WN3S20200DT

Power Schottky diode

Rev.01 - 22 November 2022 Product data sheet

1. General description

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

2. Features and benefits

- High junction temperature up to 175°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

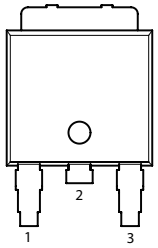
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage			200			V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; $T_{mb} \leq 150$ °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		-	0.90	1.02	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C		-	0.05	5	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
WN3S20200DT	TO252	WN3S20200DTJ	Reel	2500	TO252d	07-Sep-2022

7. Marking

Table 4. Marking codes

Type number	Marking codes
WN3S20200DT	WN3S20 200DT

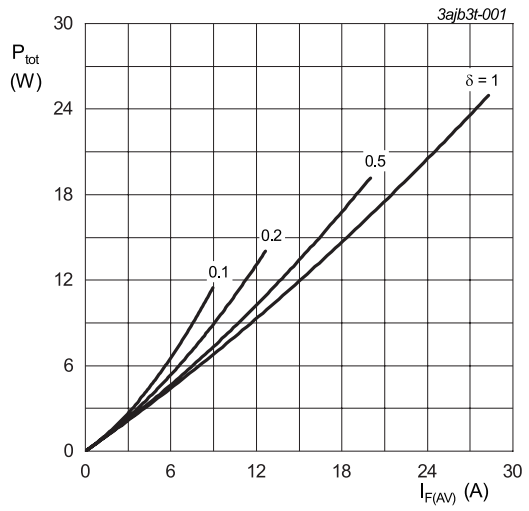
8. Limiting values

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			200	V
V_{RWM}	crest working reverse voltage			200	V
V_R	reverse voltage	DC		200	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; $T_{mb} \leq 150$ °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		272	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse		299.2	A
T_{stg}	storage temperature			-40 to 175	°C
T_j	junction temperature		[1]	-40 to 175	°C

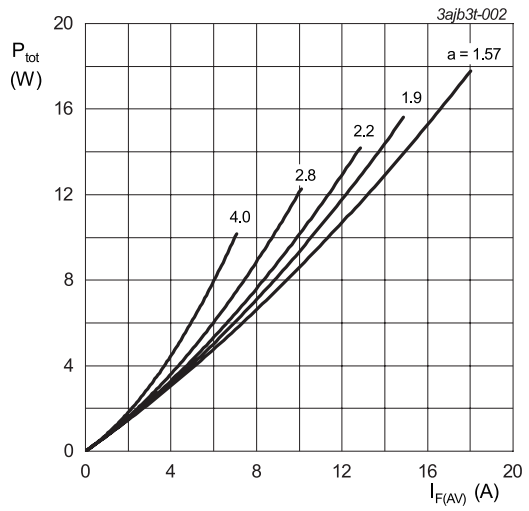
[1] The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_{tot}/dT_j < 1/R_{th(j-a)}$



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

V_o = 0.697 V; R_s = 0.0065 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 = 0.697 V; R_s = 0.0065 Ω

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

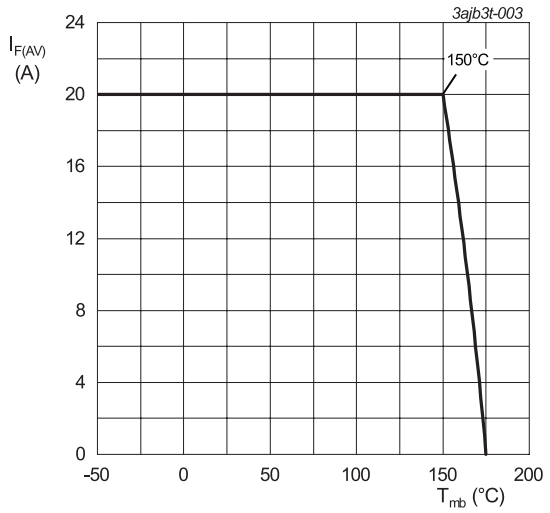


Fig. 3. Average forward current as a function of mounting base temperature; maximum values

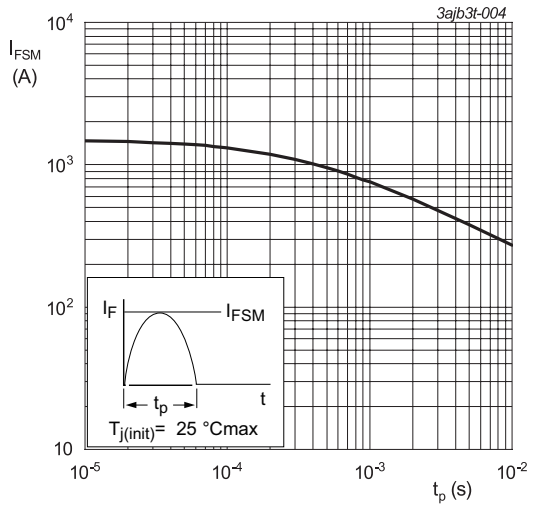


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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		-	-	1.3	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		-	50	-	K/W

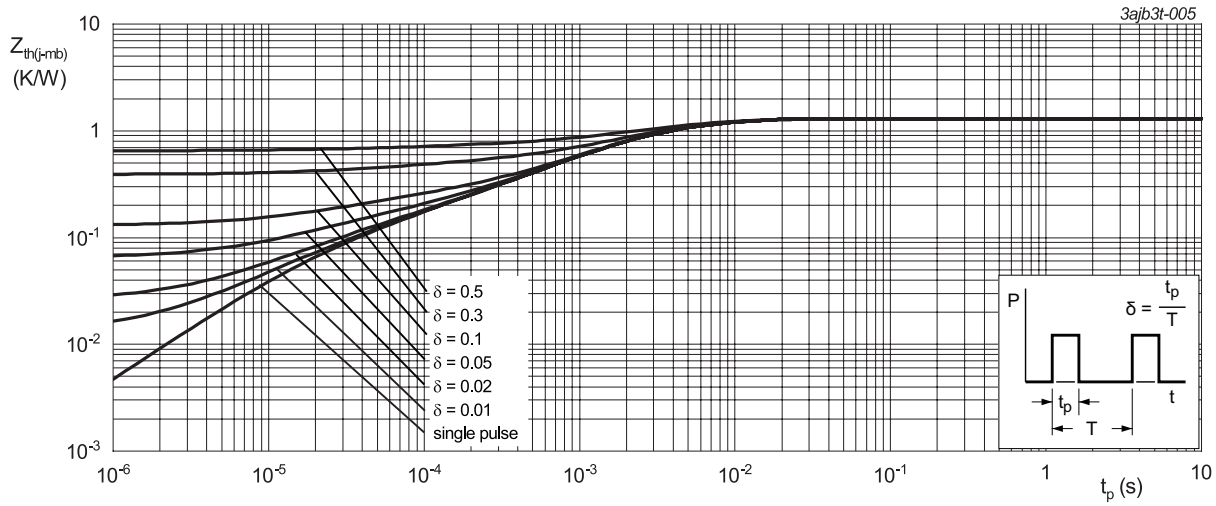
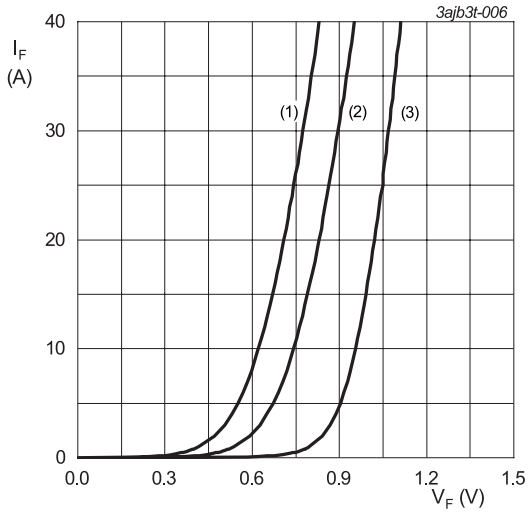


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values

10. Characteristics

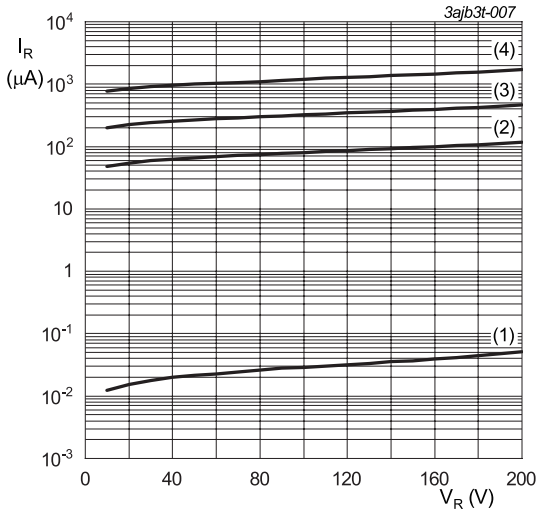
Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 20 A; T_j = 25 °C; Fig. 6		-	0.90	1.02	V
		I_F = 20 A; T_j = 125 °C; Fig. 6		-	0.80	-	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C; Fig. 7; Fig. 8		-	0.05	5	µA
		V_R = 200 V; T_j = 125 °C; Fig. 7; Fig. 8		-	0.2		mA



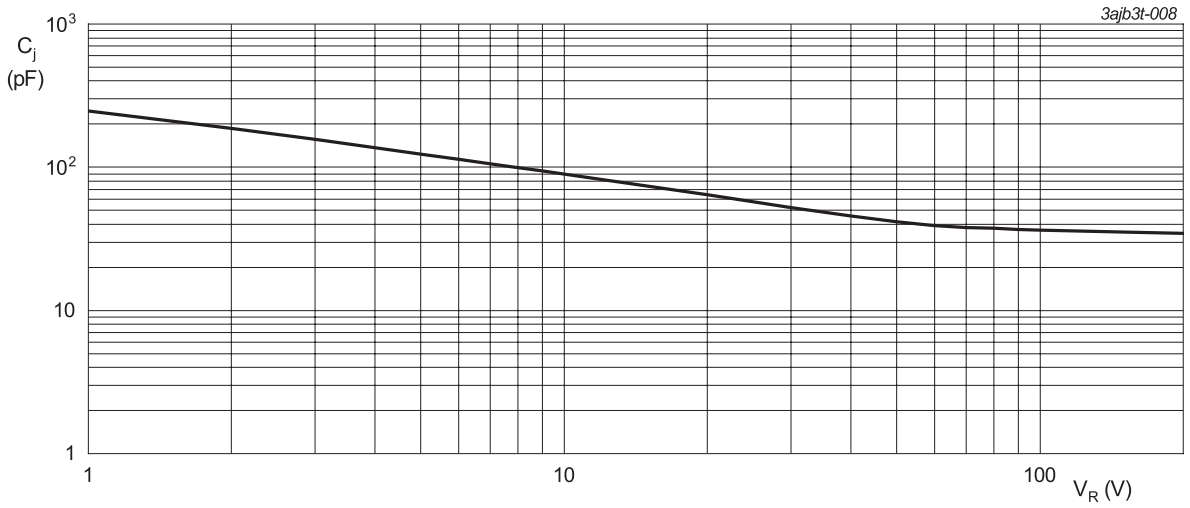
V_o = 0.697 V; R_s = 0.0065 Ω
(1) T_j = 175 °C; typical values
(2) T_j = 175 °C; maximum values
(3) T_j = 25 °C; maximum values

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



(1) T_j = 25 °C; typical values
(2) T_j = 125 °C; typical values
(3) T_j = 150 °C; typical values
(4) T_j = 175 °C; typical values

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

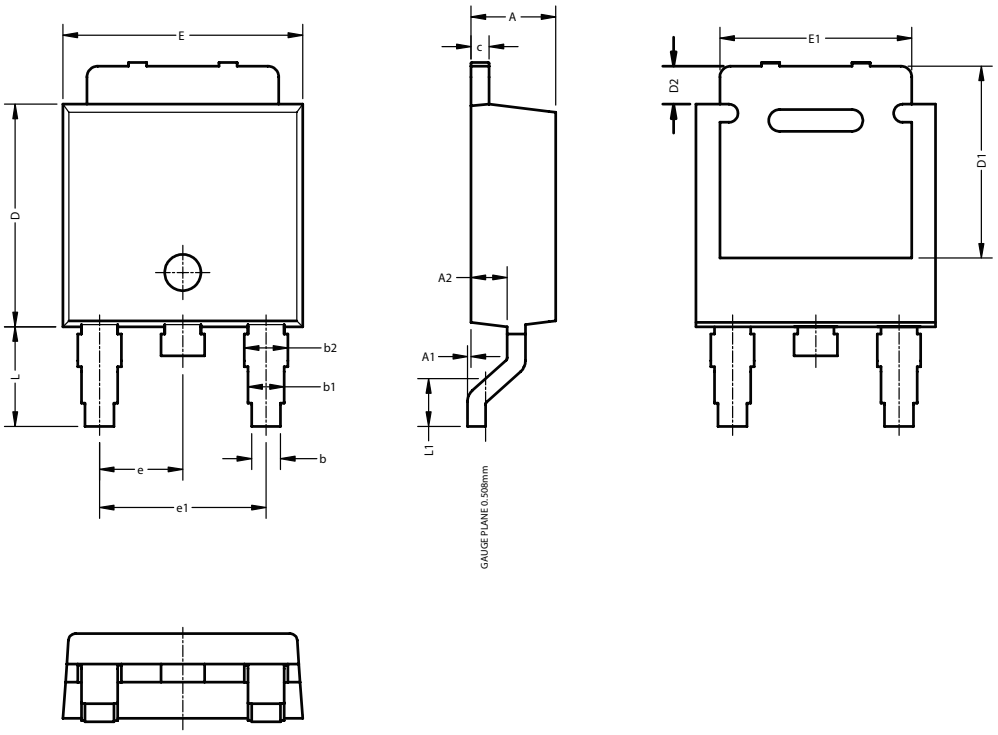


f = 1 MHz; T_j = 25 °C

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

12. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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