

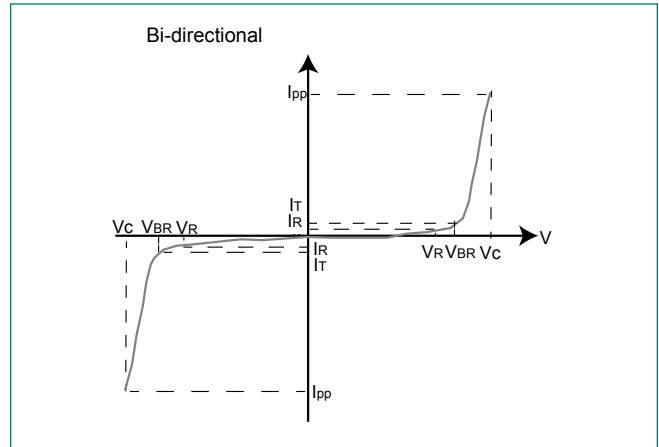
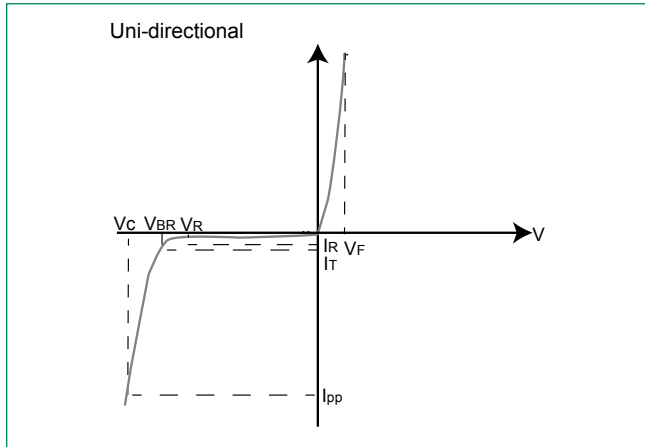
### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Marking |      | Reverse Stand off Voltage V <sub>R</sub> (Volts) | Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub> |        | Test Current I <sub>T</sub> (mA) | Maximum Clamping Voltage V <sub>C</sub> @ I <sub>PP</sub> (V) | Maximum Peak Pulse Current I <sub>PP</sub> (A) | Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (μA) | Agency Approval  |
|-------------------|------------------|---------|------|--------------------------------------------------|------------------------------------------------------------|--------|----------------------------------|---------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                   |                  | Uni     | Bi   |                                                  | Min.                                                       | Max.   |                                  |                                                               |                                                |                                                              |                                                                                                     |
| 1KSMB6.8A         | 1KSMB6.8CA       | A10A    | N10A | 5.80                                             | 6.45                                                       | 7.14   | 10                               | 10.5                                                          | 95.2                                           | 900                                                          | x                                                                                                   |
| 1KSMB7.5A         | 1KSMB7.5CA       | A10B    | N10B | 6.40                                             | 7.13                                                       | 7.88   | 10                               | 11.3                                                          | 88.5                                           | 400                                                          | x                                                                                                   |
| 1KSMB8.2A         | 1KSMB8.2CA       | A10C    | N10C | 7.02                                             | 7.79                                                       | 8.61   | 10                               | 12.1                                                          | 82.6                                           | 180                                                          | x                                                                                                   |
| 1KSMB9.1A         | 1KSMB9.1CA       | A10D    | N10D | 7.78                                             | 8.65                                                       | 9.55   | 1                                | 13.4                                                          | 74.6                                           | 45                                                           | x                                                                                                   |
| 1KSMB10A          | 1KSMB10CA        | A10E    | N10E | 8.55                                             | 9.50                                                       | 10.50  | 1                                | 14.5                                                          | 69.0                                           | 8                                                            | x                                                                                                   |
| 1KSMB11A          | 1KSMB11CA        | A10F    | N10F | 9.40                                             | 10.50                                                      | 11.60  | 1                                | 15.6                                                          | 64.1                                           | 4                                                            | x                                                                                                   |
| 1KSMB12A          | 1KSMB12CA        | A10G    | N10G | 10.20                                            | 11.40                                                      | 12.60  | 1                                | 16.7                                                          | 59.9                                           | 1                                                            | x                                                                                                   |
| 1KSMB13A          | 1KSMB13CA        | A10H    | N10H | 11.10                                            | 12.40                                                      | 13.70  | 1                                | 18.2                                                          | 54.9                                           | 1                                                            | x                                                                                                   |
| 1KSMB15A          | 1KSMB15CA        | A10I    | N10I | 12.80                                            | 14.30                                                      | 15.80  | 1                                | 21.2                                                          | 47.2                                           | 1                                                            | x                                                                                                   |
| 1KSMB16A          | 1KSMB16CA        | A10J    | N10J | 13.60                                            | 15.20                                                      | 16.80  | 1                                | 22.5                                                          | 44.4                                           | 1                                                            | x                                                                                                   |
| 1KSMB18A          | 1KSMB18CA        | A10K    | N10K | 15.30                                            | 17.10                                                      | 18.90  | 1                                | 25.5                                                          | 39.2                                           | 1                                                            | x                                                                                                   |
| 1KSMB20A          | 1KSMB20CA        | A10L    | N10L | 17.10                                            | 19.00                                                      | 21.00  | 1                                | 27.7                                                          | 36.1                                           | 1                                                            | x                                                                                                   |
| 1KSMB22A          | 1KSMB22CA        | A10M    | N10M | 18.80                                            | 20.90                                                      | 23.10  | 1                                | 30.6                                                          | 32.7                                           | 1                                                            | x                                                                                                   |
| 1KSMB24A          | 1KSMB24CA        | A10N    | N10N | 20.50                                            | 22.80                                                      | 25.20  | 1                                | 33.2                                                          | 30.1                                           | 1                                                            | x                                                                                                   |
| 1KSMB27A          | 1KSMB27CA        | A10O    | N10O | 23.10                                            | 25.70                                                      | 28.40  | 1                                | 37.5                                                          | 26.7                                           | 1                                                            | x                                                                                                   |
| 1KSMB30A          | 1KSMB30CA        | A10P    | N10P | 25.60                                            | 28.50                                                      | 31.50  | 1                                | 41.4                                                          | 24.2                                           | 1                                                            | x                                                                                                   |
| 1KSMB33A          | 1KSMB33CA        | A10Q    | N10Q | 28.20                                            | 31.40                                                      | 34.70  | 1                                | 45.7                                                          | 21.9                                           | 1                                                            | x                                                                                                   |
| 1KSMB36A          | 1KSMB36CA        | A10R    | N10R | 30.80                                            | 34.20                                                      | 37.80  | 1                                | 49.9                                                          | 20.0                                           | 1                                                            | x                                                                                                   |
| 1KSMB39A          | 1KSMB39CA        | A10S    | N10S | 33.30                                            | 37.10                                                      | 41.00  | 1                                | 53.9                                                          | 18.6                                           | 1                                                            | x                                                                                                   |
| 1KSMB43A          | 1KSMB43CA        | A10T    | N10T | 36.80                                            | 40.90                                                      | 45.20  | 1                                | 59.3                                                          | 16.9                                           | 1                                                            | x                                                                                                   |
| 1KSMB47A          | 1KSMB47CA        | A10U    | N10U | 40.20                                            | 44.70                                                      | 49.40  | 1                                | 64.8                                                          | 15.4                                           | 1                                                            | x                                                                                                   |
| 1KSMB51A          | 1KSMB51CA        | A10V    | N10V | 43.60                                            | 48.50                                                      | 53.60  | 1                                | 70.1                                                          | 14.3                                           | 1                                                            | x                                                                                                   |
| 1KSMB56A          | 1KSMB56CA        | A10W    | N10W | 47.80                                            | 53.20                                                      | 58.80  | 1                                | 77.0                                                          | 13.0                                           | 1                                                            | x                                                                                                   |
| 1KSMB62A          | 1KSMB62CA        | A10X    | N10X | 53.00                                            | 58.90                                                      | 65.10  | 1                                | 85.0                                                          | 11.8                                           | 1                                                            | x                                                                                                   |
| 1KSMB68A          | 1KSMB68CA        | A10Y    | N10Y | 58.10                                            | 64.60                                                      | 71.40  | 1                                | 92.0                                                          | 10.9                                           | 1                                                            | x                                                                                                   |
| 1KSMB75A          | 1KSMB75CA        | A10Z    | N10Z | 64.10                                            | 71.30                                                      | 78.80  | 1                                | 103.0                                                         | 9.7                                            | 1                                                            | x                                                                                                   |
| 1KSMB82A          | 1KSMB82CA        | B10A    | O10A | 70.10                                            | 77.90                                                      | 86.10  | 1                                | 113.0                                                         | 8.8                                            | 1                                                            | x                                                                                                   |
| 1KSMB91A          | 1KSMB91CA        | B10B    | O10B | 77.80                                            | 86.50                                                      | 95.50  | 1                                | 125.0                                                         | 8.0                                            | 1                                                            | x                                                                                                   |
| 1KSMB100A         | 1KSMB100CA       | B10C    | O10C | 85.50                                            | 95.00                                                      | 105.00 | 1                                | 137.0                                                         | 7.3                                            | 1                                                            | x                                                                                                   |
| 1KSMB110A         | 1KSMB110CA       | B10D    | O10D | 94.00                                            | 105.00                                                     | 116.00 | 1                                | 152.0                                                         | 6.6                                            | 1                                                            | x                                                                                                   |
| 1KSMB120A         | 1KSMB120CA       | B10E    | O10E | 102.00                                           | 114.00                                                     | 126.00 | 1                                | 165.0                                                         | 6.1                                            | 1                                                            | x                                                                                                   |
| 1KSMB130A         | 1KSMB130CA       | B10F    | O10F | 111.00                                           | 124.00                                                     | 137.00 | 1                                | 179.0                                                         | 5.6                                            | 1                                                            | x                                                                                                   |
| 1KSMB150A         | 1KSMB150CA       | B10G    | O10G | 128.00                                           | 143.00                                                     | 158.00 | 1                                | 207.0                                                         | 4.8                                            | 1                                                            | x                                                                                                   |
| 1KSMB160A         | 1KSMB160CA       | B10H    | O10H | 136.00                                           | 152.00                                                     | 168.00 | 1                                | 219.0                                                         | 4.6                                            | 1                                                            | x                                                                                                   |
| 1KSMB170A         | 1KSMB170CA       | B10I    | O10I | 144.50                                           | 162.00                                                     | 179.00 | 1                                | 234.0                                                         | 4.3                                            | 1                                                            | x                                                                                                   |
| 1KSMB180A         | 1KSMB180CA       | B10J    | O10J | 153.00                                           | 171.00                                                     | 189.00 | 1                                | 246.0                                                         | 4.1                                            | 1                                                            | x                                                                                                   |

For bidirectional type having V<sub>R</sub> of 10 volts and less, the I<sub>R</sub> limit is double.

For parts without A V<sub>BR</sub> is ± 10% and V<sub>C</sub> is 5% higher than with A parts, the parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

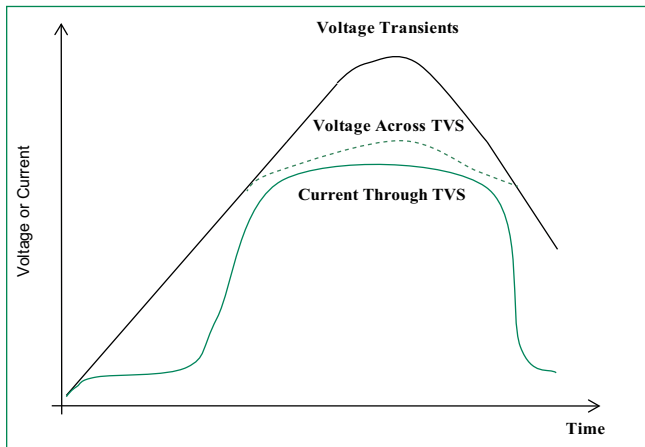
## I-V Curve Characteristics



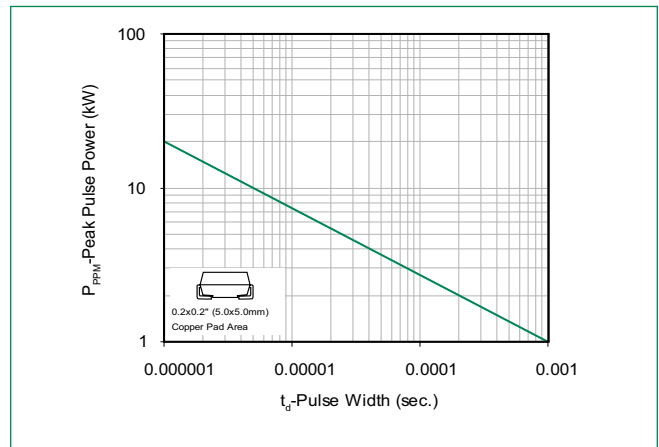
- $P_{PPM}$  Peak Pulse Power Dissipation** – Max power dissipation  
 **$V_R$  Stand-off Voltage** – Maximum voltage that can be applied to the TVS without operation  
 **$V_{BR}$  Breakdown Voltage** – Maximum voltage that flows through the TVS at a specified test current ( $I_T$ )  
 **$V_C$  Clamping 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 ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

**Figure 1 - TVS Transients Clamping Waveform**

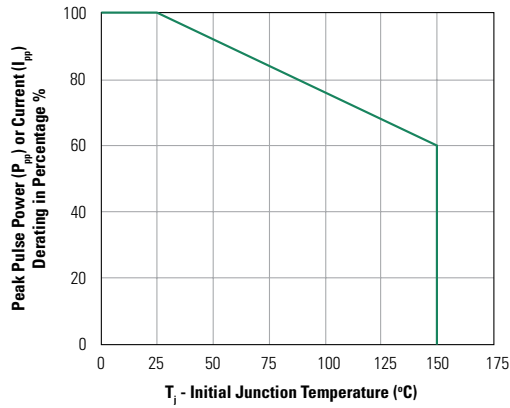


**Figure 2 - Peak Pulse Power Rating Curve**

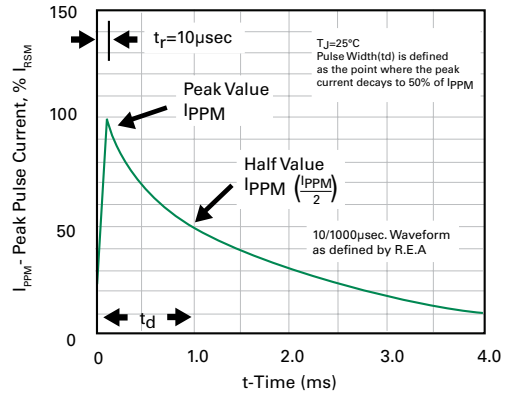


**Ratings and Characteristic Curves** ( $T_A=25^\circ\text{C}$  unless otherwise noted) (Continued)

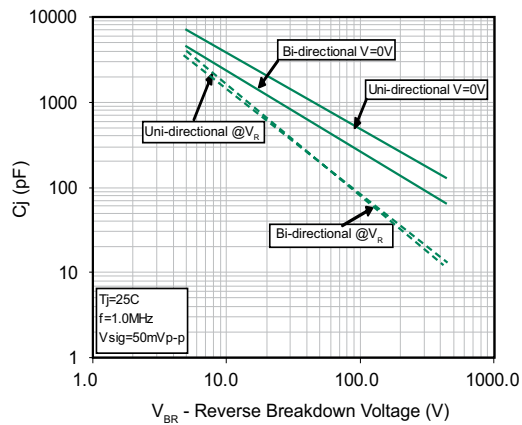
**Figure 3 - Peak Pulse Power Derating Curve**



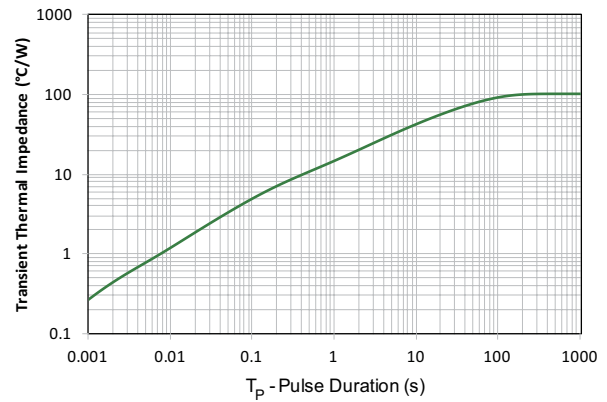
**Figure 4 - Pulse Waveform**



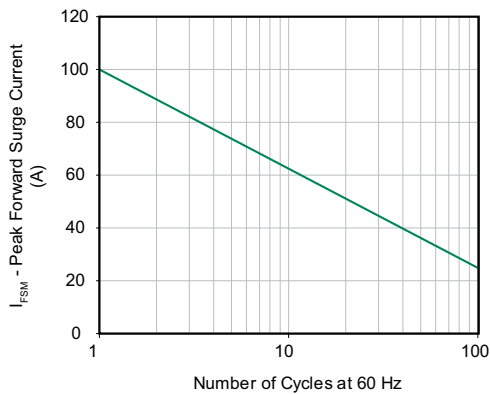
**Figure 5 - Typical Junction Capacitance**



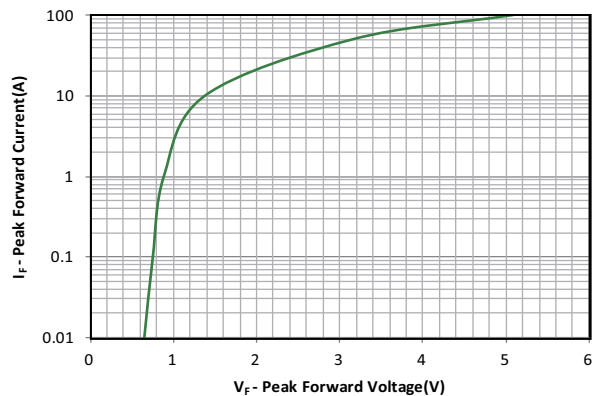
**Figure 6 - Typical Transient Thermal Impedance**



**Figure 7 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only**

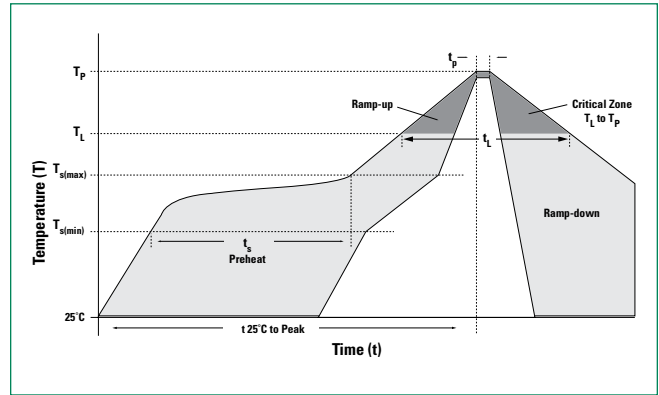


**Figure 8 - Peak Forward Voltage Drop vs Peak Forward Current (Typical Values)**



## 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 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                   |



## Physical Specifications

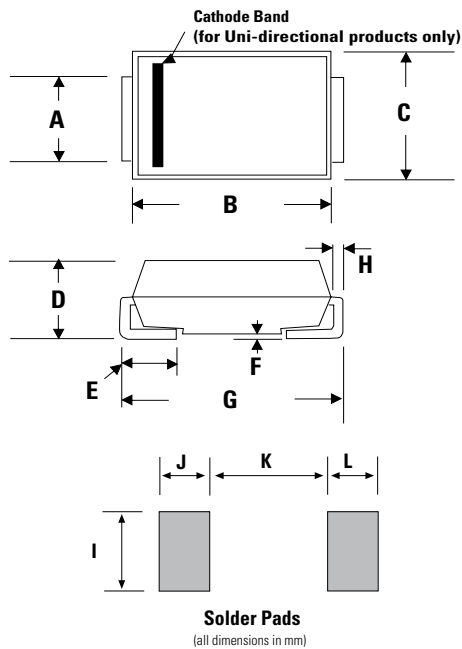
|          |                                                                   |
|----------|-------------------------------------------------------------------|
| Weight   | 0.003 ounce, 0.093 grams                                          |
| Case     | JEDEC DO214AA. Molded plastic body over glass passivated junction |
| Polarity | Color band denotes cathode except Bidirectional.                  |
| Terminal | Matte Tin-plated leads, Solderable per JESD22-B102                |

## Environmental Specifications

|                     |                          |
|---------------------|--------------------------|
| High Temp. Storage  | JESD22-A103              |
| HTRB                | JESD22-A108              |
| Temperature Cycling | JESD22-A104              |
| MSL                 | JEDEC-J-STD-020, Level 1 |
| H3TRB               | JESD22-A101              |
| RSH                 | JESD22-A111              |

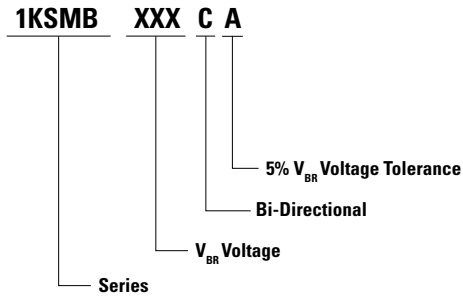
## Dimensions

### DO-214AA (SMB J-Bend)

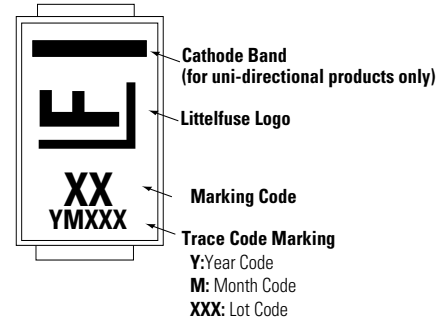


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.077  | 0.086 | 1.950       | 2.200 |
| B          | 0.160  | 0.180 | 4.060       | 4.570 |
| C          | 0.130  | 0.155 | 3.300       | 3.940 |
| D          | 0.084  | 0.096 | 2.130       | 2.440 |
| E          | 0.030  | 0.060 | 0.760       | 1.520 |
| F          | -      | 0.008 | -           | 0.203 |
| G          | 0.205  | 0.220 | 5.210       | 5.590 |
| H          | 0.006  | 0.012 | 0.152       | 0.305 |
| I          | 0.089  | -     | 2.260       | -     |
| J          | 0.085  | -     | 2.160       | -     |
| K          | -      | 0.107 | -           | 2.740 |
| L          | 0.085  | -     | 2.160       | -     |

### Part Numbering System



### Part Marking System



### Packaging

| Part number | Component Package | Quantity | Packaging Option                 | Packaging Specification |
|-------------|-------------------|----------|----------------------------------|-------------------------|
| 1KSMBxxxXX  | DO-214AA          | 3000     | Tape & Reel - 12mm tape/13" reel | EIA STD RS-481          |

### Tape and Reel Specification

