

## Surface Mount Transient Voltage Suppressor

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Built-in strain relief
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps from 0 volt to BV min
- Typical IR less than 1μA above 10V
- Moisture sensitivity level: level 1, per J-STD-020
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



**DO-214AC (SMA)**

### MECHANICAL DATA

**Case:** DO-214AC (SMA)

Molding compound, UL flammability classification rating 94V-0

Base P/N with suffix "G" on packing code - Green compound (halogen-free)

Base P/N with prefix "H" on packing code - AEC-Q101 qualified

**Terminal:** Matte tin plated leads, solderable per JESD22-B102

Meet JESD 201 class 1A whisker test

with prefix "H" on packing code meet JESD 201 class 2 whisker test

**Polarity:** Indicated by cathode band

**Weight:** 0.06 g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T <sub>A</sub> =25°C unless otherwise noted) |                  |              |       |
|----------------------------------------------------------------------------------------------|------------------|--------------|-------|
| PARAMETER                                                                                    | SYMBOL           | VALUE        | UNIT  |
| Peak power dissipation at T <sub>A</sub> =25°C, tp=1ms(Note 1)                               | P <sub>PK</sub>  | 400          | Watts |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load          | I <sub>FSM</sub> | 40           | A     |
| Maximum instantaneous forward voltage at 25 A for Unidirectional only                        | V <sub>F</sub>   | 3.5          | Volts |
| Operating junction temperature range                                                         | T <sub>J</sub>   | - 55 to +150 | °C    |
| Storage temperature range                                                                    | T <sub>STG</sub> | - 55 to +150 | °C    |

Note 1: Non-repetitive Current Pulse Per Fig. 3 and Derated above T<sub>A</sub>=25°C Per Fig. 2

Devices for Bipolar Applications

1. For Bidirectional Use C or CA Suffix for Types P4SMA6.8 through Types P4SMA200A
2. Electrical Characteristics Apply in Both Directions

| ORDERING INFORMATION  |                    |              |                     |            |                          |
|-----------------------|--------------------|--------------|---------------------|------------|--------------------------|
| PART NO.              | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | PACKAGE    | PACKING                  |
| P4SMAxxxx<br>(Note 1) | Prefix "H"         | R3           | Suffix "G"          | SMA        | 1,800 / 7" Plastic reel  |
|                       |                    | R2           |                     | SMA        | 7,500 / 13" Paper reel   |
|                       |                    | M2           |                     | SMA        | 7,500 / 13" Plastic reel |
|                       |                    | F3           |                     | Folded SMA | 1,800 / 7" Plastic reel  |
|                       |                    | F2           |                     | Folded SMA | 7,500 / 13" Paper reel   |
|                       |                    | F4           |                     | Folded SMA | 7,500 / 13" Plastic reel |

Note 1: "xxxx" defines voltage from 6.8V (P4SMA6.8) to 200V (P4SMA200A)

| EXAMPLE       |           |                    |              |                |                    |
|---------------|-----------|--------------------|--------------|----------------|--------------------|
| PREFERRED P/N | PART NO.  | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND | DESCRIPTION        |
| P4SMA200A R3  | P4SMA200A |                    | R3           |                |                    |
| P4SMA200A R3G | P4SMA200A |                    | R3           | G              | Green compound     |
| P4SMA200AHR3  | P4SMA200A | H                  | R3           |                | AEC-Q101 qualified |

RATINGS AND CHARACTERISTICS CURVES (TA=25°C unless otherwise noted)

FIG. 1 PEAK PULSE POWER RATING CURVE

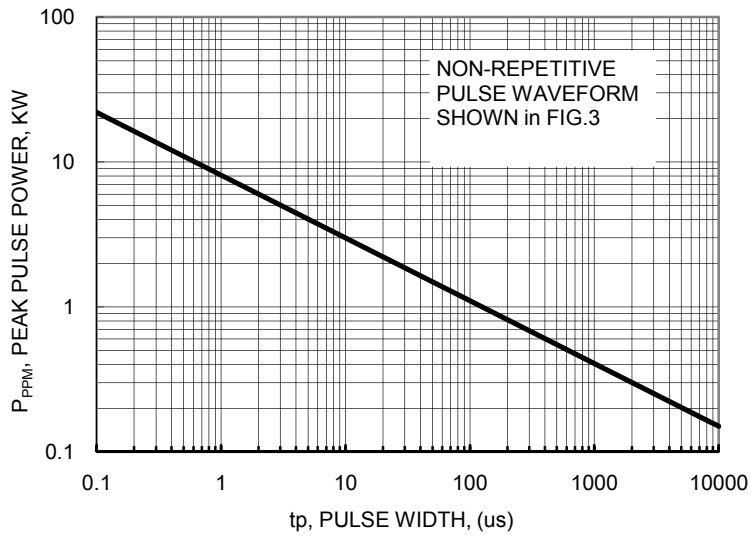


FIG.2 PULSE DERATING CURVE

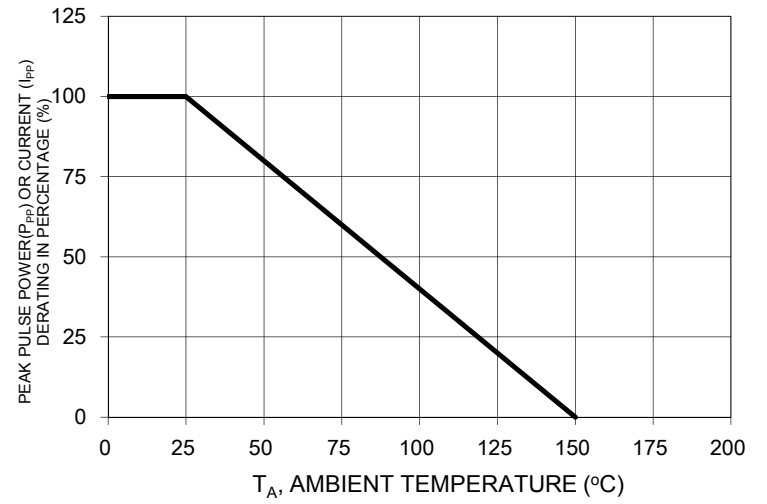


FIG. 3 CLAMPING POWER PULSE WAVEFORM

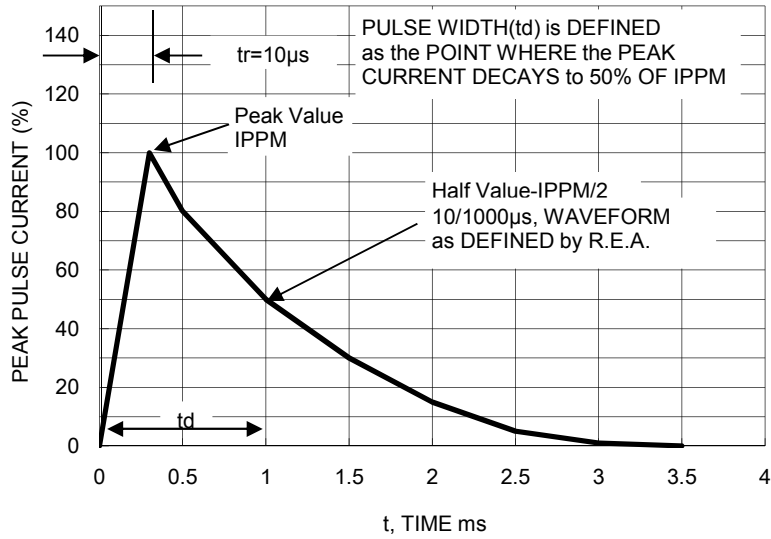


FIG. 4 MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

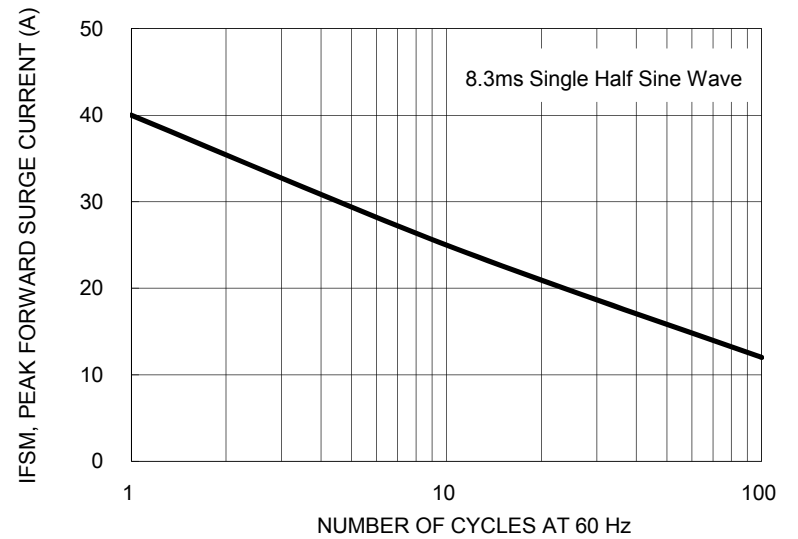
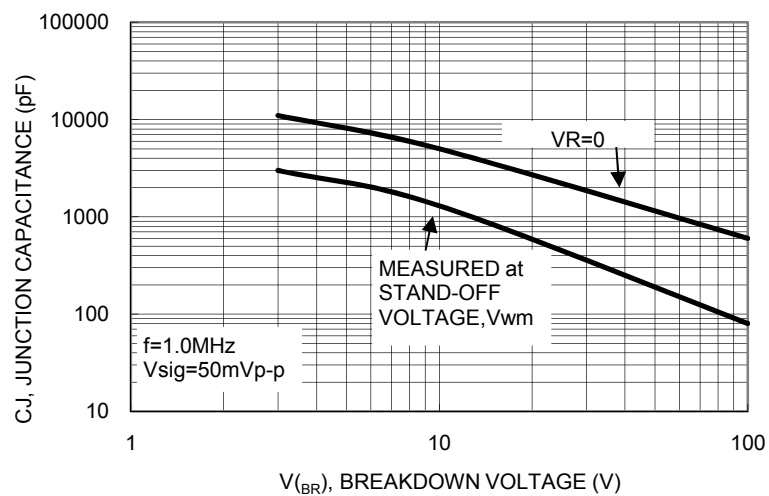


FIG. 5 TYPICAL JUNCTION CAPACITANCE



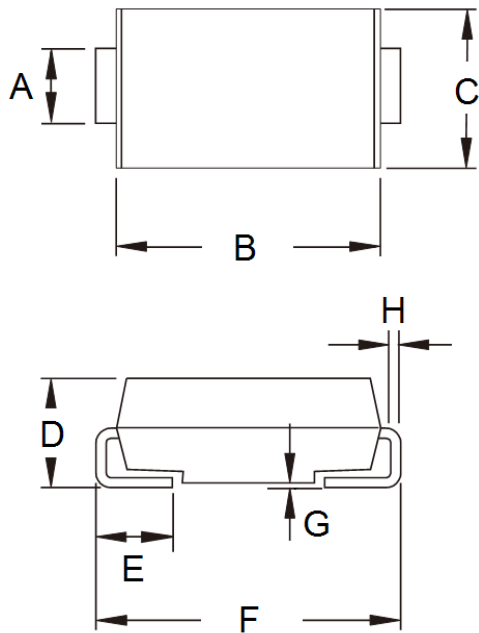
| Device    | Device<br>Marking<br>Code | Breakdown Voltage<br>$V_{BR}$ (V)<br>(Note 1) |       | Test<br>Current<br>$I_T$<br>(mA) | Stand-Off<br>Voltage<br>$V_{WM}$<br>(V) | Maximum<br>Reverse Leakage<br>@ $V_{WM}$<br>$I_D$ ( $\mu A$ ) | Maximum<br>Peak Pulse<br>Current $I_{PPM}$<br>(A) (Note 2) | Maximum<br>Clamping Voltage<br>@ $I_{PPM}$<br>$V_C$ (V) | Maximum<br>Temperature<br>Coefficient<br>of $V_{BR}$ (%/°C) |
|-----------|---------------------------|-----------------------------------------------|-------|----------------------------------|-----------------------------------------|---------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|
|           |                           | Min                                           | Max   |                                  |                                         |                                                               |                                                            |                                                         |                                                             |
| P4SMA6.8  | ADJ                       | 6.12                                          | 7.48  | 10                               | 5.50                                    | 1000                                                          | 38.0                                                       | 10.8                                                    | 0.057                                                       |
| P4SMA6.8A | AEJ                       | 6.46                                          | 7.14  | 10                               | 5.80                                    | 1000                                                          | 40.0                                                       | 10.5                                                    | 0.057                                                       |
| P4SMA7.5  | AFJ                       | 6.75                                          | 8.25  | 10                               | 6.05                                    | 500                                                           | 35.0                                                       | 11.7                                                    | 0.061                                                       |
| P4SMA7.5A | AGJ                       | 7.13                                          | 7.88  | 10                               | 6.40                                    | 500                                                           | 37.0                                                       | 11.3                                                    | 0.061                                                       |
| P4SMA8.2  | AHJ                       | 7.38                                          | 9.02  | 10                               | 6.63                                    | 200                                                           | 33.0                                                       | 12.5                                                    | 0.065                                                       |
| P4SMA8.2A | AKJ                       | 7.79                                          | 8.61  | 10                               | 7.02                                    | 200                                                           | 34.0                                                       | 12.1                                                    | 0.065                                                       |
| P4SMA9.1  | ALJ                       | 8.19                                          | 10.00 | 1.0                              | 7.37                                    | 50                                                            | 30.0                                                       | 13.8                                                    | 0.068                                                       |
| P4SMA9.1A | AMJ                       | 8.65                                          | 9.55  | 1.0                              | 7.78                                    | 50                                                            | 31.0                                                       | 13.4                                                    | 0.068                                                       |
| P4SMA10   | ANJ                       | 9.00                                          | 11.00 | 1.0                              | 8.10                                    | 10                                                            | 28.0                                                       | 15.0                                                    | 0.073                                                       |
| P4SMA10A  | APJ                       | 9.50                                          | 10.50 | 1.0                              | 8.55                                    | 10                                                            | 29.0                                                       | 14.5                                                    | 0.073                                                       |
| P4SMA11   | AQJ                       | 9.90                                          | 12.10 | 1.0                              | 8.92                                    | 1                                                             | 26.0                                                       | 16.2                                                    | 0.075                                                       |
| P4SMA11A  | ARJ                       | 10.50                                         | 11.60 | 1.0                              | 9.40                                    | 1                                                             | 27.0                                                       | 15.6                                                    | 0.075                                                       |
| P4SMA12   | ASJ                       | 10.80                                         | 13.20 | 1.0                              | 9.72                                    | 1                                                             | 24.0                                                       | 17.3                                                    | 0.078                                                       |
| P4SMA12A  | ATJ                       | 11.40                                         | 12.60 | 1.0                              | 10.2                                    | 1                                                             | 25.0                                                       | 16.7                                                    | 0.078                                                       |
| P4SMA13   | AUJ                       | 11.70                                         | 14.30 | 1.0                              | 10.5                                    | 1                                                             | 22.0                                                       | 19.0                                                    | 0.081                                                       |
| P4SMA13A  | AVJ                       | 12.40                                         | 13.70 | 1.0                              | 11.1                                    | 1                                                             | 23.0                                                       | 18.2                                                    | 0.081                                                       |
| P4SMA15   | AWJ                       | 13.50                                         | 16.50 | 1.0                              | 12.1                                    | 1                                                             | 19.0                                                       | 22.0                                                    | 0.084                                                       |
| P4SMA15A  | AXJ                       | 14.30                                         | 15.80 | 1.0                              | 12.8                                    | 1                                                             | 20.0                                                       | 21.2                                                    | 0.084                                                       |
| P4SMA16   | AYJ                       | 14.40                                         | 17.60 | 1.0                              | 12.9                                    | 1                                                             | 17.8                                                       | 23.5                                                    | 0.086                                                       |
| P4SMA16A  | AZJ                       | 15.20                                         | 16.80 | 1.0                              | 13.6                                    | 1                                                             | 18.6                                                       | 22.5                                                    | 0.086                                                       |
| P4SMA18   | BDJ                       | 16.20                                         | 19.80 | 1.0                              | 14.5                                    | 1                                                             | 16.0                                                       | 26.5                                                    | 0.088                                                       |
| P4SMA18A  | BEJ                       | 17.10                                         | 18.90 | 1.0                              | 15.3                                    | 1                                                             | 16.5                                                       | 25.5                                                    | 0.088                                                       |
| P4SMA20   | BFJ                       | 18.00                                         | 22.00 | 1.0                              | 16.2                                    | 1                                                             | 14.0                                                       | 29.1                                                    | 0.090                                                       |
| P4SMA20A  | BGJ                       | 19.00                                         | 21.00 | 1.0                              | 17.1                                    | 1                                                             | 15.0                                                       | 27.7                                                    | 0.090                                                       |
| P4SMA22   | BHJ                       | 19.80                                         | 24.20 | 1.0                              | 17.8                                    | 1                                                             | 13.0                                                       | 31.9                                                    | 0.092                                                       |
| P4SMA22A  | BKJ                       | 20.90                                         | 23.10 | 1.0                              | 18.8                                    | 1                                                             | 13.7                                                       | 30.6                                                    | 0.092                                                       |
| P4SMA24   | BLJ                       | 21.60                                         | 26.40 | 1.0                              | 19.4                                    | 1                                                             | 12.0                                                       | 34.7                                                    | 0.094                                                       |
| P4SMA24A  | BMJ                       | 22.80                                         | 25.20 | 1.0                              | 20.5                                    | 1                                                             | 12.6                                                       | 33.2                                                    | 0.094                                                       |
| P4SMA27   | BNJ                       | 24.30                                         | 29.70 | 1.0                              | 21.8                                    | 1                                                             | 10.7                                                       | 39.1                                                    | 0.096                                                       |
| P4SMA27A  | BPJ                       | 25.70                                         | 28.40 | 1.0                              | 23.1                                    | 1                                                             | 11.0                                                       | 37.5                                                    | 0.096                                                       |
| P4SMA30   | BQJ                       | 27.00                                         | 33.00 | 1.0                              | 24.3                                    | 1                                                             | 9.6                                                        | 43.5                                                    | 0.097                                                       |
| P4SMA30A  | BRJ                       | 28.50                                         | 31.50 | 1.0                              | 25.6                                    | 1                                                             | 10.0                                                       | 41.4                                                    | 0.097                                                       |
| P4SMA33   | BSJ                       | 29.70                                         | 36.30 | 1.0                              | 26.8                                    | 1                                                             | 8.8                                                        | 47.7                                                    | 0.098                                                       |
| P4SMA33A  | BTJ                       | 31.40                                         | 34.70 | 1.0                              | 28.2                                    | 1                                                             | 9.0                                                        | 45.7                                                    | 0.098                                                       |
| P4SMA36   | BUJ                       | 32.40                                         | 39.60 | 1.0                              | 29.1                                    | 1                                                             | 8.0                                                        | 52.0                                                    | 0.099                                                       |
| P4SMA36A  | BVJ                       | 34.20                                         | 37.80 | 1.0                              | 30.8                                    | 1                                                             | 8.4                                                        | 49.9                                                    | 0.099                                                       |
| P4SMA39   | BWJ                       | 35.10                                         | 42.90 | 1.0                              | 31.6                                    | 1                                                             | 7.4                                                        | 56.4                                                    | 0.100                                                       |
| P4SMA39A  | BXJ                       | 37.10                                         | 41.00 | 1.0                              | 33.3                                    | 1                                                             | 7.7                                                        | 53.9                                                    | 0.100                                                       |
| P4SMA43   | BYJ                       | 38.70                                         | 47.30 | 1.0                              | 34.8                                    | 1                                                             | 6.7                                                        | 61.9                                                    | 0.101                                                       |
| P4SMA43A  | BZJ                       | 40.90                                         | 45.20 | 1.0                              | 36.8                                    | 1                                                             | 7.0                                                        | 59.3                                                    | 0.101                                                       |
| P4SMA47   | CDJ                       | 42.30                                         | 51.70 | 1.0                              | 38.1                                    | 1                                                             | 6.2                                                        | 67.8                                                    | 0.101                                                       |
| P4SMA47A  | CEJ                       | 44.70                                         | 49.40 | 1.0                              | 40.2                                    | 1                                                             | 6.4                                                        | 64.8                                                    | 0.101                                                       |
| P4SMA51   | CFJ                       | 45.90                                         | 56.10 | 1.0                              | 41.3                                    | 1                                                             | 5.7                                                        | 73.5                                                    | 0.102                                                       |
| P4SMA51A  | CGJ                       | 48.50                                         | 53.60 | 1.0                              | 43.6                                    | 1                                                             | 6.0                                                        | 70.1                                                    | 0.102                                                       |
| P4SMA56   | CHJ                       | 50.40                                         | 61.60 | 1.0                              | 45.4                                    | 1                                                             | 5.2                                                        | 80.5                                                    | 0.103                                                       |
| P4SMA56A  | CKJ                       | 53.20                                         | 58.80 | 1.0                              | 47.8                                    | 1                                                             | 5.4                                                        | 77.0                                                    | 0.103                                                       |

| Device    | Device Marking Code | Breakdown Voltage<br>$V_{BR}$ (V)<br>(Note 1) |      | Test Current<br>$I_T$<br>(mA) | Stand-Off Voltage<br>$V_{WM}$<br>(V) | Maximum Reverse Leakage<br>@ $V_{WM}$<br>$I_D$ ( $\mu A$ ) | Maximum Peak Pulse Current $I_{PPM}$<br>(A) (Note 2) | Maximum Clamping Voltage<br>@ $I_{PPM}$<br>$V_c$ (V) | Maximum Temperature Coefficient<br>of $V_{BR}$ (%/°C) |
|-----------|---------------------|-----------------------------------------------|------|-------------------------------|--------------------------------------|------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------|
|           |                     | Min                                           | Max  |                               |                                      |                                                            |                                                      |                                                      |                                                       |
| P4SMA62   | CLJ                 | 55.8                                          | 68.2 | 1.0                           | 50.2                                 | 1                                                          | 4.7                                                  | 89.0                                                 | 0.104                                                 |
| P4SMA62A  | CMJ                 | 58.9                                          | 65.1 | 1.0                           | 53.0                                 | 1                                                          | 5.0                                                  | 85.0                                                 | 0.104                                                 |
| P4SMA68   | CNJ                 | 61.2                                          | 74.8 | 1.0                           | 55.1                                 | 1                                                          | 4.2                                                  | 98.0                                                 | 0.104                                                 |
| P4SMA68A  | CPJ                 | 64.6                                          | 71.4 | 1.0                           | 58.1                                 | 1                                                          | 4.5                                                  | 92.0                                                 | 0.104                                                 |
| P4SMA75   | CQJ                 | 67.5                                          | 82.5 | 1.0                           | 60.7                                 | 1                                                          | 3.8                                                  | 108                                                  | 0.105                                                 |
| P4SMA75A  | CRJ                 | 71.3                                          | 78.8 | 1.0                           | 64.1                                 | 1                                                          | 4.0                                                  | 103                                                  | 0.105                                                 |
| P4SMA82   | CSJ                 | 73.8                                          | 90.2 | 1.0                           | 66.4                                 | 1                                                          | 3.5                                                  | 118                                                  | 0.105                                                 |
| P4SMA82A  | CTJ                 | 77.9                                          | 86.1 | 1.0                           | 70.1                                 | 1                                                          | 3.7                                                  | 113                                                  | 0.105                                                 |
| P4SMA91   | CUJ                 | 81.9                                          | 100  | 1.0                           | 73.7                                 | 1                                                          | 3.2                                                  | 131                                                  | 0.106                                                 |
| P4SMA91A  | CVJ                 | 86.5                                          | 95.5 | 1.0                           | 77.8                                 | 1                                                          | 3.3                                                  | 125                                                  | 0.106                                                 |
| P4SMA100  | CWJ                 | 90                                            | 110  | 1.0                           | 81.0                                 | 1                                                          | 2.9                                                  | 144                                                  | 0.106                                                 |
| P4SMA100A | CXJ                 | 95                                            | 105  | 1.0                           | 85.5                                 | 1                                                          | 3.0                                                  | 137                                                  | 0.106                                                 |
| P4SMA110  | CYJ                 | 99                                            | 121  | 1.0                           | 89.2                                 | 1                                                          | 2.6                                                  | 158                                                  | 0.107                                                 |
| P4SMA110A | CZJ                 | 105                                           | 116  | 1.0                           | 94.0                                 | 1                                                          | 2.7                                                  | 152                                                  | 0.107                                                 |
| P4SMA120  | RDJ                 | 108                                           | 132  | 1.0                           | 97.2                                 | 1                                                          | 2.4                                                  | 173                                                  | 0.107                                                 |
| P4SMA120A | REJ                 | 114                                           | 126  | 1.0                           | 102                                  | 1                                                          | 2.5                                                  | 165                                                  | 0.107                                                 |
| P4SMA130  | RFJ                 | 117                                           | 143  | 1.0                           | 105                                  | 1                                                          | 2.2                                                  | 187                                                  | 0.107                                                 |
| P4SMA130A | RGJ                 | 124                                           | 137  | 1.0                           | 111                                  | 1                                                          | 2.3                                                  | 179                                                  | 0.107                                                 |
| P4SMA150  | RHJ                 | 135                                           | 165  | 1.0                           | 121                                  | 1                                                          | 1.9                                                  | 215                                                  | 0.108                                                 |
| P4SMA150A | RKJ                 | 143                                           | 158  | 1.0                           | 128                                  | 1                                                          | 2.0                                                  | 207                                                  | 0.108                                                 |
| P4SMA160  | RLJ                 | 144                                           | 176  | 1.0                           | 130                                  | 1                                                          | 1.8                                                  | 230                                                  | 0.108                                                 |
| P4SMA160A | RMJ                 | 152                                           | 168  | 1.0                           | 136                                  | 1                                                          | 1.9                                                  | 219                                                  | 0.108                                                 |
| P4SMA170  | RNJ                 | 153                                           | 187  | 1.0                           | 138                                  | 1                                                          | 1.7                                                  | 244                                                  | 0.108                                                 |
| P4SMA170A | RPJ                 | 162                                           | 179  | 1.0                           | 145                                  | 1                                                          | 1.8                                                  | 234                                                  | 0.108                                                 |
| P4SMA180  | RQJ                 | 162                                           | 198  | 1.0                           | 146                                  | 1                                                          | 1.6                                                  | 258                                                  | 0.108                                                 |
| P4SMA180A | RRJ                 | 171                                           | 189  | 1.0                           | 154                                  | 1                                                          | 1.7                                                  | 246                                                  | 0.108                                                 |
| P4SMA200  | RSJ                 | 180                                           | 220  | 1.0                           | 162                                  | 1                                                          | 1.4                                                  | 287                                                  | 0.108                                                 |
| P4SMA200A | RTJ                 | 190                                           | 210  | 1.0                           | 171                                  | 1                                                          | 1.51                                                 | 274                                                  | 0.108                                                 |

Notes:

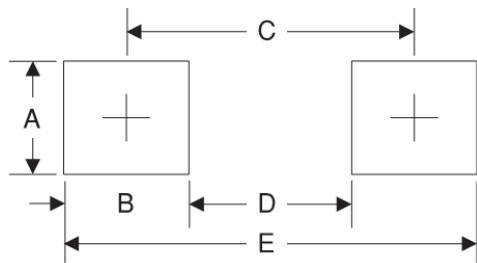
1.  $V_{BR}$  measure after  $I_T$  applied for 300us,  $I_T$ =square wave pulse or equivalent.
2. Surge current waveform per Figure. 3 and derate per Figure. 2.
3. For bipolar types having  $V_{WM}$  of 10 volts and under, the  $I_D$  limit is doubled.
4. For bidirectional use C or CA suffix for types PS4MA6.8 through P4SMA200A.
5. All terms and symbols are consistent with ANSI/IEEE C62.35.

PACKAGE OUTLINE DIMENSIONS



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.27      | 1.58 | 0.050       | 0.062 |
| B    | 4.06      | 4.60 | 0.160       | 0.181 |
| C    | 2.29      | 2.83 | 0.090       | 0.111 |
| D    | 1.99      | 2.50 | 0.078       | 0.098 |
| E    | 0.90      | 1.41 | 0.035       | 0.056 |
| F    | 4.95      | 5.33 | 0.195       | 0.210 |
| G    | 0.10      | 0.20 | 0.004       | 0.008 |
| H    | 0.15      | 0.31 | 0.006       | 0.012 |

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



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

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