

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 conduction voltage
- Negligible switching losses

3. Applications

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

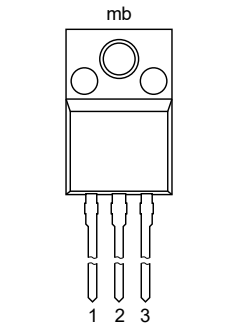
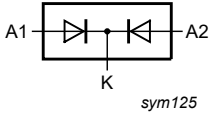
4. Quick reference data

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	$\delta = 0.5$; $T_h \leq 84$ °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
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	μ A
		$V_R = 100$ 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	 <p style="text-align: center;">TO-220F (SOT186A)</p>	
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

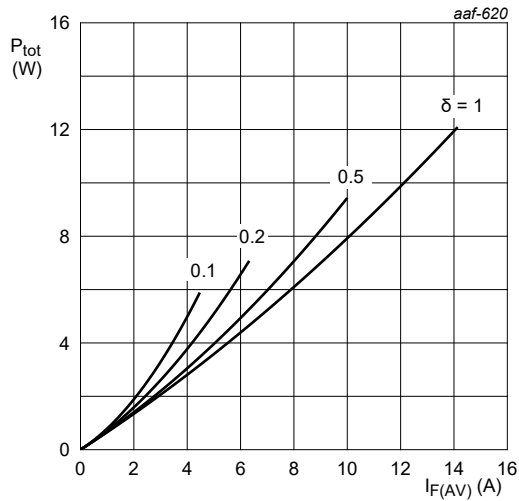
Type number	Package		
	Name	Description	Version
WNS20S100CX	TO-220F	plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 3-lead TO-220 "full pack"	SOT186A

7. Limiting values

Table 4. Limiting values

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

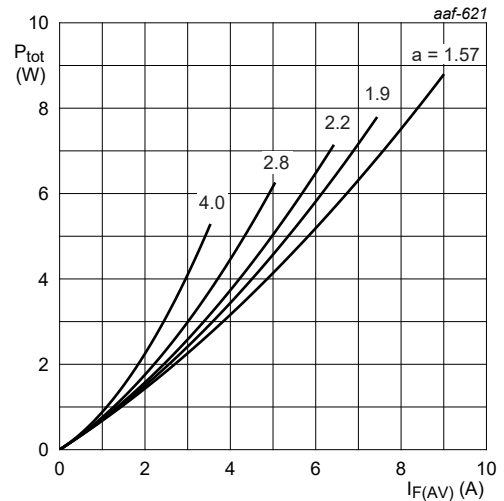
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	100	V
V_{RWM}	limiting crest working reverse voltage		-	100	V
V_R	limiting reverse voltage	DC	-	100	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_h \leq 84$ °C; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; 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



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

$$V_o = 0.641 \text{ V}; R_s = 0.0151 \text{ } \Omega$$

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



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

$$V_o = 0.641 \text{ V}; R_s = 0.0151 \text{ } \Omega$$

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

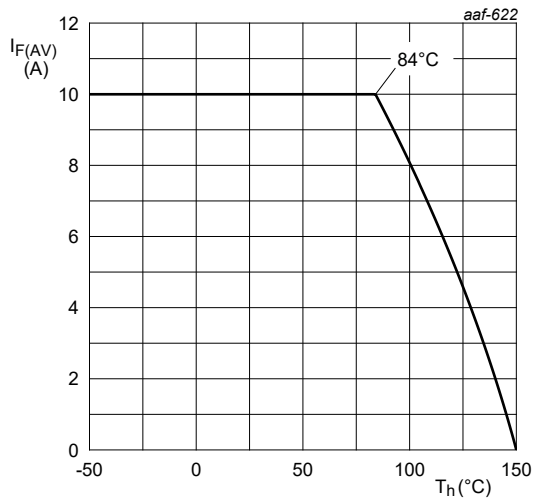


Fig. 3. Average forward current as a function of heatsink temperature; maximum values; per diode

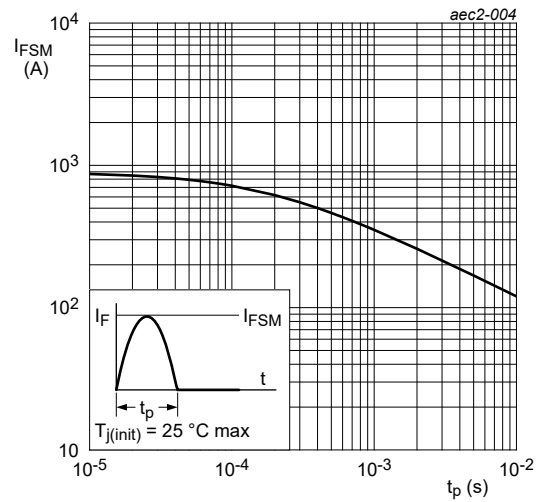


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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

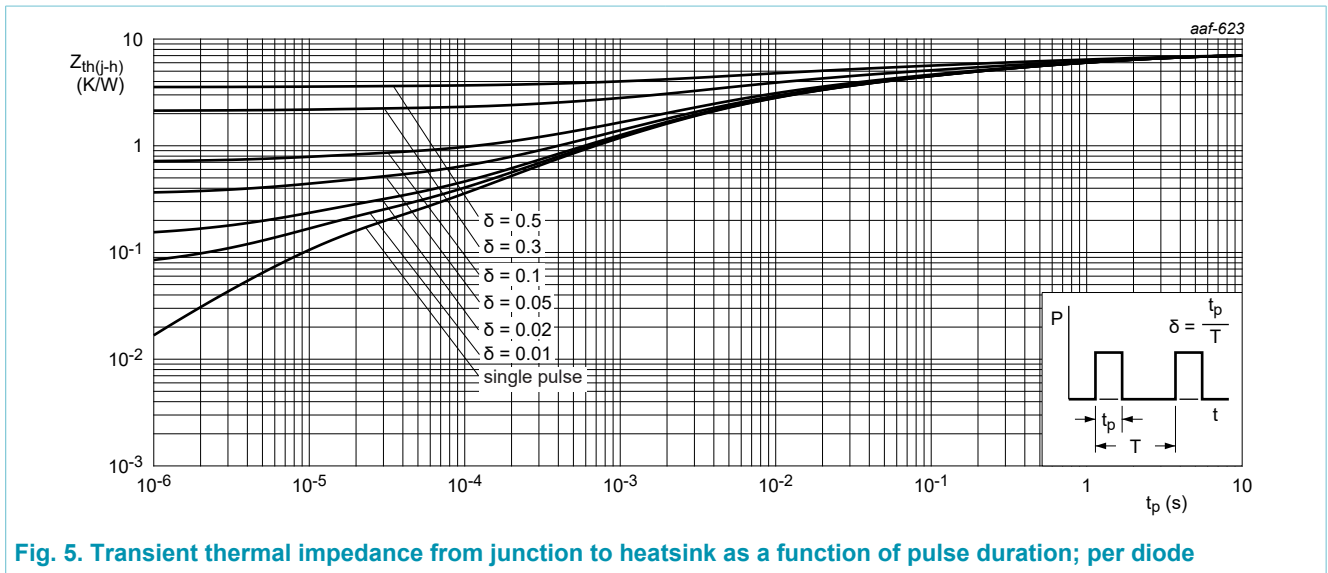
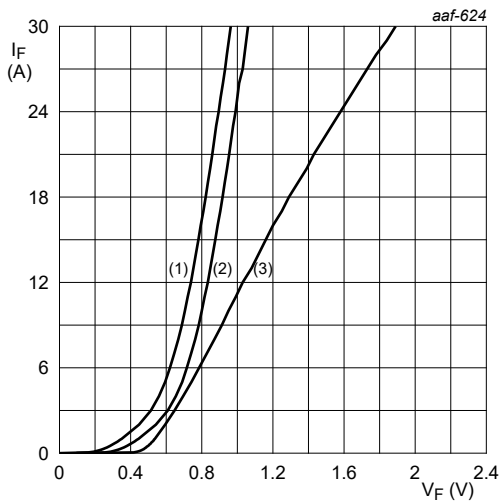


Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; per diode

9. Characteristics

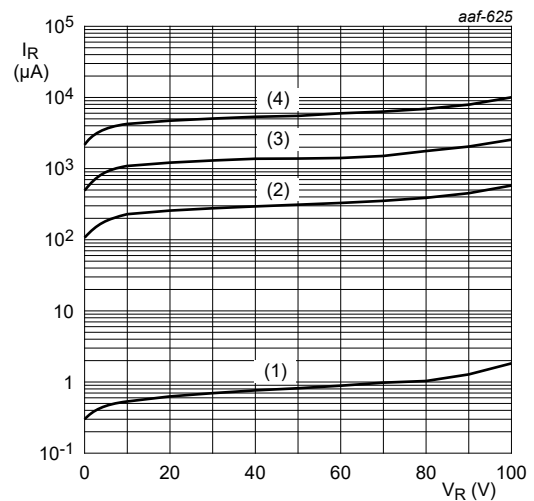
Table 6. Characteristics

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



$V_o = 0.641\text{ V}; R_s = 0.0151\ \Omega$
 (1) $T_j = 150\text{ °C};$ typical values
 (2) $T_j = 150\text{ °C};$ maximum values
 (3) $T_j = 25\text{ °C};$ maximum values

Fig. 6. Forward current as a function of forward voltage; per diode



(1) $T_j = 25\text{ °C};$ typical values
 (2) $T_j = 100\text{ °C};$ typical values
 (3) $T_j = 125\text{ °C};$ typical values
 (4) $T_j = 150\text{ °C};$ typical values

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

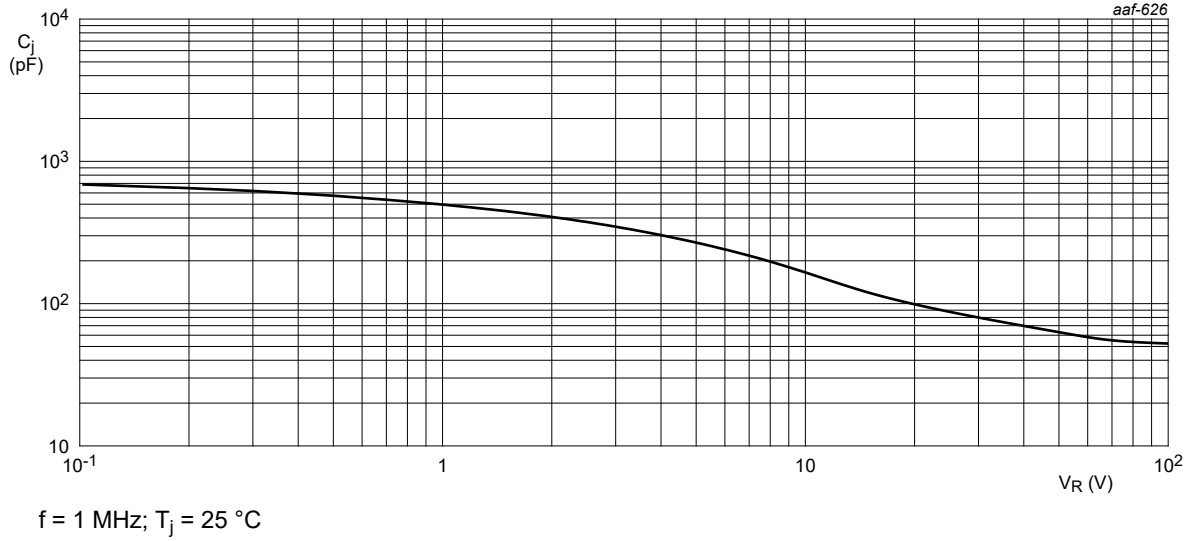


Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

10. Package outline

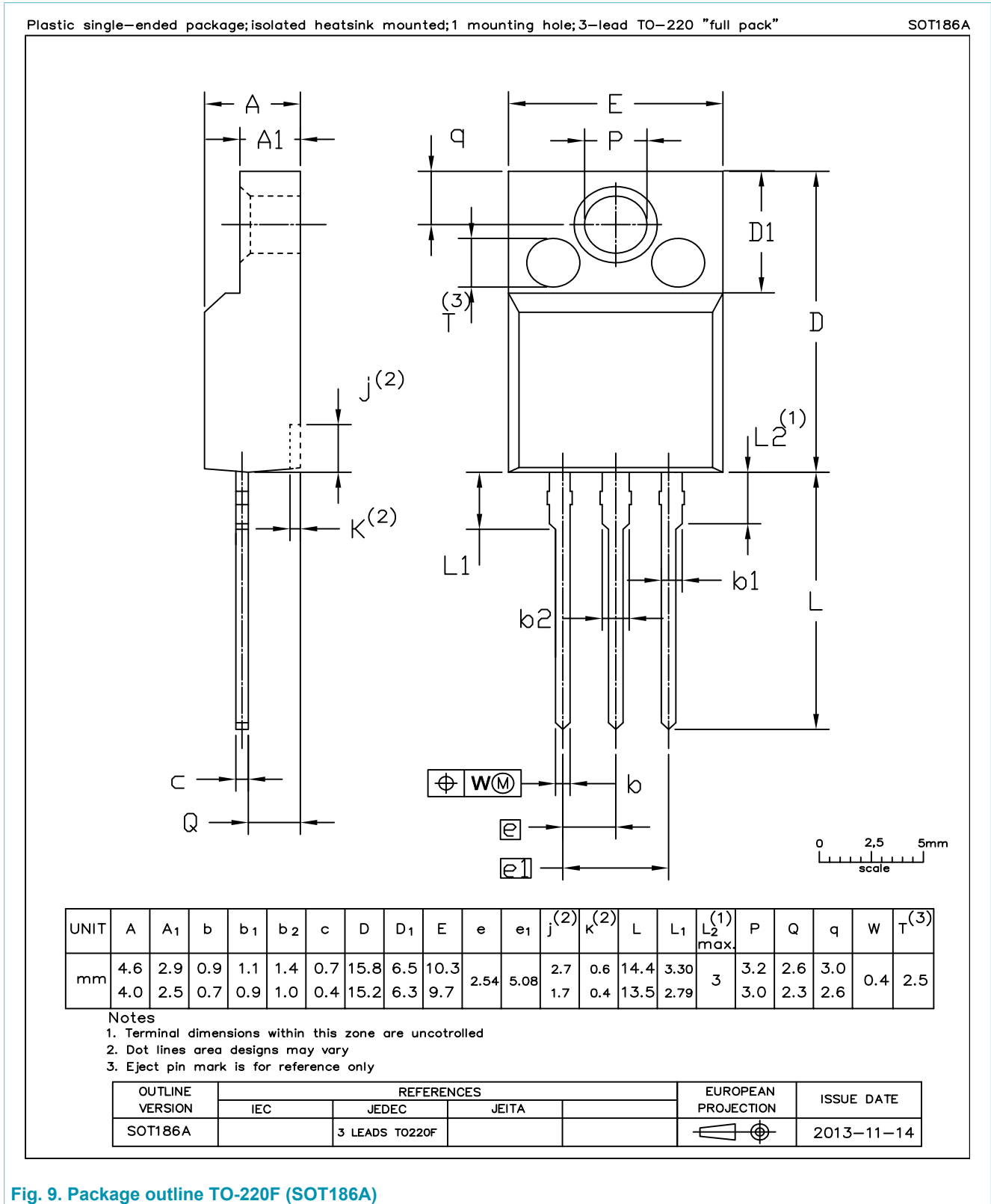


Fig. 9. Package outline TO-220F (SOT186A)

11. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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