

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

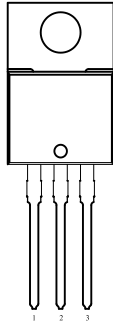
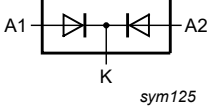
4. Quick reference data

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 | $\delta = 0.5$; $T_{mb} \leq 129$ °C; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3 | - | - | 10 | A |
| $I_{O(AV)}$ | average output current | $\delta = 0.5$; $T_{mb} \leq 129$ °C; square-wave pulse; both diodes conducting | - | - | 20 | A |
| Static characteristics | | | | | | |
| V_F | forward voltage | $I_F = 5$ A; $T_j = 25$ °C; Fig. 6 ; per diode | - | 0.56 | 0.62 | V |
| | | $I_F = 5$ A; $T_j = 125$ °C; Fig. 6 ; per diode | - | 0.52 | 0.58 | V |
| | | $I_F = 10$ A; $T_j = 25$ °C; Fig. 6 ; per diode | - | 0.7 | 0.75 | V |
| | | $I_F = 10$ A; $T_j = 125$ °C; Fig. 6 ; per diode | - | 0.63 | 0.7 | 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 | - | - | 15 | mA |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1 | A1 | anode 1 |  <p>TO-220E</p> |  |
| 2 | K | cathode | | |
| 3 | A2 | anode 2 | | |
| mb | K | mounting base; connected to cathode | | |

6. Ordering information

Table 3. Ordering information

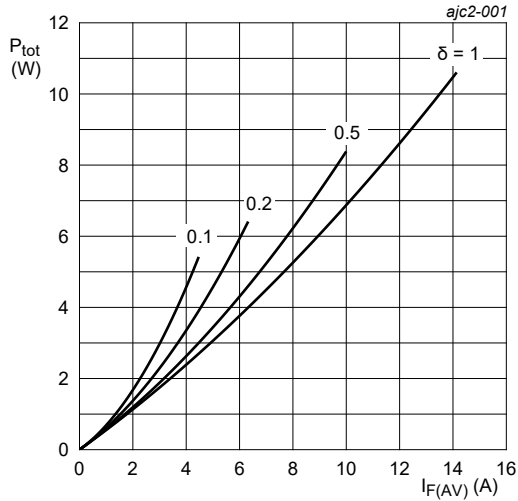
| Type number | Package | | Version |
|-------------|---------|----------------------------------------------------------------------------------|---------|
| | Name | Description | |
| WNS20H100C | TO-220E | plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB | TO-220E |

7. Limiting values

Table 4. Limiting values

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

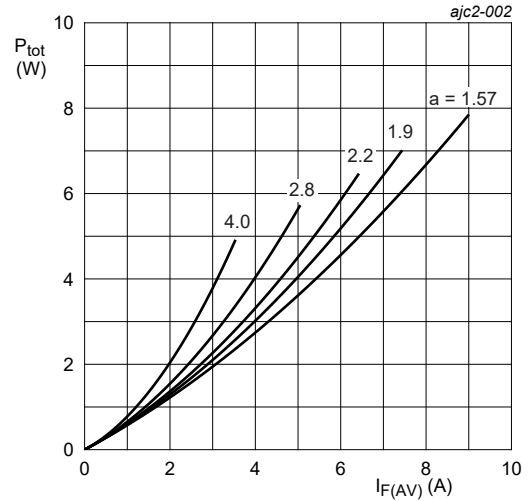
| Symbol | Parameter | Conditions | Min | Max | Unit |
|-------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------------|
| 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 | $\delta = 0.5$; $T_{mb} \leq 129\text{ }^\circ\text{C}$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3 | - | 10 | A |
| $I_{O(AV)}$ | average output current | $\delta = 0.5$; $T_{mb} \leq 129\text{ }^\circ\text{C}$; 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 | - | 180 | A |
| | | $t_p = 8.3\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse; per diode | - | 198 | A |
| T_{stg} | storage temperature | | -40 | 150 | $^\circ\text{C}$ |
| T_j | junction temperature | | - | 150 | $^\circ\text{C}$ |



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

$$V_o = 0.536\text{ V}; R_s = 0.0151\ \Omega$$

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



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

$$V_o = 0.536\text{ V}; R_s = 0.0151\ \Omega$$

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

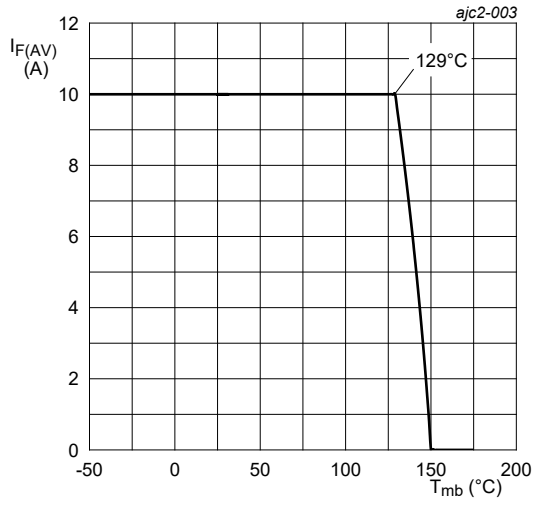


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

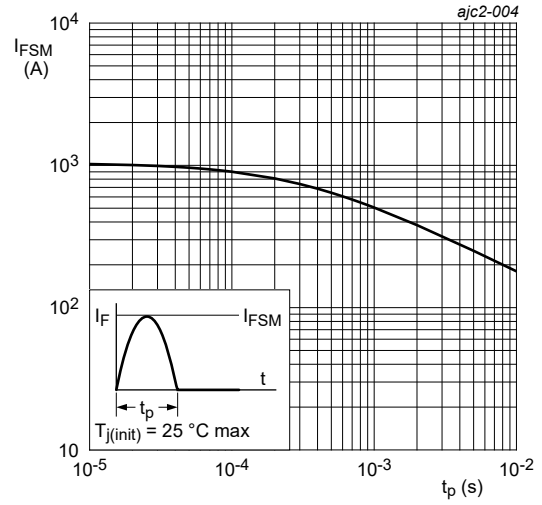


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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 | - | - | 2.5 | K/W |
| | | both diodes conducting | - | - | 1.2 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | - | 60 | - | K/W |

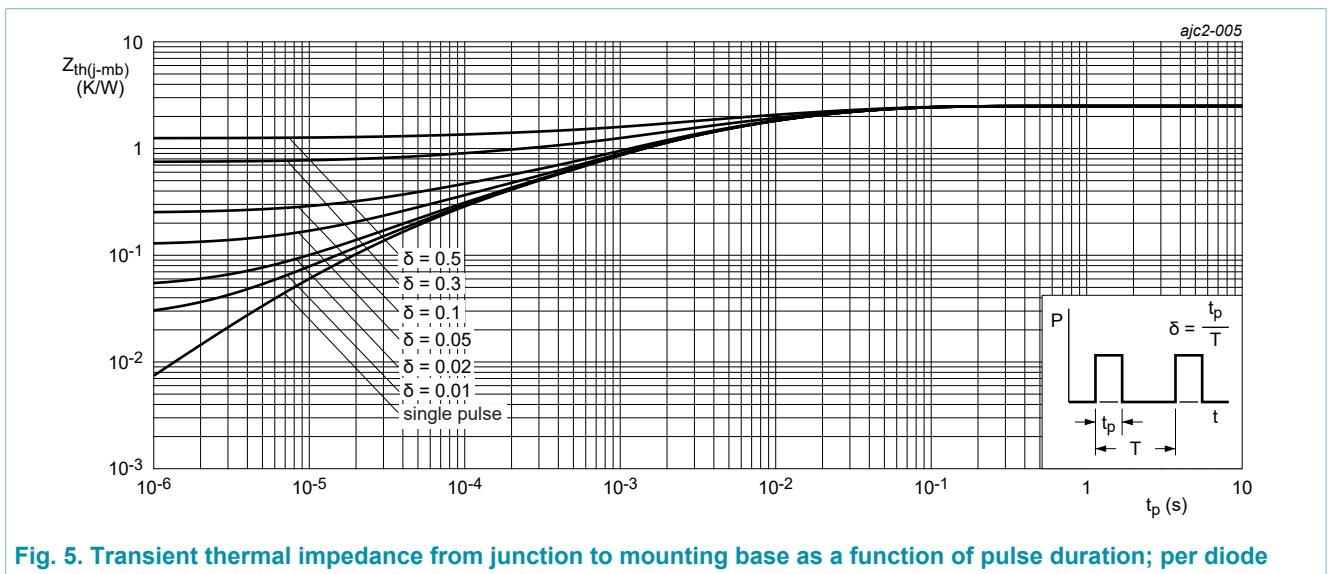
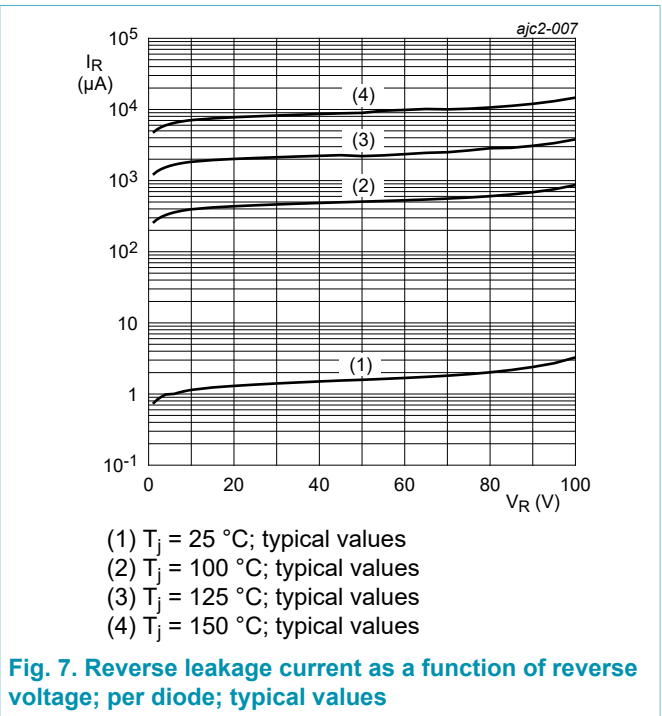
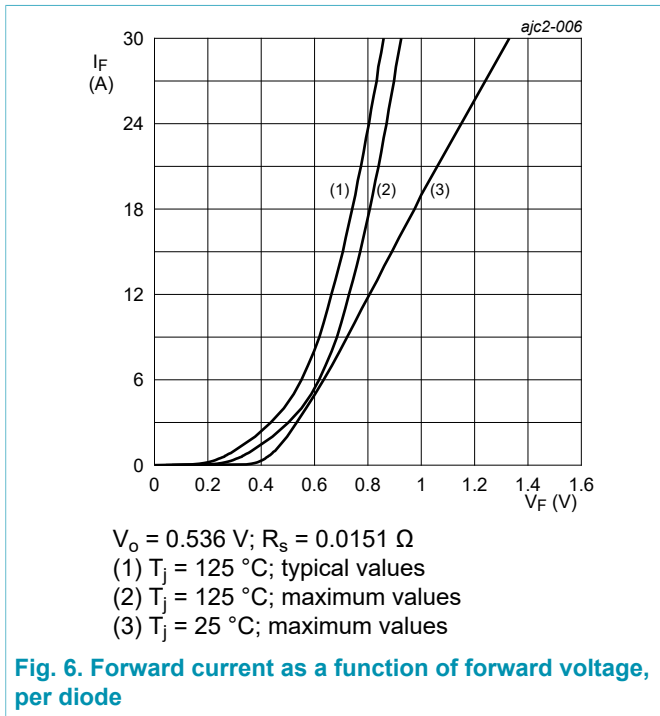


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; per diode

9. Characteristics

Table 6. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------------------------|-----------------|----------------------------------------------------------------------|-----|------|------|---------------|
| Static characteristics | | | | | | |
| V_F | forward voltage | $I_F = 5\text{ A}; T_j = 25\text{ °C};$ Fig. 6; per diode | - | 0.56 | 0.62 | V |
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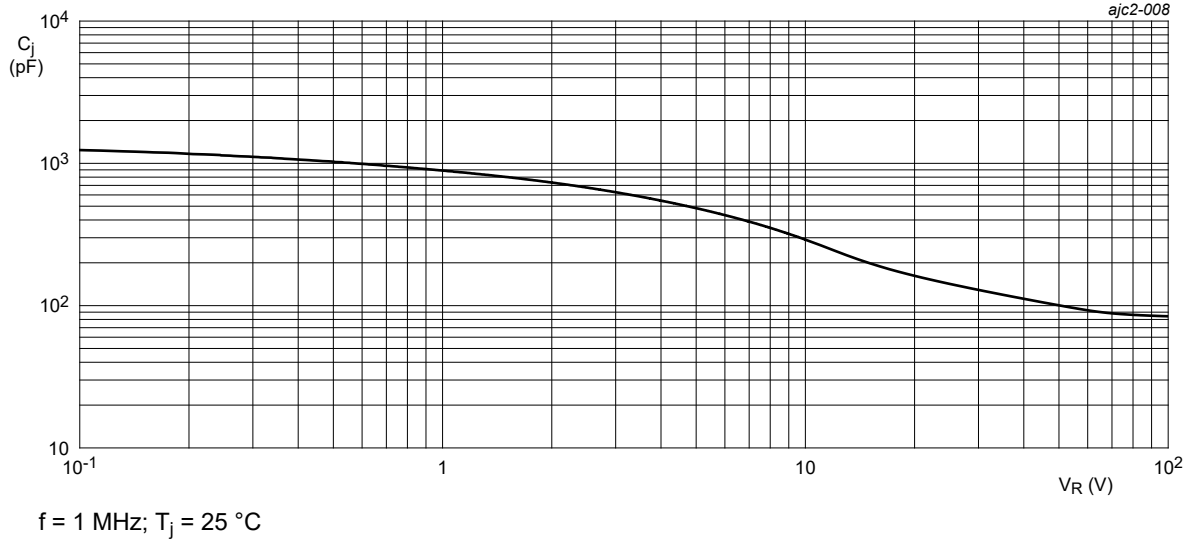


