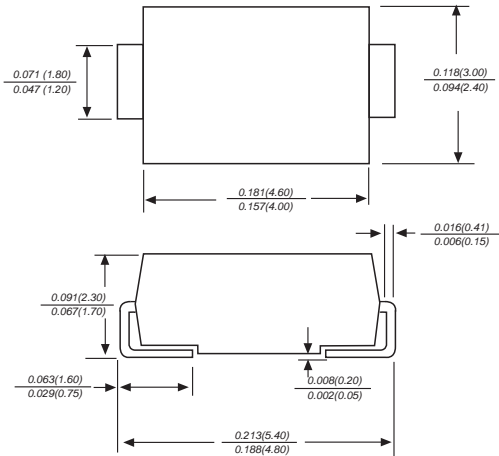


# SMAJ5.0 THRU SMAJ170CA

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

*Stand-off Voltage: 5.0-170 Volts    Peak pulse power: 400 Watts*

### DO-214AC



Dimensions in inches and (millimeters)

### FEATURE

- ◆ Optimized for LAN protection applications
- ◆ Ideal for ESD protection of data lines in accordance with IEC 1000-4-2(IEC801-2)
- ◆ Ideal for EFT protection of data lines in accordance with IEC1000-4-4(IEC801-2)
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated junction
- ◆ 400w peak pulse power capability
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0v to  $V_{(BR)}$  min
- ◆ High temperature soldering guaranteed: 260°C/10S at terminals

### MECHANICAL DATA

**Case:** JEDEC DO-214AC molded plastic body over passivated chip

**Terminals:** Solder plated, solderable per MIL-STD 750, method 2026

**Polarity:** Color band denotes cathode except for bidirectional types

**Mounting Position:** Any

**Weight:** 0.003 ounce, 0.093 grams

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use suffix C or CA for types SMAJ5.0 thru SMAJ170 (e.g. SMAJ5.0C, SMAJ170CA)  
Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

|  | SYMBOLS                           | VALUE        | UNITS |
|--|-----------------------------------|--------------|-------|
| Peak pulse power dissipation with a 10/1000μs wavetorm(NOTE 1,2,5,FIG.1) | P <sub>PPM</sub>                  | Minimum 400  | Watts |
| Peak forward surge current (Note 4)                                      | I <sub>FSM</sub>                  | 40.0         | Amps  |
| Peak pulse current with a 10/1000μs waveform(NOTE 1)                     | I <sub>PPM</sub>                  | See Table 1  | Amps  |
| Steady state power dissipation (Note 3)                                  | P <sub>M(AV)</sub>                | 1.0          | Watts |
| Maximum instantaneous forward voltage at 25A(Note 4)                     | V <sub>F</sub>                    | 3.5          | Volts |
| Operating junction and storage temperature range                         | T <sub>STG</sub> , T <sub>J</sub> | -55 to + 150 | °C    |

- Notes:**
1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub>=25°C per Fig.2
  2. Mounted on 5.0mm<sup>2</sup> copper pads to each terminal
  3. Lead temperature at T<sub>L</sub>=75°C per Fig.5
  4. Measured on 8.3ms single half sine-wave. For uni-directional devices only.
  5. Peak pulse power waveform is 10/1000μs

## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Type Number |           | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I <sub>T</sub> | Breakdown Voltage Max. @ I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RMW</sub> |
|-------------|-----------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni)       | (Bi)      | RMW(V)                    | V <sub>BR MIN</sub> (V)                | V <sub>BR MAX</sub> (V)                 | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (uA)               |
| SMAJ5.0     | SMAJ5.0C  | 5.0                       | 6.40                                   | 7.55                                    | 10.0                | 9.6                                       | 41.7                | 800.0                             |
| SMAJ5.0A    | SMAJ5.0CA | 5.0                       | 6.40                                   | 7.25                                    | 10.0                | 9.2                                       | 43.5                | 800.0                             |
| SMAJ6.0     | SMAJ6.0C  | 6.0                       | 6.67                                   | 8.45                                    | 10.0                | 11.4                                      | 35.1                | 800.0                             |
| SMAJ6.0A    | SMAJ6.0CA | 6.0                       | 6.67                                   | 7.67                                    | 10.0                | 10.3                                      | 38.8                | 800.0                             |
| SMAJ6.5     | SMAJ6.5C  | 6.5                       | 7.22                                   | 9.14                                    | 10.0                | 12.3                                      | 32.5                | 500.0                             |
| SMAJ6.5A    | SMAJ6.5CA | 6.5                       | 7.22                                   | 8.30                                    | 10.0                | 11.2                                      | 35.7                | 500.0                             |
| SMAJ7.0     | SMAJ7.0C  | 7.0                       | 7.78                                   | 9.86                                    | 10.0                | 13.3                                      | 30.1                | 200.0                             |
| SMAJ7.0A    | SMAJ7.0CA | 7.0                       | 7.78                                   | 8.95                                    | 10.0                | 12.0                                      | 33.3                | 200.0                             |
| SMAJ7.5     | SMAJ7.5C  | 7.5                       | 8.33                                   | 10.67                                   | 1.0                 | 14.3                                      | 28.0                | 100.0                             |
| SMAJ7.5A    | SMAJ7.5CA | 7.5                       | 8.33                                   | 9.58                                    | 1.0                 | 12.9                                      | 31.0                | 100.0                             |
| SMAJ8.0     | SMAJ8.0C  | 8.0                       | 8.89                                   | 11.3                                    | 1.0                 | 15.0                                      | 26.7                | 50.0                              |
| SMAJ8.0A    | SMAJ8.0CA | 8.0                       | 8.89                                   | 10.23                                   | 1.0                 | 13.6                                      | 29.4                | 50.0                              |
| SMAJ8.5     | SMAJ8.5C  | 8.5                       | 9.44                                   | 11.92                                   | 1.0                 | 15.9                                      | 25.2                | 20.0                              |
| SMAJ8.5A    | SMAJ8.5CA | 8.5                       | 9.44                                   | 10.82                                   | 1.0                 | 14.4                                      | 27.8                | 20.0                              |
| SMAJ9.0     | SMAJ9.0C  | 9.0                       | 10.0                                   | 12.6                                    | 1.0                 | 16.9                                      | 23.7                | 10.0                              |
| SMAJ9.0A    | SMAJ9.0CA | 9.0                       | 10.0                                   | 11.5                                    | 1.0                 | 15.4                                      | 26.0                | 10.0                              |
| SMAJ10      | SMAJ10C   | 10                        | 11.1                                   | 14.1                                    | 1.0                 | 18.8                                      | 21.3                | 5.0                               |
| SMAJ10A     | SMAJ10CA  | 10                        | 11.1                                   | 12.8                                    | 1.0                 | 17.0                                      | 23.5                | 5.0                               |
| SMAJ11      | SMAJ11C   | 11                        | 12.2                                   | 15.4                                    | 1.0                 | 20.1                                      | 19.9                | 5.0                               |
| SMAJ11A     | SMAJ11CA  | 11                        | 12.2                                   | 14.0                                    | 1.0                 | 18.2                                      | 22.0                | 5.0                               |
| SMAJ12      | SMAJ12C   | 12                        | 13.3                                   | 16.9                                    | 1.0                 | 22.0                                      | 18.2                | 5.0                               |
| SMAJ12A     | SMAJ12CA  | 12                        | 13.3                                   | 15.3                                    | 1.0                 | 19.9                                      | 20.1                | 5.0                               |
| SMAJ13      | SMAJ13C   | 13                        | 14.4                                   | 18.2                                    | 1.0                 | 23.8                                      | 16.8                | 5.0                               |
| SMAJ13A     | SMAJ13CA  | 13                        | 14.4                                   | 16.5                                    | 1.0                 | 21.5                                      | 18.6                | 5.0                               |
| SMAJ14      | SMAJ14C   | 14                        | 15.6                                   | 19.8                                    | 1.0                 | 25.8                                      | 15.5                | 5.0                               |
| SMAJ14A     | SMAJ14CA  | 14                        | 15.6                                   | 17.9                                    | 1.0                 | 23.2                                      | 17.2                | 5.0                               |
| SMAJ15      | SMAJ15C   | 15                        | 16.7                                   | 21.1                                    | 1.0                 | 26.9                                      | 14.9                | 5.0                               |
| SMAJ15A     | SMAJ15CA  | 15                        | 16.7                                   | 19.2                                    | 1.0                 | 24.4                                      | 16.4                | 5.0                               |
| SMAJ16      | SMAJ16C   | 16                        | 17.8                                   | 22.6                                    | 1.0                 | 28.8                                      | 13.9                | 5.0                               |
| SMAJ16A     | SMAJ16CA  | 16                        | 17.8                                   | 20.5                                    | 1.0                 | 26.0                                      | 15.4                | 5.0                               |
| SMAJ17      | SMAJ17C   | 17                        | 18.9                                   | 23.9                                    | 1.0                 | 30.5                                      | 13.1                | 5.0                               |
| SMAJ17A     | SMAJ17CA  | 17                        | 18.9                                   | 21.7                                    | 1.0                 | 27.6                                      | 14.5                | 5.0                               |

## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Type Number |          | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I <sub>T</sub> | Breakdown Voltage Max. @ I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RMW</sub> |
|-------------|----------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni)       | (Bi)     | RMW(V)                    | V <sub>BR MIN</sub> (V)                | V <sub>BR MAX</sub> (V)                 | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (uA)               |
| SMAJ18      | SMAJ18C  | 18                        | 20.0                                   | 25.3                                    | 1.0                 | 32.2                                      | 12.4                | 5.0                               |
| SMAJ18A     | SMAJ18CA | 18                        | 20.0                                   | 23.3                                    | 1.0                 | 29.2                                      | 13.7                | 5.0                               |
| SMAJ20      | SMAJ20C  | 20                        | 22.2                                   | 28.1                                    | 1.0                 | 35.8                                      | 11.2                | 5.0                               |
| SMAJ20A     | SMAJ20CA | 20                        | 22.2                                   | 25.5                                    | 1.0                 | 32.4                                      | 12.3                | 5.0                               |
| SMAJ22      | SMAJ22C  | 22                        | 24.4                                   | 30.9                                    | 1.0                 | 39.4                                      | 10.2                | 5.0                               |
| SMAJ22A     | SMAJ22CA | 22                        | 24.4                                   | 28.0                                    | 1.0                 | 35.5                                      | 11.3                | 5.0                               |
| SMAJ24      | SMAJ24C  | 24                        | 26.7                                   | 33.8                                    | 1.0                 | 43.0                                      | 9.3                 | 5.0                               |
| SMAJ24A     | SMAJ24CA | 24                        | 26.7                                   | 30.7                                    | 1.0                 | 38.9                                      | 10.3                | 5.0                               |
| SMAJ26      | SMAJ26C  | 26                        | 28.9                                   | 36.6                                    | 1.0                 | 46.6                                      | 8.6                 | 5.0                               |
| SMAJ26A     | SMAJ26CA | 26                        | 28.9                                   | 33.2                                    | 1.0                 | 42.1                                      | 9.5                 | 5.0                               |
| SMAJ28      | SMAJ28C  | 28                        | 31.1                                   | 39.4                                    | 1.0                 | 50.0                                      | 8.0                 | 5.0                               |
| SMAJ28A     | SMAJ28CA | 28                        | 31.1                                   | 35.8                                    | 1.0                 | 45.4                                      | 8.8                 | 5.0                               |
| SMAJ30      | SMAJ30C  | 30                        | 33.3                                   | 42.2                                    | 1.0                 | 53.5                                      | 7.5                 | 5.0                               |
| SMAJ30A     | SMAJ30CA | 30                        | 33.3                                   | 38.3                                    | 1.0                 | 48.4                                      | 8.3                 | 5.0                               |
| SMAJ33      | SMAJ33C  | 33                        | 36.7                                   | 46.5                                    | 1.0                 | 59.0                                      | 6.8                 | 5.0                               |
| SMAJ33A     | SMAJ33CA | 33                        | 36.7                                   | 42.2                                    | 1.0                 | 53.3                                      | 7.5                 | 5.0                               |
| SMAJ36      | SMAJ36C  | 36                        | 40.0                                   | 50.7                                    | 1.0                 | 64.3                                      | 6.2                 | 5.0                               |
| SMAJ36A     | SMAJ36CA | 36                        | 40.0                                   | 46.0                                    | 1.0                 | 58.1                                      | 6.9                 | 5.0                               |
| SMAJ40      | SMAJ40C  | 40                        | 44.4                                   | 56.3                                    | 1.0                 | 71.4                                      | 5.6                 | 5.0                               |
| SMAJ40A     | SMAJ40CA | 40                        | 44.4                                   | 51.1                                    | 1.0                 | 64.5                                      | 6.2                 | 5.0                               |
| SMAJ43      | SMAJ43C  | 43                        | 47.8                                   | 60.5                                    | 1.0                 | 76.7                                      | 5.2                 | 5.0                               |
| SMAJ43A     | SMAJ43CA | 43                        | 47.8                                   | 54.9                                    | 1.0                 | 69.4                                      | 5.8                 | 5.0                               |
| SMAJ45      | SMAJ45C  | 45                        | 50.0                                   | 63.3                                    | 1.0                 | 80.3                                      | 5.0                 | 5.0                               |
| SMAJ45A     | SMAJ45CA | 45                        | 50.0                                   | 57.5                                    | 1.0                 | 72.7                                      | 5.5                 | 5.0                               |
| SMAJ48      | SMAJ48C  | 48                        | 53.3                                   | 67.5                                    | 1.0                 | 85.5                                      | 4.7                 | 5.0                               |
| SMAJ48A     | SMAJ48CA | 48                        | 53.3                                   | 61.3                                    | 1.0                 | 77.4                                      | 5.2                 | 5.0                               |
| SMAJ51      | SMAJ51C  | 51                        | 56.7                                   | 71.8                                    | 1.0                 | 91.1                                      | 4.4                 | 5.0                               |
| SMAJ51A     | SMAJ51CA | 51                        | 56.7                                   | 65.2                                    | 1.0                 | 82.4                                      | 4.9                 | 5.0                               |
| SMAJ54      | SMAJ54C  | 54                        | 60.0                                   | 76.0                                    | 1.0                 | 96.3                                      | 4.2                 | 5.0                               |
| SMAJ54A     | SMAJ54CA | 54                        | 60.0                                   | 69.0                                    | 1.0                 | 87.1                                      | 4.6                 | 5.0                               |
| SMAJ58      | SMAJ58C  | 58                        | 64.4                                   | 81.6                                    | 1.0                 | 103                                       | 3.9                 | 5.0                               |
| SMAJ58A     | SMAJ58CA | 58                        | 64.4                                   | 74.1                                    | 1.0                 | 93.6                                      | 4.3                 | 5.0                               |

## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Type Number |           | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I <sub>T</sub> | Breakdown Voltage Max. @ I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RMW</sub> |
|-------------|-----------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni)       | (Bi)      | RMW(V)                    | V <sub>BR MIN</sub> (V)                | V <sub>BR MAX</sub> (V)                 | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (uA)               |
| SMAJ60      | SMAJ60C   | 60                        | 66.7                                   | 84.5                                    | 1.0                 | 107                                       | 3.7                 | 5.0                               |
| SMAJ60A     | SMAJ60CA  | 60                        | 66.7                                   | 76.7                                    | 1.0                 | 96.8                                      | 4.1                 | 5.0                               |
| SMAJ64      | SMAJ64C   | 64                        | 71.1                                   | 90.1                                    | 1.0                 | 114                                       | 3.5                 | 5.0                               |
| SMAJ64A     | SMAJ64CA  | 64                        | 71.1                                   | 81.8                                    | 1.0                 | 103                                       | 3.9                 | 5.0                               |
| SMAJ70      | SMAJ70C   | 70                        | 77.8                                   | 98.6                                    | 1.0                 | 125                                       | 3.2                 | 5.0                               |
| SMAJ70A     | SMAJ70CA  | 70                        | 77.8                                   | 89.5                                    | 1.0                 | 113                                       | 3.5                 | 5.0                               |
| SMAJ75      | SMAJ75C   | 75                        | 83.0                                   | 105.7                                   | 1.0                 | 134                                       | 3.0                 | 5.0                               |
| SMAJ75A     | SMAJ75CA  | 75                        | 83.0                                   | 95.8                                    | 1.0                 | 121                                       | 3.3                 | 5.0                               |
| SMAJ78      | SMAJ78C   | 78                        | 86.0                                   | 109.8                                   | 1.0                 | 139                                       | 2.9                 | 5.0                               |
| SMAJ78A     | SMAJ78CA  | 78                        | 86.0                                   | 99.7                                    | 1.0                 | 126                                       | 3.2                 | 5.0                               |
| SMAJ85      | SMAJ85C   | 85                        | 94.0                                   | 119.2                                   | 1.0                 | 151                                       | 2.6                 | 5.0                               |
| SMAJ85A     | SMAJ85CA  | 85                        | 94.0                                   | 108.2                                   | 1.0                 | 137                                       | 2.9                 | 5.0                               |
| SMAJ90      | SMAJ90C   | 90                        | 100                                    | 126.5                                   | 1.0                 | 160                                       | 2.5                 | 5.0                               |
| SMAJ90A     | SMAJ90CA  | 90                        | 100                                    | 115.5                                   | 1.0                 | 146                                       | 2.7                 | 5.0                               |
| SMAJ100     | SMAJ100C  | 100                       | 111                                    | 141.0                                   | 1.0                 | 179                                       | 2.2                 | 5.0                               |
| SMAJ100A    | SMAJ100CA | 100                       | 111                                    | 128.0                                   | 1.0                 | 162                                       | 2.5                 | 5.0                               |
| SMAJ110     | SMAJ110C  | 110                       | 122                                    | 154.5                                   | 1.0                 | 196                                       | 2.0                 | 5.0                               |
| SMAJ110A    | SMAJ110CA | 110                       | 122                                    | 140.5                                   | 1.0                 | 177                                       | 2.3                 | 5.0                               |
| SMAJ120     | SMAJ120C  | 120                       | 133                                    | 169.0                                   | 1.0                 | 214                                       | 1.9                 | 5.0                               |
| SMAJ120A    | SMAJ120CA | 120                       | 133                                    | 153.0                                   | 1.0                 | 193                                       | 2.1                 | 5.0                               |
| SMAJ130     | SMAJ130C  | 130                       | 144                                    | 182.5                                   | 1.0                 | 231                                       | 1.7                 | 5.0                               |
| SMAJ130A    | SMAJ130CA | 130                       | 144                                    | 165.5                                   | 1.0                 | 209                                       | 1.9                 | 5.0                               |
| SMAJ150     | SMAJ150C  | 150                       | 167                                    | 211.5                                   | 1.0                 | 268                                       | 1.5                 | 5.0                               |
| SMAJ150A    | SMAJ150CA | 150                       | 167                                    | 192.5                                   | 1.0                 | 243                                       | 1.6                 | 5.0                               |
| SMAJ160     | SMAJ160C  | 160                       | 178                                    | 226.0                                   | 1.0                 | 287                                       | 1.4                 | 5.0                               |
| SMAJ160A    | SMAJ160CA | 160                       | 178                                    | 205.0                                   | 1.0                 | 259                                       | 1.5                 | 5.0                               |
| SMAJ170     | SMAJ170C  | 170                       | 189                                    | 239.5                                   | 1.0                 | 304                                       | 1.3                 | 5.0                               |
| SMAJ170A    | SMAJ170CA | 170                       | 189                                    | 217.5                                   | 1.0                 | 275                                       | 1.5                 | 5.0                               |

### NOTES:

1. V<sub>BR</sub> measured after I<sub>T</sub> applied for 300μs, I<sub>T</sub>=square wave pulse or equivalent
2. Surge current waveform per Fig.3 and derated per Fig.2
3. For bidirectional types having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled
4. All items and symbols are consistent with ANSI/IEEE C62.35
5. Peak pulse power waveform is 10/1000μs

# RATINGS AND CHARACTERISTIC CURVES SMAJ5.0 THUR SMAJ170CA

FIG. 1-PEAK PULSE POWER RATING CURVE

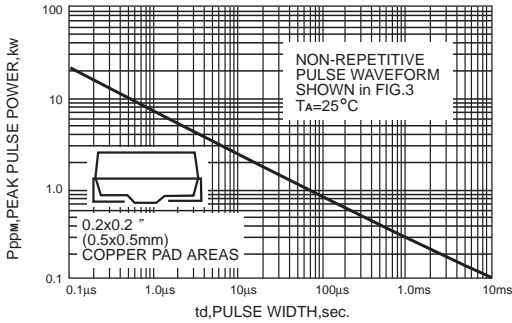


FIG. 2-PULSE DERATING CURVE

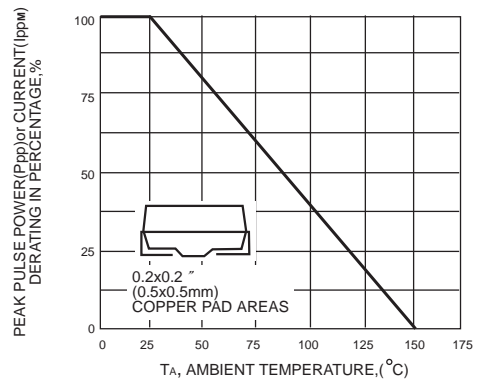


FIG.3-PULSE WAVEFORM

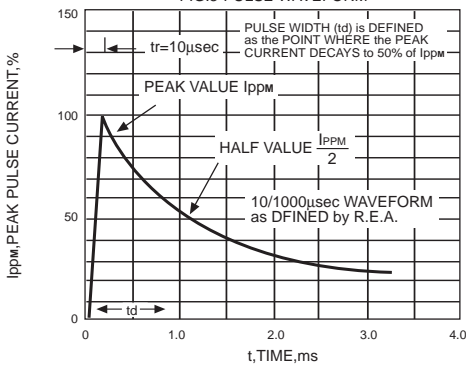


FIG. 4-TYPICAL JUNCTIONAL CAPACITANCE UNIDIRECTIONAL

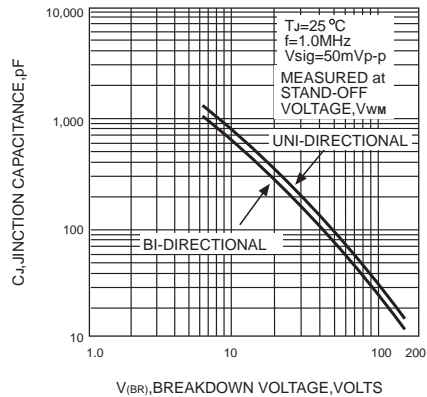


FIG.5-STEADY STATE POWER DERATING CURVE

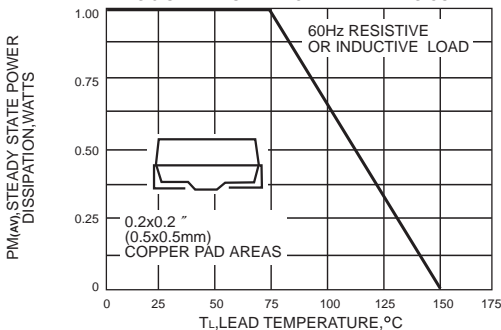


FIG.6-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

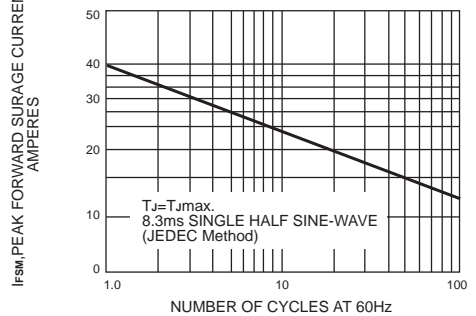
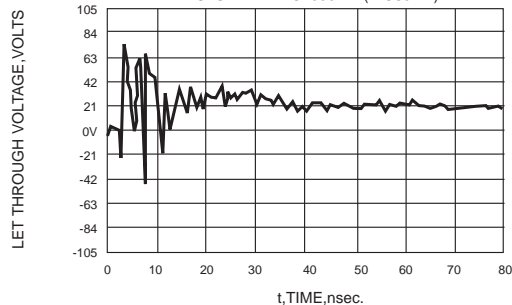


FIG.7-TYPICAL RESPONSE TO 8KV POSITLVE GOING ESD PULSE PER IEC1000-4-2(IEC801-2)



单击下面可查看定价，库存，交付和生命周期等信息

[>>STAR\\_SEA\(星海\)](#)