	75	3.0	134
SMAJ75A	SMAJ75CA	83.3	92.1	1.0	1.0	75	3.3	121

■电性参数 (T_A =25℃ 除非另有规定)

Electrical Characteristics (T_A =25℃ unless otherwise noted)

产品型号（单向） Part Number(Uni)	产品型号（双向） Part Number(Bi)	击穿电压 V_{BR}@I_T Breakdown Voltage V_{BR}@I_T			最大反向漏电流 I_R @V_{WM} Maximum Reverse Leakage I_R (3) (μA)	最大工作电压 V_{RWM} Working Peak Reverse Voltage V_{RWM} (V)	最大反向浪涌电流 IPP Maximum Reverse Surge Current IPP(2) (A)	最大箝位电压 Maximum Clamping Voltage Vc @ I_{PP} (V)
		最小 Min(V)	最大 Max (V)	测试电流 IT(1)(mA)				
SMAJ78	SMAJ78C	86.7	106	1.0	1.0	78	2.9	139
SMAJ78A	SMAJ78CA	86.7	95.8	1.0	1.0	78	3.2	126
SMAJ85	SMAJ85C	94.4	115	1.0	1.0	85	2.0	151
SMAJ85A	SMAJ85CA	94.4	104	1.0	1.0	85	2.2	137
SMAJ90	SMAJ90C	100	122	1.0	1.0	90	1.9	160
SMAJ90A	SMAJ90CA	100	111	1.0	1.0	90	2.1	146
SMAJ100	SMAJ100C	111	136	1.0	1.0	100	1.7	179
SMAJ100A	SMAJ100CA	111	123	1.0	1.0	100	1.9	162
SMAJ110	SMAJ110C	122	149	1.0	1.0	110	1.5	196
SMAJ110A	SMAJ110CA	122	135	1.0	1.0	110	1.7	177
SMAJ120	SMAJ120C	133	163	1.0	1.0	120	1.4	214
SMAJ120A	SMAJ120CA	133	147	1.0	1.0	120	1.6	193
SMAJ130	SMAJ130C	144	176	1.0	1.0	130	1.3	231
SMAJ130A	SMAJ130CA	144	159	1.0	1.0	130	1.4	209
SMAJ150	SMAJ150C	167	204	1.0	1.0	150	1.1	268
SMAJ150A	SMAJ150CA	167	185	1.0	1.0	150	1.2	243
SMAJ160	SMAJ160C	178	218	1.0	1.0	160	1.0	287
SMAJ160A	SMAJ160CA	178	197	1.0	1.0	160	1.2	259
SMAJ170	SMAJ170C	189	231	1.0	1.0	170	0.99	304
SMAJ170A	SMAJ170CA	189	209	1.0	1.0	170	1.09	275
SMAJ188	SMAJ188C	209	255	1.0	1.0	188	0.90	344
SMAJ188A	SMAJ188CA	209	231	1.0	1.0	188	0.91	328

备注：Notes:

(1) 脉冲测试：t_p≤50ms Pulse test: t_p≤50ms

(2) 浪涌电流波形，如图3，功率降额曲线如图2。

Surge current waveform per Fig. 3 and derated per Fig.2.

(3) 对于双向型，V_{WM}在10V及10V以下，I_R值加倍

For bi-directional types having VWM of 10 V and less, the I_R limit is doubled

(4) 对于双向SMAJ5.0CA，V_{BR}最大值为7.25V

For the bi-directional SMAJ5.0CA, the maximum V_{BR} is 7.25 V

■特性曲线（典型） Characteristics(Typical)

图1：最大脉冲功率曲线
FIG1:Peak Pulse Power Rating Curve

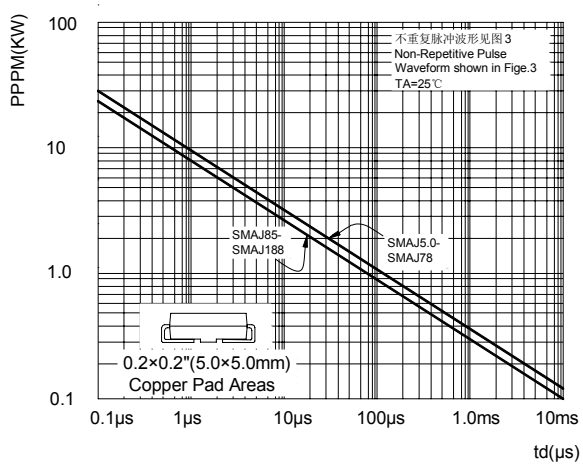


图2：脉冲功率或电流与结温关系
FIG2: Pulse Power or Current vs. Initial Junction Temperature

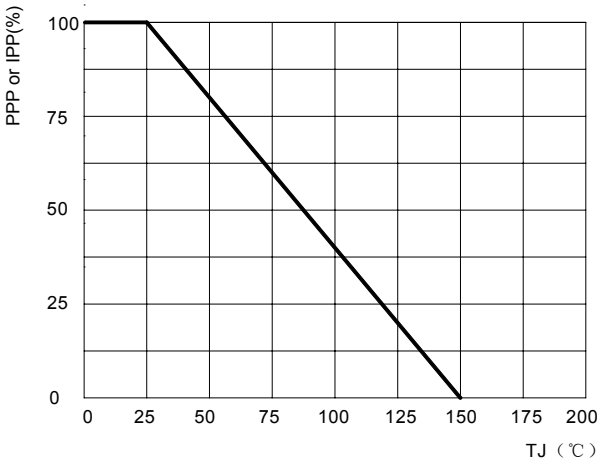


图3：脉冲波形
FIG3: Pulse Waveform

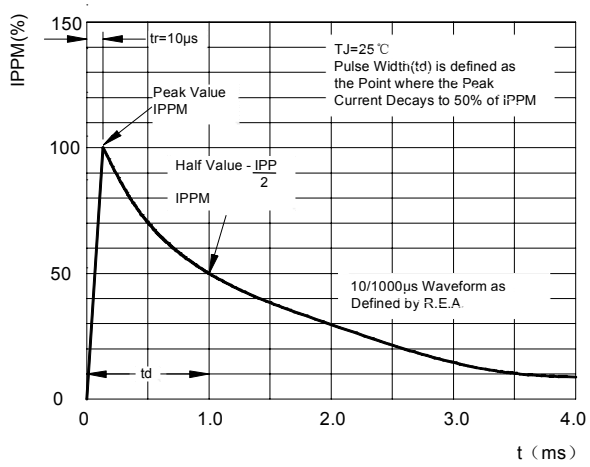


图4：典型瞬态热阻
FIG4:Typical Transient Thermal Impedance

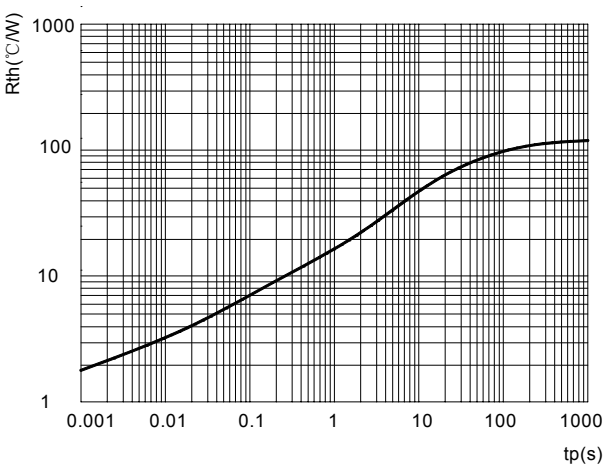


图5：最大不重复浪涌电流
FIG5: Maximum Non-Repetitive Surge Current

