

# Schottky Diode

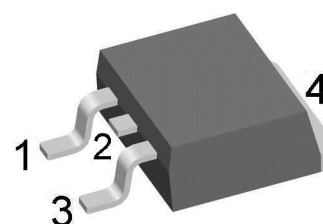
$$\begin{aligned} V_{RRM} &= 30\text{ V} \\ I_{FAV} &= 2 \times 25\text{ A} \\ V_F &= 0.35\text{ V} \end{aligned}$$

High Performance Schottky Diode  
 Low Loss and Soft Recovery  
 Common Cathode

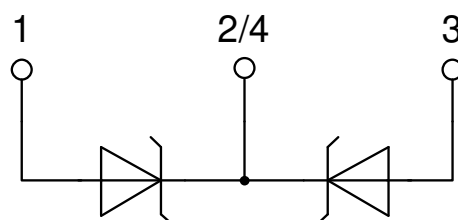
Part number

**DSSK48-003BS**

Marking on Product: DSSK48-003BS



Backside: cathode



## 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: TO-263 (D2Pak)

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

## Disclaimer Notice

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| Schottky   |                                              |                                                                    |                                | Ratings                        |      |      |      |
|------------|----------------------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------|------|------|------|
| Symbol     | Definition                                   | Conditions                                                         |                                | min.                           | typ. | max. | Unit |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 30   | V    |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 30   | V    |
| $I_R$      | reverse current, drain current               | $V_R = 30\text{ V}$                                                | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 20   | mA   |
|            |                                              | $V_R = 30\text{ V}$                                                | $T_{VJ} = 100^{\circ}\text{C}$ |                                |      | 60   | mA   |
| $V_F$      | forward voltage drop                         | $I_F = 20\text{ A}$                                                | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 0.44 | V    |
|            |                                              | $I_F = 40\text{ A}$                                                |                                |                                |      | 0.54 | V    |
|            |                                              | $I_F = 20\text{ A}$                                                | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 0.35 | V    |
|            |                                              | $I_F = 40\text{ A}$                                                |                                |                                |      | 0.48 | V    |
| $I_{FAV}$  | average forward current                      | $T_C = 130^{\circ}\text{C}$<br>rectangular $d = 0.5$               | $T_{VJ} = 150^{\circ}\text{C}$ |                                |      | 25   | A    |
| $V_{F0}$   | threshold voltage                            | } for power loss calculation only                                  |                                | $T_{VJ} = 150^{\circ}\text{C}$ |      | 0.19 | V    |
| $r_F$      | slope resistance                             |                                                                    |                                |                                |      | 6.8  | mΩ   |
| $R_{thJC}$ | thermal resistance junction to case          |                                                                    |                                |                                |      | 1.2  | K/W  |
| $R_{thCH}$ | thermal resistance case to heatsink          |                                                                    |                                |                                | 0.25 |      | K/W  |
| $P_{tot}$  | total power dissipation                      | $T_C = 25^{\circ}\text{C}$                                         |                                |                                |      | 105  | W    |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 300  | A    |
| $C_J$      | junction capacitance                         | $V_R = 5\text{ V}$ $f = 1\text{ MHz}$                              | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 1.77 |      | nF   |

| Package TO-263 (D2Pak) |                              |              | Ratings |      |      |      |
|------------------------|------------------------------|--------------|---------|------|------|------|
| Symbol                 | Definition                   | Conditions   | min.    | typ. | max. | Unit |
| $I_{RMS}$              | RMS current                  | per terminal |         |      | 35   | A    |
| $T_{VJ}$               | virtual junction temperature |              | -55     |      | 150  | °C   |
| $T_{op}$               | operation temperature        |              | -55     |      | 125  | °C   |
| $T_{stg}$              | storage temperature          |              | -55     |      | 150  | °C   |
| <b>Weight</b>          |                              |              |         | 1.5  |      | g    |
| $F_c$                  | mounting force with clip     |              | 20      |      | 60   | N    |

### Product Marking



| Ordering    | Ordering Number  | Marking on Product | Delivery Mode | Quantity | Code No. |
|-------------|------------------|--------------------|---------------|----------|----------|
| Standard    | DSSK48-003BS-TRL | DSSK48-003BS       | Tape & Reel   | 800      | 484326   |
| Alternative | DSSK48-003BS-TUB | DSSK48-003BS       | Tube          | 50       | 484318   |

| Similar Part | Package      | Voltage class |
|--------------|--------------|---------------|
| DSSK48-003B  | TO-220AB (3) | 30            |
| DSSK48-0025B | TO-220AB (3) | 25            |

### Equivalent Circuits for Simulation

\* on die level

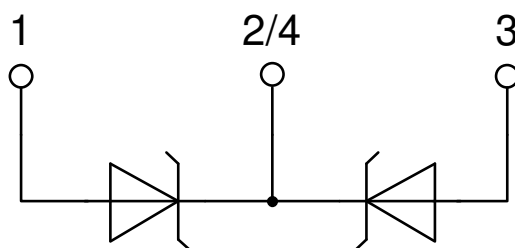
$T_{VJ} = 150^{\circ}\text{C}$

|                                                                                     |                    |                 |    |
|-------------------------------------------------------------------------------------|--------------------|-----------------|----|
|  |                    | <b>Schottky</b> |    |
| $V_{0\max}$                                                                         | threshold voltage  | 0.19            | V  |
| $R_{0\max}$                                                                         | slope resistance * | 3.6             | mΩ |

**Outlines TO-263 (D2Pak)**


| Dim. | Millimeter |       | Inches      |       |
|------|------------|-------|-------------|-------|
|      | min        | max   | min         | max   |
| A    | 4.06       | 4.83  | 0.160       | 0.190 |
| A1   | typ. 0.10  |       | typ. 0.004  |       |
| A2   | 2.41       |       | 0.095       |       |
| b    | 0.51       | 0.99  | 0.020       | 0.039 |
| b2   | 1.14       | 1.40  | 0.045       | 0.055 |
| c    | 0.40       | 0.74  | 0.016       | 0.029 |
| c2   | 1.14       | 1.40  | 0.045       | 0.055 |
| D    | 8.38       | 9.40  | 0.330       | 0.370 |
| D1   | 8.00       | 8.89  | 0.315       | 0.350 |
| D2   | 2.5        |       | 0.098       |       |
| E    | 9.65       | 10.41 | 0.380       | 0.410 |
| E1   | 6.22       | 8.50  | 0.245       | 0.335 |
| e    | 2.54 BSC   |       | 0.100 BSC   |       |
| e1   | 4.28       |       | 0.169       |       |
| H    | 14.61      | 15.88 | 0.575       | 0.625 |
| L    | 1.78       | 2.79  | 0.070       | 0.110 |
| L1   | 1.02       | 1.68  | 0.040       | 0.066 |
| W    | typ. 0.02  | 0.040 | typ. 0.0008 | 0.002 |

*All dimensions conform with and/or within JEDEC standard.*



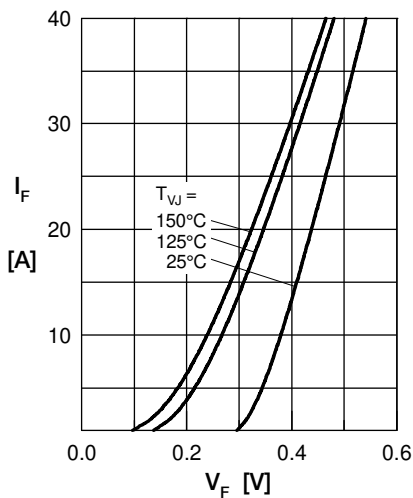
**Schottky**


Fig. 1 Max. forward voltage drop characteristics

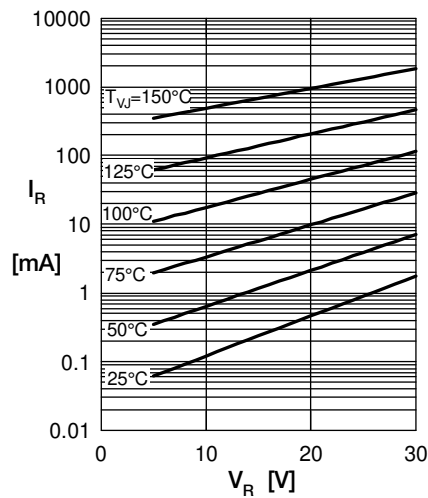


Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$

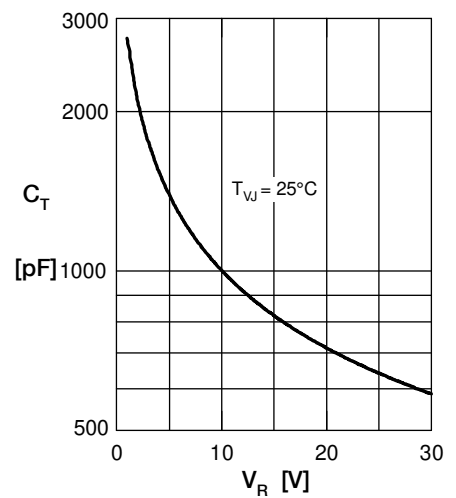


Fig. 3 Typ. junction capacitance  $C_T$  vs. reverse voltage  $V_R$

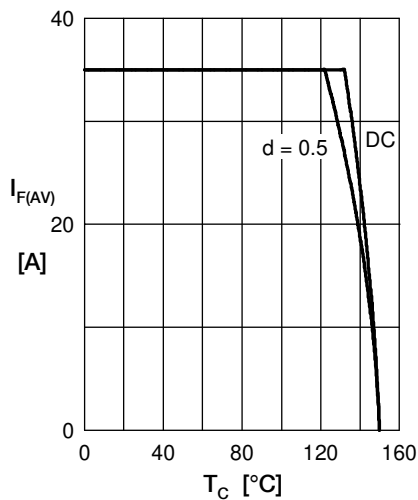


Fig. 4 Average forward current  $I_{F(AV)}$  vs. case temp.  $T_C$

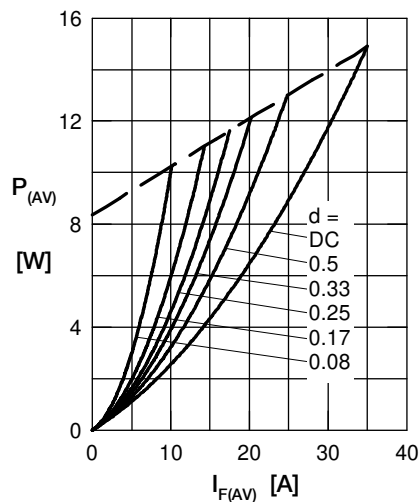


Fig. 5 Forward power loss characteristics

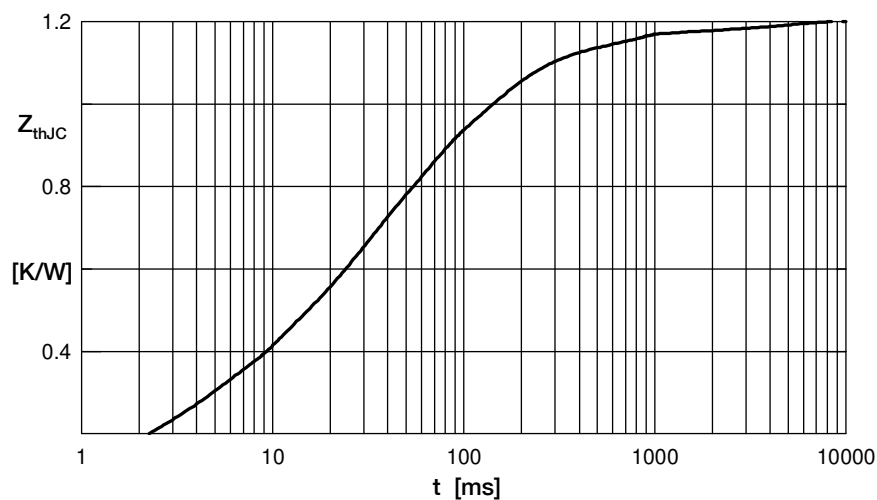


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode