

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

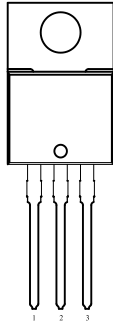
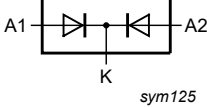
4. Quick reference data

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> |  |
| 2 | K | cathode | | |
| 3 | A2 | anode 2 | | |
| mb | K | mounting base; connected to cathode | | |

6. Ordering information

Table 3. Ordering information

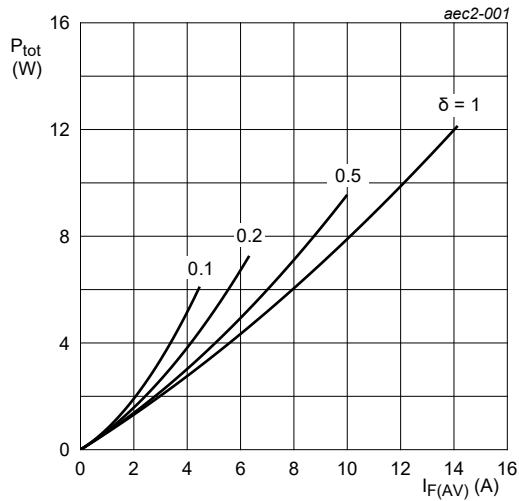
| Type number | Package | | Version |
|-------------|---------|--|---------|
| | Name | Description | |
| WNS20S100C | TO-220E | plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB | TO-220E |

7. Limiting values

Table 4. Limiting values

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

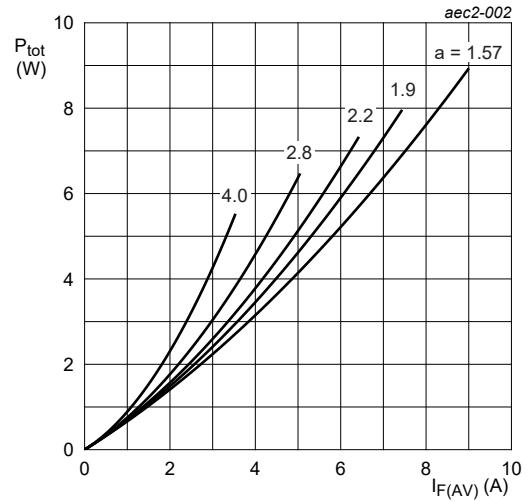
| Symbol | Parameter | Conditions | Min | Max | Unit |
|--------------------|--|--|-----|-----|------|
| V _{RRM} | repetitive peak reverse voltage | | - | 100 | V |
| V _{RWM} | limiting crest working reverse voltage | | - | 100 | V |
| V _R | limiting reverse voltage | DC | - | 100 | V |
| I _{F(AV)} | average forward current | δ = 0.5 ; T _{mb} ≤ 117 °C; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3 | - | 10 | A |
| I _{O(AV)} | average output current | δ = 0.5 ; T _{mb} ≤ 116 °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 |



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

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

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



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

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

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

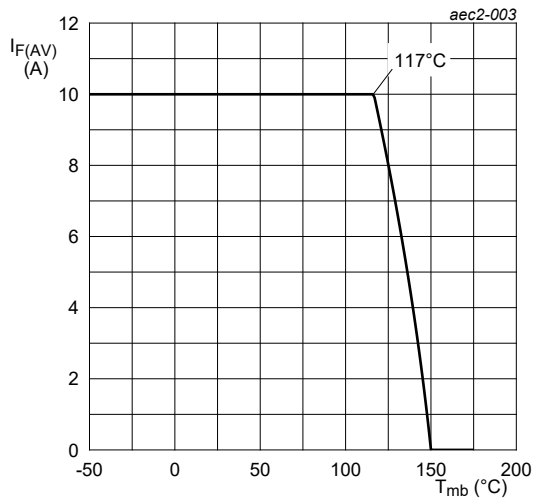


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

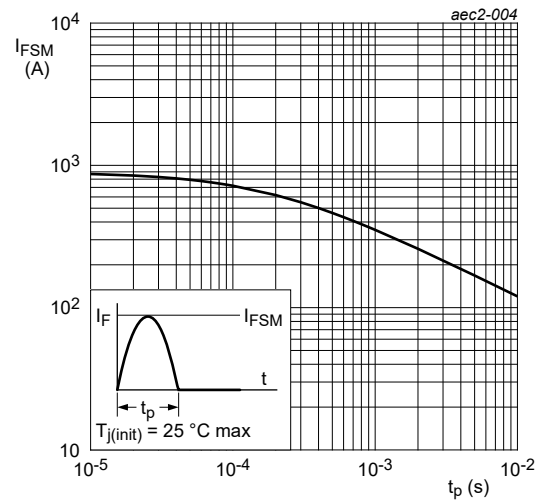


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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 |

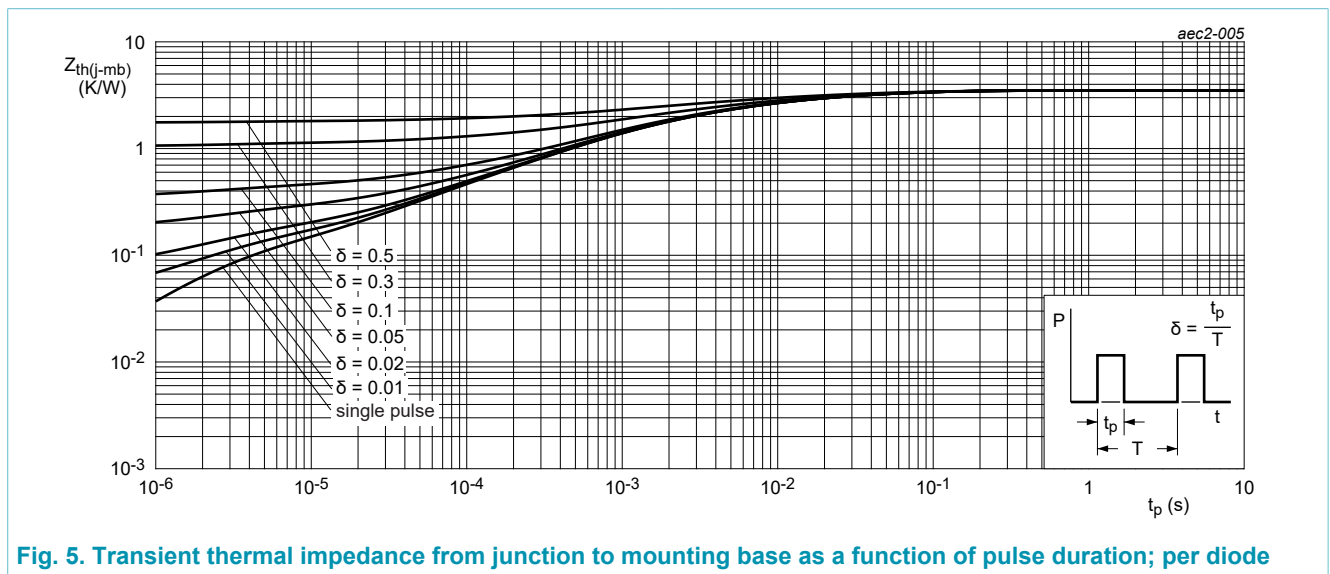
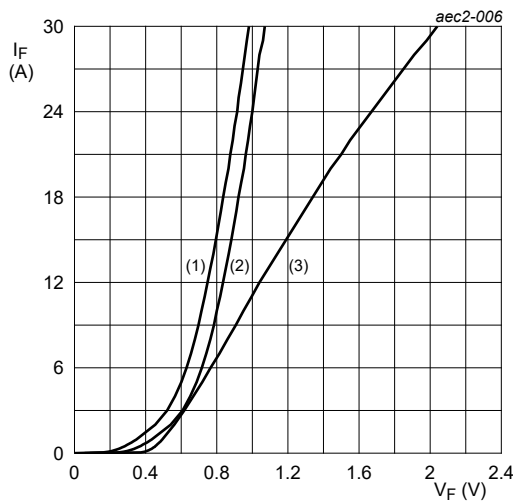


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; per diode

9. Characteristics

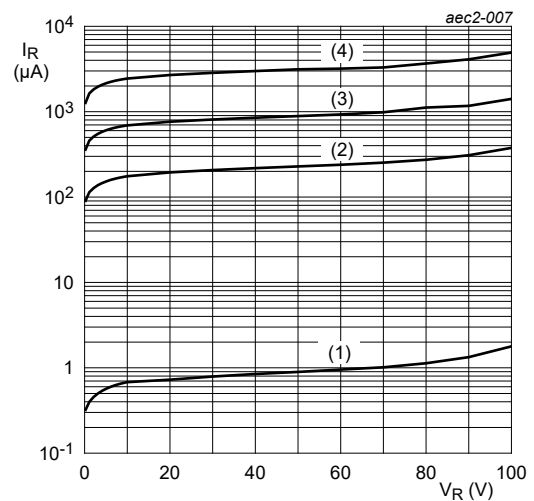
Table 6. Characteristics

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



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

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



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

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

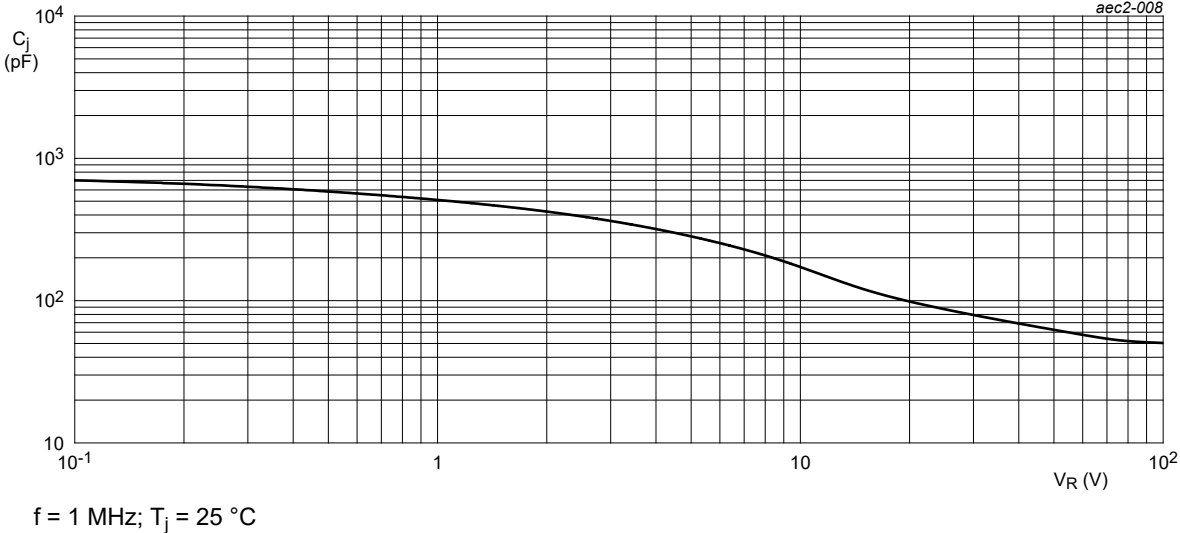


Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

10. Package outline

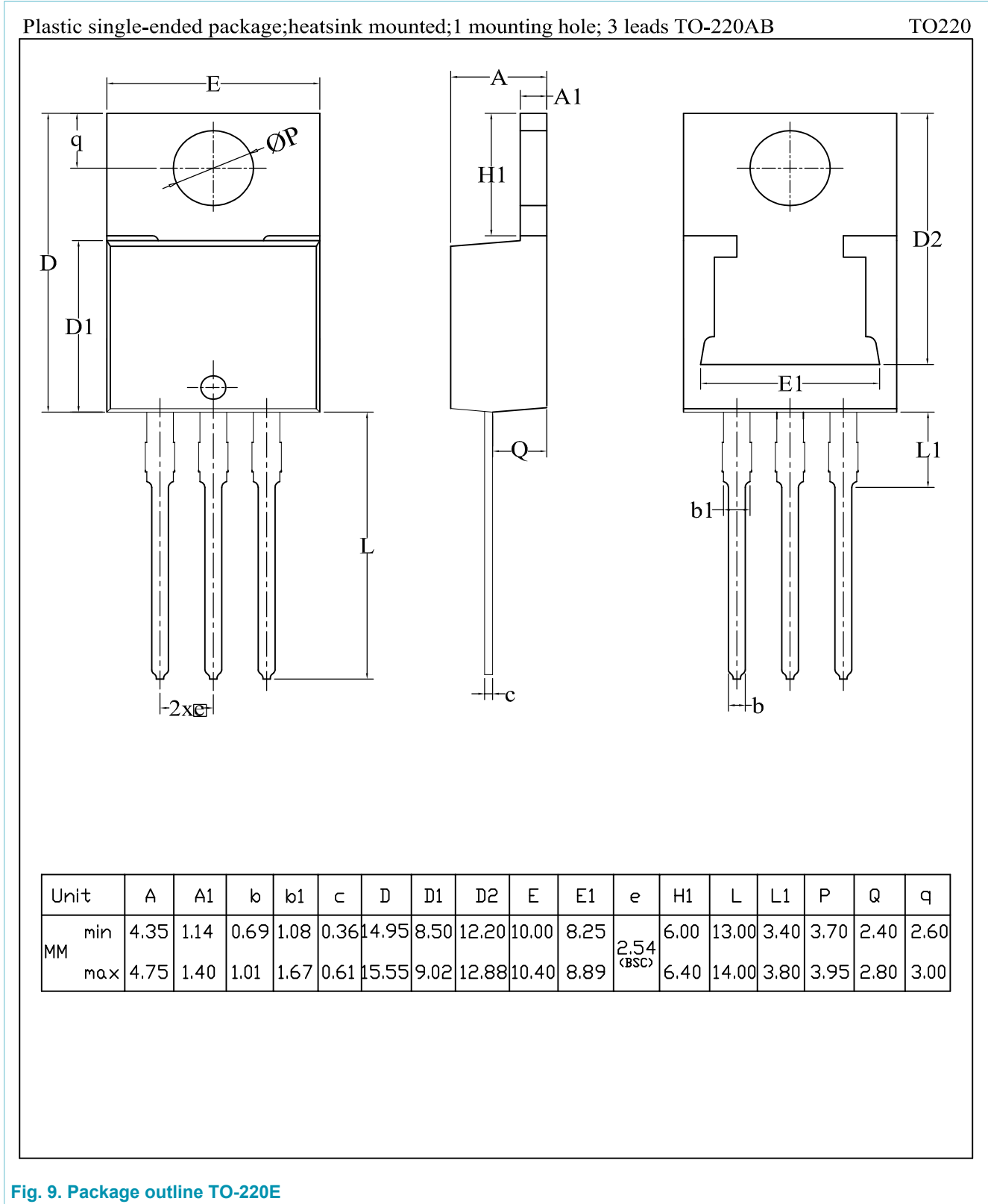


Fig. 9. Package outline TO-220E

11. Legal information

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| Document status [1][2] | Product status [3] | Definition |
|--------------------------------|--------------------|---|
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| 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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