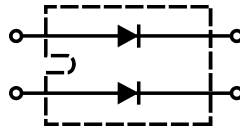


# Fast Recovery Epitaxial Diode (FRED)

## DSEI 2x 121

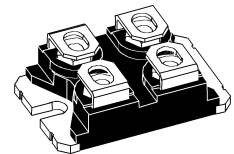
$I_{FAVM} = 2x 123 A$   
 $V_{RRM} = 200 V$   
 $t_{rr} = 35 ns$

$V_{RSM}$	$V_{RRM}$	Type
V	V	
200	200	DSEI 2x 121-02A



miniBLOC, SOT-227 B

E72873

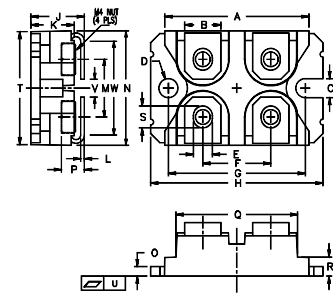


Symbol	Test Conditions	Maximum Ratings (per diode)	
$I_{FRMS}$	$T_{VJ} = T_{VJM}$	150	A
$I_{FAVM}$ ①	$T_C = 70^\circ C$ ; rectangular, $d = 0.5$	123	A
$I_{FRM}$	$t_p < 10 \mu s$ ; rep. rating, pulse width limited by $T_{VJM}$	600	A
$I_{FSM}$	$T_{VJ} = 45^\circ C$ ; $t = 10 ms$ (50 Hz), sine	1200	A
	$t = 8.3 ms$ (60 Hz), sine	1300	A
	$T_{VJ} = 150^\circ C$ ; $t = 10 ms$ (50 Hz), sine	1080	A
	$t = 8.3 ms$ (60 Hz), sine	1170	A
$I^2t$	$T_{VJ} = 45^\circ C$ ; $t = 10 ms$ (50 Hz), sine	7200	A <sup>2</sup> s
	$t = 8.3 ms$ (60 Hz), sine	7100	A <sup>2</sup> s
	$T_{VJ} = 150^\circ C$ ; $t = 10 ms$ (50 Hz), sine	5800	A <sup>2</sup> s
	$t = 8.3 ms$ (60 Hz), sine	5700	A <sup>2</sup> s
$T_{VJ}$		-40...+150	°C
$T_{VJM}$		150	°C
$T_{stg}$		-40...+150	°C
$P_{tot}$	$T_C = 25^\circ C$	250	W
$V_{ISOL}$	50/60 Hz, RMS	2500	V~
	$I_{ISOL} \leq 1 mA$		
$M_d$	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

### Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low  $I_{RM}$ -values
- Soft recovery behaviour

### miniBLOC, SOT-227 B



M4 screws (4x) supplied

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.20	1.489	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004
V	3.30	4.57	0.130	0.180
W	0.780	0.830	0.031	0.033

Symbol	Test Conditions	Characteristic Values (per diode)	
		typ.	max.
$I_R$	$T_{VJ} = 25^\circ C$	$V_R = V_{RRM}$	1 mA
	$T_{VJ} = 25^\circ C$	$V_R = 0.8 \cdot V_{RRM}$	0.5 mA
	$T_{VJ} = 125^\circ C$	$V_R = 0.8 \cdot V_{RRM}$	20 mA
$V_F$	$I_F = 120 A$ ; $T_{VJ} = 150^\circ C$	0.89	0.95 V
	$T_{VJ} = 25^\circ C$		1.10 V
$V_{TO}$	For power-loss calculations only		0.7 V
$r_T$	$T_{VJ} = T_{VJM}$		2.1 mΩ
$R_{thJC}$			0.5 K/W
$R_{thCK}$		0.1	K/W
$t_{rr}$	$I_F = 1 A$ ; $-di/dt = 400 A/\mu s$ ; $V_R = 30 V$ ; $T_{VJ} = 25^\circ C$	35	50 ns
	$V_R = 100 V$ ; $I_F = 100 A$ ; $-di_F/dt = 200 A/\mu s$	12	15 A
$I_{RM}$	$L \leq 0.05 \mu H$ ; $T_{VJ} = 100^\circ C$		

①  $I_{FAVM}$  rating includes reverse blocking losses at  $T_{VJM}$ ,  $V_R = 0.8 V_{RRM}$ , duty cycle  $d = 0.5$

