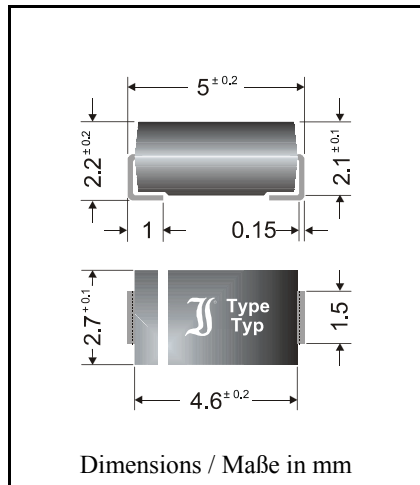


**Surface Mount**  
**unidirectional and bidirectional**  
**Transient Voltage Suppressor Diodes**

**Unidirektionale und bidirektionale**  
**Spannungs-Begrenzer-Dioden**  
**für die Oberflächenmontage**



|                                                  |                |
|--------------------------------------------------|----------------|
| Pulse power dissipation – Impuls-Verlustleistung | 400 W          |
| Maximum stand-off voltage                        | 6.5...170 V    |
| Maximale Sperrspannung                           |                |
| Plastic case                                     | ~ SMA          |
| Kunststoffgehäuse                                | ~ DO-214AC     |
| Weight approx. – Gewicht ca.                     | 0.07 g         |
| Plastic material has UL classification 94V-0     |                |
| Gehäusematerial UL94V-0 klassifiziert            |                |
| Standard packaging taped and reeled              | see page 18    |
| Standard Lieferform gegurtet auf Rolle           | siehe Seite 18 |

Suffix “C” or “CA” for bidirectional types

Suffix “C” oder “CA” für bidirektionale Typen

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

<sup>1)</sup> Non-repetitive current pulse see curve  $I_{\text{PPM}} = f(t_r)$

Höchstzulässiger Spitzenwert eines einmaligen Strom-Impulses, siehe Kurve  $I_{\text{PPM}} = f(t_r)$

<sup>2)</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

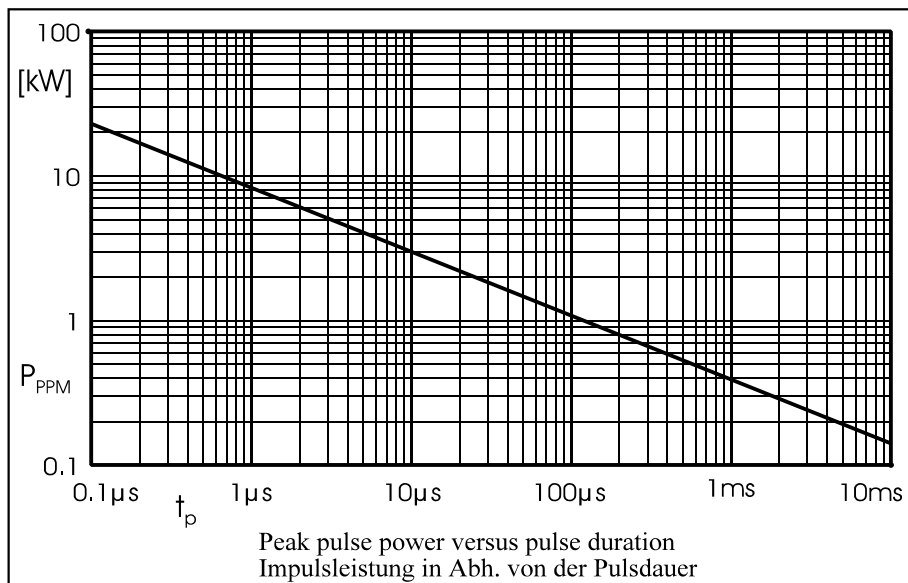
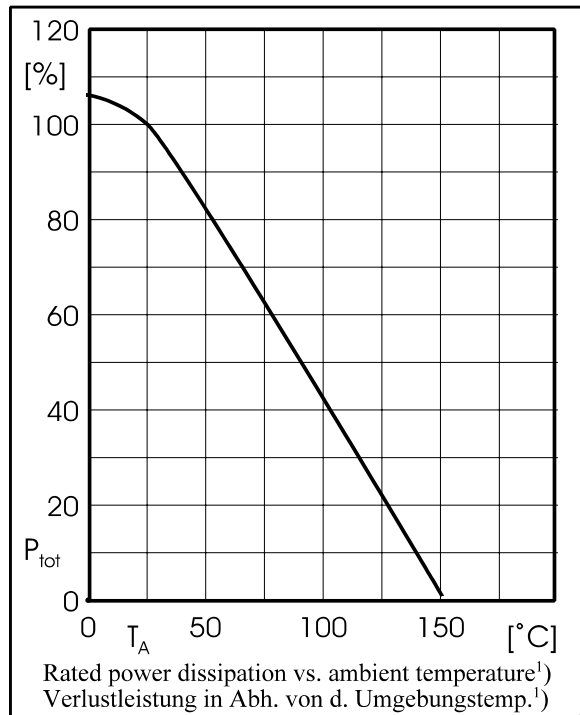
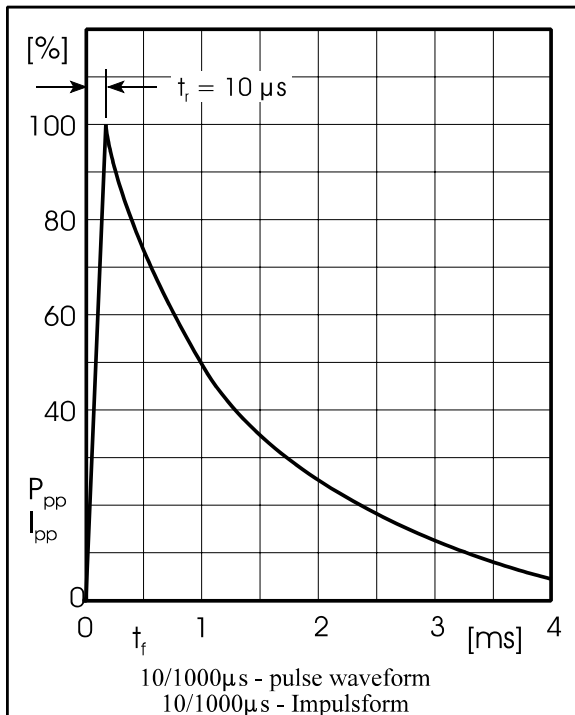
<sup>3)</sup> Unidirectional diodes only – nur für unidirektionale Dioden

**Maximum ratings**
**Grenzwerte**

| Type<br>Typ  | Max. stand-off voltage<br>Max. Sperrspannung<br>at / bei $I_D$ |                  | 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] |
| P4 SMAJ 6.5  | 6.5                                                            | 500              | 7.2 *)                                                                                             | 8.8 *)            | 12.3                                                                                     | 32.5          |
| P4 SMAJ 6.5A | 6.5                                                            | 500              | 7.2 *)                                                                                             | 8.0 *)            | 11.2                                                                                     | 35.7          |
| P4 SMAJ 7.0  | 7.0                                                            | 200              | 7.8 *)                                                                                             | 9.5 *)            | 13.3                                                                                     | 30.1          |
| P4 SMAJ 7.0A | 7.0                                                            | 200              | 7.8 *)                                                                                             | 8.7 *)            | 12.0                                                                                     | 33.3          |
| P4 SMAJ 7.5  | 7.5                                                            | 100              | 8.3                                                                                                | 10.1              | 14.3                                                                                     | 28.0          |
| P4 SMAJ 7.5A | 7.5                                                            | 100              | 8.3                                                                                                | 9.2               | 12.9                                                                                     | 31.0          |
| P4 SMAJ 8.0  | 8.0                                                            | 50               | 8.9                                                                                                | 10.9              | 15.0                                                                                     | 26.7          |
| P4 SMAJ 8.0A | 8.0                                                            | 50               | 8.9                                                                                                | 9.9               | 13.6                                                                                     | 29.4          |
| P4 SMAJ 8.5  | 8.5                                                            | 10               | 9.4                                                                                                | 11.5              | 15.9                                                                                     | 25.2          |
| P4 SMAJ 8.5A | 8.5                                                            | 10               | 9.4                                                                                                | 10.4              | 14.4                                                                                     | 27.8          |
| P4 SMAJ 9.0  | 9.0                                                            | 5                | 10.0                                                                                               | 12.2              | 16.9                                                                                     | 23.7          |
| P4 SMAJ 9.0A | 9.0                                                            | 5                | 10.0                                                                                               | 11.1              | 15.4                                                                                     | 26.0          |
| P4 SMAJ 10   | 10                                                             | 5                | 11.1                                                                                               | 13.5              | 18.8                                                                                     | 21.3          |
| P4 SMAJ 10A  | 10                                                             | 5                | 11.1                                                                                               | 12.3              | 17.0                                                                                     | 23.5          |
| P4 SMAJ 11   | 11                                                             | 5                | 12.2                                                                                               | 14.9              | 20.1                                                                                     | 19.9          |
| P4 SMAJ 11A  | 11                                                             | 5                | 12.2                                                                                               | 13.5              | 18.2                                                                                     | 22.0          |
| P4 SMAJ 12   | 12                                                             | 5                | 13.3                                                                                               | 16.2              | 22.0                                                                                     | 18.2          |
| P4 SMAJ 12A  | 12                                                             | 5                | 13.3                                                                                               | 14.8              | 19.9                                                                                     | 20.1          |
| P4 SMAJ 13   | 13                                                             | 5                | 14.4                                                                                               | 17.6              | 23.8                                                                                     | 16.8          |
| P4 SMAJ 13A  | 13                                                             | 5                | 14.4                                                                                               | 16.0              | 21.5                                                                                     | 18.6          |
| P4 SMAJ 14   | 14                                                             | 5                | 15.6                                                                                               | 19.0              | 25.8                                                                                     | 15.5          |
| P4 SMAJ 14A  | 14                                                             | 5                | 15.6                                                                                               | 17.3              | 23.2                                                                                     | 17.2          |
| P4 SMAJ 15   | 15                                                             | 5                | 16.7                                                                                               | 20.4              | 26.9                                                                                     | 14.9          |
| P4 SMAJ 15A  | 15                                                             | 5                | 16.7                                                                                               | 18.6              | 24.4                                                                                     | 16.4          |
| P4 SMAJ 16   | 16                                                             | 5                | 17.8                                                                                               | 21.7              | 28.8                                                                                     | 13.9          |
| P4 SMAJ 16A  | 16                                                             | 5                | 17.8                                                                                               | 19.8              | 26.0                                                                                     | 15.4          |
| P4 SMAJ 17   | 17                                                             | 5                | 18.9                                                                                               | 23.1              | 30.5                                                                                     | 13.1          |
| P4 SMAJ 17A  | 17                                                             | 5                | 18.9                                                                                               | 21.0              | 27.6                                                                                     | 14.5          |
| P4 SMAJ 18   | 18                                                             | 5                | 20.0                                                                                               | 24.4              | 32.2                                                                                     | 12.4          |
| P4 SMAJ 18A  | 18                                                             | 5                | 20.0                                                                                               | 22.2              | 29.2                                                                                     | 13.7          |
| P4 SMAJ 20   | 20                                                             | 5                | 22.2                                                                                               | 27.1              | 35.8                                                                                     | 11.2          |
| P4 SMAJ 20A  | 20                                                             | 5                | 22.2                                                                                               | 24.6              | 32.4                                                                                     | 12.3          |
| P4 SMAJ 22   | 22                                                             | 5                | 24.4                                                                                               | 29.8              | 39.4                                                                                     | 10.2          |
| P4 SMAJ 22A  | 22                                                             | 5                | 24.4                                                                                               | 27.1              | 35.5                                                                                     | 11.3          |
| P4 SMAJ 24   | 24                                                             | 5                | 26.7                                                                                               | 32.6              | 43.0                                                                                     | 9.3           |
| P4 SMAJ 24A  | 24                                                             | 5                | 26.7                                                                                               | 29.6              | 38.9                                                                                     | 10.3          |
| P4 SMAJ 26   | 26                                                             | 5                | 28.9                                                                                               | 35.3              | 46.6                                                                                     | 8.6           |
| P4 SMAJ 26A  | 26                                                             | 5                | 28.9                                                                                               | 32.1              | 42.1                                                                                     | 9.5           |
| P4 SMAJ 28   | 28                                                             | 5                | 31.1                                                                                               | 37.9              | 50.0                                                                                     | 8.0           |
| P4 SMAJ 28A  | 28                                                             | 5                | 31.1                                                                                               | 34.5              | 45.4                                                                                     | 8.8           |
| P4 SMAJ 30   | 30                                                             | 5                | 33.3                                                                                               | 40.1              | 53.5                                                                                     | 7.5           |
| P4 SMAJ 30A  | 30                                                             | 5                | 33.3                                                                                               | 36.9              | 48.4                                                                                     | 8.3           |
| P4 SMAJ 33   | 33                                                             | 5                | 36.7                                                                                               | 44.8              | 59.0                                                                                     | 6.8           |
| P4 SMAJ 33A  | 33                                                             | 5                | 36.7                                                                                               | 40.7              | 53.3                                                                                     | 7.5           |

**Maximum ratings****Grenzwerte**

| Type<br>Typ  | Max. stand-off voltage<br>Max. Sperrspannung<br>at / bei $I_D$ |                  | Breakdown voltage at $I_T = 1$ mA<br>Abbruch-Spannung bei $I_T = 1$ 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] |
| P4 SMAJ 36   | 36                                                             | 5                | 40.0                                                                   | 48.8              | 64.3                                                                                     | 6.2           |
| P4 SMAJ 36A  | 36                                                             | 5                | 40.0                                                                   | 44.4              | 58.1                                                                                     | 6.9           |
| P4 SMAJ 40   | 40                                                             | 5                | 44.4                                                                   | 54.2              | 71.4                                                                                     | 5.6           |
| P4 SMAJ 40A  | 40                                                             | 5                | 44.4                                                                   | 49.3              | 64.5                                                                                     | 6.2           |
| P4 SMAJ 43   | 43                                                             | 5                | 47.8                                                                   | 58.3              | 76.7                                                                                     | 5.2           |
| P4 SMAJ 43A  | 43                                                             | 5                | 47.8                                                                   | 53.1              | 69.4                                                                                     | 5.8           |
| P4 SMAJ 45   | 45                                                             | 5                | 50.0                                                                   | 61.0              | 80.3                                                                                     | 5.0           |
| P4 SMAJ 45A  | 45                                                             | 5                | 50.0                                                                   | 55.5              | 72.7                                                                                     | 5.5           |
| P4 SMAJ 48   | 48                                                             | 5                | 53.3                                                                   | 65.0              | 85.5                                                                                     | 4.7           |
| P4 SMAJ 48A  | 48                                                             | 5                | 53.3                                                                   | 59.2              | 77.4                                                                                     | 5.2           |
| P4 SMAJ 51   | 51                                                             | 5                | 56.7                                                                   | 69.2              | 91.1                                                                                     | 4.4           |
| P4 SMAJ 51A  | 51                                                             | 5                | 56.7                                                                   | 62.9              | 82.4                                                                                     | 4.9           |
| P4 SMAJ 54   | 54                                                             | 5                | 60.0                                                                   | 73.2              | 96.3                                                                                     | 4.2           |
| P4 SMAJ 54A  | 54                                                             | 5                | 60.0                                                                   | 66.6              | 87.1                                                                                     | 4.6           |
| P4 SMAJ 58   | 58                                                             | 5                | 64.4                                                                   | 78.6              | 103                                                                                      | 3.9           |
| P4 SMAJ 58A  | 58                                                             | 5                | 64.4                                                                   | 71.5              | 93.6                                                                                     | 4.3           |
| P4 SMAJ 60   | 60                                                             | 5                | 66.7                                                                   | 81.4              | 107                                                                                      | 3.7           |
| P4 SMAJ 60A  | 60                                                             | 5                | 66.7                                                                   | 74.0              | 96.8                                                                                     | 4.1           |
| P4 SMAJ 64   | 64                                                             | 5                | 71.1                                                                   | 86.7              | 114                                                                                      | 3.5           |
| P4 SMAJ 64A  | 64                                                             | 5                | 71.1                                                                   | 78.9              | 103                                                                                      | 3.9           |
| P4 SMAJ 70   | 70                                                             | 5                | 77.8                                                                   | 94.9              | 125                                                                                      | 3.2           |
| P4 SMAJ 70A  | 70                                                             | 5                | 77.8                                                                   | 86.4              | 113                                                                                      | 3.5           |
| P4 SMAJ 75   | 75                                                             | 5                | 83.3                                                                   | 102               | 134                                                                                      | 3.0           |
| P4 SMAJ 75A  | 75                                                             | 5                | 83.3                                                                   | 92.5              | 121                                                                                      | 3.3           |
| P4 SMAJ 78   | 78                                                             | 5                | 86.7                                                                   | 106               | 139                                                                                      | 2.9           |
| P4 SMAJ 78A  | 78                                                             | 5                | 86.7                                                                   | 96.2              | 126                                                                                      | 3.2           |
| P4 SMAJ 85   | 85                                                             | 5                | 94.4                                                                   | 115               | 151                                                                                      | 2.6           |
| P4 SMAJ 85A  | 85                                                             | 5                | 94.4                                                                   | 105               | 137                                                                                      | 2.9           |
| P4 SMAJ 90   | 90                                                             | 5                | 100                                                                    | 122               | 160                                                                                      | 2.5           |
| P4 SMAJ 90A  | 90                                                             | 5                | 100                                                                    | 111               | 146                                                                                      | 2.7           |
| P4 SMAJ 100  | 100                                                            | 5                | 111                                                                    | 135               | 179                                                                                      | 2.2           |
| P4 SMAJ 100A | 100                                                            | 5                | 111                                                                    | 123               | 162                                                                                      | 2.5           |
| P4 SMAJ 110  | 110                                                            | 5                | 122                                                                    | 149               | 196                                                                                      | 2.0           |
| P4 SMAJ 110A | 110                                                            | 5                | 122                                                                    | 135               | 177                                                                                      | 2.3           |
| P4 SMAJ 120  | 120                                                            | 5                | 133                                                                    | 162               | 214                                                                                      | 1.9           |
| P4 SMAJ 120A | 120                                                            | 5                | 133                                                                    | 148               | 193                                                                                      | 2.1           |
| P4 SMAJ 130  | 130                                                            | 5                | 144                                                                    | 176               | 231                                                                                      | 1.7           |
| P4 SMAJ 130A | 130                                                            | 5                | 144                                                                    | 160               | 209                                                                                      | 1.9           |
| P4 SMAJ 150  | 150                                                            | 5                | 167                                                                    | 204               | 268                                                                                      | 1.5           |
| P4 SMAJ 150A | 150                                                            | 5                | 167                                                                    | 185               | 243                                                                                      | 1.6           |
| P4 SMAJ 160  | 160                                                            | 5                | 178                                                                    | 217               | 287                                                                                      | 1.4           |
| P4 SMAJ 160A | 160                                                            | 5                | 178                                                                    | 198               | 259                                                                                      | 1.5           |
| P4 SMAJ 170  | 170                                                            | 5                | 189                                                                    | 231               | 304                                                                                      | 1.3           |
| P4 SMAJ 170A | 170                                                            | 5                | 189                                                                    | 210               | 275                                                                                      | 1.4           |



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

<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