

Fast Recovery Epitaxial Diode (FRED)

$$I_{FAVM} = 17 \text{ A}$$

$$V_{RRM} = 1200 \text{ V}$$

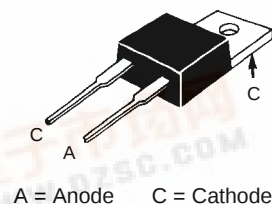
$$t_{tr} = 40 \text{ ns}$$

V_{RSM}	V_{RRM}	Type
1200V	1200V	DSEI 20-12A



Symbol	Test Conditions	Maximum Ratings
I_{FRMS}	$T_{VJ} = T_{VJM}$	70 A
I_{FAVM} ①	$T_C = 85^\circ\text{C}$; rectangular, $d = 0.5$	17 A
I_{FRM}	$t_p < 10 \mu\text{s}$; rep. rating, pulse width limited by T_{VJM}	220 A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$	
	$t = 10 \text{ ms}$ (50 Hz), sine	130 A
	$t = 8.3 \text{ ms}$ (60 Hz), sine	140 A
	$T_{VJ} = 150^\circ\text{C}$	
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}$	
	$t = 10 \text{ ms}$ (50 Hz), sine	85 A ² s
	$t = 8.3 \text{ ms}$ (60 Hz), sine	80 A ² s
	$T_{VJ} = 150^\circ\text{C}$	
T_{VJ}	$t = 10 \text{ ms}$ (50 Hz), sine	60 A ² s
	$t = 8.3 \text{ ms}$ (60 Hz), sine	60 A ² s
T_{VJM}		-40...+150 °C
T_{stg}		150 °C
P_{tot}	$T_C = 25^\circ\text{C}$	-40...+150 °C
M_d	Mounting torque with screw M3	78 W
	Mounting torque with screw M3.5	0.45/4 Nm/lb.in.
$Weight$		0.55/5 Nm/lb.in.
		2 g

TO-220 AC



Features

- Low I_{RM} -values
- Planar passivated chips
- Very short recovery time
- Soft recovery behaviour
- Epoxy meet UL 94V-0.
- Extremely low switching losses
- International standard package JEDEC TO-220 AC

Applications

- Snubber diode
- Anti saturation diode
- Inductive heating and melting
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Antiparallel diode for high frequency switching devices
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Low losses
- Low noise switching
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Operating at lower temperature or space saving by reduced cooling

Symbol	Test Conditions	Characteristic Values	
		Typ.	Max.
I _R	V _R = V _{RRM}	T _{VJ} = 25°C	750 μA
	V _R = 0.8 V _{RRM}	T _{VJ} = 25°C	250 μA
	V _R = 0.8 V _{RRM}	T _{VJ} = 125°C	7 mA
V _F	I _F = 12 A	T _{VJ} = 150°C	1.87 V
		T _{VJ} = 25°C	2.15 V
V _{T0}	For power-loss calculations only		1.65 V
r _T	T _{VJ} = T _{VJM}		18.2 mΩ
R _{thJC}		0.5	1.6 K/W
R _{thCK}			K/W
R _{thJA}			60 K/W
t _{tr}	I _F = 1 A; -di/dt = 100 A/μs; V _R = 30 V; T _{VJ} = 25°C	40	60 ns
I _{RM}	V _R = 540 V; I _F = 20 A; -di _F /dt = 100 A/μs		7 A
	L ≤ 0.05 μH T _{VJ} = 100°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 DIN/IEC 747

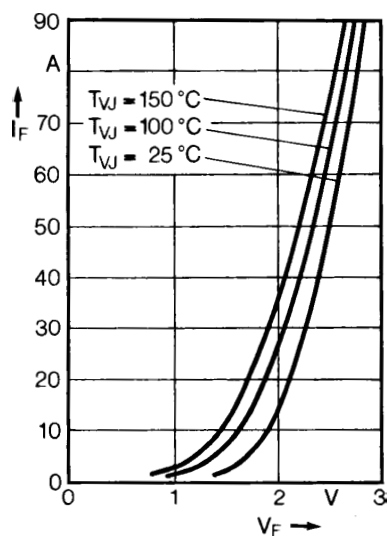


Fig. 1 Forward current versus voltage drop.

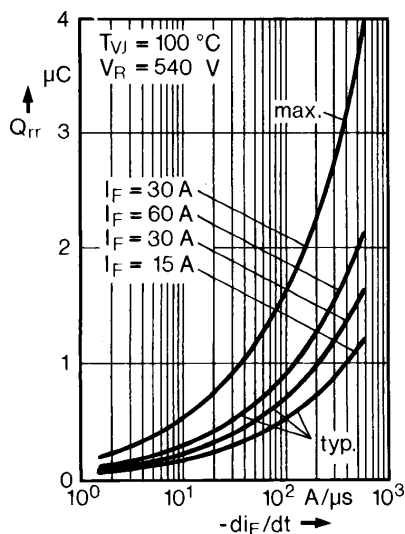


Fig. 2 Recovery charge versus $-di_F/dt$.

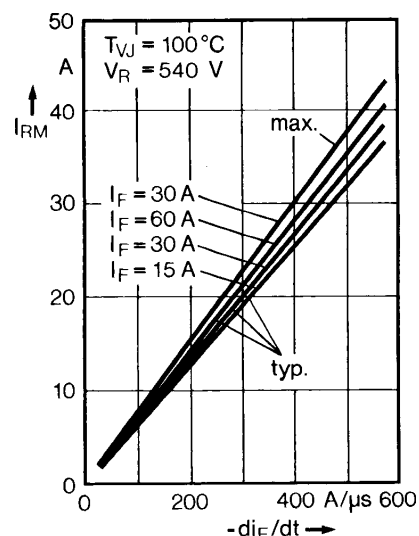


Fig. 3 Peak reverse current versus $-di_F/dt$.

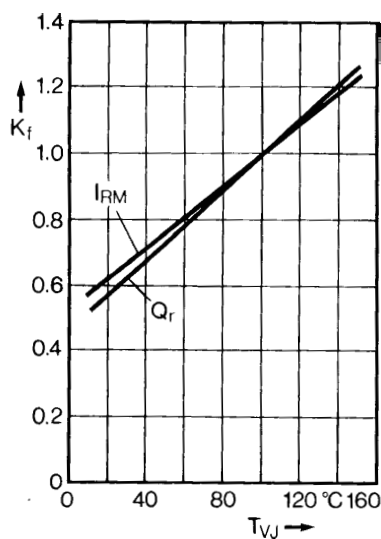


Fig. 4 Dynamic parameters versus junction temperature.

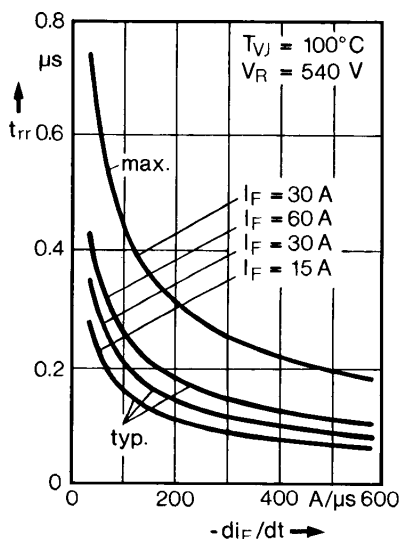


Fig. 5 Recovery time versus $-di_F/dt$.

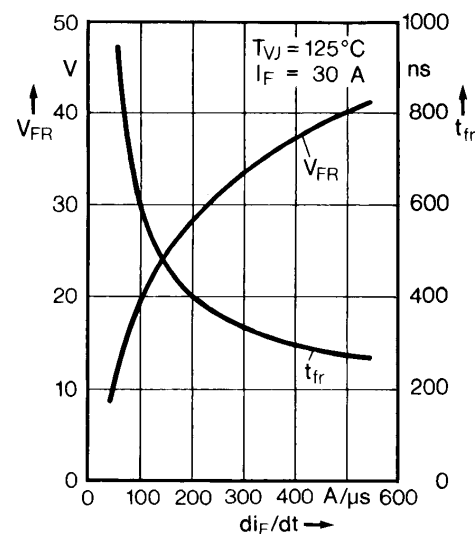


Fig. 6 Peak forward voltage versus $-di_F/dt$.

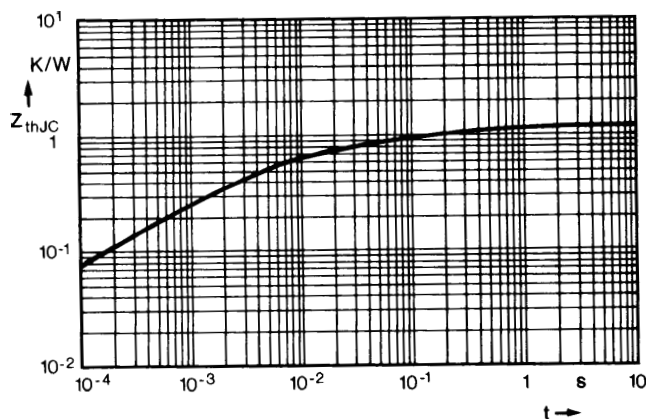
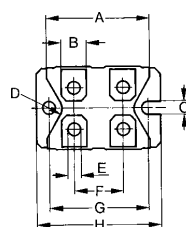


Fig. 7 Transient thermal impedance junction to case.



Dimensions
miniBLOC SOT-227 B
M4 screws (4x) supplied

Dim.	Millimeter	Inches
	Min. Max.	Min. Max.
A	31.5 31.7	1.241 1.249
B	7.8 8.2	0.307 0.323
C	4.0 -	0.158 -
D	4.1 4.3	0.162 0.169
E	4.1 4.3	0.162 0.169
F	14.9 15.1	0.587 0.595
G	30.1 30.3	1.186 1.193
H	38.0 38.2	1.497 1.505
J	11.8 12.2	0.465 0.481
K	8.9 9.1	0.351 0.359
L	0.75 0.85	0.030 0.033
M	12.6 12.8	0.496 0.504
N	25.2 25.4	0.993 1.001
O	1.95 2.05	0.077 0.081
P	- 5.0	- 0.197