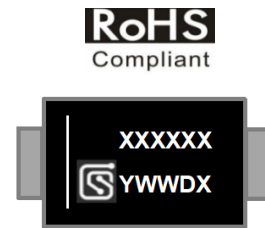


**Features**

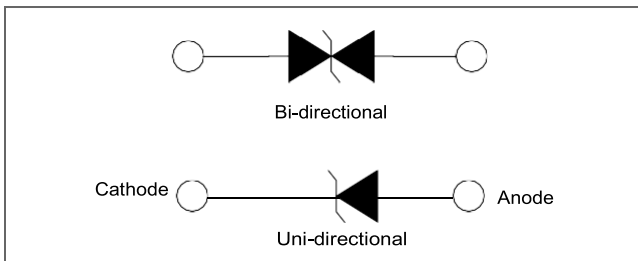
- 3000W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C
- High reliability application and automotive grade AEC-Q101 qualified



**Applications**

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

**Function Diagram**




| Maximum Ratings and Thermal Characteristics (T <sub>A</sub> =25°C unless otherwise noted) |                  |            |      |
|---|------------------|------------|------|
| Parameter   | Symbol           | Value      | Unit |
| Peak Pulse Power Dissipation at T <sub>A</sub> =25°C by 10/1000µs Waveform (Fig.3)        | P <sub>PPM</sub> | 3000       | W    |
| Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =50°C                           | P <sub>D</sub>   | 6.5        | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)                          | I <sub>FSM</sub> | 300        | A    |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)              | V <sub>F</sub>   | 3.5/5      | V    |
| Operating Temperature Range   | T <sub>J</sub>   | -55 to 150 | °C   |
| Storage Temperature Range   | T <sub>STG</sub> | -55 to 150 | °C   |

| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
|        | Pending            |

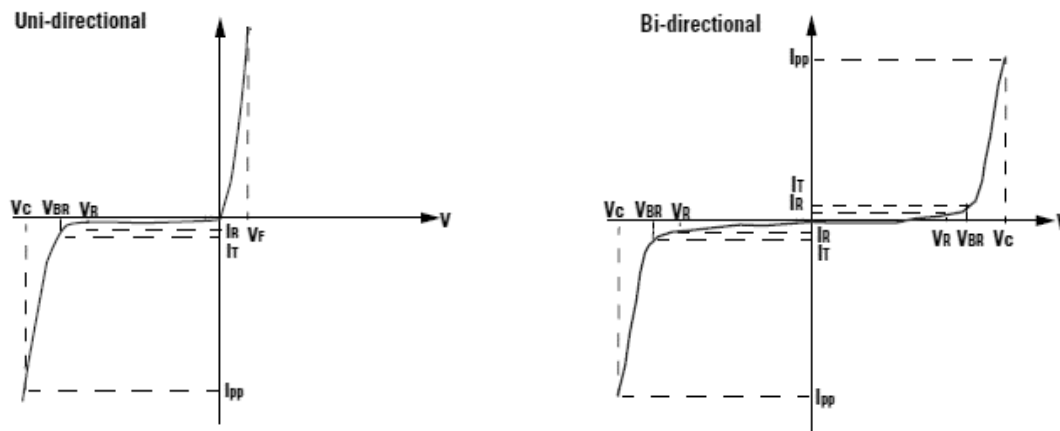
**Notes:**

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
2. V<sub>F</sub> < 3.5V for single die parts and V<sub>F</sub> < 5V for stacked-die parts.

