

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

$$V_{RRM} = 150V$$

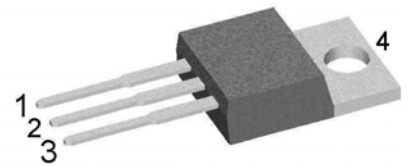
$$I_{FAV} = 2 \times 10A$$

$$V_F = 0.73V$$

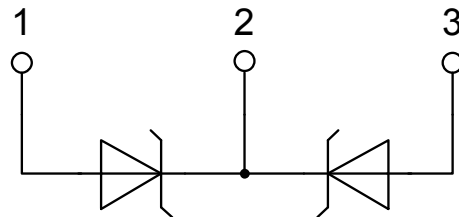
High Performance Schottky Diode  
Low Loss and Soft Recovery  
Common Cathode

Part number

DSA20C150PB



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:

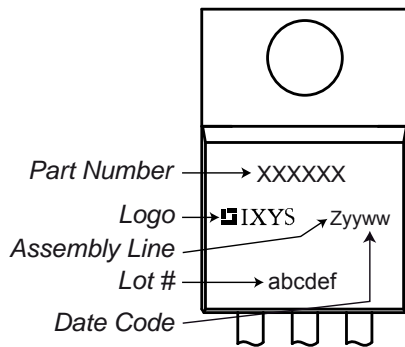
- Rectifiers in switch mode power supplies (SMPS)
- Free wheeling diode in low voltage converters

### Package: TO-220

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

| Schottky   |  |  |                              | Ratings |      |               |   |
|------------|--|--|------------------------------|---------|------|---------------|---|
| Symbol     | Definition                                   | Conditions   | min.                         | typ.    | max. | Unit          |   |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage |  |                              |         | 150  | V             |   |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     |  |                              |         | 150  | V             |   |
| $I_R$      | reverse current, drain current               | $V_R = 150\text{ V}$   |                              |         | 200  | $\mu\text{A}$ |   |
|            |  | $V_R = 150\text{ V}$   |                              |         | 2    | mA            |   |
| $V_F$      | forward voltage drop                         | $I_F = 10\text{ A}$  |                              |         | 0.87 | V             |   |
|            |  | $I_F = 20\text{ A}$  |                              |         | 0.98 | V             |   |
|            |  | $I_F = 10\text{ A}$  | $T_{VJ} = 125^\circ\text{C}$ |         |      | 0.73          | V |
|            |  | $I_F = 20\text{ A}$  | $T_{VJ} = 125^\circ\text{C}$ |         |      | 0.85          | V |
| $I_{FAV}$  | average forward current                      | $T_C = 155^\circ\text{C}$<br>rectangular $d = 0.5$                 |                              |         | 10   | A             |   |
| $V_{FO}$   | threshold voltage                            | } for power loss calculation only                                  |                              |         | 0.54 | V             |   |
| $r_F$      | slope resistance                             |  |                              |         | 11.4 | m $\Omega$    |   |
| $R_{thJC}$ | thermal resistance junction to case          |  |                              |         | 2.4  | K/W           |   |
| $R_{thCH}$ | thermal resistance case to heatsink          |  |                              | 0.50    |      | K/W           |   |
| $P_{tot}$  | total power dissipation                      |  |                              |         | 65   | W             |   |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ |                              |         | 220  | A             |   |
| $C_J$      | junction capacitance                         | $V_R = 24\text{ V}$ $f = 1\text{ MHz}$                             |                              |         | 53   | pF            |   |

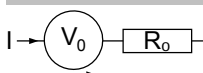
| Package TO-220 |                              |                            | Ratings |      |      |      |
|----------------|------------------------------|----------------------------|---------|------|------|------|
| Symbol         | Definition                   | Conditions                 | min.    | typ. | max. | Unit |
| $I_{RMS}$      | RMS current                  | per terminal <sup>1)</sup> |         |      | 35   | 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>  |                              |                            |         | 2    |      | g    |
| $M_D$          | mounting torque              |                            | 0.4     |      | 0.6  | Nm   |
| $F_C$          | mounting force with clip     |                            | 20      |      | 60   | N    |

**Product Marking**

**Part number**

- D = Diode
- S = Schottky Diode
- A = low VF
- 20 = Current Rating [A]
- C = Common Cathode
- 150 = Reverse Voltage [V]
- PB = TO-220AB (3)

