

# Schottky Diode

$$\begin{aligned} V_{RRM} &= 150 \text{ V} \\ I_{FAV} &= 2 \times 120 \text{ A} \\ V_F &= 0.85 \text{ V} \end{aligned}$$

High Performance Schottky Diode  
 Low Loss and Soft Recovery  
 Parallel legs

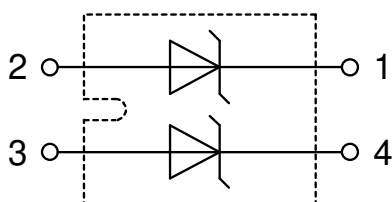
Part number

**DSA240X150NA**



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

## Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).

| Schottky   |                                              |                                                                    |                                | Ratings                        |      |      |      |
|------------|----------------------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------|------|------|------|
| Symbol     | Definition                                   | Conditions                                                         |                                | min.                           | typ. | max. | Unit |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 150  | V    |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 150  | V    |
| $I_R$      | reverse current, drain current               | $V_R = 150\text{ V}$                                               | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 1.5  | mA   |
|            |                                              | $V_R = 150\text{ V}$                                               | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 15   | mA   |
| $V_F$      | forward voltage drop                         | $I_F = 120\text{ A}$                                               | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 0.98 | V    |
|            |                                              | $I_F = 240\text{ A}$                                               |                                |                                |      | 1.24 | V    |
|            |                                              | $I_F = 120\text{ A}$                                               | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 0.85 | V    |
|            |                                              | $I_F = 240\text{ A}$                                               |                                |                                |      | 1.15 | V    |
| $I_{FAV}$  | average forward current                      | $T_C = 95^{\circ}\text{C}$<br>rectangular $d = 0.5$                | $T_{VJ} = 150^{\circ}\text{C}$ |                                |      | 120  | A    |
| $V_{F0}$   | threshold voltage                            | } for power loss calculation only                                  |                                | $T_{VJ} = 150^{\circ}\text{C}$ |      | 0.51 | V    |
| $r_F$      | slope resistance                             |                                                                    |                                |                                |      | 2.5  | mΩ   |
| $R_{thJC}$ | thermal resistance junction to case          |                                                                    |                                |                                |      | 0.4  | K/W  |
| $R_{thCH}$ | thermal resistance case to heatsink          |                                                                    |                                |                                | 0.1  |      | K/W  |
| $P_{tot}$  | total power dissipation                      | $T_C = 25^{\circ}\text{C}$                                         |                                |                                |      | 310  | W    |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 1.60 | kA   |
| $C_J$      | junction capacitance                         | $V_R = 24\text{ V}$ $f = 1\text{ MHz}$                             | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 902  |      | pF   |

| 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   |
| <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    |



#### Part description

D = Diode  
 S = Schottky Diode  
 A = low VF  
 240 = Current Rating [A]  
 X = Parallel legs  
 150 = Reverse Voltage [V]  
 NA = SOT-227B (minibloc)

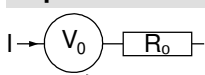
| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DSA240X150NA    | DSA240X150NA       | Tube          | 10       | 511101   |

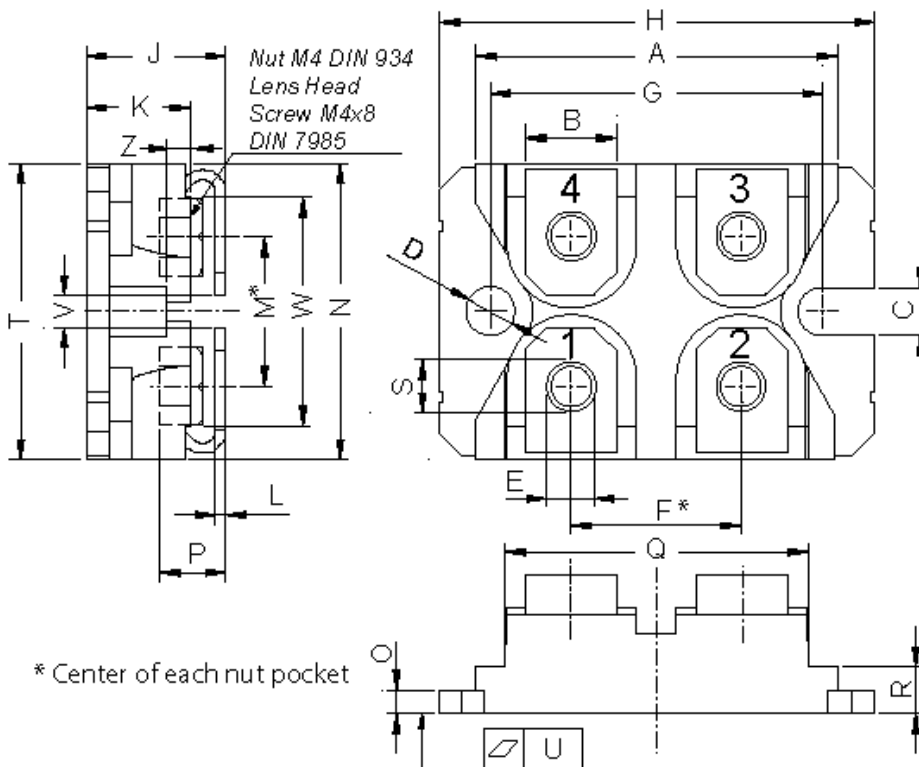
| Similar Part  | Package             | Voltage class |
|---------------|---------------------|---------------|
| DSS2x101-015A | SOT-227B (minibloc) | 150           |

#### Equivalent Circuits for Simulation

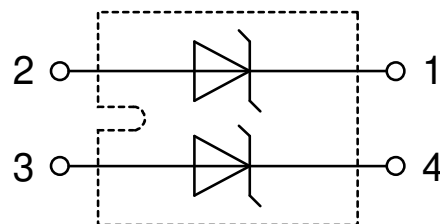
\* on die level

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

|                                                                                     |                    |                 |    |
|-------------------------------------------------------------------------------------|--------------------|-----------------|----|
|  |                    | <b>Schottky</b> |    |
| $V_{0\max}$                                                                         | threshold voltage  | 0.51            | V  |
| $R_{0\max}$                                                                         | slope resistance * | 0.6             | 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 |



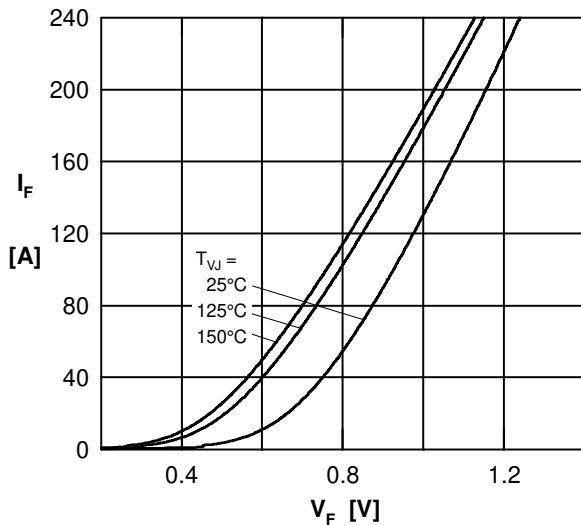
**Schottky**


Fig. 1 Max. forward voltage drop characteristics

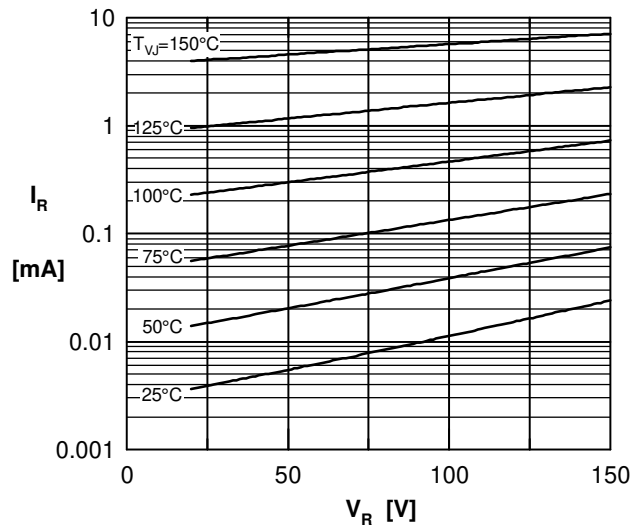
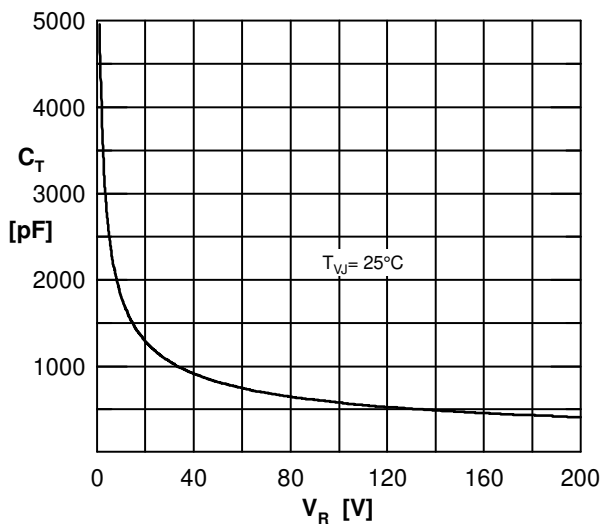
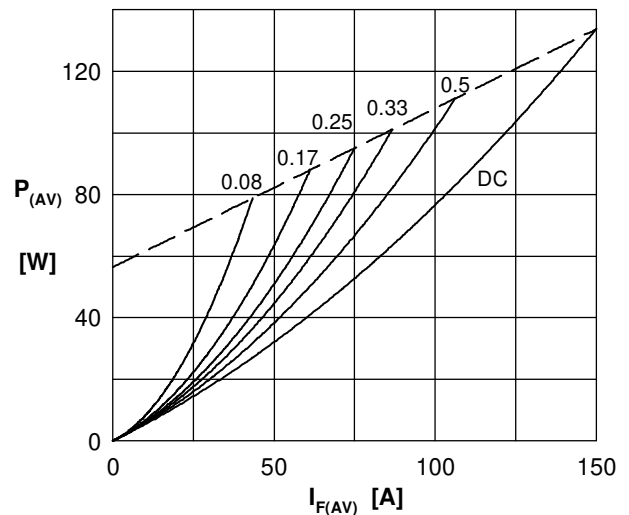
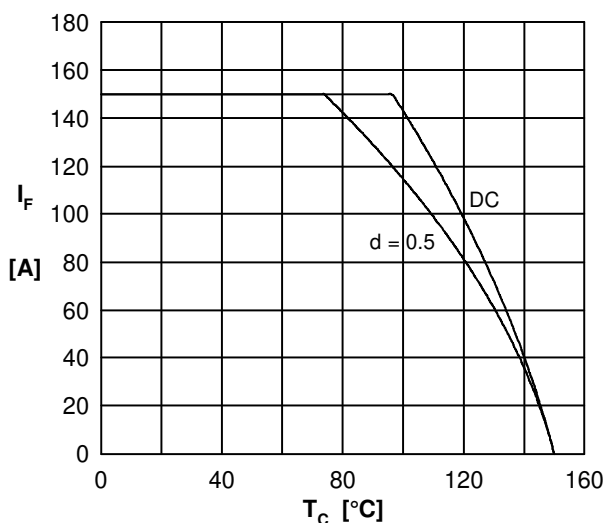
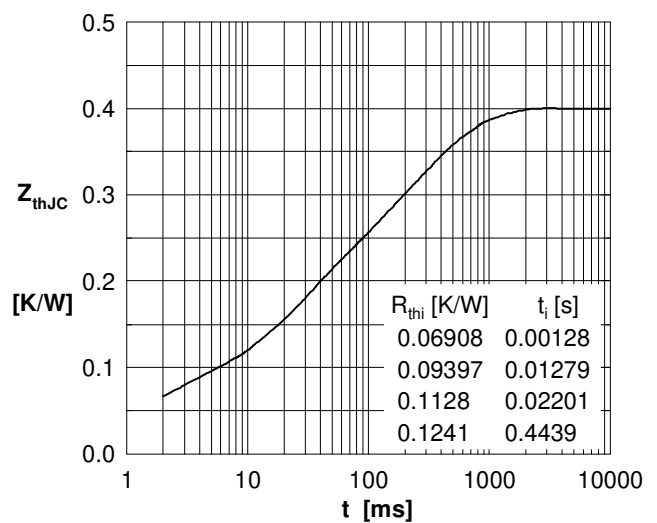

 Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$ 

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

 Fig. 4a Power dissipation versus direct output current  
 Fig. 4b and ambient temperature

 Fig. 5 Average forward current  $I_{F(AV)}$  vs. case temp.  $T_C$ 


Fig. 6 Transient thermal impedance junction to case