



# 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 Chip Type DR24-200-60

|                                                         |            |      |      |           |               |      |      |      |
|---------------------------------------------------------|------------|------|------|-----------|---------------|------|------|------|
| Maximum allowable average forward current <sup>1)</sup> |            |      |      | $I_{FAV}$ | 200 A         |      |      |      |
| Repetitive peak reverse voltage                         |            |      |      | $V_{RRM}$ | 4600...6000 V |      |      |      |
| $V_{RRM}$ , V                                           | 4600       | 4800 | 5000 | 5200      | 5400          | 5600 | 5800 | 6000 |
| Voltage code                                            | 46         | 48   | 50   | 52        | 54            | 56   | 58   | 60   |
| $T_j$ , °C                                              | -60...+150 |      |      |           |               |      |      |      |

### MAXIMUM ALLOWABLE RATINGS

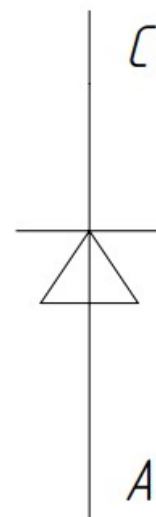
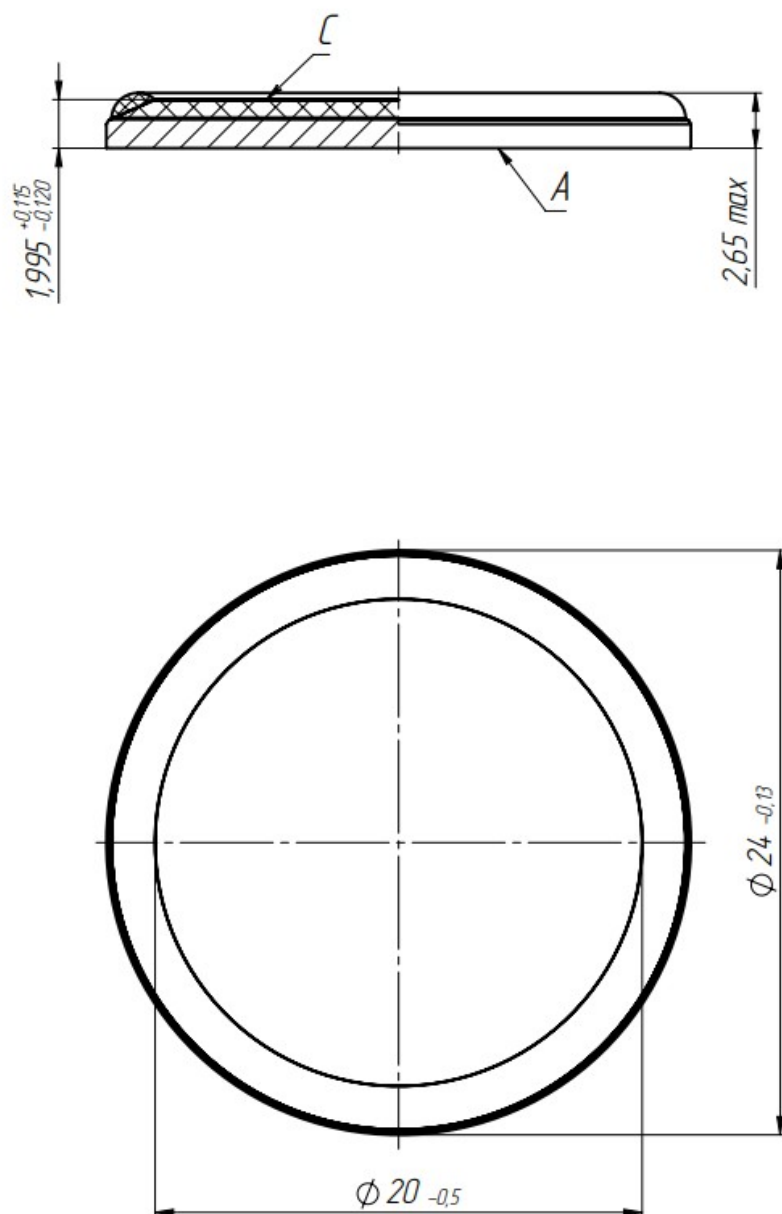
| Symbols and parameters |                                                         | Units                            | Values               | Test conditions                                                                                                          |                                                                                       |
|------------------------|---------------------------------------------------------|----------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ON-STATE               |                                                         |                                  |                      |                                                                                                                          |                                                                                       |
| I <sub>FAV</sub>       | Maximum allowable average forward current <sup>1)</sup> | A                                | 200<br>263           | T <sub>c</sub> =117 °C; Double side cooled;<br>T <sub>c</sub> =100 °C; Double side cooled;<br>180° half-sine wave; 50 Hz |                                                                                       |
| I <sub>FRMS</sub>      | RMS forward current <sup>1)</sup>                       | A                                | 314                  | T <sub>c</sub> =117 °C; Double side cooled;<br>180° half-sine wave; 50 Hz                                                |                                                                                       |
| I <sub>FSM</sub>       | Surge forward current <sup>1)</sup>                     | kA                               | 3.0<br>3.5           | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                                              | 180° half-sine wave;<br>t <sub>p</sub> =10 ms; single pulse;<br>V <sub>R</sub> =0 V;  |
|                        |                                                         |                                  | 3.0<br>3.5           | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                                              | 180° half-sine wave;<br>t <sub>p</sub> =8.3 ms; single pulse;<br>V <sub>R</sub> =0 V; |
| I <sup>2</sup> t       | Safety factor <sup>1)</sup>                             | A <sup>2</sup> s·10 <sup>3</sup> | 40<br>60             | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                                              | 180° half-sine wave;<br>t <sub>p</sub> =10 ms; single pulse;<br>V <sub>R</sub> =0 V;  |
|                        |                                                         |                                  | 30<br>50             | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                                              | 180° half-sine wave;<br>t <sub>p</sub> =8.3 ms; single pulse;<br>V <sub>R</sub> =0 V; |
| BLOCKING               |                                                         |                                  |                      |                                                                                                                          |                                                                                       |
| V <sub>RRM</sub>       | Repetitive peak reverse voltages                        | V                                | 4600...6000          | T <sub>j min</sub> < T <sub>j</sub> < T <sub>j max</sub> ;<br>180° half-sine wave; 50 Hz                                 |                                                                                       |
| V <sub>RSM</sub>       | Non-repetitive peak reverse voltages                    | V                                | 4700...6100          | T <sub>j min</sub> < T <sub>j</sub> < T <sub>j max</sub> ;<br>180° half-sine wave; single pulse                          |                                                                                       |
| V <sub>R</sub>         | Reverse continuous voltages                             | V                                | 0.6·V <sub>RRM</sub> | T <sub>j</sub> =T <sub>j max</sub>                                                                                       |                                                                                       |
| THERMAL                |                                                         |                                  |                      |                                                                                                                          |                                                                                       |
| T <sub>stg</sub>       | Storage temperature                                     | °C                               | −60...+50            |                                                                                                                          |                                                                                       |
| T <sub>j</sub>         | Operating junction temperature                          | °C                               | −60...+150           |                                                                                                                          |                                                                                       |
| MECHANICAL             |                                                         |                                  |                      |                                                                                                                          |                                                                                       |
| F                      | Mounting force <sup>1)</sup>                            | kN                               | 5.0...7.0            |                                                                                                                          |                                                                                       |

## CHARACTERISTICS

| Symbols and parameters |                                                          | Units | Values | Conditions                                                               |                     |
|------------------------|----------------------------------------------------------|-------|--------|--------------------------------------------------------------------------|---------------------|
| ON-STATE               |                                                          |       |        |                                                                          |                     |
| V <sub>FM</sub>        | Peak forward voltage <sup>1)</sup> , max                 | V     | 2.20   | T <sub>j</sub> =25 °C; I <sub>FM</sub> =628 A                            |                     |
| V <sub>F(TO)</sub>     | Forward threshold voltage, max                           | V     | 1.206  | T <sub>j</sub> =T <sub>j max</sub> ;                                     |                     |
| r <sub>T</sub>         | Forward slope resistance <sup>1)</sup> , max             | mΩ    | 2.341  | 0.5 π I <sub>FAV</sub> < I <sub>T</sub> < 1.5 π I <sub>FAV</sub>         |                     |
| BLOCKING               |                                                          |       |        |                                                                          |                     |
| I <sub>RRM</sub>       | Repetitive peak reverse current, max                     | mA    | 35     | T <sub>j</sub> =T <sub>j max</sub> ;<br>V <sub>R</sub> =V <sub>RRM</sub> |                     |
| THERMAL                |                                                          |       |        |                                                                          |                     |
| R <sub>thjc</sub>      | Thermal resistance, junction to case <sup>1)</sup> , max | °C/W  | 0.070  | Direct current                                                           | Double side cooled  |
| R <sub>thjc-A</sub>    |                                                          |       | 0.154  |                                                                          | Anode side cooled   |
| R <sub>thjc-K</sub>    |                                                          |       | 0.126  |                                                                          | Cathode side cooled |
| MECHANICAL             |                                                          |       |        |                                                                          |                     |
| m                      | Weight, max                                              | g     | 7.10   |                                                                          |                     |

| PART NUMBERING GUIDE          |    |     |    | NOTES                                                                                                                                    |
|-------------------------------|----|-----|----|------------------------------------------------------------------------------------------------------------------------------------------|
| DR                            | 24 | 200 | 60 | 1) Depending on the specifications of the housing used. The specified values are relevant when using the Proton-Electrotex D.A1 housing. |
| 1                             | 2  | 3   | 4  |                                                                                                                                          |
| 1. Rectifier Diode Chip       |    |     |    |                                                                                                                                          |
| 2. Maximum diameter, mm       |    |     |    |                                                                                                                                          |
| 3. Average forward current, A |    |     |    |                                                                                                                                          |
| 4. Voltage code               |    |     |    |                                                                                                                                          |

## OVERALL DIMENSIONS



All dimensions in millimeters

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In the interest of product improvement, Proton-Electrotex reserves the right to change data sheet without notice.