

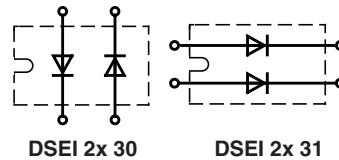
# Fast Recovery Epitaxial Diode (FRED)

$$I_{FAVM} = 2x\ 30\ A$$

$$V_{RRM} = 400/600\ V$$

$$t_{rr} = 35\ ns$$

$V_{RSM}$ V	$V_{RRM}$ V	Type
440	400	DSEI 2x 30-04C DSEI 2x 31-04C
640	600	DSEI 2x 30-06C DSEI 2x 31-06C


**miniBLOC, SOT-227 B**


Symbol	Test Conditions	Maximum Ratings (per diode)	
$I_{FRMS}$	$T_{VJ} = T_{VJM}$	70	A
$I_{FAVM}$ ①	$T_C = 85^\circ C$ ; rectangular, $d = 0.5$	30	A
$I_{FRM}$	$t_p < 10\ \mu s$ ; rep. rating, pulse width limited by $T_{VJM}$	375	A
$I_{FSM}$	$T_{VJ} = 45^\circ C$ ; $t = 10\ ms$ (50 Hz), sine	300	A
	$t = 8.3\ ms$ (60 Hz), sine	320	A
	$T_{VJ} = 150^\circ C$ ; $t = 10\ ms$ (50 Hz), sine	260	A
	$t = 8.3\ ms$ (60 Hz), sine	280	A
$I^2t$	$T_{VJ} = 45^\circ C$ ; $t = 10\ ms$ (50 Hz), sine	450	A <sup>2</sup> s
	$t = 8.3\ ms$ (60 Hz), sine	420	A <sup>2</sup> s
	$T_{VJ} = 150^\circ C$ ; $t = 10\ ms$ (50 Hz), sine	340	A <sup>2</sup> s
	$t = 8.3\ ms$ (60 Hz), sine	320	A <sup>2</sup> s
$T_{VJ}$		-40...+150	°C
$T_{VJM}$		150	°C
$T_{stg}$		-40...+150	°C
$P_{tot}$	$T_C = 25^\circ C$	100	W
$V_{ISOL}$	50/60 Hz, RMS $I_{ISOL} \leq 1\ mA$	2500	V~
$M_d$	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
<b>Weight</b>		30	g

Symbol	Test Conditions	Characteristic Values (per diode)	
		typ.	max.
$I_R$	$T_{VJ} = 25^\circ C$ ; $V_R = V_{RRM}$		100 $\mu A$
	$T_{VJ} = 25^\circ C$ ; $V_R = 0.8 \cdot V_{RRM}$		50 $\mu A$
	$T_{VJ} = 125^\circ C$ ; $V_R = 0.8 \cdot V_{RRM}$		7 mA
$V_F$	$I_F = 30\ A$ ; $T_{VJ} = 150^\circ C$ $T_{VJ} = 25^\circ C$		1.4 V
			1.6 V
$V_{T0}$	For power-loss calculations only		1.01 V
$r_T$	$T_{VJ} = T_{VJM}$		7.1 mΩ
$R_{thJC}$	0.05		1.25 K/W
$R_{thCK}$		K/W	
$t_{rr}$	$I_F = 1\ A$ ; $-di/dt = 100\ A/\mu s$ ; $V_R = 30\ V$ ; $T_{VJ} = 25^\circ C$	35	50 ns
$I_{RM}$	$V_R = 350\ V$ ; $I_F = 30\ A$ ; $-di_F/dt = 240\ A/\mu s$ $L \leq 0.05\ \mu H$ ; $T_{VJ} = 100^\circ C$	10	11 A

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

## 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  $I_{FRM}$ -values
- Soft recovery behaviour

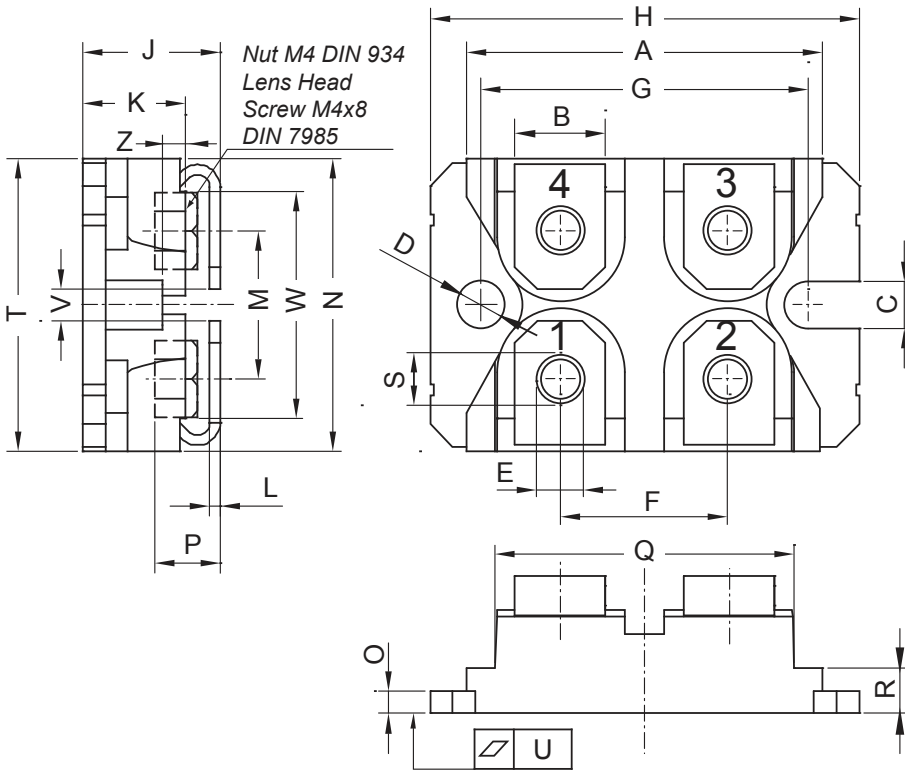
## Applications

- 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

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

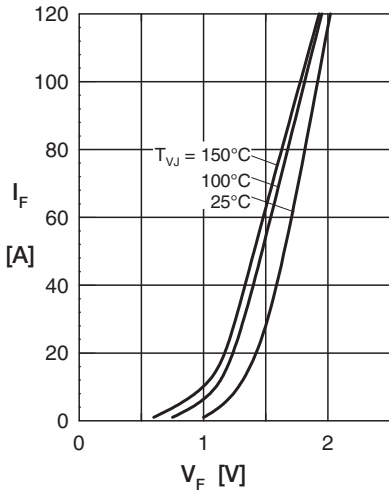


Fig. 1 Forward current vs. voltage drop

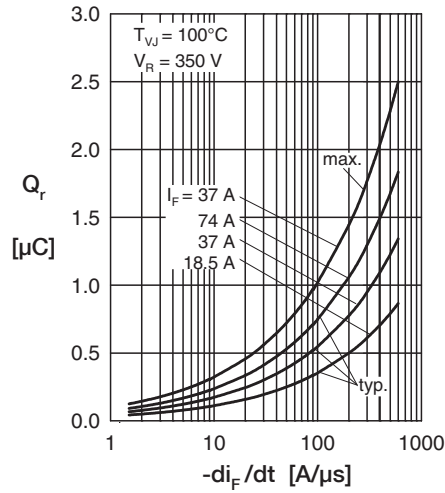


