

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO-263(D2PAK) plastic package.

2. Features and benefits

- Trench structure
- High junction temperature up to 150°C
- High efficiency
- Low forward voltage drop, negligible switching losses

3. Applications

- DC to DC converters
- Freewheeling diode
- OR-ing diode

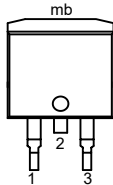
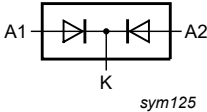
4. Quick reference data

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 | $\delta = 0.5$; $T_{mb} \leq 133$ °C; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3 | - | - | 20 | A |
| $I_{O(AV)}$ | average output current | $\delta = 0.5$; $T_{mb} \leq 130$ °C; square-wave pulse; both diodes conducting | - | - | 40 | A |
| Static characteristics | | | | | | |
| V_F | forward voltage | $I_F = 10$ A; $T_j = 25$ °C; Fig. 6 ; per diode | - | 0.53 | 0.59 | V |
| | | $I_F = 10$ A; $T_j = 125$ °C; Fig. 6 ; per diode | - | 0.49 | 0.56 | V |
| | | $I_F = 20$ A; $T_j = 25$ °C; Fig. 6 ; per diode | - | 0.64 | 0.71 | V |
| | | $I_F = 20$ A; $T_j = 125$ °C; Fig. 6 ; per diode | - | 0.61 | 0.68 | 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 | - | - | 40 | mA |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------------------------------|--|---|
| 1 | A1 | anode 1 |  D2PAK (TO-263E) |  |
| 2 | K | cathode | | |
| 3 | A2 | anode 2 | | |
| mb | K | mounting base; connected to cathode | | |

6. Ordering information

Table 3. Ordering information

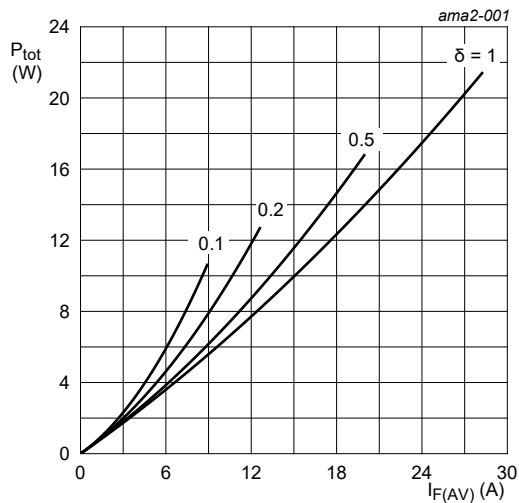
| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| WNS40H100CB | D2PAK | plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped) | TO-263E |

7. Limiting values

Table 4. Limiting values

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

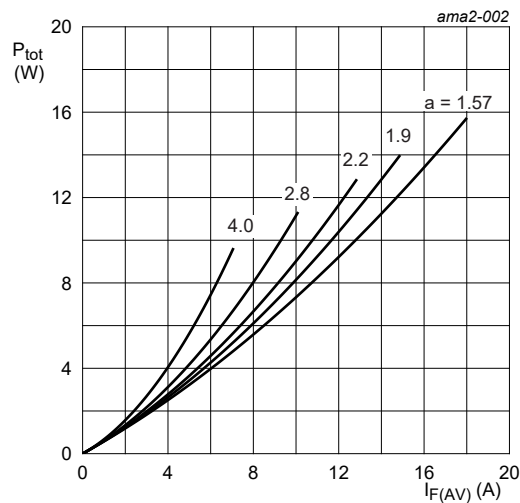
| Symbol | Parameter | Conditions | Min | Max | Unit |
|-------------|--|---|-----|-----|--------------------|
| V_{RRM} | repetitive peak reverse voltage | | - | 100 | V |
| V_{RWM} | limiting crest working reverse voltage | | - | 100 | V |
| V_R | limiting reverse voltage | DC | - | 100 | V |
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$; $T_{mb} \leq 133\text{ }^{\circ}\text{C}$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3 | - | 20 | A |
| $I_{O(AV)}$ | average output current | $\delta = 0.5$; $T_{mb} \leq 130\text{ }^{\circ}\text{C}$; square-wave pulse; both diodes conducting | - | 40 | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 10\text{ ms}$; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; sine-wave pulse; per diode; Fig. 4 | - | 380 | A |
| | | $t_p = 8.3\text{ ms}$; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; sine-wave pulse; per diode | - | 418 | A |
| T_{stg} | storage temperature | | -40 | 150 | $^{\circ}\text{C}$ |
| T_j | junction temperature | | - | 150 | $^{\circ}\text{C}$ |



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

$$V_o = 0.557\text{ V}; R_s = 0.0071\text{ }\Omega$$

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



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

$$V_o = 0.570\text{ V}; R_s = 0.0071\text{ }\Omega$$

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

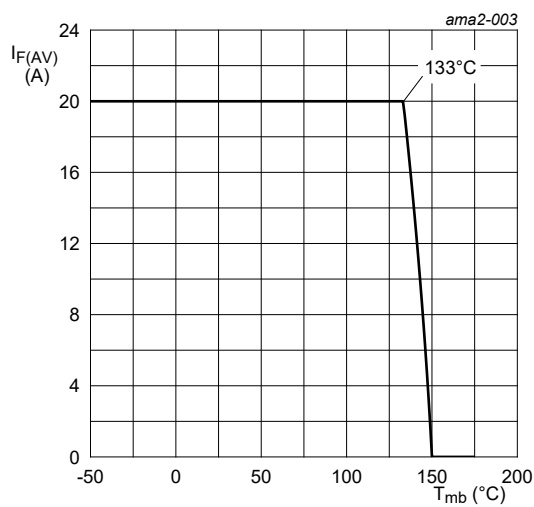


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

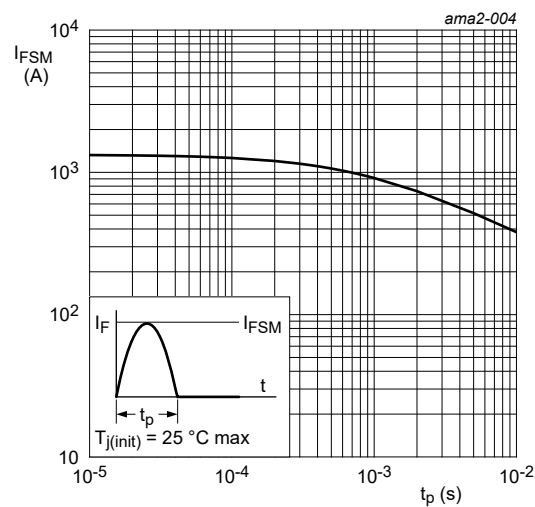


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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 | - | - | 1 | K/W |
| | | both diodes conducting | - | - | 0.6 | K/W |
| R _{th(j-a)} | thermal resistance from junction to ambient | in free air | - | 60 | - | K/W |

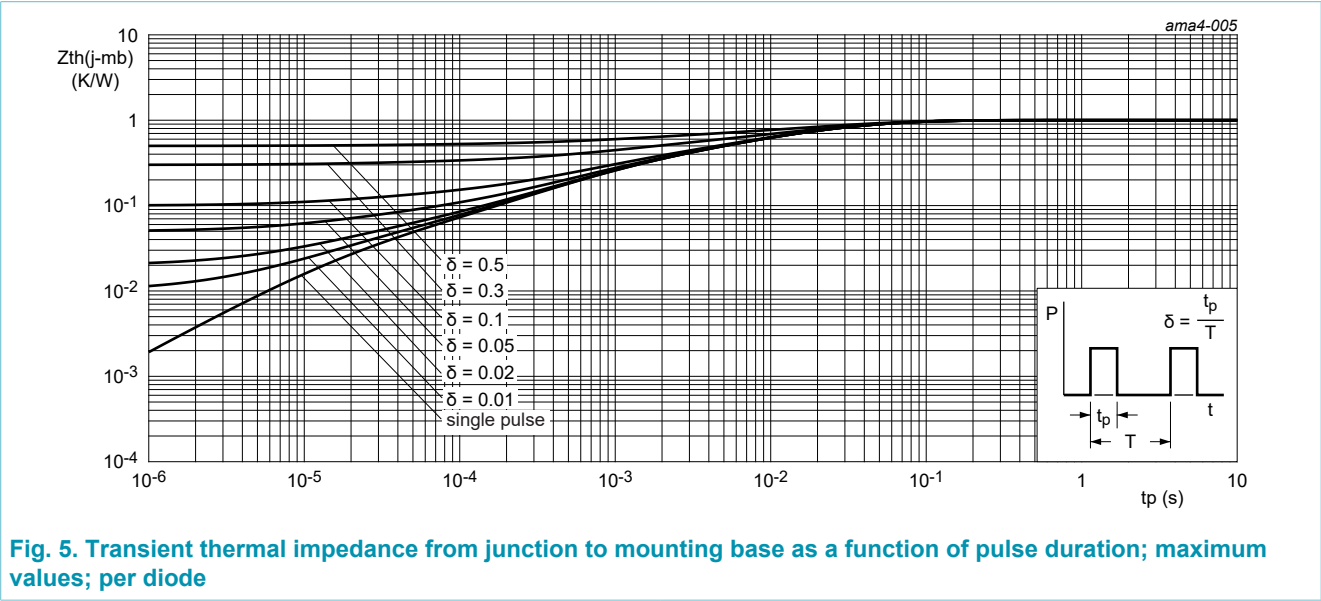
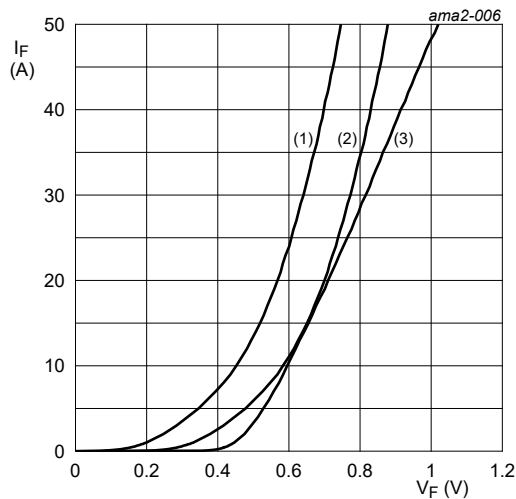


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values; per diode

9. Characteristics

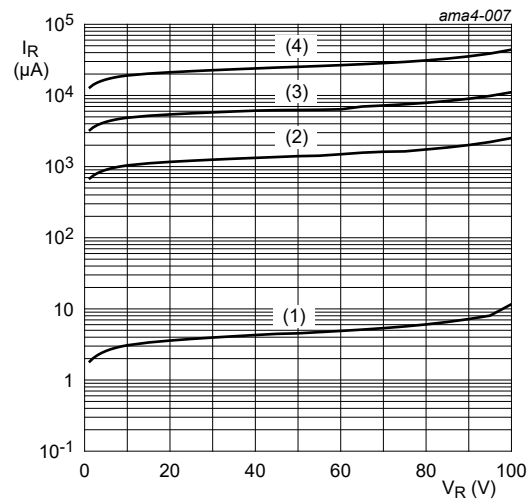
Table 6. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------------|-----------------|--|-----|------|------|------|
| Static characteristics | | | | | | |
| V _F | forward voltage | I _F = 10 A; T _j = 25 °C; Fig. 6; per diode | - | 0.53 | 0.59 | V |
| | | I _F = 10 A; T _j = 125 °C; Fig. 6; per diode | - | 0.49 | 0.56 | V |
| | | I _F = 20 A; T _j = 25 °C; Fig. 6; per diode | - | 0.64 | 0.71 | V |
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| 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 | - | - | 40 | mA |



V₀ = 0.557 V; R_s = 0.0071 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

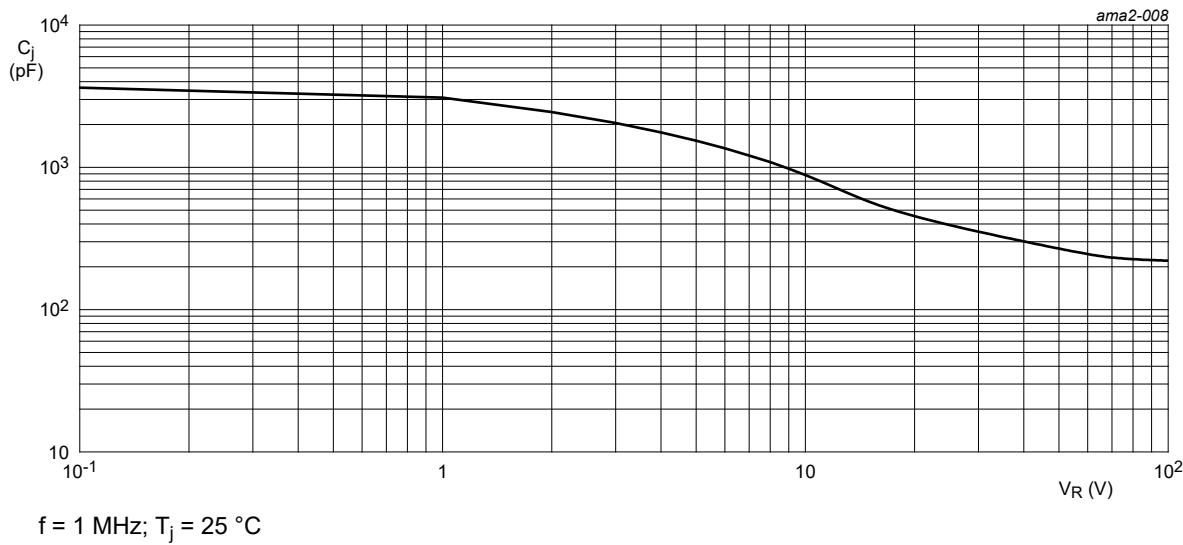
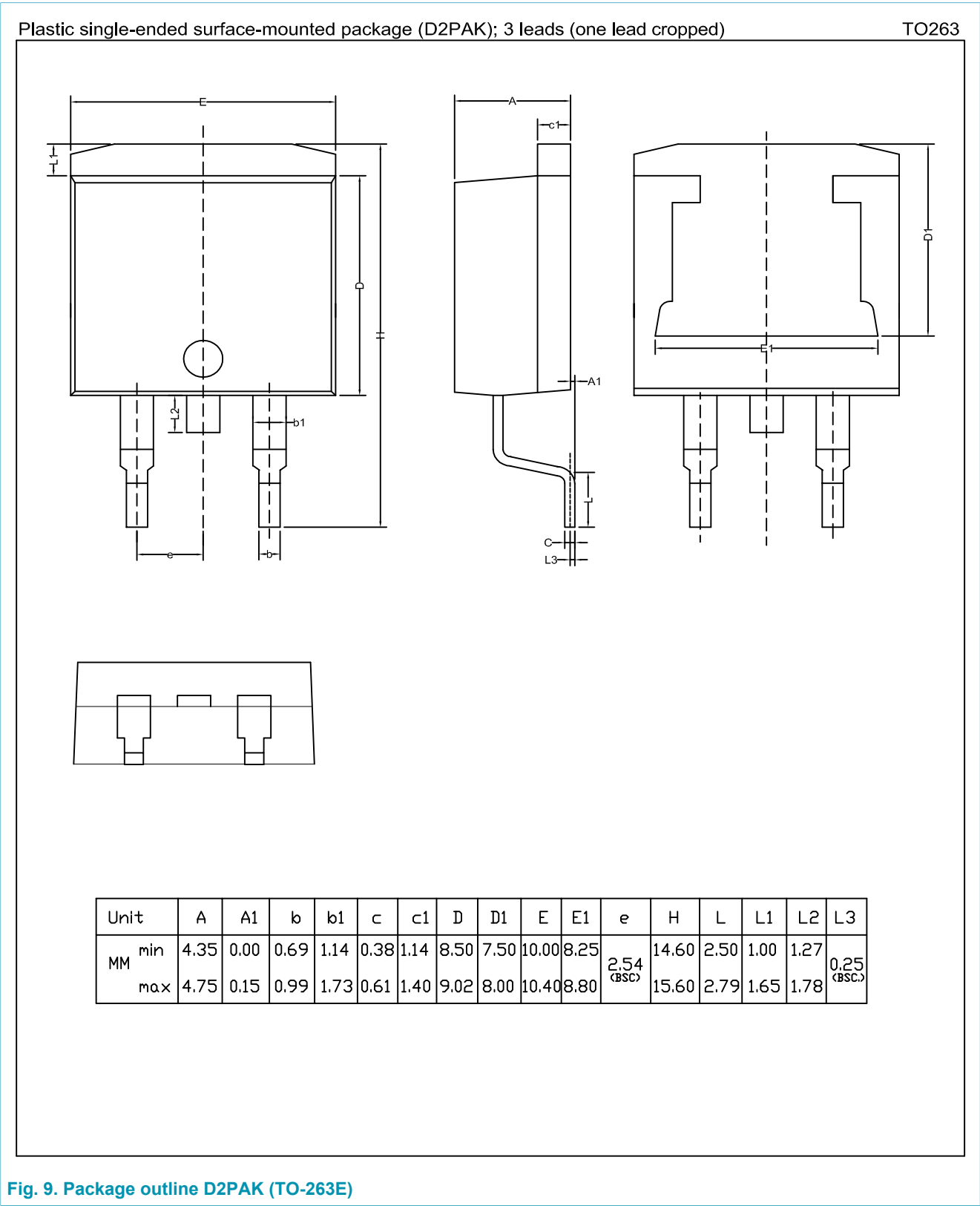


Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

10. Package outline



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