

1. General description

Dual Silicon Carbide Schottky diode in a 3-lead TO247 plastic package, designed for high frequency switched-mode power supplies.



2. Features and benefits

- Highly stable switching performance
- High forward surge capability I_{FSM}
- Extremely fast reverse recovery time
- Superior in efficiency to Silicon Diode alternatives
- Reduced losses in associated MOSFET
- Reduced EMI
- Reduced cooling requirements
- RoHS compliant
- High junction operating temperature capability ($T_{j(max)} = 175\text{ °C}$)

3. Applications

- Power factor correction
- Telecom / Server SMPS
- UPS
- PV inverter
- PC Silverbox
- LED / OLED TV
- Motor Drives

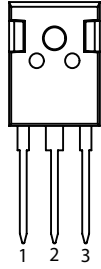
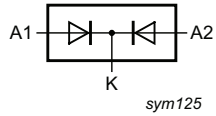
4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Notes | Values | | | Unit |
|--------------------------------|----------------------------------|--|-------|------------|------|------|------|
| Absolute maximum rating | | | | | | | |
| V_{RRM} | repetitive peak reverse voltage | | | 1200 | | | V |
| $I_{O(AV)}$ | limiting average forward current | $\delta = 0.5$; square-wave pulse; $T_{mb} \leq 138\text{ °C}$; both diodes conducting; Fig. 1 ; Fig. 2 ; Fig. 3 | | 20 | | | A |
| T_j | junction temperature | | | -55 to 175 | | | °C |
| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
| Static characteristics | | | | | | | |
| V_F | forward voltage | $I_F = 10\text{ A}$; $T_j = 25\text{ °C}$; per diode; Fig. 5 | | - | 1.42 | 1.60 | V |
| | | $I_F = 10\text{ A}$; $T_j = 150\text{ °C}$; per diode; Fig. 5 | | - | 1.90 | 2.30 | V |
| | | $I_F = 10\text{ A}$; $T_j = 175\text{ °C}$; per diode; Fig. 5 | | - | 2.00 | 2.50 | V |
| Dynamic characteristics | | | | | | | |
| Q_r | recovered charge | $I_F = 10\text{ A}$; $di_F/dt = 500\text{ A}/\mu\text{s}$; $V_R = 400\text{ V}$; $T_j = 25\text{ °C}$; per diode; Fig. 7 | | - | 22 | - | nC |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------------------------------|---|---|
| 1 | A1 | anode |  |  |
| 2 | K | cathode | | |
| 3 | A2 | anode | | |
| mb | mb | mounting base; connected to cathode | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|----------------|--------------|-----------------------|----------------|------------------------|-----------------|--------------------|
| WN2C2D201200CW | TO247 | WN2C2D201200CW6Q | Tube | 30 | SOT429 | 25-Mar-2013 |

