

## 3000 WATT TVS COMPONENT



**DO-214AB PACKAGE**

### APPLICATIONS

- Automotive

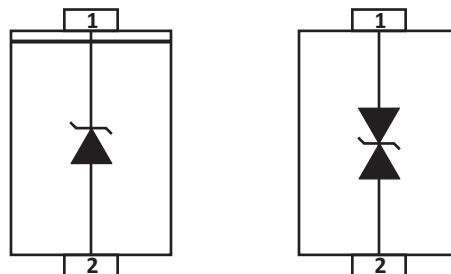
### FEATURES

- *AEC-Q101 Qualified*
- UL Registered
- IEC Compatibility 61000-4-2 (ESD)
- IEC Compatibility 61000-4-4 (EFT)
- IEC Compatibility 61000-4-5 (Surge)
- Glass Passivated Chip
- 3000 Watts Peak Pulse Power per Line ( $t_p = 10/1000\mu s$ )
- Low Leakage Current
- Unidirectional and Bidirectional Configurations
- Excellent Clamping Capability
- Very Fast Response Time
- Available in Multiple Voltages
- RoHS Compliant

### MECHANICAL CHARACTERISTICS

- Molded JEDEC DO-214AB Package
- Approximate Weight: 0.262 grams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- 16mm Tape and Reel Per EIA Standard 481
- Terminal: Solderable per MIL-STD-750, Method 2026
- Flammability Rating UL 94V-0

### PIN CONFIGURATIONS



## TYPICAL DEVICE CHARACTERISTICS

## MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER   | SYMBOL    | VALUE      | UNITS |
|---|-----------|------------|-------|
| Operating Temperature   | $T_A$     | -55 to 150 | °C    |
| Storage Temperature   | $T_{STG}$ | -55 to 150 | °C    |
| Peak Pulse Power (tp = 10/1000µs) - See Figure 1 and Note 2                           | $P_{PP}$  | 3000       | Watts |
| Power Dissipation on Infinite Heatsink at $T_L = 75^\circ\text{C}$                    | $P_D$     | 6.0        | Watts |
| Peak Forward Surge Current, 8.3ms single half sinewave - Unidirectional Only (Note 2) | $I_{FSM}$ | 300        | Amps  |
| Maximum Instantaneous Forward Voltage at 100A - Unidirectional Only                   | $V_F$     | 5.0        | V     |

## NOTE

1. Non-repetitive current pulse per Figure 2 and derated above  $T_A = 25^\circ\text{C}$  per Figure 2.
2. Measured on 8.3ms single half sinewave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

## ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| PART NUMBER<br>(Notes 1-2) | DEVICE MARKING |     | REVERSE STAND-OFF VOLTAGE<br><br>$V_{RWM}$<br>VOLTS | BREAKDOWN VOLTAGE<br><br>$V_{(BR)} @ I_T$<br>VOLTS |       | TEST CURRENT<br><br>$@ I_T$<br>mA | MAXIMUM CLAMPING VOLTAGE<br>(Fig. 2)<br><br>$@ I_P$<br>$V_C$<br>VOLTS | MAXIMUM REVERSE SURGE CURRENT<br><br>$@ I_{PP}$<br>AMPS | MAXIMUM REVERSE LEAKAGE CURRENT<br><br>$@ V_{RWM}$<br>$I_R$<br>µA |
|----------------------------|----------------|-----|---|--|-------|-----------------------------------|---|---|---|
|                            | UNI            | BI  |   | MIN  | MAX   |                                   |   |   |   |
| PAM32DOAB5.0A              | RDE            | DDE | 5.0   | 6.40   | 7.00  | 50                                | 9.2   | 326   | 5000  |
| PAM32DOAB6.0A              | RDG            | DDG | 6.0   | 6.67   | 7.37  | 50                                | 10.3  | 291   | 5000  |
| PAM32DOAB6.5A              | RDK            | DDK | 6.5   | 7.22   | 7.98  | 50                                | 11.2  | 268   | 2000  |
| PAM32DOAB7.0A              | PDM            | DDM | 7.0   | 7.78   | 8.60  | 50                                | 12.0  | 250   | 1000  |
| PAM32DOAB7.5A              | PDP            | DDP | 7.5   | 8.33   | 9.21  | 5                                 | 12.9  | 233   | 250   |
| PAM32DOAB8.0A              | PDR            | DDR | 8.0   | 8.89   | 9.83  | 5                                 | 13.6  | 221   | 150   |
| PAM32DOAB8.5A              | PDT            | DDT | 8.5   | 9.44   | 10.40 | 5                                 | 14.4  | 208   | 50  |
| PAM32DOAB9.0A              | PDV            | DDV | 9.0   | 10.00  | 11.10 | 5                                 | 15.4  | 195   | 20  |
| PAM32DOAB10A               | PDX            | DDX | 10.0  | 11.10  | 12.30 | 5                                 | 17.0  | 176   | 15  |
| PAM32DOAB11A               | PDZ            | DDZ | 11.0  | 12.20  | 13.50 | 5                                 | 18.2  | 165   | 2   |
| PAM32DOAB12A               | PEE            | DEE | 12.0  | 13.30  | 14.70 | 5                                 | 19.9  | 151   | 2   |
| PAM32DOAB13A               | PEG            | DEG | 13.0  | 14.40  | 15.90 | 5                                 | 21.5  | 140   | 2   |
| PAM32DOAB14A               | PEK            | DEK | 14.0  | 15.60  | 17.20 | 5                                 | 23.2  | 129   | 2   |
| PAM32DOAB15A               | PEM            | DEM | 15.0  | 16.70  | 18.50 | 5                                 | 24.4  | 123   | 2   |
| PAM32DOAB16A               | PEP            | DEP | 16.0  | 17.80  | 19.70 | 5                                 | 26.0  | 115   | 2   |
| PAM32DOAB17A               | PER            | DER | 17.0  | 18.90  | 20.90 | 5                                 | 27.6  | 109   | 2   |
| PAM32DOAB18A               | PET            | DET | 18.0  | 20.00  | 22.10 | 5                                 | 29.2  | 103   | 2   |
| PAM32DOAB20A               | PEV            | DEV | 20.0  | 22.20  | 24.50 | 5                                 | 32.4  | 92.6  | 2   |
| PAM32DOAB22A               | PEX            | DEX | 22.0  | 24.40  | 26.90 | 5                                 | 35.5  | 84.5  | 2   |
| PAM32DOAB24A               | PEZ            | DEZ | 24.0  | 26.70  | 29.50 | 5                                 | 38.9  | 77.1  | 2   |
| PAM32DOAB26A               | PFE            | DFE | 26.0  | 28.90  | 31.90 | 5                                 | 42.1  | 71.3  | 2   |
| PAM32DOAB28A               | PFG            | DFG | 28.0  | 31.10  | 34.40 | 5                                 | 45.4  | 66.1  | 2   |

## TYPICAL DEVICE CHARACTERISTICS

## ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

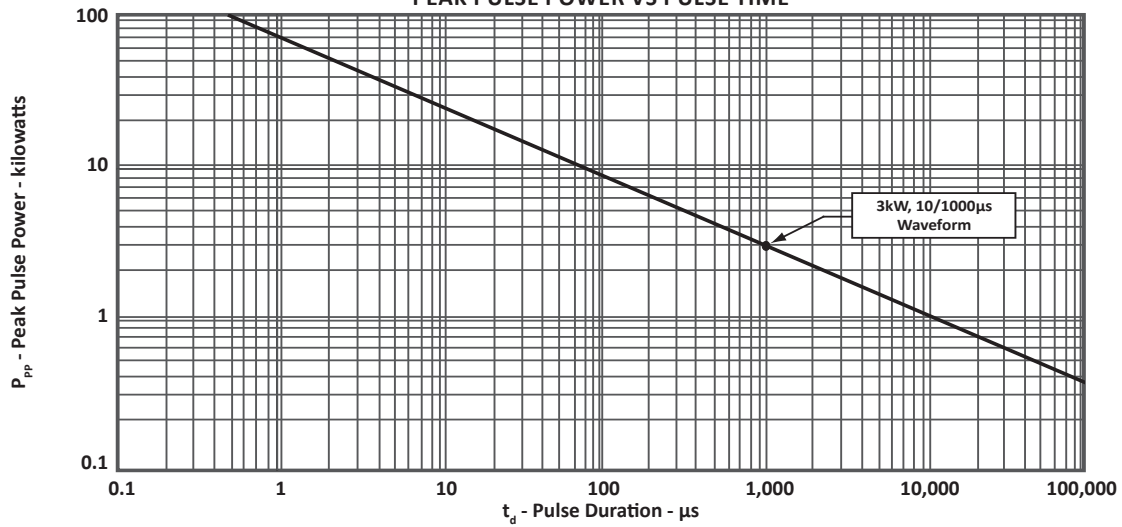
| PART NUMBER<br>(Note 1-2) | DEVICE MARKING |     | REVERSE STAND-OFF VOLTAGE<br><br>$V_{RWM}$<br>VOLTS | BREAKDOWN VOLTAGE<br><br>$V_{(BR)} @ I_T$<br>VOLTS |        | TEST CURRENT<br><br>@ $I_T$<br>mA | MAXIMUM CLAMPING VOLTAGE<br>(Fig. 2)<br><br>@ $I_P$<br>$V_C$<br>VOLTS | MAXIMUM REVERSE SURGE CURRENT<br><br>@ $I_{PP}$<br>AMPS | MAXIMUM REVERSE LEAKAGE CURRENT<br><br>@ $V_{RWM}$<br>$I_R$<br>$\mu A$ |
|---------------------------|----------------|-----|---|--|--------|-----------------------------------|---|---|--|
|                           | UNI            | BI  |   | MIN  | MAX    |                                   |   |   |  |
|                           | PAM32DOAB30A   | PFK | DFK   | 30.0   | 33.30  | 36.80                             | 5   | 48.4  | 62.0   |
| PAM32DOAB33A              | PFM            | DFM | 33.0  | 36.70  | 40.60  | 5                                 | 53.3  | 56.3  | 2  |
| PAM32DOAB36A              | PFP            | DFP | 36.0  | 40.00  | 44.20  | 5                                 | 58.1  | 51.6  | 2  |
| PAM32DOAB40A              | PFR            | DFR | 40.0  | 44.40  | 49.10  | 5                                 | 64.5  | 46.5  | 2  |
| PAM32DOAB43A              | PFT            | DFT | 43.0  | 47.80  | 52.80  | 5                                 | 69.4  | 43.2  | 2  |
| PAM32DOAB45A              | PFV            | DFV | 45.0  | 50.0   | 55.30  | 5                                 | 72.7  | 41.3  | 2  |
| PAM32DOAB48A              | PFX            | DFX | 48.0  | 53.30  | 58.90  | 5                                 | 77.4  | 38.8  | 2  |
| PAM32DOAB51A              | PFZ            | DFZ | 51.0  | 56.70  | 62.70  | 5                                 | 82.4  | 36.4  | 2  |
| PAM32DOAB54A              | RGE            | DGE | 54.0  | 60.00  | 66.30  | 5                                 | 87.1  | 34.4  | 2  |
| PAM32DOAB58A              | RGG            | DGG | 58.0  | 64.40  | 71.20  | 5                                 | 93.6  | 32.1  | 2  |
| PAM32DOAB60A              | PGK            | DGK | 60.0  | 66.70  | 73.70  | 5                                 | 96.8  | 31.0  | 2  |
| PAM32DOAB64A              | PGM            | DGM | 64.0  | 71.10  | 78.60  | 5                                 | 103.0   | 29.1  | 2  |
| PAM32DOAB70A              | PGP            | DGP | 70.0  | 77.80  | 86.00  | 5                                 | 113.0   | 26.6  | 2  |
| PAM32DOAB75A              | PGR            | DGR | 75.0  | 83.30  | 92.10  | 5                                 | 121.0   | 24.8  | 2  |
| PAM32DOAB78A              | PGT            | DGT | 78.0  | 86.70  | 95.80  | 5                                 | 126.0   | 23.8  | 2  |
| PAM32DOAB85A              | PGV            | DGV | 85.0  | 94.40  | 104.00 | 5                                 | 137.0   | 21.9  | 2  |
| PAM32DOAB90A              | PGX            | DGX | 90.0  | 100.00   | 111.00 | 5                                 | 146.0   | 20.6  | 2  |
| PAM32DOAB100A             | PGZ            | DGZ | 100.0   | 111.00   | 123.00 | 5                                 | 162.0   | 18.5  | 2  |
| PAM32DOAB110A             | PHE            | DHE | 110.0   | 122.00   | 135.00 | 5                                 | 177.0   | 17.0  | 2  |
| PAM32DOAB120A             | PHG            | DHG | 120.0   | 133.00   | 147.00 | 5                                 | 193.0   | 15.5  | 2  |
| PAM32DOAB130A             | PHK            | DHK | 130.0   | 144.00   | 159.00 | 5                                 | 209.0   | 14.4  | 2  |
| PAM32DOAB150A             | PHM            | DHM | 150.0   | 167.00   | 185.00 | 5                                 | 243.0   | 12.4  | 2  |
| PAM32DOAB160A             | PHP            | DHP | 160.0   | 178.00   | 197.00 | 5                                 | 259.0   | 11.6  | 2  |
| PAM32DOAB170A             | PHR            | DHR | 170.0   | 189.00   | 209.00 | 5                                 | 275.0   | 10.9  | 2  |
| PAM32DOAB180A             | PHT            | DHT | 180.0   | 200.00   | 220.00 | 5                                 | 291.6   | 10.3  | 2  |
| PAM32DOAB190A             | PHV            | DHV | 190.0   | 211.00   | 232.00 | 5                                 | 307.8   | 9.8   | 2  |
| PAM32DOAB200A             | PHW            | DHW | 200.0   | 224.00   | 247.00 | 5                                 | 324.0   | 9.3   | 2  |
| PAM32DOAB220A             | PHX            | DHX | 220.0   | 246.00   | 272.00 | 5                                 | 356.0   | 8.4   | 2  |

## NOTE

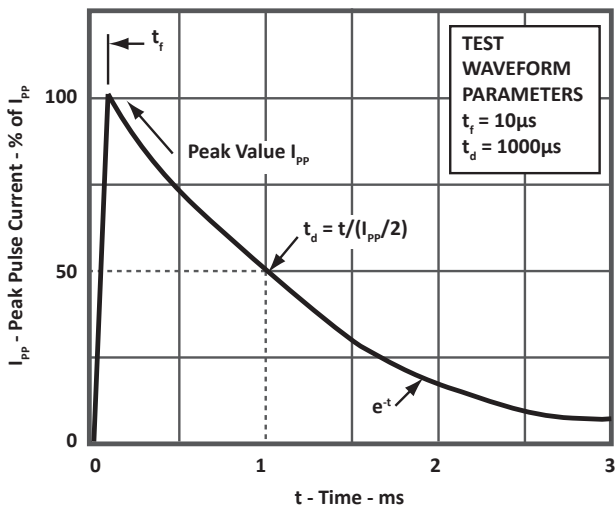
- 5% tolerance.
- Add suffix 'CA' after part number to specify a bidirectional device, i.e., PAM32DOAB22CA.

**TYPICAL DEVICE CHARACTERISTICS**

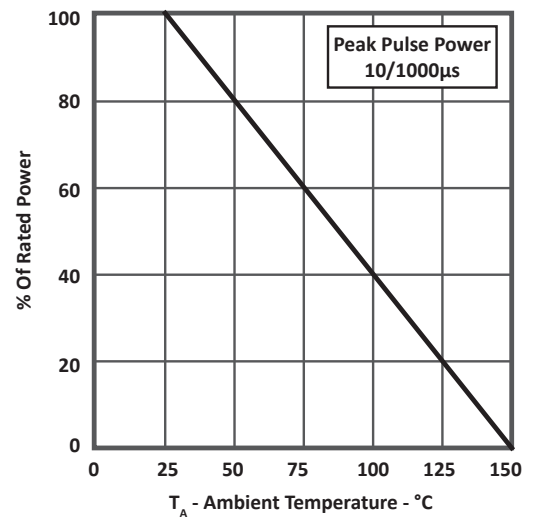
**FIGURE 1  
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2  
PULSE WAVEFORM**

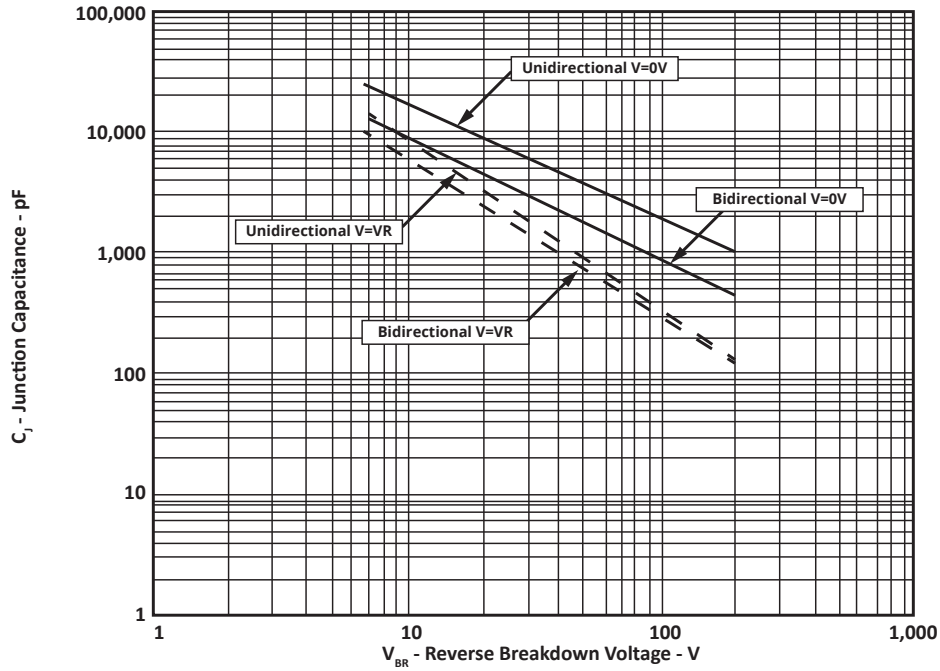


**FIGURE 3  
POWER DERATING CURVE**

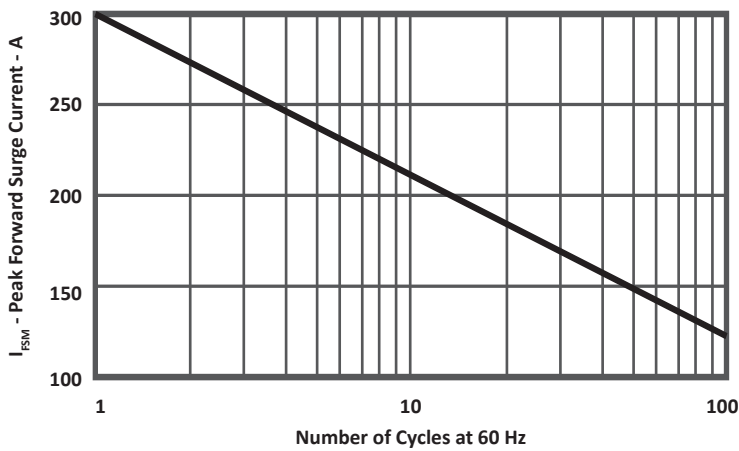


**TYPICAL DEVICE CHARACTERISTICS**

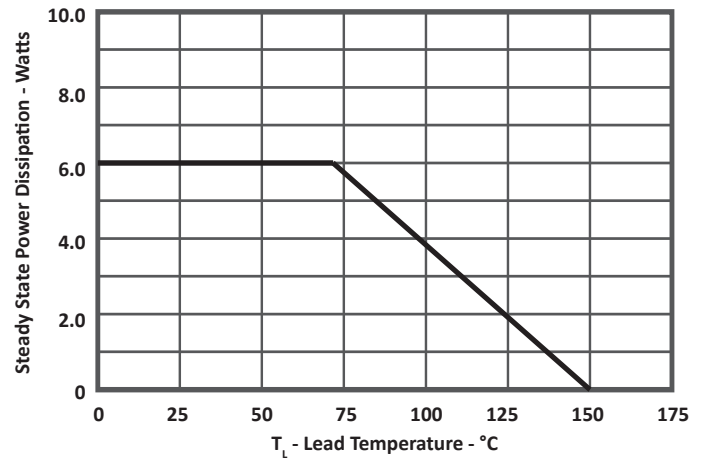
**FIGURE 4**  
**TYPICAL JUNCTION CAPACITANCE**



**FIGURE 5**  
**MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT**



**FIGURE 6**  
**STEADY STATE POWER DERATING CURVE**



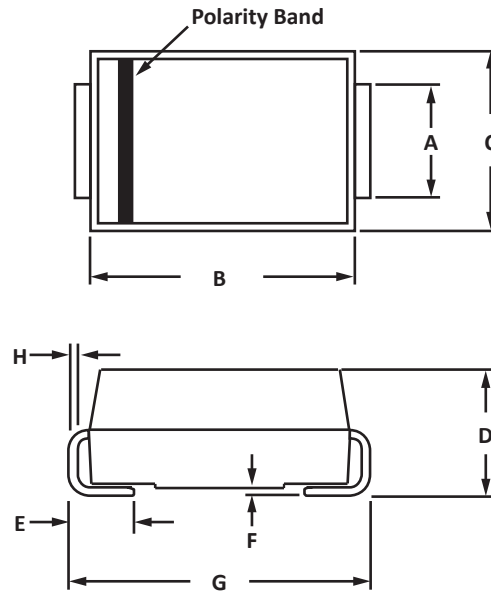
## PACKAGE INFORMATION

## OUTLINE DIMENSIONS

| DIM | MILLIMETERS |       | INCHES |       |
|-----|-------------|-------|--------|-------|
|     | MIN         | MAX   | MIN    | MAX   |
| A   | 2.75        | 3.25  | 0.108  | 0.128 |
| B   | 6.90        | 7.40  | 0.272  | 0.291 |
| C   | 5.75        | 6.25  | 0.226  | 0.246 |
| D   | 2.15        | 2.62  | 0.085  | 0.103 |
| E   | 0.95        | 1.52  | 0.037  | 0.060 |
| F   | 0.051       | 0.203 | 0.002  | 0.008 |
| G   | 7.70        | 8.20  | 0.303  | 0.323 |
| H   | 0.15        | 0.31  | 0.006  | 0.012 |

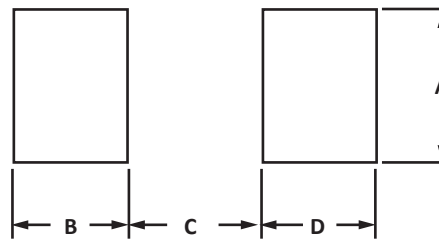
## NOTES

1. Dimensions are exclusive of mold flash and metal burrs.

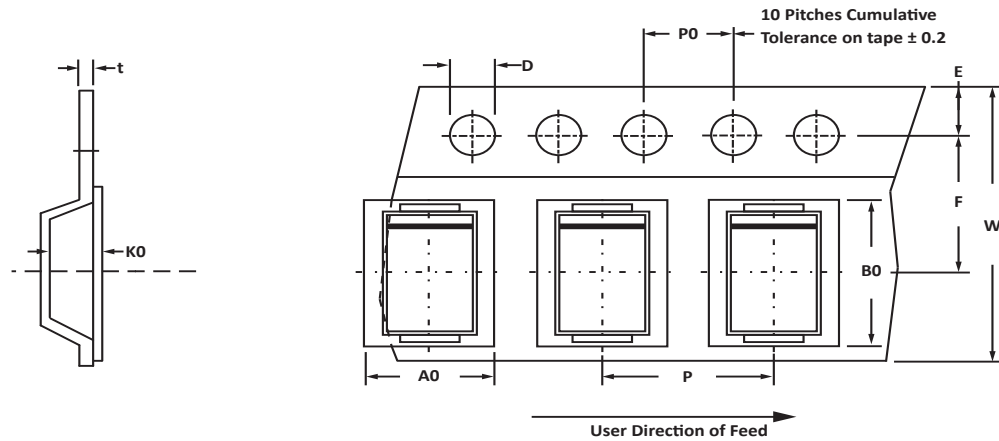


## PAD LAYOUT DIMENSIONS

| DIM | MILLIMETERS |      | INCHES |       |
|-----|-------------|------|--------|-------|
|     | MIN         | MAX  | MIN    | MAX   |
| A   | 3.30        | -    | 0.130  | -     |
| B   | 2.40        | -    | 0.094  | -     |
| C   | -           | 4.20 | -      | 0.165 |
| D   | 2.40        | -    | 0.094  | -     |



## TAPE AND REEL



## SPECIFICATIONS

| REEL DIA.   | TAPE WIDTH | A0          | B0          | K0          | D          | E           | F          | W            | P0          | P           | tmax |
|-------------|------------|-------------|-------------|-------------|------------|-------------|------------|--------------|-------------|-------------|------|
| 330mm (13") | 16mm       | 6.05 ± 0.30 | 8.31 ± 0.30 | 2.54 ± 0.10 | 1.55 ± 0.1 | 1.75 ± 0.20 | 7.5 ± 0.20 | 16.00 ± 0.20 | 4.00 ± 0.20 | 8.00 ± 0.20 | 0.4  |

## NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Marking on Part - marking code (see page 2), date code, logo and cathode defined by polarity band.

## ORDERING INFORMATION

| BASE PART NUMBER<br>(Voltage = xx) | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------------------------|-----------------|-------------|----------|-----------|----------|
| PAM32DOABxxA                       | N/A             | -T13        | 3,000    | 13"       | N/A      |
| PAM32DOABxxA                       | N/A             | -T500       | 500      | 7"        | N/A      |
| PAM32DOABxxCA                      | N/A             | -T13        | 3,000    | 13"       | N/A      |
| PAM32DOABxxCA                      | N/A             | T500        | 500      | 7"        | N/A      |

This device is only available in a Lead-Free configuration.

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 30 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection that include Transient Voltage Suppressor (TVS) Arrays, Steering Diode Array Hybrids, High-power Components and Modules, as well as Steering Diodes, EMI Filter/TVS Arrays and Thyristor Surge Suppressors. These components deliver circuit protection in electronic systems from numerous overvoltage events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices is an ISO 9001 certified company.

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