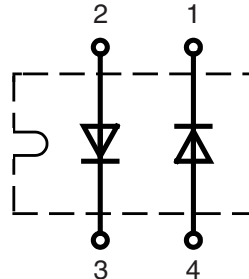


# Fast Recovery Epitaxial Diode (FRED)

$I_{FAVM} = 2x 60 A$   
 $V_{RRM} = 400 V$   
 $t_{rr} = 35 ns$

$V_{RSM}$	$V_{RRM}$	Type
V	V	
440	400	DSEI2x60-04C



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
$I_{FRMS}$	$T_{VJ} = T_{VJM}$	100	A
$I_{FAVM}$ ①	$T_C = 70^\circ C$ ; rectangular, $d = 0.5$	60	A
$I_{FRM}$	$t_p < 10 \mu s$ ; rep. rating, pulse width limited by $T_{VJM}$	800	A
$I_{FSM}$	$T_{VJ} = 45^\circ C$ ; $t = 10 ms$ (50 Hz), sine	550	A
	$t = 8.3 ms$ (60 Hz), sine	600	A
	$T_{VJ} = 150^\circ C$ ; $t = 10 ms$ (50 Hz), sine	480	A
	$t = 8.3 ms$ (60 Hz), sine	520	A
$I^2t$	$T_{VJ} = 45^\circ C$ ; $t = 10 ms$ (50 Hz), sine	1510	A <sup>2</sup> s
	$t = 8.3 ms$ (60 Hz), sine	1490	A <sup>2</sup> s
	$T_{VJ} = 150^\circ C$ ; $t = 10 ms$ (50 Hz), sine	1150	A <sup>2</sup> s
	$t = 8.3 ms$ (60 Hz), sine	1120	A <sup>2</sup> s
$T_{VJ}$		-40...+150	°C
$T_{VJM}$		150	°C
$T_{stg}$		-40...+150	°C
$P_{tot}$	$T_C = 25^\circ C$	180	W
$V_{ISOL}$	50/60 Hz, RMS; $I_{ISOL} \leq 1 mA$	2500	V~
$M_d$	mounting torque	1.5	Nm
Weight	typical	30	g

## Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low  $I_{RM}$ -values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

## Applications

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

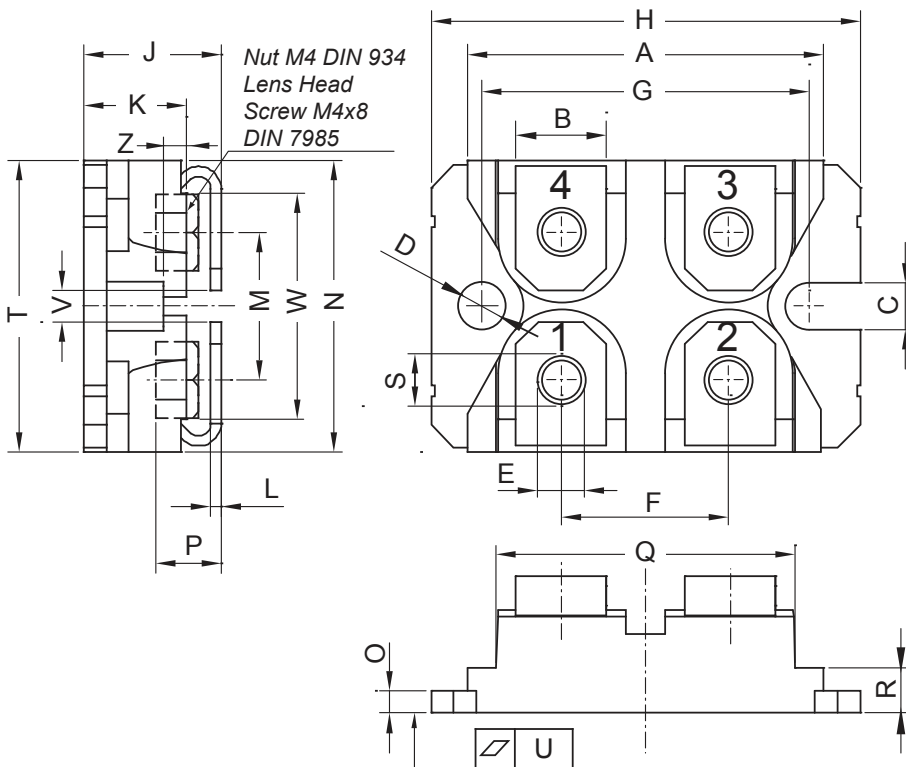
## Advantages

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

Symbol	Conditions	Characteristic Values		
		typ.	max.	
$I_R$	$V_R = V_{RRM}$ $T_{VJ} = 25^\circ C$		200	$\mu A$
	$V_R = 0.8 \cdot V_{RRM}$ $T_{VJ} = 25^\circ C$		100	$\mu A$
	$V_R = 0.8 \cdot V_{RRM}$ $T_{VJ} = 125^\circ C$		14	mA
$V_F$	$I_F = 60 A$ $T_{VJ} = 150^\circ C$		1.5	V
	$T_{VJ} = 25^\circ C$		1.8	V
$V_{T0}$	for power-loss calculations only		1.13	V
$r_T$	$T_{VJ} = T_{VJM}$		4.7	m $\Omega$
$R_{thJC}$		0.7		K/W
$R_{thCK}$		0.05		K/W
$t_{rr}$	$I_F = 1 A$ ; $-di/dt = 200 A/\mu s$ ; $V_R = 30 V$ ; $T_{VJ} = 25^\circ C$	35	50	ns
$I_{RM}$	$V_R = 350 V$ ; $I_F = 60 A$ ; $-di_F/dt = 480 A/\mu s$ $L \leq 0.05 \mu H$ ; $T_{VJ} = 100^\circ C$	19	21	A

