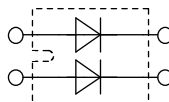


# HiPerFRED

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

Part number

DSEP2x31-04A



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:

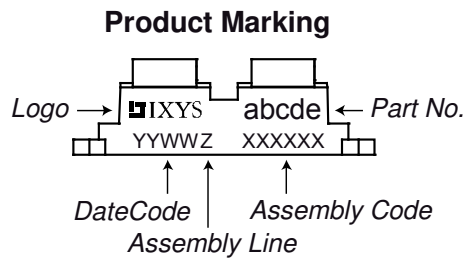
- Housing: SOT-227B (minibloc)
- Industry standard outline
- Cu base plate internal DCB isolated
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

## Ratings

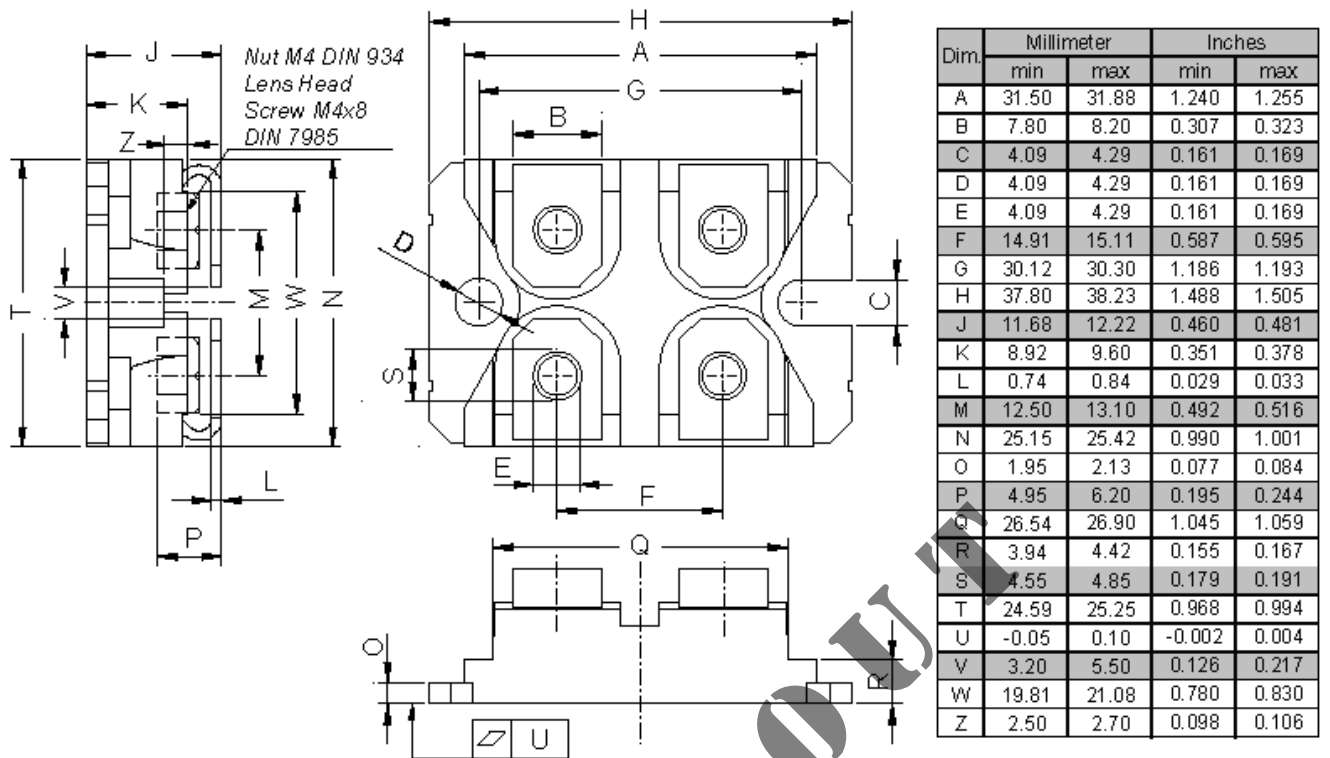
Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$V_{RRM}$	max. repetitive reverse voltage				400	V
$I_R$	reverse current	$V_R = 400\text{ V}$			250	$\mu\text{A}$
		$V_R = 400\text{ V}$			1	mA
$V_F$	forward voltage	$I_F = 30\text{ A}$			1.47	V
		$I_F = 60\text{ A}$			1.67	V
		$I_F = 30\text{ A}$			1.07	V
		$I_F = 60\text{ A}$			1.28	V
$I_{FAV}$	average forward current	rectangular $d = 0.5$			30	A
$V_{F0}$	threshold voltage				0.88	V
$r_F$	slope resistance				6.5	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				1.15	K/W
$T_{VJ}$	virtual junction temperature		-40		150	$^{\circ}\text{C}$
$P_{tot}$	total power dissipation				100	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}$ (50 Hz), sine			280	A
$I_{RM}$	max. reverse recovery current				11	A
		$I_F = 30\text{ A}; V_R = 200\text{ V}$			18	A
$t_{rr}$	reverse recovery time	$-di_F/dt = 400\text{ A}/\mu\text{s}$			20	ns
					65	ns
$C_J$	junction capacitance	$V_R = 200\text{ V}; f = 1\text{ MHz}$			44	pF

Recommended replacement:  
DPF60X400NA, DSEI2x31-04C

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



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSEP2x31-04A	DSEP2x31-04A	Tube	10	479020

**Outlines SOT-227B (minibloc)**


PHASE-OUT

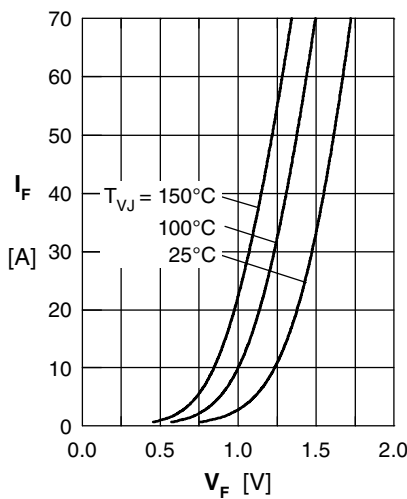


Fig. 1 Forward current  $I_F$  vs.  $V_F$

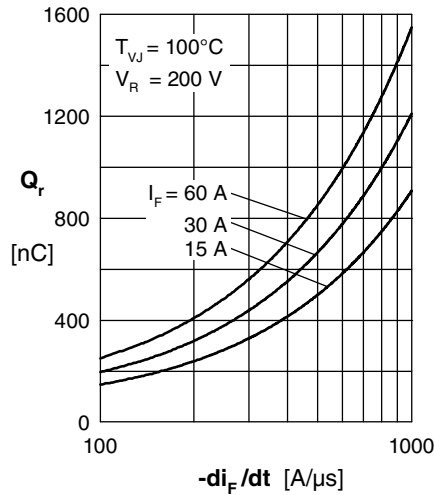


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

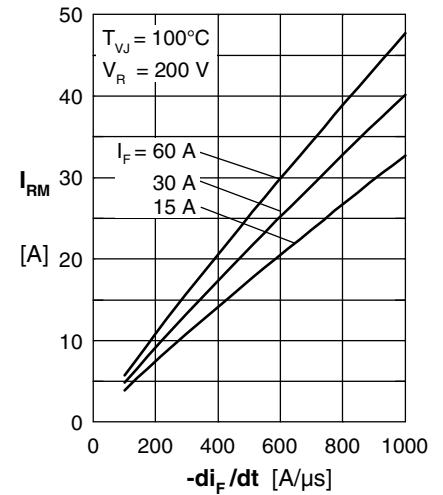


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

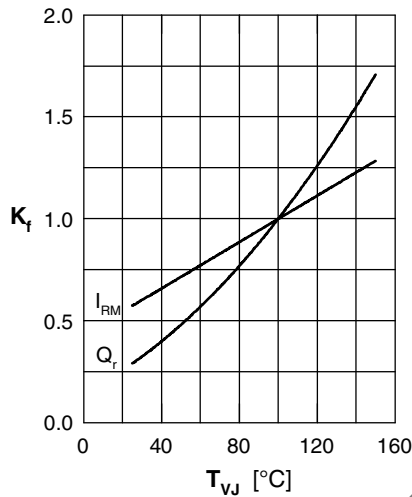


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

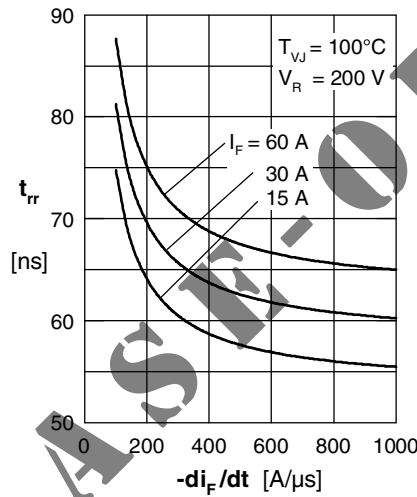


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

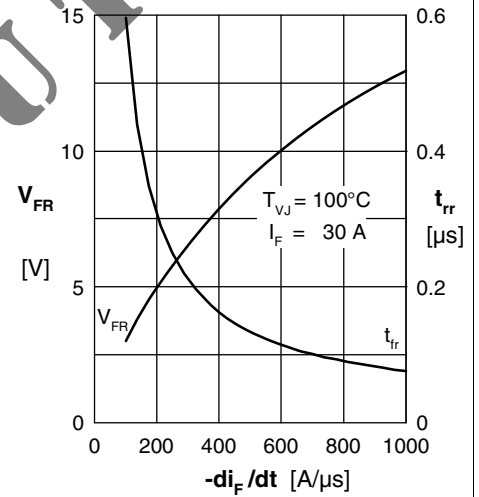


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

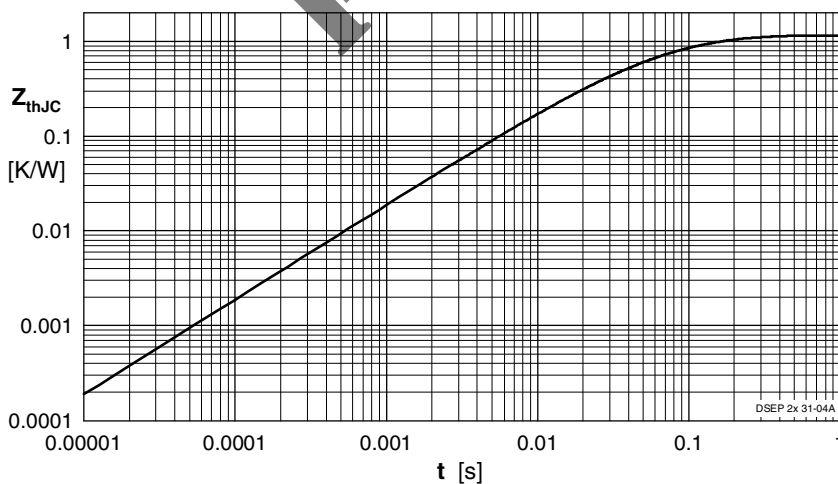


Fig. 7 Transient thermal resistance junction to case

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