# WN3S20100D

## Power Schottky diode

Rev.01 - 19 October 2022 Product data sheet

## 1. General description

Power Schottky diode in TO252 (DPAK) surface-mountable plastic package.

## 2. Features and benefits

- Trench structure
- High junction temperature up to 150°C
- Low forward voltage drop, negligible switching losses
- High efficiency

## 3. Applications

- DC to DC converters
- Freewheeling diode
- OR-ing diode
- Switched mode power supply rectifier

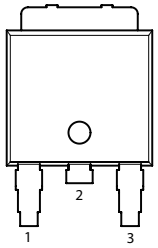
## 4. Quick reference data

**Table 1. Quick reference data**

| Symbol | Parameter | Conditions | Notes | Values | | | Unit |
|---|---|---|---|---|---|---|---|
| **Absolute maximum rating** | | | | | | | |
| $V_{RRM}$ | repetitive peak reverse voltage | | | 100 | | | V |
| $I_{F(AV)}$ | average forward current | δ = 0.5 ; square-wave pulse; $T_{mb} \leq 125$ °C; Fig. 1; Fig. 2; Fig. 3 | | 20 | | | A |
| **Symbol** | **Parameter** | **Conditions** | **Notes** | **Min** | **Typ** | **Max** | **Unit** |
| **Static characteristics** | | | | | | | |
| $V_F$ | forward voltage | $I_F$ = 20 A; $T_j$ = 25 °C; Fig. 6 | | - | 0.75 | 0.85 | V |
| $I_R$ | reverse current | $V_R$ = 100 V; $T_j$ = 25 °C | | - | 15 | 50 | μA |

## 5. Pinning information

**Table 2. Pinning information**

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|---|---|---|---|---|
| 1 | A | anode |  |  |
| 2 | K | cathode | | |
| 3 | A | anode | | |
| mb | K | mounting base; connected to cathode | | |

## 6. Ordering information

**Table 3. Ordering information**

| Type number | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|---|---|---|---|---|---|---|
| WN3S20100D | TO252 | WN3S20100DJ | Reel | 2500 | TO252d | 07-Sep-2022 |

## 7. Marking

**Table 4. Marking codes**

| Type number | Marking codes |
|---|---|
| WN3S20100D | WN3S20<br>100D |

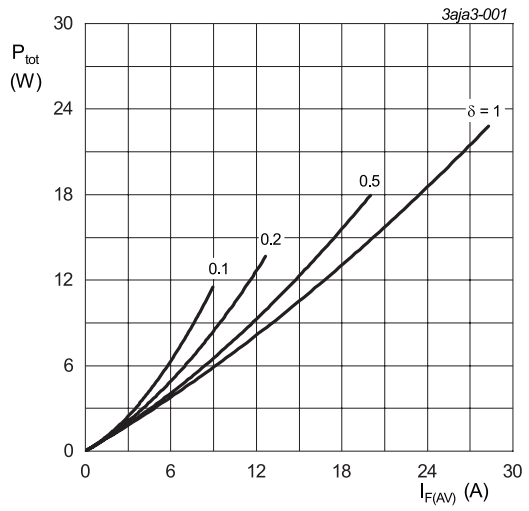
# 8. Limiting values

**Table 5. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134).*

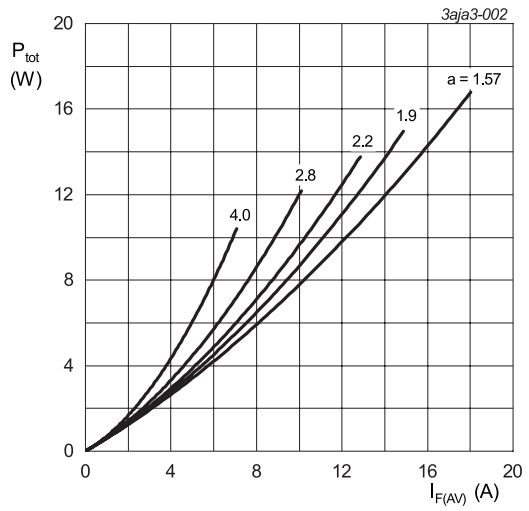
| Symbol | Parameter | Conditions | Notes | Values | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | repetitive peak reverse voltage | | | 100 | V |
| $V_{RWM}$ | crest working reverse voltage | | | 100 | V |
| $V_R$ | reverse voltage | DC | | 100 | V |
| $I_{F(AV)}$ | average forward current | δ = 0.5 ; square-wave pulse; $T_{mb} \leq 125$ °C; Fig. 1; Fig. 2; Fig. 3 | | 20 | A |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p$ = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4 | | 250 | A |
| | | $t_p$ = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse | | 275 | A |
| $T_{stg}$ | storage temperature | | | -40 to 150 | °C |
| $T_j$ | junction temperature | | [1] | -40 to 150 | °C |