**Characteristics (T = 25°C unless otherwise noted)**

| Part Number<br>(Uni) | Part Number<br>(Bi) | Key Marking |       | Reverse<br>Stand off<br>Voltage V <sub>R</sub><br>(Volts) | Breakdown Voltage<br>V <sub>BR</sub> (Volts) @ I <sub>T</sub> |        | Test<br>Current I <sub>T</sub><br>(mA) | Maximum<br>Clamping<br>Voltage V <sub>C</sub> @<br>I <sub>nn</sub><br>(V) | Maximum Peak<br>Pulse Current<br>I <sub>pp</sub> (A) | Maximum<br>Reverse Leakag<br>I <sub>R</sub> @ V <sub>R</sub><br>(μA) | Agency<br>Approval<br> |
|----------------------|---------------------|-------------|-------|---|---|--------|--|---|--|--|---|
|                      |                     | UNI         | BI    |   | MIN   | MAX    |  |   |  |  |   |
| TPSMD10A             | TPSMD10CA           | AD010       | AD010 | 10.0  | 11.10   | 12.30  | 1                                      | 17.0  | 176.5  | 5  |   |
| TPSMD11A             | TPSMD11CA           | AD011       | AD011 | 11.0  | 12.20   | 13.50  | 1                                      | 18.2  | 164.8  | 2  |   |
| TPSMD12A             | TPSMD12CA           | AD012       | AD012 | 12.0  | 13.30   | 14.70  | 1                                      | 19.9  | 150.8  | 2  |   |
| TPSMD13A             | TPSMD13CA           | AD013       | AD013 | 13.0  | 14.40   | 15.90  | 1                                      | 21.5  | 139.5  | 2  |   |
| TPSMD14A             | TPSMD14CA           | AD014       | AD014 | 14.0  | 15.60   | 17.20  | 1                                      | 23.2  | 129.3  | 2  |   |
| TPSMD15A             | TPSMD15CA           | AD015       | AD015 | 15.0  | 16.70   | 18.50  | 1                                      | 24.4  | 123.0  | 2  |   |
| TPSMD16A             | TPSMD16CA           | AD016       | AD016 | 16.0  | 17.80   | 19.70  | 1                                      | 26.0  | 115.4  | 2  |   |
| TPSMD17A             | TPSMD17CA           | AD017       | AD017 | 17.0  | 18.90   | 20.90  | 1                                      | 27.6  | 108.7  | 2  |   |
| TPSMD18A             | TPSMD18CA           | AD018       | AD018 | 18.0  | 20.00   | 22.10  | 1                                      | 29.2  | 102.7  | 2  |   |
| TPSMD20A             | TPSMD20CA           | AD020       | AD020 | 20.0  | 22.20   | 24.50  | 1                                      | 32.4  | 92.6   | 2  |   |
| TPSMD22A             | TPSMD22CA           | AD022       | AD022 | 22.0  | 24.40   | 26.90  | 1                                      | 35.5  | 84.5   | 2  |   |
| TPSMD24A             | TPSMD24CA           | AD024       | AD024 | 24.0  | 26.70   | 29.50  | 1                                      | 38.9  | 77.1   | 2  |   |
| TPSMD26A             | TPSMD26CA           | AD026       | AD026 | 26.0  | 28.90   | 31.90  | 1                                      | 42.1  | 71.3   | 2  |   |
| TPSMD28A             | TPSMD28CA           | AD028       | AD028 | 28.0  | 31.10   | 34.40  | 1                                      | 45.4  | 66.1   | 2  |   |
| TPSMD30A             | TPSMD30CA           | AD030       | AD030 | 30.0  | 33.30   | 36.80  | 1                                      | 48.4  | 62.0   | 2  |   |
| TPSMD33A             | TPSMD33CA           | AD033       | AD033 | 33.0  | 36.70   | 40.60  | 1                                      | 53.3  | 56.3   | 2  |   |
| TPSMD36A             | TPSMD36CA           | AD036       | AD036 | 36.0  | 40.00   | 44.20  | 1                                      | 58.1  | 51.6   | 2  |   |
| TPSMD40A             | TPSMD40CA           | AD040       | AD040 | 40.0  | 44.40   | 49.10  | 1                                      | 64.5  | 46.5   | 2  |   |
| TPSMD43A             | TPSMD43CA           | AD043       | AD043 | 43.0  | 47.80   | 52.80  | 1                                      | 69.4  | 43.2   | 2  |   |
| TPSMD45A             | TPSMD45CA           | AD045       | AD045 | 45.0  | 50.00   | 55.30  | 1                                      | 72.7  | 41.3   | 2  |   |
| TPSMD48A             | TPSMD48CA           | AD048       | AD048 | 48.0  | 53.30   | 58.90  | 1                                      | 77.4  | 38.8   | 2  |   |
| TPSMD51A             | TPSMD51CA           | AD051       | AD051 | 51.0  | 56.70   | 62.70  | 1                                      | 82.4  | 36.4   | 2  |   |
| TPSMD54A             | TPSMD54CA           | AD054       | AD054 | 54.0  | 60.00   | 66.30  | 1                                      | 87.1  | 34.4   | 2  |   |
| TPSMD58A             | TPSMD58CA           | AD058       | AD058 | 58.0  | 64.40   | 71.20  | 1                                      | 93.6  | 32.1   | 2  |   |
| TPSMD60A             | TPSMD60CA           | AD060       | AD060 | 60.0  | 66.70   | 73.70  | 1                                      | 96.8  | 31.0   | 2  |   |
| TPSMD64A             | TPSMD64CA           | AD064       | AD064 | 64.0  | 71.10   | 78.60  | 1                                      | 103.0   | 29.1   | 2  |   |
| TPSMD70A             | TPSMD70CA           | AD070       | AD070 | 70.0  | 77.80   | 86.00  | 1                                      | 113.0   | 26.5   | 2  |   |
| TPSMD75A             | TPSMD75CA           | AD075       | AD075 | 75.0  | 83.30   | 92.10  | 1                                      | 121.0   | 24.8   | 2  |   |
| TPSMD78A             | TPSMD78CA           | AD078       | AD078 | 78.0  | 86.70   | 95.80  | 1                                      | 126.0   | 23.8   | 2  |   |
| TPSMD85A             | TPSMD85CA           | AD085       | AD085 | 85.0  | 94.40   | 104.00 | 1                                      | 137.0   | 21.9   | 2  |   |

