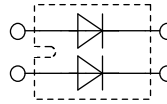


# HiPerFRED

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

Part number

**DSEP2x31-06A**



Backside: isolated

E72873

### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I<sub>rm</sub>-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I<sub>rm</sub> 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:

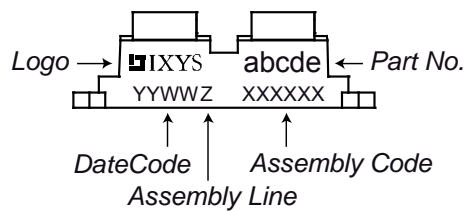
- Housing: SOT-227B (minibloc)
- Industry standard outline
- Cu base plate internal DCB isolated
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

### Ratings

Symbol	Definition	Conditions	Ratings			Unit	
			min.	typ.	max.		
V <sub>RRM</sub>	max. repetitive reverse voltage	T <sub>VJ</sub> = 25 °C			600	V	
I <sub>R</sub>	reverse current	V <sub>R</sub> = 600 V			250	μA	
		V <sub>R</sub> = 600 V			1	mA	
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 30 A			1.58	V	
		I <sub>F</sub> = 60 A			1.88	V	
		I <sub>F</sub> = 30 A	T <sub>VJ</sub> = 150 °C			1.23	V
		I <sub>F</sub> = 60 A	T <sub>VJ</sub> = 150 °C			1.48	V
I <sub>FAV</sub>	average forward current	rectangular d = 0.5			30	A	
V <sub>F0</sub>	threshold voltage	} for power loss calculation only			0.98	V	
r <sub>F</sub>	slope resistance				8.2	mΩ	
R <sub>thJC</sub>	thermal resistance junction to case				1.15	K/W	
T <sub>VJ</sub>	virtual junction temperature		-40		150	°C	
P <sub>tot</sub>	total power dissipation	T <sub>C</sub> = 25 °C			100	W	
I <sub>FSM</sub>	max. forward surge current	t = 10 ms (50 Hz), sine			250	A	
I <sub>RM</sub>	max. reverse recovery current	T <sub>VJ</sub> = 25 °C		12		A	
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 300 V	T <sub>VJ</sub> = 100 °C		20	A	
t <sub>rr</sub>	reverse recovery time	-di <sub>F</sub> /dt = 400 A/μs	T <sub>VJ</sub> = 25 °C		30	ns	
			T <sub>VJ</sub> = 100 °C		90	ns	
C <sub>J</sub>	junction capacitance	V <sub>R</sub> = 400 V; f = 1 MHz			26	pF	

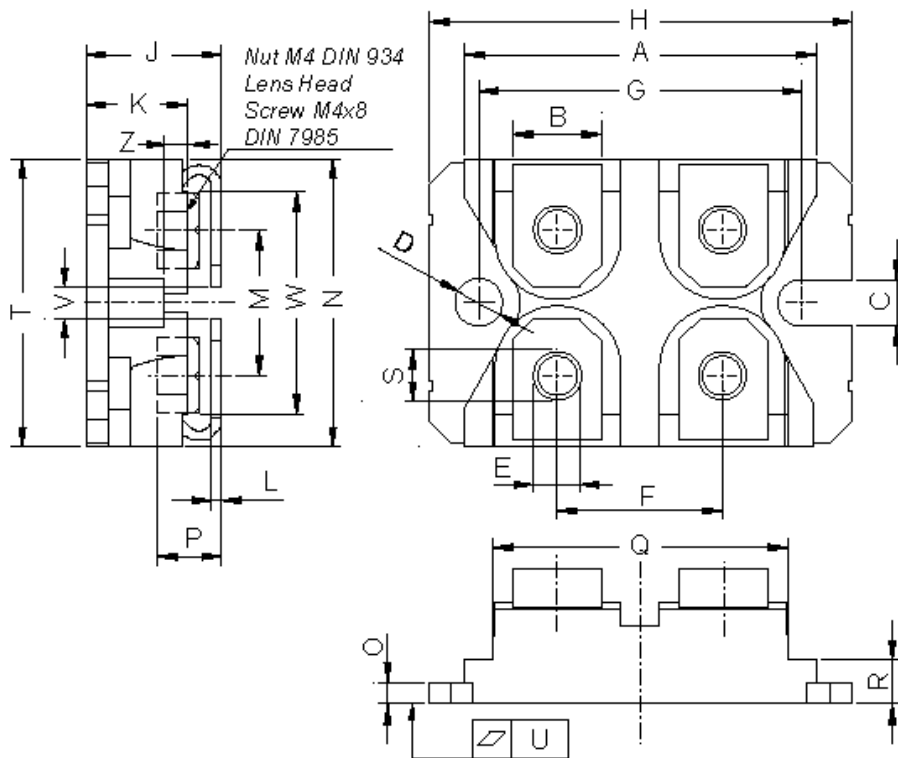
Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per terminal			100	A
$R_{thCH}$	thermal resistance case to heatsink			0.10		K/W
$T_{stg}$	storage temperature		-40		150	°C
<b>Weight</b>				30		g
$M_D$	mounting torque		1.1		1.5	Nm
$M_T$	terminal torque		1.1		1.5	Nm
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V
$d_{Spp/App}$	creepage   striking distance on surface   through air	terminal to terminal	10.5	3.2		mm
$d_{Spb/Apb}$	creepage   striking distance on surface   through air	terminal to backside	8.6	6.8		mm

### Product Marking



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSEP2x31-06A	DSEP2x31-06A	Tube	10	473928

Similar Part	Package	Voltage Class
DSEP2x31-06B	SOT-227B (minibloc)	600

**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

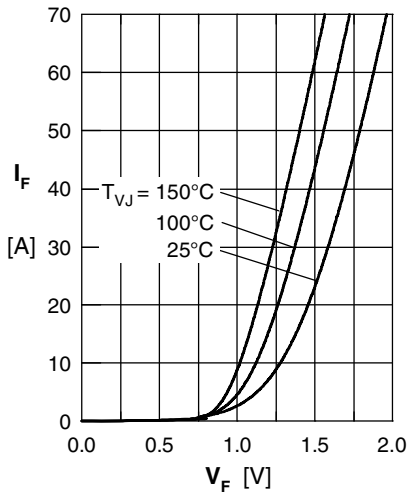


Fig. 1 Forward current  $I_F$  vs.  $V_F$

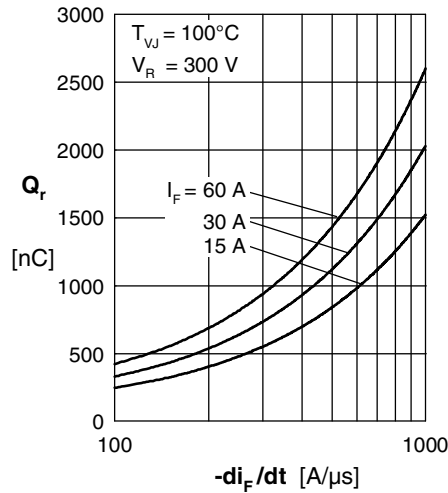


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

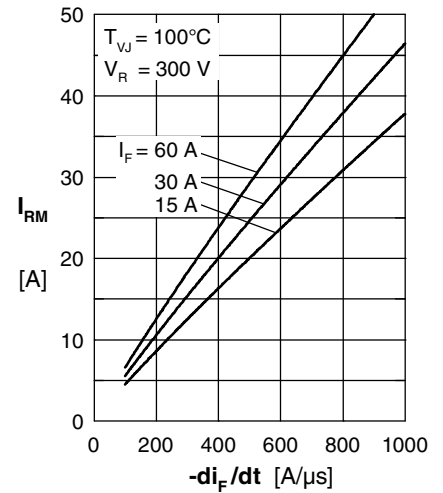


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

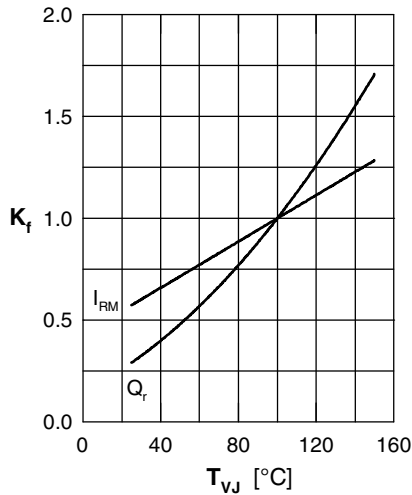


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

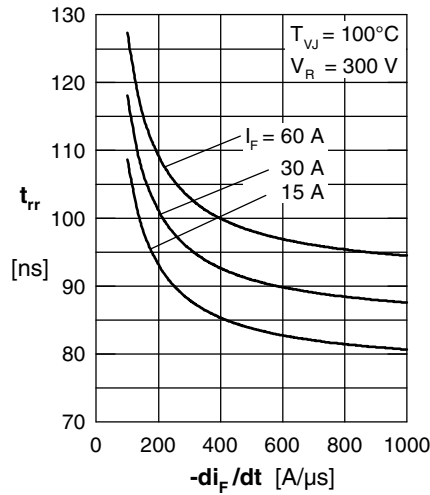


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

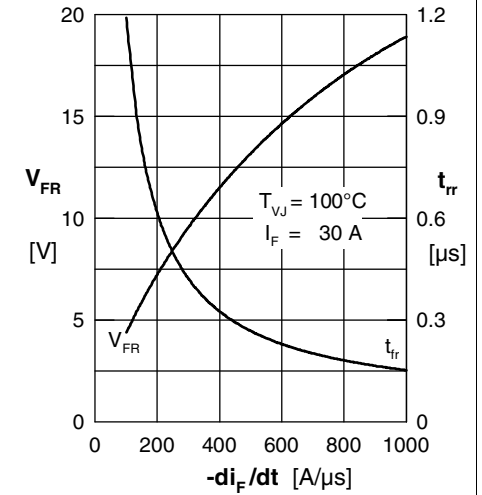


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

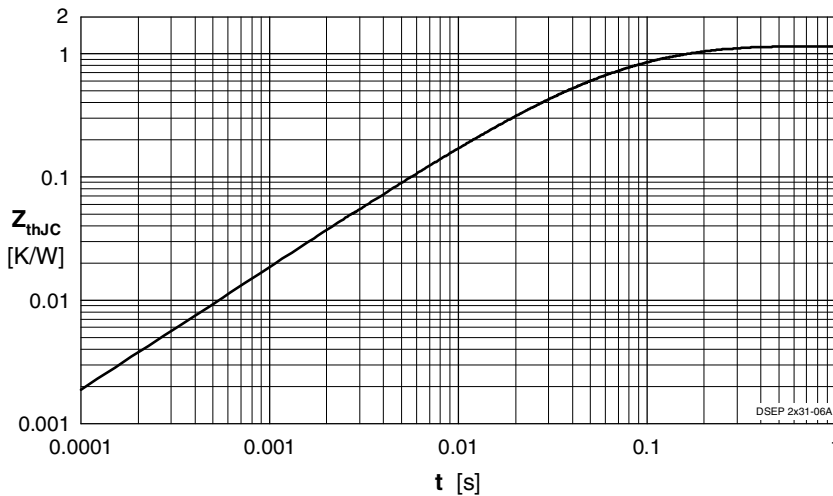


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.436	0.0055
2	0.482	0.0092
3	0.117	0.0007
4	0.115	0.0418