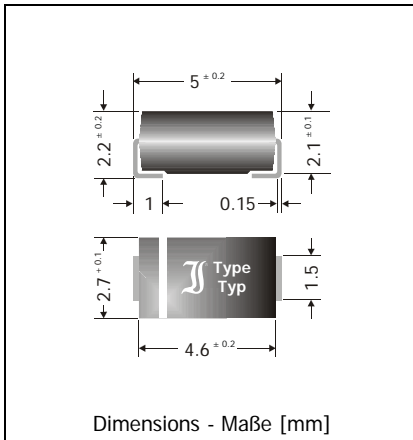



### P4SMAJ5.0 ... P4SMAJ170CA

**Surface mount unidirectional and bidirectional Transient Voltage Suppressor Diodes**  
**Unidirektionale und bidirektionale Spannungs-Begrenzer-Dioden für die Oberflächenmontage**

Version 2006-04-14



|   |   |
|---|---|
| Peak pulse power dissipation<br>Impuls-Verlustleistung                                | 400 W   |
| Nominal Stand-off voltage<br>Nominale Sperrspannung                                   | 5.0...170 V   |
| Plastic case<br>Kunststoffgehäuse   | ~ SMA<br>~ DO-214AC   |
| Weight approx. – Gewicht ca.  | 0.07 g  |
| Plastic material has UL classification 94V-0<br>Gehäusematerial UL94V-0 klassifiziert |  |
| Standard packaging taped and reeled<br>Standard Lieferform gegurtet auf Rollen        |   |

For bidirectional types (add suffix "C" or "CA"), electrical characteristics apply in both directions.  
Für bidirektionale Dioden (ergänze Suffix "C" oder "CA") gelten die elektrischen Werte in beiden Richtungen.

#### Maximum ratings and Characteristics

#### Grenz- und Kennwerte

|  |                          |                |                              |
|--|--------------------------|----------------|------------------------------|
| Peak pulse power dissipation (10/1000 $\mu$ s waveform)<br>Impuls-Verlustleistung (Strom-Impuls 10/1000 $\mu$ s) | $T_A = 25^\circ\text{C}$ | $P_{PPM}$      | 400 W <sup>1)</sup>          |
| Steady state power dissipation<br>Verlustleistung im Dauerbetrieb  | $T_T = 75^\circ\text{C}$ | $P_{M(AV)}$    | 1 W                          |
| Peak forward surge current, 60 Hz half sine-wave<br>Stoßstrom für eine 60 Hz Sinus-Halbwellen                    | $T_A = 25^\circ\text{C}$ | $I_{FSM}$      | 40 A <sup>2)</sup>           |
| Max. instantaneous forward voltage<br>Augenblickswert der Durchlass-Spannung                                     | $I_F = 25\text{ A}$      | $V_F$          | < 3.5 V <sup>2)</sup>        |
| Operating junction temperature – Sperrschichttemperatur<br>Storage temperature – Lagerungstemperatur             |                          | $T_J$<br>$T_S$ | -50...+150°C<br>-50...+150°C |
| Thermal resistance junction to ambient air<br>Wärmewiderstand Sperrschicht – umgebende Luft                      |                          | $R_{thA}$      | < 70 K/W <sup>3)</sup>       |
| Thermal resistance junction to terminal<br>Wärmewiderstand Sperrschicht – Anschluss                              |                          | $R_{thT}$      | < 30 K/W                     |

**TVS diodes having breakdown voltage  $V_{BR} = 220 \dots 550\text{ V}$ : please refer to datasheet P4SMA220**  
**TVS-Dioden mit Abbruchspannung  $V_{BR} = 220 \dots 550\text{ V}$ : siehe Datenblatt P4SMA220**

- 1 Non-repetitive pulse see curve  $I_{pp} = f(t) / P_{pp} = f(t)$   
Höchstzulässiger Spitzenwert eines einmaligen Impulses, siehe Kurve  $I_{pp} = f(t) / P_{pp} = f(t)$
- 2 Unidirectional diodes only – Nur für unidirektionale Dioden
- 3 Mounted on P.C. board with 25 mm<sup>2</sup> copper pads at each terminal  
Montage auf Leiterplatte mit 25 mm<sup>2</sup> Kupferbelag (Löt-pad) an jedem Anschluss

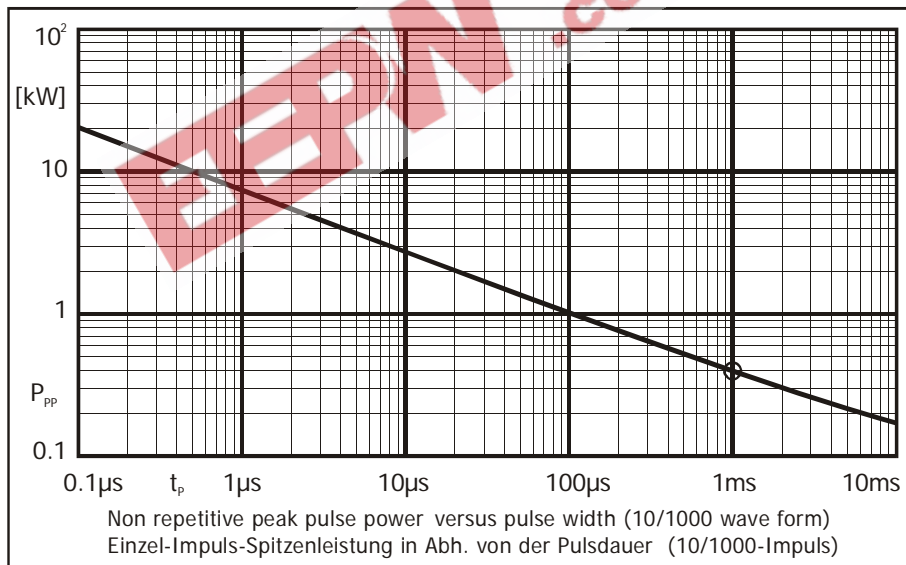
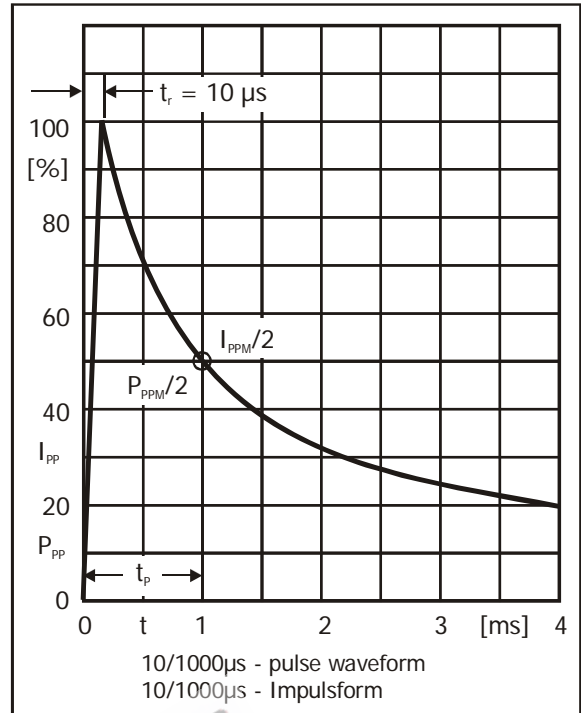
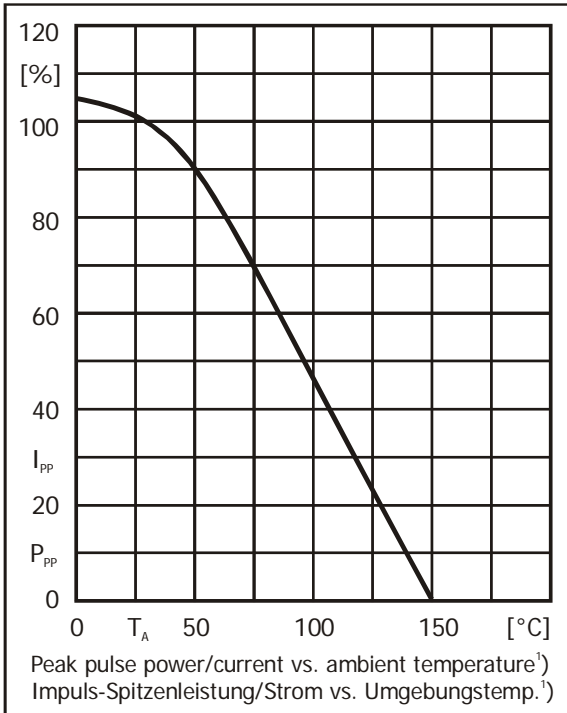
**Maximum ratings**
**Grenzwerte**