### I-V Curve Characteristics



$P_{PPM}$  Peak Pulse Power Dissipation -- Max power dissipation

$V_R$  Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

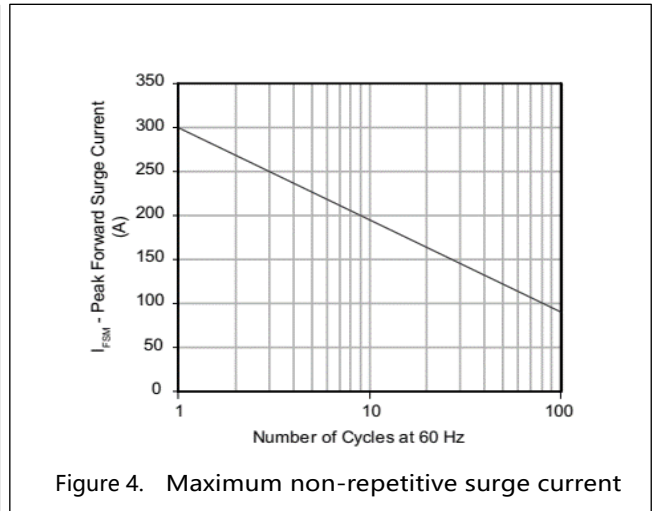
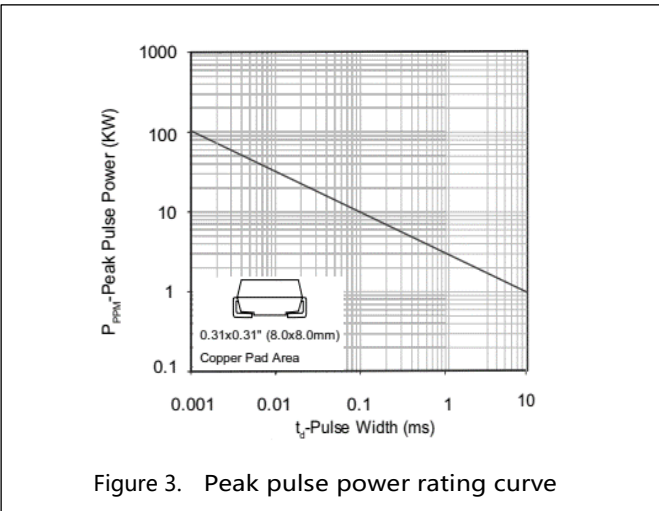
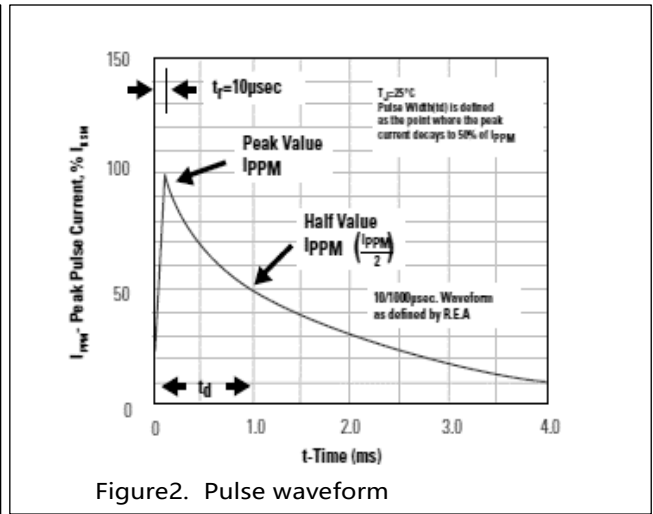
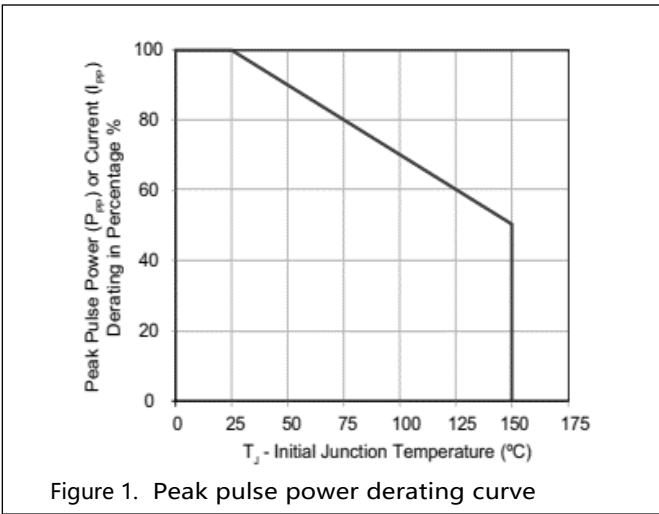
$V_{BR}$  Breakdown Voltage -- Maximum voltage that flows through the TVS at a specified test current ( $I_T$ )

