

DATA SHEET

BYW29EX series
Rectifier diodes
ultrafast, rugged

Product specification

September 2018

**Rectifier diodes
ultrafast, rugged**

BYW29EX series

GENERAL DESCRIPTION

Glass passivated epitaxial rectifier diodes in a full pack plastic envelope, featuring low forward voltage drop, ultra-fast recovery times, soft recovery characteristic and guaranteed reverse surge and ESD capability. They are intended for use in switched mode power supplies and high frequency circuits in general where low conduction and switching losses are essential.

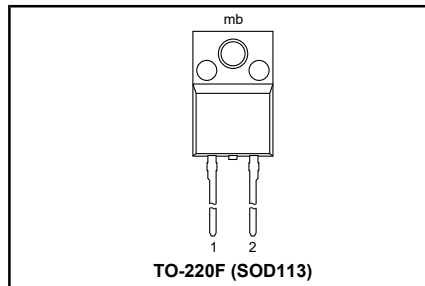
QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | MAX. | UNIT |
|-------------|---------------------------------|-------|-------|------|
| V_{RRM} | Repetitive peak reverse voltage | 150 | 200 | V |
| V_F | Forward voltage | 0.895 | 0.895 | V |
| $I_{F(AV)}$ | Forward current | 8 | 8 | A |
| t_{rr} | Reverse recovery time | 25 | 25 | ns |
| I_{RRM} | Repetitive peak reverse current | 0.2 | 0.2 | A |

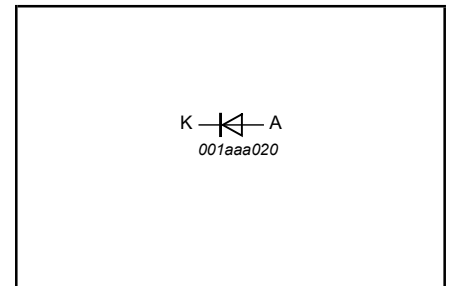
PINNING - SOD113

| PIN | DESCRIPTION |
|------|-------------|
| 1 | cathode |
| 2 | anode |
| case | isolated |

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | | UNIT |
|--------------|--------------------------------------|---|------|------|------|------------------|
| | | | | | | |
| V_{RRM} | Repetitive peak reverse voltage | | - | -150 | -200 | V |
| V_{RWM} | Crest working reverse voltage | | - | 150 | 200 | V |
| V_R | Continuous reverse voltage | | - | 150 | 200 | V |
| $I_{F(AV)}$ | Average forward current ¹ | square wave; $\delta = 0.5$; $T_{hs} \leq 106^\circ\text{C}$ sinusoidal; $a = 1.57$; $T_{hs} \leq 109^\circ\text{C}$ | - | 8 | | A |
| $I_{F(RMS)}$ | RMS forward current | | - | 7.3 | | A |
| I_{FRM} | Repetitive peak forward current | $t = 25 \mu\text{s}$; $\delta = 0.5$; $T_{hs} \leq 106^\circ\text{C}$ | - | 16 | | A |
| I_{FSM} | Non-repetitive peak forward current | $t = 10 \text{ms}$ $t = 8.3 \text{ms}$ sinusoidal; with reapplied | - | 80 | | A |
| I_{FSM} | Non-repetitive peak forward current | $t = 8.3 \text{ms}$ sinusoidal; with reapplied | - | 88 | | A |
| I^2t | I^2t for fusing | $V_{RWM(max)}$ $t = 10 \text{ms}$ | - | 32 | | A ² s |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2 \mu\text{s}$; $\delta = 0.001$ | - | 0.2 | | A |
| I_{RSM} | Non-repetitive peak reverse current | $t_p = 100 \mu\text{s}$ | - | 0.2 | | A |
| T_{stg} | Storage temperature | | -40 | 150 | | °C |
| T_j | Operating junction temperature | | - | 150 | | °C |

¹ Neglecting switching and reverse current losses

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ESD LIMITING VALUE

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|--------|---|---|------|------|------|
| V_C | Electrostatic discharge capacitor voltage | Human body model; $C = 250 \text{ pF}$; $R = 1.5 \text{ k}\Omega$ | - | 8 | kV |

ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs} = 25 \text{ }^\circ\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------|---|---|------|------|------|------|
| V_{isol} | R.M.S. isolation voltage from both terminals to external heatsink | $f = 50\text{-}60 \text{ Hz}$; sinusoidal waveform; R.H. $\leq 65\%$; clean and dustfree | - | | 2500 | V |
| C_{isol} | Capacitance from both terminals to external heatsink | $f = 1 \text{ MHz}$ | - | 10 | - | pF |

THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------------------|---|--|------|------|------|------|
| $R_{th\ j\text{-}hs}$ | Thermal resistance junction to heatsink | with heatsink compound | - | - | 5.5 | K/W |
| $R_{th\ j\text{-}a}$ | Thermal resistance junction to ambient | without heatsink compound in free air | - | 55 | 7.2 | K/W |

STATIC CHARACTERISTICS

$T_j = 25 \text{ }^\circ\text{C}$ unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--------|-----------------|--|------|------|-------|---------------|
| V_F | Forward voltage | $I_F = 8 \text{ A}$; $T_j = 150 \text{ }^\circ\text{C}$ | - | 0.80 | 0.895 | V |
| | | $I_F = 8 \text{ A}$ | - | 0.92 | 1.05 | V |
| | | $I_F = 20 \text{ A}$ | - | 1.1 | 1.3 | V |
| I_R | Reverse current | $V_R = V_{RWM}$; $T_j = 100 \text{ }^\circ\text{C}$ | - | 0.2 | 0.6 | mA |
| | | $V_R = V_{RWM}$ | - | 2 | 10 | μA |

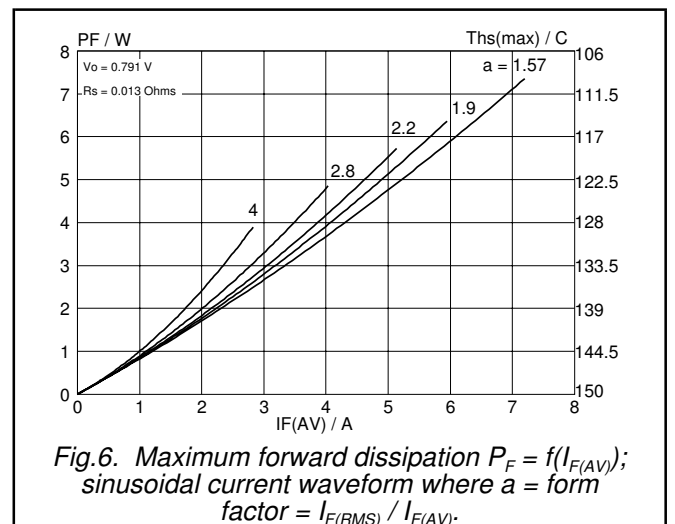
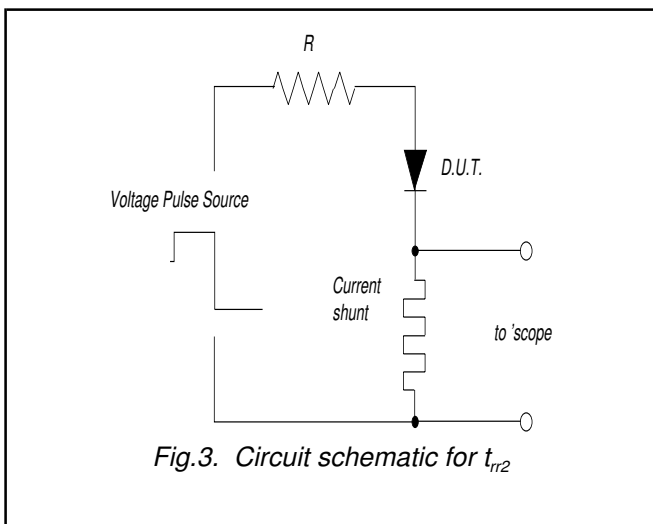
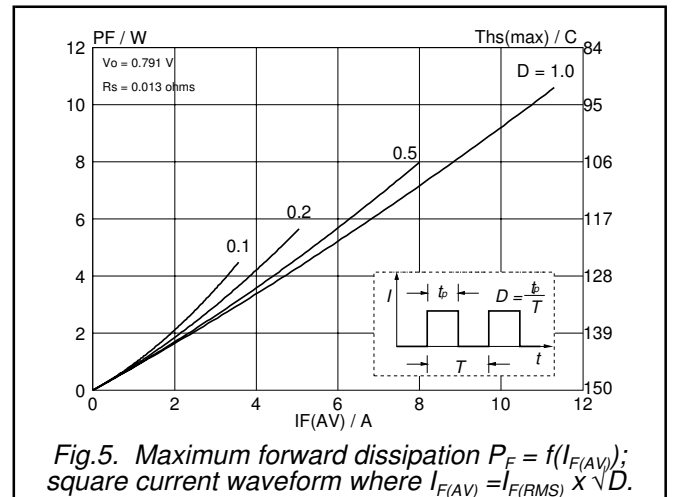
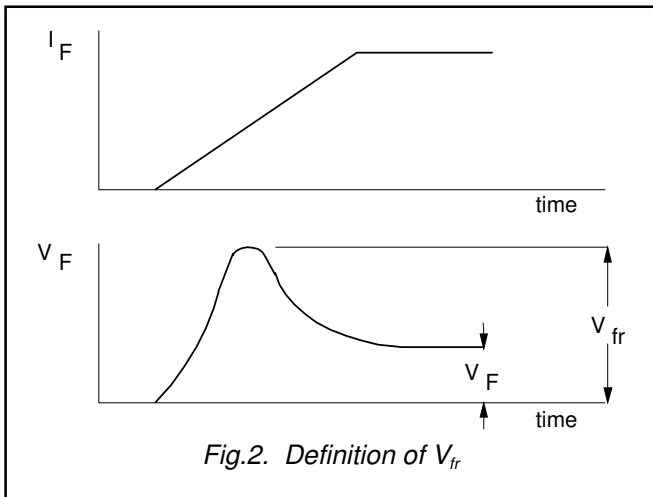
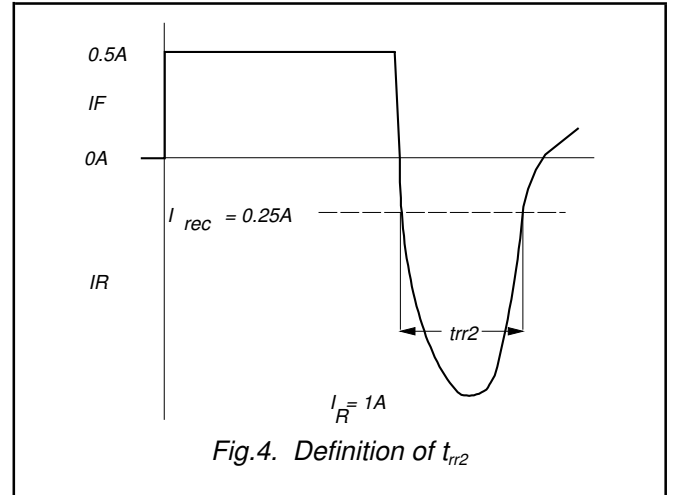
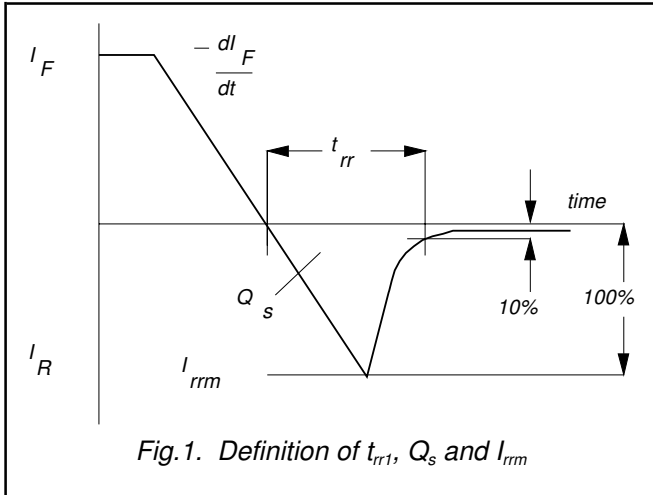
DYNAMIC CHARACTERISTICS

$T_j = 25 \text{ }^\circ\text{C}$ unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|--------------------------|---|------|------|------|------|
| Q_s | Reverse recovery charge | $I_F = 2 \text{ A}$; $V_R \geq 30 \text{ V}$; $-di_F/dt = 20 \text{ A}/\mu\text{s}$ | - | 4 | 11 | nC |
| t_{rr1} | Reverse recovery time | $I_F = 1 \text{ A}$; $V_R \geq 30 \text{ V}$; $-di_F/dt = 100 \text{ A}/\mu\text{s}$ | - | 20 | 25 | ns |
| t_{rr2} | Reverse recovery time | $I_F = 0.5 \text{ A}$ to $I_R = 1 \text{ A}$; $I_{rec} = 0.25 \text{ A}$ | - | 15 | 20 | ns |
| V_{fr} | Forward recovery voltage | $I_F = 1 \text{ A}$; $di_F/dt = 10 \text{ A}/\mu\text{s}$ | - | 1 | - | V |

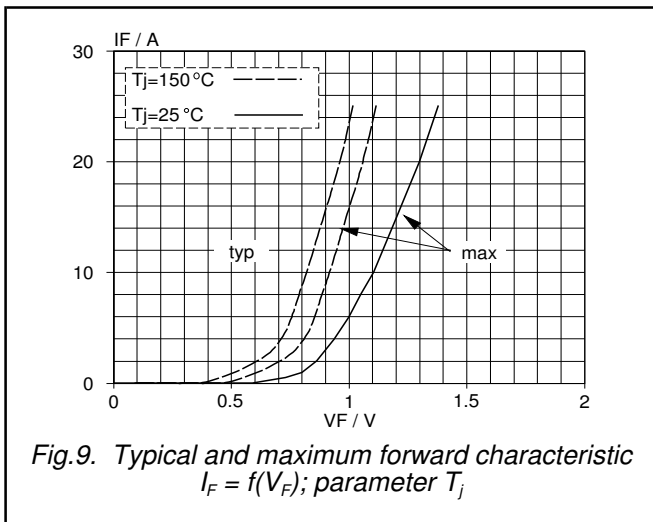
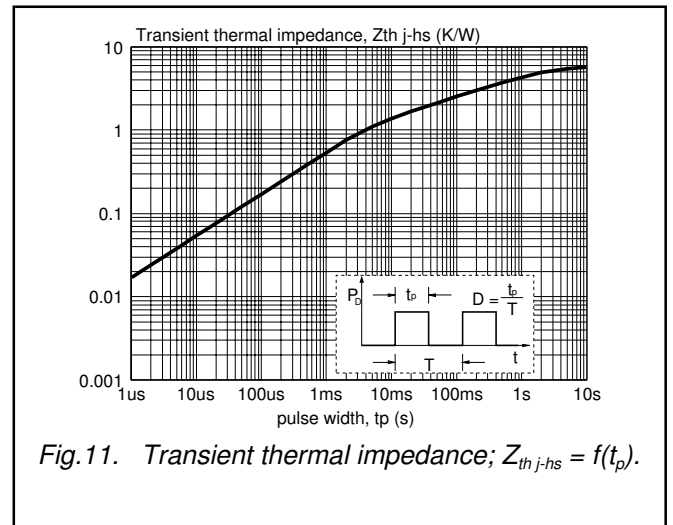
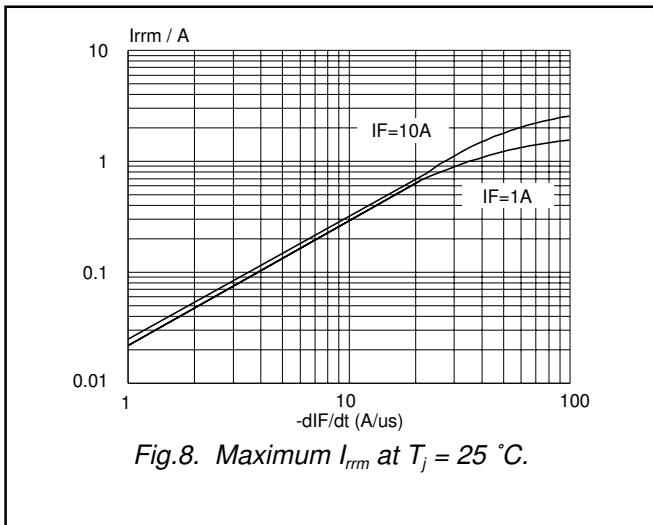
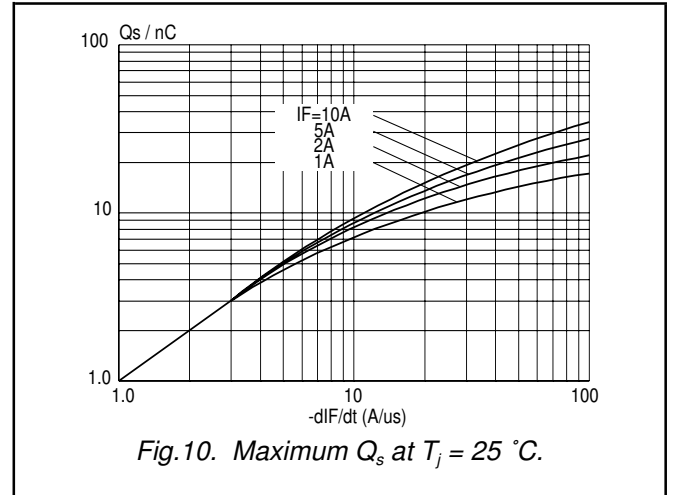
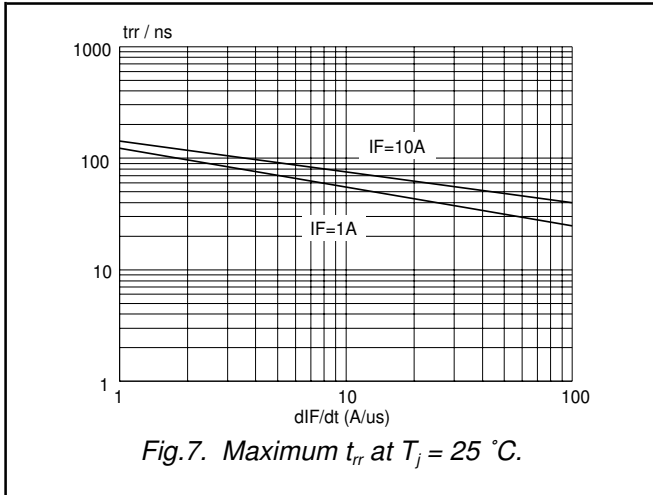
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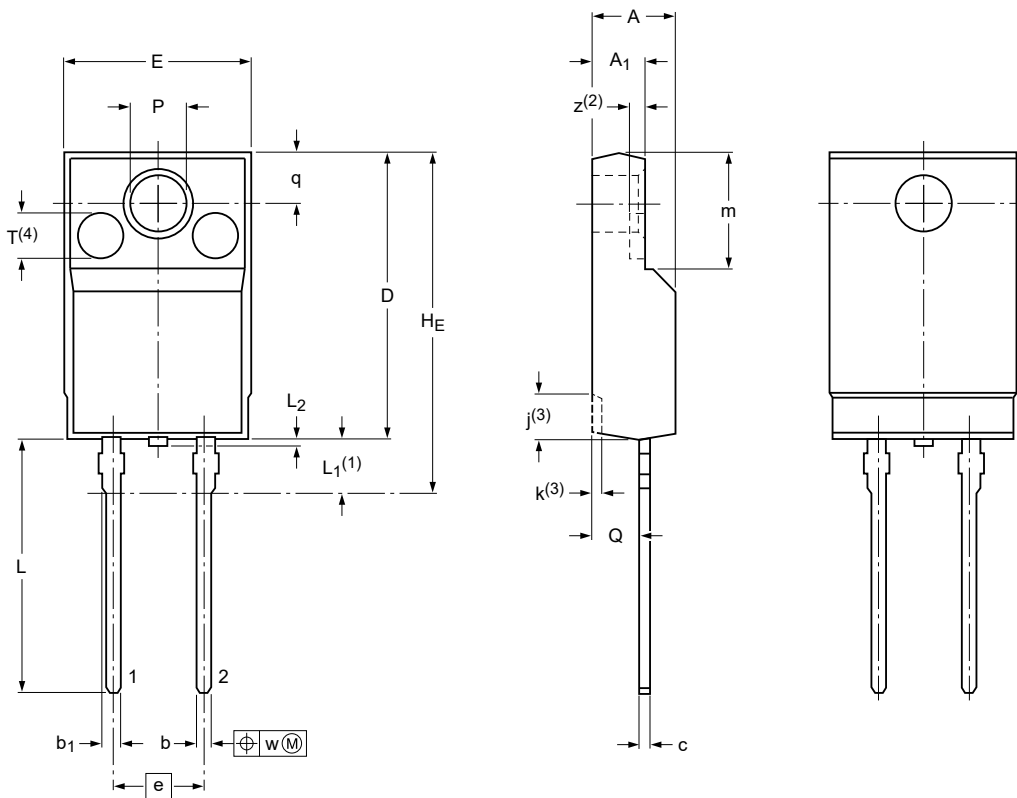
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MECHANICAL DATA

