

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO-220 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

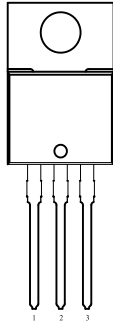
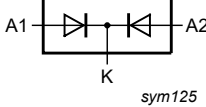
4. Quick reference data

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	$\delta = 0.5$; $T_{mb} \leq 117$ °C; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3	-	-	10	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 116$ °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-220E</p>	 <p style="text-align: center;"><i>sym125</i></p>
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

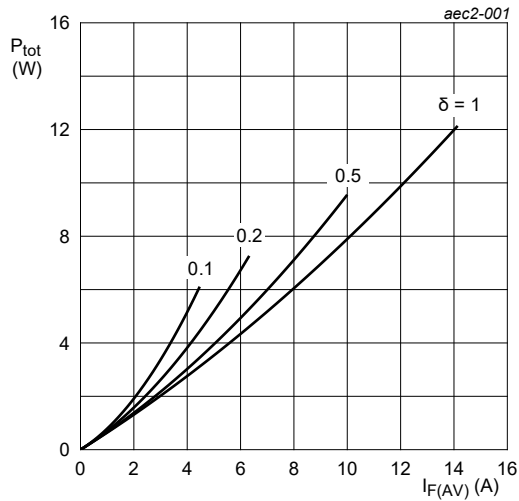
Type number	Package		Version
	Name	Description	
WNS20S100C	TO-220E	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	TO-220E

7. Limiting values

Table 4. Limiting values

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

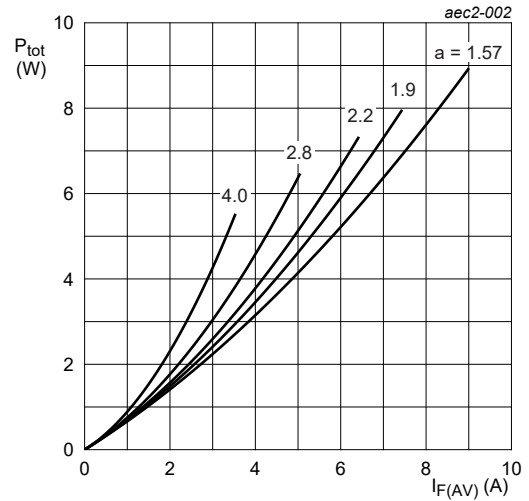
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	100	V
V_{RWM}	limiting crest working reverse voltage		-	100	V
V_R	limiting reverse voltage	DC	-	100	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_{mb} \leq 117\text{ }^\circ\text{C}$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3	-	10	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 116\text{ }^\circ\text{C}$; square-wave pulse; both diodes conducting	-	20	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse; per diode; Fig. 4	-	120	A
		$t_p = 8.3\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse; per diode	-	132	A
T_{stg}	storage temperature		-40	150	$^\circ\text{C}$
T_j	junction temperature		-	150	$^\circ\text{C}$



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

$$V_o = 0.623\text{ V}; R_s = 0.0166\ \Omega$$

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



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

$$V_o = 0.623\text{ V}; R_s = 0.0166\ \Omega$$

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

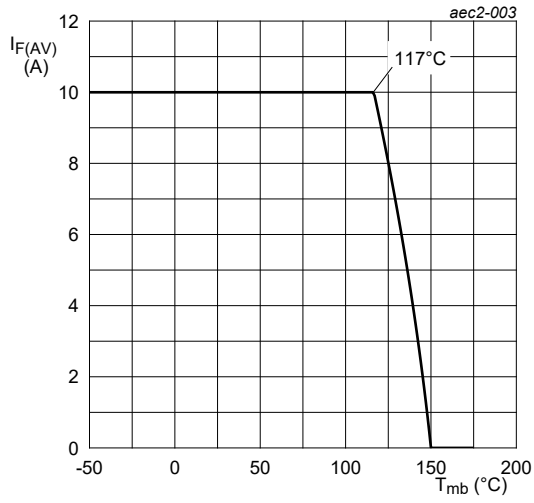


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

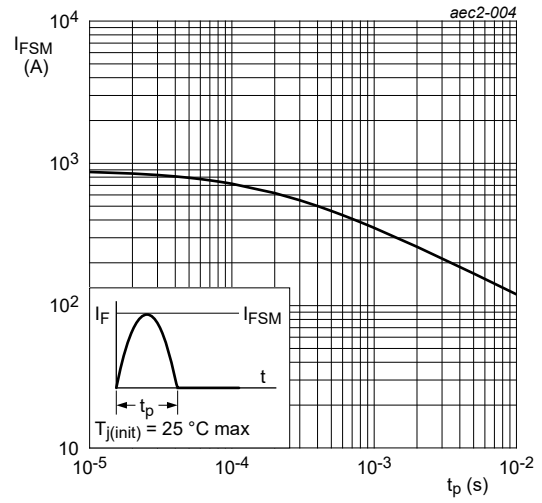


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; Fig. 5	-	-	3.5	K/W
		both diodes conducting	-	-	1.8	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	60	-	K/W

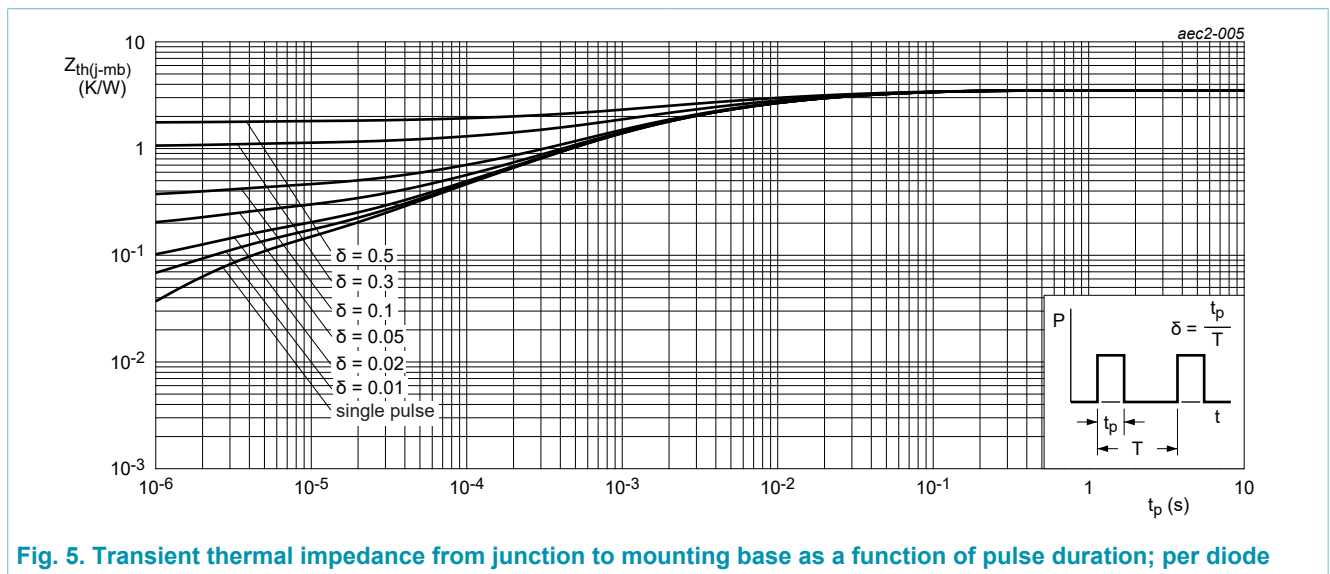
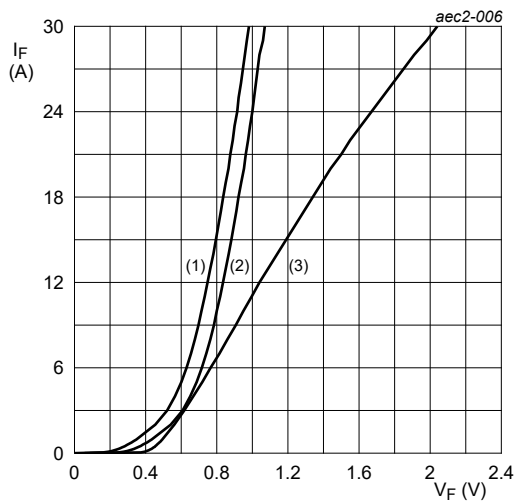


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; per diode

9. Characteristics

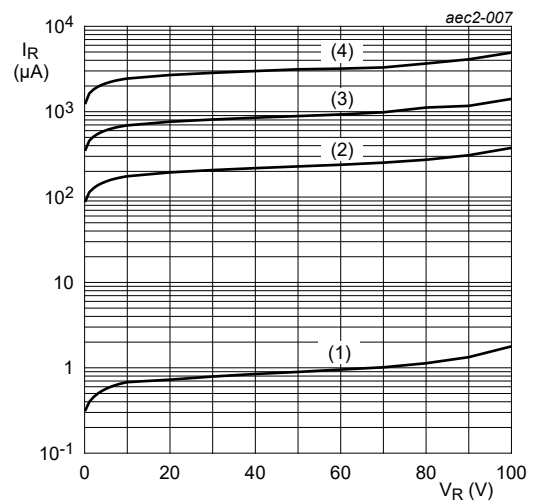
Table 6. Characteristics

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



$V_o = 0.623 \text{ V}; R_s = 0.0166 \text{ } \Omega$
 (1) $T_j = 150 \text{ }^\circ\text{C}; \text{ typical values}$
 (2) $T_j = 150 \text{ }^\circ\text{C}; \text{ maximum values}$
 (3) $T_j = 25 \text{ }^\circ\text{C}; \text{ maximum values}$

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



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

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

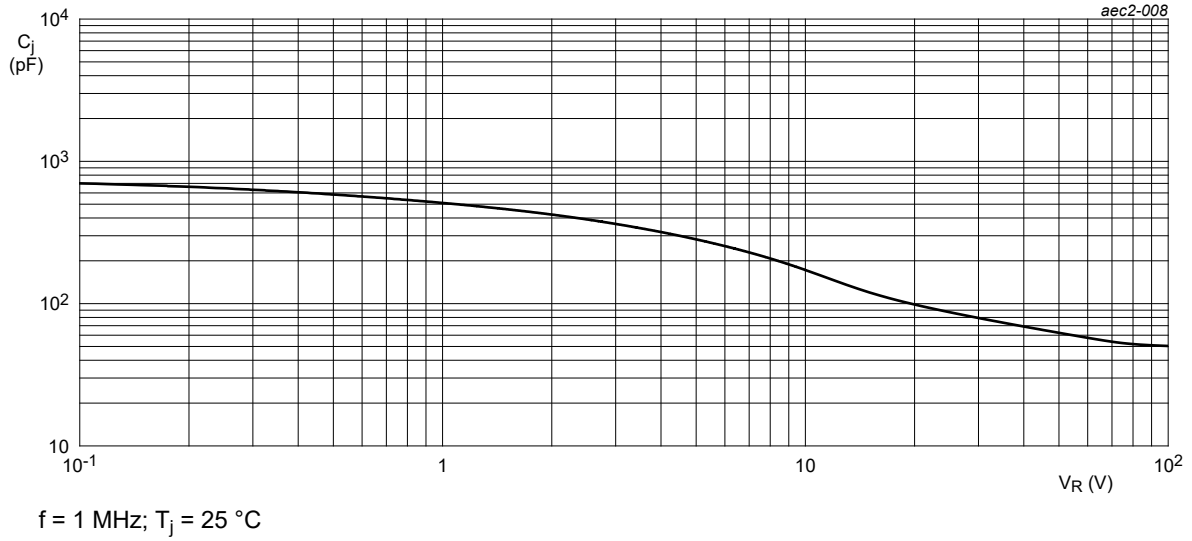


Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

10. Package outline

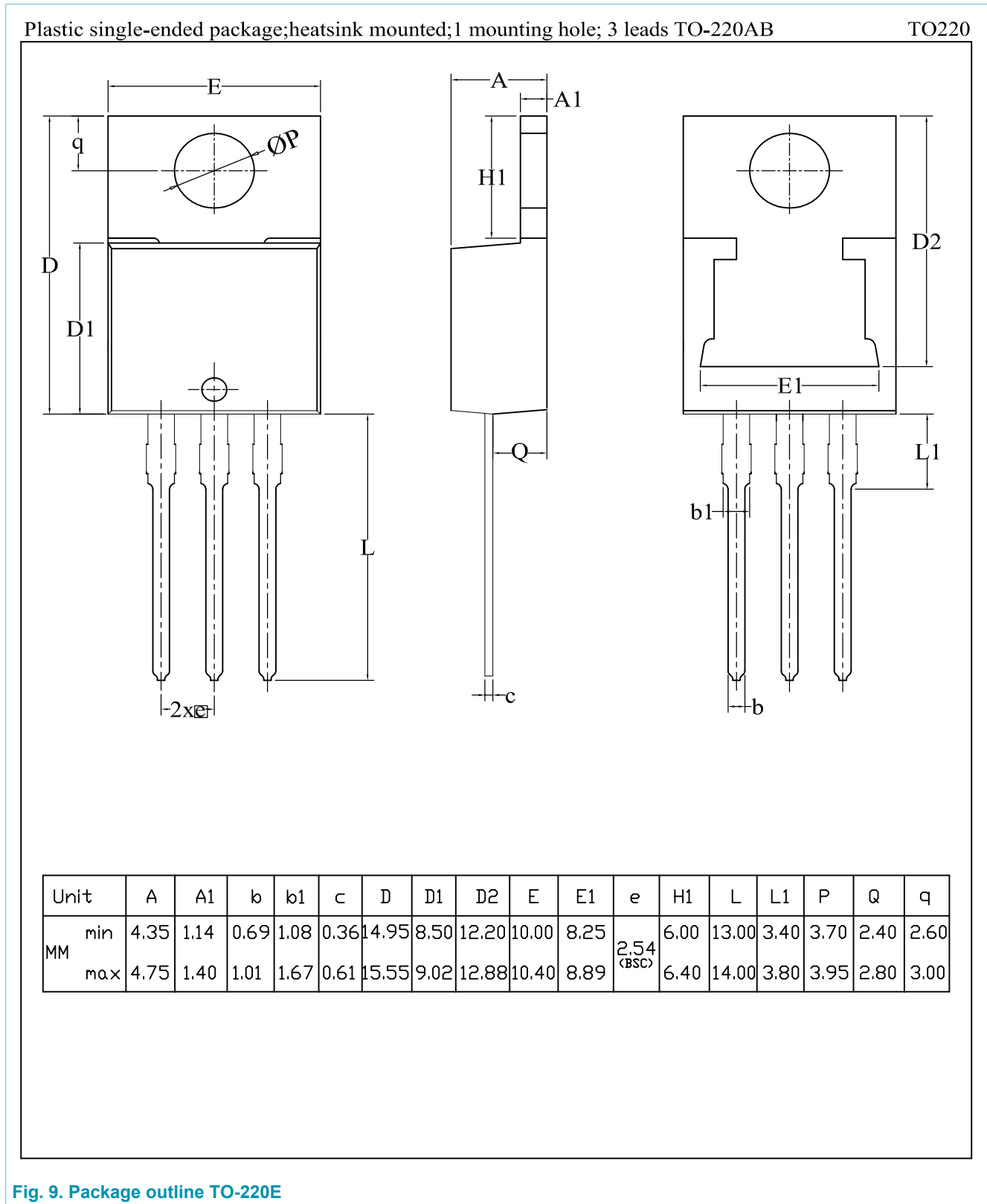


Fig. 9. Package outline TO-220E

11. 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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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