Data according to IEC 60747

IXYS reserves the right to change limits, test conditions and dimensions

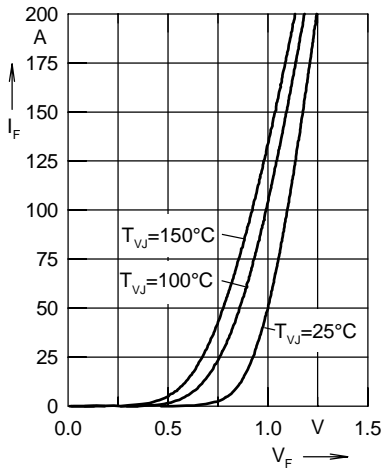
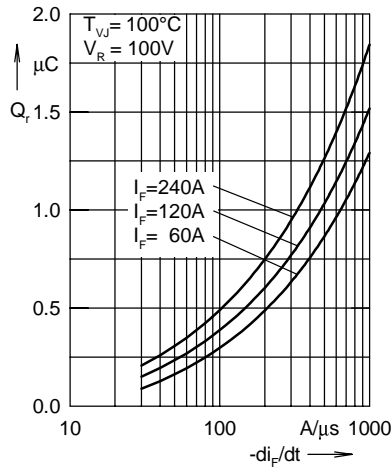
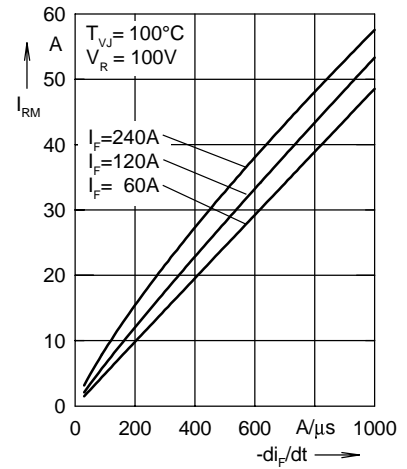
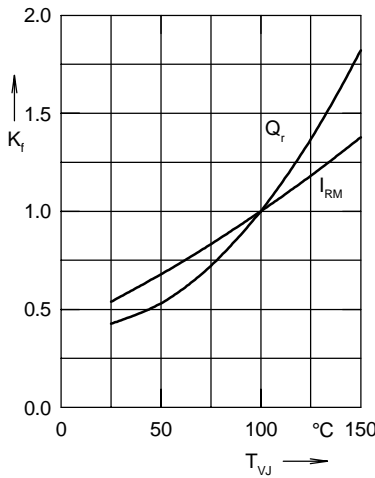
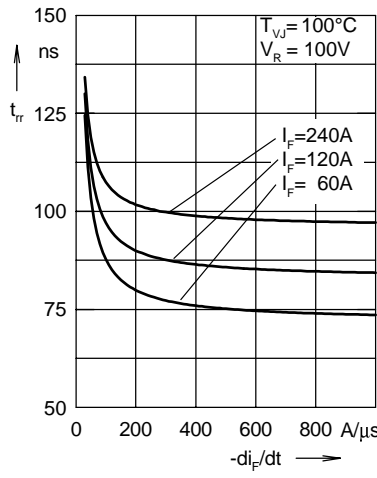
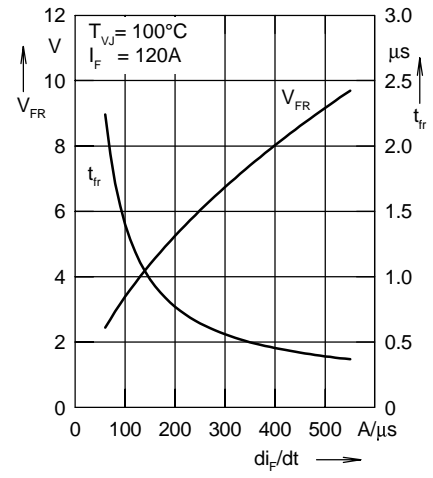
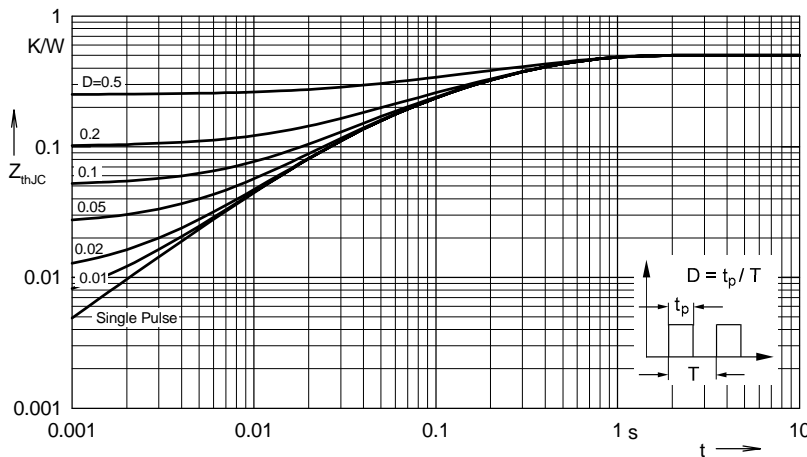

 Fig. 1 Forward current  $I_F$  versus  $V_F$ 

 Fig. 2 Typ. reverse recovery charge  $Q_r$  versus  $-di_F/dt$ 

 Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$ 

 Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$ 

 Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$ 

 Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$ 


Fig. 7 Transient thermal impedance junction to case at various duty cycles

 Constants for  $Z_{thJC}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.0725	0.028
2	0.1423	0.092
3	0.2852	0.35