

1. General description

Dual common cathode power Schottky diode designed for high frequency switched mode power supplies in a TO220F "full pack" plastic package.



2. Features and benefits

- Trench structure
- High junction temperature up to 150°C
- Low forward voltage drop, negligible switching losses
- High efficiency

3. Applications

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

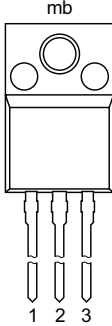
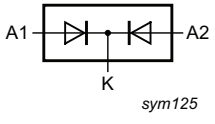
4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Notes | Values | | | Unit |
|--------------------------------|---------------------------------|--|-------|--------|------|------|---------|
| Absolute maximum rating | | | | | | | |
| V_{RRM} | repetitive peak reverse voltage | | | 60 | | | V |
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3 | | 15 | | | A |
| $I_{O(AV)}$ | average output current | $\delta = 0.5$; square-wave pulse; both diodes conducting | | 30 | | | A |
| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
| Static characteristics | | | | | | | |
| V_F | forward voltage | $I_F = 15$ A; $T_j = 25$ °C; per diode; Fig. 6 | | - | 0.62 | 0.70 | V |
| I_R | reverse current | $V_R = 60$ V; $T_j = 25$ °C; per diode; Fig. 7 ; Fig. 8 | | - | 35 | 100 | μ A |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------------------|---|---|
| 1 | A1 | anode 1 |  |  sym125 |
| 2 | K | cathode | | |
| 3 | A2 | anode 2 | | |
| mb | n.c. | mounting base; isolated | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|-------------|--------------|-----------------------|----------------|------------------------|-----------------|--------------------|
| WN3S3060CX | TO220F | WN3S3060CXQ | Tube | 50 | SOT186A | 14-Nov-2013 |

7. Marking

Table 4. Marking codes

| Type number | Marking codes |
|-------------|----------------|
| WN3S3060CX | WN3S30 60CX |

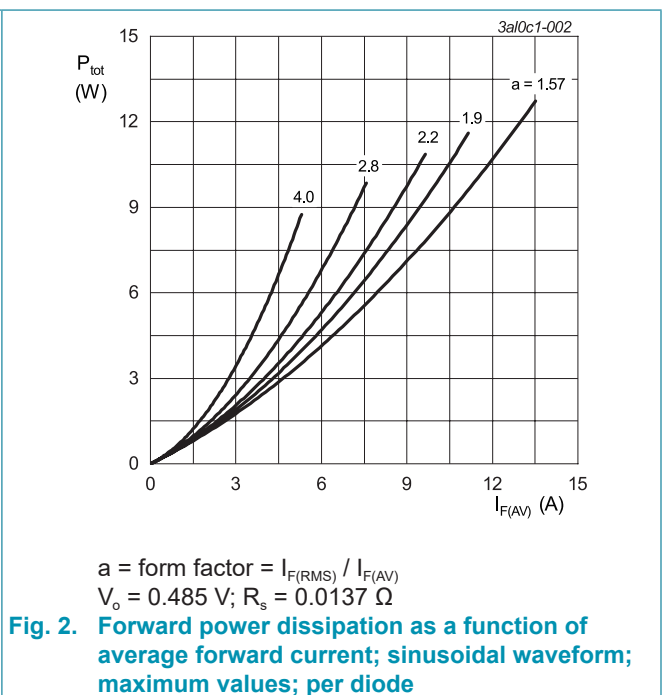
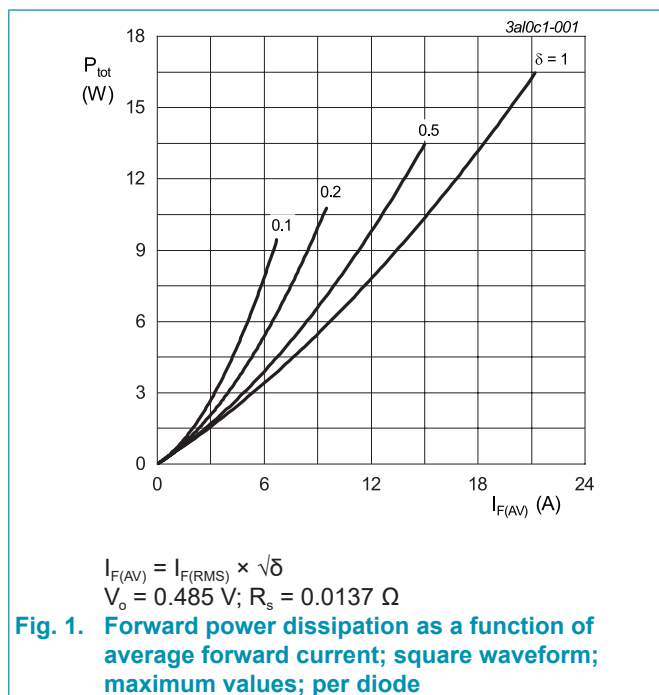
8. Limiting values

