

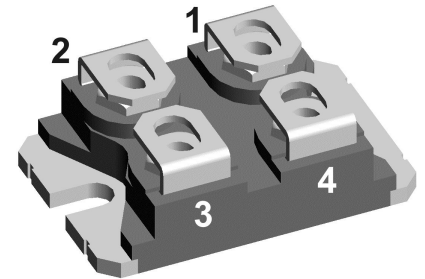
# Schottky Diode

$$\begin{aligned} V_{RRM} &= 100 \text{ V} \\ I_{FAV} &= 2 \times 40 \text{ A} \\ V_F &= 0.7 \text{ V} \end{aligned}$$

High Performance Schottky Diode  
 Low Loss and Soft Recovery  
 Parallel legs

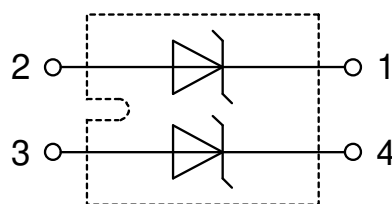
Part number

**DSS2x41-01A**



Backside: isolated

 E72873



## Features / Advantages:

- Very low  $V_f$
- Extremely low switching losses
- Low  $I_{rm}$  values
- Improved thermal behaviour
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching

## Applications:

- Rectifiers in switch mode power supplies (SMPS)
- Free wheeling diode in low voltage converters

## 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

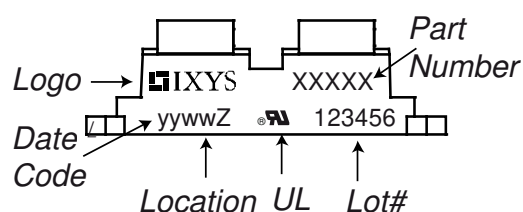
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| Schottky          |                                              |                                                    |                         | Ratings                 |      |      |      |
|-------------------|----------------------------------------------|----------------------------------------------------|-------------------------|-------------------------|------|------|------|
| Symbol            | Definition                                   | Conditions                                         |                         | min.                    | typ. | max. | Unit |
| V <sub>RSM</sub>  | max. non-repetitive reverse blocking voltage | T <sub>VJ</sub> = 25°C                             |                         |                         |      | 100  | V    |
| V <sub>RRM</sub>  | max. repetitive reverse blocking voltage     | T <sub>VJ</sub> = 25°C                             |                         |                         |      | 100  | V    |
| I <sub>R</sub>    | reverse current, drain current               | V <sub>R</sub> = 100 V                             | T <sub>VJ</sub> = 25°C  |                         |      | 1    | mA   |
|                   |                                              | V <sub>R</sub> = 100 V                             | T <sub>VJ</sub> = 125°C |                         |      | 10   | mA   |
| V <sub>F</sub>    | forward voltage drop                         | I <sub>F</sub> = 40 A                              | T <sub>VJ</sub> = 25°C  |                         |      | 0.88 | V    |
|                   |                                              | I <sub>F</sub> = 80 A                              |                         |                         |      | 1.05 | V    |
|                   |                                              | I <sub>F</sub> = 40 A                              | T <sub>VJ</sub> = 125°C |                         |      | 0.70 | V    |
|                   |                                              | I <sub>F</sub> = 80 A                              |                         |                         |      | 0.88 | V    |
| I <sub>FAV</sub>  | average forward current                      | T <sub>C</sub> = 110°C<br>rectangular      d = 0.5 | T <sub>VJ</sub> = 150°C |                         |      | 40   | A    |
| V <sub>F0</sub>   | threshold voltage                            | } for power loss calculation only                  |                         | T <sub>VJ</sub> = 150°C |      | 0.49 | V    |
| r <sub>F</sub>    | slope resistance                             |                                                    |                         |                         |      | 4.3  | mΩ   |
| R <sub>thJC</sub> | thermal resistance junction to case          |                                                    |                         |                         |      | 1.1  | K/W  |
| R <sub>thCH</sub> | thermal resistance case to heatsink          |                                                    |                         |                         | 0.1  |      | K/W  |
| P <sub>tot</sub>  | total power dissipation                      | T <sub>C</sub> = 25°C                              |                         |                         |      | 110  | W    |
| I <sub>FSM</sub>  | max. forward surge current                   | t = 10 ms; (50 Hz), sine; V <sub>R</sub> = 0 V     |                         | T <sub>VJ</sub> = 45°C  |      | 450  | A    |
| C <sub>J</sub>    | junction capacitance                         | V <sub>R</sub> = 12 V   f = 1 MHz                  |                         | T <sub>VJ</sub> = 25°C  |      | 572  | pF   |

| Package SOT-227B (minibloc) |                                                              |                      |                                     | Ratings |      |      |      |
|-----------------------------|--------------------------------------------------------------|----------------------|-------------------------------------|---------|------|------|------|
| Symbol                      | Definition                                                   | Conditions           |                                     | min.    | typ. | max. | Unit |
| $I_{RMS}$                   | RMS current                                                  | per terminal         |                                     |         |      | 70   | 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

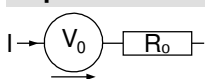


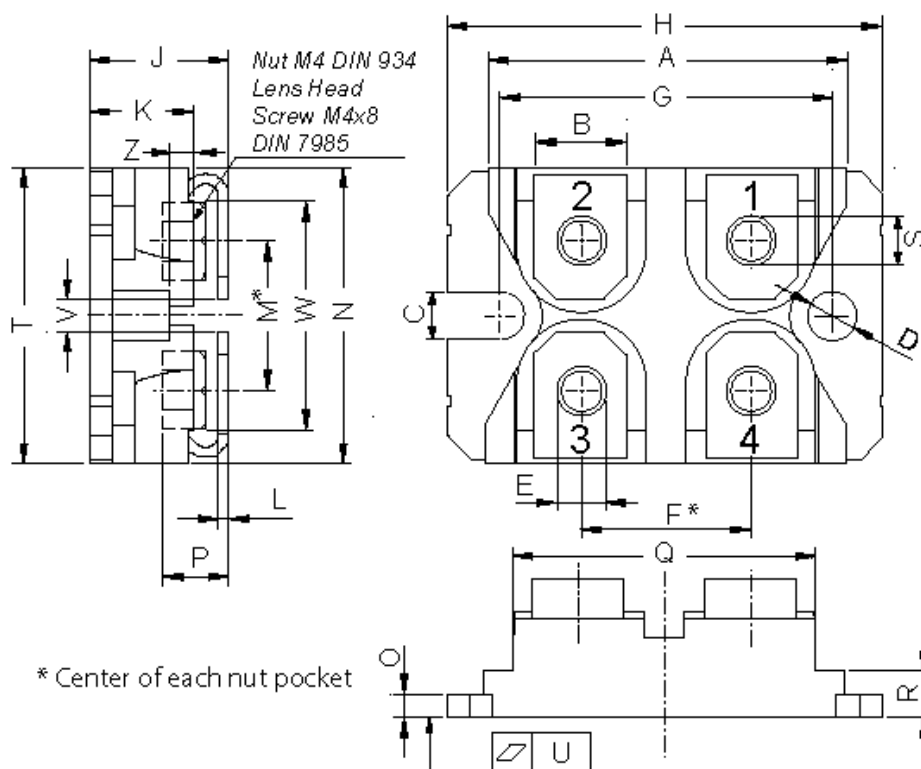
| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DSS2x41-01A     | DSS2x41-01A        | Tube          | 10       | 475556   |

## Equivalent Circuits for Simulation

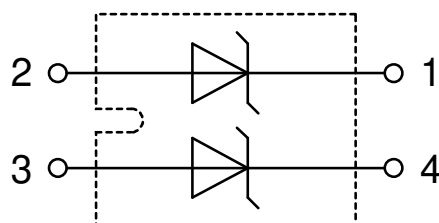
\* on die level

$T_{VJ} = 150^{\circ}\text{C}$

|                                                                                     |                    |                 |    |
|-------------------------------------------------------------------------------------|--------------------|-----------------|----|
|  |                    | <b>Schottky</b> |    |
| $V_{0\max}$                                                                         | threshold voltage  | 0.49            | V  |
| $R_{0\max}$                                                                         | slope resistance * | 2.5             | 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 |



