

P4SMA Transient Voltage Suppressor

VBR : 6.8 - 440 Volts

PPK : 400 Watts

Features

- 400W surge capability at 1ms
- Excellent clamping capability
- Low zener impedance
- Fast response time : typically less than 1.0 ps from 0 volt to VBR(min.)
- Typical IR less than 1µA above 10V
- RoHS compliant package
- AEC-Q101 compliant available

Applications

- For Bi-directional use C or CA Suffix
- Electrical characteristics apply in both directions

Mechanical Data

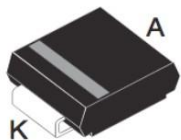
- Case : SMA Molded plastic
- Epoxy : UL94V-0 rate flame retardant
- Lead : Axial lead solderable per MIL-STD-202, method 208 guaranteed

208 guaranteed

- Polarity : Color band denotes cathode end
- Mounting position : Any
- Weight : 0.065 gram

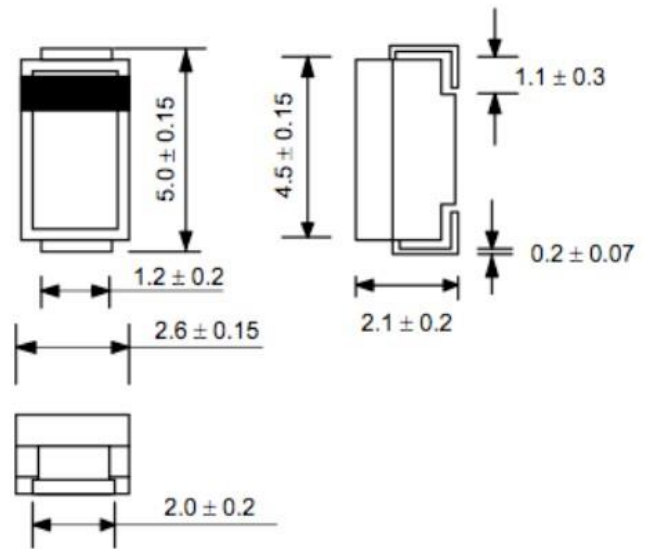
Packing & Order Information

5,000/Reel



RoHS
COMPLIANT

SMA (DO-214AC)



Dimensions in millimeters

Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified.

| Symbol | Parameter | Value | Unit |
|----------|---|--------------|------|
| PPK | Peak Power Dissipation at Ta = 25°C, Tp=1ms (Note 1) | Minimum 400 | W |
| PD | Steady State Power Dissipation at TL = 75 °C | 1.0 | W |
| IFSM | Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note 3) IFSM 100 Amps. | 40 | A |
| TJ, TSTG | Operating and Storage Temperature Range | -55 to + 150 | °C |

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Notes:

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above $T_a = 25^\circ\text{C}$ per Fig. 1
- (2) Mounted on copper Lead area at 5.0 mm^2 (0.013 mm thick).
- (3) 8.3 ms single half sine-wave, duty cycle = 4 pulses per Minutes maximum.

ELECTRICAL CHARACTERISTICS (Rating at 25°C ambient temperature unless otherwise specified)

| Type No. | Breakdown Voltage @ I_t (Note 1) | | Working Peak Reverse Voltage VRWM | Maximum Reverse Leakage @ VRWM IR | Maximum Reverse Current IRSM | Maximum Clamping Voltage @ IRSM VRSM | Maximum Temperature Co-efficient of VBR | |
|-----------|--------------------------------------|------|-----------------------------------|-----------------------------------|------------------------------|--------------------------------------|---|------------|
| | VBR (V) | | | | | | | I_t (mA) |
| | Min | Max | (V) | (μA) | (A) | (V) | (% / $^\circ\text{C}$) | |
| P4SMA6.8 | 6.12 | 7.48 | 10 | 5.50 | 1000 | 38.0 | 10.8 | 0.057 |
| P4SMA6.8A | 6.45 | 7.14 | 10 | 5.80 | 1000 | 40.0 | 10.5 | 0.057 |
| P4SMA7.5 | 6.75 | 8.25 | 10 | 6.05 | 500 | 36.0 | 11.7 | 0.061 |
| P4SMA7.5A | 7.13 | 7.88 | 10 | 6.40 | 500 | 37.0 | 11.3 | 0.061 |
| P4SMA8.2 | 7.38 | 9.02 | 10 | 6.63 | 200 | 33.0 | 12.5 | 0.065 |
| P4SMA8.2A | 7.79 | 8.61 | 10 | 7.02 | 200 | 35.0 | 12.1 | 0.065 |
| P4SMA9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50 | 30.0 | 13.8 | 0.068 |
| P4SMA9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 31.0 | 13.4 | 0.068 |
| P4SMA10 | 9.00 | 11.0 | 1.0 | 8.10 | 10 | 28.0 | 15.0 | 0.073 |
| P4SMA10A | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 29.0 | 14.5 | 0.073 |
| P4SMA11 | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 26.0 | 16.2 | 0.075 |
| P4SMA11A | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 27.0 | 15.6 | 0.075 |
| P4SMA12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 24.0 | 17.3 | 0.078 |
| P4SMA12A | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 25.0 | 16.7 | 0.078 |
| P4SMA13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 22.0 | 19.0 | 0.081 |
| P4SMA13A | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 23.0 | 18.2 | 0.081 |
| P4SMA15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 19.0 | 22.0 | 0.084 |
| P4SMA15A | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 20.0 | 21.2 | 0.084 |
| P4SMA16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 18.0 | 23.5 | 0.086 |
| P4SMA16A | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 19.0 | 22.5 | 0.086 |
| P4SMA17 | 15.3 | 18.7 | 1.0 | 13.7 | 5.0 | 17.0 | 25.0 | 0.087 |
| P4SMA17A | 16.2 | 17.9 | 1.0 | 14.5 | 5.0 | 18.0 | 24.0 | 0.087 |
| P4SMA18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 16.0 | 26.5 | 0.088 |
| P4SMA18A | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 17.0 | 25.5 | 0.088 |
| P4SMA20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 14.0 | 29.1 | 0.090 |
| P4SMA20A | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 15.0 | 27.7 | 0.090 |

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| Type No. | Breakdown Voltage @ It (Note 1) | | Working Peak Reverse Voltage VRWM (V) | Maximum Reverse Leakage @ VRWM (µA) | Maximum Reverse Current IRSM (A) | Maximum Clamping Voltage @ IRSM VRSM (V) | Maximum Temperature Co-efficient of VBR (% / °C) | |
|----------|-----------------------------------|------|---------------------------------------|-------------------------------------|----------------------------------|--|--|---------|
| | VBR (V) | | | | | | | It (mA) |
| | Min | Max | | | | | | |
| P4SMA22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 13.0 | 31.9 | 0.092 |
| P4SMA22A | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 14.0 | 30.6 | 0.092 |
| P4SMA24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 12.0 | 34.7 | 0.094 |
| P4SMA24A | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 13.0 | 33.2 | 0.094 |
| P4SMA27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 11.0 | 39.1 | 0.096 |
| P4SMA27A | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 11.2 | 37.5 | 0.096 |
| P4SMA30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 10.0 | 43.5 | 0.097 |
| P4SMA30A | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 10.0 | 41.4 | 0.097 |
| P4SMA33 | 29.7 | 36.6 | 1.0 | 26.8 | 5.0 | 9.0 | 47.7 | 0.098 |
| P4SMA33A | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 9.0 | 45.7 | 0.098 |
| P4SMA36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 8.0 | 52.0 | 0.099 |
| P4SMA36A | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 8.4 | 49.9 | 0.099 |
| P4SMA39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 7.4 | 56.4 | 0.100 |
| P4SMA39A | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 7.8 | 53.9 | 0.100 |
| P4SMA43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 6.8 | 61.9 | 0.101 |
| P4SMA43A | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 7.1 | 59.3 | 0.101 |
| P4SMA47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 6.2 | 67.8 | 0.101 |
| P4SMA47A | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 6.5 | 64.8 | 0.101 |
| P4SMA51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 5.7 | 73.5 | 0.102 |
| P4SMA51A | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 6.0 | 70.1 | 0.102 |
| P4SMA56 | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 5.2 | 80.5 | 0.103 |
| P4SMA56A | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 5.5 | 77.0 | 0.103 |
| P4SMA62 | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 4.7 | 89.0 | 0.104 |
| P4SMA62A | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 5.0 | 85.0 | 0.104 |
| P4SMA68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 4.3 | 98.0 | 0.104 |
| P4SMA68A | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 4.6 | 92.0 | 0.104 |
| P4SMA75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 3.9 | 108 | 0.105 |
| P4SMA75A | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 4.1 | 103 | 0.105 |
| P4SMA82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.6 | 118 | 0.105 |

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| Type No. | Breakdown Voltage @ It (Note 1) | | Working Peak Reverse Voltage VRWM (V) | Maximum Reverse Leakage @ VRWM (µA) | Maximum Reverse Current IRSM (A) | Maximum Clamping Voltage @ IRSM VRSM (V) | Maximum Temperature Co-efficient of VBR (% / °C) | |
|-----------|-----------------------------------|------|---------------------------------------|-------------------------------------|----------------------------------|--|--|---------|
| | VBR (V) | | | | | | | It (mA) |
| | Min | Max | | | | | | |
| P4SMA82A | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.7 | 113 | 0.105 |
| P4SMA91 | 81.9 | 100 | 1.0 | 73.7 | 5.0 | 3.2 | 131 | 0.106 |
| P4SMA91A | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 3.4 | 125 | 0.106 |
| P4SMA100 | 90.0 | 110 | 1.0 | 81.0 | 5.0 | 2.9 | 144 | 0.106 |
| P4SMA100A | 95.0 | 105 | 1.0 | 85.5 | 5.0 | 3.1 | 137 | 0.106 |
| P4SMA110 | 99.0 | 121 | 1.0 | 89.2 | 5.0 | 2.7 | 158 | 0.107 |
| P4SMA110A | 105 | 116 | 1.0 | 91.0 | 5.0 | 2.8 | 152 | 0.107 |
| P4SMA120 | 108 | 132 | 1.0 | 97.2 | 5.0 | 2.4 | 173 | 0.107 |
| P4SMA120A | 114 | 126 | 1.0 | 102 | 5.0 | 2.5 | 165 | 0.107 |
| P4SMA130 | 117 | 143 | 1.0 | 105 | 5.0 | 2.2 | 187 | 0.107 |
| P4SMA130A | 124 | 137 | 1.0 | 111 | 5.0 | 2.3 | 179 | 0.107 |
| P4SMA150 | 135 | 165 | 1.0 | 121 | 5.0 | 2.0 | 215 | 0.108 |
| P4SMA150A | 143 | 158 | 1.0 | 128 | 5.0 | 2.0 | 207 | 0.108 |
| P4SMA160 | 144 | 176 | 1.0 | 130 | 5.0 | 1.8 | 230 | 0.108 |
| P4SMA160A | 152 | 168 | 1.0 | 136 | 5.0 | 1.9 | 219 | 0.108 |
| P4SMA170 | 153 | 187 | 1.0 | 138 | 5.0 | 1.7 | 244 | 0.108 |
| P4SMA170A | 162 | 179 | 1.0 | 145 | 5.0 | 1.8 | 234 | 0.108 |
| P4SMA180 | 162 | 198 | 1.0 | 146 | 5.0 | 1.6 | 258 | 0.108 |
| P4SMA180A | 171 | 189 | 1.0 | 154 | 5.0 | 1.7 | 246 | 0.108 |
| P4SMA200 | 180 | 220 | 1.0 | 162 | 5.0 | 1.5 | 287 | 0.108 |
| P4SMA200A | 190 | 210 | 1.0 | 171 | 5.0 | 1.53 | 274 | 0.108 |
| P4SMA220 | 198 | 242 | 1.0 | 175 | 5.0 | 1.16 | 344 | 0.108 |
| P4SMA220A | 209 | 231 | 1.0 | 185 | 5.0 | 1.22 | 328 | 0.108 |
| P4SMA250 | 225 | 275 | 1.0 | 202 | 5.0 | 1.11 | 360 | 0.110 |
| P4SMA250A | 237 | 263 | 1.0 | 214 | 5.0 | 1.16 | 344 | 0.110 |
| P4SMA300 | 270 | 330 | 1.0 | 243 | 5.0 | 0.93 | 430 | 0.110 |
| P4SMA300A | 285 | 315 | 1.0 | 256 | 5.0 | 0.97 | 414 | 0.110 |
| P4SMA350 | 315 | 385 | 1.0 | 284 | 5.0 | 0.79 | 504 | 0.110 |
| P4SMA350A | 332 | 368 | 1.0 | 300 | 5.0 | 0.83 | 482 | 0.110 |

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| Type No. | Breakdown Voltage @ It (Note 1) | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ VRWM | Maximum Reverse Current | Maximum Clamping Voltage @ IRSM | Maximum Temperature Co-efficient of VBR | |
|-----------|-----------------------------------|-----|------------------------------|--------------------------------|-------------------------|---------------------------------|---|----------|
| | VBR (V) | | | | | | | VRWM |
| | Min | Max | It (mA) | (V) | (μ A) | (A) | (V) | (% / °C) |
| P4SMA400 | 360 | 440 | 1.0 | 324 | 5.0 | 0.70 | 574 | 0.110 |
| P4SMA400A | 380 | 420 | 1.0 | 342 | 5.0 | 0.73 | 548 | 0.110 |
| P4SMA440 | 396 | 484 | 1.0 | 356 | 5.0 | 0.95 | 631 | 0.110 |
| P4SMA440A | 418 | 462 | 1.0 | 376 | 5.0 | 1.00 | 602 | 0.110 |

