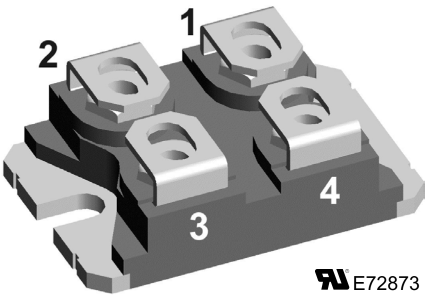
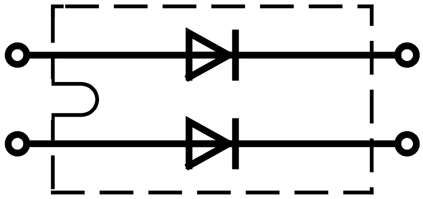
Fast Recovery Epitaxial Diode (FRED)

I_{FAVM} = 2x 123 A
V_{RRM} = 200 V
t_{rr} = 35 ns

Part number

DSEI2x121-02A





Features / Advantages:

- 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
- Antisaturation 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)

Package: miniBLOC, SOT-227 B

- Isolation voltage 2500 V~
- International standard package (ISOTOP compatible)
- 2 independent FREDs in 1 package
- RoHS compliant
- Epoxy meets UL 94V-0

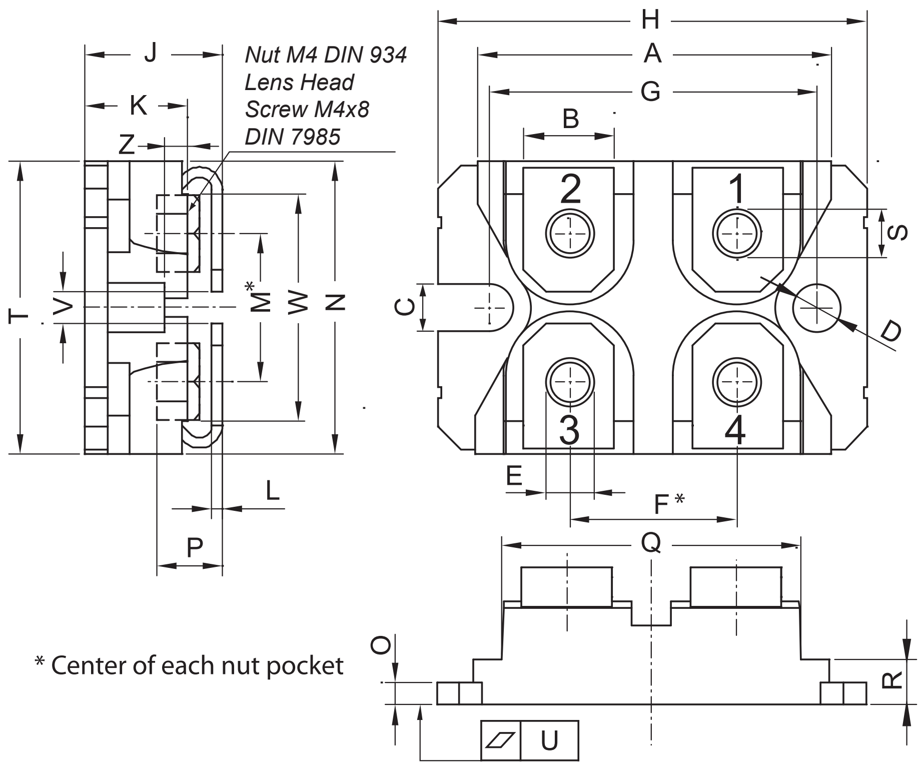
Symbol	Conditions			Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$			150	A
I_{FAVM} ①	$T_C = 70°C$; rectangular, d = 0.5			123	A
I_{FRM}	$t_P < 10$ s; rep. rating, pulse width limited by T_{VJM}			600	A
I_{FSM}	$T_{VJ} = 45°C$;	t = 10 ms	(50 Hz), sine	1200	A
		t = 8.3 ms	(60 Hz), sine	1300	A
	$T_{VJ} = 150°C$;	t = 10 ms	(50 Hz), sine	1080	A
		t = 8.3 ms	(60 Hz), sine	1170	A
I^2t	$T_{VJ} = 45°C$;	t = 10 ms	(50 Hz), sine	7200	A^2s
		t = 8.3 ms	(60 Hz), sine	7100	A^2s
	$T_{VJ} = 150°C$;	t = 10 ms	(50 Hz), sine	5800	A^2s
		t = 8.3 ms	(60 Hz), sine	5700	A^2s
P_{tot}	$T_C = 25°C$			250	W

