WN3S20H100CX

Dual power Schottky diode

Rev.01 - 23 November 2021 Product data sheet

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO220F "full pack" 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

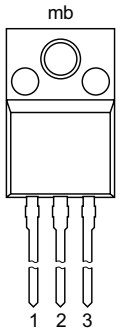
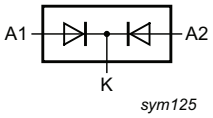
4. Quick reference data

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; per diode; Fig. 1; Fig. 2; Fig. 3	10				A
$I_{O(AV)}$	average output current	δ = 0.5 ; square-wave pulse; both diodes conducting	20				A
Symbol	**Parameter**	**Conditions**		**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 5 A; T_j = 25 °C; per diode; Fig. 6		-	0.54	0.62	V
		I_F = 5 A; T_j = 125 °C; per diode; Fig. 6		-	0.51	0.58	V
		I_F = 10 A; T_j = 25 °C; per diode; Fig. 6		-	0.68	0.75	V
		I_F = 10 A; T_j = 125 °C; per diode; Fig. 6		-	0.63	0.7	V
I_R	reverse current	V_R = 100 V; T_j = 25 °C; per diode; Fig. 7; Fig. 8		-	-	50	µA
		V_R = 100 V; T_j = 125 °C; per diode; Fig. 7; Fig. 8		-	-	15	mA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1		
2	K	cathode		
3	A2	anode 2		
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
WN3S20H100CX	TO220F	WN3S20H100CXQ	Tube	50	SOT186A	14-Nov-2013

7. Marking

Table 4. Marking codes

Type number	Marking codes
WN3S20H100CX	WN3S 20H100CX

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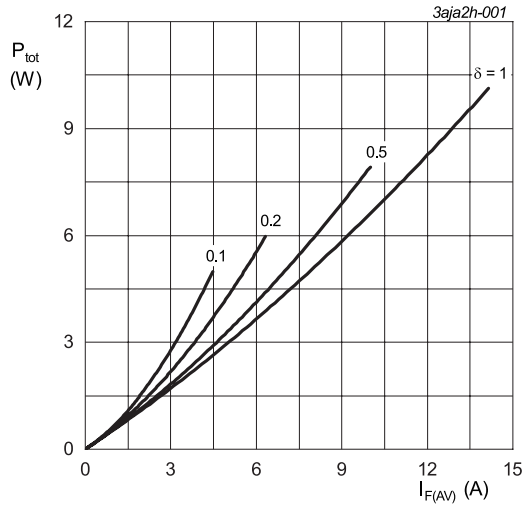
8. Limiting values

Table 5. Limiting values

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

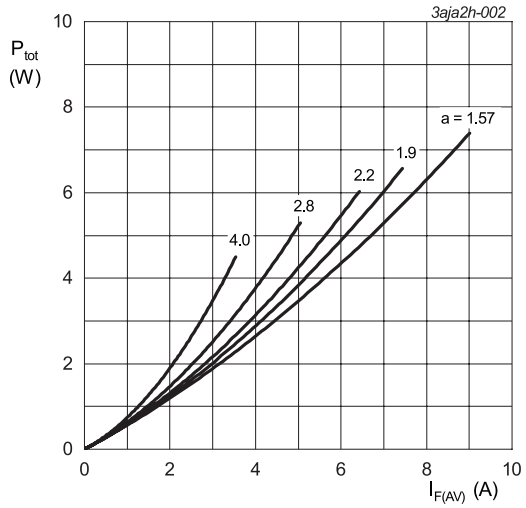
Symbol	Parameter	Conditions	Values	Unit
V_{RRM}	repetitive peak reverse voltage		100	V
V_{RWM}	crest working reverse voltage		100	V
V_R	reverse voltage	DC	100	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3	10	A
$I_{O(AV)}$	average output current	δ = 0.5 ; square-wave pulse; both diodes conducting	20	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4	180	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode	198	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 = 0.531 V; R_s = 0.0131 Ω

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



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

V_o = 0.531 V; R_s = 0.0131 Ω

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

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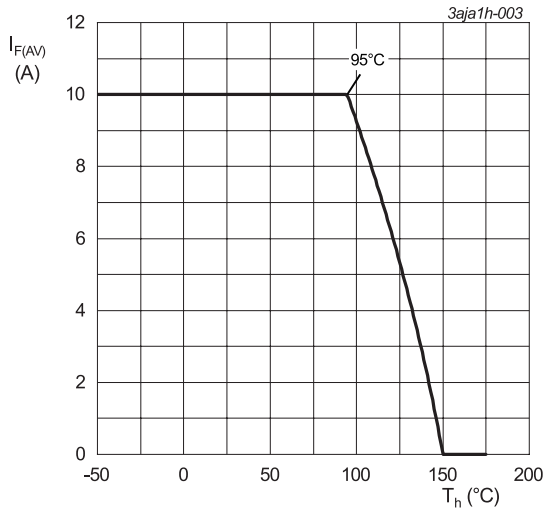

