



PROTON-ELECTROTEX RUSSIA

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

Rectifier Diode Type D233-1000-18

| | | | | | |
|---------------------------------|-----------|-----------|---------------|------|------|
| Average forward current | | I_{FAV} | 1000 A | | |
| Repetitive peak reverse voltage | | V_{RRM} | 1000 ÷ 1800 V | | |
| V_{RRM}, V | 1000 | 1200 | 1400 | 1600 | 1800 |
| Voltage code | 10 | 12 | 14 | 16 | 18 |
| $T_{jv}, ^\circ C$ | -60 ÷ 190 | | | | |

MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | Units | Values | Test conditions |
|------------------------|--------------------------------------|-------------------|----------------------|--|
| ON-STATE | | | | |
| I_{FAV} | Average forward current | A | 1000 1155 | $T_c=117^\circ C$; Double side cooled; $T_c=100^\circ C$; Double side cooled; 180° half-sine wave; 50 Hz |
| I_{FRMS} | RMS forward current | A | 1570 | $T_c=117^\circ C$; Double side cooled; 180° half-sine wave; 50 Hz |
| I_{FSM} | Surge forward current | kA | 16.0 18.0 | $T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_R=0$ V; |
| | | | 17.0 20.0 | $T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; 60 Hz ($t_p=8.3$ ms); single pulse; $V_R=0$ V; |
| I^2t | Safety factor | $A^2s \cdot 10^3$ | 1280 1620 | $T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_R=0$ V; |
| | | | 1195 1660 | $T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; 60 Hz ($t_p=8.3$ ms); single pulse; $V_R=0$ V; |
| BLOCKING | | | | |
| V_{RRM} | Repetitive peak reverse voltages | V | 1000 ÷ 1800 | $T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; |
| V_{RSM} | Non-repetitive peak reverse voltages | V | 1100 ÷ 1900 | $T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz; single pulse; |
| V_R | Reverse continuous voltages | V | $0.75 \cdot V_{RRM}$ | $T_j = T_{jmax}$; |
| THERMAL | | | | |
| T_{stg} | Storage temperature | $^\circ C$ | -60 ÷ 190 | |
| T_j | Operating junction temperature | $^\circ C$ | -60 ÷ 190 | |
| MECHANICAL | | | | |
| F | Mounting force | kN | 9.0 ÷ 11.0 | |
| a | Acceleration | m/s^2 | 50 | Device unclamped |
| | | | 100 | Device clamped |

JSC "PROTON-ELECTROTEX"

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CHARACTERISTICS

| Symbols and parameters | | Units | Values | Conditions | |
|------------------------|---|--------------------|------------------|--|---------------------|
| ON-STATE | | | | | |
| V_{FM} | Peak forward voltage, max | V | 1.55 | $T_j=25\text{ }^\circ\text{C}; I_{FM}=3140\text{ A}$ | |
| $V_{F(TO)}$ | Forward threshold voltage, max | V | 0.95 | $T_j=T_{j\text{ max}}$ | |
| r_T | Forward slope resistance, max | m Ω | 0.350 | $0.5\pi I_{FAV} < I_T < 1.5\pi I_{FAV}$ | |
| BLOCKING | | | | | |
| I_{RRM} | Repetitive peak reverse current, max | mA | 50 | $T_j=T_{j\text{ max}};$ $V_R=V_{RRM}$ | |
| THERMAL | | | | | |
| R_{thjc} | Thermal resistance, junction to case, max | $^\circ\text{C/W}$ | 0.040 | Direct current | Double side cooled |
| R_{thjc-A} | | | 0.088 | | Anode side cooled |
| R_{thjc-K} | | | 0.072 | | Cathode side cooled |
| R_{thck} | Thermal resistance, case to heatsink, max | $^\circ\text{C/W}$ | 0.008 | Direct current | |
| MECHANICAL | | | | | |
| w | Weight, typ | g | 180 | | |
| D_s | Surface creepage distance | mm (inch) | 23.69 (0.933) | | |
| D_a | Air strike distance | mm (inch) | 19.10 (0.752) | | |

PART NUMBERING GUIDE

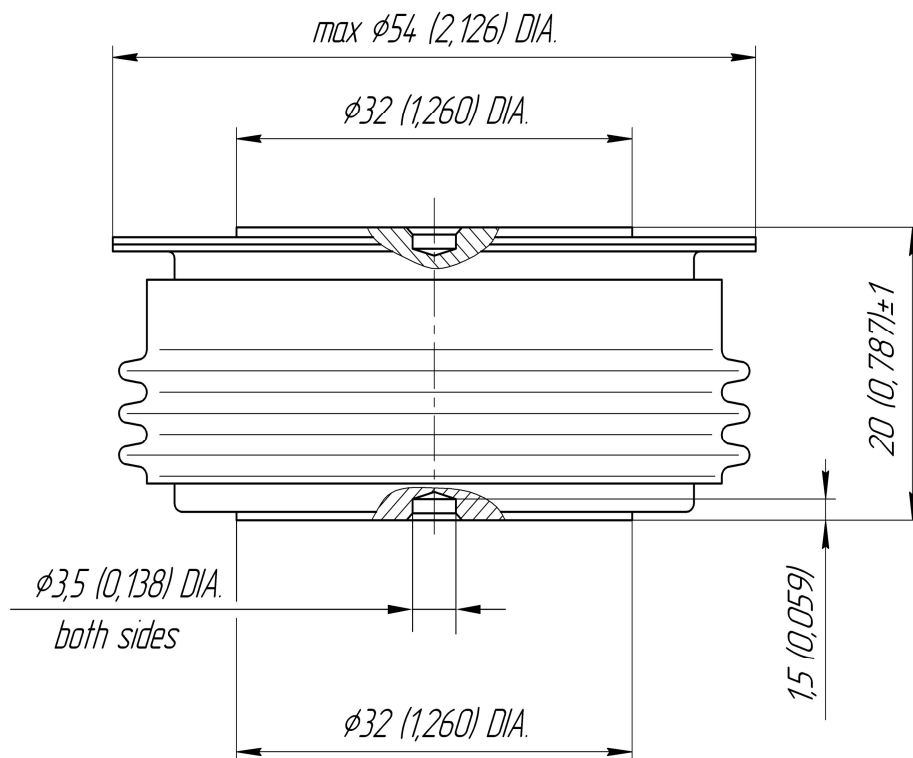
| | | | | |
|---|-----|------|----|---|
| D | 233 | 1000 | 18 | N |
| 1 | 2 | 3 | 4 | 5 |

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

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All dimensions in millimeters (inches)

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