

1. General description

Ultrafast power diode in a SMB surface-mountable plastic package.

2. Features and benefits

- Low on-state loss
- Low leakage current
- Low thermal resistance
- Surface-mountable package
- Reduces switching losses in associated MOSFET or IGBT

3. Applications

- Buck and Boost converter
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)
- Inverter freewheeling and protection diode

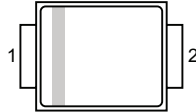

4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Values | | | Unit |
|--------------------------------|-------------------------------------|---|--------|------|------|------|
| Absolute maximum rating | | | | | | |
| V_{RRM} | repetitive peak reverse voltage | | 600 | | | V |
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$; square-wave pulse; $T_{lead} \leq 105\text{ }^{\circ}\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3 | 3 | | | A |
| I_{FRM} | repetitive peak forward current | $\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{lead} \leq 105\text{ }^{\circ}\text{C}$; square-wave pulse | 6 | | | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 10\text{ ms}$; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; sine-wave pulse; Fig. 4 | 100 | | | A |
| | | $t_p = 8.3\text{ ms}$; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; sine-wave pulse; | 110 | | | A |
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
| Static characteristics | | | | | | |
| V_F | forward voltage | $I_F = 3\text{ A}$; $T_j = 25\text{ }^{\circ}\text{C}$; Fig. 6 | - | - | 1.3 | V |
| | | $I_F = 3\text{ A}$; $T_j = 150\text{ }^{\circ}\text{C}$; Fig. 6 | - | 0.88 | 1.05 | V |
| Dynamic characteristics | | | | | | |
| t_{rr} | reverse recovery time | $I_F = 1\text{ A}$; $V_R = 30\text{ V}$; $di_F/dt = 50\text{ A}/\mu\text{s}$; $T_j = 25\text{ }^{\circ}\text{C}$; Fig. 7 | - | 50 | - | ns |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|--|---|
| 1 | K | cathode |  |  |
| 2 | A | anode | | |
| | | | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package Name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|-------------|--------------|-----------------------|----------------|------------------------|-----------------|--------------------|
| MURS360B | SMB | MURS360BJ | Reel | 3000 | SMB | 20-Feb-2017 |

7. Marking

Table 4. Marking codes

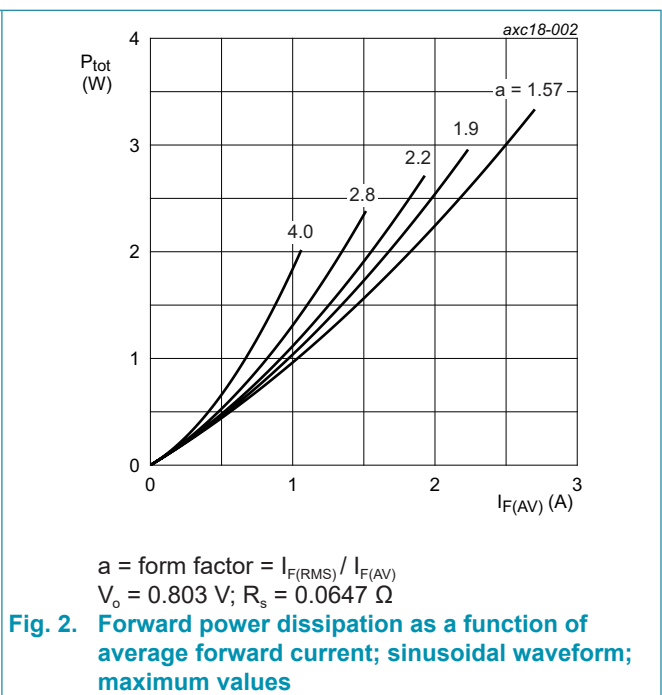
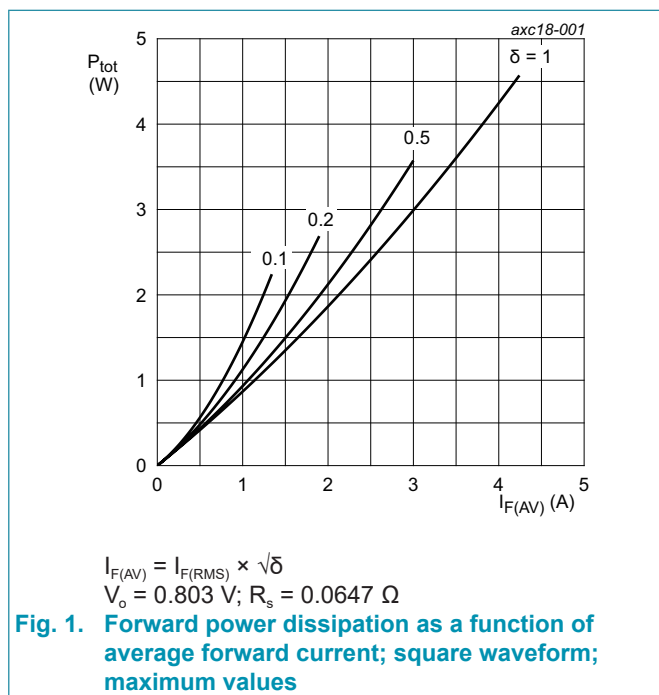
| Type number | Marking codes |
|-------------|---------------|
| MURS360B | 360B |

8. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter | Conditions | Values | Unit |
|-------------|-------------------------------------|--|------------|------------------|
| V_{RRM} | repetitive peak reverse voltage | | 600 | V |
| V_{RWM} | crest working reverse voltage | | 600 | V |
| V_R | reverse voltage | DC | 600 | V |
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$; square-wave pulse; $T_{lead} \leq 105\text{ }^\circ\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3 | 3 | A |
| I_{FRM} | repetitive peak forward current | $\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{lead} \leq 105\text{ }^\circ\text{C}$; square-wave pulse | 6 | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 10\text{ ms}$; $T_{j(init)} = 25\text{ }^\circ\text{C}$; sine-wave pulse; Fig. 4 | 100 | A |
| | | $t_p = 8.3\text{ ms}$; $T_{j(init)} = 25\text{ }^\circ\text{C}$; sine-wave pulse; | 110 | A |
| T_{stg} | storage temperature | | -65 to 175 | $^\circ\text{C}$ |
| T_j | junction temperature | | 175 | $^\circ\text{C}$ |



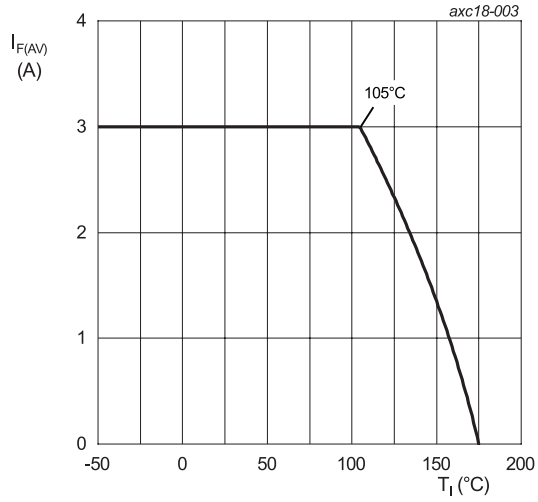


Fig. 3. Forward current as a function of lead temperature; typical values

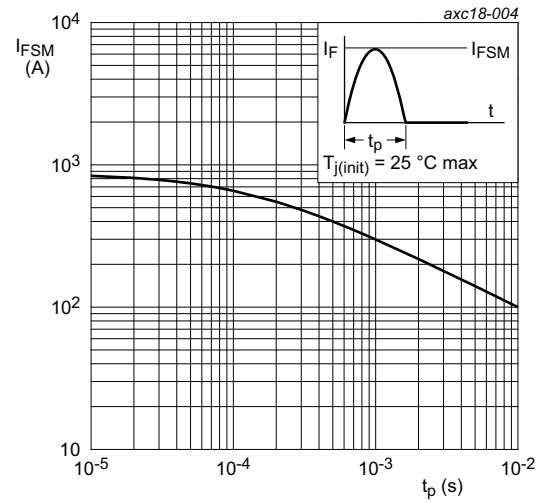


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|--|--|-----|-----|-----|------|
| $R_{th(j-lead)}$ | thermal resistance from junction to lead | mounted on a minimum footprint printed-circuit board (FR4); Fig. 5 | - | 23 | 25 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient free air | mounted on a minimum footprint printed-circuit board (FR4) | - | 75 | - | K/W |

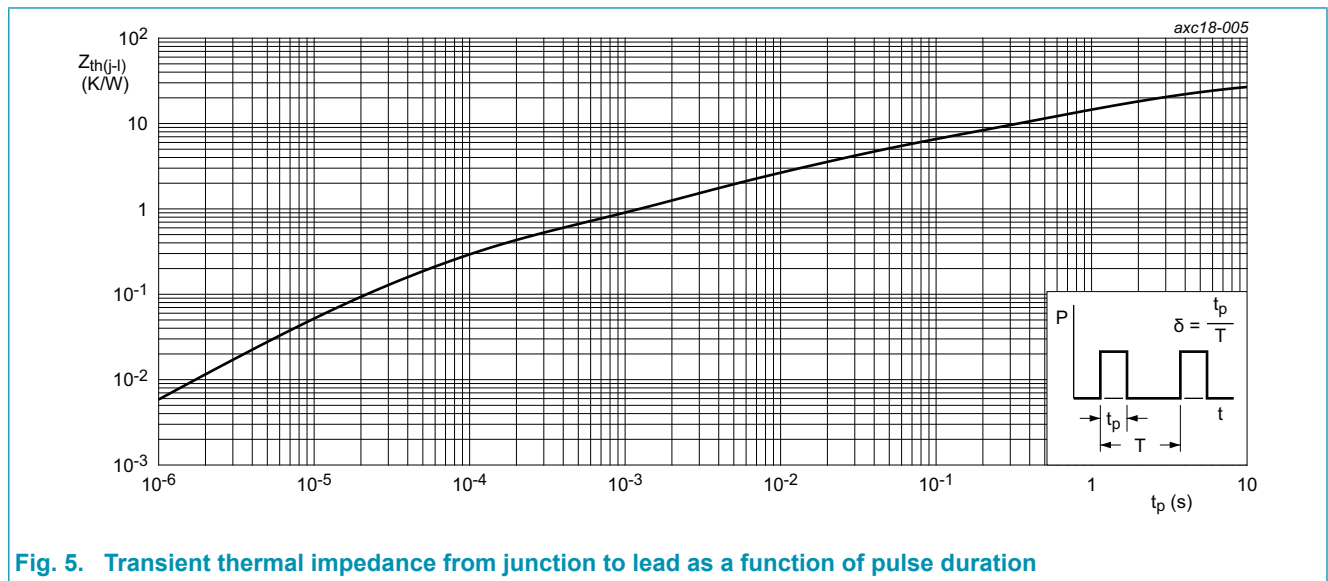
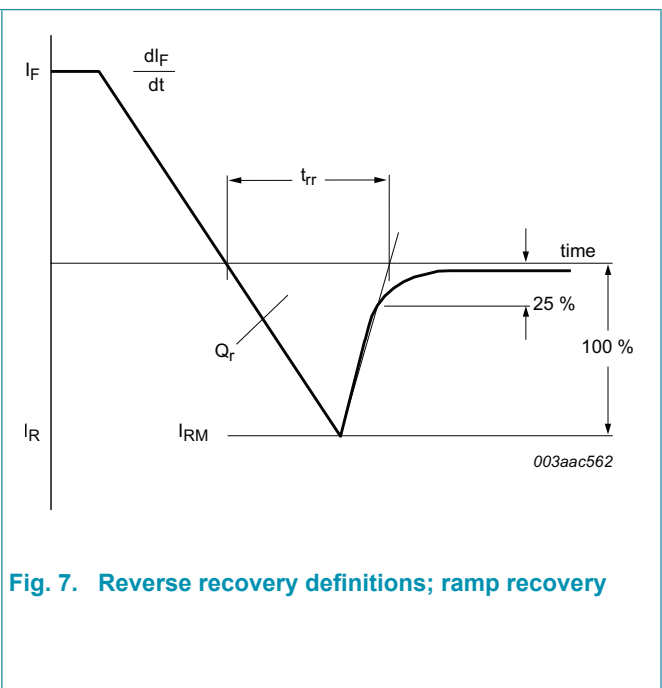
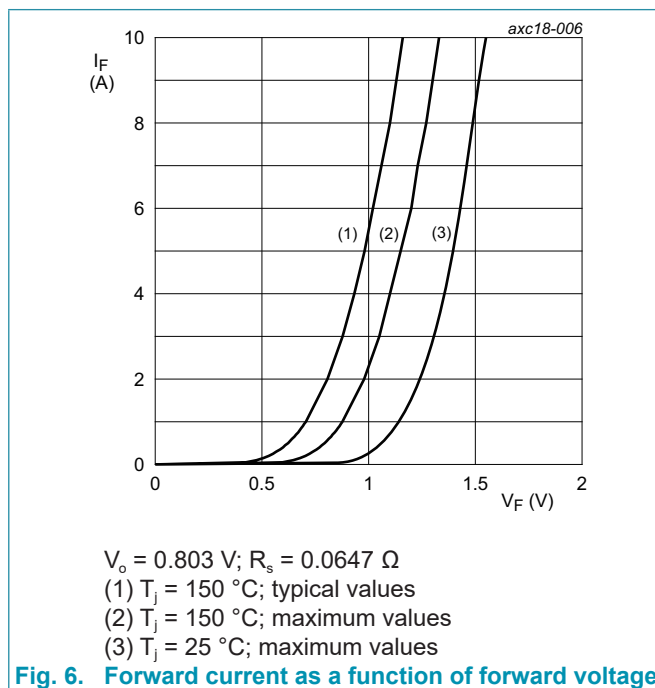


Fig. 5. Transient thermal impedance from junction to lead as a function of pulse duration

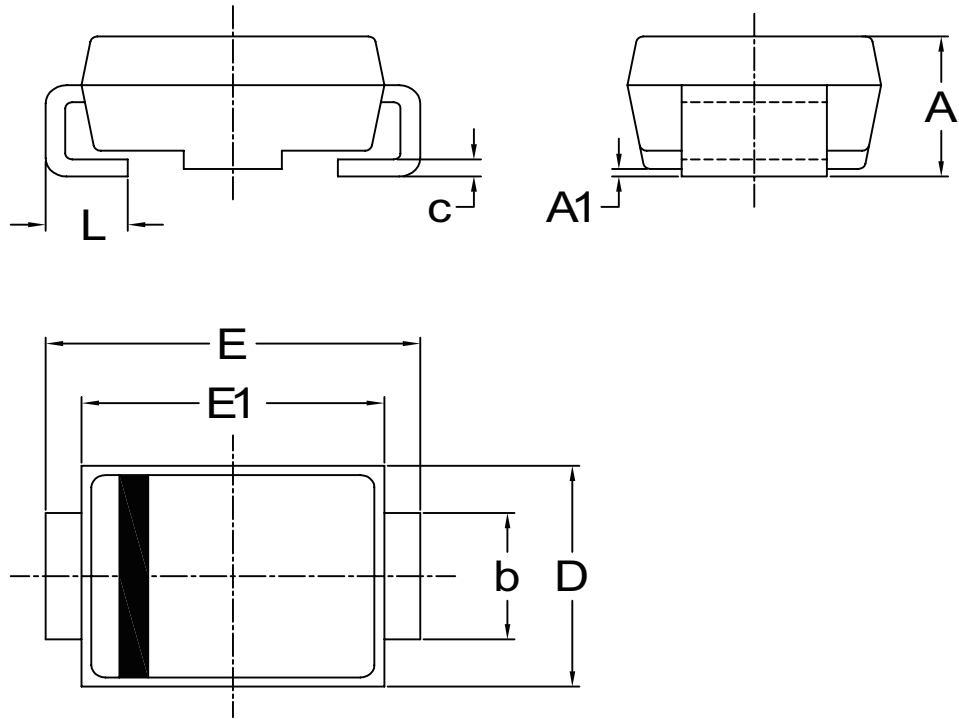
10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------------------------------|---------------------------------|--|------|------|------|---------------|
| Static characteristics | | | | | | |
| V_F | forward current | $I_F = 3\text{ A}; T_j = 25\text{ }^\circ\text{C}; \text{Fig. 6}$ | - | - | 1.3 | V |
| | | $I_F = 3\text{ A}; T_j = 150\text{ }^\circ\text{C}; \text{Fig. 6}$ | - | 0.88 | 1.05 | V |
| I_R | reverse current | $V_R = 600\text{ V}; T_j = 25\text{ }^\circ\text{C}$ | - | - | 3 | μA |
| | | $V_R = 600\text{ V}; T_j = 150\text{ }^\circ\text{C}$ | - | - | 1 | mA |
| Dynamic characteristics | | | | | | |
| Q_r | reverse charge | $I_F = 3\text{ A}; V_R = 400\text{ V}; dI_F/dt = 200\text{ A}/\mu\text{s}; T_j = 25\text{ }^\circ\text{C}; \text{Fig. 7}$ | - | 122 | - | nC |
| | | $I_F = 3\text{ A}; V_R = 400\text{ V}; dI_F/dt = 200\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}; \text{Fig. 7}$ | - | 199 | - | nC |
| t_{rr} | reverse recovery time | $I_F = 1\text{ A}; V_R = 30\text{ V}; dI_F/dt = 50\text{ A}/\mu\text{s}; T_j = 25\text{ }^\circ\text{C}; \text{Fig. 7}$ | - | 50 | - | ns |
| | | $I_F = 0.5\text{ A}; I_R = 1\text{ A}; I_{R(\text{meas})} = 0.25\text{ A}; T_j = 25\text{ }^\circ\text{C}; \text{Step recovery}$ | - | - | 50 | ns |
| | | $I_F = 3\text{ A}; V_R = 400\text{ V}; dI_F/dt = 200\text{ A}/\mu\text{s}; T_j = 25\text{ }^\circ\text{C}; \text{Fig. 7}$ | - | 52 | - | ns |
| | | $I_F = 3\text{ A}; V_R = 400\text{ V}; dI_F/dt = 200\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}; \text{Fig. 7}$ | - | 65 | - | ns |
| I_{RM} | peak reverse recovery current | $I_F = 3\text{ A}; V_R = 400\text{ V}; dI_F/dt = 200\text{ A}/\mu\text{s}; T_j = 25\text{ }^\circ\text{C}; \text{Fig. 7}$ | - | 4.7 | - | A |
| | | $I_F = 3\text{ A}; V_R = 400\text{ V}; dI_F/dt = 200\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}; \text{Fig. 7}$ | - | 6.1 | - | A |
| E_{as} | non-repetitive avalanche energy | $I_R = 1.2\text{ A}; T_{j(\text{init})} = 25\text{ }^\circ\text{C}; L = 15\text{ mH}$ | 10.8 | - | - | mJ |



11. Package outline



| UNIT | A | A1 | b | c | D | E | E1 | L | |
|------|-----|------|------|------|------|------|------|------|------|
| mm | Max | 2.50 | 0.20 | 2.21 | 0.31 | 3.95 | 5.60 | 4.60 | 1.60 |
| | Min | 2.00 | 0.05 | 1.96 | 0.15 | 3.30 | 5.20 | 4.05 | 0.75 |

Remark: Dimensions D and E1 do not include mold flash.

12. 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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13. Contents

| | |
|----------------------------------|----|
| 1. General description..... | 1 |
| 2. Features and benefits | 1 |
| 3. Applications | 1 |
| 4. Quick reference data..... | 1 |
| 5. Pinning information..... | 2 |
| 6. Ordering information..... | 2 |
| 7. Marking..... | 2 |
| 8. Limiting values | 3 |
| 9. Thermal characteristics | 5 |
| 10. Characteristics..... | 6 |
| 11. Package outline | 7 |
| 12. Legal information | 8 |
| 13. Contents | 10 |

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