

## HiPerFRED

$$V_{RRM} = 1200\text{ V}$$

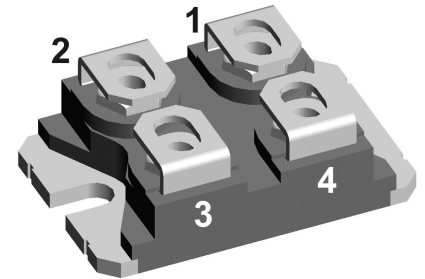
$$I_{FAV} = 2 \times 30\text{ A}$$

$$t_{rr} = 40\text{ ns}$$

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

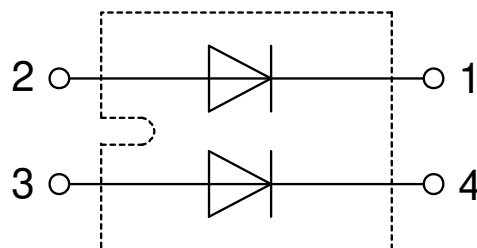
Part number

**DSEP2x31-12A**



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

#### Terms and Conditions of Usage

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;

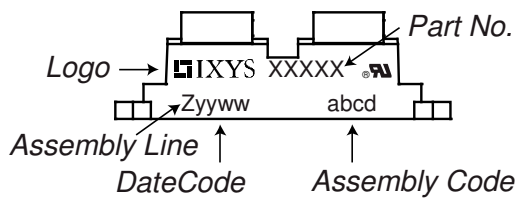
- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

| Fast Diode |  |  |                         | Ratings |      |            |  |
|------------|--|--|-------------------------|---------|------|------------|--|
| Symbol     | Definition                                   | Conditions   | min.                    | typ.    | max. | Unit       |  |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}C$   |                         |         | 1200 | V          |  |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}C$   |                         |         | 1200 | V          |  |
| $I_R$      | reverse current, drain current               | $V_R = 1200\text{ V}$  | $T_{VJ} = 25^{\circ}C$  |         | 250  | $\mu A$    |  |
|            |  | $V_R = 1200\text{ V}$  | $T_{VJ} = 150^{\circ}C$ |         | 1    | mA         |  |
| $V_F$      | forward voltage drop                         | $I_F = 30\text{ A}$  | $T_{VJ} = 25^{\circ}C$  |         | 2.72 | V          |  |
|            |  | $I_F = 60\text{ A}$  |                         |         | 3.24 | V          |  |
|            |  | $I_F = 30\text{ A}$  | $T_{VJ} = 150^{\circ}C$ |         | 1.77 | V          |  |
|            |  | $I_F = 60\text{ A}$  |                         |         | 2.26 | V          |  |
| $I_{FAV}$  | average forward current                      | $T_C = 75^{\circ}C$<br>rectangular $d = 0.5$                                       | $T_{VJ} = 150^{\circ}C$ |         | 30   | A          |  |
| $V_{FO}$   | threshold voltage                            | } for power loss calculation only  | $T_{VJ} = 150^{\circ}C$ |         | 1.31 | V          |  |
| $r_F$      | slope resistance                             |  |                         |         | 15.4 | m $\Omega$ |  |
| $R_{thJC}$ | thermal resistance junction to case          |  |                         |         | 1.15 | K/W        |  |
| $R_{thCH}$ | thermal resistance case to heatsink          |  |                         | 0.10    |      | K/W        |  |
| $P_{tot}$  | total power dissipation                      |  | $T_C = 25^{\circ}C$     |         | 100  | W          |  |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$                 | $T_{VJ} = 45^{\circ}C$  |         | 200  | A          |  |
| $C_J$      | junction capacitance                         | $V_R = 600\text{ V}$ $f = 1\text{ MHz}$  | $T_{VJ} = 25^{\circ}C$  |         | 12   | pF         |  |
| $I_{RM}$   | max. reverse recovery current                | } $I_F = 30\text{ A}; V_R = 600\text{ V}$<br>$-di_F/dt = 200\text{ A}/\mu\text{s}$ | $T_{VJ} = 25^{\circ}C$  |         | 8.5  | A          |  |
|            |  |  | $T_{VJ} = 100^{\circ}C$ |         | 13   | A          |  |
| $t_{rr}$   | reverse recovery time                        |  | $T_{VJ} = 25^{\circ}C$  |         | 60   | ns         |  |
|            |  |  | $T_{VJ} = 100^{\circ}C$ |         | 170  | 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   |  |
| <b>Weight</b>               |  |                      |                                     |         | 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; $I_{ISOL} \leq 1$ mA | 3000    |      | V    |  |
|                             |  | t = 1 minute         |                                     | 2500    |      | V    |  |

### Product Marking

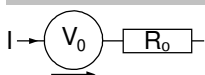


| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DSEP2x31-12A    | DSEP2x31-12A       | Tube          | 10       | 473286   |

### Equivalent Circuits for Simulation

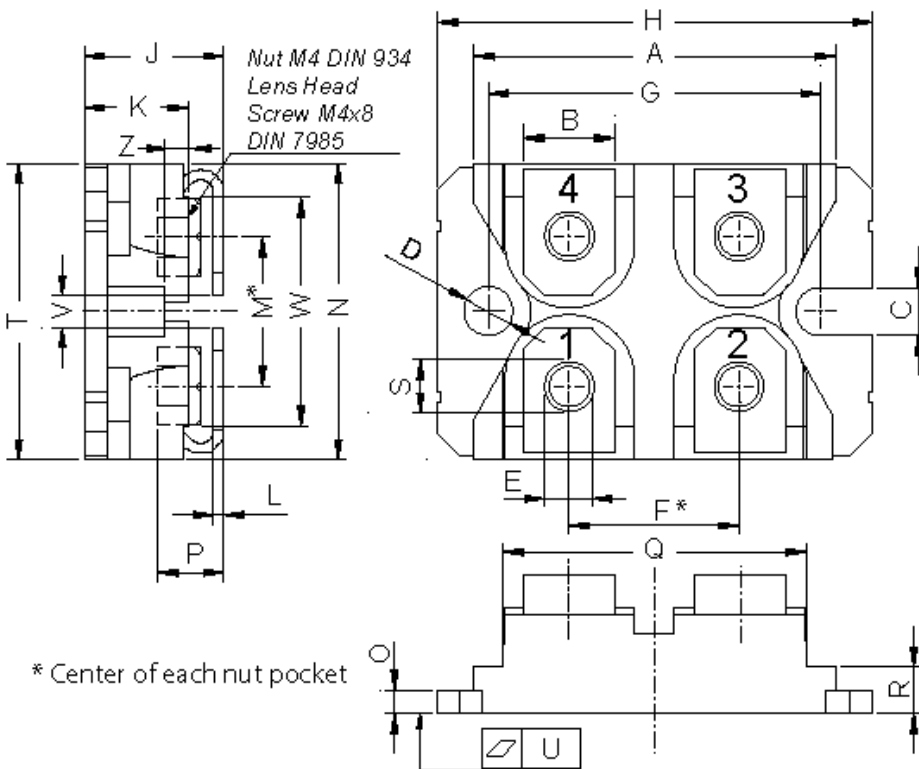
\* on die level

$T_{VJ} = 150$  °C

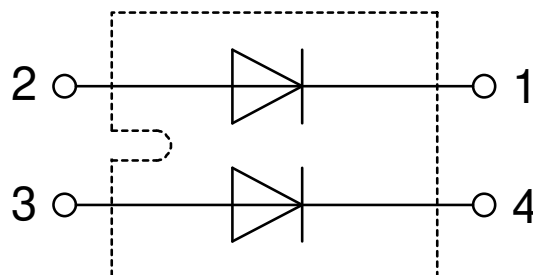


| Symbol       | Definition         | Value | Unit |
|--------------|--------------------|-------|------|
| $V_{0\ max}$ | threshold voltage  | 1.31  | V    |
| $R_{0\ max}$ | slope resistance * | 13.5  | mΩ   |