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 | | | 60 | V |
| V_{RWM} | crest working reverse voltage | | | 60 | V |
| V_R | reverse voltage | DC | | 60 | V |
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3 | | 15 | A |
| $I_{O(AV)}$ | average output current | $\delta = 0.5$; square-wave pulse; both diodes conducting | | 30 | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 10$ ms; $T_{j(\text{init})} = 25$ °C; sine-wave pulse; per diode; Fig. 4 | | 150 | A |
| | | $t_p = 8.3$ ms; $T_{j(\text{init})} = 25$ °C; sine-wave pulse; per diode | | 165 | A |
| T_{stg} | storage temperature | | | -40 to 150 | °C |
| T_j | junction temperature | | [1] | -40 to 150 | °C |

[1] The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_{tot}/dT_j < 1/R_{th(j-a)}$



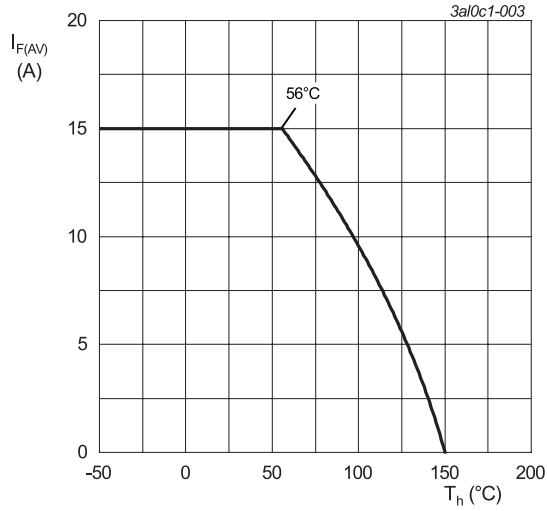


Fig. 3. Average forward current as a function of heatsink temperature; maximum values; per diode

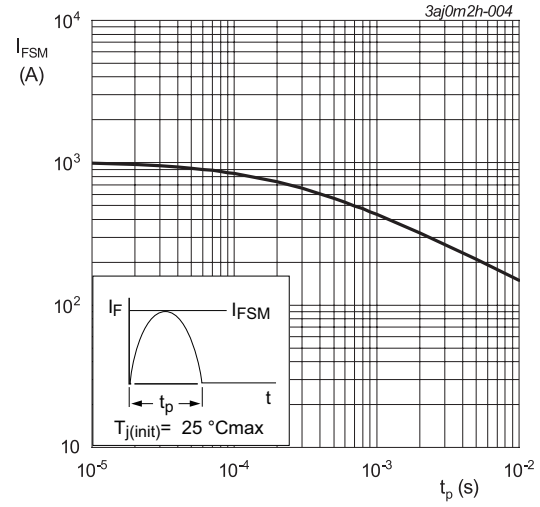


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
|---------------|--|--|-------|-----|-----|-----|------|
| $R_{th(j-h)}$ | thermal resistance from junction to heatsink | with heatsink compound; per diode; | | - | - | 7 | K/W |
| | | with heatsink compound; both diodes conducting | | - | - | 4.8 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient free air | in free air | | - | 65 | - | K/W |

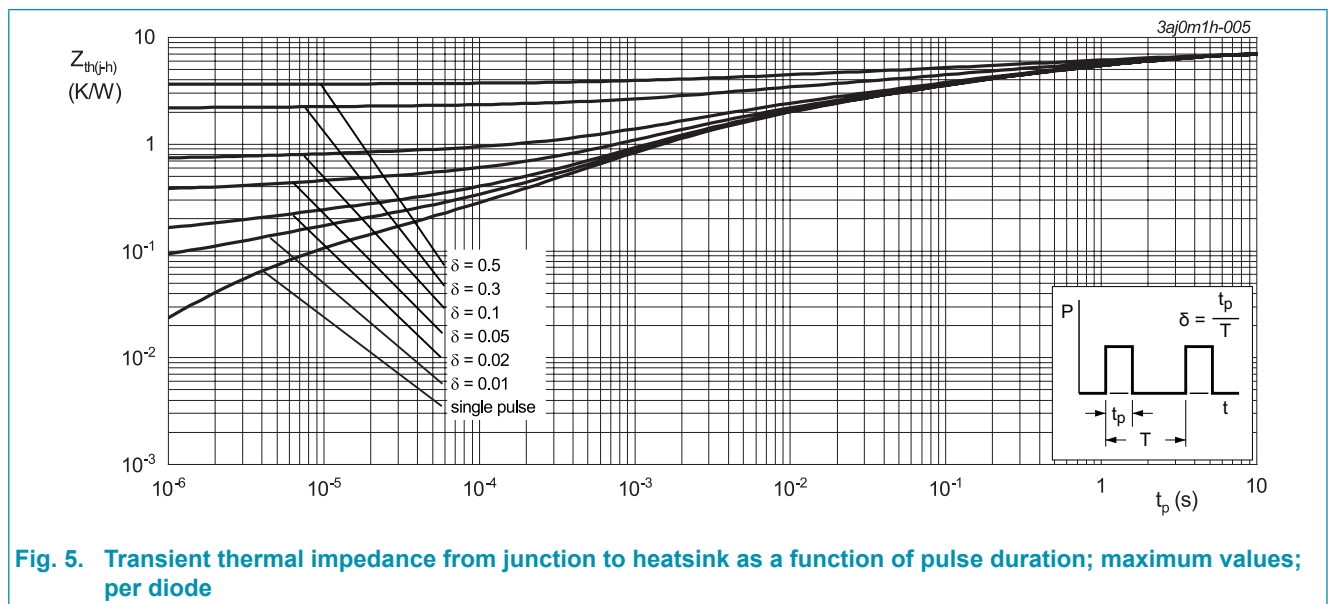


Fig. 5. Transient thermal impedance from junction to heatsink as a function of pulse duration; maximum values; per diode

10. Isolation characteristics

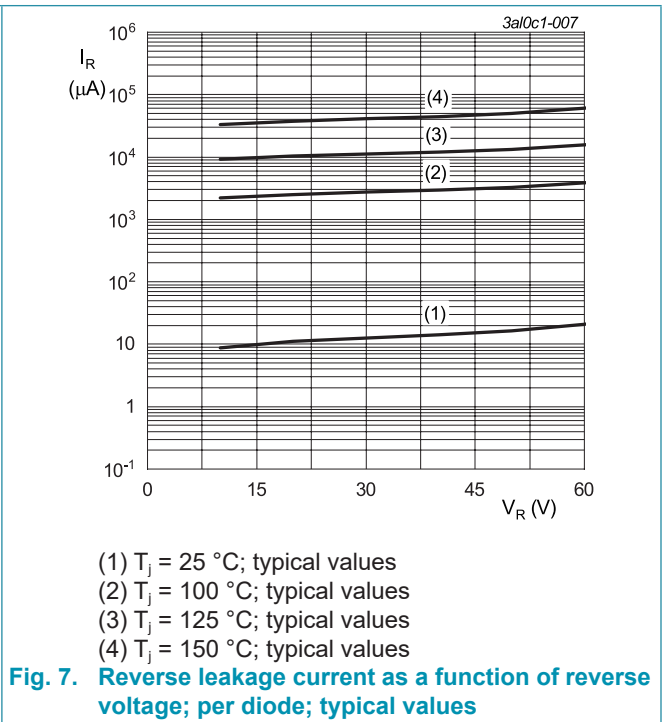
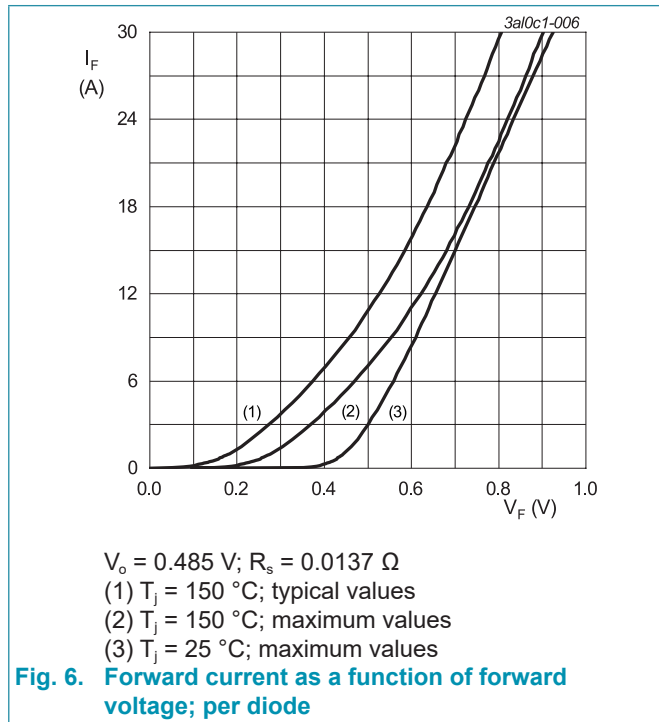
Table 7. Isolation characteristics

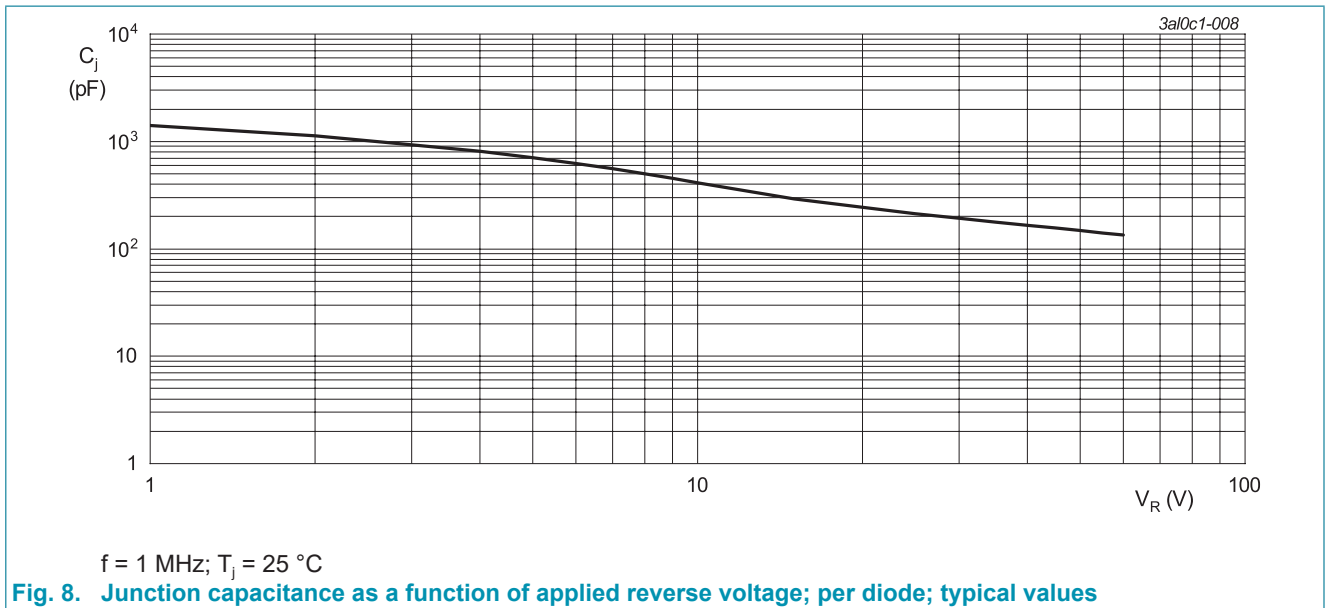
| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
|-----------------|-----------------------|---|-------|-----|-----|------|------|
| $V_{isol(RMS)}$ | RMS isolation voltage | from all terminals to external heatsink; sinusoidal waveform; clean and dust free; 50 Hz \leq f \leq 60 Hz; $T_h = 25^\circ\text{C}$; RH \leq 65 % | | - | - | 2500 | V |

11. Characteristics

Table 8. Characteristics

| Symbol | Parameter | Conditions | Notes | Min | Typ | Max | Unit |
|-------------------------------|-----------------|--|-------|-----|------|------|------|
| Static characteristics | | | | | | | |
| V _F | forward voltage | I _F = 15 A; T _j = 25 °C; per diode; Fig. 6 | | - | 0.62 | 0.70 | V |
| | | I _F = 15 A; T _j = 125 °C; per diode; Fig. 6 | | - | 0.61 | - | V |
| | | I _F = 3 A; T _j = 25 °C; per diode; Fig. 6 | | - | 0.40 | - | V |
| | | I _F = 3 A; T _j = 125 °C; per diode; Fig. 6 | | - | 0.30 | - | V |
| I _R | reverse current | V _R = 60 V; T _j = 25 °C; per diode; Fig. 7 ; Fig. 8 | | - | 35 | 100 | μA |
| | | V _R = 60 V; T _j = 125 °C; per diode; Fig. 7 ; Fig. 8 | | - | 20 | 100 | mA |

