

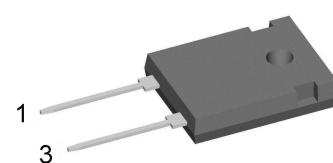
# Schottky Diode

$$\begin{aligned} V_{RRM} &= 45 \text{ V} \\ I_{FAV} &= 60 \text{ A} \\ V_F &= 0.57 \text{ V} \end{aligned}$$

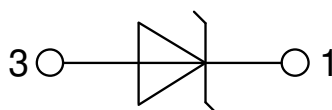
High Performance Schottky Diode  
 Low Loss and Soft Recovery  
 Single Diode

Part number

**DSS60-0045B**



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-247

- 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 | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 45   | V    |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 45   | V    |
| $I_R$      | reverse current, drain current               | $V_R = 45\text{ V}$                                                | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 60   | mA   |
|            |                                              | $V_R = 45\text{ V}$                                                | $T_{VJ} = 100^{\circ}\text{C}$ |                                |      | 250  | mA   |
| $V_F$      | forward voltage drop                         | $I_F = 60\text{ A}$                                                | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 0.60 | V    |
|            |                                              | $I_F = 120\text{ A}$                                               |                                |                                |      | 0.86 | V    |
|            |                                              | $I_F = 60\text{ A}$                                                | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 0.57 | V    |
|            |                                              | $I_F = 120\text{ A}$                                               |                                |                                |      | 0.87 | V    |
| $I_{FAV}$  | average forward current                      | $T_C = 105^{\circ}\text{C}$<br>rectangular $d = 0.5$               | $T_{VJ} = 150^{\circ}\text{C}$ |                                |      | 60   | A    |
| $V_{F0}$   | threshold voltage                            | } for power loss calculation only                                  |                                | $T_{VJ} = 150^{\circ}\text{C}$ |      | 0.27 | V    |
| $r_F$      | slope resistance                             |                                                                    |                                |                                |      | 4.9  | mΩ   |
| $R_{thJC}$ | thermal resistance junction to case          |                                                                    |                                |                                |      | 0.8  | K/W  |
| $R_{thCH}$ | thermal resistance case to heatsink          |                                                                    |                                |                                | 0.25 |      | K/W  |
| $P_{tot}$  | total power dissipation                      | $T_C = 25^{\circ}\text{C}$                                         |                                |                                |      | 155  | W    |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 600  | A    |
| $C_J$      | junction capacitance                         | $V_R = 5\text{ V}$ $f = 1\text{ MHz}$                              | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 2.93 |      | nF   |
| $E_{AS}$   | non-repetitive avalanche energy              | $I_{AS} = 31\text{ A}$ $L = 180\text{ }\mu\text{H}$                | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 137  | mJ   |
| $I_{AR}$   | repetitive avalanche current                 | $V_A = 1.5 \cdot V_R$ typ. $f = 10\text{ kHz}$                     |                                |                                |      | 3.1  | A    |

| Package TO-247 |                              |              | Ratings |      |      |      |
|----------------|------------------------------|--------------|---------|------|------|------|
| Symbol         | Definition                   | Conditions   | min.    | typ. | max. | Unit |
| $I_{RMS}$      | RMS current                  | per terminal |         |      | 70   | A    |
| $T_{VJ}$       | virtual junction temperature |              | -55     |      | 150  | °C   |
| $T_{op}$       | operation temperature        |              | -55     |      | 125  | °C   |
| $T_{stg}$      | storage temperature          |              | -55     |      | 150  | °C   |
| Weight         |                              |              |         | 6    |      | g    |
| $M_D$          | mounting torque              |              | 0.8     |      | 1.2  | Nm   |
| $F_C$          | mounting force with clip     |              | 20      |      | 120  | N    |

### Product Marking

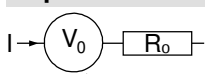


| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DSS60-0045B     | DSS60-0045B        | Tube          | 30       | 475599   |

### Equivalent Circuits for Simulation

\* on die level

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

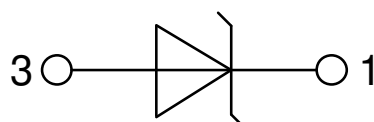


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|             |                    |      |    |
|-------------|--------------------|------|----|
| $V_{0\max}$ | threshold voltage  | 0.27 | V  |
| $R_{0\max}$ | slope resistance * | 2.4  | mΩ |

**Outlines TO-247**


| Sym. | Inches |       | Millimeter |       |
|------|--------|-------|------------|-------|
|      | min.   | max.  | min.       | max.  |
| A    | 0.185  | 0.209 | 4.70       | 5.30  |
| A1   | 0.087  | 0.102 | 2.21       | 2.59  |
| A2   | 0.059  | 0.098 | 1.50       | 2.49  |
| D    | 0.819  | 0.845 | 20.79      | 21.45 |
| E    | 0.610  | 0.640 | 15.48      | 16.24 |
| E2   | 0.170  | 0.216 | 4.31       | 5.48  |
| e    | 0.430  | BSC   | 10.92      | BSC   |
| L    | 0.780  | 0.800 | 19.80      | 20.30 |
| L1   | -      | 0.177 | -          | 4.49  |
| Ø P  | 0.140  | 0.144 | 3.55       | 3.65  |
| Q    | 0.212  | 0.244 | 5.38       | 6.19  |
| S    | 0.242  | BSC   | 6.14       | BSC   |
| b    | 0.039  | 0.055 | 0.99       | 1.40  |
| b2   | 0.065  | 0.094 | 1.65       | 2.39  |
| b4   | 0.102  | 0.135 | 2.59       | 3.43  |
| c    | 0.015  | 0.035 | 0.38       | 0.89  |
| D1   | 0.515  | -     | 13.07      | -     |
| D2   | 0.020  | 0.053 | 0.51       | 1.35  |
| E1   | 0.530  | -     | 13.45      | -     |
| Ø P1 | -      | 0.29  | -          | 7.39  |



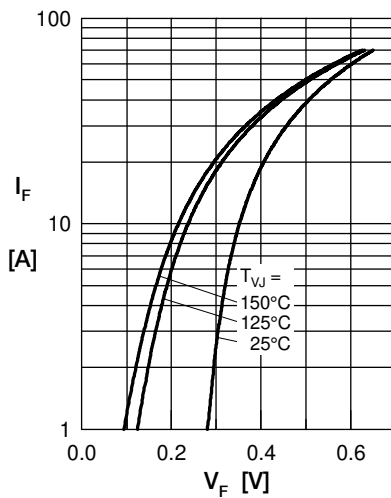
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Fig. 1 Max. forward voltage drop characteristics

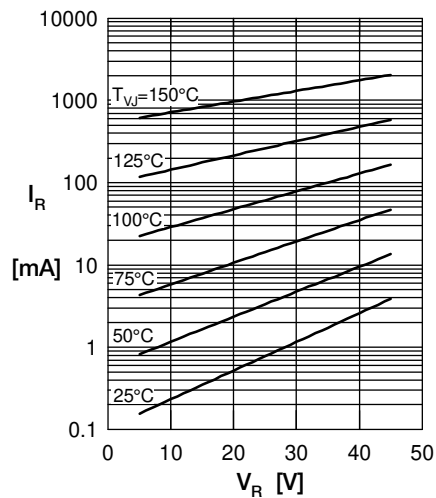
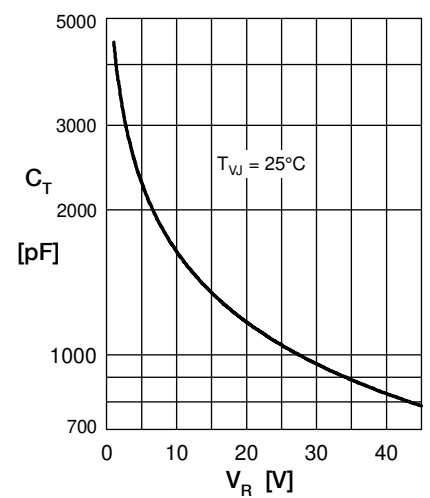
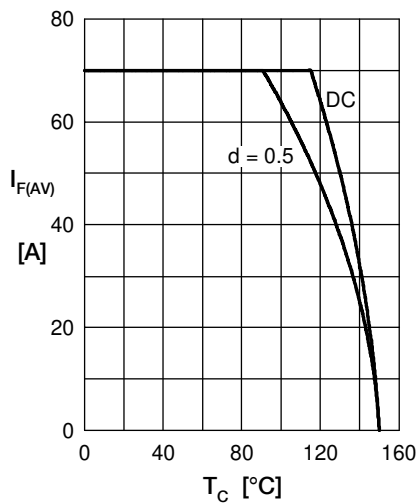
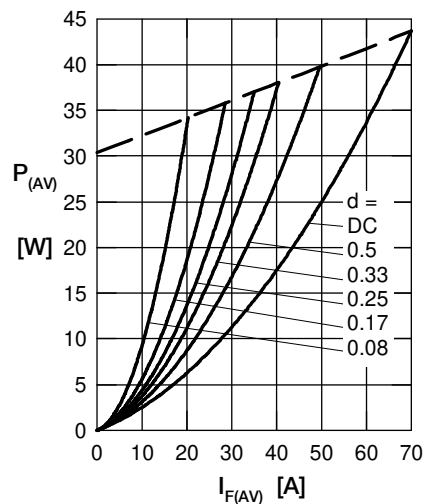

 Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$ 

 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

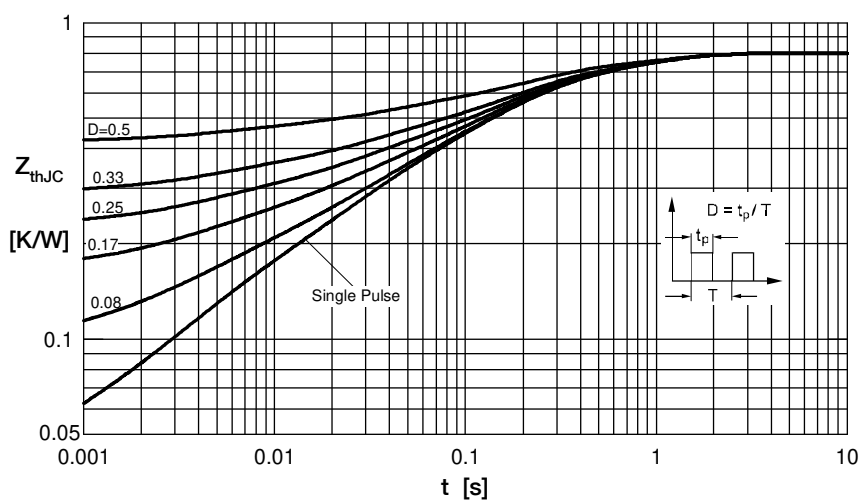


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode