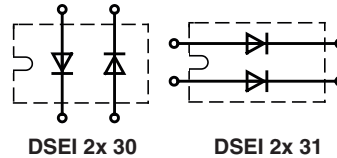


Fast Recovery Epitaxial Diode (FRED)

 $I_{FAVM} = 2x\ 30\ A$
 $V_{RRM} = 1000\ V$
 $t_{rr} = 35\ ns$

V_{RSM}	V_{RRM}	Type
V	V	
1000	1000	DSEI 2x 30-10B DSEI 2x 31-10B


miniBLOC, SOT-227 B


E72873

Symbol	Test Conditions	Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$	70	A
I_{FAVM} ①	$T_C = 50^\circ C$; 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 $t = 8.3\ ms$ (60 Hz), sine	200	A
		210	A
	$T_{VJ} = 150^\circ C$; $t = 10\ ms$ (50 Hz), sine $t = 8.3\ ms$ (60 Hz), sine	185	A
		195	A
I^2t	$T_{VJ} = 45^\circ C$; $t = 10\ ms$ (50 Hz), sine $t = 8.3\ ms$ (60 Hz), sine	200	A ² s
		180	A ² s
	$T_{VJ} = 150^\circ C$; $t = 10\ ms$ (50 Hz), sine $t = 8.3\ ms$ (60 Hz), sine	170	A ² s
		160	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_{RM} -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

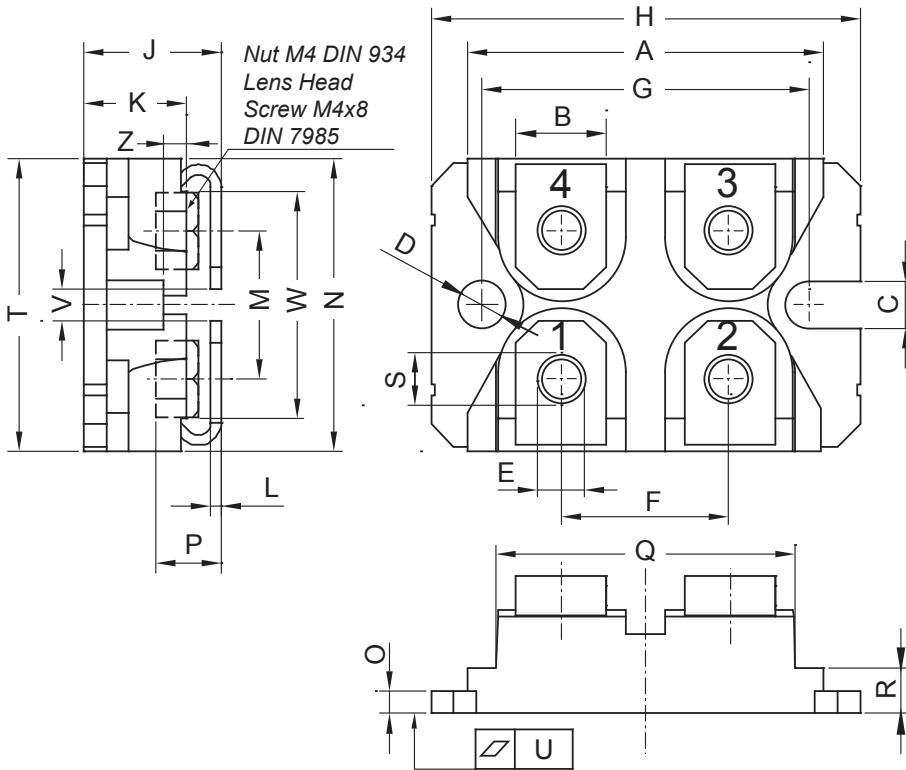
Advantages

- 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	$T_{VJ} = 25^\circ C$ $V_R = V_{RRM}$		750 μA
	$T_{VJ} = 25^\circ C$ $V_R = 0.8 \cdot V_{RRM}$		250 μA
	$T_{VJ} = 125^\circ C$ $V_R = 0.8 \cdot V_{RRM}$		7 mA
V_F	$I_F = 30\ A$; $T_{VJ} = 150^\circ C$ $T_{VJ} = 25^\circ C$		2 V
			2.4 V
V_{T0}	For power-loss calculations only		1.5 V
r_T	$T_{VJ} = T_{VJM}$		12.5 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}	$V_R = 540\ V$; $I_F = 30\ A$; $-di_F/dt = 240\ A/\mu s$ $L \leq 0.05\ \mu H$; $T_{VJ} = 100^\circ C$	16	18 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

