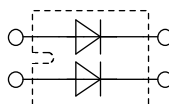


HiPerFRED

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

Part number

DSEP2x31-03A



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:

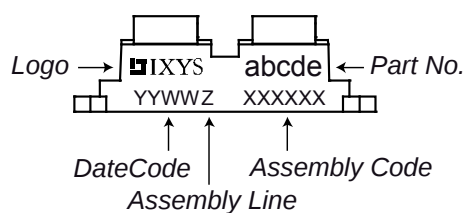
- Housing: SOT-227B (minibloc)
- Industry standard outline
- Cu base plate internal DCB isolated
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	max. repetitive reverse voltage		$T_{VJ} = 25^{\circ}\text{C}$			300	V
I_R	reverse current	$V_R = 300\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			10	μA
		$V_R = 300\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1	mA
V_F	forward voltage	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.23	V
		$I_F = 60\text{ A}$				1.40	V
		$I_F = 30\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			0.90	V
		$I_F = 60\text{ A}$				1.10	V
I_{FAV}	average forward current	rectangular $d = 0.5$	$T_C = 110^{\circ}\text{C}$			30	A
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^{\circ}\text{C}$		0.71	V
r_F	slope resistance					6.2	m Ω
R_{thJC}	thermal resistance junction to case					1.15	K/W
T_{VJ}	virtual junction temperature			-40		150	$^{\circ}\text{C}$
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			100	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			300	A
I_{RM}	max. reverse recovery current		$T_{VJ} = 25^{\circ}\text{C}$		10		A
		$I_F = 30\text{ A}; V_R = 150\text{ V}$	$T_{VJ} = 100^{\circ}\text{C}$		12.5		A
t_{rr}	reverse recovery time	$-di_F/dt = 400\text{ A}/\mu\text{s}$	$T_{VJ} = 25^{\circ}\text{C}$		30		ns
			$T_{VJ} = 100^{\circ}\text{C}$		55		ns
C_J	junction capacitance	$V_R = 150\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		66		pF

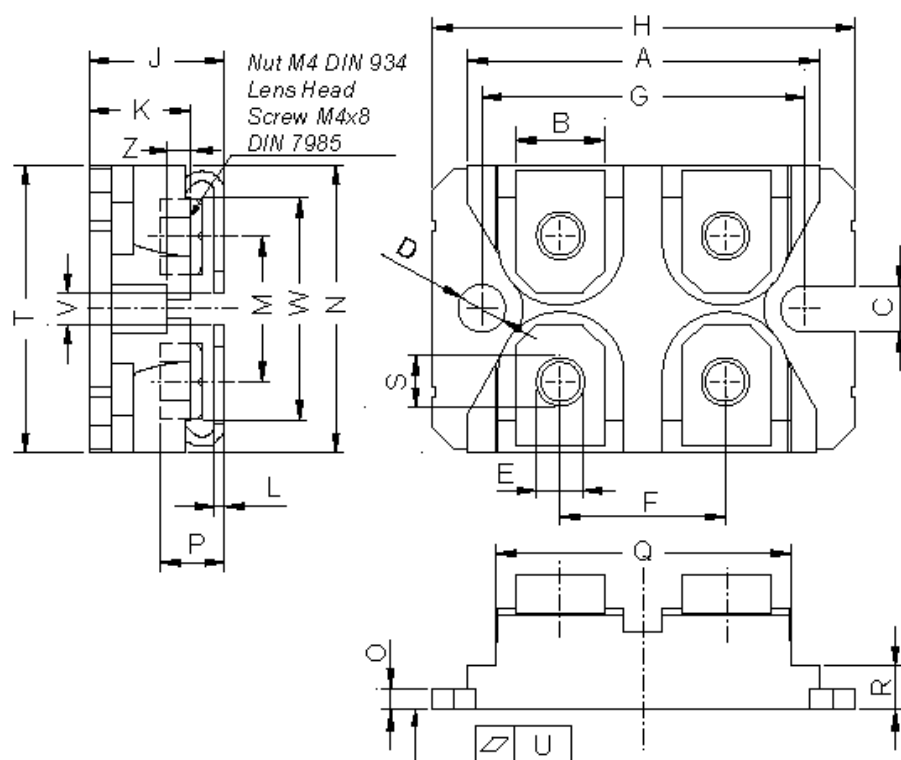
Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per terminal			100	A
R_{thCH}	thermal resistance case to heatsink			0.10		K/W
T_{stg}	storage temperature		-40		150	°C
Weight				30		g
M_D	mounting torque		1.1		1.5	Nm
M_T	terminal torque		1.1		1.5	Nm
V_{ISOL}	isolation 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	DSEP2x31-03A	DSEP2x31-03A	Tube	10	473278

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

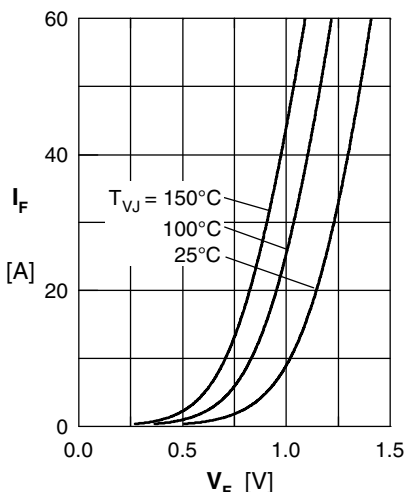
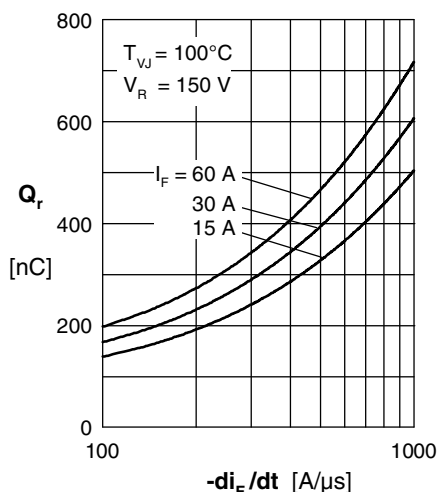
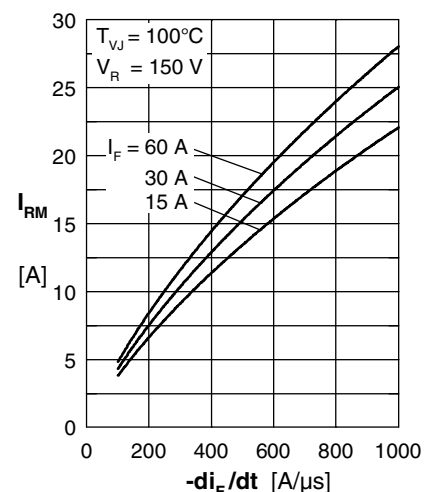
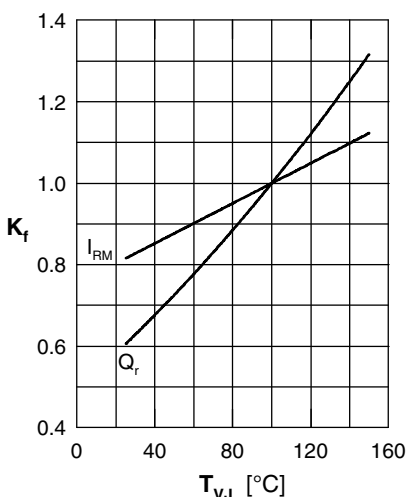
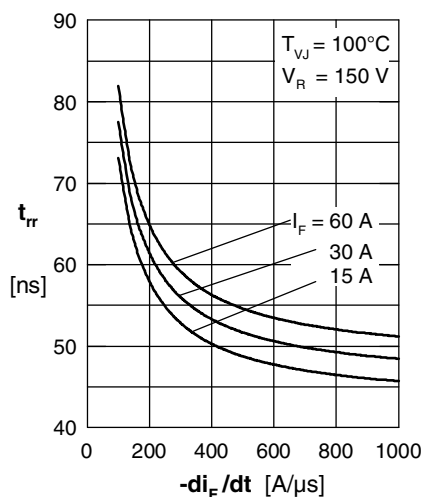
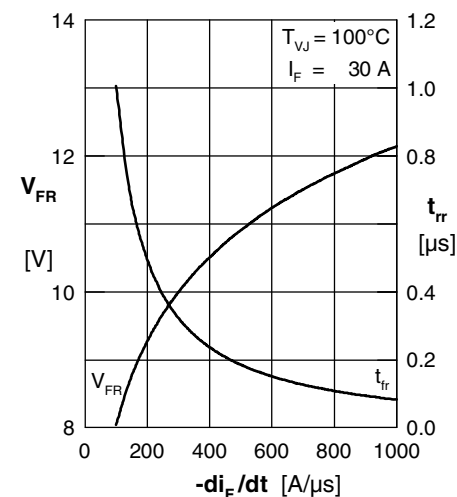
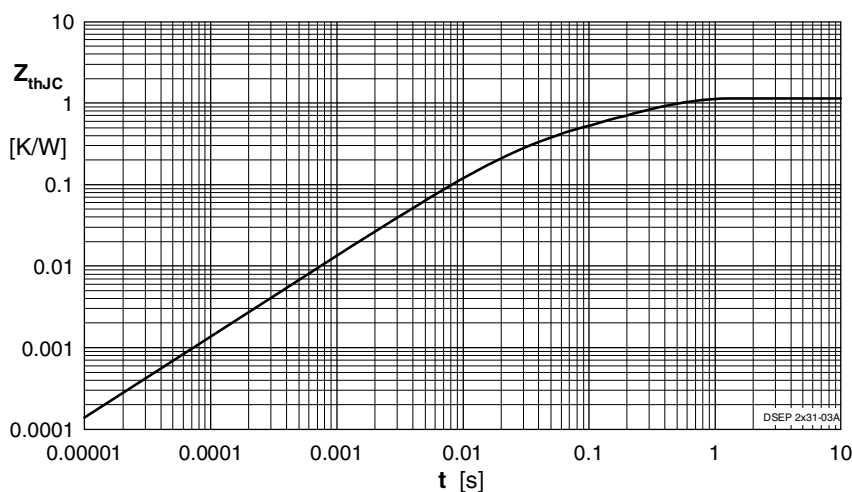
Fig. 1 Forward current I_F vs. V_F Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$ Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$ Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ} Fig. 5 Recovery time t_{rr} versus $-di_F/dt$ Fig. 6 Peak forward voltage V_{FR} and t_{rr} versus $-di_F/dt$ 

Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation ...A:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0397

Constants for Z_{thJC} calculation ...AR:

i	R_{thi} (K/W)	t_i (s)
1	0.368	0.0052
2	0.1417	0.0003
3	0.0295	0.0004
4	0.5604	0.0092