| Type<br>Typ | Stand-off voltage<br>Sperrspannung | Max. rev. current<br>Max. Sperrstrom<br>at / bei $V_{WM}$ | Breakdown voltage at $I_T = 1$ mA<br>Abbruch-Spannung bei $I_T = 1$ mA<br>) at / bei $I_T = 10$ mA |                  | Max. clamping voltage<br>Max. Begrenzer-Spannung<br>at / bei $I_{PPM}$ (10/1000 $\mu$ s) |               |
|-------------|------------------------------------|---|--|------------------|--|---------------|
|             | $V_{WM}$ [V]                       | $I_D$ [ $\mu$ A]  | $V_{BR}$ min [V]   | $V_{BR}$ max [V] | $V_C$ [V]  | $I_{PPM}$ [A] |
| P4SMAJ5.0   | 5.0                                | 800   | 6.4 *)   | 7.8 *)           | 10.3   | 38.8          |
| P4SMAJ5.0A  | 5.0                                | 800   | 6.4 *)   | 7.0 *)           | 9.2  | 43.5          |
| P4SMAJ6.5   | 6.5                                | 500   | 7.2 *)   | 8.8 *)           | 12.3   | 32.5          |
| P4SMAJ6.5A  | 6.5                                | 500   | 7.2 *)   | 8.0 *)           | 11.2   | 35.7          |
| P4SMAJ7.0   | 7.0                                | 200   | 7.8 *)   | 9.5 *)           | 13.3   | 30.1          |
| P4SMAJ7.0A  | 7.0                                | 200   | 7.8 *)   | 8.7 *)           | 12.0   | 33.3          |
| P4SMAJ7.5   | 7.5                                | 100   | 8.3  | 10.1             | 14.3   | 28.0          |
| P4SMAJ7.5A  | 7.5                                | 100   | 8.3  | 9.2              | 12.9   | 31.0          |
| P4SMAJ8.0   | 8.0                                | 50  | 8.9  | 10.9             | 15.0   | 26.7          |
| P4SMAJ8.0A  | 8.0                                | 50  | 8.9  | 9.9              | 13.6   | 29.4          |
| P4SMAJ8.5   | 8.5                                | 10  | 9.4  | 11.5             | 15.9   | 25.2          |
| P4SMAJ8.5A  | 8.5                                | 10  | 9.4  | 10.4             | 14.4   | 27.8          |
| P4SMAJ9.0   | 9.0                                | 5   | 10.0   | 12.2             | 16.9   | 23.7          |
| P4SMAJ9.0A  | 9.0                                | 5   | 10.0   | 11.1             | 15.4   | 26.0          |
| P4SMAJ10    | 10                                 | 5   | 11.1   | 13.5             | 18.8   | 21.3          |
| P4SMAJ10A   | 10                                 | 5   | 11.1   | 12.3             | 17.0   | 23.5          |
| P4SMAJ11    | 11                                 | 5   | 12.2   | 14.9             | 20.1   | 19.9          |
| P4SMAJ11A   | 11                                 | 5   | 12.2   | 13.5             | 18.2   | 22.0          |
| P4SMAJ12    | 12                                 | 5   | 13.3   | 16.2             | 22.0   | 18.2          |
| P4SMAJ12A   | 12                                 | 5   | 13.3   | 14.8             | 19.9   | 20.1          |
| P4SMAJ13    | 13                                 | 5   | 14.4   | 17.6             | 23.8   | 16.8          |
| P4SMAJ13A   | 13                                 | 5   | 14.4   | 16.0             | 21.5   | 18.6          |
| P4SMAJ14    | 14                                 | 5   | 15.6   | 19.0             | 25.8   | 15.5          |
| P4SMAJ14A   | 14                                 | 5   | 15.6   | 17.3             | 23.2   | 17.2          |
| P4SMAJ15    | 15                                 | 5   | 16.7   | 20.4             | 26.9   | 14.9          |
| P4SMAJ15A   | 15                                 | 5   | 16.7   | 18.6             | 24.4   | 16.4          |
| P4SMAJ16    | 16                                 | 5   | 17.8   | 21.7             | 28.8   | 13.9          |
| P4SMAJ16A   | 16                                 | 5   | 17.8   | 19.8             | 26.0   | 15.4          |
| P4SMAJ17    | 17                                 | 5   | 18.9   | 23.1             | 30.5   | 13.1          |
| P4SMAJ17A   | 17                                 | 5   | 18.9   | 21.0             | 27.6   | 14.5          |
| P4SMAJ18    | 18                                 | 5   | 20.0   | 24.4             | 32.2   | 12.4          |
| P4SMAJ18A   | 18                                 | 5   | 20.0   | 22.2             | 29.2   | 13.7          |
| P4SMAJ20    | 20                                 | 5   | 22.2   | 27.1             | 35.8   | 11.2          |
| P4SMAJ20A   | 20                                 | 5   | 22.2   | 24.6             | 32.4   | 12.3          |
| P4SMAJ22    | 22                                 | 5   | 24.4   | 29.8             | 39.4   | 10.2          |
| P4SMAJ22A   | 22                                 | 5   | 24.4   | 27.1             | 35.5   | 11.3          |
| P4SMAJ24    | 24                                 | 5   | 26.7   | 32.6             | 43.0   | 9.3           |
| P4SMAJ24A   | 24                                 | 5   | 26.7   | 29.6             | 38.9   | 10.3          |
| P4SMAJ26    | 26                                 | 5   | 28.9   | 35.3             | 46.6   | 8.6           |
| P4SMAJ26A   | 26                                 | 5   | 28.9   | 32.1             | 42.1   | 9.5           |
| P4SMAJ28    | 28                                 | 5   | 31.1   | 37.9             | 50.0   | 8.0           |
| P4SMAJ28A   | 28                                 | 5   | 31.1   | 34.5             | 45.4   | 8.8           |
| P4SMAJ30    | 30                                 | 5   | 33.3   | 40.1             | 53.5   | 7.5           |
| P4SMAJ30A   | 30                                 | 5   | 33.3   | 36.9             | 48.4   | 8.3           |
| P4SMAJ33    | 33                                 | 5   | 36.7   | 44.8             | 59.0   | 6.8           |

## Maximum ratings

## Grenzwerte

| Type<br>Typ | Stand-off voltage<br>Sperrspannung | Max. rev. current<br>Max. Sperrstrom<br>at / bei $V_{WM}$ | Breakdown voltage at $I_T = 1$ mA<br>Abbruch-Spannung bei $I_T = 1$ mA<br>*) at / bei $I_T = 10$ mA |                  | Max. clamping voltage<br>Max. Begrenzer-Spannung<br>at / bei $I_{PPM}$ (10/1000 $\mu$ s) |               |
|-------------|------------------------------------|---|---|------------------|--|---------------|
|             | $V_{WM}$ [V]                       | $I_D$ [ $\mu$ A]  | $V_{BR}$ min [V]  | $V_{BR}$ max [V] | $V_C$ [V]  | $I_{PPM}$ [A] |
| P4SMAJ33A   | 33                                 | 5   | 36.7  | 40.7             | 53.3   | 7.5           |
| P4SMAJ36    | 36                                 | 5   | 40.0  | 48.4             | 64.3   | 6.2           |
| P4SMAJ36A   | 36                                 | 5   | 40.0  | 44.4             | 58.1   | 6.9           |
| P4SMAJ40    | 40                                 | 5   | 44.4  | 54.2             | 71.4   | 5.6           |
| P4SMAJ40A   | 40                                 | 5   | 44.4  | 49.3             | 64.5   | 6.2           |
| P4SMAJ43    | 43                                 | 5   | 47.8  | 58.3             | 76.7   | 5.2           |
| P4SMAJ43A   | 43                                 | 5   | 47.8  | 53.1             | 69.4   | 5.8           |
| P4SMAJ45    | 45                                 | 5   | 50.0  | 61.0             | 80.3   | 5.0           |
| P4SMAJ45A   | 45                                 | 5   | 50.0  | 55.5             | 72.7   | 5.5           |
| P4SMAJ48    | 48                                 | 5   | 53.3  | 65.0             | 85.5   | 4.7           |
| P4SMAJ48A   | 48                                 | 5   | 53.3  | 59.2             | 77.4   | 5.2           |
| P4SMAJ51    | 51                                 | 5   | 56.7  | 69.2             | 91.1   | 4.4           |
| P4SMAJ51A   | 51                                 | 5   | 56.7  | 62.9             | 82.4   | 4.9           |
| P4SMAJ54    | 54                                 | 5   | 60.0  | 73.2             | 96.3   | 4.2           |
| P4SMAJ54A   | 54                                 | 5   | 60.0  | 66.6             | 87.1   | 4.6           |
| P4SMAJ58    | 58                                 | 5   | 64.4  | 78.6             | 103  | 3.9           |
| P4SMAJ58A   | 58                                 | 5   | 64.4  | 71.5             | 93.6   | 4.3           |
| P4SMAJ60    | 60                                 | 5   | 66.7  | 81.4             | 107  | 3.7           |
| P4SMAJ60A   | 60                                 | 5   | 66.7  | 74.0             | 96.8   | 4.1           |
| P4SMAJ64    | 64                                 | 5   | 71.1  | 86.7             | 114  | 3.5           |
| P4SMAJ64A   | 64                                 | 5   | 71.1  | 78.9             | 103  | 3.9           |
| P4SMAJ70    | 70                                 | 5   | 77.8  | 94.9             | 125  | 3.2           |
| P4SMAJ70A   | 70                                 | 5   | 77.8  | 86.4             | 113  | 3.5           |
| P4SMAJ75    | 75                                 | 5   | 83.3  | 102              | 134  | 3.0           |
| P4SMAJ75A   | 75                                 | 5   | 83.3  | 92.5             | 121  | 3.3           |
| P4SMAJ78    | 78                                 | 5   | 86.7  | 106              | 139  | 2.9           |
| P4SMAJ78A   | 78                                 | 5   | 86.7  | 96.2             | 126  | 3.2           |
| P4SMAJ85    | 85                                 | 5   | 94.4  | 115              | 151  | 2.6           |
| P4SMAJ85A   | 85                                 | 5   | 94.4  | 105              | 137  | 2.9           |
| P4SMAJ90    | 90                                 | 5   | 100   | 122              | 160  | 2.5           |
| P4SMAJ90A   | 90                                 | 5   | 100   | 111              | 146  | 2.7           |
| P4SMAJ100   | 100                                | 5   | 111   | 135              | 179  | 2.2           |
| P4SMAJ100A  | 100                                | 5   | 111   | 123              | 162  | 2.5           |
| P4SMAJ110   | 110                                | 5   | 122   | 149              | 196  | 2.0           |
| P4SMAJ110A  | 110                                | 5   | 122   | 135              | 177  | 2.3           |
| P4SMAJ120   | 120                                | 5   | 133   | 162              | 214  | 1.9           |
| P4SMAJ120A  | 120                                | 5   | 133   | 148              | 193  | 2.1           |
| P4SMAJ130   | 130                                | 5   | 144   | 176              | 231  | 1.7           |
| P4SMAJ130A  | 130                                | 5   | 144   | 160              | 209  | 1.9           |
| P4SMAJ150   | 150                                | 5   | 167   | 204              | 268  | 1.5           |
| P4SMAJ150A  | 150                                | 5   | 167   | 185              | 243  | 1.6           |
| P4SMAJ160   | 160                                | 5   | 178   | 217              | 287  | 1.4           |
| P4SMAJ160A  | 160                                | 5   | 178   | 198              | 259  | 1.5           |
| P4SMAJ170   | 170                                | 5   | 189   | 231              | 304  | 1.3           |
| P4SMAJ170A  | 170                                | 5   | 189   | 210              | 275  | 1.5           |



**TVS diodes having breakdown voltage  $V_{BR} = 220 \dots 550$  V: please refer to datasheet P4SMA220**  
**TVS-Dioden mit Abbruchspannung  $V_{BR} = 220 \dots 550$  V: siehe Datenblatt P4SMA220**

<sup>1</sup> Mounted on P.C. board with 25 mm<sup>2</sup> copper pads at each terminal  
Montage auf Leiterplatte mit 25 mm<sup>2</sup> Kupferbelag (Lötpad) an jedem Anschluss