Fig. 3. Average forward current as a function of heatsink temperature; maximum values; per diode

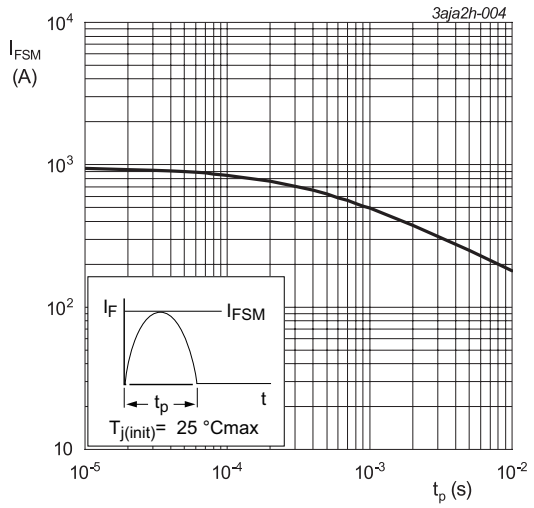

Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-h)}$	thermal resistance from junction to heatsink	with heatsink compound; per diode; Fig. 5		-	-	7	K/W
		with heatsink compound; both diodes conducting		-	-	4.8	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	65	-	K/W

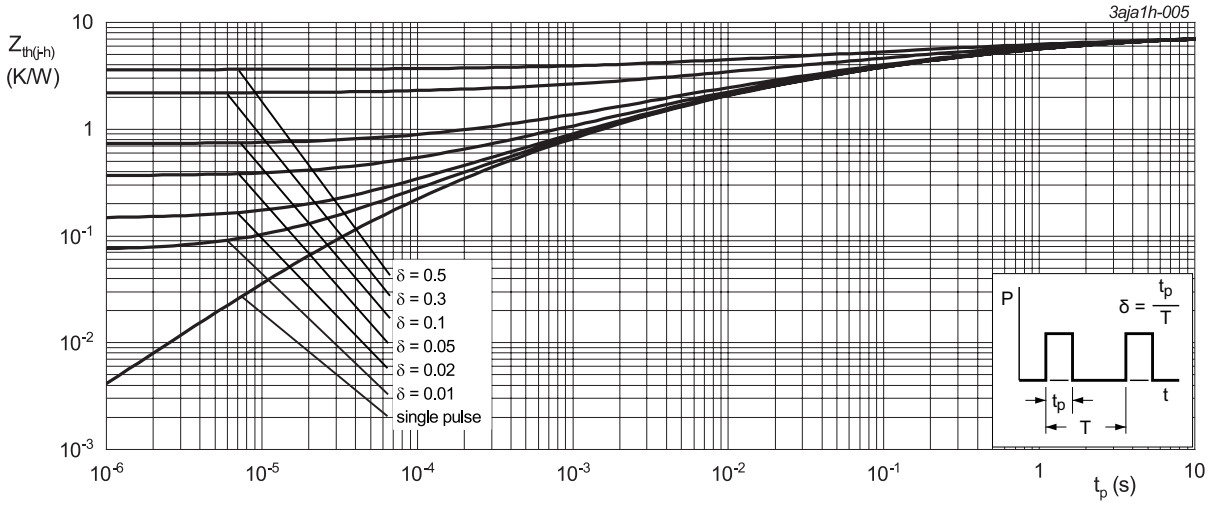

Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; maximum values; per diode

10. Isolation characteristics

Table 7. Isolation characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	from all terminals to external heatsink; sinusoidal waveform; clean and dust free; 50 Hz ≤ f ≤ 60 Hz; T_h = 25 °C; RH ≤ 65 %		-	-	2500	V

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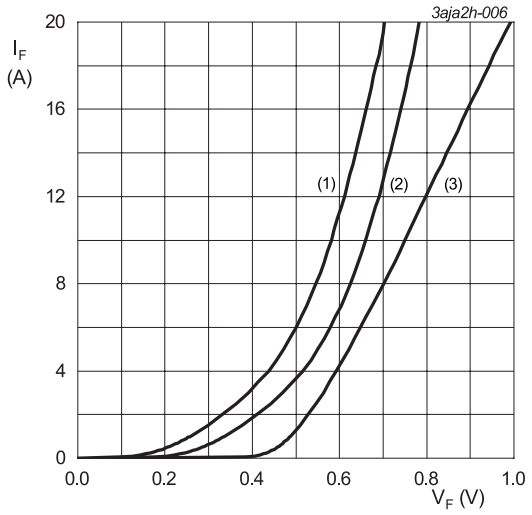
11. Characteristics

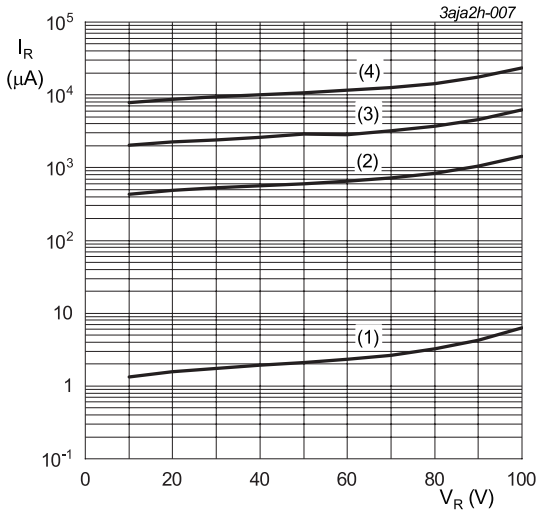
Table 8. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 5 A; T_j = 25 °C; per diode; Fig. 6		-	0.54	0.62	V
		I_F = 5 A; T_j = 125 °C; per diode; Fig. 6		-	0.51	0.58	V
		I_F = 10 A; T_j = 25 °C; per diode; Fig. 6		-	0.68	0.75	V
		I_F = 10 A; T_j = 125 °C; per diode; Fig. 6		-	0.63	0.7	V
I_R	reverse current	V_R = 100 V; T_j = 25 °C; per diode; Fig. 7; Fig. 8		-	-	50	µA
		V_R = 100 V; T_j = 125 °C; per diode; Fig. 7; Fig. 8		-	-	15	mA



V_o = 0.531 V; R_s = 0.0131 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 values

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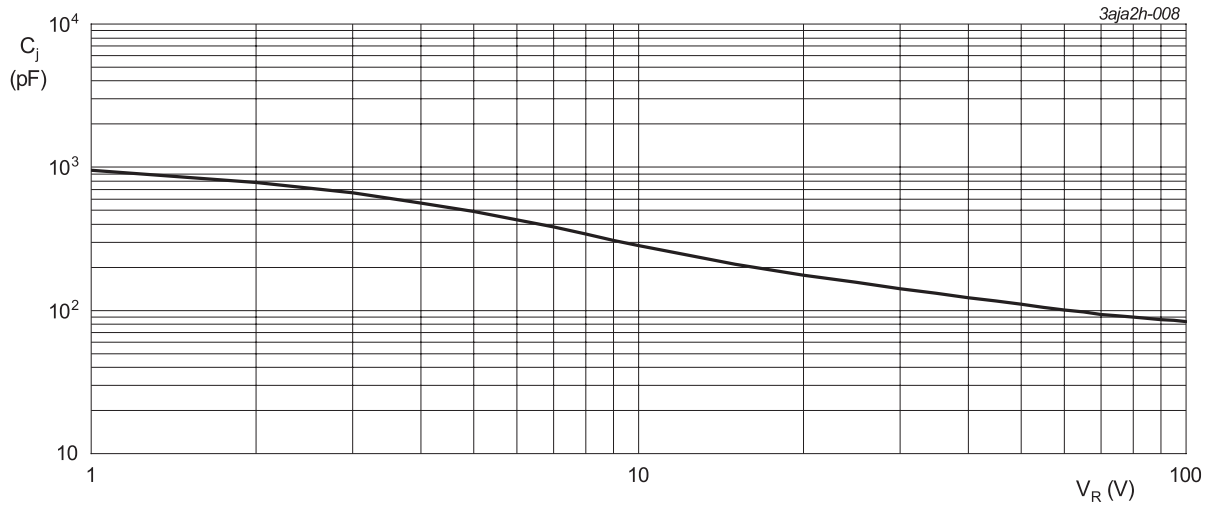

f = 1 MHz; T_j = 25 °C

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

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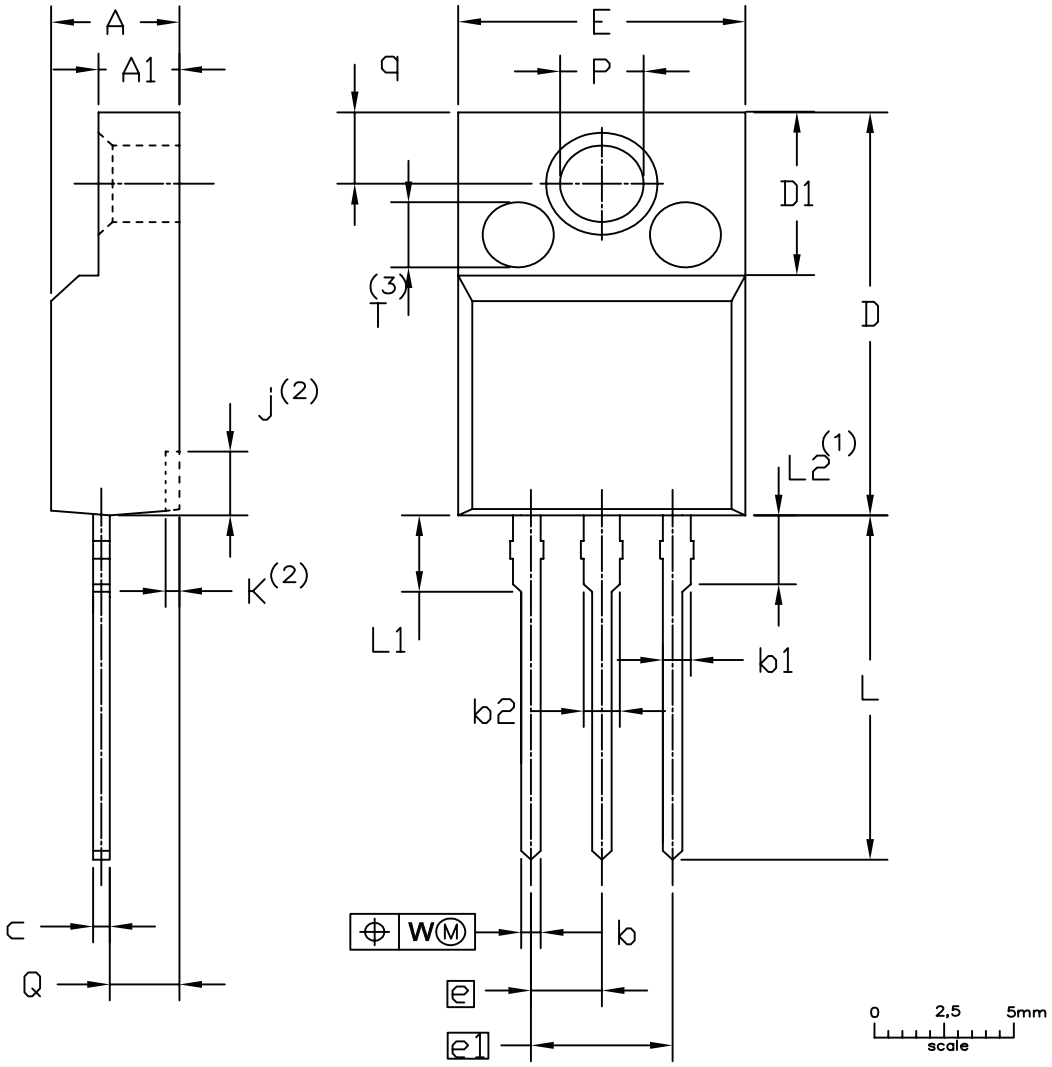
12. Package outline

Plastic single−ended package; isolated heatsink mounted; 1 mounting hole; 3−lead TO−220 "full pack" SOT186A



UNIT	A	A_1	b	b_1	b_2	c	D	D_1	E	e	e_1	j(2)	K(2)	L	L_1	L_2(1) max.	P	Q	q	W	T(3)
mm	4.6	2.9	0.9	1.1	1.4	0.7	15.8	6.5	10.3	2.54	5.08	2.7	0.6	14.4	3.30	3	3.2	2.6	3.0	0.4	2.5
	4.0	2.5	0.7	0.9	1.0	0.4	15.2	6.3	9.7			1.7	0.4	13.5	2.79		3.0	2.3	2.6		

Notes
1. Terminal dimensions within this zone are uncotrolled
2. Dot lines area designs may vary
3. Eject pin mark is for reference only

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT186A		3 LEADS TO220F				2013−11−14

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