Symbol	Conditions		Characteristic Values		
			typ.	max.	
I_R	$V_R = V_{RRM}$	$T_{VJ} = 25°C$		1	mA
	$V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 25°C$		0.5	mA
	$V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 125°C$		20	mA
V_F	$I_F = 120$ A	$T_{VJ} = 150°C$	0.89	0.95	V
		$T_{VJ} = 25°C$		1.10	V
V_T	For power-loss calculations only			0.7	V
r_T		$T_{VJ} = T_{VJM}$		2.1	mΩ
R_{thJC}				0.5	K/W
R_{thCK}			0.1		K/W
t_{rr}	$I_F = 1$ A; -di/dt = 400 A/µs; $V_R = 30$ V; $T_{VJ} = 25°C$		35	50	ns
I_{RM}	$V_R = 100$ V; $I_F = 100$ A; $-di_F/dt = 200$ A/µs $L \leq 0.05$ µH; $T_{VJ} = 100°C$		12	15	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

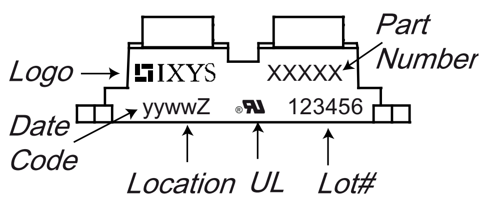
Package	miniBLOC, SOT-227 B			Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
I_{RMS}	*RMS current*	per terminal ①				150	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		150	°C
Weight					30		g
M_D	*mounting torque*			1.1		1.5	Nm
M_T	*terminal torque (M4)*			1.1		1.5	Nm
$d_{Spp/App}$	*creepage distance on surface* | *striking distance through air*	terminal to terminal	10.5	3.2			mm
$d_{Spb/Apb}$		terminal to backside	8.6	6.8			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \le 1$ mA	3000			V
		t = 1 minute		2500			V

① I_{RMS} is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.



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

Product Marking



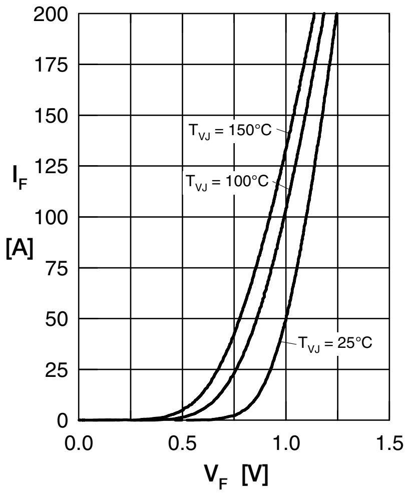


Fig. 1 Forward current I_F versus V_F

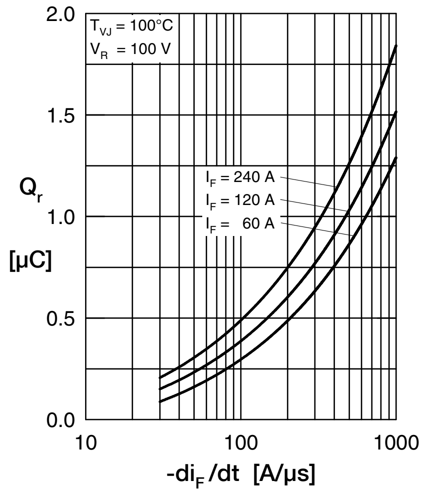


Fig. 2 Typ. reverse recov, charge Q_{rr} versus $-di_F/dt$

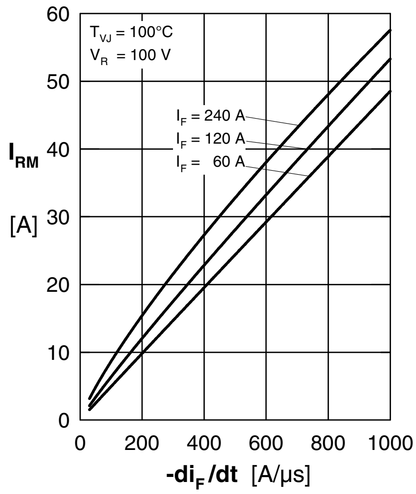


Fig. 3 Typ. peak reverse current I_{rr} versus $-di_F/dt$

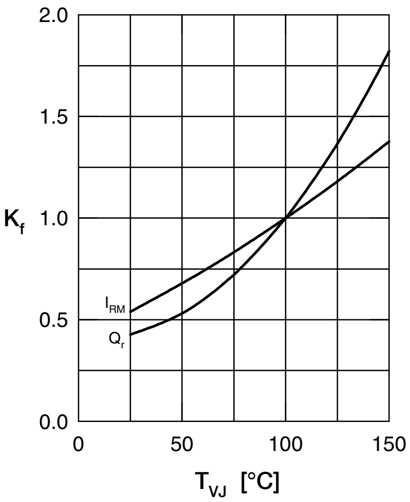


Fig. 4 Typ. dyn. parameters Q_r, I_{RM} versus T_{VJ}

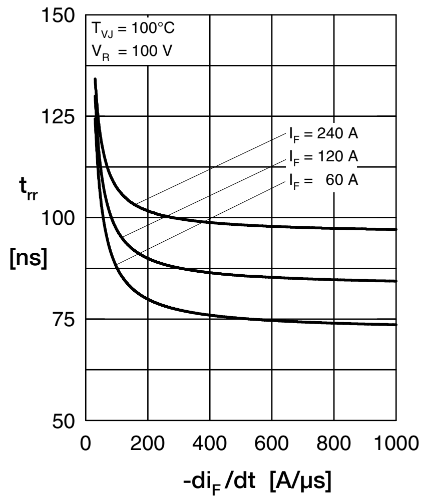


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

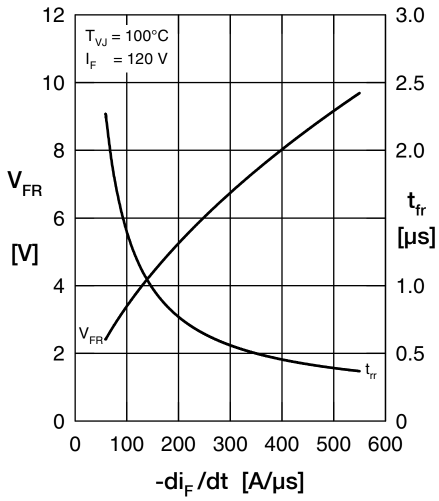


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

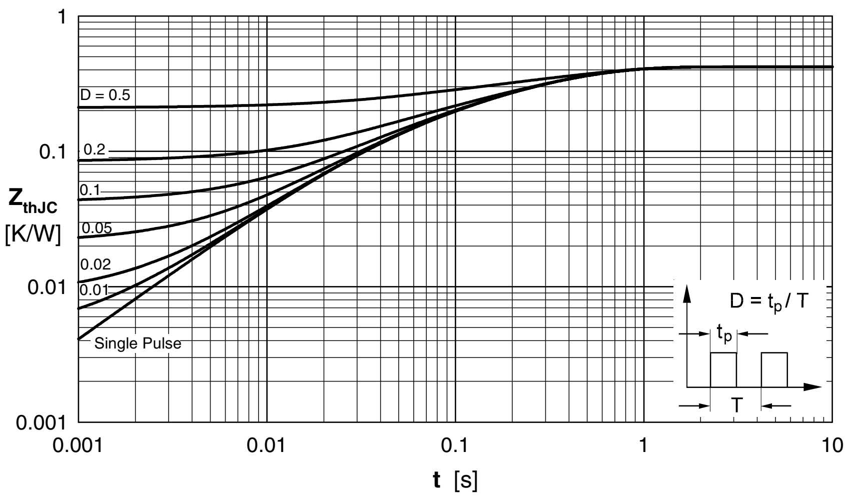


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0725	0.0028
2	0.1423	0.0092
3	0.2852	0.0350