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

Data according to IEC 60747

**miniBLOC, SOT-227 B**


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	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106

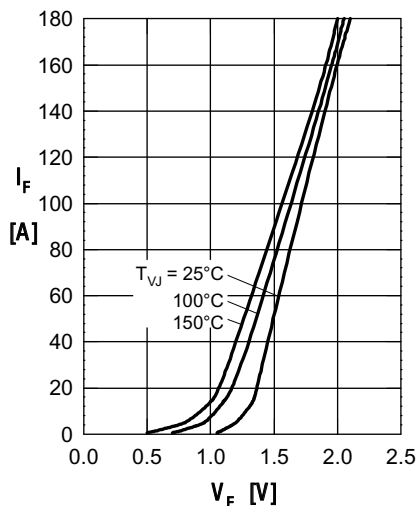


Fig. 1 Forward current  $I_F$  versus  $V_F$

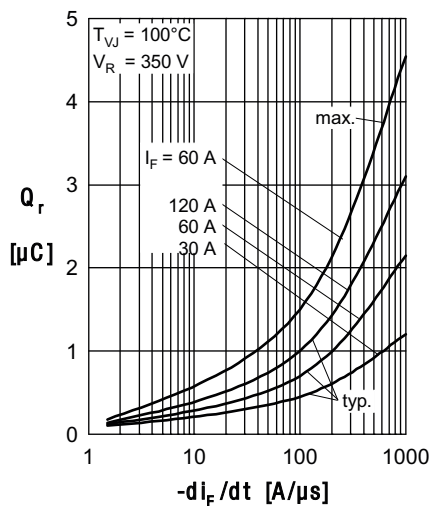


Fig. 2 Typ. recovery charge  $Q_r$  versus  $-di_F/dt$

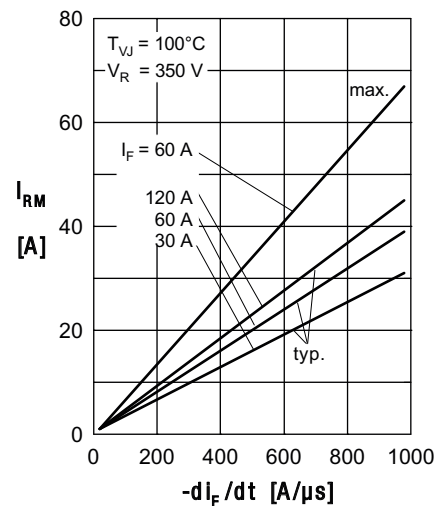


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

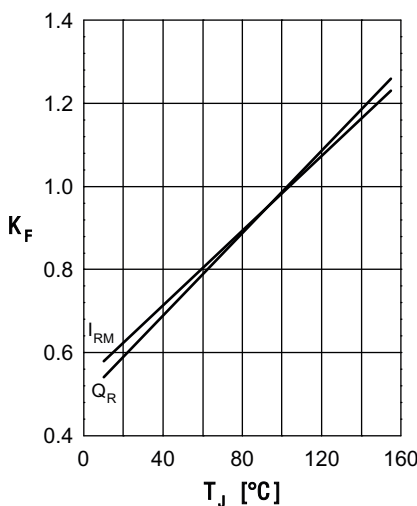


Fig. 4 Typ. dyn. parameters vs. junction temperature

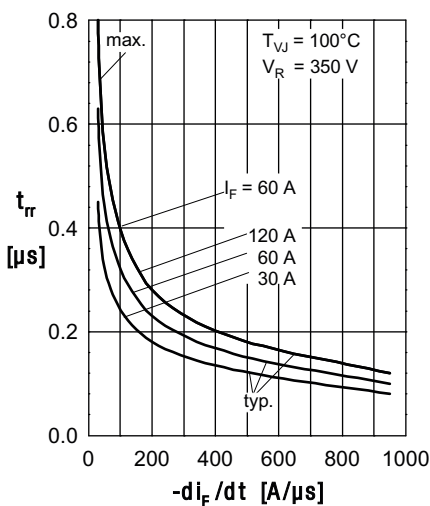


Fig. 5 Typ. recovery time  $t_{tr}$  versus  $-di_F/dt$

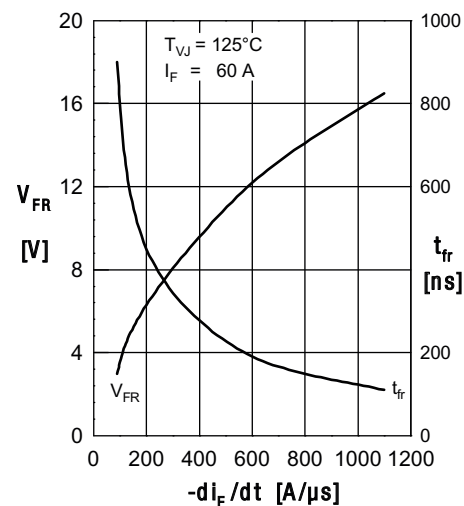


Fig. 6 Typ. peak forward voltage  $V_{FR}$  versus  $-di_F/dt$