7. Marking

Table 4. Marking codes

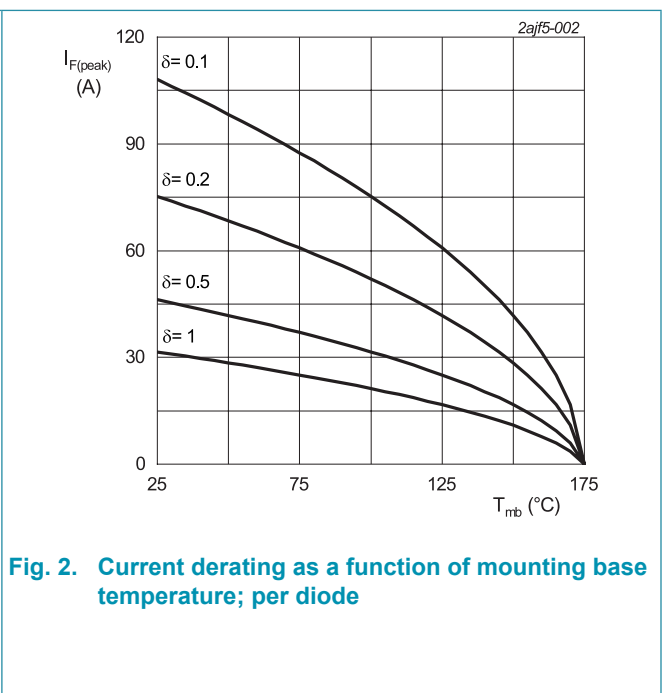
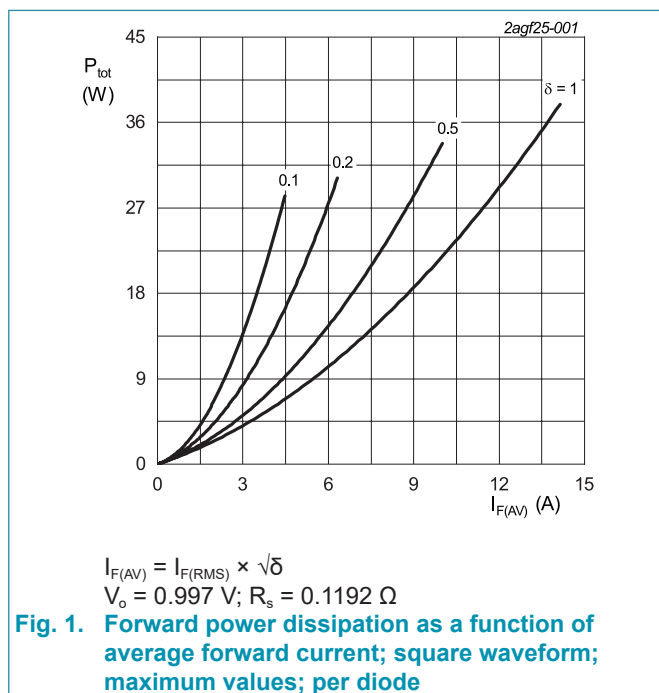
| Type number | Marking codes |
|----------------|--------------------|
| WN2C2D201200CW | WN2C2D 201200CW |

8. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter | Conditions | Notes | Values | Unit |
|-------------|-------------------------------------|--|-------|------------|----------------------|
| V_{RRM} | repetitive peak reverse voltage | | | 1200 | V |
| V_{RWM} | crest working reverse voltage | | | 1200 | V |
| V_R | reverse voltage | DC | | 1200 | V |
| $I_{O(AV)}$ | limiting average forward current | $\delta = 0.5$; square-wave pulse; $T_{mb} \leq 138\text{ }^\circ\text{C}$; both diodes conducting; Fig. 1 ; Fig. 2 ; Fig. 3 | | 20 | A |
| I_{FRM} | repetitive peak forward current | $\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 141\text{ }^\circ\text{C}$; square-wave pulse; per diode | | 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 | | 80 | A |
| | | $t_p = 10\text{ }\mu\text{s}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; square-wave pulse; per diode | | 750 | A |
| I^2t | I^2t for fusing | sine-wave pulse; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; $t_p = 10\text{ ms}$ | | 32 | A^2s |
| T_{stg} | storage temperature | | | -55 to 175 | $^\circ\text{C}$ |
| T_j | junction temperature | | | -55 to 175 | $^\circ\text{C}$ |



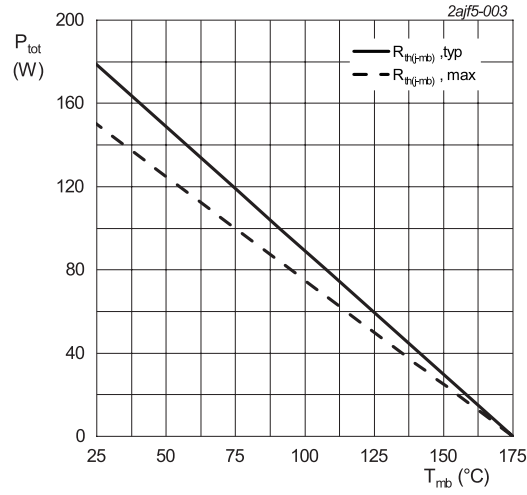


Fig. 3. Total power dissipation as a function of mounting base temperature; per diode

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
|----------------|--|-----------------------------------|-------|-----|------|------|------|
| $R_{th(j-mb)}$ | thermal resistance from junction to mounting base | per diode; Fig. 4 | | - | 0.84 | 1 | K/W |
| | | both diodes conducting | | - | 0.45 | 0.55 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient free air | in free air | | - | 40 | - | K/W |

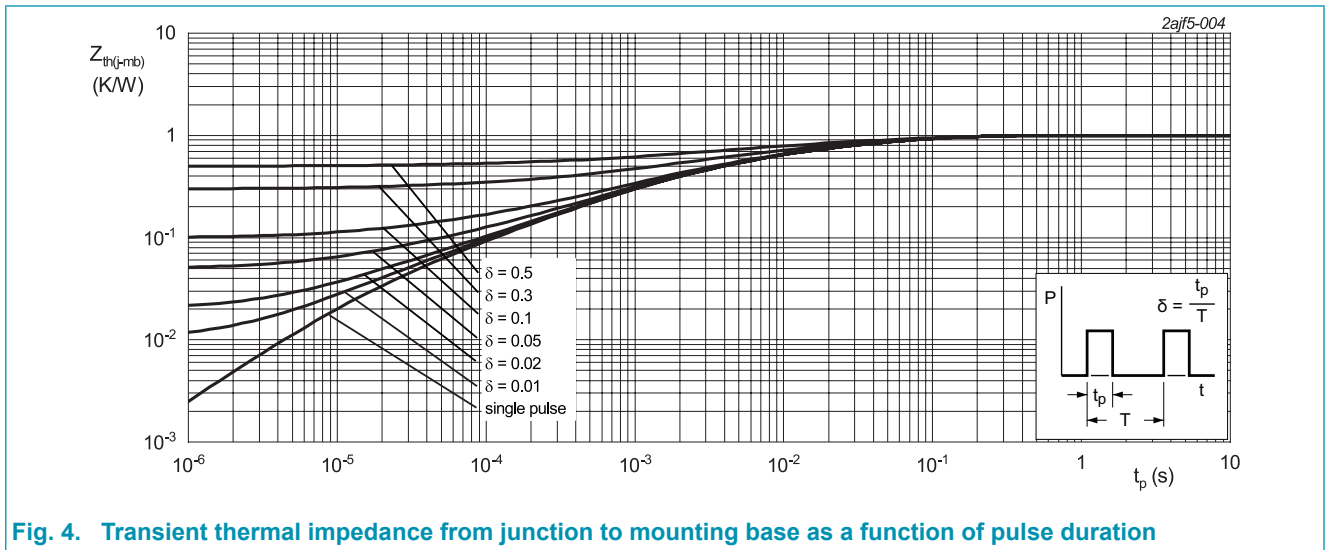
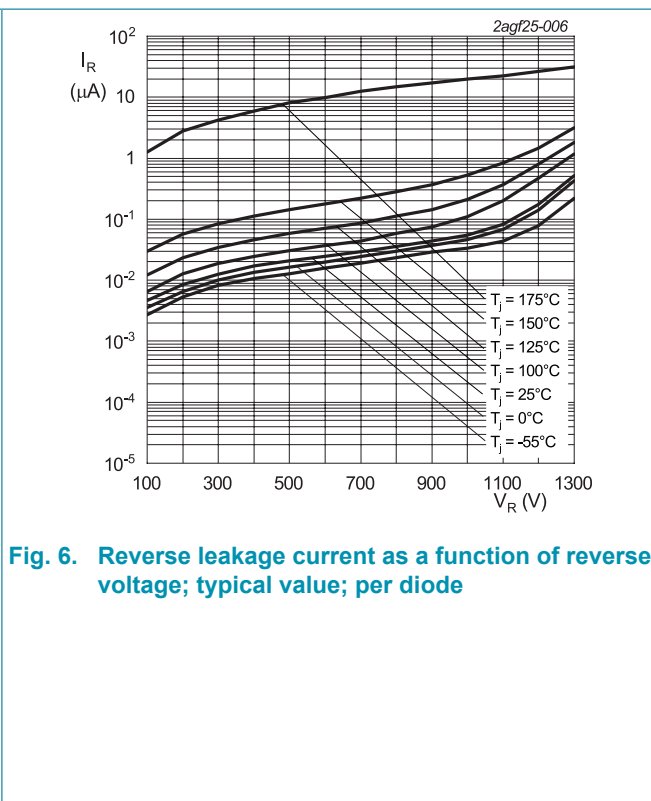
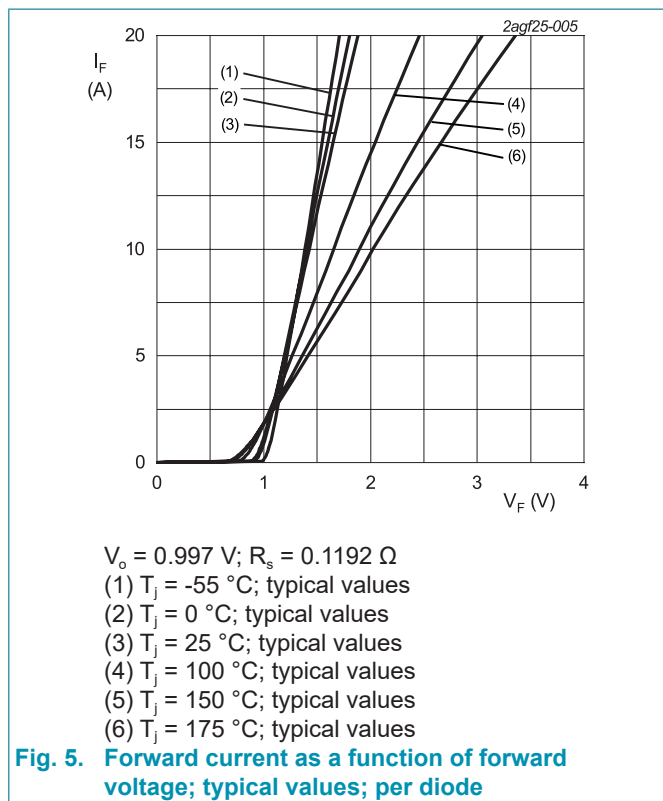


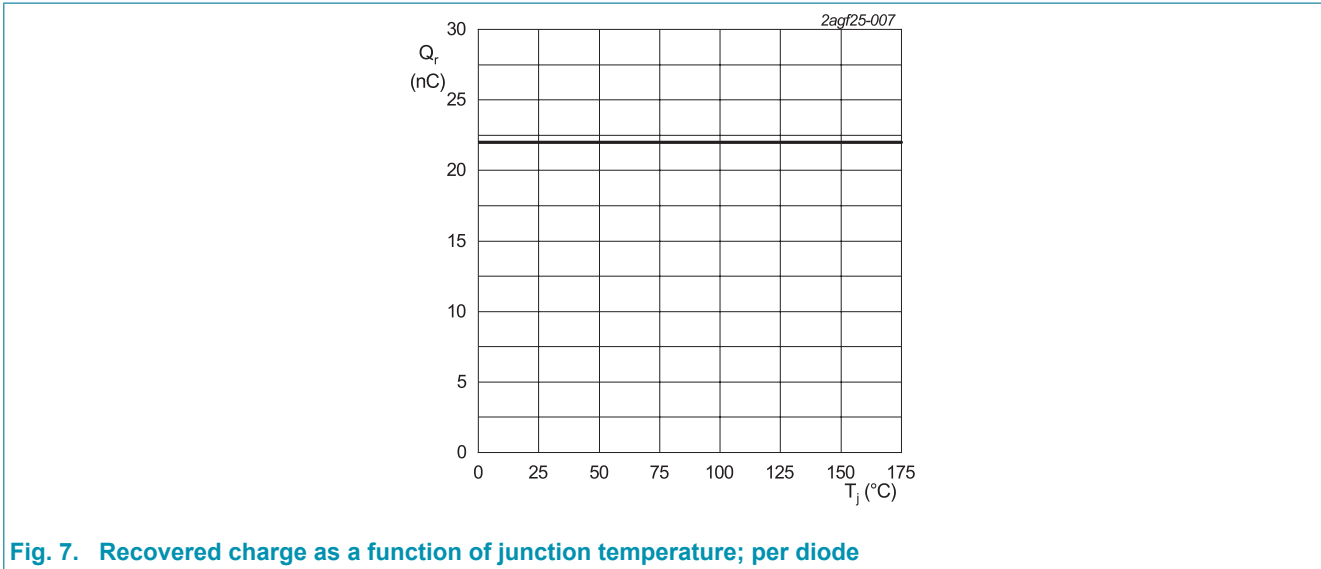
Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
|--------------------------------|---------------------------------|--|-------|-----|------|------|---------------|
| Static characteristics | | | | | | | |
| I_F | forward current | $I_F = 10 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 5 | | - | 1.42 | 1.60 | V |
| | | $I_F = 10 \text{ A}; T_j = 150 \text{ }^\circ\text{C};$ per diode; Fig. 5 | | - | 1.90 | 2.30 | V |
| | | $I_F = 10 \text{ A}; T_j = 175 \text{ }^\circ\text{C};$ per diode; Fig. 5 | | - | 2.00 | 2.50 | V |
| I_R | reverse current | $V_R = 1200 \text{ V}; T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 6 | | - | 1 | 50 | μA |
| | | $V_R = 1200 \text{ V}; T_j = 175 \text{ }^\circ\text{C};$ per diode; Fig. 6 | | - | 25 | 500 | μA |
| Dynamic characteristics | | | | | | | |
| Q_r | recovered charge | $I_F = 10 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 500 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 7 | | - | 22 | - | nC |
| C_d | diode capacitance | $f = 1 \text{ MHz}; V_R = 1 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$ | | - | 481 | - | pF |
| | | $f = 1 \text{ MHz}; V_R = 400 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$ | | - | 42 | - | pF |
| | | $f = 1 \text{ MHz}; V_R = 800 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$ | | - | 31 | - | pF |
| E_{as} | non-repetitive avalanche energy | $I_R = 4.2 \text{ A}; L = 10 \text{ mH}; T_{j(\text{init})} = 25 \text{ }^\circ\text{C};$ per diode | | 88 | - | - | mJ |

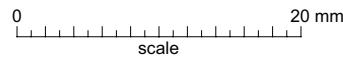
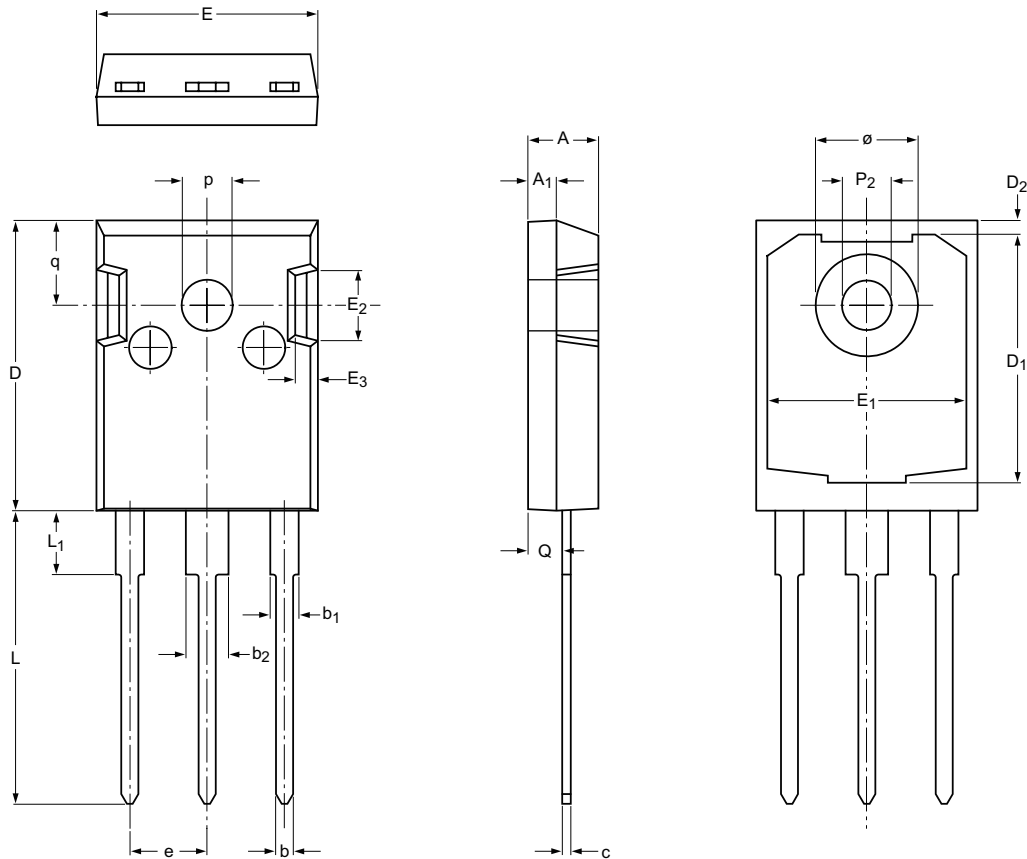




11. Package outline

Plastic single-ended through-hole package; heatsink mounted; 1 mounting hole; 3-lead TO-247

SOT429



Dimensions (mm are the original dimensions)

| Unit ⁽¹⁾ | A | A ₁ | b | b ₁ | b ₂ | c | D | D ₁ | D ₂ | E | E ₁ | E ₂ | E ₃ | e ⁽¹⁾ | L | L ₁ | P ₂ | p | Q | q | ø | | |
|---------------------|------|----------------|------|----------------|----------------|------|------|----------------|----------------|-------|----------------|----------------|----------------|------------------|-------|----------------|----------------|------|------|------|------|------|--|
| max | 5.20 | 2.10 | 1.40 | 2.20 | 3.20 | 0.70 | 20.6 | 17.68 | 1.20 | 15.75 | 14.22 | 5.20 | 1.80 | 5.45 | 20.90 | 4.75 | 3.60 | 3.70 | 2.60 | 6.18 | 7.30 | | |
| nom | | | | | | | | | | | | | | | | | | | | | | | |
| min | 4.70 | 1.90 | 1.00 | 1.80 | 2.80 | 0.50 | 20.3 | 17.28 | 0.80 | 15.45 | 13.82 | 4.80 | 1.40 | | | 20.40 | 4.25 | 3.40 | 3.50 | 2.20 | 5.78 | 7.10 | |

Note

1. Basic spacing between centers.

sot429_po

| | | | | | |
|-----------------|------------|-------|-------|---------------------|-----------------------|
| Outline version | References | | | European projection | Issue date |
| | IEC | JEDEC | JEITA | | |
| SOT429 | TO-247 | | | | 04-09-14- 13-03-25 |

12. 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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