

## Surface Mount Transient Voltage Suppressors

### QXS3K Series

#### Description

QXS3K series TVS is designed for DC power supply equipment in outdoor exposure environment. It is used to replace the traditional PTC, GDT and TVS combination solution, which is widely used in GPS module of the tower base station. etc

Working Voltage: 5.0 to 6.0 V

#### Features

- ◆ Planar junction
- ◆ Excellent clamping capability
- ◆ Repetitive rate (duty cycle): 0.01 %
- ◆ Low profile package and low inductance
- ◆ 3000A Peak Pulse power capability at 8/20us waveform
- ◆ Fast response time: typically less than 1.0ps from 0V to  $V_{BR}$  min
- ◆ High temperature soldering: 260°C/10s at terminals.
- ◆ For surface mounted application in order to optimize board space

#### Applications

TVS devices are ideal for the protection of I/O interfaces,  $V_{CC}$  bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

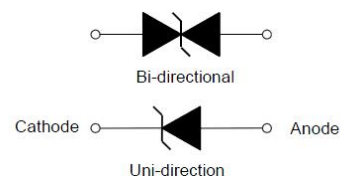
Uni-directional



Bi-directional



#### Functional Diagram



#### Maximum Ratings and Thermal Characteristics (TA=25°C Unless otherwise noted)

| Parameter                                                         | Symbol    | Value        | Units |
|-------------------------------------------------------------------|-----------|--------------|-------|
| Operating junction temperature range                              | $T_J$     | - 55 to +125 | ° C   |
| Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$ | $P_D$     | 8.0          | W     |
| Peak pulse current with a 8/20us waveform                         | $I_{PP}$  | 3000         | A     |
| Storage temperature range                                         | $T_{STG}$ | - 55 to +150 | ° C   |
| Maximum Instantaneous Forward Voltage at 80A for Unidirectional   | $V_F$     | 5.0          | V     |

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Electrical Characteristics(@25°C unless otherwise Specified)

| Part Number |            | Marking |      | Reverse Stand-Off Voltage $V_{RWM}(V)$ | Breakdown Voltage $V_{BR}$ (V) @ $I_T$ |      | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_{RWM}$ ( $\mu A$ ) |
|-------------|------------|---------|------|----------------------------------------|----------------------------------------|------|-------------------------|-----------------------------------------------|-----------------------------------------|-------------------------------------------------------|
| Uni         | Bi         | Uni     | Bi   |                                        | MIN                                    | MAX  |                         |                                               |                                         |                                                       |
| QXS3K5.0A   | QXS3K5.0CA | 3K5A    | 3K5C | 5.0                                    | 6.40                                   | 7.10 | 10                      | 20                                            | 3000                                    | 800                                                   |
| QXS3K6.0A   | QXS3K6.0CA | KAF     | KCF  | 6.0                                    | 6.50                                   | 7.40 | 10                      | 22                                            | 3000                                    | 800                                                   |

NOTE1: Surge waveform: 8/20  $\mu s$

$V_R$  : Stand-off Voltage -- Maximum voltage that can be applied

$V_{BR}$ : Breakdown Voltage

$V_C$ : Clamping Voltage -- Peak voltage measured across the suppressor at a specified  $I_{PP}$

$I_R$ : Reverse Leakage Current

Ratings and Characteristics Curves( $T_A=25^\circ C$  unless otherwise noted)

Figure 1-Pulse Waveform

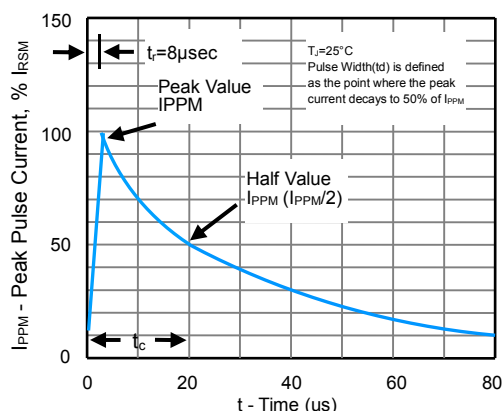
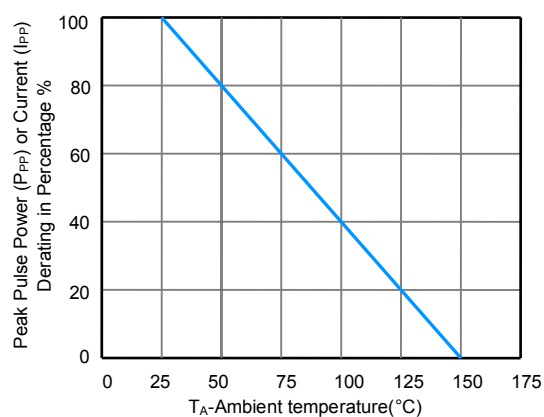
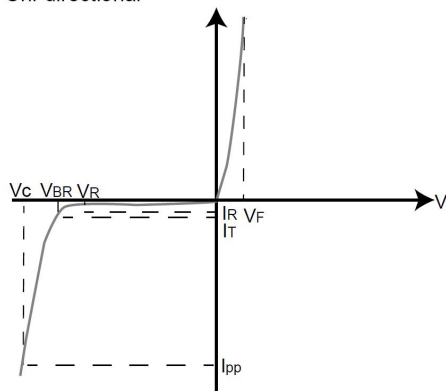


Figure 2-Pulse Derating Curve

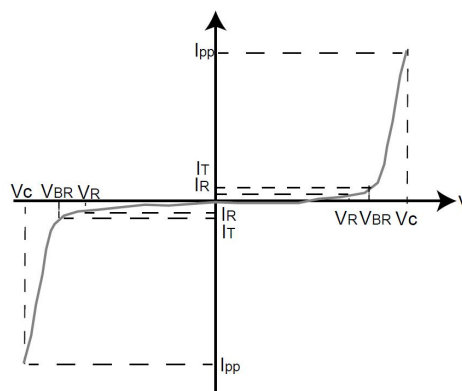


### I-V Curve Characteristics

Uni-directional



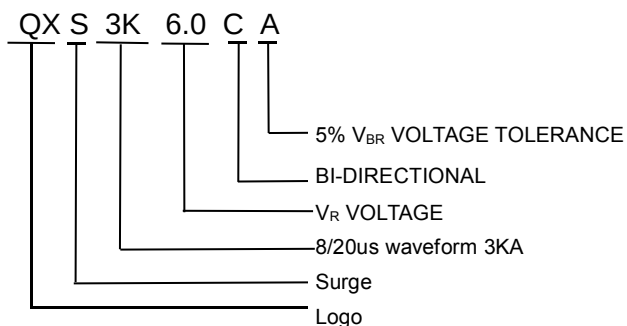
Bi-directional



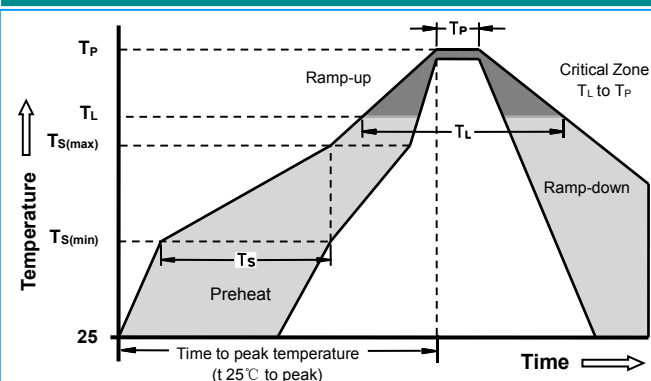
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#### Part Numbering



#### Soldering Parameters

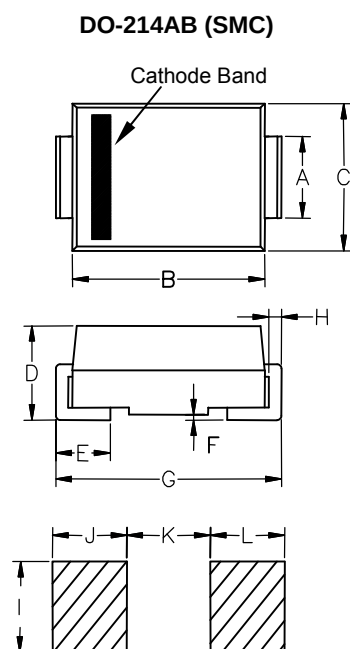


| Reflow Condition                                     |                                    | Lead-free assembly |
|------------------------------------------------------|------------------------------------|--------------------|
| Pre Heat                                             | -Temperature Min ( $T_{s(min)}$ )  | 150°C              |
|                                                      | -Temperature Max ( $T_{s(max)}$ )  | 200°C              |
|                                                      | - Time (min to max) ( $t_s$ )      | 60 - 180 Seconds   |
| Average ramp up rate ( Liquidus Temp $T_L$ to peak)  |                                    | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                 |                                    | 3°C/second max     |
| Reflow                                               | - Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                      | - Time (min to max) ( $t_s$ )      | 60 - 150 Seconds   |
| Peak Temperature ( $T_P$ )                           |                                    | 260 +0/-5°C        |
| Time within 5°C of actual peak Temperature ( $t_p$ ) |                                    | 30 Seconds         |
| Ramp-down Rate                                       |                                    | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_P$ )              |                                    | 8 minutes Max      |
| Do not exceed                                        |                                    | 260°C              |

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#### Dimensions



| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.114  | 0.126 | 2.86        | 3.160 |
| B          | 0.260  | 0.280 | 6.520       | 7.020 |
| C          | 0.220  | 0.245 | 5.520       | 6.150 |
| D          | 0.079  | 0.103 | 1.980       | 2.590 |
| E          | 0.030  | 0.060 | 0.750       | 1.510 |
| F          | -      | 0.008 | -           | 0.203 |
| G          | 0.305  | 0.320 | 7.640       | 8.020 |
| H          | 0.006  | 0.012 | 0.152       | 0.305 |
| I          | 0.129  | -     | 3.300       | -     |
| J          | 0.094  | -     | 2.400       | -     |
| K          | -      | 0.165 | -           | 4.200 |
| L          | 0.094  | -     | 2.400       | -     |

#### Packaging

| Part Number | Component Package | Quantity | TAPE & REEL |
|-------------|-------------------|----------|-------------|
| QXS3KXXXX   | DO-214AB          | 3000     | 13inch      |