

Schottky Diode Gen <sup>2</sup>

preliminary

$$V_{RRM} = 100V$$

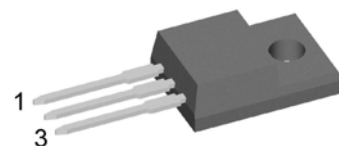
$$I_{FAV} = 2 \times 10A$$

$$V_F = 0.71V$$

High Performance Schottky Diode  
Low Loss and Soft Recovery  
Common Cathode

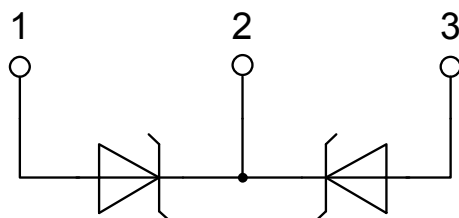
Part number

DSA20C100PN



Backside: isolated

E72873

**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-220FP

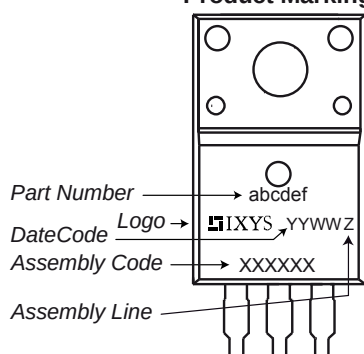
- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Base plate: Plastic overmolded tab
- Reduced weight

| Schottky   |                                              |                                                                    |                                | Ratings                        |      |      |               |
|------------|----------------------------------------------|--------------------------------------------------------------------|--------------------------------|--------------------------------|------|------|---------------|
| Symbol     | Definition                                   | Conditions                                                         |                                | min.                           | typ. | max. | Unit          |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 100  | V             |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}\text{C}$                                      |                                |                                |      | 100  | V             |
| $I_R$      | reverse current, drain current               | $V_R = 100\text{ V}$                                               | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 200  | $\mu\text{A}$ |
|            |                                              | $V_R = 100\text{ V}$                                               | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 2    | mA            |
| $V_F$      | forward voltage drop                         | $I_F = 10\text{ A}$                                                | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 0.89 | V             |
|            |                                              | $I_F = 20\text{ A}$                                                |                                |                                |      | 1.04 | V             |
|            |                                              | $I_F = 10\text{ A}$                                                | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 0.71 | V             |
|            |                                              | $I_F = 20\text{ A}$                                                |                                |                                |      | 0.87 | V             |
| $I_{FAV}$  | average forward current                      | $T_C = 140^{\circ}\text{C}$<br>rectangular $d = 0.5$               | $T_{VJ} = 175^{\circ}\text{C}$ |                                |      | 10   | A             |
| $V_{F0}$   | threshold voltage                            | } for power loss calculation only                                  |                                | $T_{VJ} = 175^{\circ}\text{C}$ |      | 0.45 | V             |
| $r_F$      | slope resistance                             |                                                                    |                                |                                |      | 16.1 | m $\Omega$    |
| $R_{thJC}$ | thermal resistance junction to case          |                                                                    |                                |                                |      | 4.5  | K/W           |
| $R_{thCH}$ | thermal resistance case to heatsink          |                                                                    |                                |                                | 0.50 |      | K/W           |
| $P_{tot}$  | total power dissipation                      | $T_C = 25^{\circ}\text{C}$                                         |                                |                                |      | 35   | W             |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 240  | A             |
| $C_J$      | junction capacitance                         | $V_R = 12\text{ V}$ $f = 1\text{ MHz}$                             | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 96   |      | pF            |

preliminary

| Package TO-220FP |                                                              |                      |                                     | Ratings |      |      |      |
|------------------|--------------------------------------------------------------|----------------------|-------------------------------------|---------|------|------|------|
| Symbol           | Definition                                                   | Conditions           |                                     | min.    | typ. | max. | Unit |
| $I_{RMS}$        | RMS current                                                  | per terminal         |                                     |         |      | 35   | A    |
| $T_{VJ}$         | virtual junction temperature                                 |                      |                                     | -55     |      | 175  | °C   |
| $T_{op}$         | operation temperature                                        |                      |                                     | -55     |      | 150  | °C   |
| $T_{stg}$        | storage temperature                                          |                      |                                     | -55     |      | 150  | °C   |
| Weight           |                                                              |                      |                                     |         | 2    |      | g    |
| $M_D$            | mounting torque                                              |                      |                                     | 0.4     |      | 0.6  | Nm   |
| $F_C$            | mounting force with clip                                     |                      |                                     | 20      |      | 60   | N    |
| $d_{Spp/App}$    | creepage distance on surface   striking distance through air | terminal to terminal | 1.6                                 | 1.0     |      |      | mm   |
| $d_{Spb/Apb}$    |                                                              | terminal to backside | 2.5                                 | 2.5     |      |      | mm   |
| $V_{ISOL}$       | isolation voltage                                            | t = 1 second         | 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA | 2500    |      |      | V    |
|                  |                                                              | t = 1 minute         |                                     | 2080    |      |      | V    |

## Product Marking



## Part number

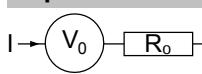
D = Diode  
 S = Schottky Diode  
 A = low VF  
 20 = Current Rating [A]  
 C = Common Cathode  
 100 = Reverse Voltage [V]  
 PN = TO-220ABFP (3)

| Ordering | Part Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-------------|--------------------|---------------|----------|----------|
| Standard | DSA20C100PN | DSA20C100PN        | Tube          | 50       | 503516   |

| Similar Part | Package      | Voltage class |
|--------------|--------------|---------------|
| DSA20C100PB  | TO-220AB (3) | 100           |

## Equivalent Circuits for Simulation

\* on die level

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

Schottky

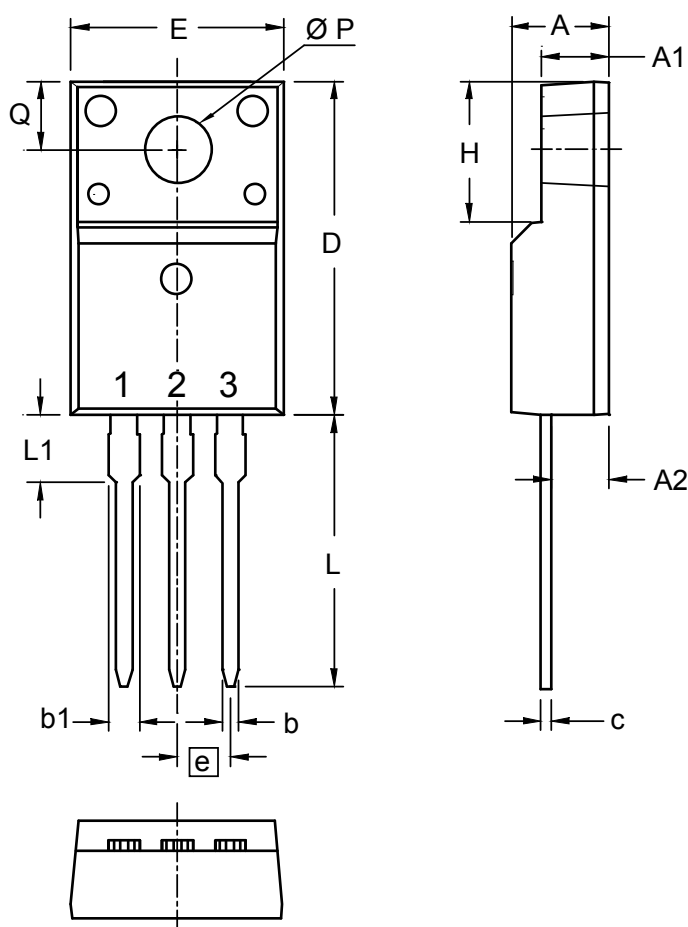
 $V_{0\max}$  threshold voltage 0.45

V

 $R_{0\max}$  slope resistance \* 12.9

mΩ

### Outlines TO-220FP



| Dim. | Millimeters |       | Inches    |       |
|------|-------------|-------|-----------|-------|
|      | min         | max   | min       | max   |
| A    | 4.50        | 4.90  | 0.177     | 0.193 |
| A1   | 2.34        | 2.74  | 0.092     | 0.108 |
| A2   | 2.56        | 2.96  | 0.101     | 0.117 |
| b    | 0.70        | 0.90  | 0.028     | 0.035 |
| c    | 0.45        | 0.60  | 0.018     | 0.024 |
| D    | 15.67       | 16.07 | 0.617     | 0.633 |
| E    | 9.96        | 10.36 | 0.392     | 0.408 |
| e    | 2.54 BSC    |       | 0.100 BSC |       |
| H    | 6.48        | 6.88  | 0.255     | 0.271 |
| L    | 12.68       | 13.28 | 0.499     | 0.523 |
| L1   | 3.03        | 3.43  | 0.119     | 0.135 |
| Ø P  | 3.08        | 3.28  | 0.121     | 0.129 |
| Q    | 3.20        | 3.40  | 0.126     | 0.134 |

