

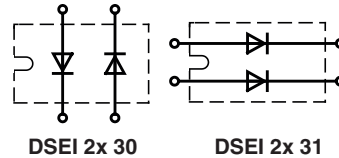
Fast Recovery Epitaxial Diode (FRED)

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

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

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

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 ² s
	$t = 8.3\ ms$ (60 Hz), sine	420	A ² s
	$T_{VJ} = 150^\circ C$; $t = 10\ ms$ (50 Hz), sine	340	A ² s
	$t = 8.3\ ms$ (60 Hz), sine	320	A ² 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.
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_{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

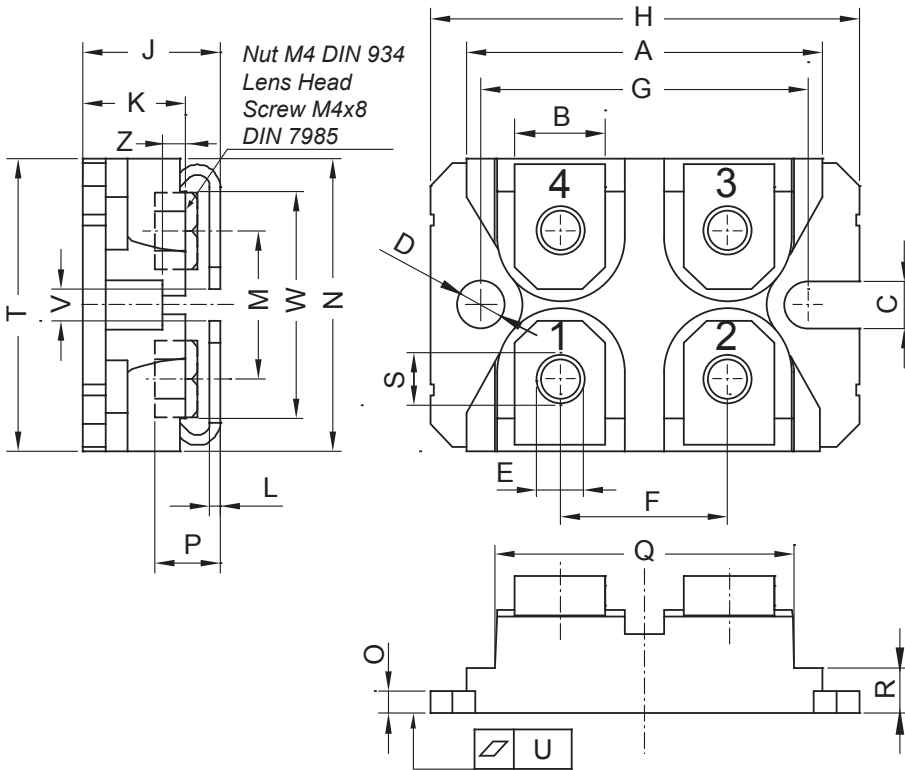
Advantages

- 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

Symbol	Test Conditions	Characteristic Values (per diode)	
		typ.	max.
I_R	$T_{VJ} = 25^\circ C$; $V_R = V_{RRM}$		100 μA
	$T_{VJ} = 25^\circ C$; $V_R = 0.8 \cdot V_{RRM}$		50 μA
	$T_{VJ} = 125^\circ C$; $V_R = 0.8 \cdot V_{RRM}$		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} R_{thCK}		0.05	1.25 K/W 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

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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

