WNS20S100CX

Dual power Schottky diode

11 March 2019 Product data sheet

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a SOT186A (TO-220F) "full pack" plastic package.

2. Features and benefits

- Trench structure
- High junction temperature up to 150°C
- Low forward condution voltage
- Negligible switching losses

3. Applications

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

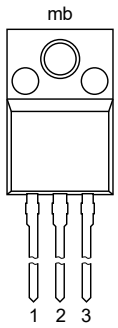
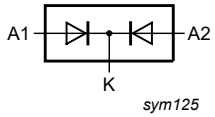
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	-	100	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; T_h ≤ 84 °C; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		-	-	10	A
$I_{O(AV)}$	average output current	δ = 0.5 ; T_h ≤ 60 °C; square-wave pulse; both diodes conducting		-	-	20	A
Static characteristics							
V_F	forward voltage	I_F = 3 A; T_j = 25 °C; Fig. 6; per diode		-	0.56	0.61	V
		I_F = 3 A; T_j = 125 °C; Fig. 6; per diode		-	0.53	0.58	V
		I_F = 10 A; T_j = 25 °C; Fig. 6; per diode		-	0.89	0.95	V
		I_F = 10 A; T_j = 125 °C; Fig. 6; per diode		-	0.73	0.8	V
I_R	reverse current	V_R = 100 V; T_j = 25 °C; Fig. 7; Fig. 8; per diode		-	-	50	µA
		V_R = 100 V; T_j = 125 °C; Fig. 7; Fig. 8; per diode		-	-	10	mA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 TO-220F (SOT186A)	
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

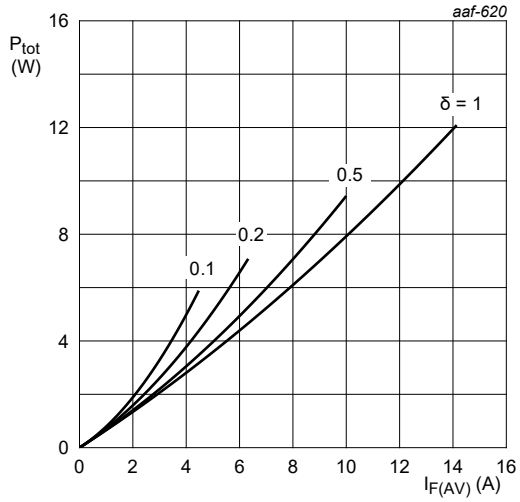
Type number	Package		
	Name	Description	Version
WNS20S100CX	TO-220F	plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 3-lead TO-220 "full pack"	SOT186A

7. Limiting values

Table 4. Limiting values

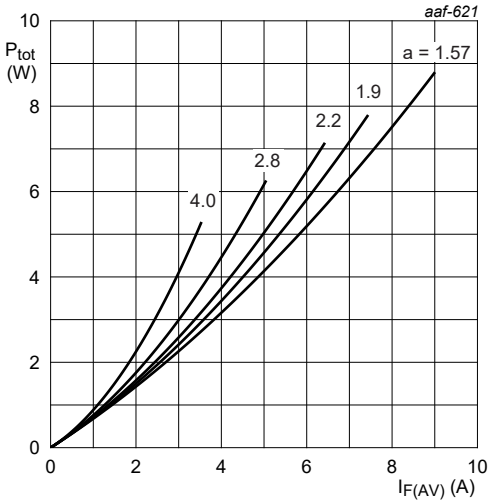
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	100	V
V_{RWM}	limiting crest working reverse voltage			-	100	V
V_R	limiting reverse voltage	DC		-	100	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_h \leq 84$ °C; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		-	10	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_h \leq 60$ °C; 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		-	120	A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode		-	132	A
T_{stg}	storage temperature			-40	150	°C
T_j	junction temperature			-	150	°C



$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$
$V_o = 0.641$ V; $R_s = 0.0151$ Ω

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



a = form factor = $I_{F(RMS)} / I_{F(AV)}$
$V_o = 0.641$ V; $R_s = 0.0151$ Ω

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

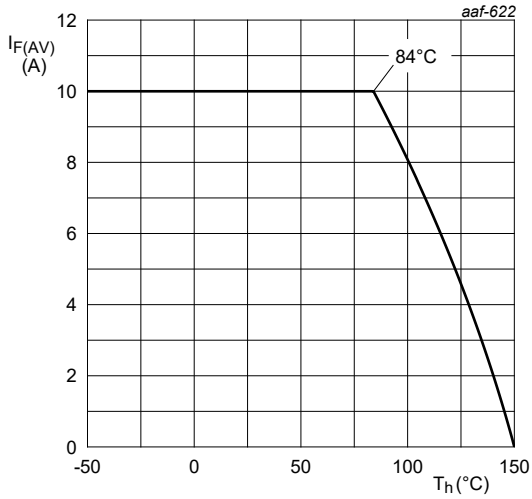


Fig. 3. Average forward current as a function of heatsink temperature; maximum values; per diode

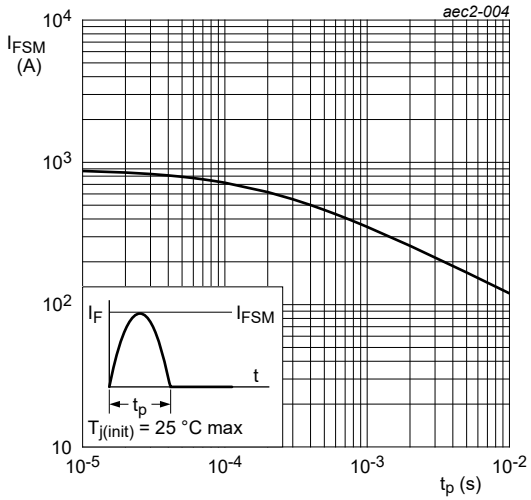


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

8. Thermal characteristics

Table 5. 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	in free air		-	55	-	K/W

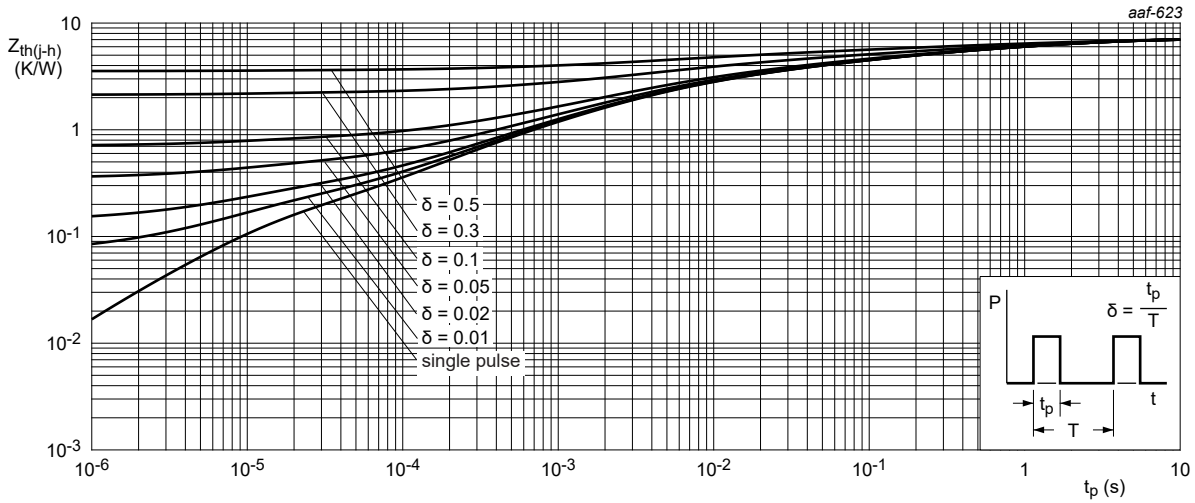
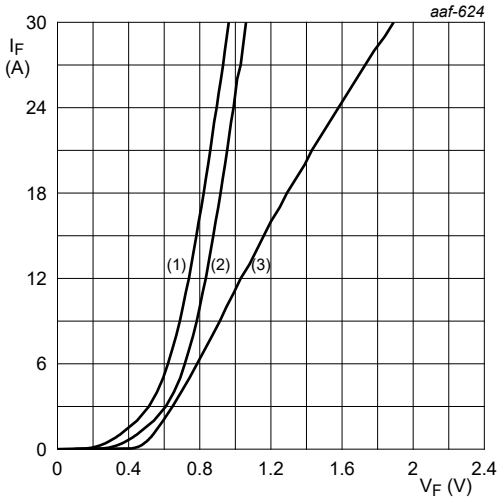


Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; per diode

9. Characteristics

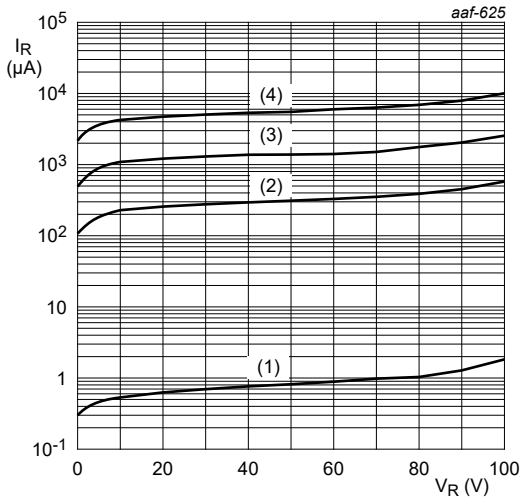
Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 3 A; T_j = 25 °C; Fig. 6; per diode		-	0.56	0.61	V
		I_F = 3 A; T_j = 125 °C; Fig. 6; per diode		-	0.53	0.58	V
		I_F = 10 A; T_j = 25 °C; Fig. 6; per diode		-	0.89	0.95	V
		I_F = 10 A; T_j = 125 °C; Fig. 6; per diode		-	0.73	0.8	V
I_R	reverse current	V_R = 100 V; T_j = 25 °C; Fig. 7; Fig. 8; per diode		-	-	50	µA
		V_R = 100 V; T_j = 125 °C; Fig. 7; Fig. 8; per diode		-	-	10	mA



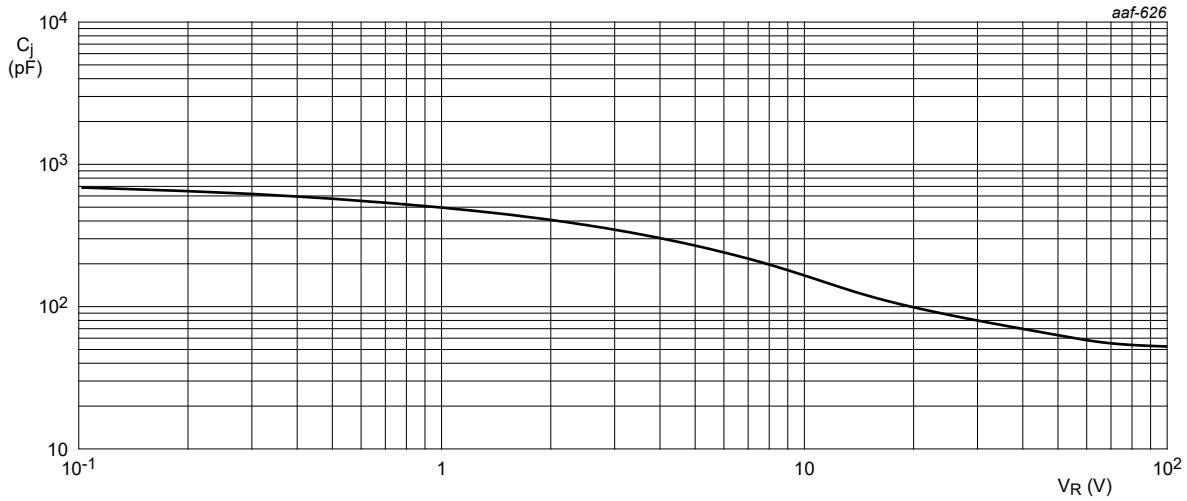
V_o = 0.641 V; R_s = 0.0151 Ω
(1) T_j = 150 °C; typical values
(2) T_j = 150 °C; maximum values
(3) T_j = 25 °C; maximum values

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

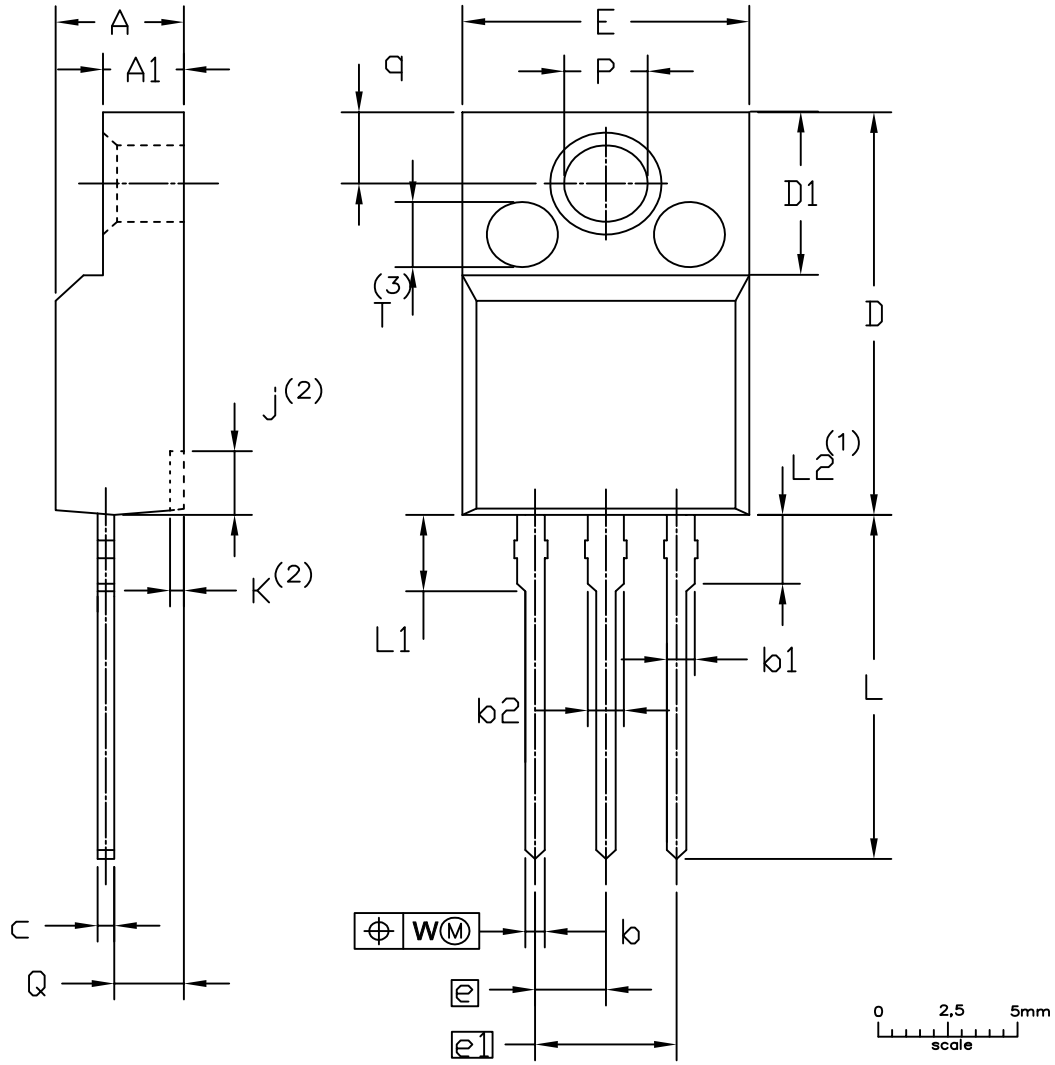


f = 1 MHz; T_j = 25 °C

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

10. 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

Fig. 9. Package outline TO-220F (SOT186A)

11. Legal information

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Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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Product [short] data sheet	Production	This document contains the product specification.

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Date of release: 11 March 2019

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