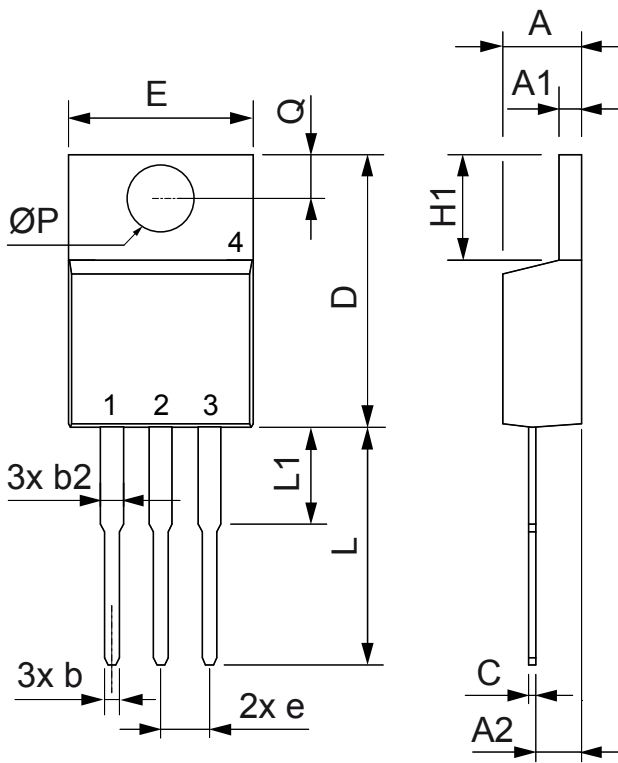
| Ordering | Part Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-------------|--------------------|---------------|----------|----------|
| Standard | DSA20C150PB | DSA20C150PB        | Tube          | 50       | 503913   |

| Similar Part | Package        | Voltage class |
|--------------|----------------|---------------|
| DSA20C150PN  | TO-220ABFP (3) | 150           |

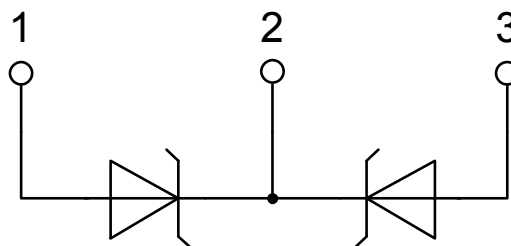
**Equivalent Circuits for Simulation**
*\* on die level*
 $T_{VJ} = 175\text{ °C}$ 

**Schottky**

|              |                    |      |    |
|--------------|--------------------|------|----|
| $V_{0\ max}$ | threshold voltage  | 0.54 | V  |
| $R_{0\ max}$ | slope resistance * | 8.2  | mΩ |

Outlines TO-220



| Dim.            | Millimeter |       | Inches |       |
|-----------------|------------|-------|--------|-------|
|                 | Min.       | Max.  | Min.   | Max.  |
| A               | 4.32       | 4.82  | 0.170  | 0.190 |
| A1              | 1.14       | 1.39  | 0.045  | 0.055 |
| A2              | 2.29       | 2.79  | 0.090  | 0.110 |
| b               | 0.64       | 1.01  | 0.025  | 0.040 |
| b2              | 1.15       | 1.65  | 0.045  | 0.065 |
| C               | 0.35       | 0.56  | 0.014  | 0.022 |
| D               | 14.73      | 16.00 | 0.580  | 0.630 |
| E               | 9.91       | 10.66 | 0.390  | 0.420 |
| e               | 2.54       | BSC   | 0.100  | BSC   |
| H1              | 5.85       | 6.85  | 0.230  | 0.270 |
| L               | 12.70      | 13.97 | 0.500  | 0.550 |
| L1              | 2.79       | 5.84  | 0.110  | 0.230 |
| $\varnothing P$ | 3.54       | 4.08  | 0.139  | 0.161 |
| Q               | 2.54       | 3.18  | 0.100  | 0.125 |



**Schottky**

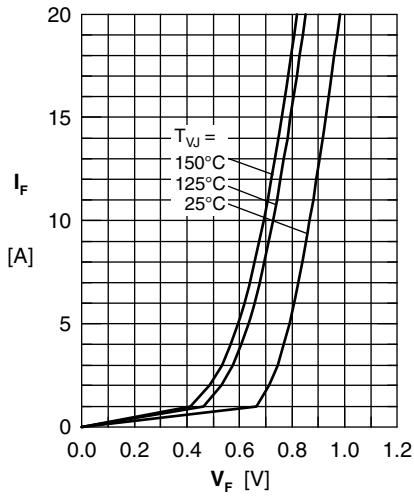


Fig. 1 Maximum forward voltage drop characteristics

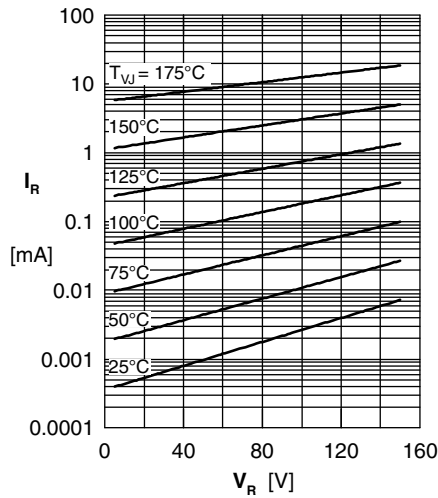


Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$

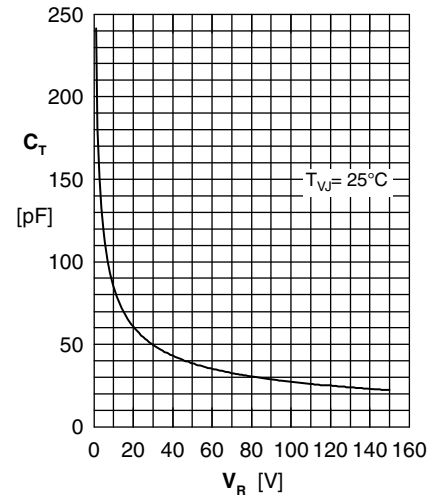


Fig. 3 Typ. junction capacitance  $C_T$  versus reverse voltage  $V_R$

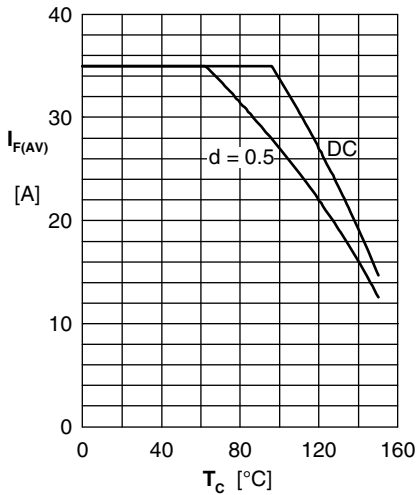


Fig. 4 Avg: forward current  $I_{F(AV)}$  vs. case temperature  $T_C$

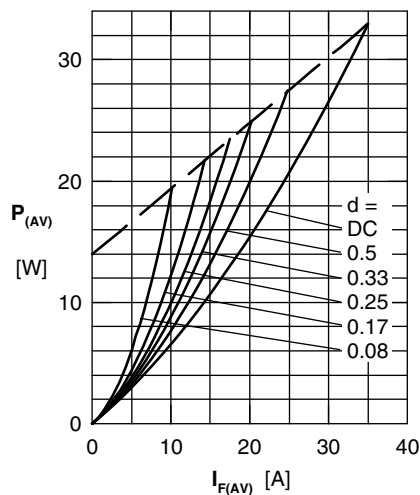


Fig. 5 Forward power loss characteristics

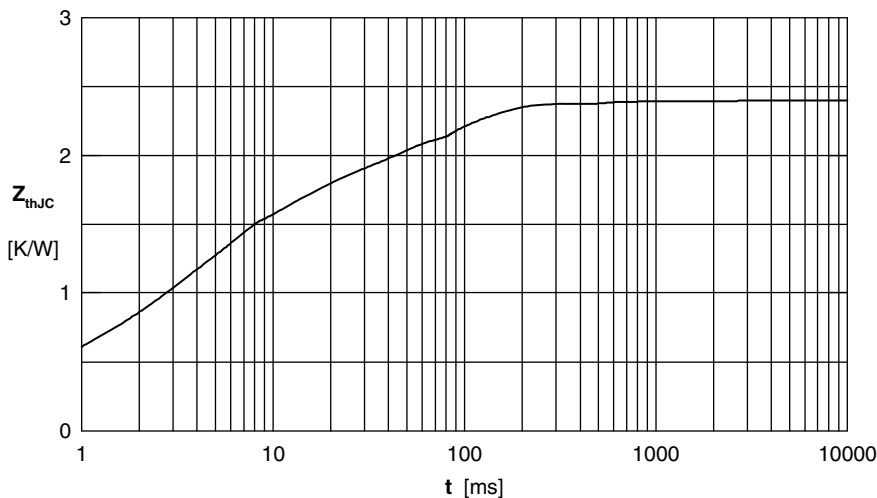


Fig. 6 Transient thermal impedance junction to case

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