



# 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 D123-250-44

Average forward current	$I_{FAV}$		250 A	
Repetitive peak reverse voltage	$V_{RRM}$		3800 ÷ 4400 V	
$V_{RRM}, V$	3800	4000	4200	4400
Voltage code	38	40	42	44
$T_j, ^\circ C$	-60 ÷ 150			

### MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
<b>ON-STATE</b>				
$I_{FAV}$	Average forward current	A	250 285	$T_c=108\text{ }^\circ C$ ; Double side cooled; $T_c=100\text{ }^\circ C$ ; Double side cooled; 180° half-sine wave; 50 Hz
$I_{FRMS}$	RMS forward current	A	392	$T_c=108\text{ }^\circ C$ ; Double side cooled; 180° half-sine wave; 50 Hz
$I_{FSM}$	Surge forward current	kA	4.0 4.4	$T_j=T_{j\max}$ $T_j=25\text{ }^\circ C$ 180° half-sine wave; 50 Hz ( $t_p=10\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
			5.0 5.8	$T_j=T_{j\max}$ $T_j=25\text{ }^\circ C$ 180° half-sine wave; 60 Hz ( $t_p=8.3\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
$I^2t$	Safety factor	$A^2s \cdot 10^3$	80 105	$T_j=T_{j\max}$ $T_j=25\text{ }^\circ C$ 180° half-sine wave; 50 Hz ( $t_p=10\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
			100 135	$T_j=T_{j\max}$ $T_j=25\text{ }^\circ C$ 180° half-sine wave; 60 Hz ( $t_p=8.3\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
<b>BLOCKING</b>				
$V_{RRM}$	Repetitive peak reverse voltages	V	3800 ÷ 4400	$T_{j\min} < T_j < T_{j\max}$ ; 180° half-sine wave; 50 Hz;
$V_{RSM}$	Non-repetitive peak reverse voltages	V	3900 ÷ 4500	$T_{j\min} < T_j < T_{j\max}$ ; 180° half-sine wave; 50 Hz; single pulse;
$V_R$	Reverse continuous voltages	V	$0.75 \cdot V_{RRM}$	$T_j = T_{j\max}$ ;
<b>THERMAL</b>				
$T_{stg}$	Storage temperature	$^\circ C$	-60 ÷ 50	
$T_j$	Operating junction temperature	$^\circ C$	-60 ÷ 150	
<b>MECHANICAL</b>				
F	Mounting force	kN	5.0 ÷ 7.0	
a	Acceleration	$m/s^2$	50	Device unclamped
			100	Device clamped

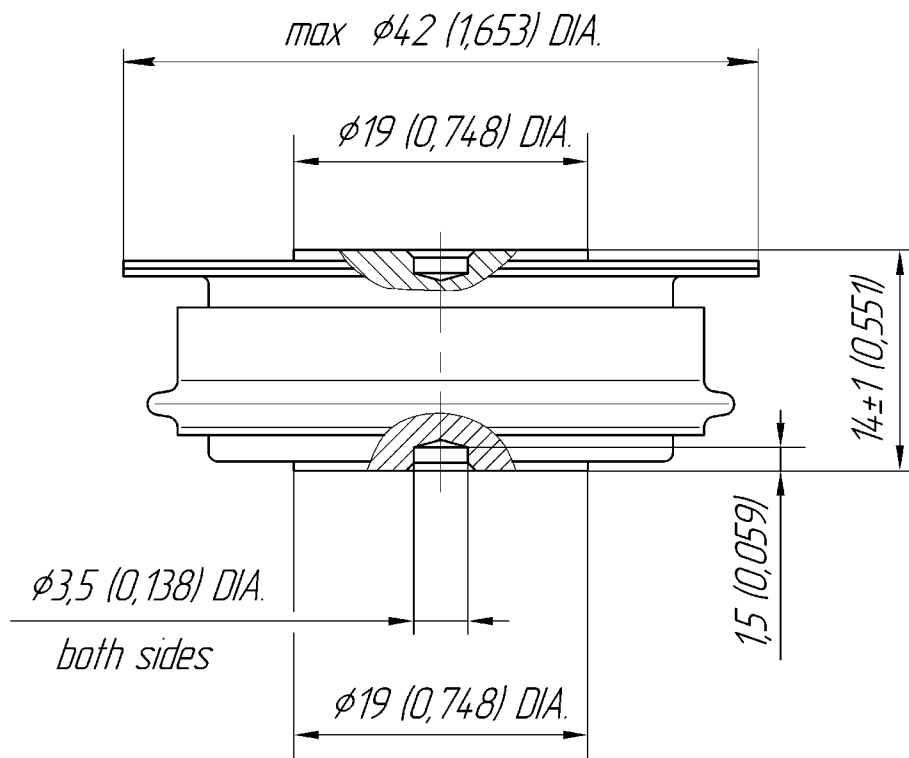
## CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions
<b>ON-STATE</b>				
$V_{FM}$	Peak forward voltage, max	V	2.20	$T_j=25\text{ }^\circ\text{C}; I_{FM}=785\text{ A}$
$V_{F(TO)}$	Forward threshold voltage, max	V	1.10	$T_j=T_{j\text{ max}}$ ;
$r_T$	Forward slope resistance, max	m $\Omega$	1.600	$0.5\pi I_{FAV} < I_T < 1.5\pi I_{FAV}$
<b>BLOCKING</b>				
$I_{RRM}$	Repetitive peak reverse current, max	mA	35	$T_j=T_{j\text{ max}}$ ; $V_R=V_{RRM}$
<b>THERMAL</b>				
$R_{thjc}$	Thermal resistance, junction to case, max	$^\circ\text{C/W}$	0.078	Double side cooled
$R_{thjc-A}$			0.172	Direct current
$R_{thjc-K}$			0.140	Cathode side cooled
$R_{thck}$	Thermal resistance, case to heatsink, max	$^\circ\text{C/W}$	0.010	Direct current
<b>MECHANICAL</b>				
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

D	123	250	44	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



All dimensions in millimeters (inches)