

Schottky Diode

$$V_{RRM} = 45 \text{ V}$$

$$I_{FAV} = 2 \times 40 \text{ A}$$

$$V_F = 0.46 \text{ V}$$

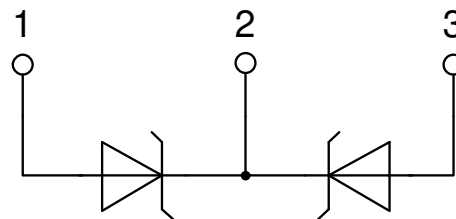
High Performance Schottky Diode
 Low Loss and Soft Recovery
 Common Cathode

Part number

DSSK80-0045B



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

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| Schottky | | | | Ratings | | | |
|------------|--|--|------------------------------|--------------------------|------|------|------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | | 45 | V |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | | 45 | V |
| I_R | reverse current, drain current | $V_R = 45\text{ V}$ | $T_{VJ} = 25^\circ\text{C}$ | | | 20 | mA |
| | | $V_R = 45\text{ V}$ | $T_{VJ} = 100^\circ\text{C}$ | | | 250 | mA |
| V_F | forward voltage drop | $I_F = 40\text{ A}$ | $T_{VJ} = 25^\circ\text{C}$ | | | 0.51 | V |
| | | $I_F = 80\text{ A}$ | | | | 0.69 | V |
| | | $I_F = 40\text{ A}$ | $T_{VJ} = 125^\circ\text{C}$ | | | 0.46 | V |
| | | $I_F = 80\text{ A}$ | | | | 0.68 | V |
| I_{FAV} | average forward current | $T_C = 125^\circ\text{C}$ rectangular $d = 0.5$ | $T_{VJ} = 150^\circ\text{C}$ | | | 40 | A |
| V_{FO} | threshold voltage | } for power loss calculation only | | | | 0.23 | V |
| r_F | slope resistance | | | | | 5.3 | 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 | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | $T_{VJ} = 45^\circ\text{C}$ | | | 750 | 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 ¹⁾ | | | 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 | DSSK80-0045B | DSSK80-0045B | Tube | 30 | 475580 |

| Similar Part | Package | Voltage class |
|--------------|--------------|---------------|
| DSB80C45HB | TO-247AD (3) | 45 |

Equivalent Circuits for Simulation

** on die level*

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



Schottky

| | | | |
|--------------|--------------------|------|----|
| $V_{0\ max}$ | threshold voltage | 0.23 | V |
| $R_{0\ max}$ | slope resistance * | 2.8 | 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 | 0.215 BSC | | 5.46 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 | | 5.38 | |
| 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 |



Schottky

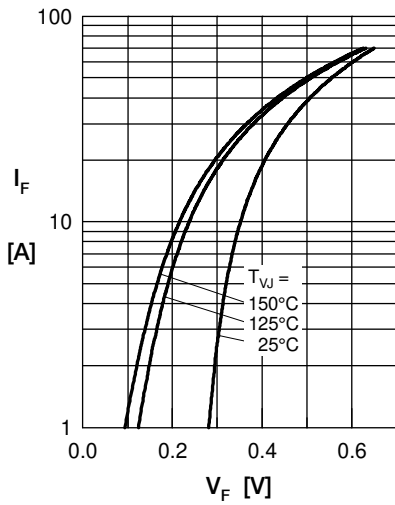


Fig. 1 Max. forward voltage drop characteristics

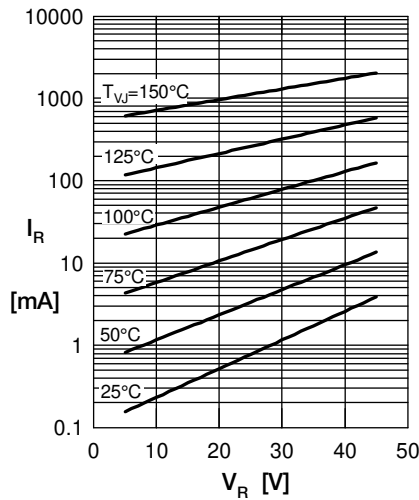


Fig. 2 Typ. reverse current I_R vs. reverse voltage V_R

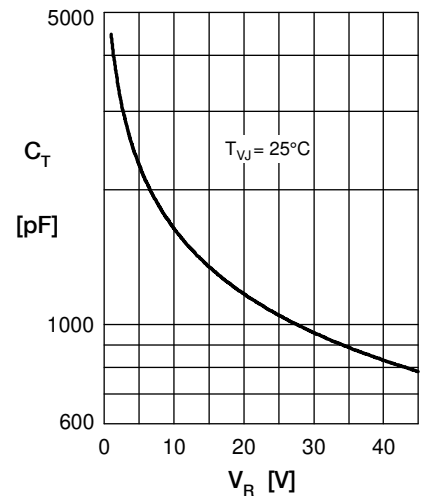


Fig. 3 Typ. junction capacitance C_T vs. reverse voltage V_R

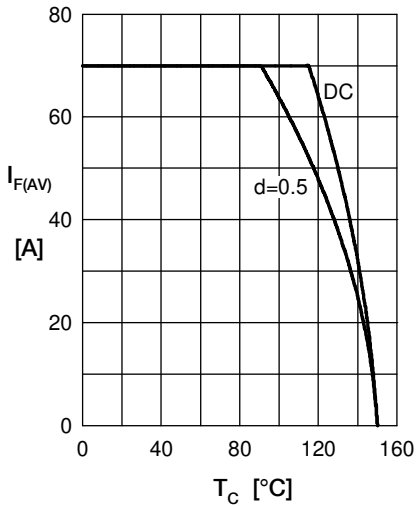


Fig. 4 Average forward current $I_{F(AV)}$ vs. case temp. T_C

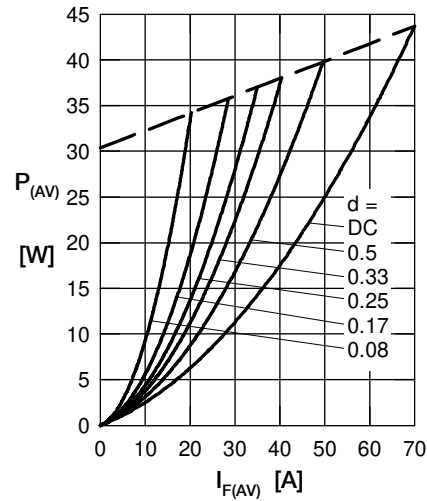


Fig. 5 Forward power loss characteristics

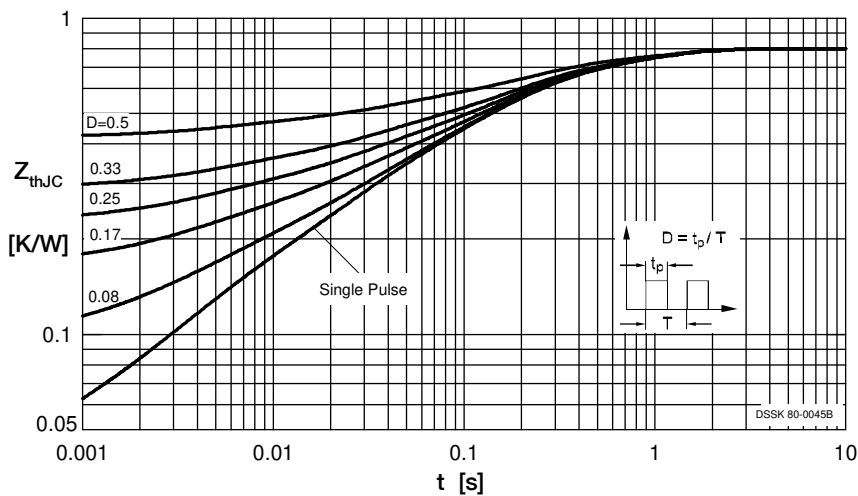


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode