

FRED

$V_{RRM} = 600\text{ V}$
 $I_{FAV} = 2 \times 120\text{ A}$
 $t_{rr} = 35\text{ ns}$

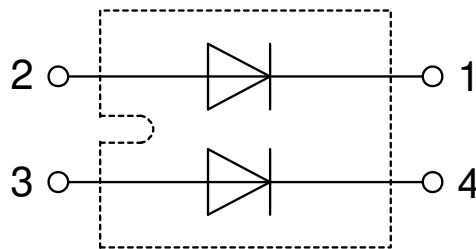
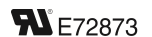
Parallel legs

Part number

DFE240X600NA



Backside: Isolated



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

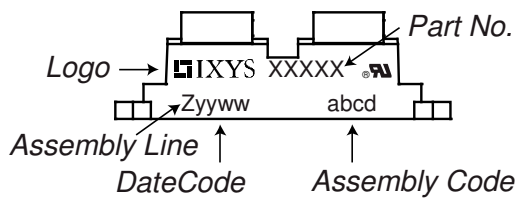
- to perform joint risk and quality assessments;

- 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.

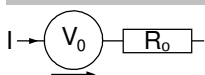
| Fast Diode | | | | Ratings | | | |
|------------|--|--|-------------|------------------------------|------|------|------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | | 600 | V |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | | 600 | V |
| I_R | reverse current, drain current | $V_R = 600\text{ V}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 3 | mA |
| | | $V_R = 480\text{ V}$ | | $T_{VJ} = 125^\circ\text{C}$ | | 20 | mA |
| V_F | forward voltage drop | $I_F = 120\text{ A}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 1.30 | V |
| | | $I_F = 240\text{ A}$ | | | | 1.55 | V |
| | | $I_F = 120\text{ A}$ | | $T_{VJ} = 150^\circ\text{C}$ | | 1.20 | V |
| | | $I_F = 240\text{ A}$ | | | | 1.61 | V |
| I_{FAV} | average forward current | $T_C = 80^\circ\text{C}$ | rectangular | $T_{VJ} = 150^\circ\text{C}$ | | 120 | A |
| V_{FO} | threshold voltage | } for power loss calculation only | | | | 0.80 | V |
| r_F | slope resistance | | | | | 1.9 | mΩ |
| R_{thJC} | thermal resistance junction to case | | | | | 0.4 | K/W |
| R_{thCH} | thermal resistance case to heatsink | | | 0.10 | | | K/W |
| P_{tot} | total power dissipation | | | $T_C = 25^\circ\text{C}$ | | 312 | W |
| I_{FSM} | max. forward surge current | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | | $T_{VJ} = 45^\circ\text{C}$ | | 1.20 | kA |
| C_J | junction capacitance | $V_R = 400\text{ V}$ $f = 1\text{ MHz}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 107 | pF |
| I_{RM} | max. reverse recovery current | } $I_F = 100\text{ A}; V_R = 300\text{ V}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 27 | A |
| | | | | $T_{VJ} = 125^\circ\text{C}$ | | 40 | A |
| t_{rr} | reverse recovery time | } $-di_F/dt = 600\text{ A}/\mu\text{s}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 80 | ns |
| | | | | $T_{VJ} = 125^\circ\text{C}$ | | 150 | ns |

| Package SOT-227B (minibloc) | | Ratings | | | | |
|-----------------------------|--|----------------------|-------------------------------------|------|------|------|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit |
| I_{RMS} | RMS current | per terminal | | | 150 | 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

Part description

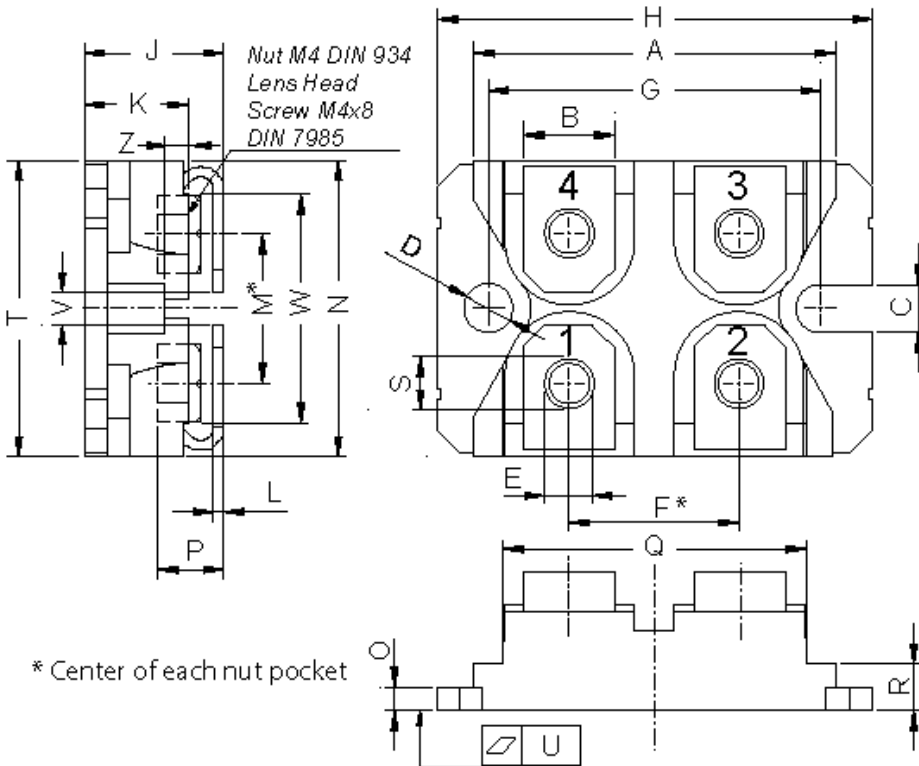
- D = Diode
- F = FRED
- E = fast, low VF
- 240 = Current Rating [A]
- X = Parallel legs
- 600 = Reverse Voltage [V]
- NA = SOT-227B (minibloc)

| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DFE240X600NA | DFE240X600NA | Tube | 10 | 522315 |

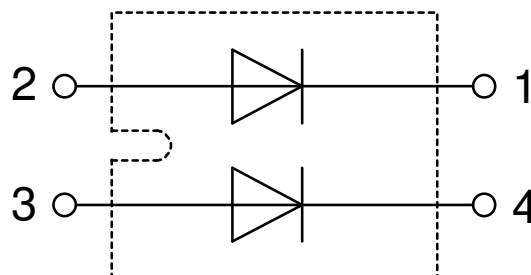
Equivalent Circuits for Simulation
** on die level*
 $T_{VJ} = 150\text{ °C}$


| Symbol | Definition | Value | Unit |
|--------------|--------------------|-------|------|
| $V_{0\ max}$ | threshold voltage | 0.8 | V |
| $R_{0\ max}$ | slope resistance * | 1.4 | 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

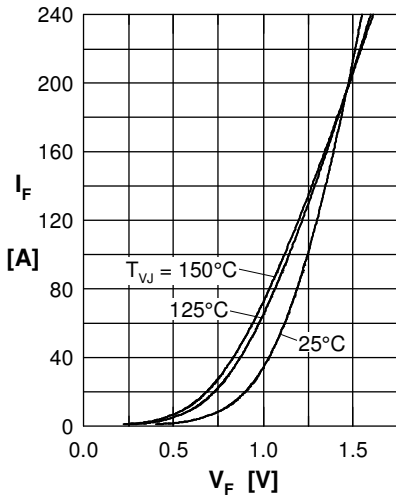


Fig. 1 Forward current I_F versus V_F

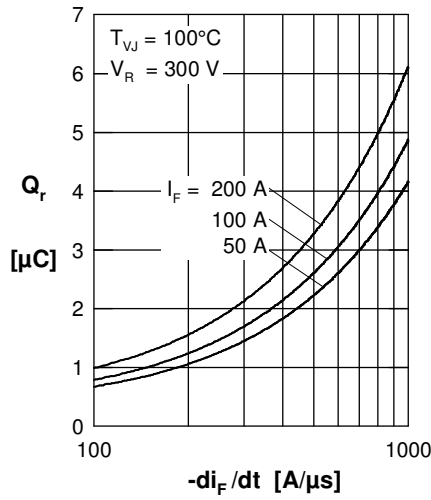


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

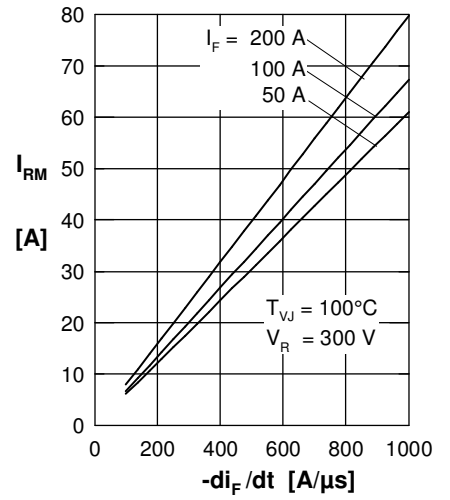


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

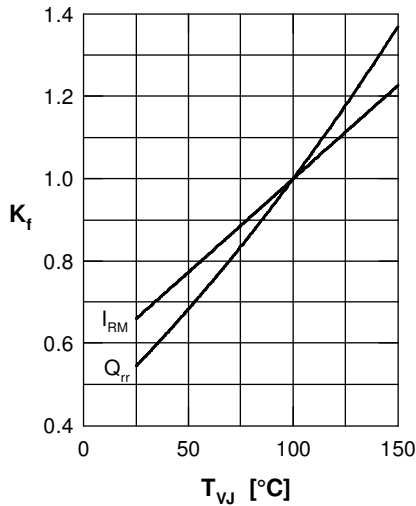


Fig. 4 Typ. dyn. parameters Q_r , I_{RM} versus T_{VJ}

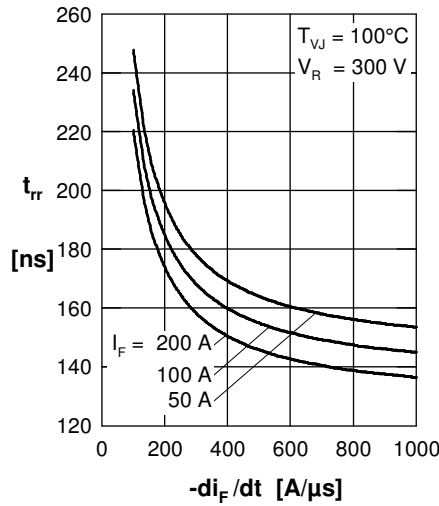


Fig. 5 Typ. recovery time t_{tr} versus $-di_F/dt$

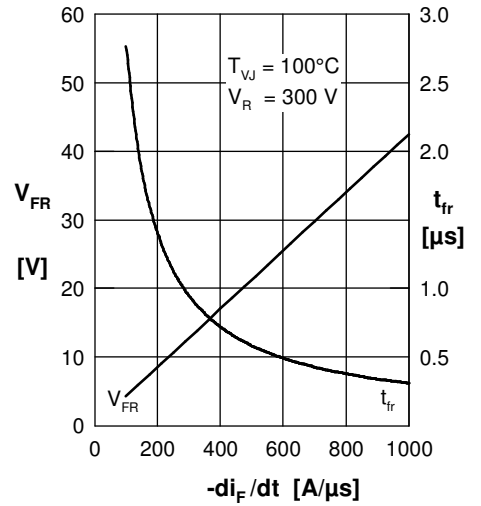


Fig. 6 Typ. peak forward voltage V_{FR} and t_{tr} versus di_F/dt

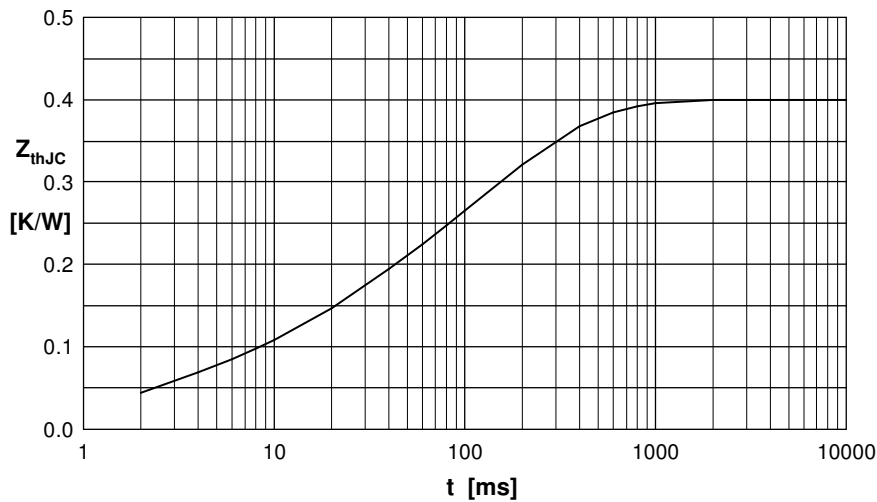


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

| i | R_{thi} [K/W] | t_i [s] |
|---|--------------------|--------------|
| 1 | 0.040 | 0.010 |
| 2 | 0.045 | 0.002 |
| 3 | 0.070 | 0.026 |
| 4 | 0.110 | 0.300 |
| 5 | 0.135 | 0.110 |

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

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- 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.);

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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).



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