[1] The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_{tot}/dT_j < 1/R_{th(j-a)}$




$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$
$V_o$ = 0.584 V; $R_s$ = 0.0078 Ω

**Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values**




a = form factor = $I_{F(RMS)} / I_{F(AV)}$
$V_o$ = 0.584 V; $R_s$ = 0.0078 Ω

**Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values**

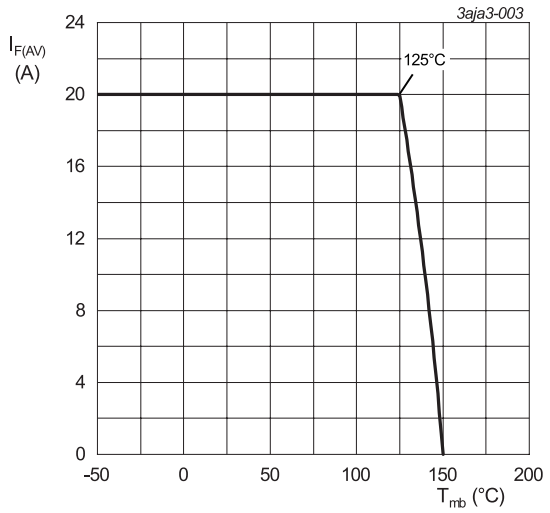



**Fig. 3. Average forward current as a function of mounting base temperature; maximum values**

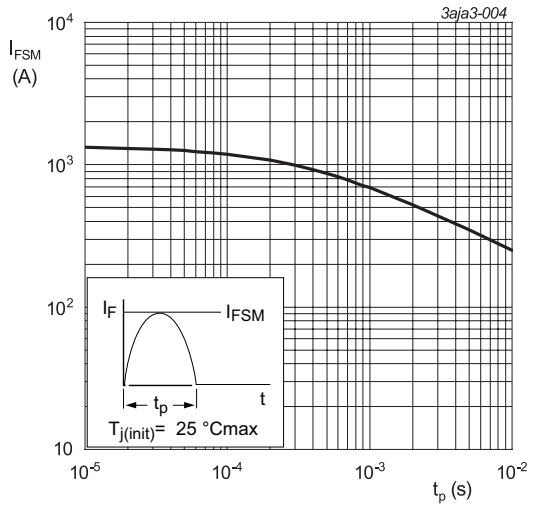



**Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values**

# 9. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $R_{th(j-mb)}$ | thermal resistance from junction to mounting base | Fig. 5 | | - | - | 1.4 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | | - | 50 | - | K/W |

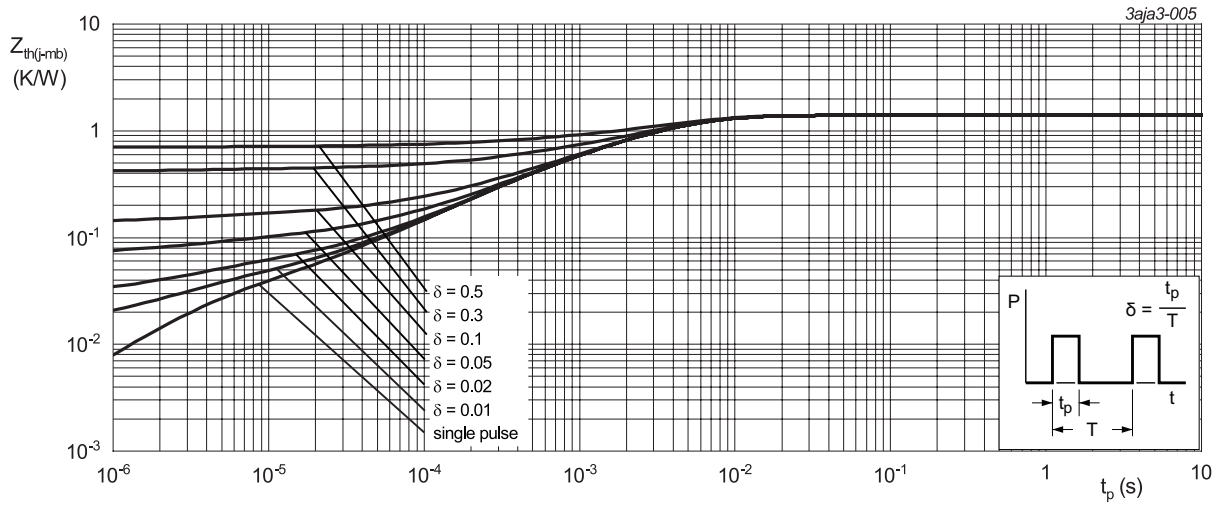
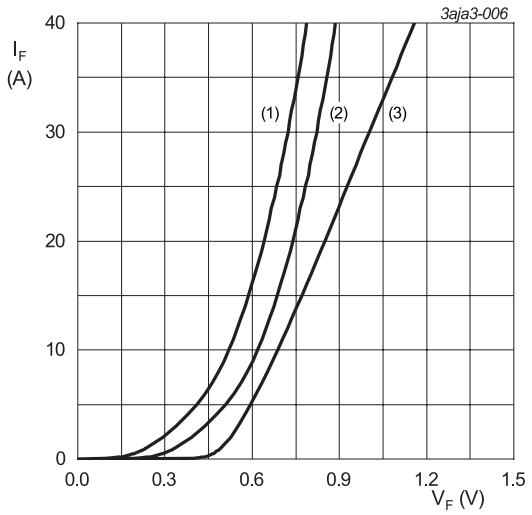



**Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values**

# 10. Characteristics

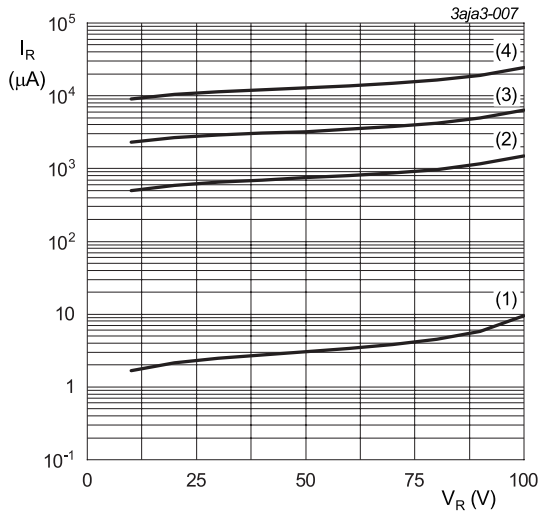
**Table 7. Characteristics**

| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Static characteristics** | | | | | | | |
| $V_F$ | forward voltage | $I_F$ = 20 A; $T_j$ = 25 °C; Fig. 6 | | - | 0.75 | 0.85 | V |
| | | $I_F$ = 10 A; $T_j$ = 25 °C; Fig. 6 | | - | 0.59 | - | V |
| | | $I_F$ = 3 A; $T_j$ = 25 °C; Fig. 6 | | - | 0.45 | - | V |
| | | $I_F$ = 20 A; $T_j$ = 125 °C; Fig. 6 | | - | 0.68 | - | V |
| | | $I_F$ = 10 A; $T_j$ = 125 °C; Fig. 6 | | - | 0.55 | - | V |
| | | $I_F$ = 3 A; $T_j$ = 125 °C; Fig. 6 | | - | 0.37 | - | V |
| $I_R$ | reverse current | $V_R$ = 100 V; $T_j$ = 25 °C; Fig. 7; Fig. 8 | | - | 15 | 50 | µA |
| | | $V_R$ = 100 V; $T_j$ = 125 °C; Fig. 7; Fig. 8 | | - | 7 | 30 | mA |



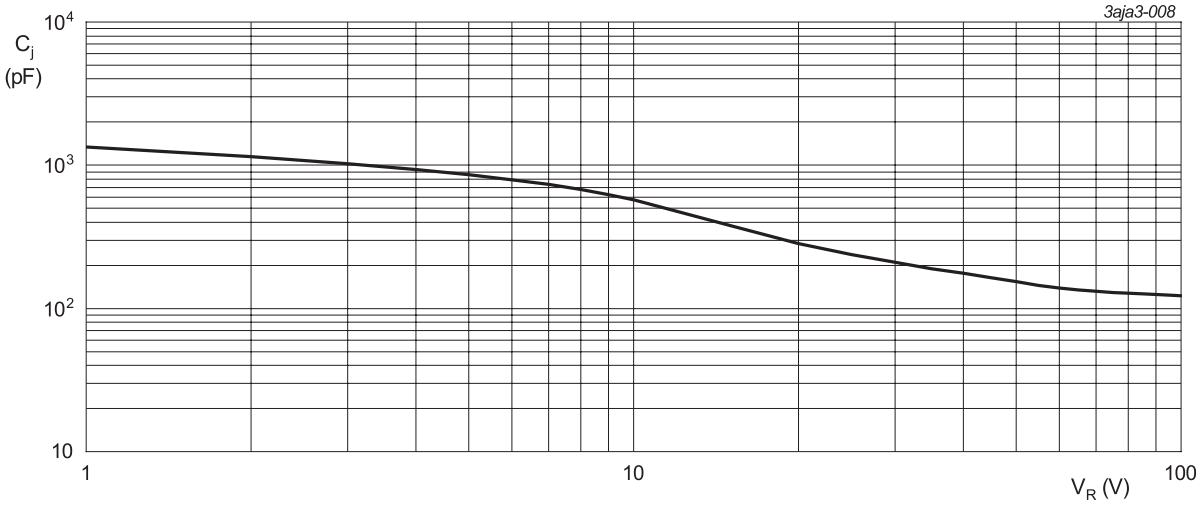

$V_o$ = 0.584 V; $R_s$ = 0.0078 Ω
(1) $T_j$ = 150 °C; typical values
(2) $T_j$ = 150 °C; maximum values
(3) $T_j$ = 25 °C; maximum values

**Fig. 6. Forward current as a function of forward voltage**




(1) $T_j$ = 25 °C; typical values
(2) $T_j$ = 100 °C; typical values
(3) $T_j$ = 125 °C; typical values
(4) $T_j$ = 150 °C; typical values

**Fig. 7. Reverse leakage current as a function of reverse voltage; typical values**

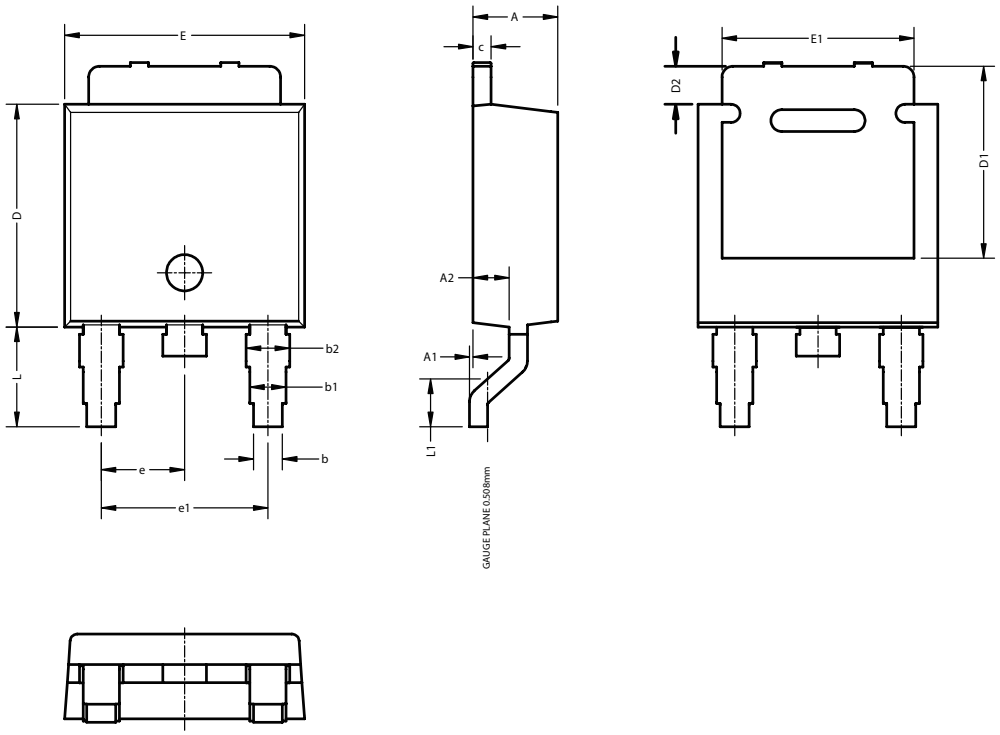



f = 1 MHz; $T_j$ = 25 °C

**Fig. 8. Junction capacitance as a function of applied reverse voltage; typical values**

## 11. Package outline

Plastic single-ended surface-mounted package (DPAK); 3 leads (one lead cropped TO252




Note:
1. All dimensions do not include mold flash & gate remain and metal protrusion.

| Unit | | A | A1 | A2 | b | b1 | b2 | c | D | D1 | D2 | E | E1 | e | e1 | L | L1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | min | 2.16 | 0.00 | 0.90 | 0.70 | 0.86 | 1.06 | 0.46 | 5.97 | 5.05 | 0.98 | 6.45 | 5.20 | 2.30 | 4.60 | 2.60 | 1.25 |
| | nom | | | | | | | | | | | | | | | | |
| | max | 2.41 | 0.10 | 1.10 | 0.90 | 1.11 | 1.32 | 0.58 | 6.22 | 5.35 | 1.18 | 6.75 | 5.40 | | | 2.90 | 1.65 |

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**Date of release: 19 October 2022**