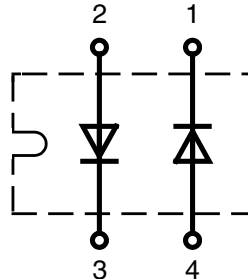


Fast Recovery Epitaxial Diode (FRED)

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

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 ² s
		$t = 8.3 ms$ (60 Hz), sine	1490 A ² s
	$T_{VJ} = 150^\circ C$;	$t = 10 ms$ (50 Hz), sine	1150 A ² s
		$t = 8.3 ms$ (60 Hz), sine	1120 A ² 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

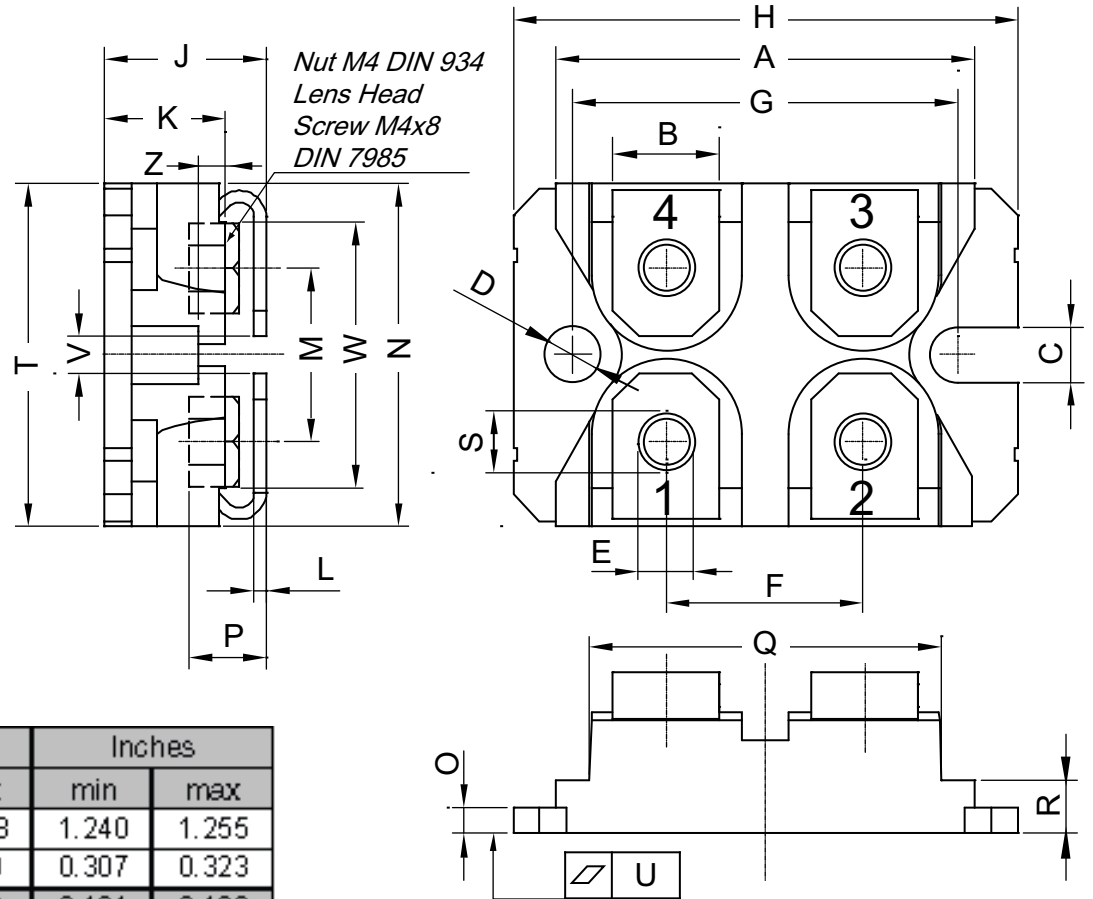
- Antiparallel diode for high frequency switching devices
- Anti saturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners 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	$V_R = V_{RRM}$ $V_R = 0.8 \cdot V_{RRM}$ $V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 25^\circ C$	200	μA
		$T_{VJ} = 25^\circ C$	100	μA
		$T_{VJ} = 125^\circ C$	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 Ω
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



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

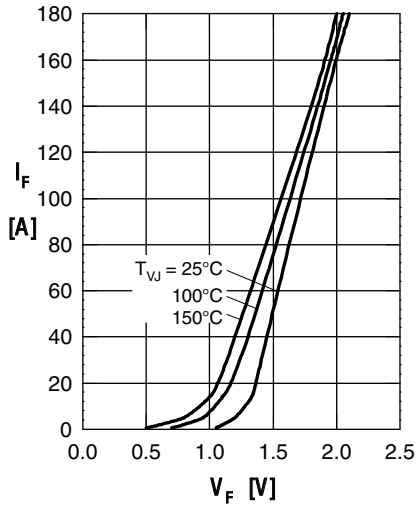


Fig. 1 Forward current I_F versus V_F

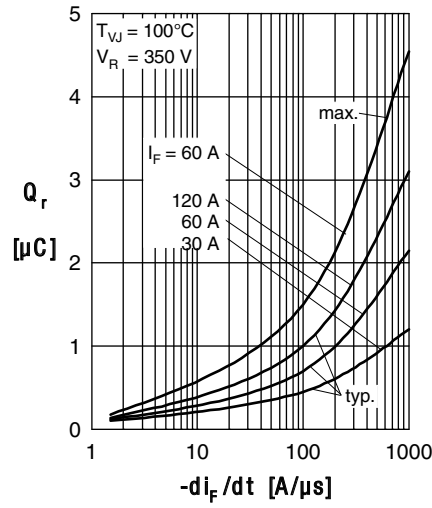


Fig. 2 Typ. recovery charge Q_r versus $-di_F/dt$

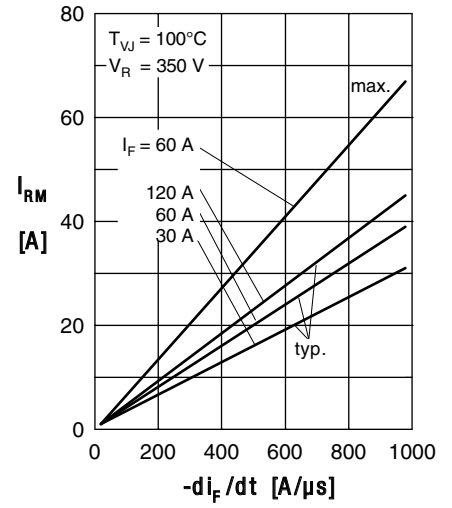


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

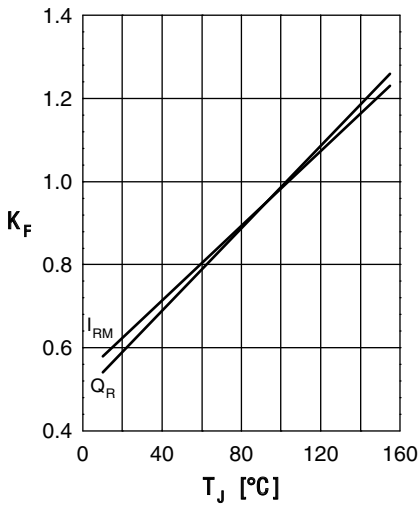


Fig. 4 Typ. dyn. parameters vs. junction temperature

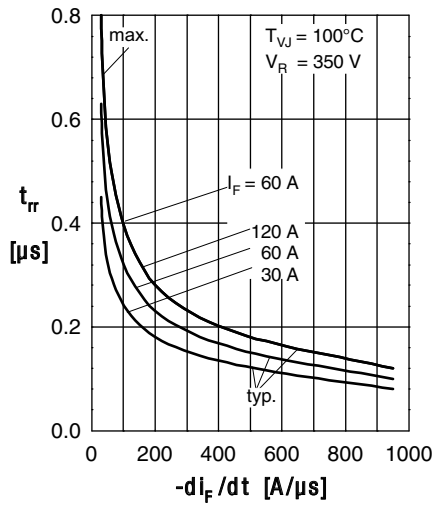


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

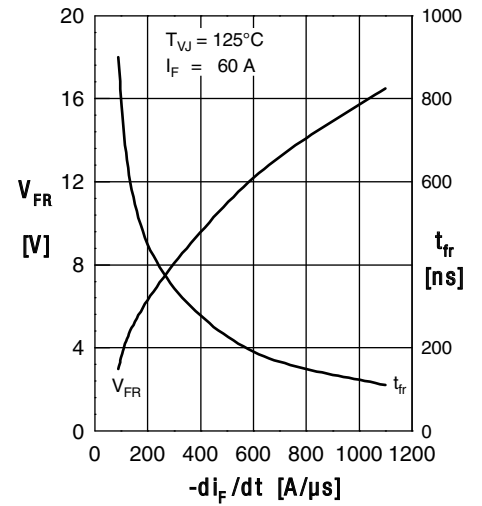
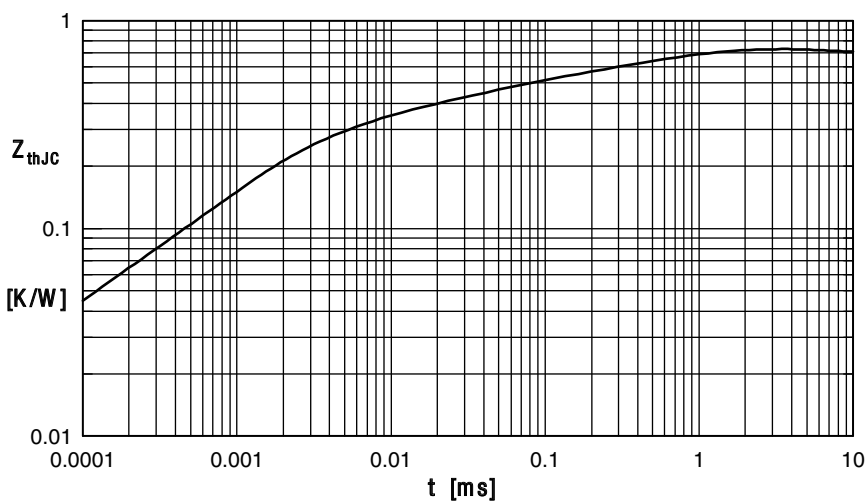
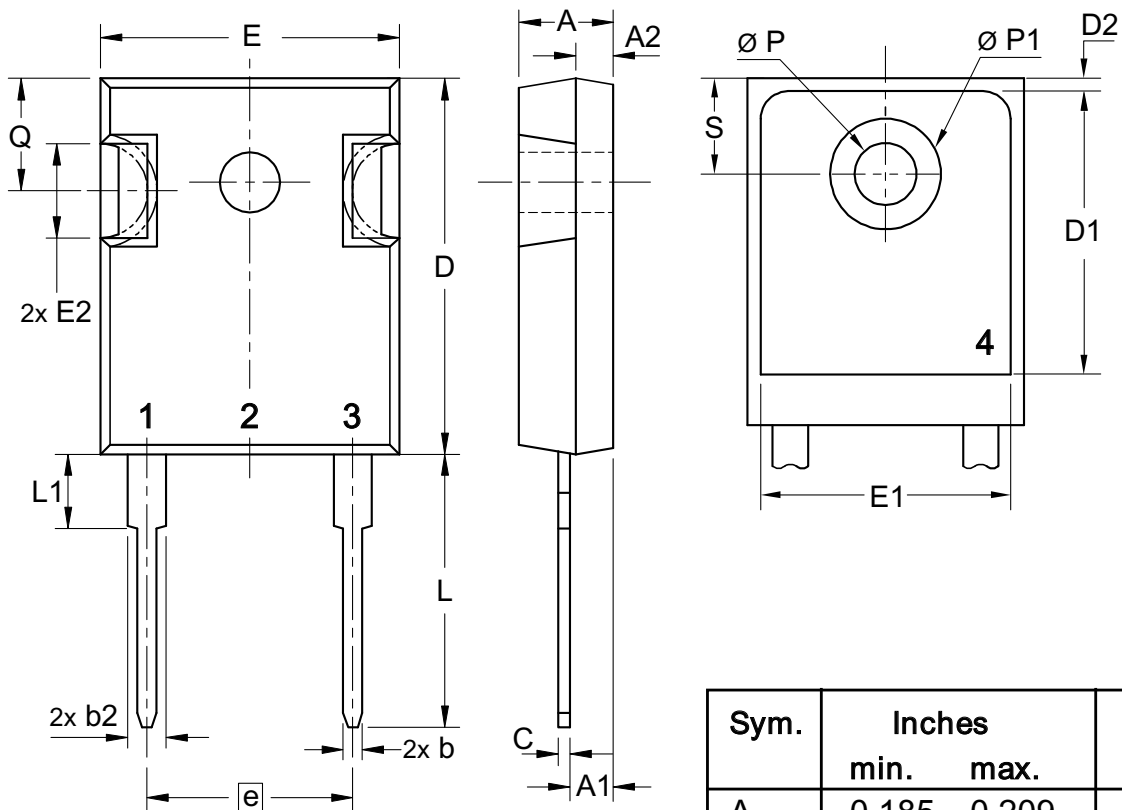


Fig. 6 Typ. peak forward voltage V_{FR} versus $-di_F/dt$



Dimensions TO-247 AD



Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.430 BSC		10.92 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39