

Fast Recovery Epitaxial Diode (FRED)

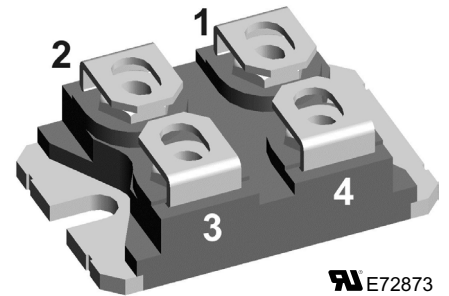
$$I_{FAVM} = 2 \times 123 \text{ A}$$

$$V_{RRM} = 200 \text{ V}$$

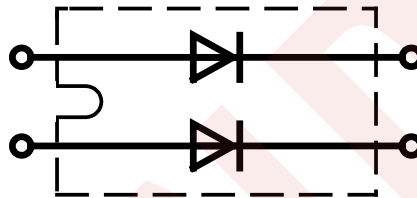
$$t_{rr} = 35 \text{ ns}$$

Part number

DSEI2x121-02A



E72873


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

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

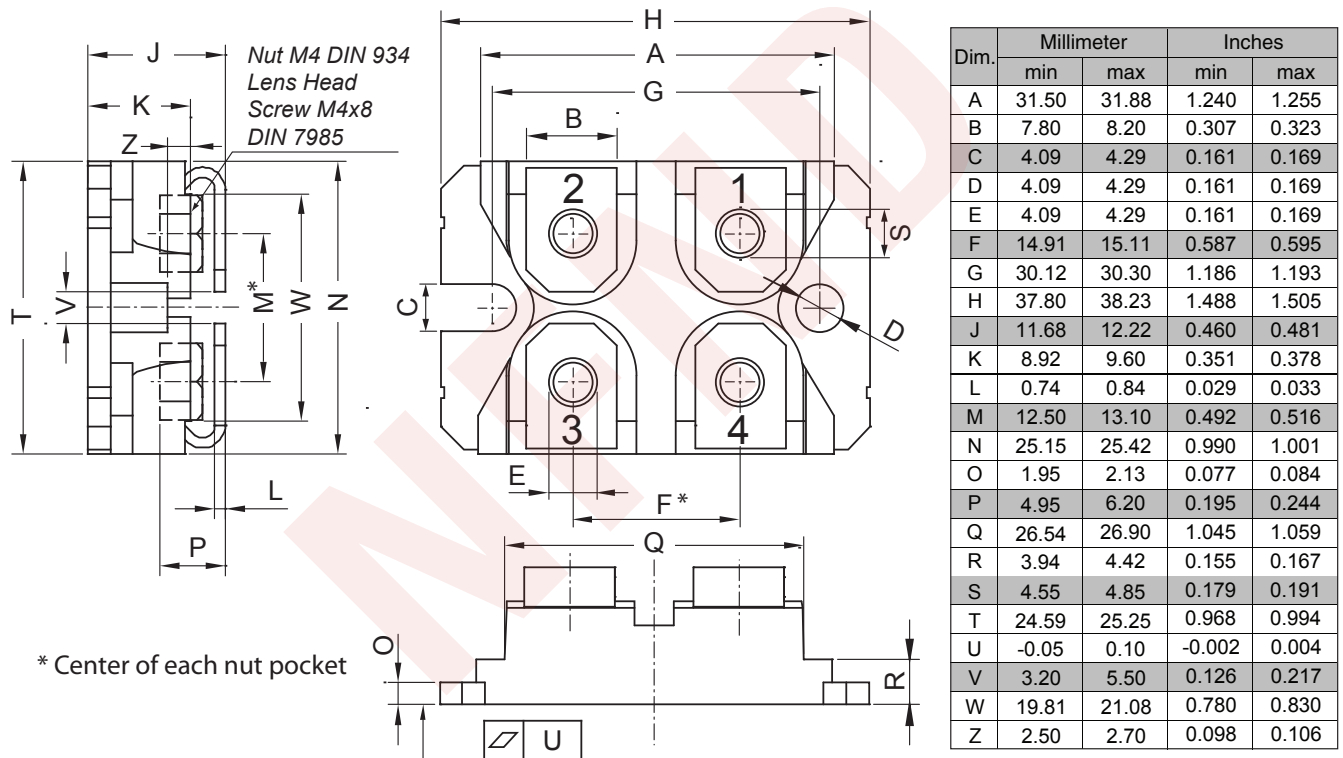
Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R	$V_R = V_{RRM}$ $T_{VJ} = 25^\circ\text{C}$		1	mA
	$V_R = 0.8 \cdot V_{RRM}$ $T_{VJ} = 25^\circ\text{C}$		0.5	mA
	$V_R = 0.8 \cdot V_{RRM}$ $T_{VJ} = 125^\circ\text{C}$		20	mA
V_F	$I_F = 120$ A $T_{VJ} = 150^\circ\text{C}$	0.89	0.95	V
	$T_{VJ}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

 ① I_{FAVM} rating includes reverse blocking losses at T_{VJM} , $V_R = 0.8 V_{RRM}$, duty cycle $d = 0.5$

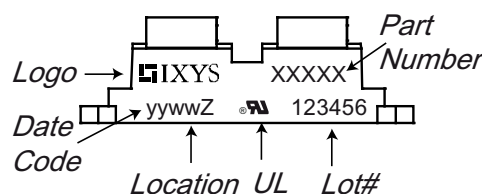
Data according to IEC 60747

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 $t = 1$ minute	3000 2500			V V
			50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA			

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.



Product Marking



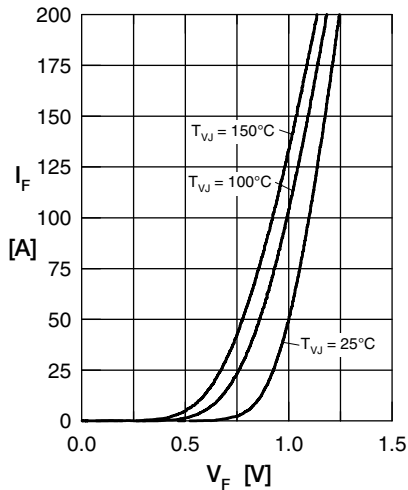


Fig. 1 Forward current I_F versus V_F

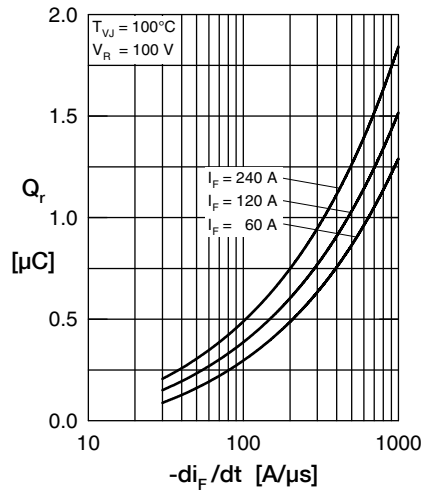


Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

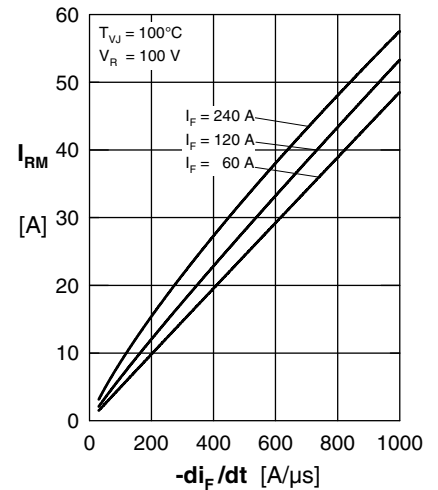


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

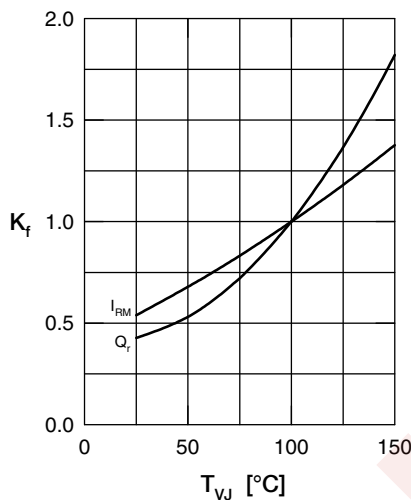


Fig. 4 Typ. dyn. parameters Q_{rr} , I_{RM} versus T_{VJ}

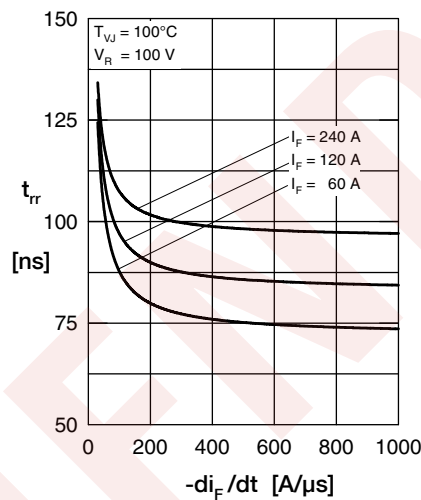


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

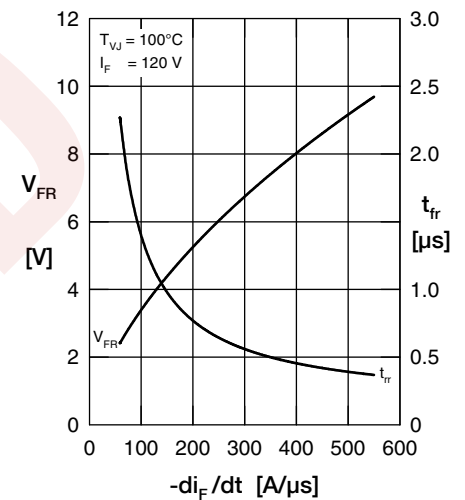


Fig. 6 Typ. peak forward voltage V_{FR} and t_{rr} versus di_F/dt

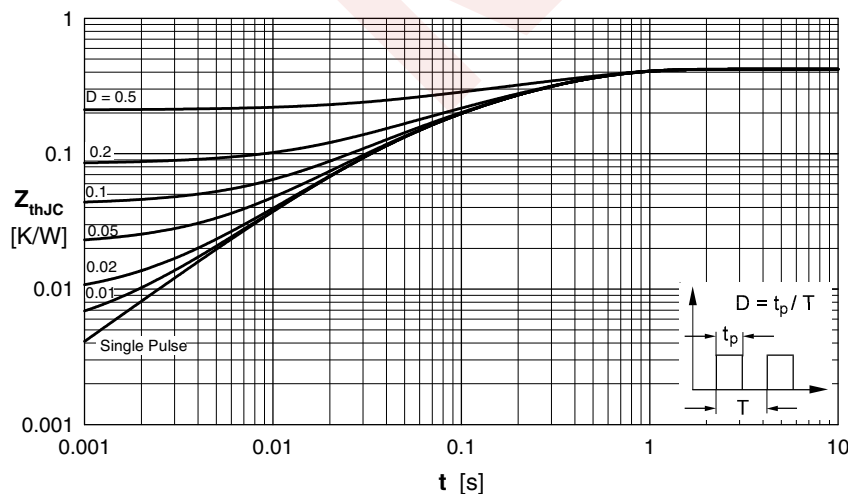


Fig. 7 Transient thermal impedance junction to case

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