

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

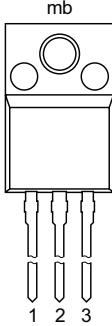
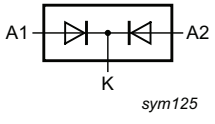
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
Absolute maximum rating						
V_{RRM}	repetitive peak reverse voltage		150			V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3	10			A
$I_{O(AV)}$	average output current	$\delta = 0.5$; square-wave pulse; both diodes conducting	20			A
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 5\text{ A}$; $T_j = 25\text{ °C}$; per diode; Fig. 6	-	0.76	-	V
		$I_F = 5\text{ A}$; $T_j = 125\text{ °C}$; per diode; Fig. 6	-	0.59	-	V
		$I_F = 10\text{ A}$; $T_j = 25\text{ °C}$; per diode; Fig. 6	-	1.06	1.1	V
		$I_F = 10\text{ A}$; $T_j = 125\text{ °C}$; per diode; Fig. 6	-	0.68	0.75	V
I_R	reverse current	$V_R = 150\text{ V}$; $T_j = 25\text{ °C}$; per diode; Fig. 7 ; Fig. 8	-	-	50	μA
		$V_R = 150\text{ V}$; $T_j = 125\text{ °C}$; 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
WN3S20H150CX	TO220F	WN3S20H150CXQ	Tube	50	SOT186A	14-Nov-2013

7. Marking

Table 4. Marking codes

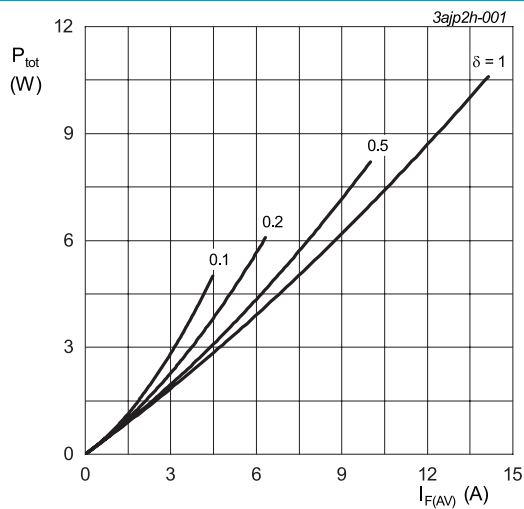
Type number	Marking codes
WN3S20H150CX	WN3S 20H150CX

8. Limiting values

Table 5. Limiting values

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

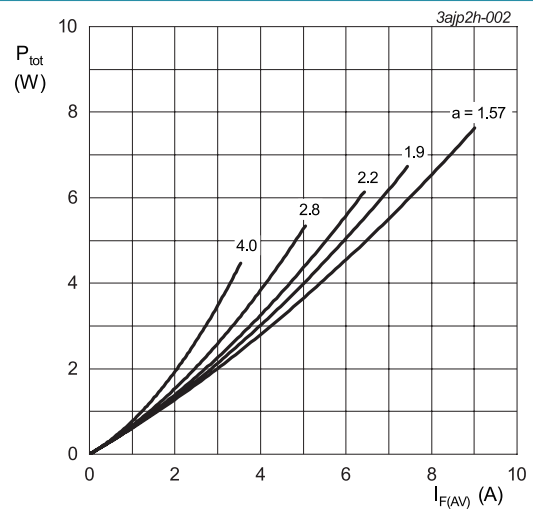
Symbol	Parameter	Conditions	Values	Unit
V_{RRM}	repetitive peak reverse voltage		150	V
V_{RWM}	crest working reverse voltage		150	V
V_R	reverse voltage	DC	150	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3	10	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; square-wave pulse; both diodes conducting	20	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10$ ms; $T_{j(\text{init})} = 25$ °C; sine-wave pulse; per diode; Fig. 4	180	A
		$t_p = 8.3$ ms; $T_{j(\text{init})} = 25$ °C; sine-wave pulse; per diode	198	A
T_{stg}	storage temperature		-40 to 150	°C
T_j	junction temperature		150	°C



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

$$V_o = 0.579 \text{ V}; R_s = 0.0121 \Omega$$

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



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

$$V_o = 0.579 \text{ V}; R_s = 0.0121 \Omega$$

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

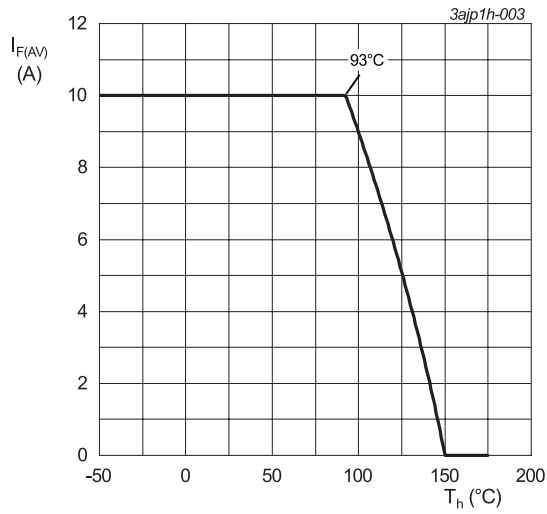


Fig. 3. Average forward current as a function of heatsink temperature; maximum values; per diode

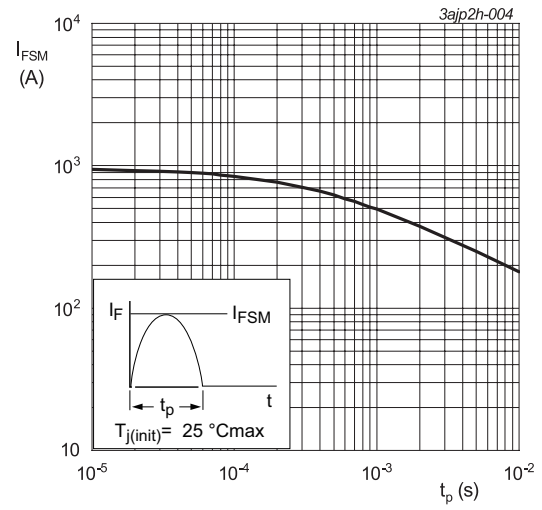


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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

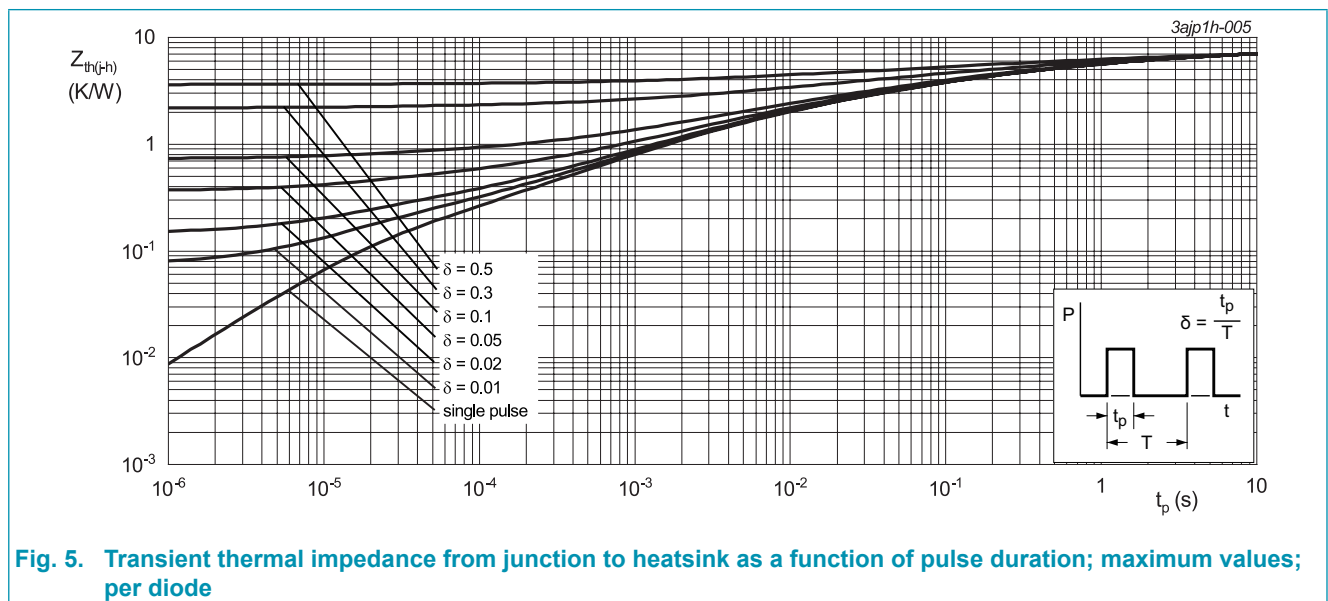


Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; maximum values; per diode

10. Isolation characteristics

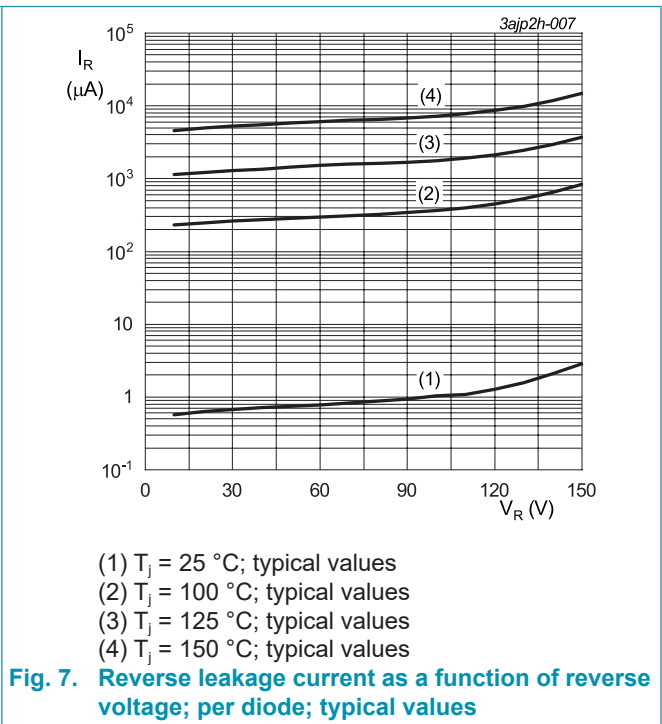
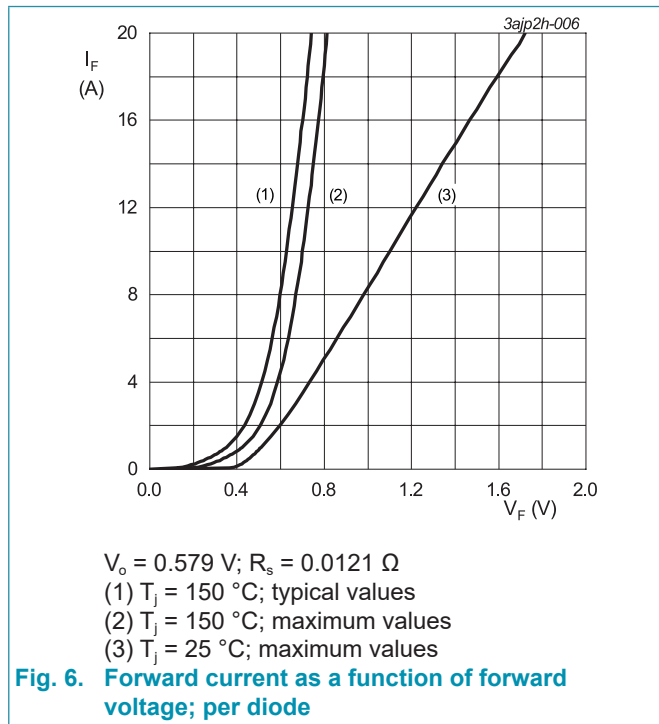
Table 7. Isolation characteristics

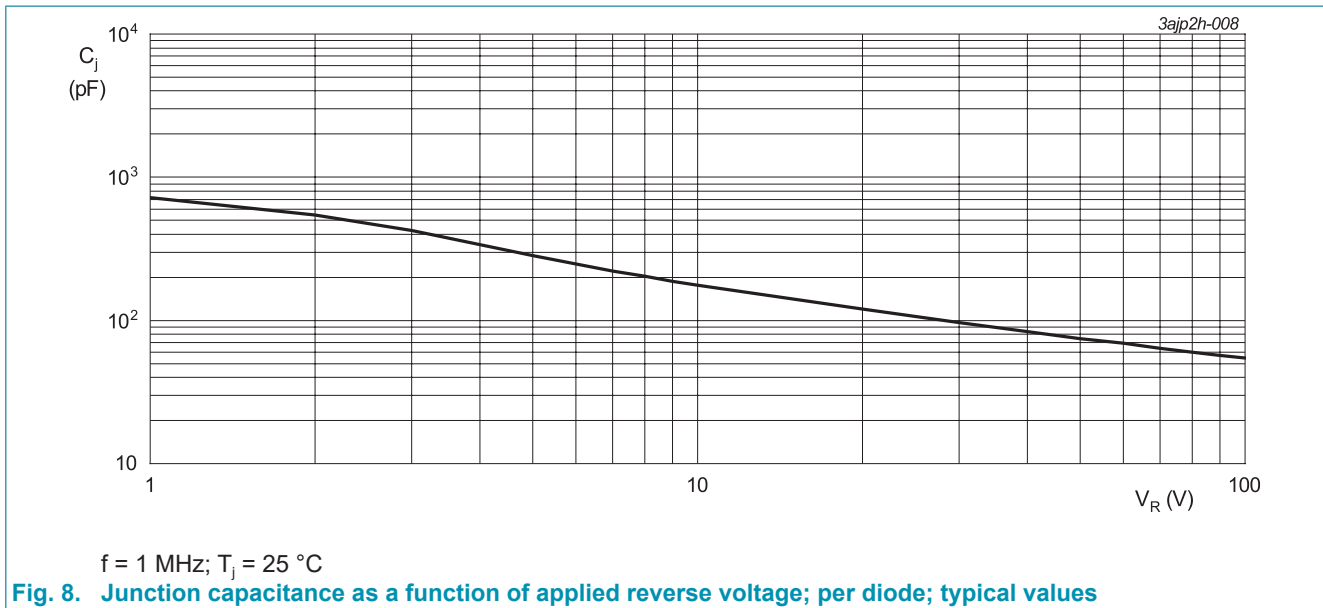
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	from all terminals to external heatsink; sinusoidal waveform; clean and dust free; $50\text{ Hz} \leq f \leq 60\text{ Hz}$; $T_h = 25\text{ }^\circ\text{C}$; $RH \leq 65\%$	-	-	2500	V

11. Characteristics

Table 8. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 5 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 6	-	0.76	-	V
		$I_F = 5 \text{ A}; T_j = 125 \text{ }^\circ\text{C};$ per diode; Fig. 6	-	0.59	-	V
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I_R	reverse current	$V_R = 150 \text{ V}; T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 7 ; Fig. 8	-	-	50	μA
		$V_R = 150 \text{ V}; T_j = 125 \text{ }^\circ\text{C};$ per diode; Fig. 7 ; Fig. 8	-	-	15	mA

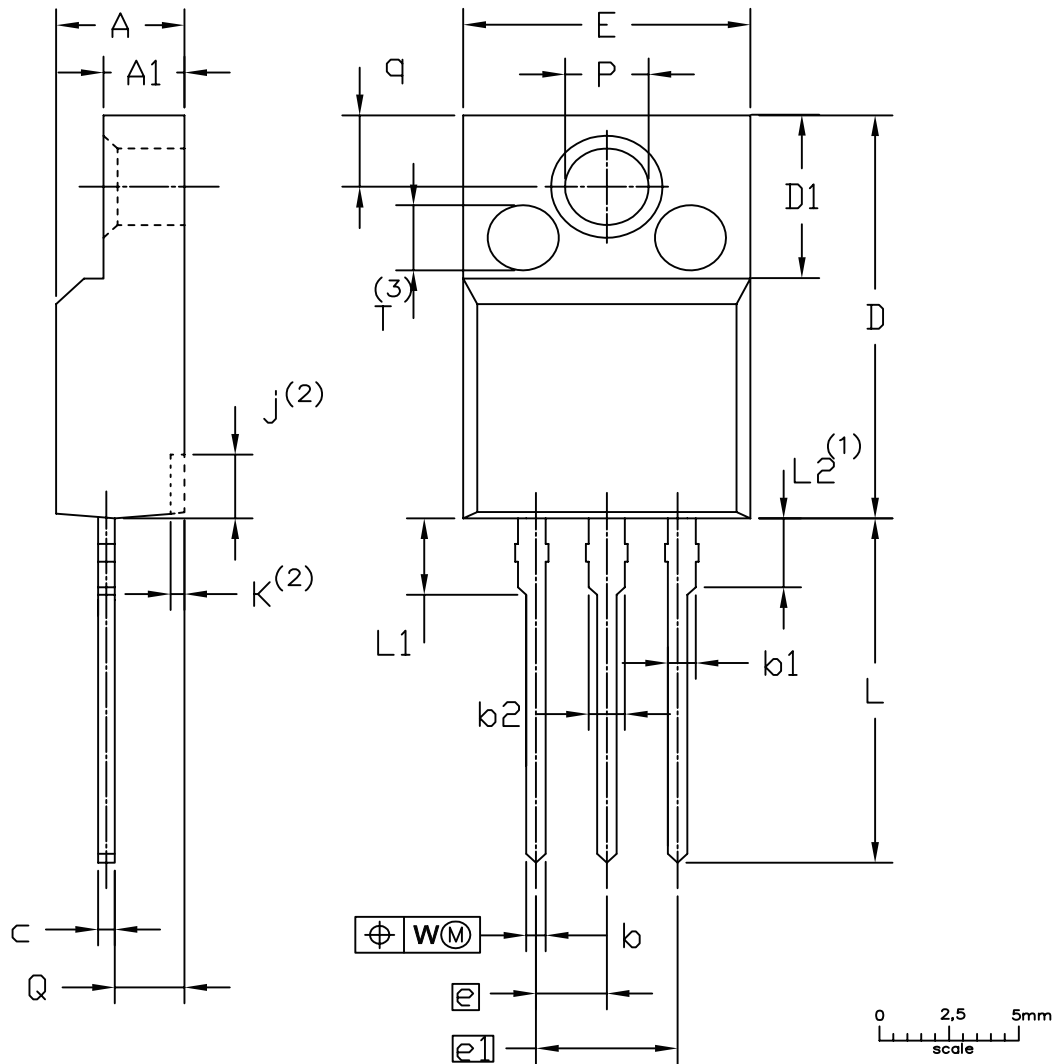




12. Package outline

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 uncontrolled
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

13. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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