Fig. 2 Recovery charge versus  $-di_F/dt$

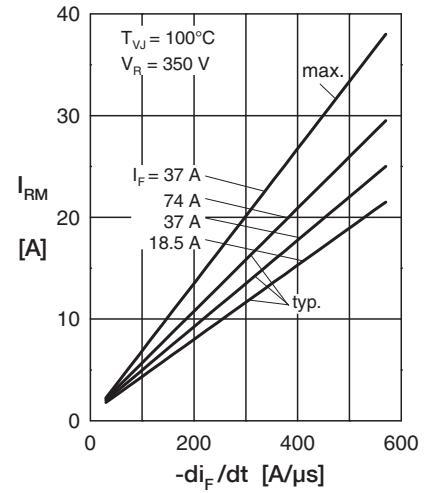


Fig. 3 Peak reverse current versus  $-di_F/dt$

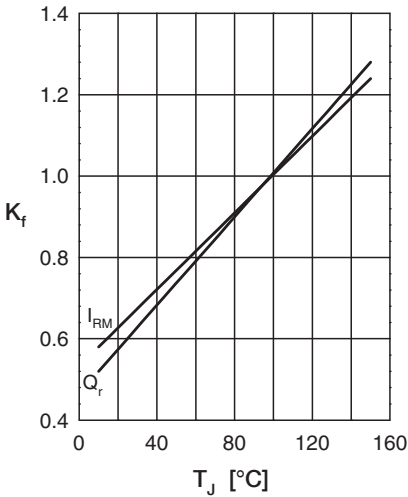


Fig. 4 Dynamic parameters vs. junction temperature

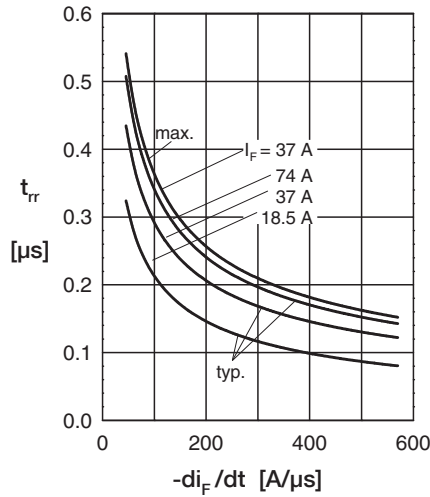


Fig. 5 Recovery time versus  $-di_F/dt$

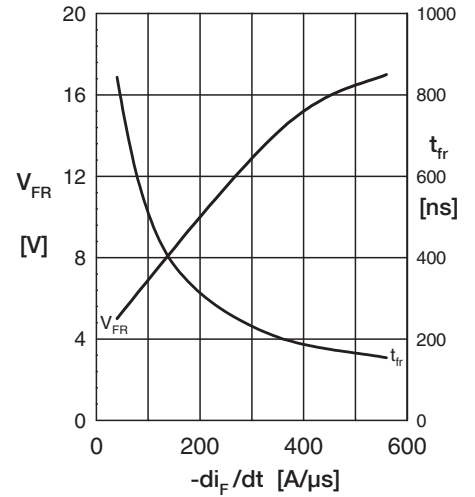


Fig. 6 Peak forward voltage versus  $-di_F/dt$

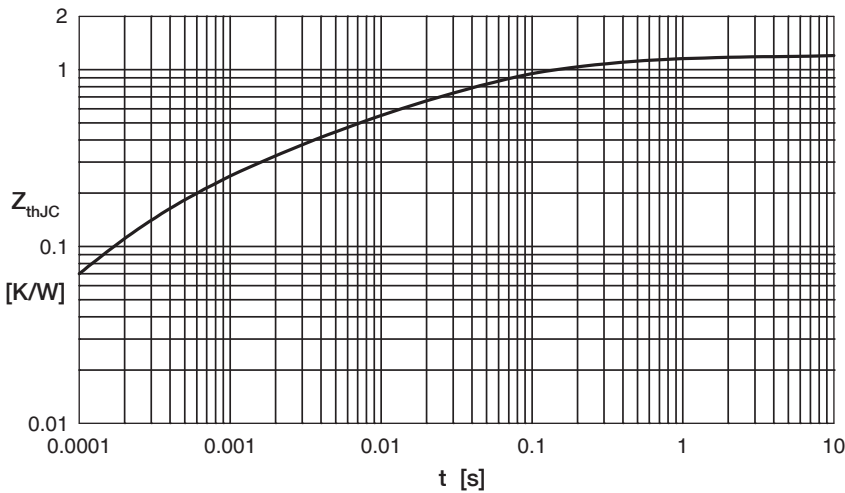


Fig. 7 Transient thermal impedance junction to case