Fig. 8. Junction capacitance as a function of applied reverse voltage; per diode; typical values

10. Package outline

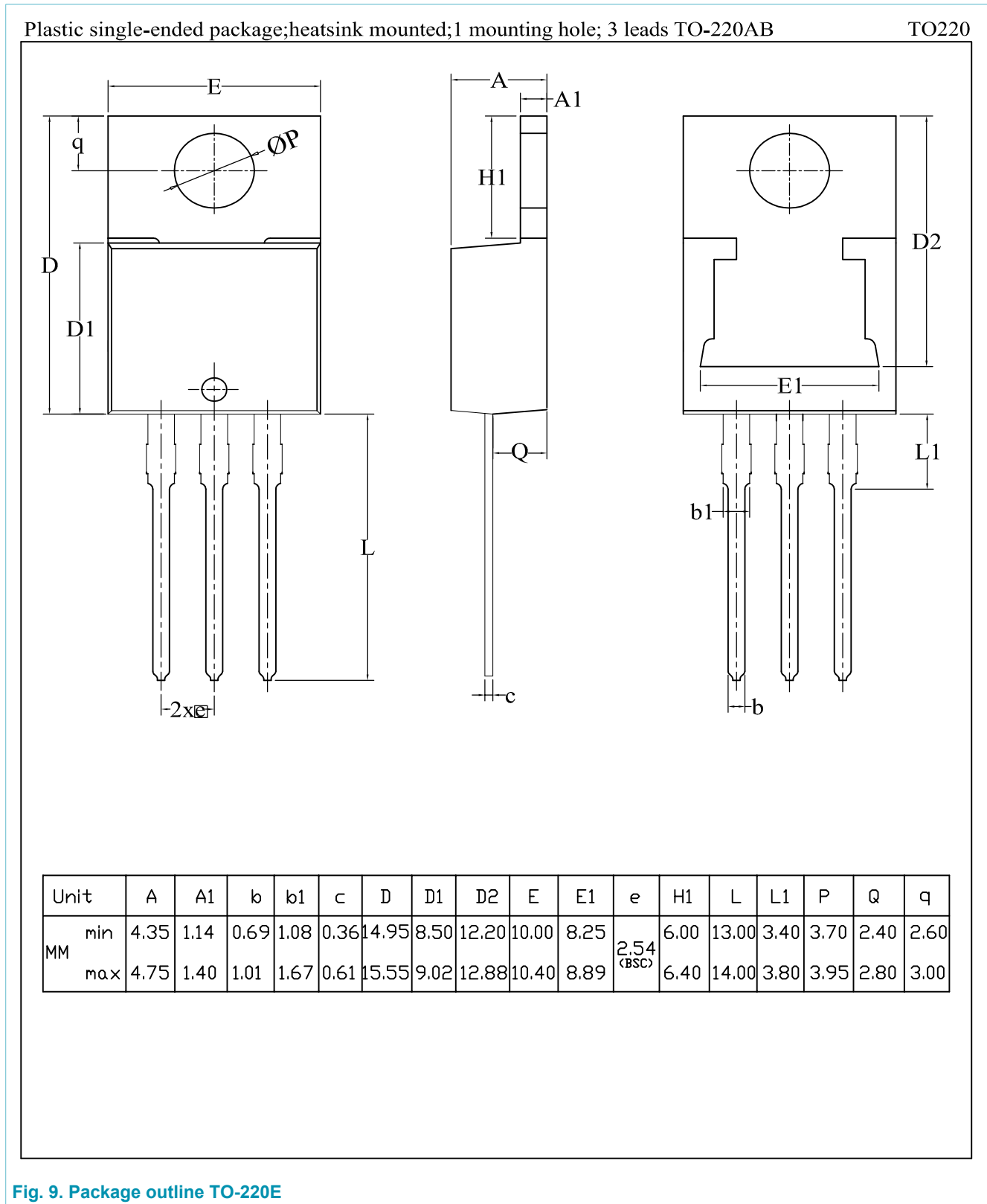


Fig. 9. Package outline TO-220E

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. |

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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