



# 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 D123-200-60

Average forward current				$I_{FAV}$	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	
<b>ON-STATE</b>					
$I_{FAV}$	Average forward current	A	200 255	$T_c=116 °C$ ; Double side cooled; $T_c=100 °C$ ; Double side cooled; 180° half-sine wave; 50 Hz	
$I_{FRMS}$	RMS forward current	A	314	$T_c=116 °C$ ; Double side cooled; 180° half-sine wave; 50 Hz	
$I_{FSM}$	Surge forward current	kA	3.0 3.5	$T_j=T_{j max}$ $T_j=25 °C$	180° half-sine wave; 50 Hz ( $t_p=10 ms$ ); single pulse; $V_R=0 V$ ;
			4.0 4.6	$T_j=T_{j max}$ $T_j=25 °C$	180° half-sine wave; 60 Hz ( $t_p=8.3 ms$ ); single pulse; $V_R=0 V$ ;
$I^2t$	Safety factor	$A^2s \cdot 10^3$	45 60	$T_j=T_{j max}$ $T_j=25 °C$	180° half-sine wave; 50 Hz ( $t_p=10 ms$ ); single pulse; $V_R=0 V$ ;
			65 85	$T_j=T_{j max}$ $T_j=25 °C$	180° half-sine wave; 60 Hz ( $t_p=8.3 ms$ ); single pulse; $V_R=0 V$ ;
<b>BLOCKING</b>					
$V_{RRM}$	Repetitive peak reverse voltages	V	4600 ÷ 6000	$T_{j min} < T_j < T_{j max}$ ; 180° half-sine wave; 50 Hz;	
$V_{RSM}$	Non-repetitive peak reverse voltages	V	4700 ÷ 6100	$T_{j min} < T_j < T_{j max}$ ; 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	°C	-60 ÷ 150		
$T_j$	Operating junction temperature	°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	

#### JSC "PROTON-ELECTROTEX"

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## CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions	
<b>ON-STATE</b>					
$V_{FM}$	Peak forward voltage, max	V	2.50	$T_j=25\text{ }^\circ\text{C}; I_{FM}=628\text{ A}$	
$V_{F(TO)}$	Forward threshold voltage, max	V	1.10	$T_j=T_{j\text{ max}}$	
$r_T$	Forward slope resistance, max	m $\Omega$	2.600	$0.5\pi I_{FAV} < I_T < 1.5\pi I_{FAV}$	
<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	$^\circ\text{C/W}$	0.070	Direct current	Double side cooled
$R_{thjc-A}$			0.154		Anode side cooled
$R_{thjc-K}$			0.126		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

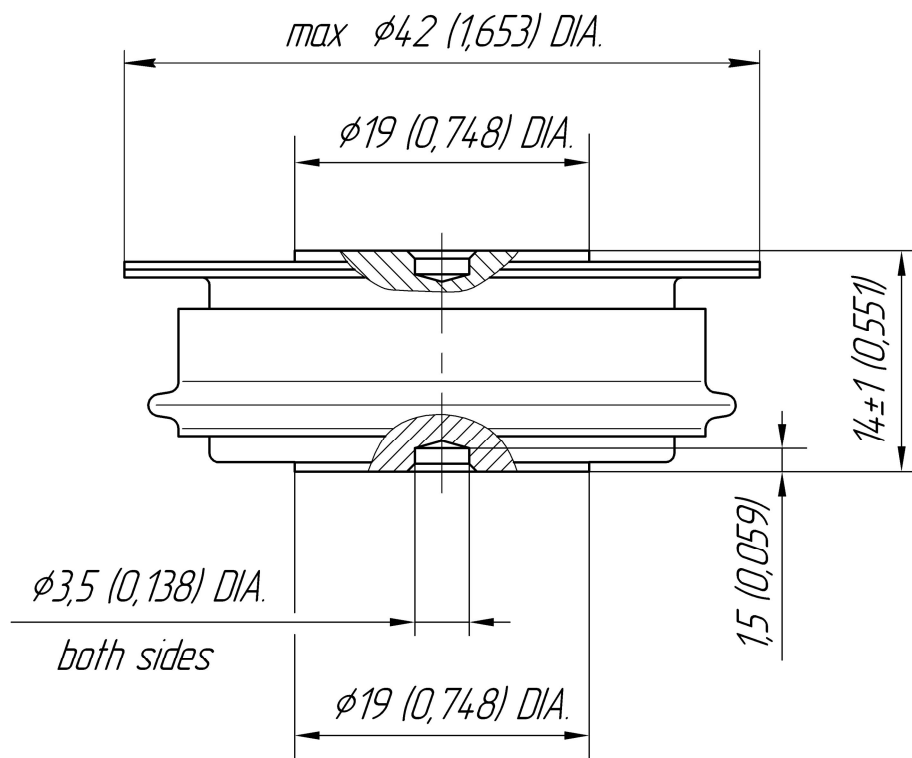
D	123	200	60	N
1	2	3	4	5

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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