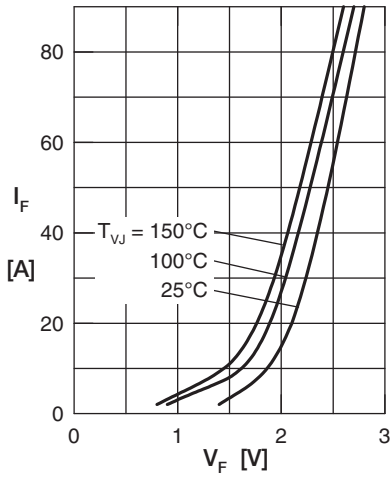


Fig. 1 Typ. forward current versus voltage drop

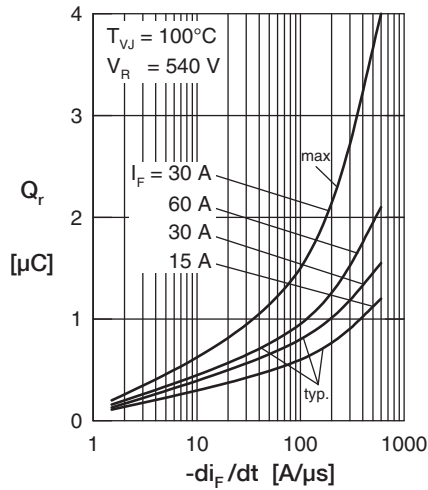


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

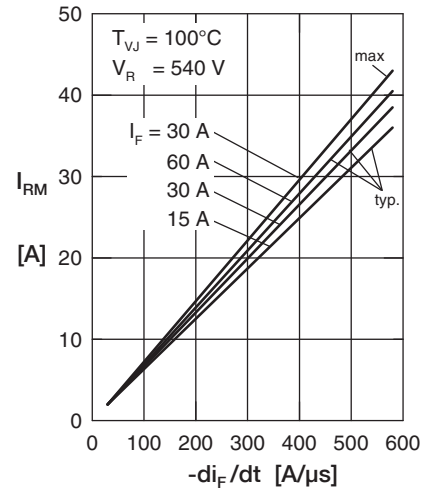


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

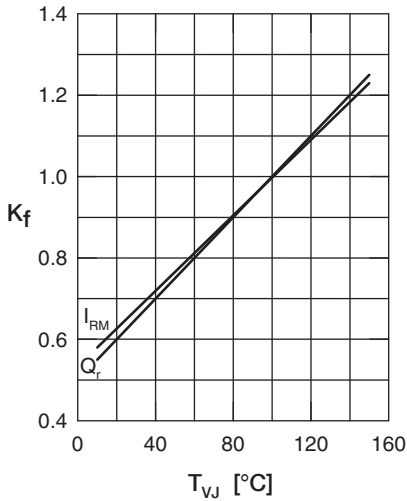


Fig. 4 Dynamic parameters vs. junction temperature

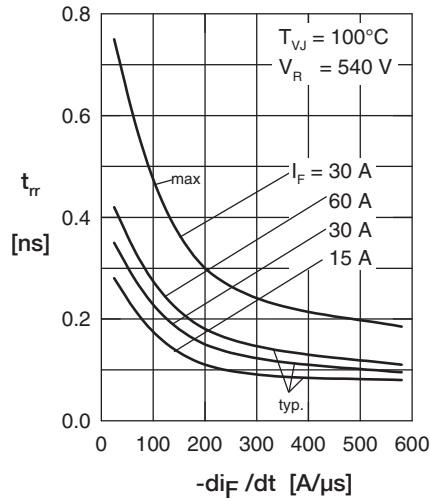


Fig. 5 Typ. recovery time versus $-di_F/dt$

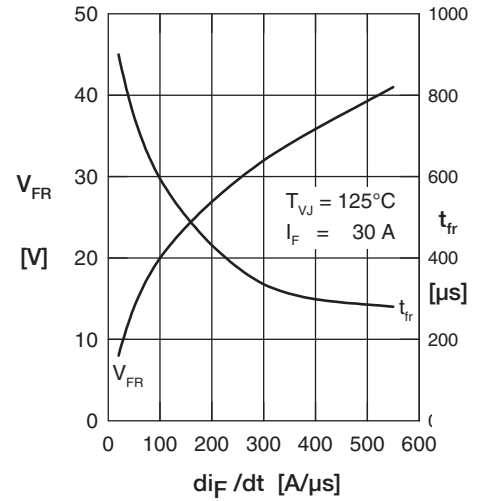


Fig. 6 Typ. peak forward voltage versus di_F/dt

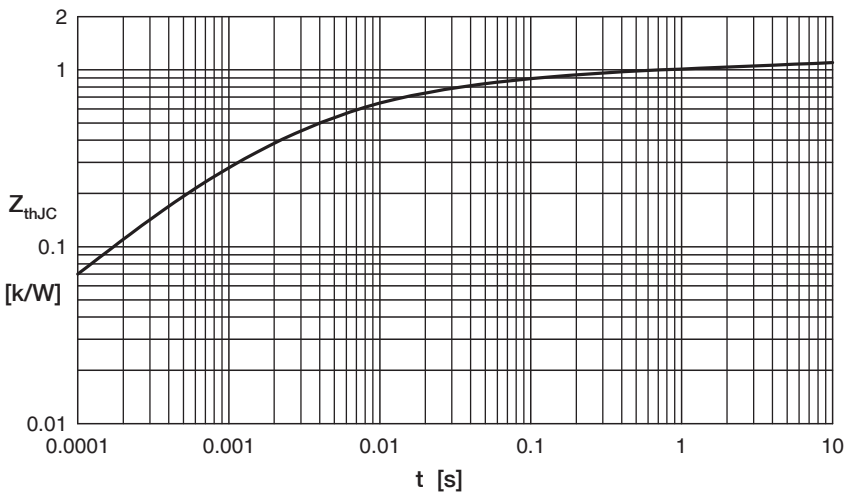


Fig. 7 Transient thermal impedance junction to case