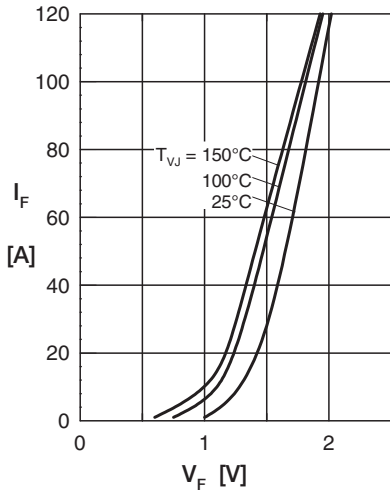


Fig. 1 Forward current vs. voltage drop

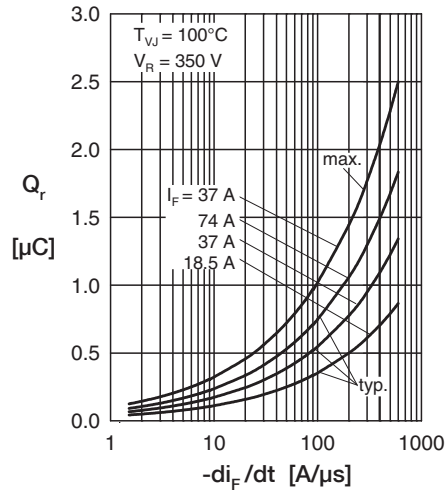


Fig. 2 Recovery charge versus $-di_F/dt$

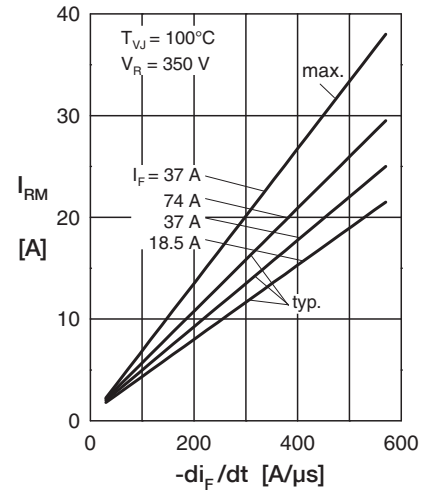


Fig. 3 Peak reverse current versus $-di_F/dt$

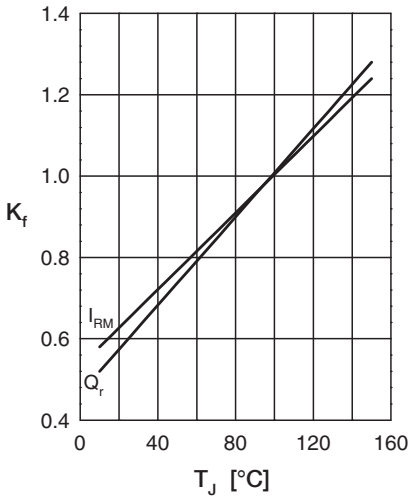


Fig. 4 Dynamic parameters vs. junction temperature

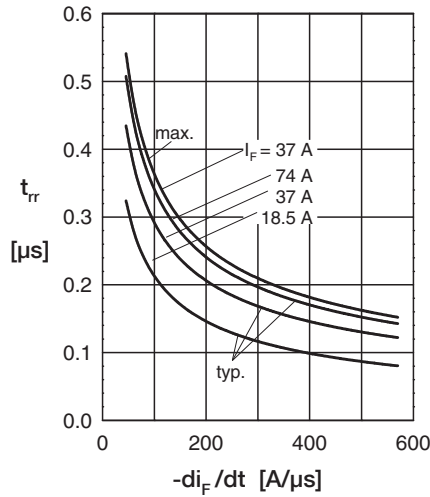


Fig. 5 Recovery time versus $-di_F/dt$

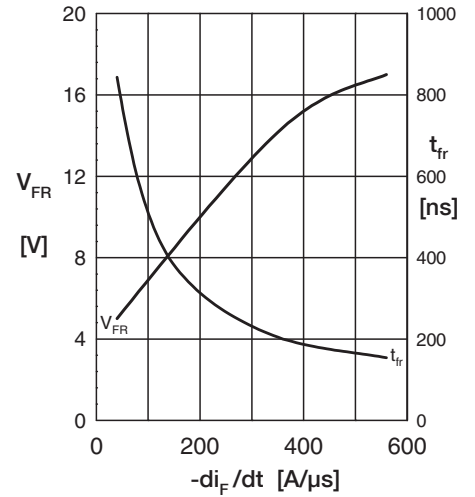


Fig. 6 Peak forward voltage versus $-di_F/dt$

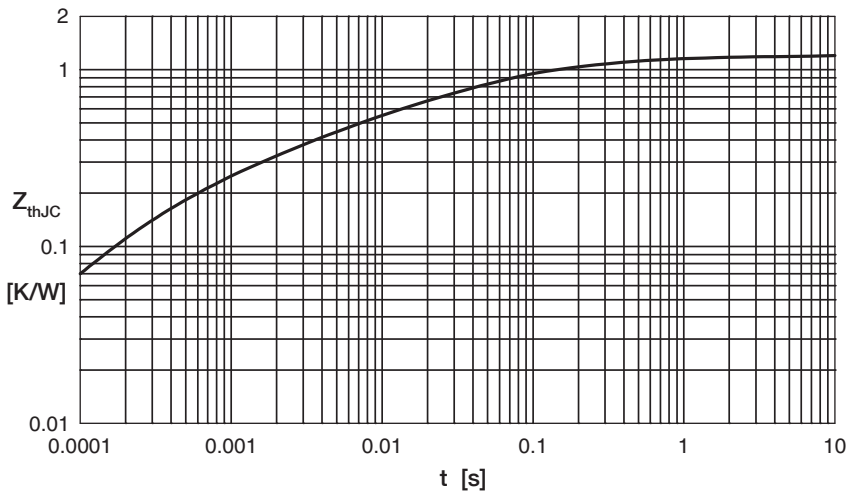


Fig. 7 Transient thermal impedance junction to case

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