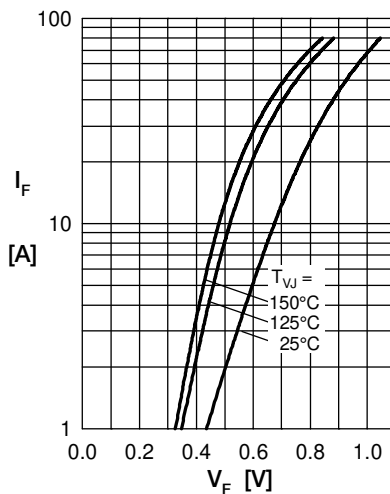
**Schottky**


Fig. 1 Max. forward voltage drop characteristics

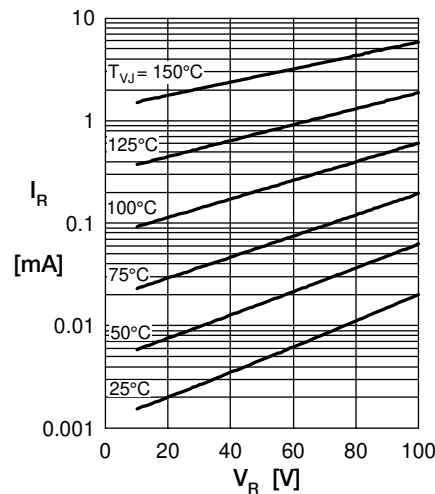
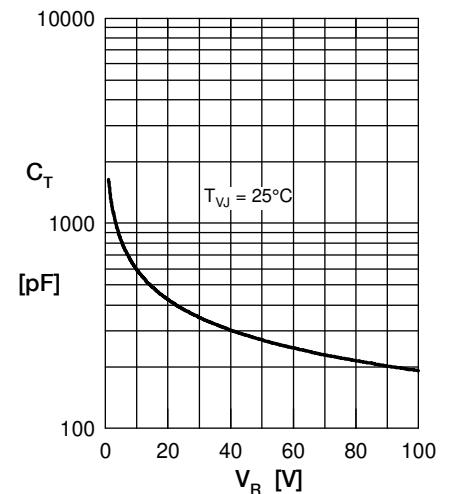
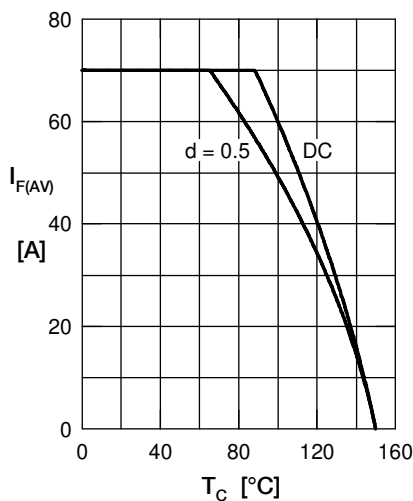
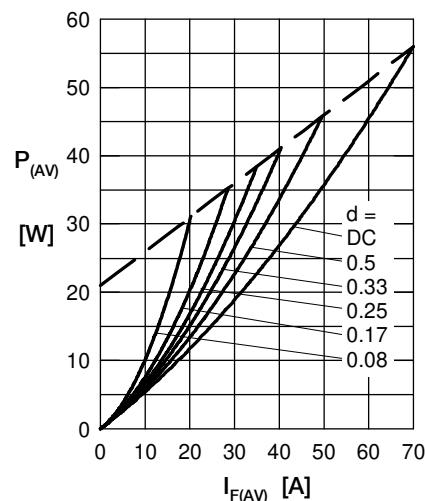

 Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$ 

 Fig. 3 Typ. junction capacitance  $C_T$  vs. reverse voltage  $V_R$ 

 Fig. 4 Average forward current  $I_{F(AV)}$  vs. case temp.  $T_C$ 


Fig. 5 Forward power loss characteristics

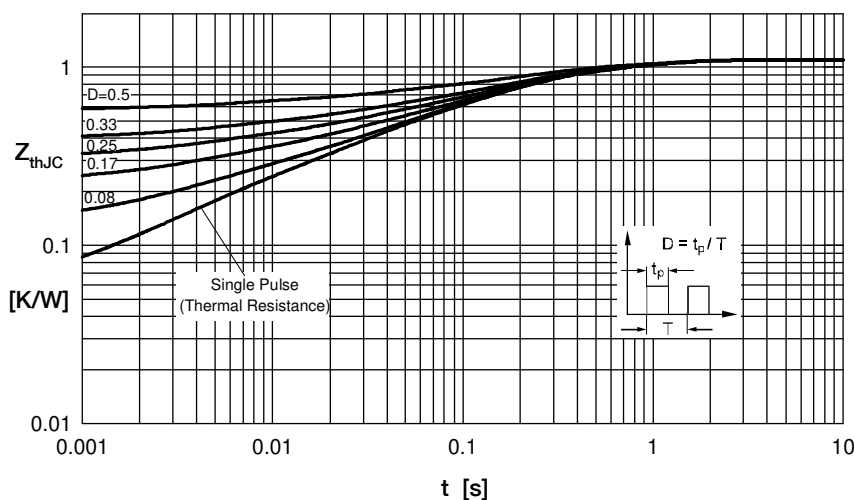


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode