WN3S15200XT

Power Schottky diode

Rev.01 - 12 November 2024 Product data sheet

1. General description

Power Schottky diode in TO220F-2L 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

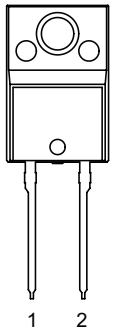
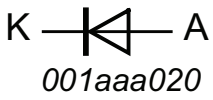
4. Quick reference data

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; $T_h \leq 101$ °C; per diode; Fig. 1; Fig. 2; Fig. 3		15			A
Symbol	**Parameter**	**Conditions**	**Notes**	**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 15 A; T_j = 25 °C; per diode; Fig. 6		-	0.88	0.95	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C; per diode; Fig. 7		-	0.04	5	µA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		 001aaa020
2	A	anode		
mb	n.c.	mounting base; isolated		

6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WN3S15200XT	TO220F-2L	WN3S15200XTQ	Tube	50	TO220Fd-2L	02-Aug-2022

7. Marking

Table 4. Marking codes

Type number	Marking codes
WN3S15200XT	WN3S15 200XT

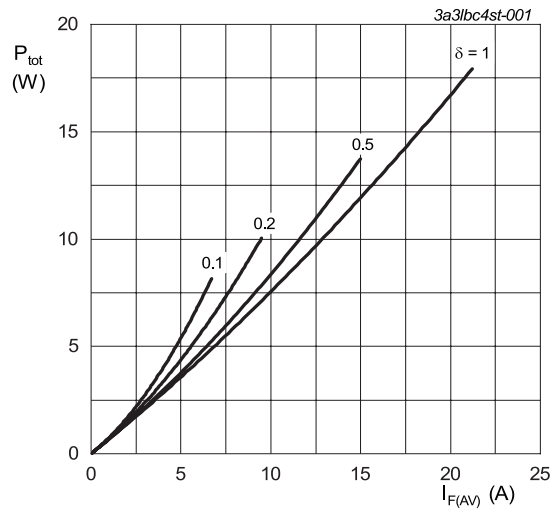
8. Limiting values

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; $T_h \leq 101$ °C; per diode; Fig. 1; Fig. 2; Fig. 3		15	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		200	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode		220	A
T_{stg}	storage temperature			-40 to 175	°C
T_j	junction temperature		[1]	-40 to 175	°C

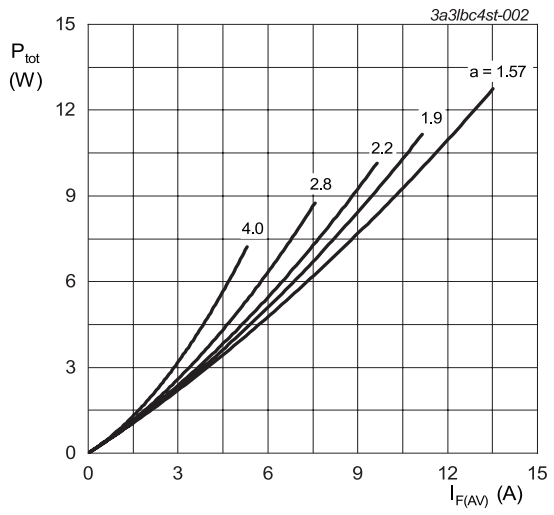
[1] The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_{tot}/dT_j < 1/R_{th(j-a)}$



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

V_o = 0.674 V; R_s = 0.0081 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 = 0.674 V; R_s = 0.0081 Ω

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

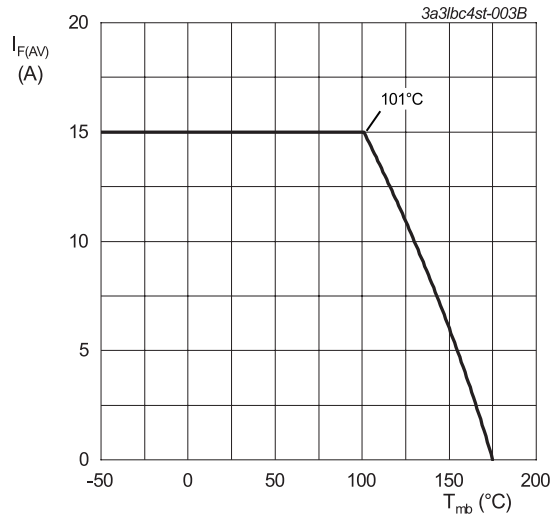


Fig. 3. Average forward current as a function of heatsink temperature; maximum values

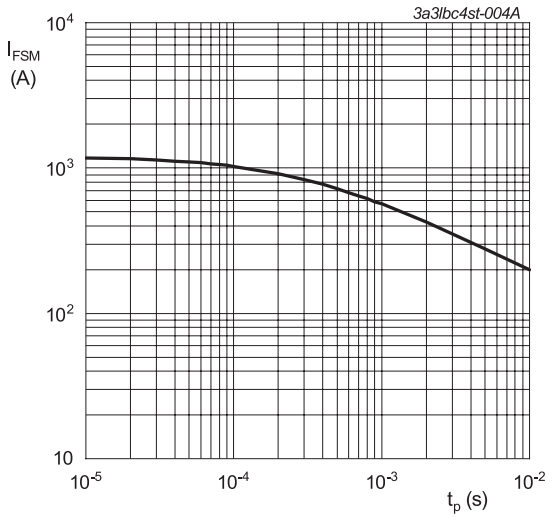


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-h)}$	thermal resistance from junction to heatsink	Fig. 5		-	-	5.39	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	60	-	K/W

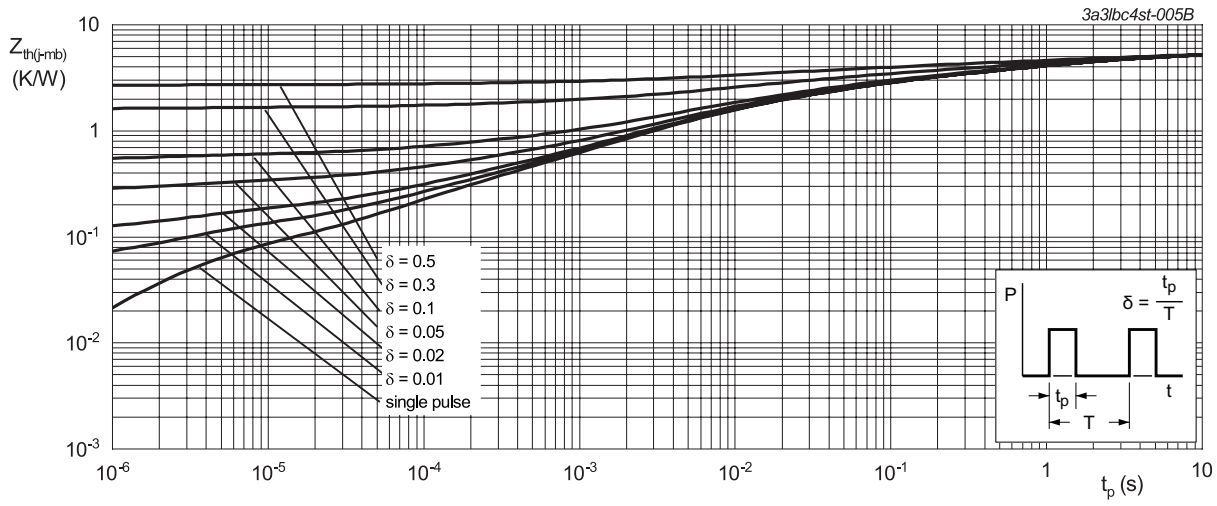


Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; maximum values

10. Isolation characteristics

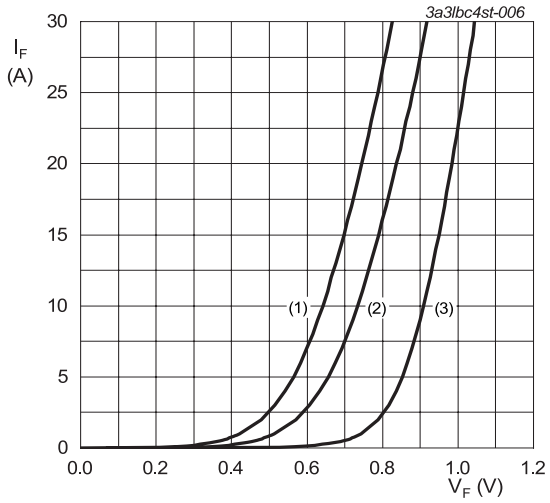
Table 7. Isolation characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	50 Hz ≤ f ≤ 60 Hz; RH ≤ 65 %; from all pins to external heatsink; sinusoidal waveform; clean and dust free		-	-	2500	V
C_{isol}	isolation capacitance	f = 1 MHz; from cathode to external heatsink		-	10	-	pF

11. Characteristics

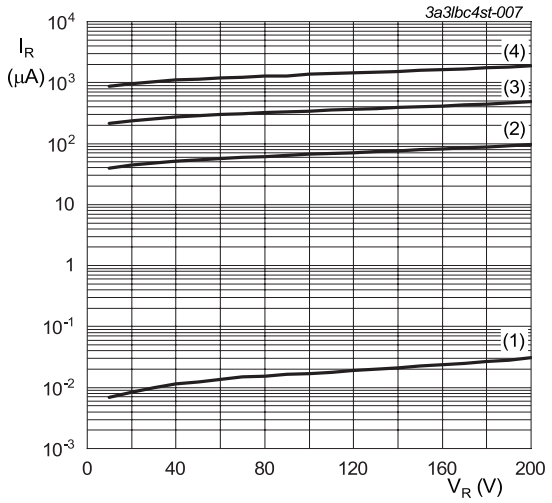
Table 8. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 15 A; T_j = 25 °C; per diode; Fig. 6		-	0.88	0.95	V
		I_F = 15 A; T_j = 125 °C; per diode		-	0.77	-	V
		I_F = 15 A; T_j = 175 °C; per diode; Fig. 6		-	0.72	0.79	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C; per diode; Fig. 7		-	0.04	5	µA
		V_R = 200 V; T_j = 125 °C; per diode; Fig. 7		-	0.1	-	mA



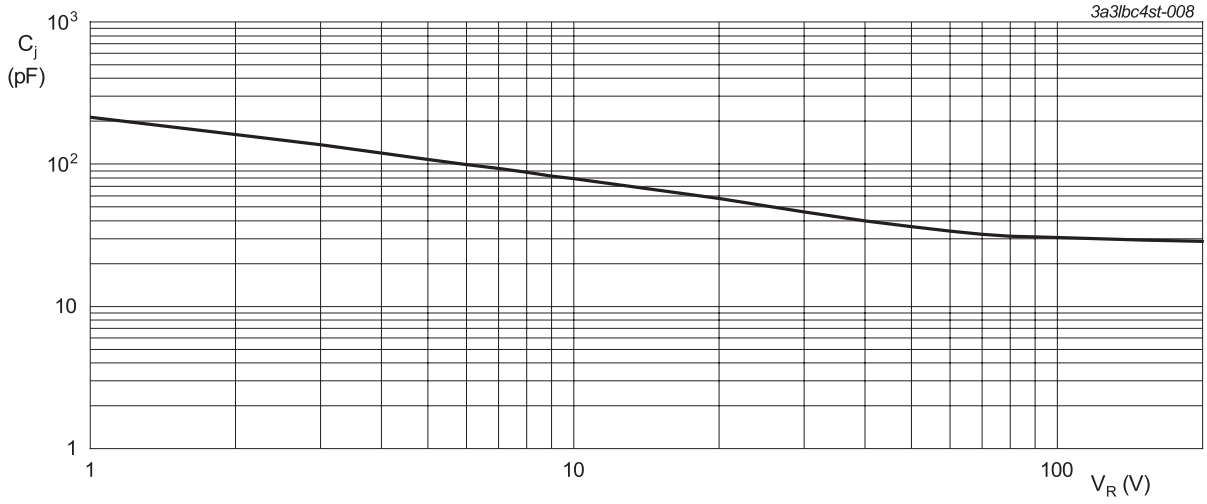
V_o = 0.674 V; R_s = 0.0081 Ω
(1) T_j = 175 °C; typical values
(2) T_j = 175 °C; maximum values
(3) T_j = 25 °C; maximum values

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

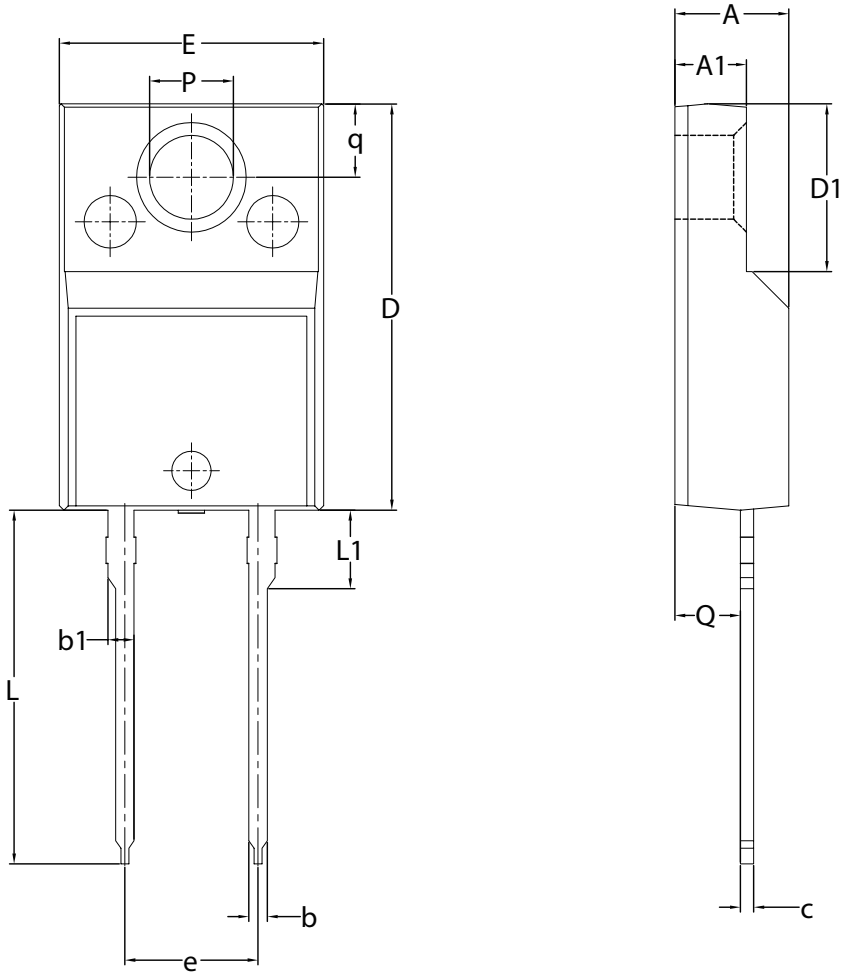


f = 1 MHz; T_j = 25 °C

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

12. Package outline

Plastic single-ended package; isolated heatsink mounted;1 mounting hole; 2 leads TO-220 'full pack' TO220F-2L



Unit		A	A1	b	b1	c	D	D1	E	e	L	L1	P	Q	q
MM	min	4.00	2.50	0.70	0.90	0.40	15.20	6.30	9.80	5.08 (BSC)	13.50	2.80	3.00	2.30	2.60
	max	4.60	3.10	0.90	1.10	0.70	15.80	6.50	10.30		14.40	3.30	3.40	2.80	3.00

Note:

1. All dimensions don't include mold flash and metal protrusion.

13. Legal information

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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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14. Contents

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Date of release: 12 November 2024