

# Schottky Diode

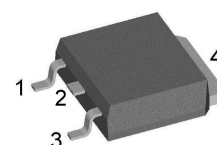
$$\begin{aligned} V_{RRM} &= 45 \text{ V} \\ I_{FAV} &= 6 \text{ A} \\ V_F &= 0.5 \text{ V} \end{aligned}$$

High Performance Schottky Diode  
 Low Loss and Soft Recovery  
 Single Diode

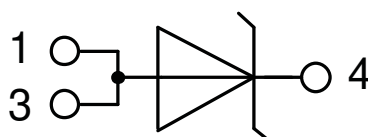
Part number

**DSS6-0045AS**

Marking on Product: 6Y045AS



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-252 (DPak)

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

## Disclaimer Notice

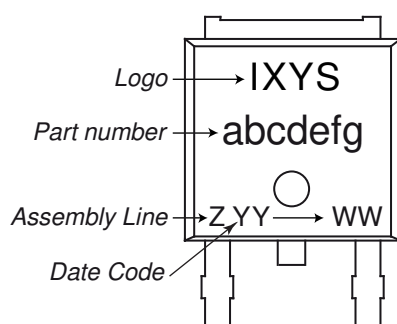
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| Schottky   |                                              |                                                                    |                                | Ratings                        |      |      |               |
|------------|----------------------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------|------|------|---------------|
| 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               | $V_R = 45\text{ V}$                                                | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 250  | $\mu\text{A}$ |
|            |                                              | $V_R = 45\text{ V}$                                                | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 2.5  | mA            |
| $V_F$      | forward voltage drop                         | $I_F = 6\text{ A}$                                                 | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 0.63 | V             |
|            |                                              | $I_F = 12\text{ A}$                                                |                                |                                |      | 0.71 | V             |
|            |                                              | $I_F = 6\text{ A}$                                                 | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 0.50 | V             |
|            |                                              | $I_F = 12\text{ A}$                                                |                                |                                |      | 0.59 | V             |
| $I_{FAV}$  | average forward current                      | $T_C = 165^{\circ}\text{C}$<br>rectangular $d = 0.5$               | $T_{VJ} = 175^{\circ}\text{C}$ |                                |      | 6    | A             |
| $V_{F0}$   | threshold voltage                            | } for power loss calculation only                                  |                                | $T_{VJ} = 175^{\circ}\text{C}$ |      | 0.35 | V             |
| $r_F$      | slope resistance                             |                                                                    |                                |                                |      | 13.9 | m $\Omega$    |
| $R_{thJC}$ | thermal resistance junction to case          |                                                                    |                                |                                |      | 3    | K/W           |
| $R_{thCH}$ | thermal resistance case to heatsink          |                                                                    |                                |                                | 0.50 |      | K/W           |
| $P_{tot}$  | total power dissipation                      | $T_C = 25^{\circ}\text{C}$                                         |                                |                                |      | 50   | W             |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 120  | A             |
| $C_J$      | junction capacitance                         | $V_R = 5\text{ V}$ $f = 1\text{ MHz}$                              | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 497  |      | pF            |

| Package TO-252 (DPak) |                              |                            | Ratings |      |      |      |
|-----------------------|------------------------------|----------------------------|---------|------|------|------|
| Symbol                | Definition                   | Conditions                 | min.    | typ. | max. | Unit |
| $I_{RMS}$             | RMS current                  | per terminal <sup>1)</sup> |         |      | 20   | A    |
| $T_{VJ}$              | virtual junction temperature |                            | -55     |      | 175  | °C   |
| $T_{op}$              | operation temperature        |                            | -55     |      | 150  | °C   |
| $T_{stg}$             | storage temperature          |                            | -55     |      | 150  | °C   |
| <b>Weight</b>         |                              |                            |         | 0.3  |      | g    |
| $F_C$                 | mounting force with clip     |                            | 20      |      | 60   | N    |

<sup>1)</sup>  $I_{RMS}$  is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.

### Product Marking

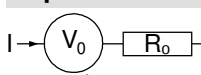


| Ordering    | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|-------------|-----------------|--------------------|---------------|----------|----------|
| Standard    | DSS6-0045AS-TRL | 6Y045AS            | Tape & Reel   | 2500     | 497878   |
| Alternative | DSS6-0045AS-TUB | 6Y045AS            | Tube          | 70       | 525014   |

### Equivalent Circuits for Simulation

\* on die level

$T_{VJ} = 175\text{ °C}$



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$V_{0\text{ max}}$  threshold voltage 0.35

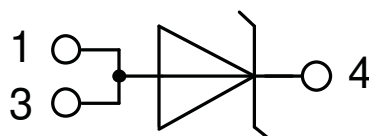
V

$R_{0\text{ max}}$  slope resistance \* 10.7

mΩ

**Outlines TO-252 (DPak)**


| Dim | Millimeters |       | Inches    |       |
|-----|-------------|-------|-----------|-------|
|     | min         | max   | min       | max   |
| A   | 2.20        | 2.40  | 0.087     | 0.094 |
| A1  | 2.10        | 2.50  | 0.083     | 0.098 |
| b   | 0.66        | 0.86  | 0.026     | 0.034 |
| b2  | -           | 0.96  | -         | 0.038 |
| b3  | 5.04        | 5.64  | 0.198     | 0.222 |
| b4  | 4.34 BSC    |       | 0.171 BSC |       |
| b5  | 0.50 BSC    |       | 0.020 BSC |       |
| c   | 0.40        | 0.86  | 0.016     | 0.034 |
| D   | 5.90        | 6.30  | 0.232     | 0.248 |
| E   | 6.40        | 6.80  | 0.252     | 0.268 |
| e   | 2.10        | 2.50  | 0.083     | 0.098 |
| H   | 9.20        | 10.10 | 0.362     | 0.398 |
| L   | 0.55        | 1.28  | 0.022     | 0.050 |
| L1  | 2.50        | 2.90  | 0.098     | 0.114 |
| L2  | 0.40        | 0.60  | 0.016     | 0.024 |
| L3  | 0.50        | 0.90  | 0.020     | 0.035 |
| L4  | 0.60        | 1.00  | 0.024     | 0.039 |
| L5  | 0.82        | 1.22  | 0.032     | 0.048 |
| L6  | 0.79        | 0.99  | 0.031     | 0.039 |
| L7  | 0.81        | 1.01  | 0.032     | 0.040 |
| L8  | 0.40        | 0.80  | 0.016     | 0.031 |
| L9  | 1.50 BSC    |       | 0.059 BSC |       |
| Ø P | 1.00 BSC    |       | 0.039 BSC |       |



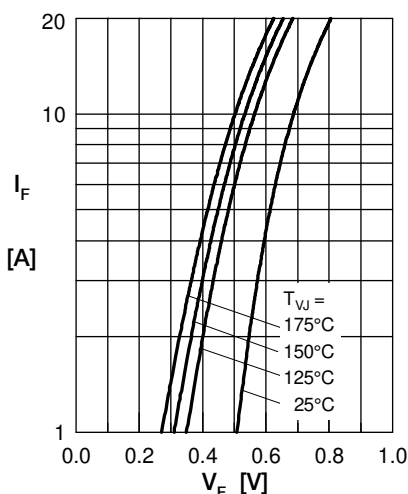
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Fig. 1 Max. forward voltage drop characteristics

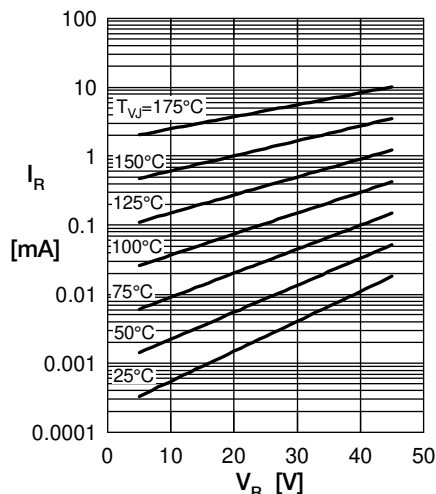


Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$

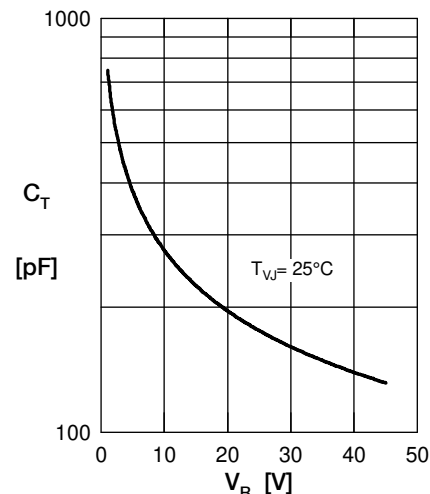


Fig. 3 Typ. junction capacitance  $C_T$  vs. reverse voltage  $V_R$

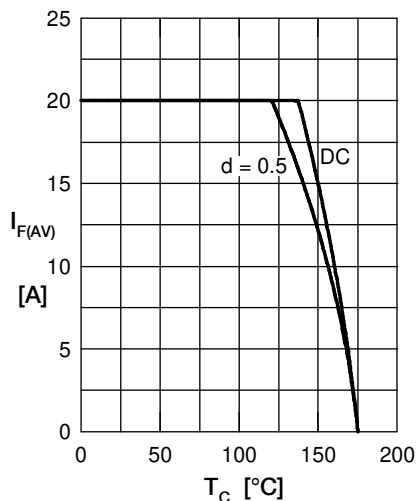


Fig. 4 Average forward current  $I_{F(AV)}$  vs. case temp.  $T_C$

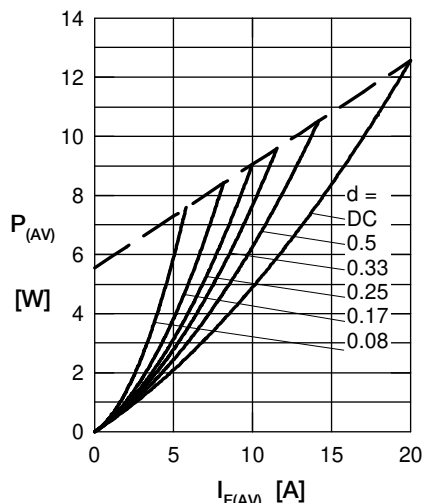


Fig. 5 Forward power loss characteristics

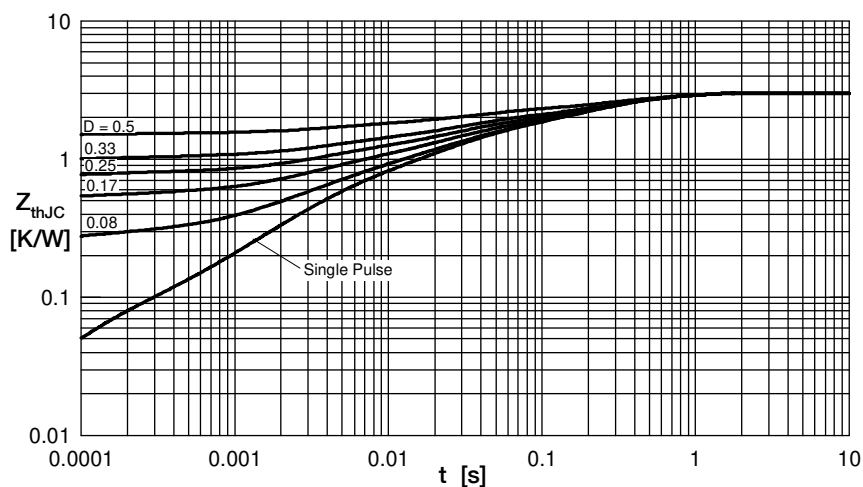


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode