# WN3S40H100C

## Dual power Schottky diode

Rev.01 - 14 December 2021 Product data sheet

## 1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO220 plastic package.

## 2. Features and benefits

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

## 3. Applications

- DC to DC converters
- Freewheeling diode
- OR-ing diode

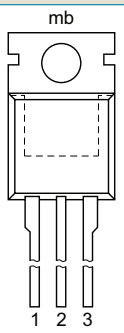
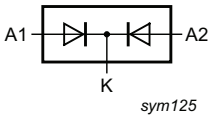
## 4. Quick reference data

**Table 1. Quick reference data**

| Symbol | Parameter | Conditions | 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; $T_{mb} \leq 134$ °C; per diode; Fig. 1; Fig. 2; Fig. 3 | 20 | | | | A |
| $I_{O(AV)}$ | average output current | δ = 0.5 ; square-wave pulse; $T_{mb} \leq 131$ °C; both diodes conducting | 40 | | | | A |
| **Symbol** | **Parameter** | **Conditions** | | **Min** | **Typ** | **Max** | **Unit** |
| **Static characteristics** | | | | | | | |
| $V_F$ | forward voltage | $I_F$ = 10 A; $T_j$ = 25 °C; prediode; Fig. 6 | | - | 0.54 | 0.59 | V |
| | | $I_F$ = 10 A; $T_j$ = 125 °C; prediode; Fig. 6 | | - | 0.5 | 0.56 | V |
| | | $I_F$ = 20 A; $T_j$ = 25 °C; prediode; Fig. 6 | | - | 0.67 | 0.71 | V |
| | | $I_F$ = 20 A; $T_j$ = 125 °C; prediode; Fig. 6 | | - | 0.63 | 0.68 | V |
| $I_R$ | reverse current | $V_R$ = 100 V; $T_j$ = 25 °C; Fig. 7 | | - | - | 50 | µA |
| | | $V_R$ = 100 V; $T_j$ = 125 °C; Fig. 7 | | - | - | 30 | mA |

## 5. Pinning information

**Table 2. Pinning information**

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|---|---|---|---|---|
| 1 | A | anode 1 |   |   |
| 2 | K | cathode | | |
| 3 | A | anode 2 | | |
| mb | mb | 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 |
|---|---|---|---|---|---|---|
| WN3S40H100C | TO220 | WN3S40H100CQ | Tube | 50 | SOT78 | 13-Jun-2008 |

## 7. Marking

**Table 4. Marking codes**

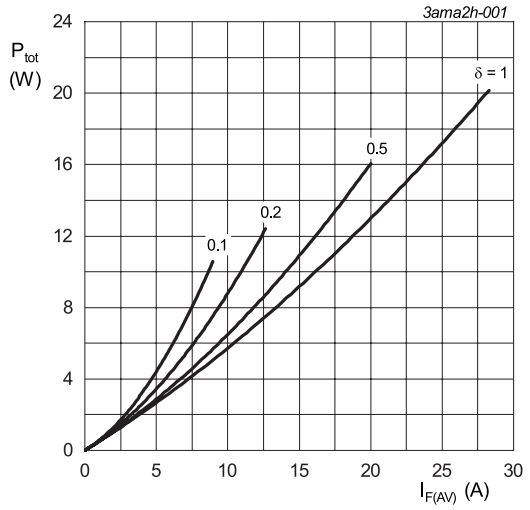
| Type number | Marking codes |
|---|---|
| WN3S40H100C | WN3S<br>40H100C |

