High power cycling capability
Low on-state and switching losses
Optimized for line frequency rectifiers
Designed for traction and industrial applications

# Power Rectifier
# Avalanche Diode
# Type DA123-320-18

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Average forward current | | | | $I_{FAV}$ | 320 A | | | |
| Repetitive peak reverse voltage | | | | $V_{RRM}$ | 1000 ÷ 1800 V | | | |
| $V_{RRM}$, V | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1800 |
| Voltage code | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 18 |
| $T_j$, °C | – 60 ÷ 150 | | | | | | | |

## MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | Units | Values | Test conditions | |
|---|---|---|---|---|---|
| **ON-STATE** | | | | | |
| $I_{FAV}$ | Average forward current | A | 320<br>370 | $T_c$=110 °C; Double side cooled;<br>$T_c$=100 °C; Double side cooled;<br>180° half-sine wave; 50 Hz | |
| $I_{FRMS}$ | RMS forward current | A | 503 | $T_c$=110 °C; Double side cooled;<br>180° half-sine wave; 50 Hz | |
| $I_{FSM}$ | Surge forward current | kA | 5.5<br>6.3 | $T_j$=$T_{j\,max}$<br>$T_j$=25 °C | 180° half-sine wave;<br>$t_p$=10 ms; single pulse;<br>$V_R$=0 V |
| | | | 6.0<br>6.9 | $T_j$=$T_{j\,max}$<br>$T_j$=25 °C | 180° half-sine wave;<br>$t_p$=8.3 ms; single pulse;<br>$V_R$=0 V |
| $I^2t$ | Safety factor | $A^2s\cdot10^3$ | 150<br>195 | $T_j$=$T_{j\,max}$<br>$T_j$=25 °C | 180° half-sine wave;<br>$t_p$=10 ms; single pulse;<br>$V_R$=0 V |
| | | | 145<br>195 | $T_j$=$T_{j\,max}$<br>$T_j$=25 °C | 180° half-sine wave;<br>$t_p$=8.3 ms; single pulse;<br>$V_R$=0 V |
| **BLOCKING** | | | | | |
| $V_{RRM}$ | Repetitive peak reverse voltage | V | 1000÷1800 | $T_{j\,min}$< $T_j$ <$T_{j\,max}$;<br>180° half-sine wave; 50 Hz | |
| $V_{(BR)}$ | Breakdown voltage | V | 1250÷2250 | $T_j$=25 °C; $I_{br}$=100 mA; $t_p$ = 10 ms; 5 Hz | |
| $V_R$ | Reverse continuous voltage | V | 0.75·$V_{RRM}$ | $T_j$=$T_{j\,max}$ | |
| $P_{RSM}$ | Surge reverse power dissipation | kW | 16 | $T_j$= $T_{j\,max}$; $t_p$ = 100 µs; 180° half-sine current waveforms; single pulse | |
| **THERMAL** | | | | | |
| $T_{stg}$ | Storage temperature | °C | – 60 ÷ 50 | | |
| $T_j$ | Operating junction temperature | °C | – 60 ÷ 150 | | |
| **MECHANICAL** | | | | | |
| F | Mounting force | kN | 5.0 ÷ 7.0 | | |
| a | Acceleration | $m/s^2$ | 50<br>100 | Device unclamped<br>Device clamped | |

## CHARACTERISTICS

| Symbols and parameters | | Units | Values | Conditions | |
|---|---|---|---|---|---|
| **ON-STATE** | | | | | |
| $V_{FM}$ | Peak forward voltage, max | V | 1.60 | $T_j$=25 °C; $I_{FM}$=1005 A | |
| $V_{F(TO)}$ | Forward threshold voltage, max | V | 0.95 | $T_j=T_{j\,max}$; $0.5\ \pi\ I_{FAV} < I_T < 1.5\ \pi\ I_{FAV}$ | |
| $r_T$ | Forward slope resistance, max | mΩ | 1.050 | | |
| **BLOCKING** | | | | | |
| $I_{RRM}$ | Repetitive peak reverse current, max | mA | 35 | $T_j=T_{j\,max}$; $V_R=V_{RRM}$ | |
| **THERMAL** | | | | | |
| $R_{thjc}$ | Thermal resistance, junction to case, max | °C/W | 0.0700 | Direct current | Double side cooled |
| $R_{thjc-A}$ | | | 0.1540 | | Anode side cooled |
| $R_{thjc-K}$ | | | 0.1260 | | Cathode side cooled |
| $R_{thck}$ | Thermal resistance, case to heatsink, max | °C/W | 0.0100 | Direct current | |
| **MECHANICAL** | | | | | |
| w | Weight, typ | g | 65 | | |
| $D_s$ | Surface creepage distance | mm (inch) | 11.74 (0.462) | | |
| $D_a$ | Air strike distance | mm (inch) | 11.60 (0.457) | | |

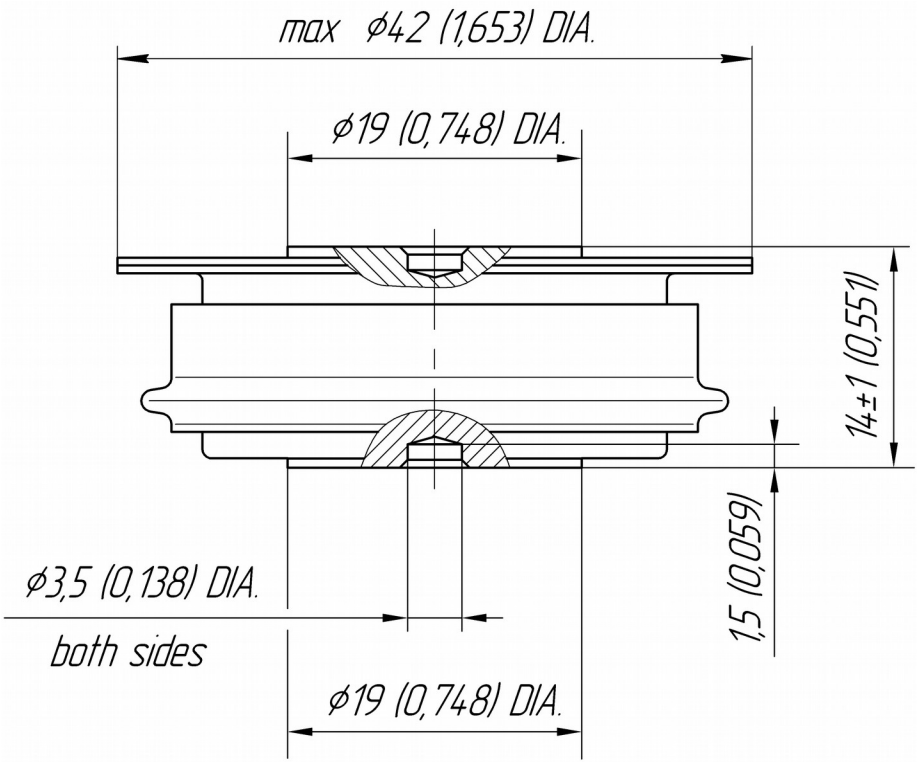
## PART NUMBERING GUIDE

| DA | 123 | 320 | 18 | N |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

1. DA — Avalanche Diode
2. Design version
3. Average forward current, A
4. Voltage code
5. Ambient conditions: N – normal; T – tropical

## OVERALL DIMENSIONS

**Package type: D.A1**




All dimensions in millimeters (inches)

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