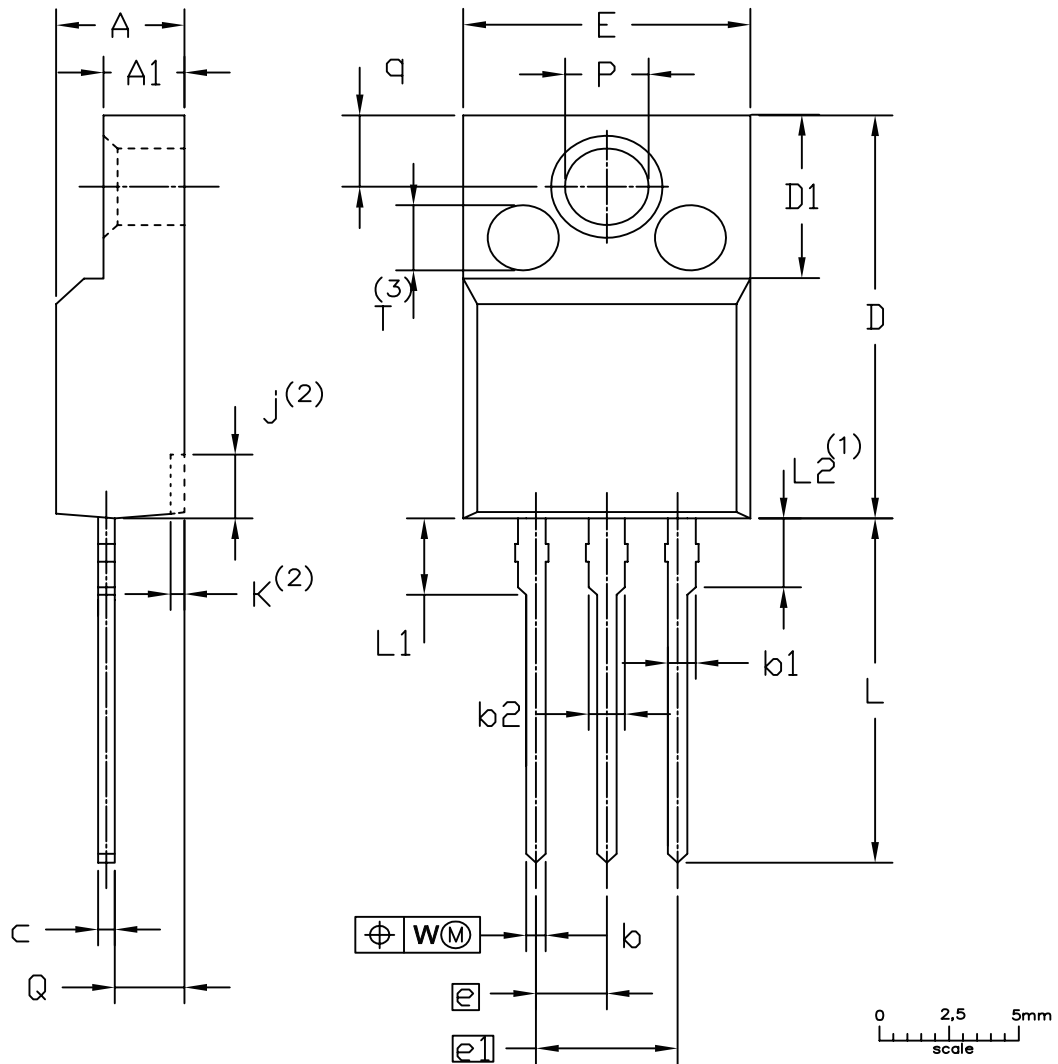




12. Package outline

Plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 3-lead TO-220 "full pack"

SOT186A



| UNIT | A | A ₁ | b | b ₁ | b ₂ | c | D | D ₁ | E | e | e ₁ | j ⁽²⁾ | k ⁽²⁾ | L | L ₁ | L ₂ ⁽¹⁾ max. | P | Q | q | W | T ⁽³⁾ |
|------|-----|----------------|-----|----------------|----------------|-----|------|----------------|------|------|----------------|------------------|------------------|------|----------------|---------------------------------------|-----|-----|-----|-----|------------------|
| mm | 4.6 | 2.9 | 0.9 | 1.1 | 1.4 | 0.7 | 15.8 | 6.5 | 10.3 | 2.54 | 5.08 | 2.7 | 0.6 | 14.4 | 3.30 | 3 | 3.2 | 2.6 | 3.0 | 0.4 | 2.5 |
| | 4.0 | 2.5 | 0.7 | 0.9 | 1.0 | 0.4 | 15.2 | 6.3 | 9.7 | | | 1.7 | 0.4 | 13.5 | 2.79 | | 3.0 | 2.3 | 2.6 | | |

Notes

- Terminal dimensions within this zone are uncontrolled
- Dot lines area designs may vary
- Eject pin mark is for reference only

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|----------------|-------|------------------------|------------|
| | IEC | JEDEC | JEITA | | |
| SOT186A | | 3 LEADS TO220F | | | 2013-11-14 |

13. 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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