# 8. Limiting values

**Table 5. Limiting values**

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

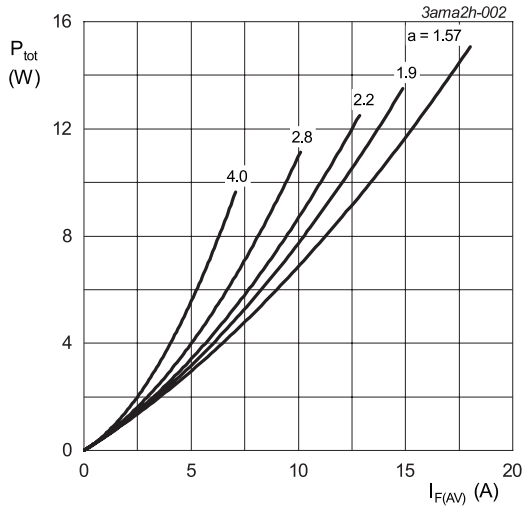
| Symbol | Parameter | Conditions | Values | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | repetitive peak reverse voltage | | 100 | V |
| $V_{RWM}$ | crest working reverse voltage | | 100 | V |
| $V_R$ | reverse voltage | DC | 100 | V |
| $I_{F(AV)}$ | average forward current | δ = 0.5 ; square-wave pulse; $T_{mb} \leq 134$ °C; per diode; Fig. 1; Fig. 2; Fig. 3 | 20 | A |
| $I_{O(AV)}$ | average output current | δ = 0.5 ; square-wave pulse; $T_{mb} \leq 131$ °C; both diodes conducting | 40 | A |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p$ = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4 | 380 | A |
| | | $t_p$ = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode | 418 | A |
| $T_{stg}$ | storage temperature | | -40 to 150 | °C |
| $T_j$ | junction temperature | | 150 | °C |




$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$

$V_o$ = 0.496 V; $R_s$ = 0.0077 Ω

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




a = form factor = $I_{F(RMS)} / I_{F(AV)}$

$V_o$ = 0.496 V; $R_s$ = 0.0077 Ω

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

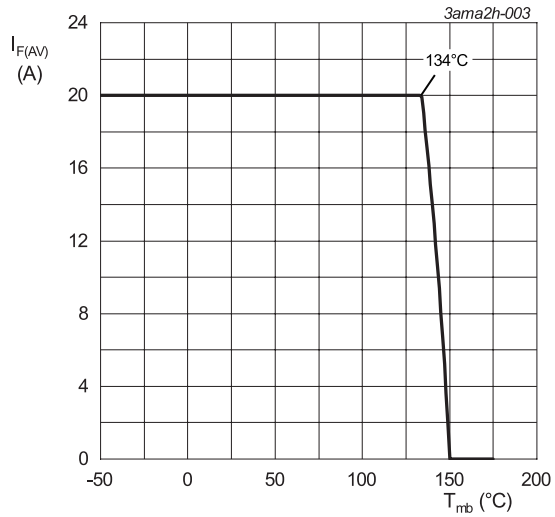



**Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode**

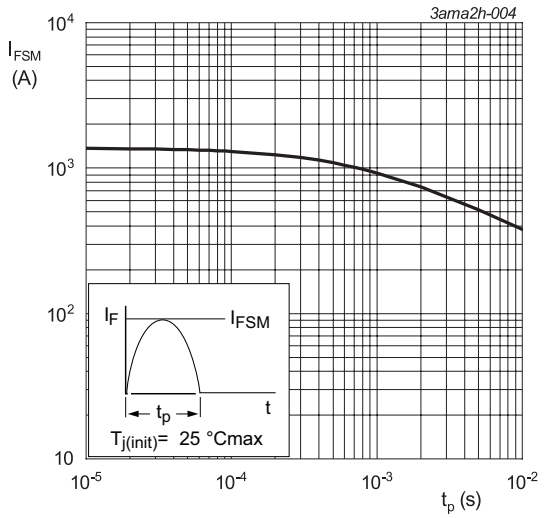



**Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode**

# 9. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $R_{th(j-mb)}$ | thermal resistance from junction to mounting base | per diode; Fig. 5 | | - | - | 1 | K/W |
| | | both diodes conducting | | - | - | 0.6 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient free air | in free air | | - | 60 | - | K/W |

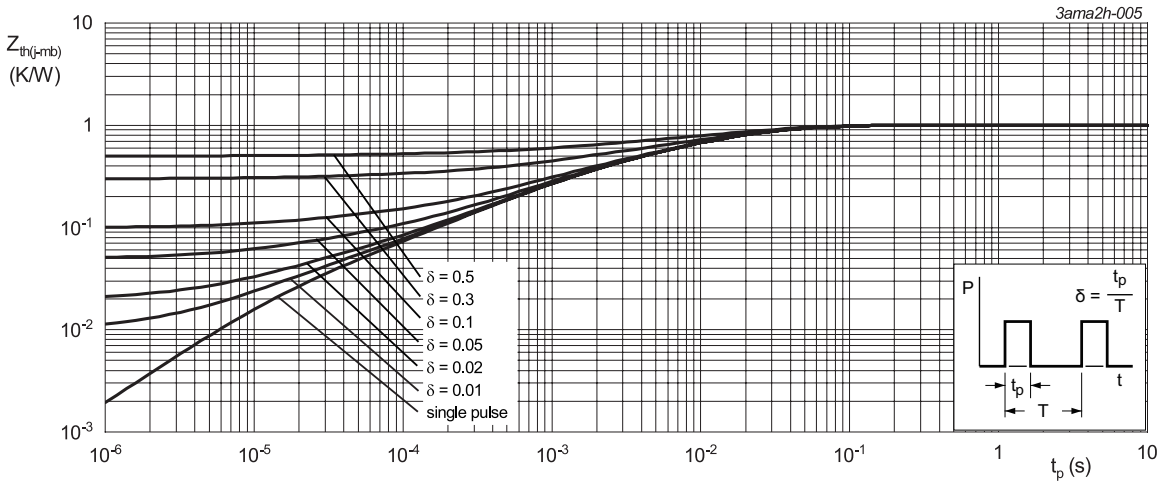
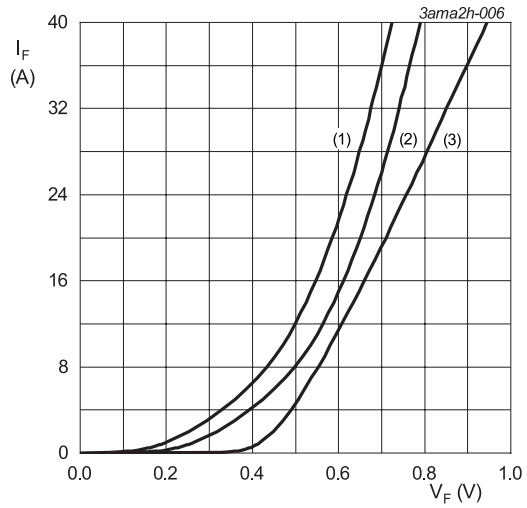



**Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values; per diode**

# 10. Characteristics

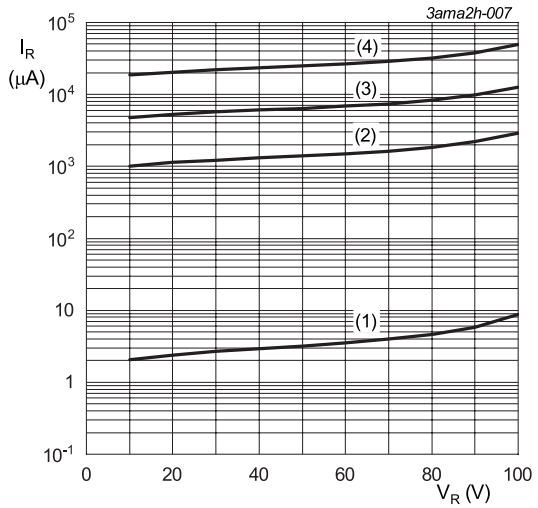
**Table 7. Characteristics**

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Static characteristics** | | | | | | | |
| $V_F$ | forward voltage | $I_F$ = 10 A; $T_j$ = 25 °C; prediode; Fig. 6 | | - | 0.54 | 0.59 | V |
| | | $I_F$ = 10 A; $T_j$ = 125 °C; prediode; Fig. 6 | | - | 0.5 | 0.56 | V |
| | | $I_F$ = 20 A; $T_j$ = 25 °C; prediode; Fig. 6 | | - | 0.67 | 0.71 | V |
| | | $I_F$ = 20 A; $T_j$ = 125 °C; prediode; Fig. 6 | | - | 0.63 | 0.68 | V |
| $I_R$ | reverse current | $V_R$ = 100 V; $T_j$ = 25 °C; prediode; Fig. 7; Fig. 8 | | - | - | 50 | µA |
| | | $V_R$ = 100 V; $T_j$ = 125 °C; prediode; Fig. 7; Fig. 8 | | - | - | 30 | mA |



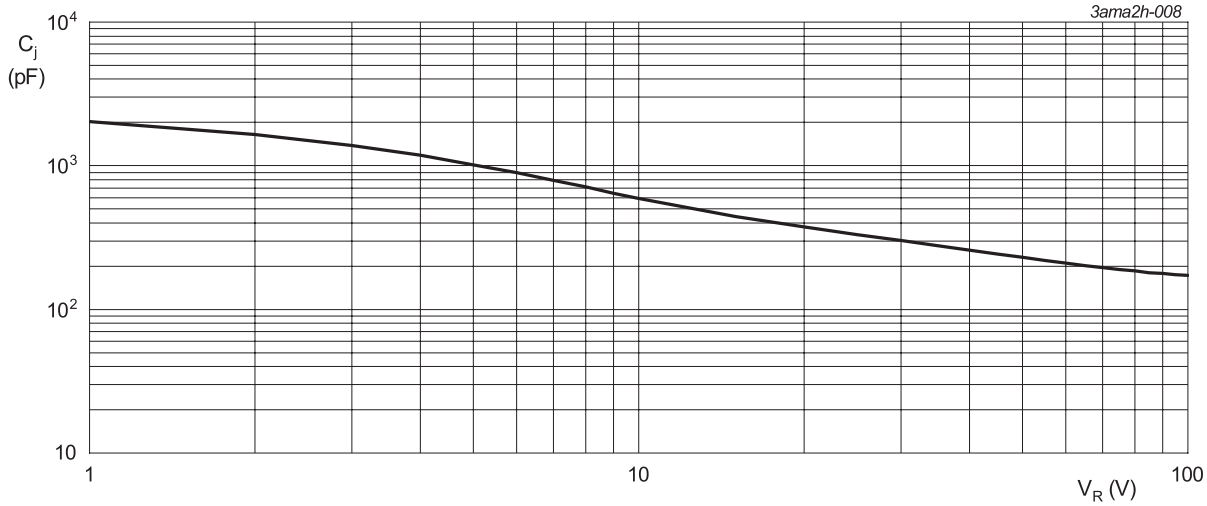

$V_o$ = 0.496 V; $R_s$ = 0.0077 Ω
(1) $T_j$ = 150 °C; typical values
(2) $T_j$ = 150 °C; maximum values
(3) $T_j$ = 25 °C; maximum values

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




(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; per diode; typical value**

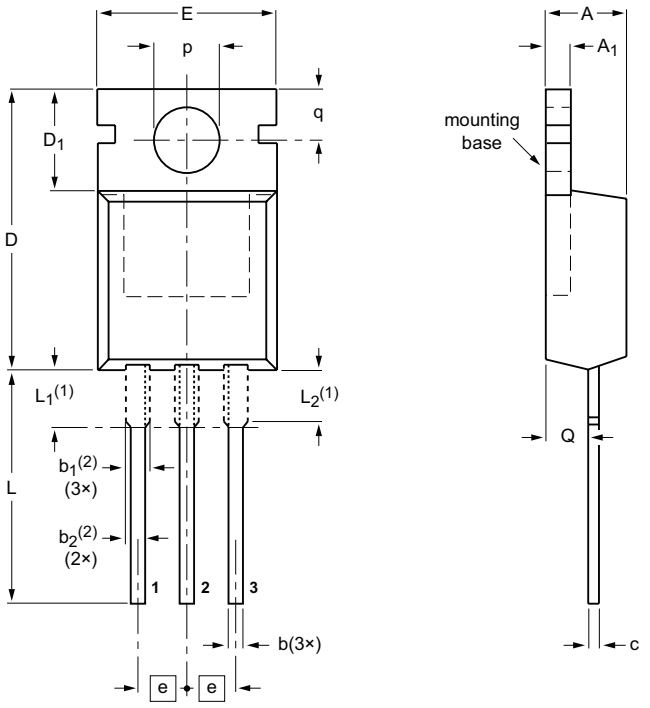


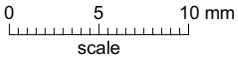

f = 1 MHz; $T_j$ = 25 °C

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

## 11. Package outline

**Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB** **SOT78**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $A_1$ | b | $b_1$(2) | $b_2$(2) | c | D | $D_1$ | E | e | L | $L_1$(1) | $L_2$(1) max. | p | q | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 4.7<br>4.1 | 1.40<br>1.25 | 0.9<br>0.6 | 1.6<br>1.0 | 1.3<br>1.0 | 0.7<br>0.4 | 16.0<br>15.2 | 6.6<br>5.9 | 10.3<br>9.7 | 2.54 | 15.0<br>12.8 | 3.30<br>2.79 | 3.0 | 3.8<br>3.5 | 3.0<br>2.7 | 2.6<br>2.2 |

**Notes**

1. Lead shoulder designs may vary.
2. Dimension includes excess dambar.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT78 | | 3-lead TO-220AB | SC-46 | | | ~~08-04-23~~<br>08-06-13 |

# 12. Legal information

## Data sheet status

| Document status [1][2] | Product status [3] | Definition |
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