



# PROTON-ELECTROTEX RUSSIA

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

## Power Rectifier Avalanche Diodes Type DA333-500-18

Average forward current		$I_{FAV}$	500 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
$T_j, °C$	- 60 ÷ 150				

### MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
<b>ON-STATE</b>					
$I_{FAV}$	Average forward current	A	500 720	$T_c=120 °C$ ; Double side cooled; $T_c=100 °C$ ; Double side cooled; 180° half-sine wave; 50 Hz	
$I_{FRMS}$	RMS forward current	A	785	$T_c=120 °C$ ; Double side cooled; 180° half-sine wave; 50 Hz	
$I_{FSM}$	Surge forward current	kA	12.0 14.0	$T_j=T_{jmax}$ $T_j=25 °C$	180° half-sine wave; 50 Hz ( $t_p=10 ms$ ); single pulse; $V_R=0 V$ ;
			13.0 15.0	$T_j=T_{jmax}$ $T_j=25 °C$	180° half-sine wave; 60 Hz ( $t_p=8.3 ms$ ); single pulse; $V_R=0 V$ ;
$I^2t$	Safety factor	$A^2s \cdot 10^3$	720 980	$T_j=T_{jmax}$ $T_j=25 °C$	180° half-sine wave; 50 Hz ( $t_p=10 ms$ ); single pulse; $V_R=0 V$ ;
			700 930	$T_j=T_{jmax}$ $T_j=25 °C$	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	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	$0.75 \cdot V_{RRM}$	$T_j=T_{jmax}$ ;	
$P_{RSM}$	Surge reverse power dissipation	kW	16	$T_j=T_{jmax}$ ; $t_p = 100 \mu s$ ; 180° half-sine wave, 50 Hz, single pulse	
<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	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	
<b>ON-STATE</b>					
$V_{FM}$	Peak forward voltage, max	V	1.60	$T_j=25\text{ }^\circ\text{C}; I_{FM}=1570\text{ A}$	
$V_{F(TO)}$	Forward threshold voltage, max	V	0.95	$T_j=T_{j\text{ max}}$	
$r_T$	Forward slope resistance, max	m $\Omega$	0.440	$0.5\pi I_{FAV} < I_T < 1.5\pi I_{FAV}$	
<b>BLOCKING</b>					
$I_{RRM}$	Repetitive peak reverse current, max	mA	50	$T_j=T_{j\text{ max}}$ $V_R=V_{RRM}$	
<b>THERMAL</b>					
$R_{thjc}$	Thermal resistance, junction to case, max	$^\circ\text{C/W}$	0.0400	Direct current	Double side cooled
$R_{thjc-A}$			0.0880		Anode side cooled
$R_{thjc-K}$			0.0720		Cathode side cooled
$R_{thck}$	Thermal resistance, case to heatsink, max	$^\circ\text{C/W}$	0.0080	Direct current	
<b>MECHANICAL</b>					
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

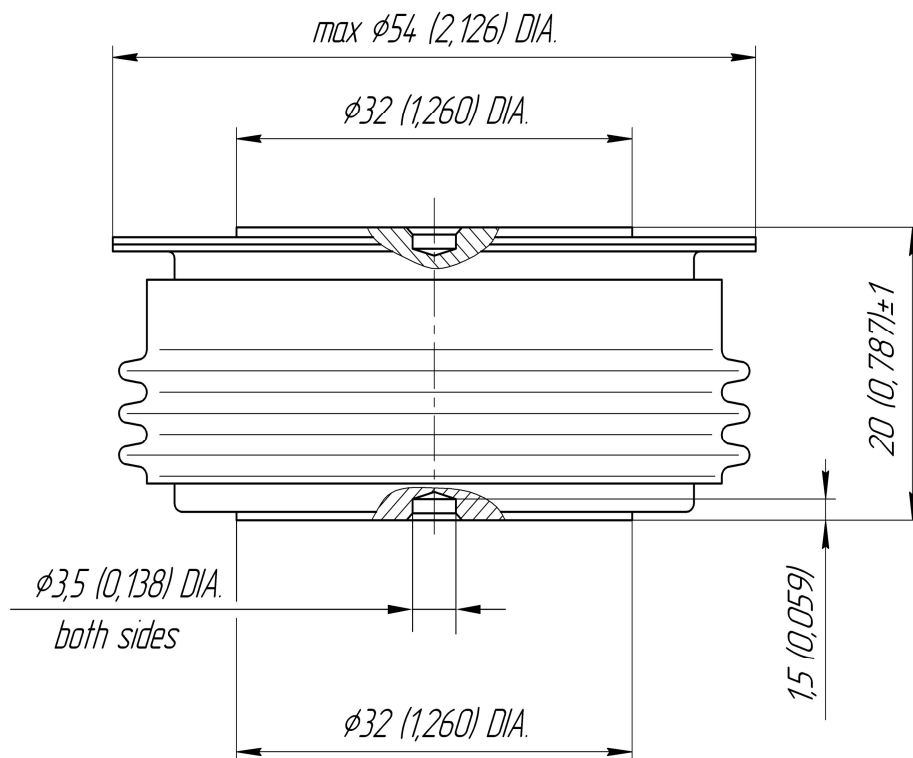
DA	333	500	18	N
1	2	3	4	5

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

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All dimensions in millimeters (inches)

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