

HiPerFRED

$$V_{RRM} = 400V$$

$$I_{FAV} = 2x\ 100A$$

$$t_{rr} = 30ns$$

High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Parallel legs

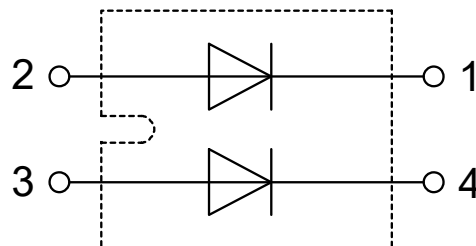
Part number

DSEP2x101-04A



Backside: isolated

 E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I_{rm} -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{rm} 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.

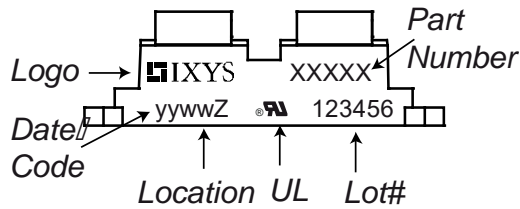


Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					400	V
V_{RRM}	max. repetitive reverse blocking voltage					400	V
I_R	reverse current, drain current	$V_R = 400\text{ V}$	$T_{VJ} = 25^\circ\text{C}$			1	mA
		$V_R = 400\text{ V}$	$T_{VJ} = 150^\circ\text{C}$			4	mA
V_F	forward voltage drop	$I_F = 100\text{ A}$	$T_{VJ} = 25^\circ\text{C}$			1,54	V
						1,95	V
		$I_F = 100\text{ A}$	$T_{VJ} = 150^\circ\text{C}$			1,22	V
						1,73	V
I_{FAV}	average forward current	$T_c = 45^\circ\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^\circ\text{C}$			100	A
V_{FO}	threshold voltage	} for power loss calculation only				0,72	V
r_F	slope resistance						
R_{thJC}	thermal resistance junction to case					0,6	K/W
R_{thCH}	thermal resistance case to heatsink				0,1		K/W
P_{tot}	total power dissipation			$T_c = 25^\circ\text{C}$		200	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		1,00	kA
C_J	junction capacitance	$V_R = 200\text{ V}$ $f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		182	pF
I_{RM}	max. reverse recovery current	} $I_F = 100\text{ A}; V_R = 200\text{ V}$ $-di_F/dt = 600\text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$		16	A
				$T_{VJ} = 100^\circ\text{C}$		30	A
t_{rr}	reverse recovery time			$T_{VJ} = 25^\circ\text{C}$		30	ns
				$T_{VJ} = 100^\circ\text{C}$		85	ns



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

Product Marking



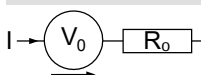
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEP2x101-04A	DSEP2x101-04A	Tube	10	484334

Similar Part	Package	Voltage class
DPF240X400NA	SOT-227B (minibloc)	400

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 150^\circ\text{C}$



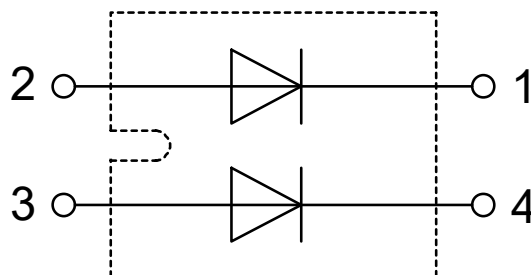
Symbol	Definition	Fast Diode	Unit
$V_{0\ max}$	threshold voltage	0,72	V
$R_{0\ max}$	slope resistance *	4,6	mΩ



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



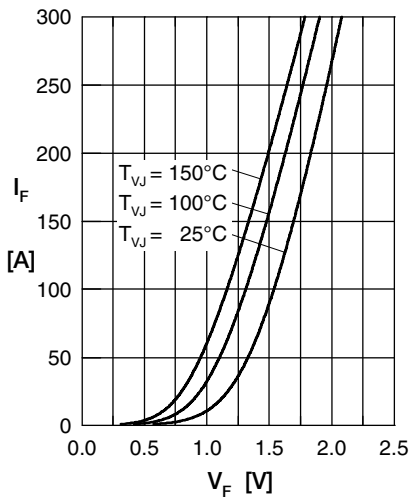
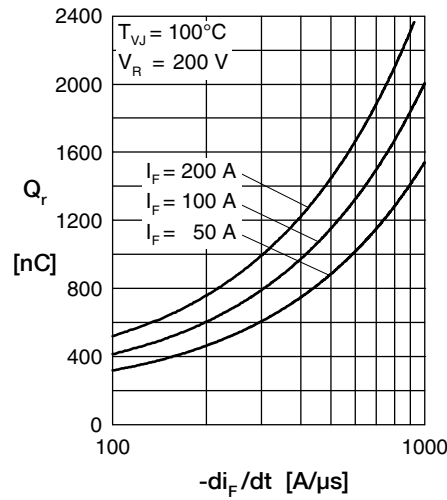
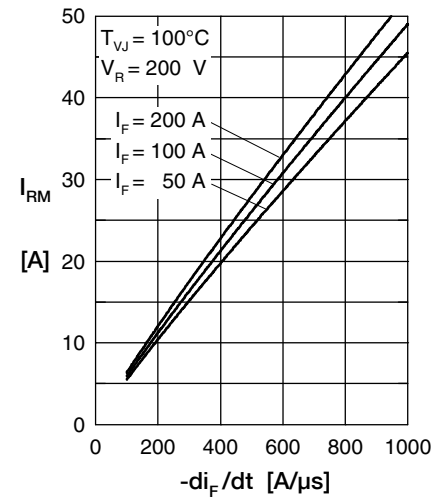
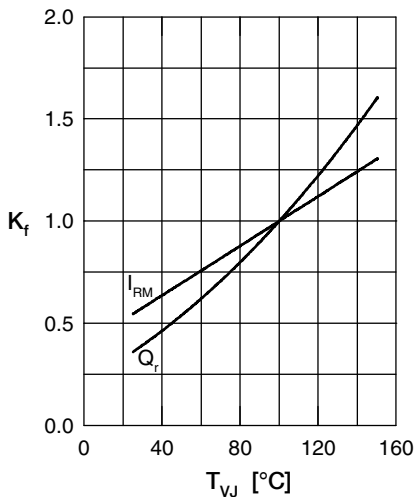
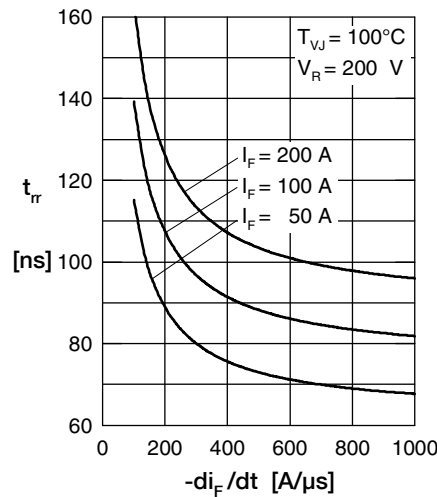
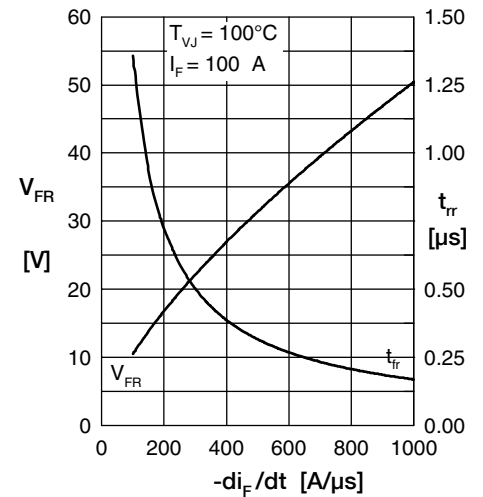
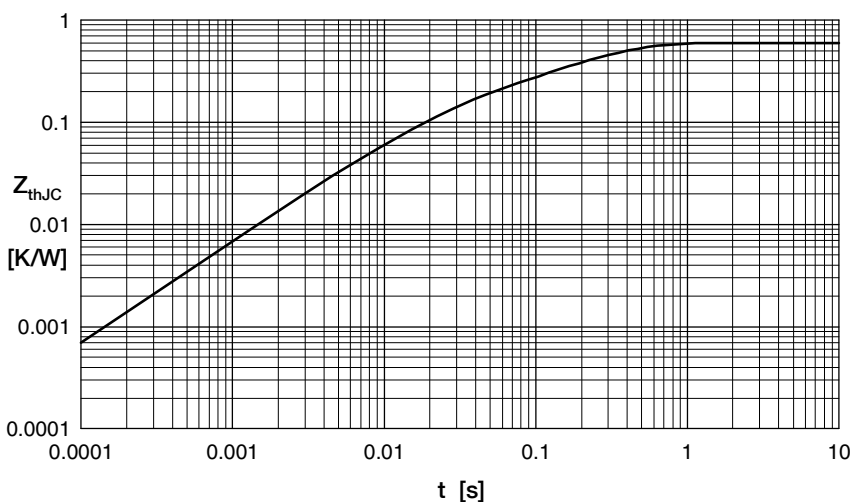
Fast Diode

 Fig. 1 Forward current I_F versus V_F

 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 Typ. dynamic parameters K_f , I_{RM} versus T_{VJ}

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

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


Fig. 7 Transient thermal resistance junction to case

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.212	0.0055
2	0.248	0.0092
3	0.063	0.0007
4	0.077	0.0391