

Fast Recovery Avalanche Diode Type DFA133-320-22

Low switching losses
Low reverse recovery charge
High power cycling capability

Average forward current		I_{FAV}	320 A	
Repetitive peak reverse voltage		V_{RRM}	1600...2200 V	
Reverse recovery time		t_{rr}^*	2.00, 2.50, 3.20, 4.00, 5.00 μ s	
V_{RRM}, V	1600	1800	2000	2200
Voltage code	16	18	20	22
$T_j, ^\circ C$	- 60...+125			

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{FAV}	Average forward current	A	320	$T_c=85^\circ C$; Double side cooled; 180° half-sine wave; 50 Hz
I_{FRMS}	RMS forward current	A	502	$T_c=85^\circ C$; Double side cooled; 180° half-sine wave; 50 Hz
I_{FSM}	Surge forward current	kA	6.5 7.5	$T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; $t_p=10$ ms; single pulse; $V_R=0$ V;
			7.0 8.0	$T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; $t_p=8.3$ ms; single pulse; $V_R=0$ V;
I^2t	Safety factor	$A^2s \cdot 10^3$	210 280	$T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; $t_p=10$ ms; single pulse; $V_R=0$ V;
			200 260	$T_j=T_{jmax}$ $T_j=25^\circ C$ 180° half-sine wave; $t_p=8.3$ ms; single pulse; $V_R=0$ V;
BLOCKING				
V_{RRM}	Repetitive peak reverse voltages	V	1600...2200	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; 50 Hz;
V_{RSM}	Non-repetitive peak reverse voltages	V	1700...2300	$T_{jmin} < T_j < T_{jmax}$; 180° half-sine wave; single pulse;
$V_{(BR)}$	Breakdown voltage	V	1800...2400	$T_j=25^\circ C$; $I_{br}=100$ mA; $t_p = 10$ ms; 5 Hz
V_R	Reverse continuous voltages	V	$0.6 \cdot V_{RRM}$	$T_j=T_{jmax}$;
P_{RSM}	Surge reverse power dissipation	kW	16	$T_j= T_{jmax}$; $t_p = 100$ μ s; 180° half-sine current waveforms; single pulse
THERMAL				
T_{stg}	Storage temperature	$^\circ C$	-60...+55	
T_j	Operating junction temperature	$^\circ C$	-60...+125	
MECHANICAL				
F	Mounting force	kN	9.0...11.0	
a	Acceleration	m/s^2	50	Device clamped

CHARACTERISTICS

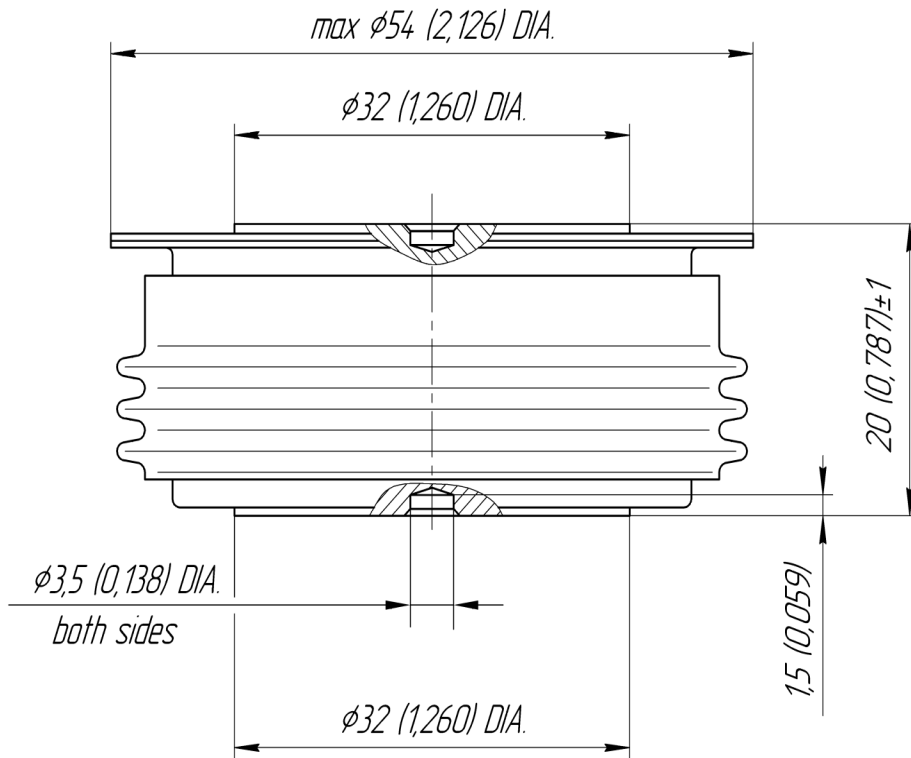
Symbols and parameters		Units	Values	Conditions	
ON-STATE					
V_{FM}	Peak forward voltage, max	V	2.50	$T_j=25\text{ }^\circ\text{C}; I_{FM}=1005\text{ A}$	
$V_{F(TO)}$	Forward threshold voltage, max	V	1.20	$T_j=T_{j\text{ max}};$ $0.5\pi I_{FAV} < I_T < 1.5\pi I_{FAV}$	
r_T	Forward slope resistance, max	m Ω	1.65		
BLOCKING					
I_{RRM}	Repetitive peak reverse current, max	mA	40	$T_j=T_{j\text{ max}};$ $V_R=V_{RRM}$	
SWITCHING					
Q_{rr}	Total recovered charge, max	μC	tbd*	$T_j=T_{j\text{ max}}; I_{FM}=I_{FAV};$ $di_R/dt=-100\text{ A}/\mu\text{s};$ $V_R=100\text{ V};$	
t_{rr}^*	Reverse recovery time ¹⁾ , max	μs	2.00, 2.50, 3.20, 4.00, 5.00		
I_{rrM}	Peak reverse recovery current, max	A	tbd*		
THERMAL					
R_{thjc}	Thermal resistance, junction to case, max	$^\circ\text{C}/\text{W}$	0.0500	Direct current	Double side cooled
R_{thjc-A}			0.1100		Anode side cooled
R_{thjc-K}			0.0900		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	$^\circ\text{C}/\text{W}$	0.0090	Direct current	
MECHANICAL					
w	Weight, max	g	180		
D_s	Surface creepage distance	mm (inch)	23.69 (0.933)		
D_a	Air strike distance	mm (inch)	19.10 (0.752)		

* **2.00 μs** - for voltage code 16

2.50, 3.20, 4.00, 5.00 μs - for the range of voltage codes (18-22)

* **tbd** – data will be refined as additional tests are conducted and statistics are collected.

PART NUMBERING GUIDE						NOTES												
DFA	133	320	22	E4	N	¹⁾ Reverse recovery time <table border="1"> <thead> <tr> <th>Symbol of group</th> <th>P4</th> <th>M4</th> <th>K4</th> <th>H4</th> <th>E4</th> </tr> </thead> <tbody> <tr> <td>$t_{rr}, \mu\text{s}$</td> <td>2.0</td> <td>2.5</td> <td>3.2</td> <td>4.00</td> <td>5.00</td> </tr> </tbody> </table>	Symbol of group	P4	M4	K4	H4	E4	$t_{rr}, \mu\text{s}$	2.0	2.5	3.2	4.00	5.00
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$t_{rr}, \mu\text{s}$	2.0	2.5	3.2	4.00	5.00													
1	2	3	4	5	6													
1. DFA – Fast recovery avalanche diode 2. Design version 3. Average forward current, A 4. Voltage code 5. Group of reverse recovery time 6. Ambient conditions: N – normal; T – tropical																		



All dimensions in millimeters (inches)