

## 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
- Low forward conduction voltage
- Negligible switching losses

## 3. Applications

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

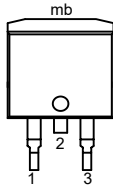
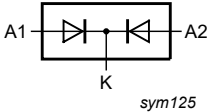
## 4. Quick reference data

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; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a> | -   | -    | 10   | A       |
| $I_{O(AV)}$                   | average output current          | $\delta = 0.5$ ; $T_{mb} \leq 116$ °C; square-wave pulse; both diodes conducting  | -   | -    | 20   | A       |
| <b>Static characteristics</b> |                                 |   |     |      |      |         |
| $V_F$                         | forward voltage                 | $I_F = 3$ A; $T_j = 25$ °C; <a href="#">Fig. 6</a> ; per diode  | -   | 0.56 | 0.61 | V       |
|                               |                                 | $I_F = 3$ A; $T_j = 125$ °C; <a href="#">Fig. 6</a> ; per diode   | -   | 0.53 | 0.58 | V       |
|                               |                                 | $I_F = 10$ A; $T_j = 25$ °C; <a href="#">Fig. 6</a> ; per diode   | -   | 0.89 | 0.95 | V       |
|                               |                                 | $I_F = 10$ A; $T_j = 125$ °C; <a href="#">Fig. 6</a> ; per diode  | -   | 0.73 | 0.8  | V       |
| $I_R$                         | reverse current                 | $V_R = 100$ V; $T_j = 25$ °C; <a href="#">Fig. 7</a> ; <a href="#">Fig. 8</a> ; per diode   | -   | -    | 50   | $\mu$ A |
|                               |                                 | $V_R = 100$ V; $T_j = 125$ °C; <a href="#">Fig. 7</a> ; <a href="#">Fig. 8</a> ; per diode  | -   | -    | 10   | mA      |

## 5. Pinning information

Table 2. Pinning information

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

## 6. Ordering information

Table 3. Ordering information

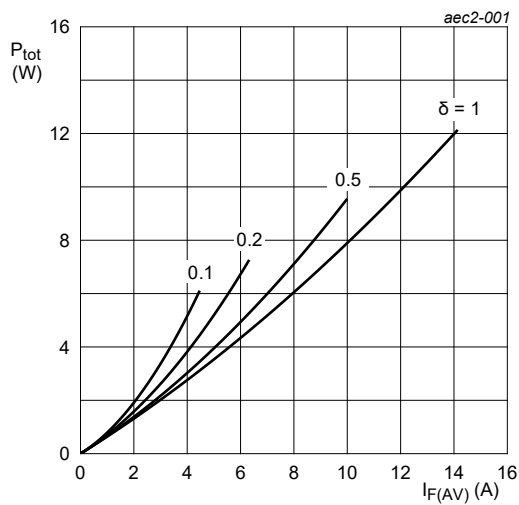
| Type number | Package |  |         |
|-------------|---------|--|---------|
|             | Name    | Description  | Version |
| WNS20S100CB | D2PAK   | plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped) | TO-263E |

## 7. Limiting values

**Table 4. Limiting values**

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

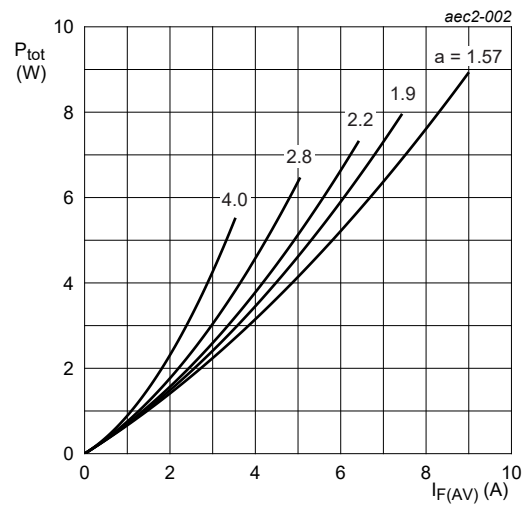
| Symbol      | Parameter                              | Conditions  | Min | Max | Unit             |
|-------------|--|---|-----|-----|------------------|
| $V_{RRM}$   | repetitive peak reverse voltage        |   | -   | 100 | V                |
| $V_{RWM}$   | limiting crest working reverse voltage |   | -   | 100 | V                |
| $V_R$       | limiting reverse voltage               | DC  | -   | 100 | V                |
| $I_{F(AV)}$ | average forward current                | $\delta = 0.5$ ; $T_{mb} \leq 117\text{ }^\circ\text{C}$ ; square-wave pulse; per diode; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a> | -   | 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; <a href="#">Fig. 4</a>                                       | -   | 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**

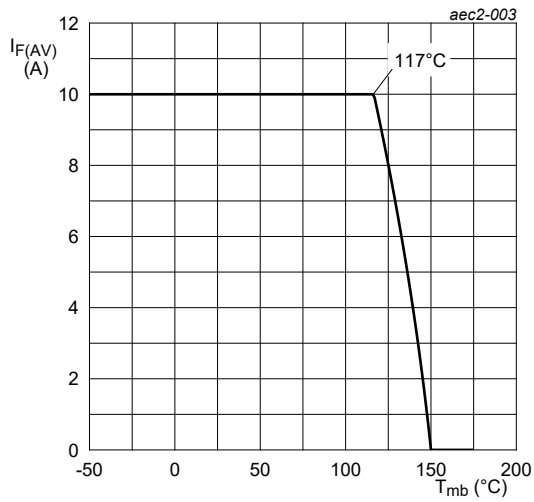


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

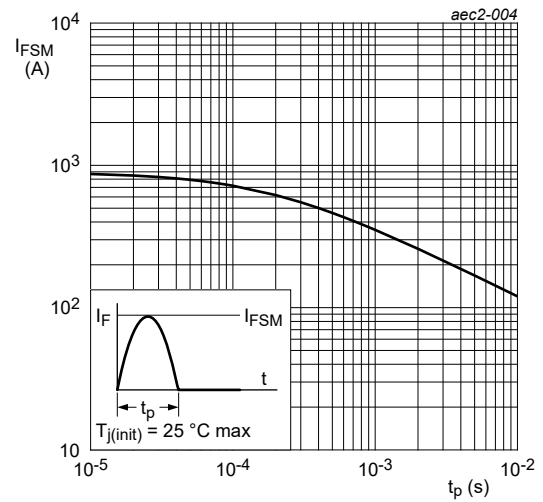


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

### 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; <a href="#">Fig. 5</a> | -   | -   | 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  |

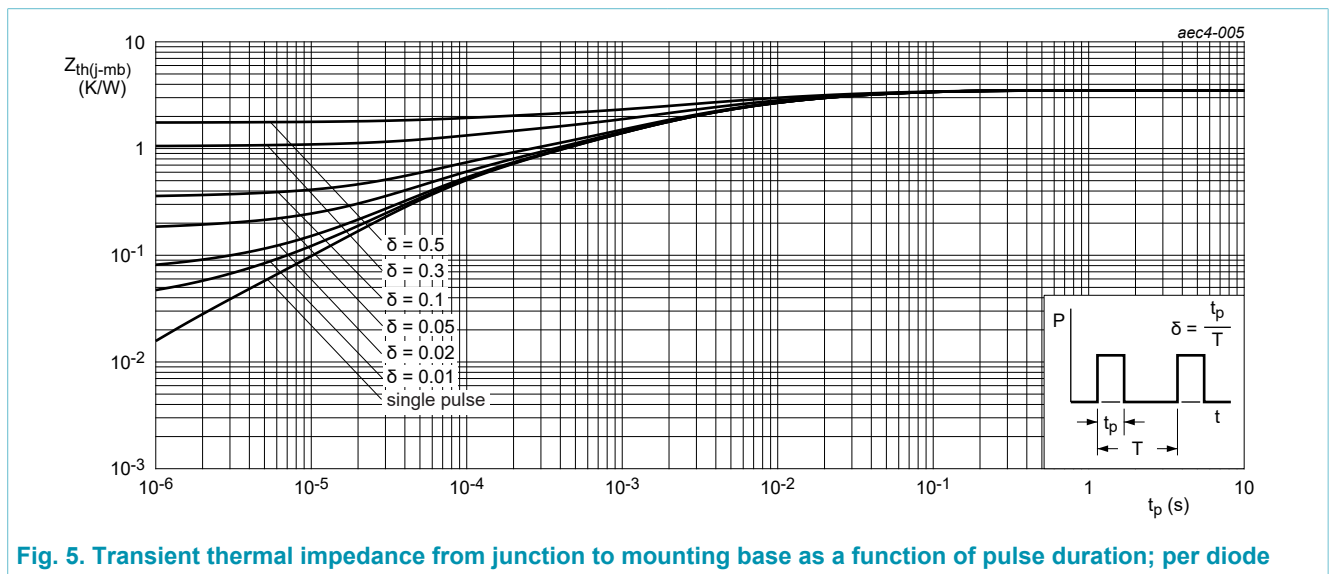
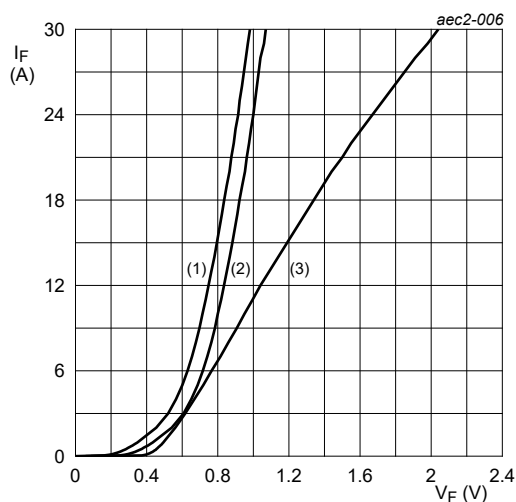


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; per diode

## 9. Characteristics

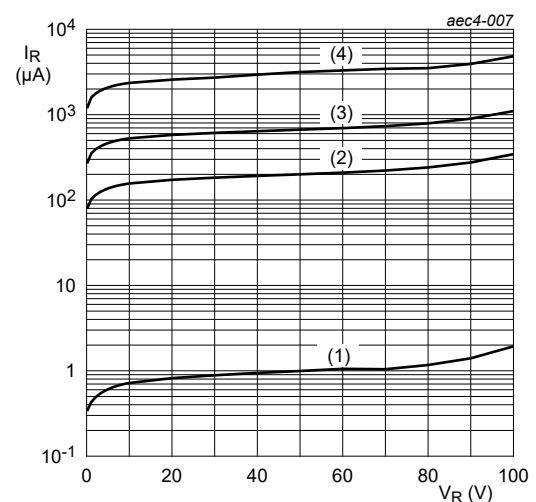
Table 6. Characteristics

| Symbol                        | Parameter       | Conditions   | Min | Typ  | Max  | Unit          |
|-------------------------------|-----------------|--|-----|------|------|---------------|
| <b>Static characteristics</b> |                 |  |     |      |      |               |
| $V_F$                         | 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             |
|                               |                 | $I_F = 10\text{ A}; T_j = 125\text{ °C};$ Fig. 6; per diode          | -   | 0.73 | 0.8  | V             |
| $I_R$                         | reverse current | $V_R = 100\text{ V}; T_j = 25\text{ °C};$ Fig. 7; Fig. 8; per diode  | -   | -    | 50   | $\mu\text{A}$ |
|                               |                 | $V_R = 100\text{ V}; T_j = 125\text{ °C};$ Fig. 7; Fig. 8; per diode | -   | -    | 10   | mA            |



$V_o = 0.623\text{ V}; R_s = 0.0166\ \Omega$   
 (1)  $T_j = 150\text{ °C};$  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

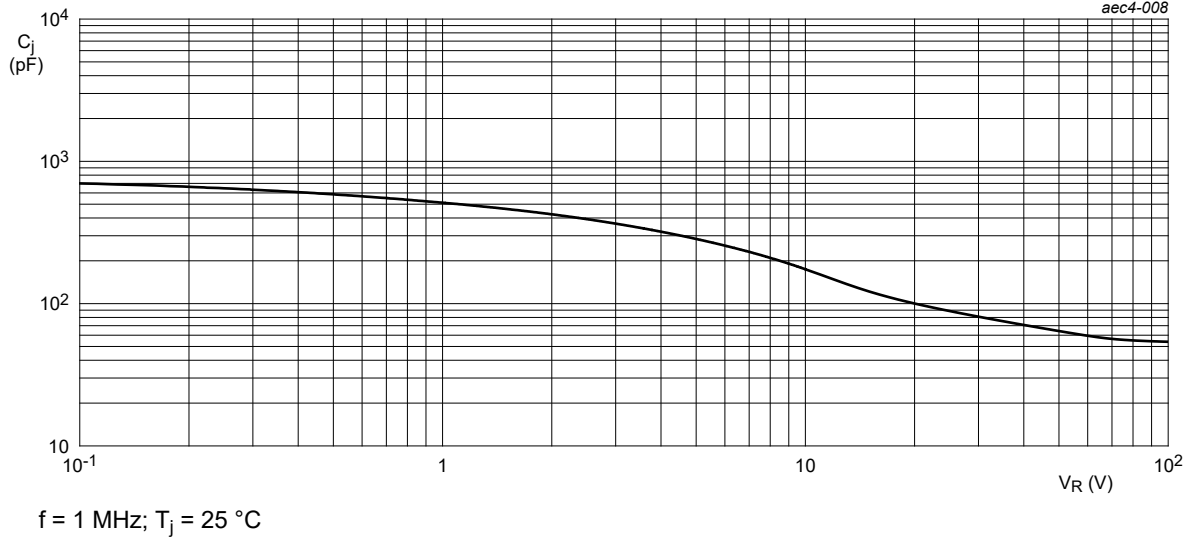


Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

### 10. Package outline

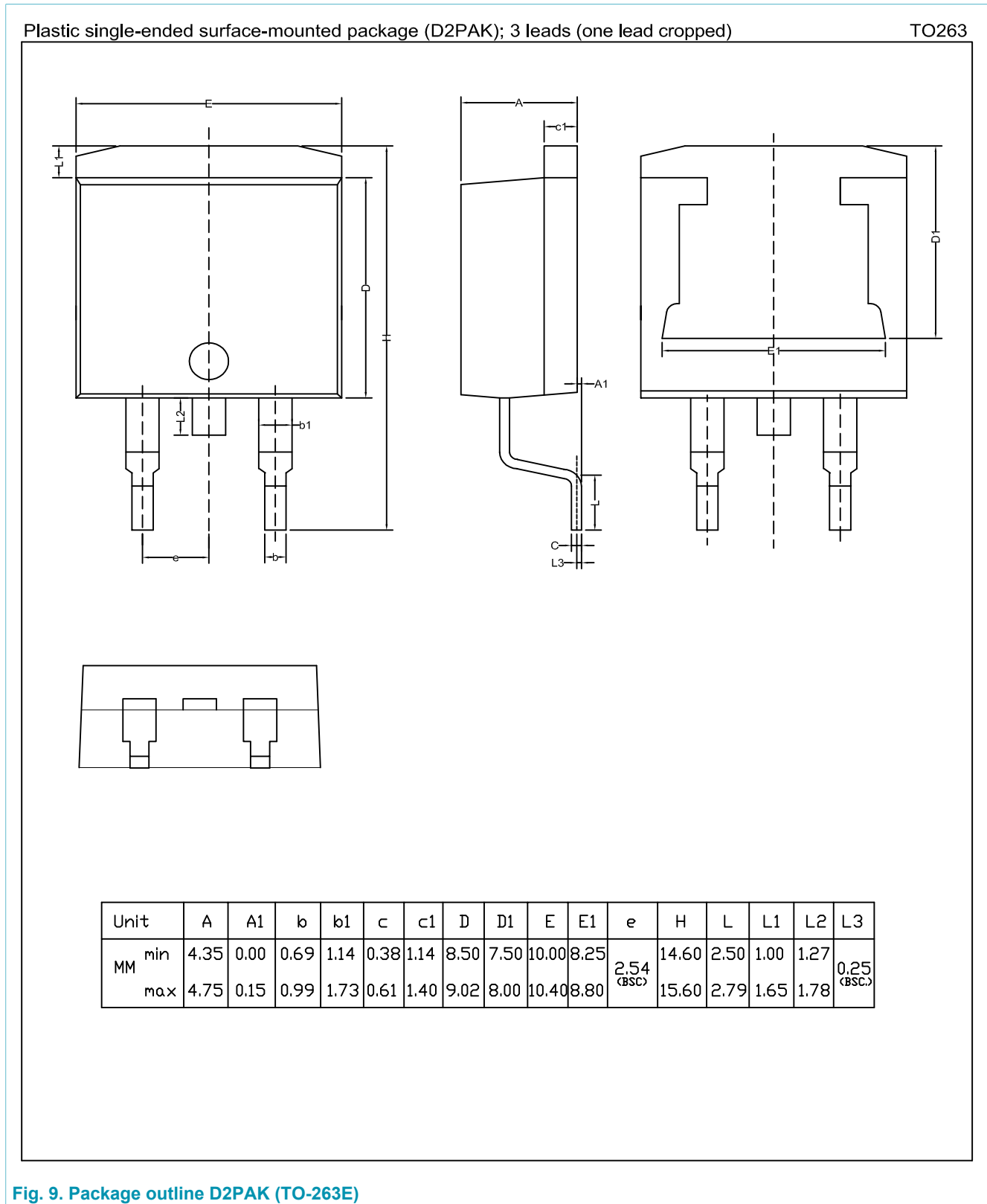


Fig. 9. Package outline D2PAK (TO-263E)



## 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. |
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