

## Schottky Diode Gen <sup>2</sup>

$$V_{RRM} = 150V$$

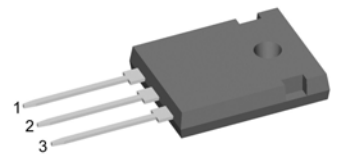
$$I_{FAV} = 2 \times 35A$$

$$V_F = 0.77V$$

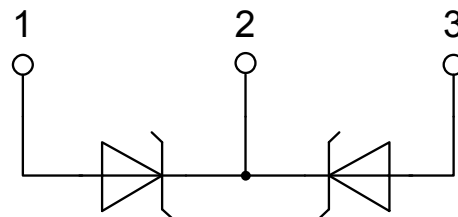
High Performance Schottky Diode  
Low Loss and Soft Recovery  
Common Cathode

Part number

**DSA70C150HB**



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

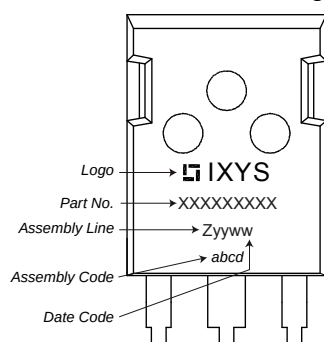
### Package: TO-247

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

| Schottky          |                                              |                                                |                                    | Ratings |      |      |      |
|-------------------|----------------------------------------------|------------------------------------------------|------------------------------------|---------|------|------|------|
| Symbol            | Definition                                   | Conditions                                     |                                    | min.    | typ. | max. | Unit |
| V <sub>RSM</sub>  | max. non-repetitive reverse blocking voltage | T <sub>VJ</sub> = 25°C                         |                                    |         |      | 150  | V    |
| V <sub>RRM</sub>  | max. repetitive reverse blocking voltage     | T <sub>VJ</sub> = 25°C                         |                                    |         |      | 150  | V    |
| I <sub>R</sub>    | reverse current, drain current               | V <sub>R</sub> = 150 V                         | T <sub>VJ</sub> = 25°C             |         |      | 680  | μA   |
|                   |                                              | V <sub>R</sub> = 150 V                         | T <sub>VJ</sub> = 125°C            |         |      | 7.5  | mA   |
| V <sub>F</sub>    | forward voltage drop                         | I <sub>F</sub> = 35 A                          | T <sub>VJ</sub> = 25°C             |         |      | 0.90 | V    |
|                   |                                              | I <sub>F</sub> = 70 A                          |                                    |         |      | 1.06 | V    |
|                   |                                              | I <sub>F</sub> = 35 A                          | T <sub>VJ</sub> = 125°C            |         |      | 0.77 | V    |
|                   |                                              | I <sub>F</sub> = 70 A                          |                                    |         |      | 0.94 | V    |
| I <sub>FAV</sub>  | average forward current                      | T <sub>C</sub> = 150°C<br>rectangular          | T <sub>VJ</sub> = 175°C<br>d = 0.5 |         |      | 35   | A    |
| V <sub>F0</sub>   | threshold voltage                            | } for power loss calculation only              |                                    |         |      | 0.53 | V    |
| r <sub>F</sub>    | slope resistance                             |                                                |                                    |         |      | 4.9  | mΩ   |
| R <sub>thJC</sub> | thermal resistance junction to case          |                                                |                                    |         |      | 0.7  | K/W  |
| R <sub>thCH</sub> | thermal resistance case to heatsink          |                                                |                                    |         | 0.25 |      | K/W  |
| P <sub>tot</sub>  | total power dissipation                      | T <sub>C</sub> = 25°C                          |                                    |         |      | 215  | W    |
| I <sub>FSM</sub>  | max. forward surge current                   | t = 10 ms; (50 Hz), sine; V <sub>R</sub> = 0 V |                                    |         |      | 600  | A    |
| C <sub>J</sub>    | junction capacitance                         | V <sub>R</sub> = 24 V f = 1 MHz                |                                    |         | 226  |      | pF   |

| Package TO-247 |                              |                            | Ratings |      |      |      |
|----------------|------------------------------|----------------------------|---------|------|------|------|
| Symbol         | Definition                   | Conditions                 | min.    | typ. | max. | Unit |
| $I_{RMS}$      | RMS current                  | per terminal <sup>1)</sup> |         |      | 50   | A    |
| $T_{VJ}$       | virtual junction temperature |                            | -55     |      | 175  | °C   |
| $T_{op}$       | operation temperature        |                            | -55     |      | 150  | °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



### Part number

D = Diode  
 S = Schottky Diode  
 A = low VF  
 70 = Current Rating [A]  
 C = Common Cathode  
 150 = Reverse Voltage [V]  
 HB = TO-247AD (3)

| Ordering | Part Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-------------|--------------------|---------------|----------|----------|
| Standard | DSA70C150HB | DSA70C150HB        | Tube          | 30       | 506708   |

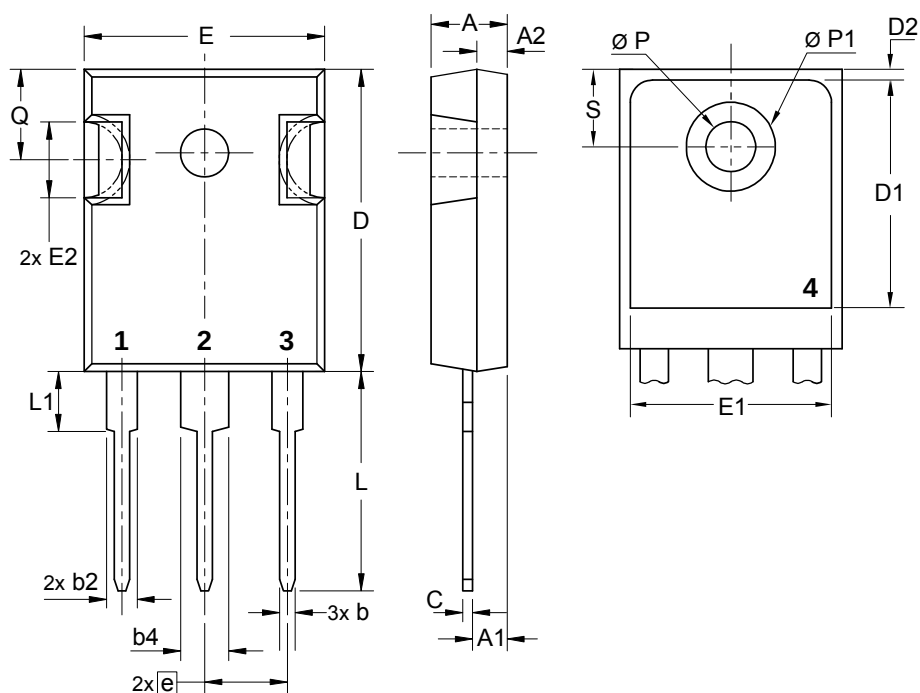
### Equivalent Circuits for Simulation

\* on die level

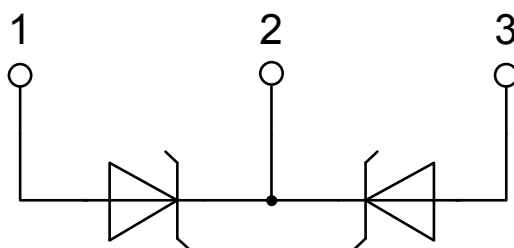
$T_{VJ} = 175^{\circ}\text{C}$

|             |                    |          |    |
|-------------|--------------------|----------|----|
|             |                    | Schottky |    |
| $V_{0\max}$ | threshold voltage  | 0.53     | V  |
| $R_{0\max}$ | slope resistance * | 2.3      | 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     | 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  |



## Schottky

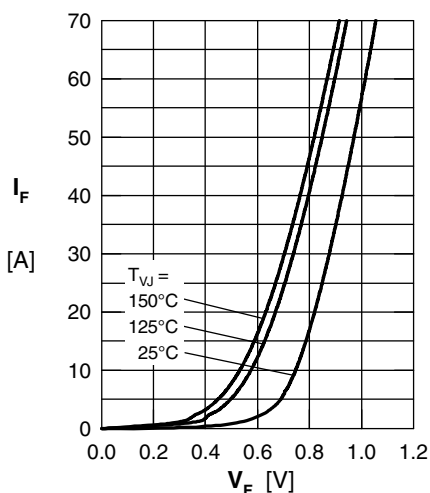


Fig. 1 Maximum forward voltage drop characteristics

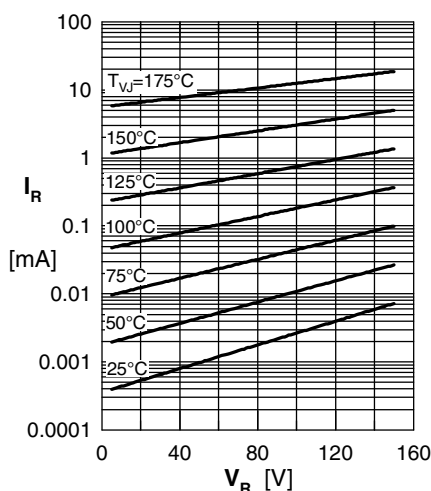


Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$

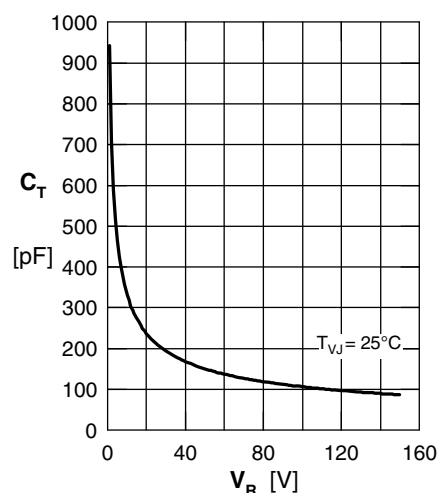


Fig. 3 Typ. junction capacitance  $C_T$  vs. reverse voltage  $V_R$

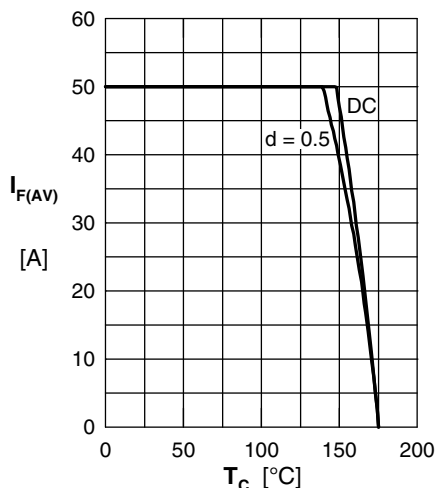


Fig. 4 Average forward current  $I_{F(AV)}$  vs. case temperature  $T_C$

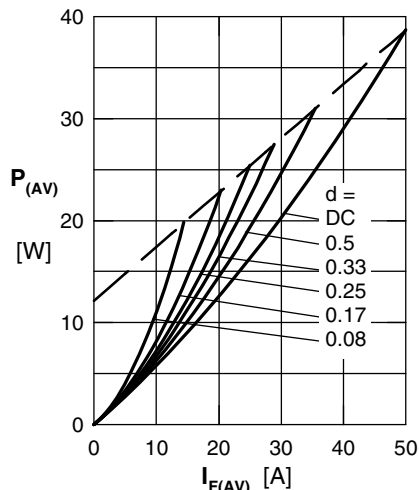


Fig. 5 Forward power loss characteristics

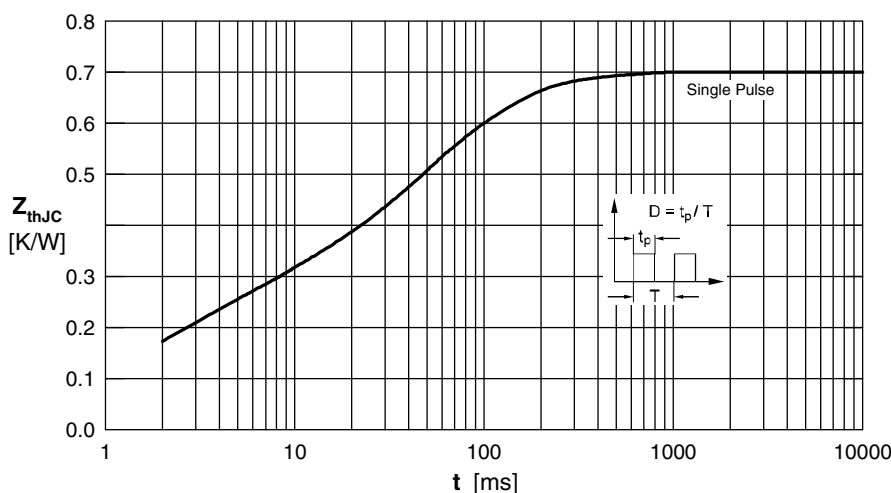


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode