

ULTRAFAST POWER RECTIFIER DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x100 A
V_{RRM}	400 V
$V_F (max)$	1.4 V

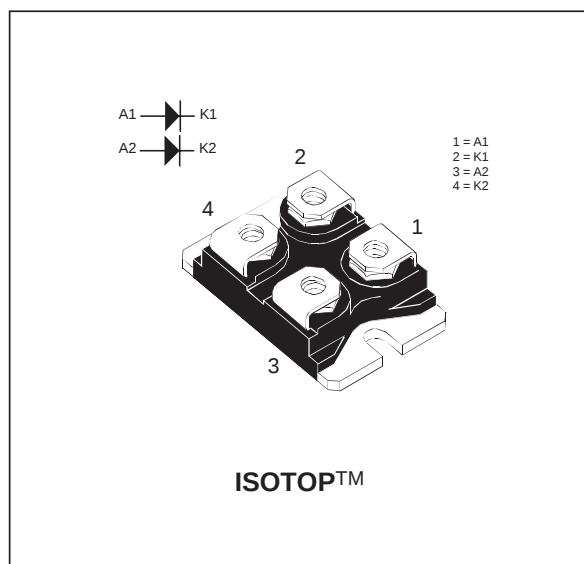
FEATURES AND BENEFITS

- LOW CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH AVALANCHE CAPABILITY
- ISOLATED PACKAGE :
2500 V_{DC}
CAPACITANCE 42pF

DESCRIPTION

High current power rectifier diode suited for Switched Mode Power Supply and high frequency DC to DC converters.

Packaged in ISOTOP, this device is intended for use in a medium voltage high current applications such as **welding equipment and Telecom supplies.**



ABSOLUTE MAXIMUM RATING

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		400	V
$I_{F(RMS)}$	RMS forward current		150	A
$I_{F(AV)}$	Average forward current	$T_c = 80^\circ\text{C}$ $\delta = 0.5$	100	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ Sinusoidal	600	A
I_{FRM}	Repetitive peak forward current	$t_p @ 10 \mu\text{s}$	800	A
T_{stg}	Storage temperature range		- 40 to + 150	°C
T_j	Maximum junction temperature		150	°C

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THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per leg	0.55	°C/W
		Total	0.33	
$R_{th(c)}$		Coupling	0.1	

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			120	μA
		$T_j = 100^\circ\text{C}$			4	12	mA
V_F^{**}	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 100\text{ A}$			1.6	V
		$T_j = 125^\circ\text{C}$	$I_F = 100\text{ A}$		0.95	1.4	

Pulse test : * $t_p = 5\text{ ms}$, duty cycle $< 2\%$

** $t_p = 380\text{ }\mu\text{s}$, duty cycle $< 2\%$

RECOVERY CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$I_F=0.5\text{A}$ $I_R=1\text{A}$ $I_{rr}=0.25\text{A}$ $I_F=1\text{A}$ $dI/dt = -50\text{A}/\mu\text{s}$ $V_R=30\text{V}$		55	100	ns
I_{RM}	Reverse recovery current	$dI_F/dt = -200\text{A}/\mu\text{s}$ $T_j=125^\circ\text{C}$ $V_R=400\text{V}$ $I_F=100\text{A}$			40	A
S factor	Softness factor	$dI_F/dt = -200\text{A}/\mu\text{s}$ $T_j=125^\circ\text{C}$ $V_R=400\text{V}$ $I_F=100\text{A}$		0.25		
t_{fr}	Forward recovery time	$I_F=100\text{A}$ $dI_F/dt = 500\text{A}/\mu\text{s}$ Measured at $1.1 \times V_F$ max.			500	ns
V_{FP}	Peak forward voltage	$T_j=25^\circ\text{C}$			12	V

To evaluate the conduction losses use the following equation :

$$P = 0.8 \times I_{F(AV)} + 0.00228 \times I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current (per diode).

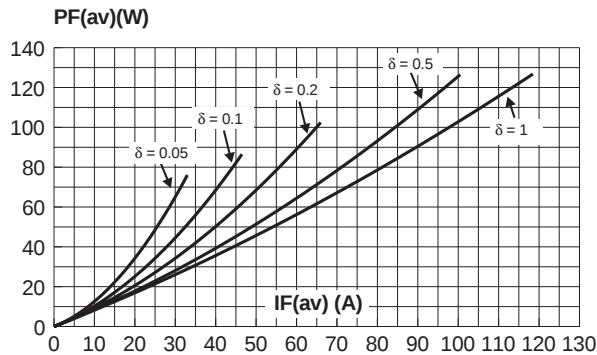


Fig. 2: Peak current versus form factor (per diode).

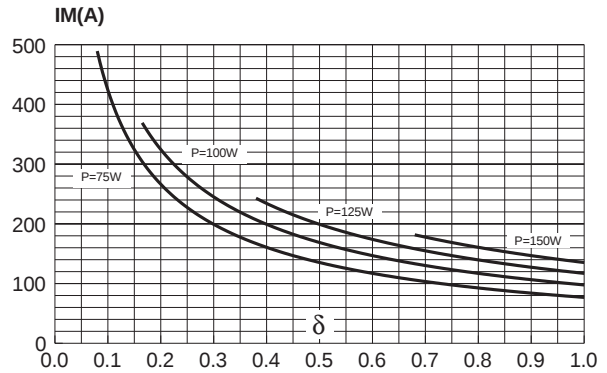


Fig. 3: Average forward current versus ambient temperature ($\delta = 0.5$, per diode).

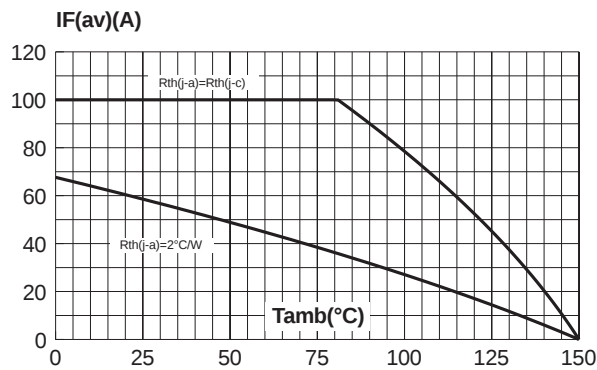


Fig. 4: Non repetitive surge peak forward current versus overload duration (per diode).

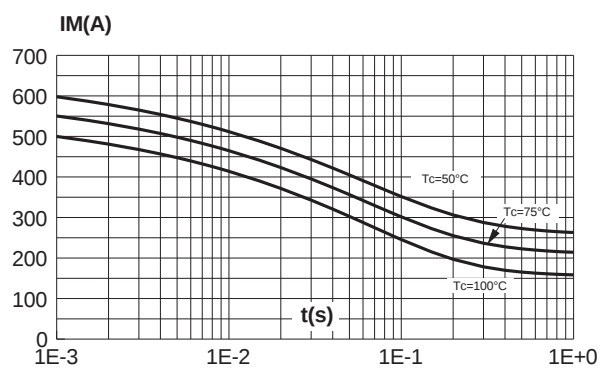


Fig. 5: Relative variation of thermal impedance junction to case versus pulse duration (per diode).

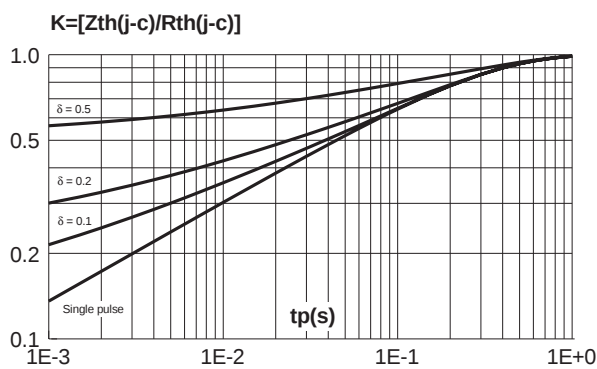


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).

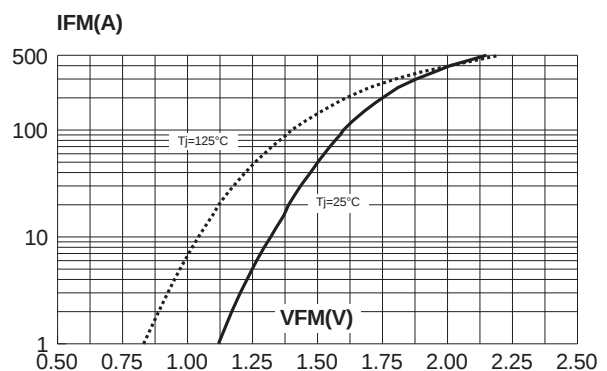


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

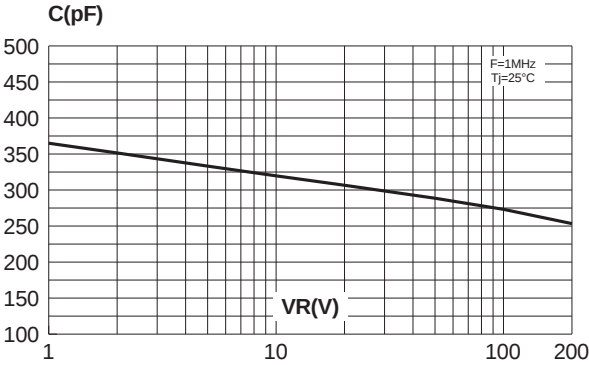


Fig. 8: Recovery charges versus dI_F/dt (per diode).

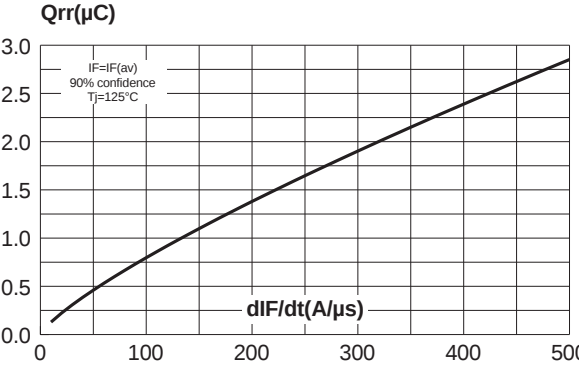


Fig. 9: Recovery current versus dI_F/dt (per diode).

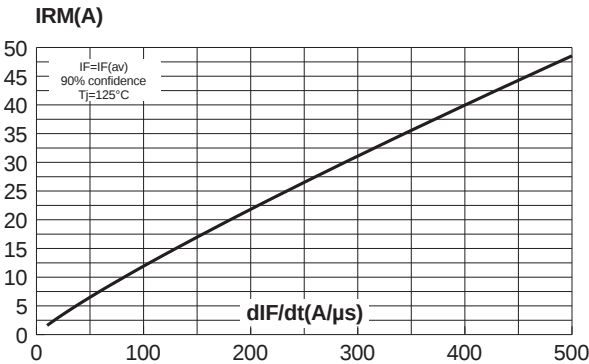


Fig. 10: Transient peak forward voltage versus dI_F/dt (per diode).

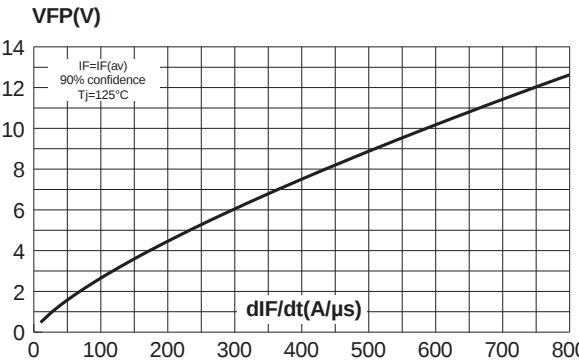
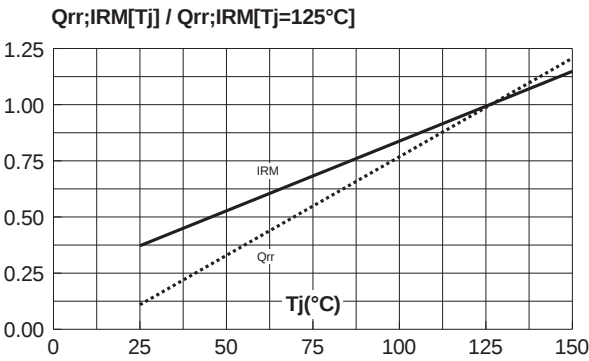


Fig. 11: Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA **ISOTOP**

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
A1	8.90	9.10	0.350	0.358
B	7.8	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80 typ.		0.976 typ.	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
P	4.00	4.30	0.157	0.69
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

- Epoxy meets UL94, V0

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