Note:

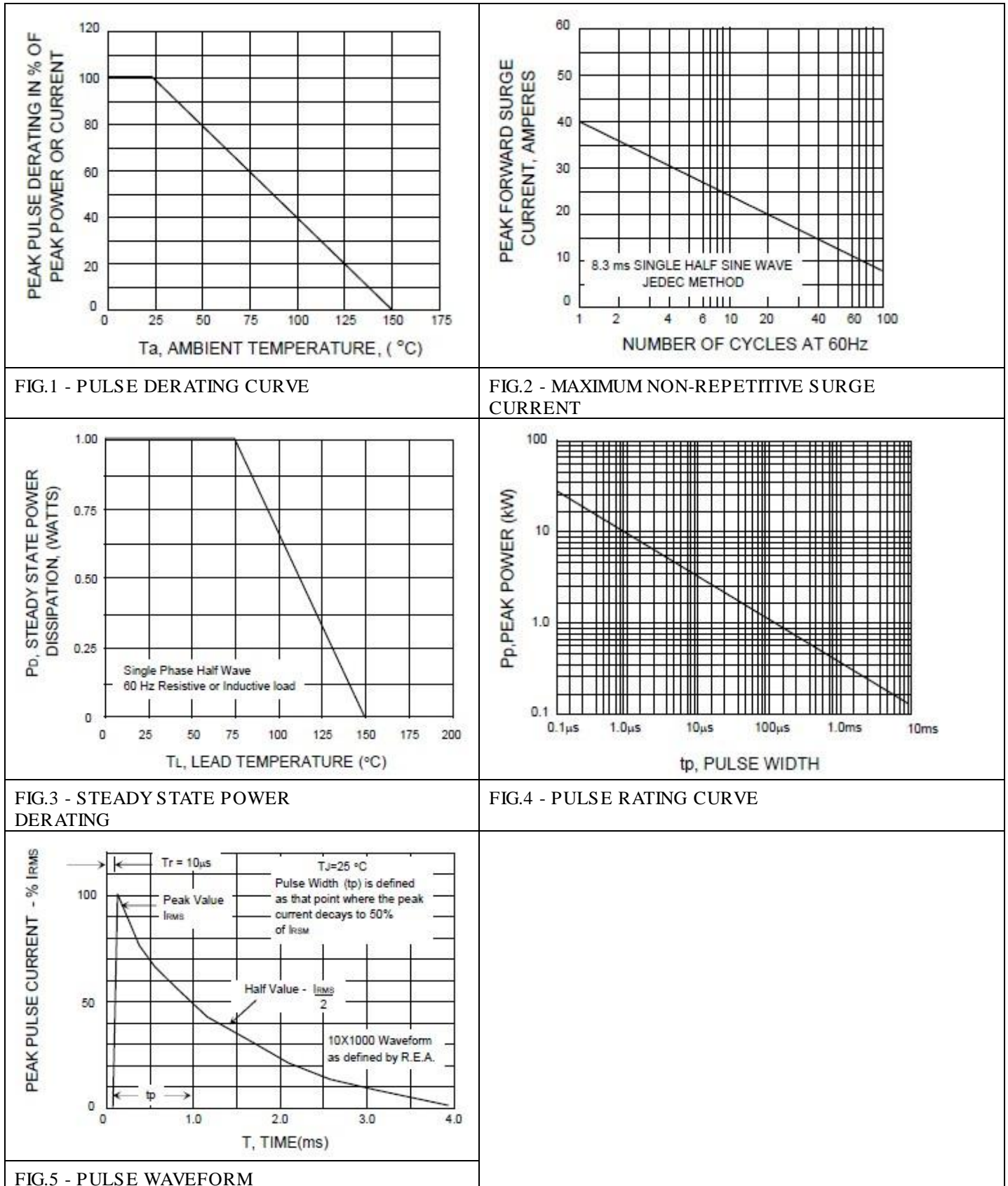
(1) "P4SMA" will be omitted in marking on the diode.

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■ RATING AND CHARACTERISTIC CURVES (P4SMA SERIES)



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