$V_C$  Clamping Voltage -- Peak voltage measured across the TVS at a specified  $I_{PPM}$  (peak impulse current)

$I_R$  Reverse Leakage Current -- Current measured at  $V_R$

$V_F$  Forward Voltage Drop for Uni-directional

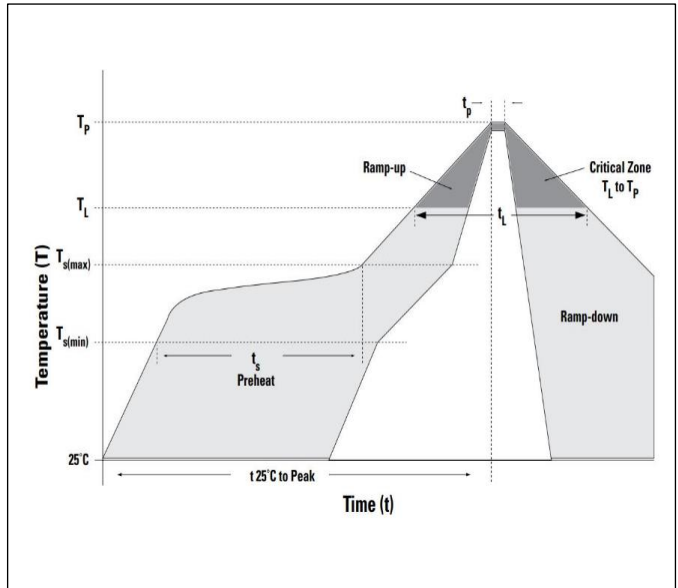
Ratings and Characteristic Curves (T = 25°C unless otherwise noted)



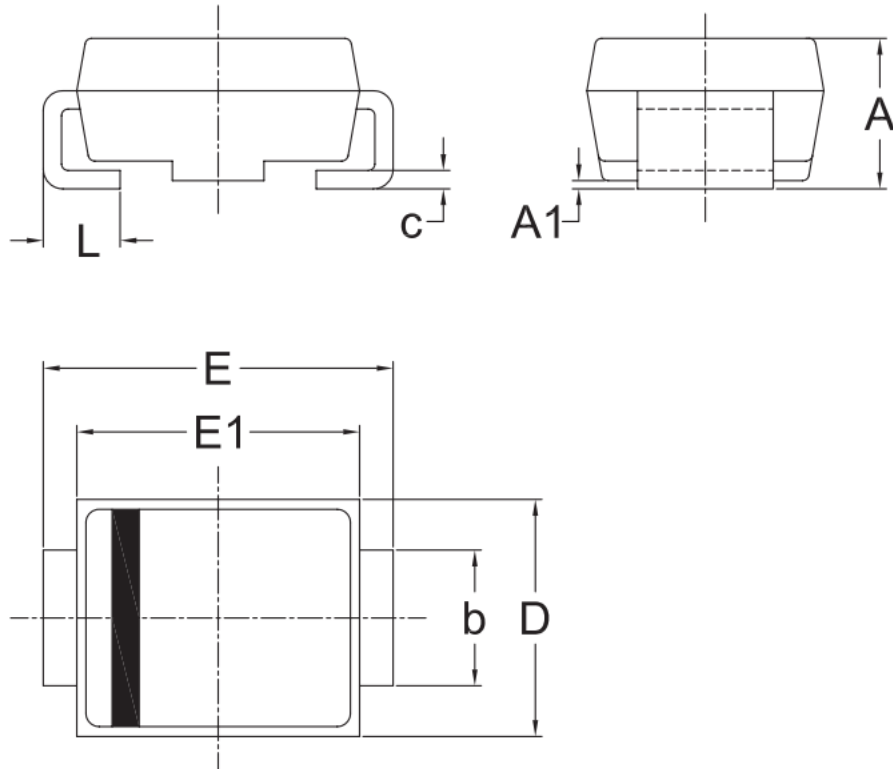
## Soldering Parameters

| 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 – 120 secs           |
| Average ramp up rate (Liquidus Temp ( $T_A$ ) to peak) |                                    | 3°C/second max          |
| $T_{s(max)}$ to $T_A$ - Ramp-up Rate                   |                                    | 3°C/second max          |
| Reflow   | - Temperature ( $T_A$ ) (Liquidus) | 217°C                   |
|  | - Time (min to max) ( $t_s$ )      | 60 – 150 seconds        |
| Peak Temperature ( $T_p$ )                             |                                    | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                    | 20 – 40 seconds         |
| Ramp-down Rate   |                                    | 6°C/second max          |
| Time 25°C to peak Temperature ( $T_p$ )                |                                    | 8 minutes Max.          |
| Do not exceed  |                                    | 260°C                   |

## Soldering profile



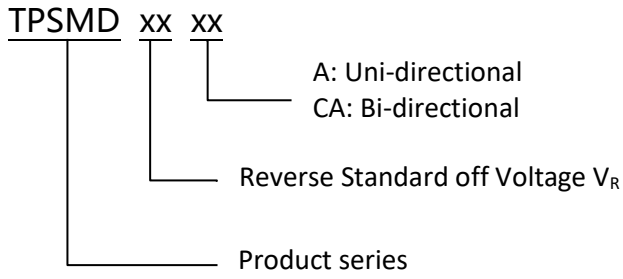
Dimensions



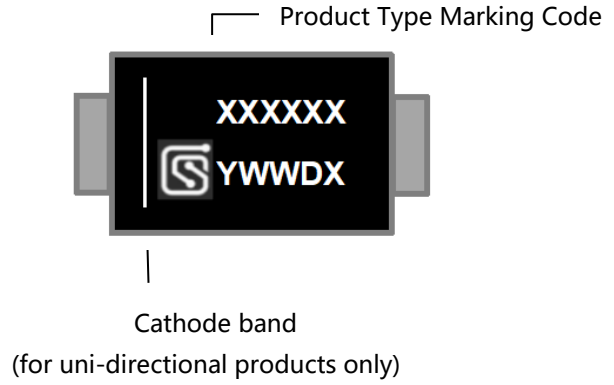
| UNIT | A   | A1   | b    | c    | D    | E    | E1   | L    |      |
|------|-----|------|------|------|------|------|------|------|------|
| mm   | Max | 2.83 | 0.30 | 3.10 | 0.25 | 6.15 | 8.15 | 7.05 | 1.60 |
|      | Min | 2.33 | 0.00 | 2.80 | 0.15 | 5.85 | 7.65 | 6.75 | 0.90 |

Remark: Dimensions D and E1 do not include mold flash & gate remain.

Part Numbering



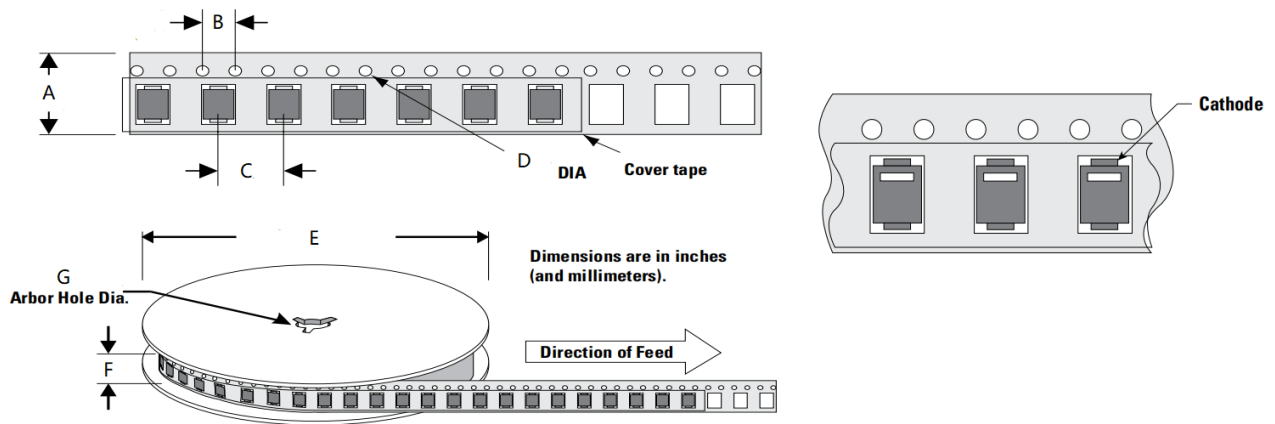
Part Marking



Packing

| Part number | Package name | Small packing quantity | Packing method |
|-------------|--------------|------------------------|----------------|
| TPSMDXXXX   | DO-214AB     | 3000                   | Tape & Reel    |

### Tape and Reel Specification



| Symbol | Millimeter  |
|--------|-------------|
| A      | 16.00±0.10  |
| B      | 4.00±0.10   |
| C      | 8.00±0.10   |
| D      | 1.55±0.05   |
| E      | 330.20±2.00 |
| F      | 19.70±2.00  |
| G      | 13.30±0.30  |

### Revision history of Specification

| Version | Change Items    | Effective Date |
|---------|-----------------|----------------|
| 1.0     | Initial Release | 13-Aug-2021    |



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [ESD Suppressors / TVS Diodes](#) category:*

*Click to view products by [SCME](#) manufacturer:*

Other Similar products are found below :

[60KS200C](#) [D18V0L1B2LP-7B](#) [D5V0F4U5P5-7](#) [NTE4902](#) [P4KE27CA](#) [P6KE11CA](#) [P6KE8.2A](#) [SA60CA](#) [SA64CA](#) [SMBJ12CATR](#)  
[SMBJ33CATR](#) [SMBJ6.5A](#) [SMBJ8.0A](#) [ESD101-B1-02ELS](#) [E6327](#) [ESD112-B1-02EL](#) [E6327](#) [ESD7451N2T5G](#) [19180-510](#) [CPDT-5V0USP-](#)  
[HF](#) [3.0SMCJ33CA-F](#) [3.0SMCJ36A-F](#) [HSPC16701B02TP](#) [JANTX1N6126A](#) [D3V3Q1B2DLP3-7](#) [D55V0M1B2WS-7](#) [SCM1293A-04SO](#)  
[ESD200-B1-CSP0201](#) [E6327](#) [SM12-7](#) [CEN955](#) [W/DATA](#) [VESD12A1A-HD1-GS08](#) [CPDQC5V0-HF](#) [D1213A-01LP4-7B](#) [ESD101-B1-02EL](#)  
[E6327](#) [AOZ8808DI-03](#) [5KP15A](#) [5KP48A](#) [5KP90A](#) [ESD3V3D7-TP](#) [15KPA36A-LF](#) [P4KE56CA](#) [P4KE68A](#) [P4KE91CATR](#) [P6KE120A](#)  
[P6KE13CA](#) [P6KE43CA](#) [P6KE6.8CA](#) [P6KE8.2](#) [P6SMBJ20CA](#) [JANTX1N6072A](#) [SR2835ESKG](#) [SA90CA](#)