Plastic single-ended package; isolated heatsink mounted;
1 mounting hole; 2-lead TO-220 'full pack'

SOD113



Dimensions (mm are the original dimensions)

| Unit | A | A ₁ | b | b ₁ | c | D | E | e | H _E max | j ⁽³⁾ | k ⁽³⁾ | L | L ₁ ⁽¹⁾ | L ₂ max | m | P | Q | q | T ⁽⁴⁾ | w | z ⁽²⁾ | |
|------|-----|----------------|-----|----------------|-----|------|------|------|-----------------------|------------------|------------------|------|-------------------------------|-----------------------|-----|-----|-----|---|------------------|------|------------------|-----|
| max | 4.6 | 2.9 | 0.9 | 1.1 | 0.7 | 15.8 | 10.3 | | | 2.7 | 0.6 | 14.4 | 3.3 | | 6.5 | 3.2 | 2.6 | | | | | |
| nom | | | | | | | | 5.08 | 19.0 | | | | | 0.5 | | | | | 2.6 | 2.55 | 0.4 | 0.8 |
| min | 4.0 | 2.5 | 0.7 | 0.9 | 0.4 | 15.2 | 9.7 | | | 1.7 | 0.4 | 13.5 | 2.8 | | 6.3 | 3.0 | 2.3 | | | | | |

Notes

1. Terminals are uncontrolled within zone L1.
2. z is depth of T.
3. Dot lines area designs may vary.
4. Eject pin mark is for reference only.

sod113_po

| Outline version | References | | | European projection | Issue date |
|-----------------|----------------|-------|-------|---------------------|-----------------------|
| | IEC | JEDEC | JEITA | | |
| SOD113 | 2-lead TO-220F | | | | 07-06-08- 15-08-28 |

Legal information

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| 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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