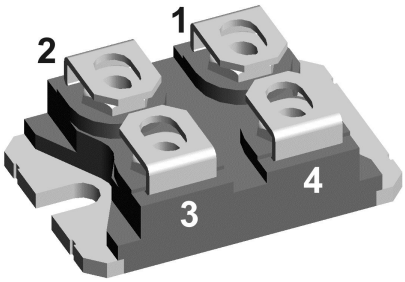
HiPerDynFRED

V_{RRM} = 1800 V
I_{FAV} = 2x 25 A
t_{rr} = 30 ns

High Performance Dynamic Fast Recovery Diode
Extreme Low Loss and Soft Recovery
Parallel legs with series connected dice

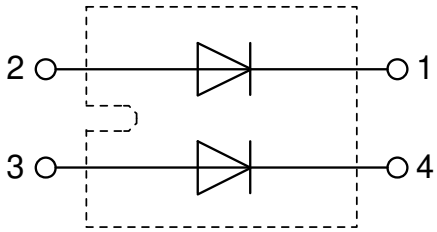
Part number

DPJ50XS1800NA



Backside: isolated

E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package: SOT-227B (minibloc)

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

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Fast Diode

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1800	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1800	V
I_R	*reverse current, drain current*	V_R = 1800 V	T_{VJ} = 25°C			250	µA
		V_R = 1800 V	T_{VJ} = 150°C			2	mA
V_F	*forward voltage drop*	I_F = 25 A	T_{VJ} = 25°C			6.99	V
		I_F = 50 A				8.72	V
		I_F = 25 A	T_{VJ} = 150°C			4.33	V
		I_F = 50 A				5.83	V
I_{FAV}	*average forward current*	T_C = 90°C	T_{VJ} = 150°C			25	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			2.92	V
r_F	*slope resistance* }					56	mΩ
R_{thJC}	*thermal resistance junction to case*					0.4	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.1		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			315	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			250	A
C_J	*junction capacitance*	V_R = 900 V f = 1 MHz	T_{VJ} = 25°C		10		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		9		A
		I_F = 30 A; V_R = 900 V	T_{VJ} = 125°C		13		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 400 A/µs	T_{VJ} = 25°C		30		ns
			T_{VJ} = 125°C		140		ns

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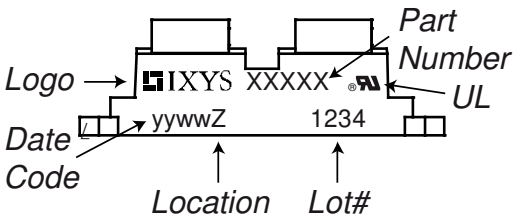
Package SOT-227B (minibloc)					Ratings			
Symbol	**Definition**	**Conditions**			**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal					100	A
T_{VJ}	*virtual junction temperature*				-40		150	°C
T_{op}	*operation temperature*				-40		125	°C
T_{stg}	*storage temperature*				-40		150	°C
Weight						30		g
M_D	*mounting torque*				1.1		1.5	Nm
M_T	*terminal torque*				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} ≤ 1 mA		3000			V
		t = 1 minute			2500			V

Product Marking



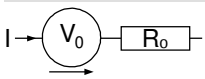
Part description

D = Diode
P = HiPerFRED
J = HiPerDyn +
50 = Current Rating [A]
XS = Parallel legs with series connected dice
1800 = Reverse Voltage [V]
NA = SOT-227B (minibloc)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPJ50XS1800NA	DPJ50XS1800NA	Tube	10	517619

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150°C



		Fast Diode	
$V_{0\ max}$	*threshold voltage*	2.92	V
$R_{0\ max}$	*slope resistance **	55	mΩ

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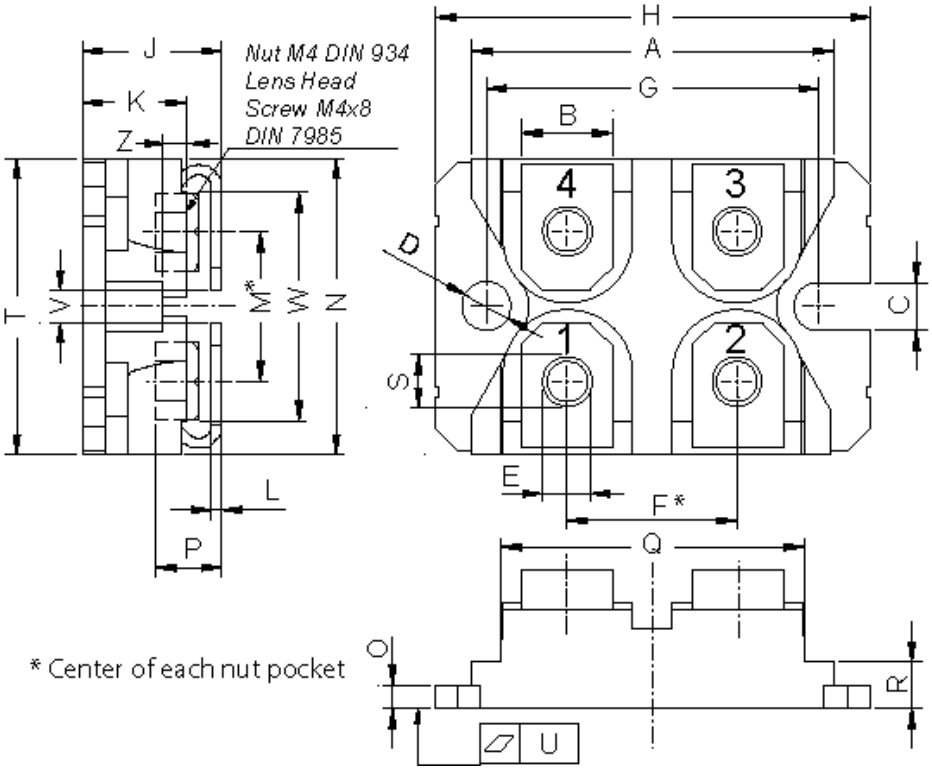
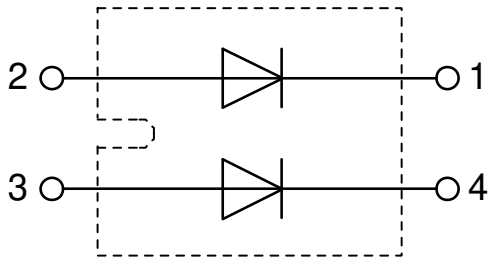
Outlines SOT-227B (minibloc)



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



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Fast Diode

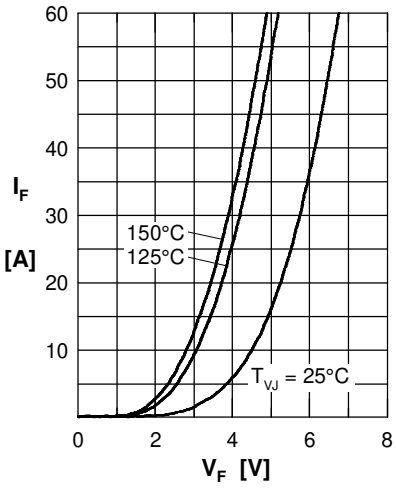

Fig. 1 Typ. Forward current I_F versus V_F

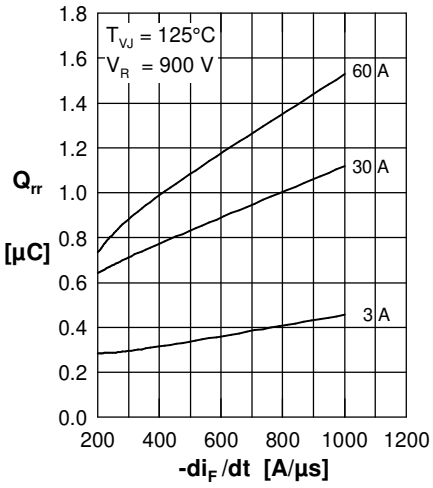

Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

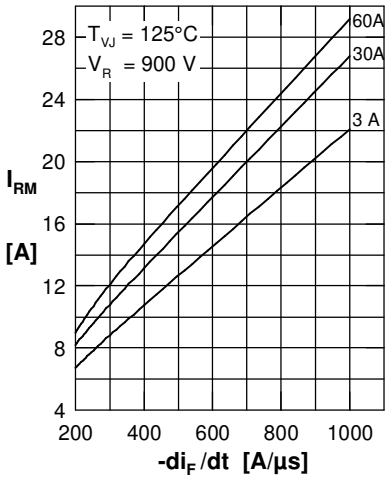

Fig. 3 Typ. reverse recov. current I_{RM} versus $-di_F/dt$

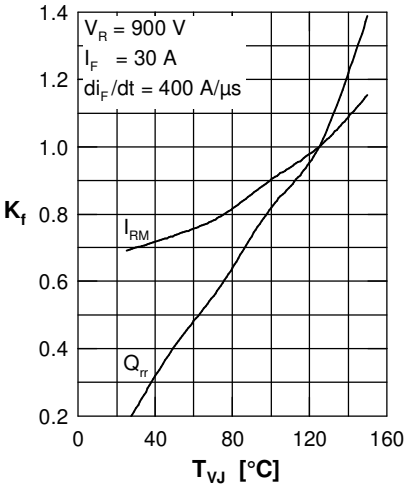

Fig. 4 Typ. dynamic parameters Q_{rr}, I_{RM} versus T_{VJ}

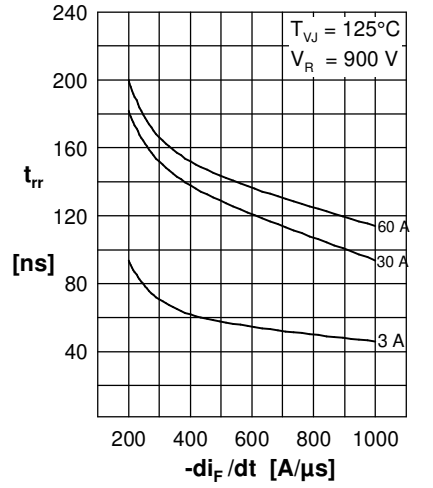

Fig. 5 Typ. reverse recov. time t_{rr} versus $-di_F/dt$

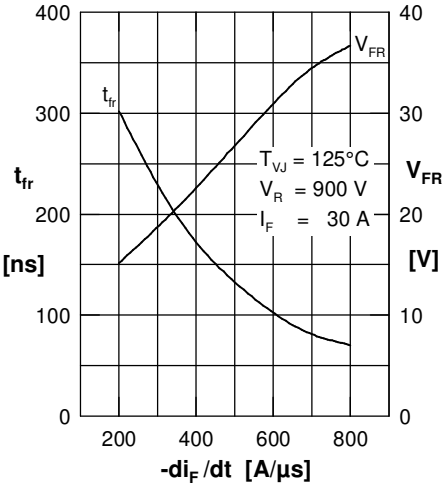

Fig. 6 Typ. forward recov. voltage V_{FR} & time t_{fr} versus di_F/dt

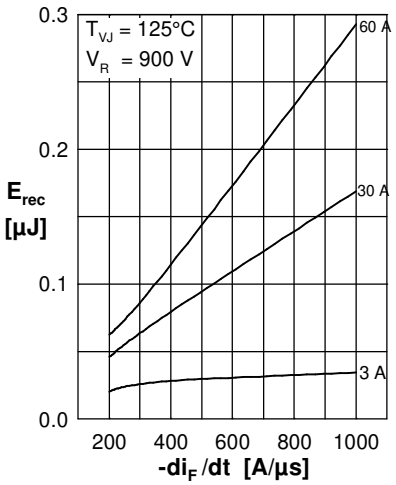

Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

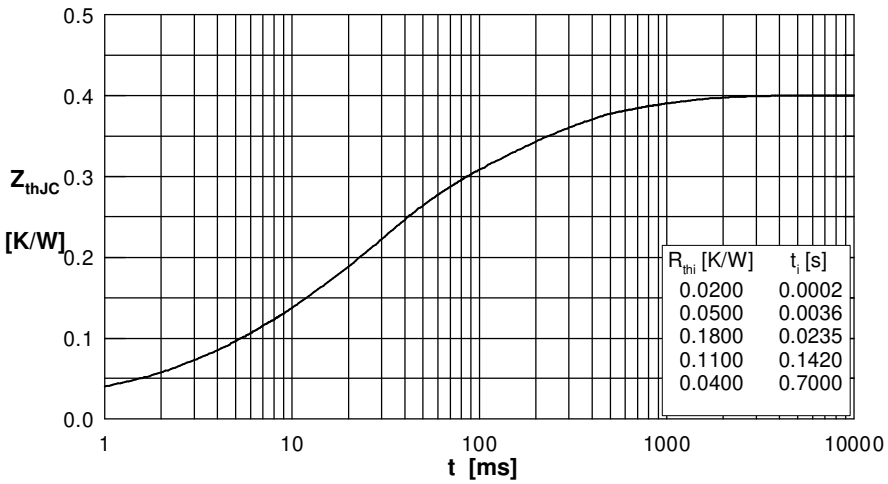

Fig. 8 Transient thermal impedance junction to case

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