## 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

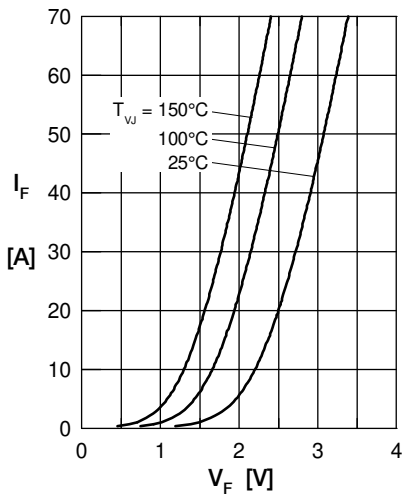


Fig. 1 Forward current  $I_F$  versus  $V_F$

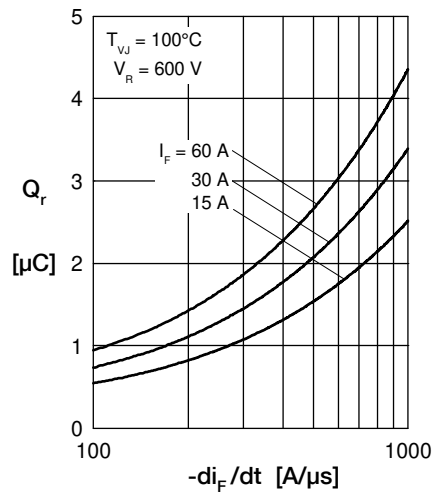


Fig. 2 Typ. reverse recov. charge  $Q_r$  versus  $-di_F/dt$

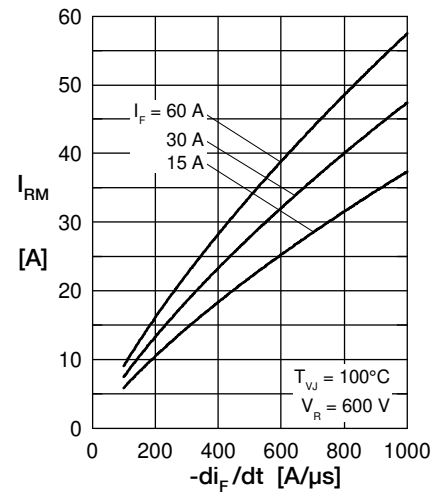


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

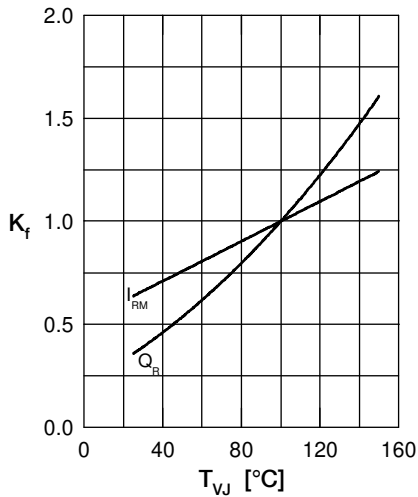


Fig. 4 Typ. dynamic parameters  $Q_r, I_{RM}$  versus  $T_{VJ}$

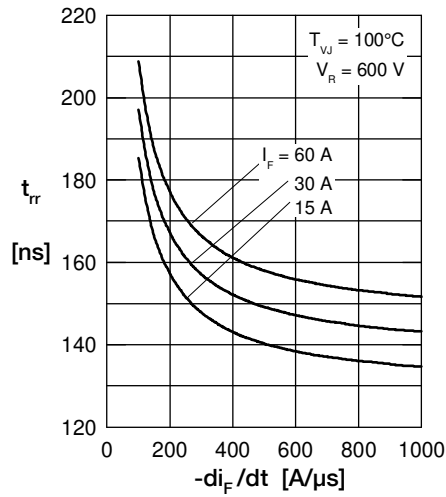


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

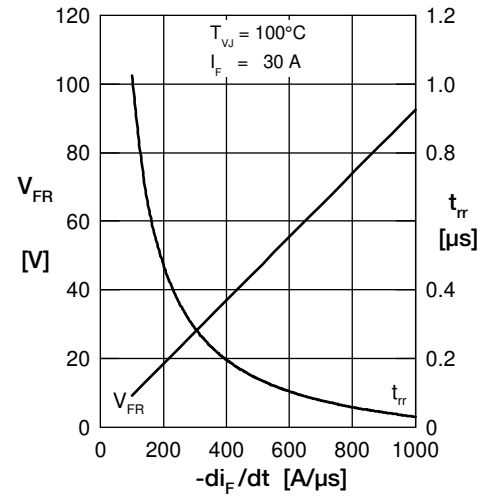


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $di_F/dt$

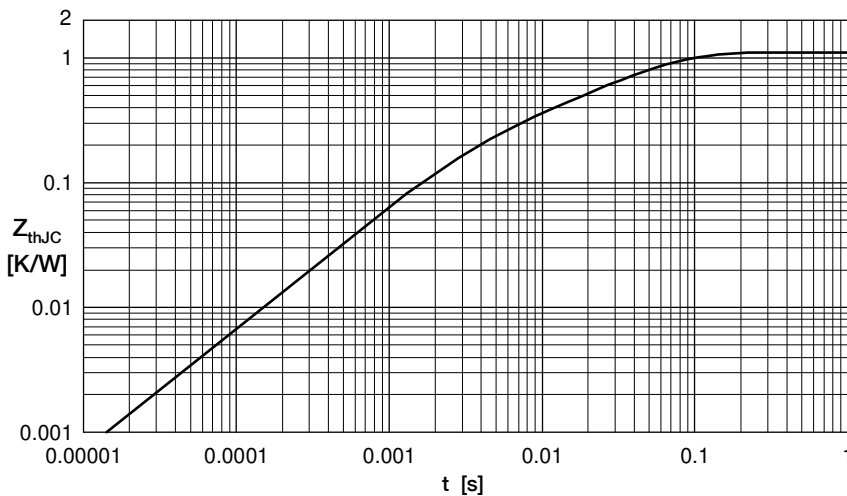


Fig. 7 Transient thermal impedance junction to case

Constants for  $Z_{thJC}$  calculation:

| 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    |

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А