

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

|             |        |
|-------------|--------|
| $I_{F(AV)}$ | 3 A    |
| $V_{RRM}$   | 60 V   |
| $T_j(max)$  | 150°C  |
| $V_F(max)$  | 0.61 V |

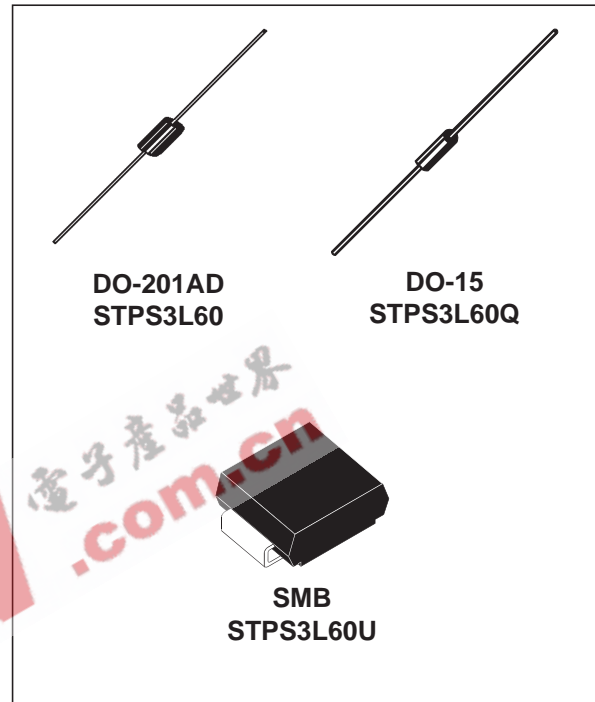
### FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

Axial and Surface Mount Power Schottky rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters. Packaged in DO-201AD, DO-15 and SMB, this device is intended for use in low voltage, high frequency inverters and small battery chargers.

For applications where there are space constraints, e.g Telecom battery charger.



### ABSOLUTE RATINGS (limiting values)

| Symbol       | Parameter                                |                                                                 | Value         | Unit             |
|--------------|------------------------------------------|-----------------------------------------------------------------|---------------|------------------|
| $V_{RRM}$    | Repetitive peak reverse voltage          |                                                                 | 60            | V                |
| $I_{F(RMS)}$ | RMS forward current                      |                                                                 | 10            | A                |
| $I_{F(AV)}$  | Average forward current                  | $T_L = 105^\circ\text{C} \quad \delta = 0.5$<br>(DO-201AD, SMB) | 3             | A                |
|              |                                          | $T_L = 75^\circ\text{C} \quad \delta = 0.5$<br>(DO-15)          |               |                  |
| $I_{FSM}$    | Surge non repetitive forward current     | $t_p = 10 \text{ ms}$ Sinusoidal                                | 100           | A                |
| $P_{ARM}$    | Repetitive peak avalanche power          | $t_p = 1 \mu\text{s} \quad T_j = 25^\circ\text{C}$              | 2000          | W                |
| $T_{stg}$    | Storage temperature range                |                                                                 | - 65 to + 150 | °C               |
| $T_j$        | Maximum operating junction temperature * |                                                                 | 150           | °C               |
| $dV/dt$      | Critical rate of rise of reverse voltage |                                                                 | 10000         | V/ $\mu\text{s}$ |

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  thermal runaway condition for a diode on its own heatsink

## STPS3L60/Q/U

### THERMAL RESISTANCES

| Symbol        | Parameter         |                     |          | Value | Unit                        |
|---------------|-------------------|---------------------|----------|-------|-----------------------------|
| $R_{th(j-l)}$ | Junction to leads | Lead length = 10 mm | DO-201AD | 20    | $^{\circ}\text{C}/\text{W}$ |
|               |                   |                     | SMB      | 20    |                             |
|               |                   |                     | DO-15    | 35    |                             |

### STATIC ELECTRICAL CHARACTERISTICS

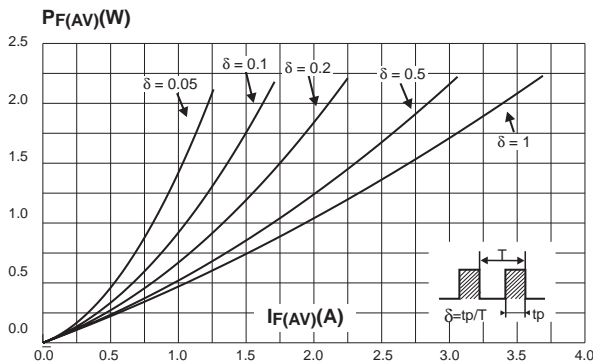
| Symbol  | Parameter               | Tests conditions            |                    | Min. | Typ. | Max. | Unit          |
|---------|-------------------------|-----------------------------|--------------------|------|------|------|---------------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^{\circ}\text{C}$  | $V_R = V_{RRM}$    |      |      | 150  | $\mu\text{A}$ |
|         |                         | $T_j = 100^{\circ}\text{C}$ |                    | 4    | 15   | mA   |               |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                    | 14   | 30   |      |               |
| $V_F^*$ | Forward voltage drop    | $T_j = 25^{\circ}\text{C}$  | $I_F = 3\text{ A}$ |      |      | 0.62 | V             |
|         |                         | $T_j = 100^{\circ}\text{C}$ |                    | 0.53 | 0.61 |      |               |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                    | 0.51 | 0.59 |      |               |
|         |                         | $T_j = 25^{\circ}\text{C}$  | $I_F = 6\text{ A}$ |      |      | 0.79 |               |
|         |                         | $T_j = 100^{\circ}\text{C}$ |                    | 0.62 | 0.71 |      |               |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                    | 0.6  | 0.69 |      |               |

Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$

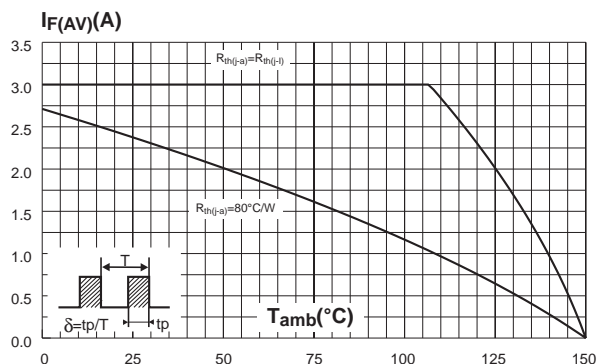
To evaluate the maximum conduction losses use the following equation:

$$P = 0.44 \times I_{F(AV)} + 0.05 \times I_F^2(RMS)$$

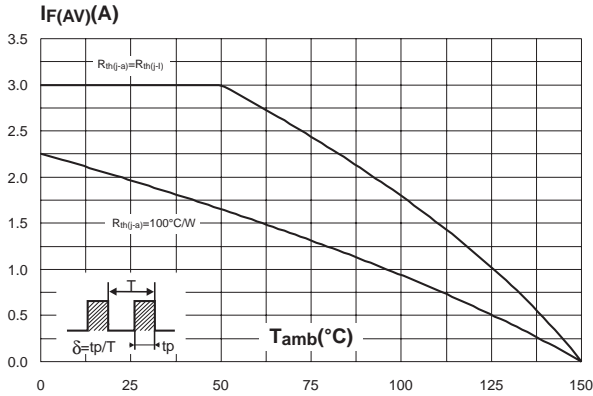
**Fig. 1:** Average forward power dissipation versus average forward current.



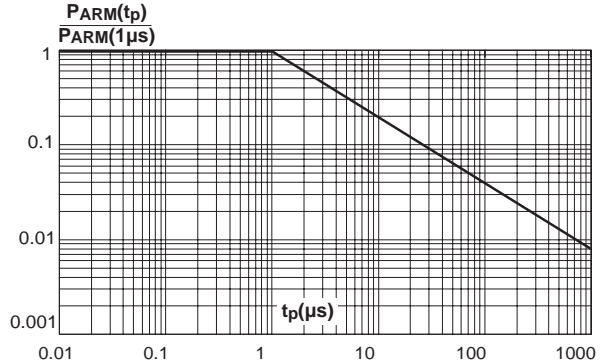
**Fig. 2-1:** Average forward current versus ambient temperature ( $\delta = 0.5$ ) (DO-201AD, SMB).



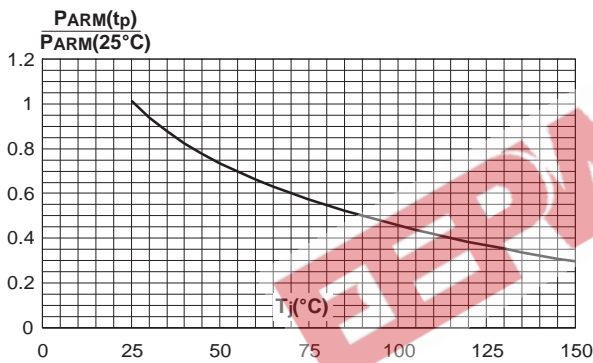
**Fig. 2-2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ) (DO-15).



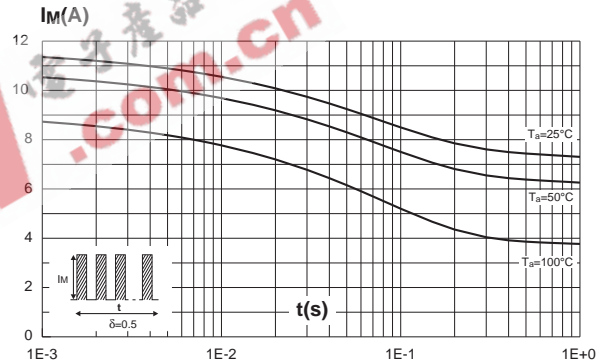
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



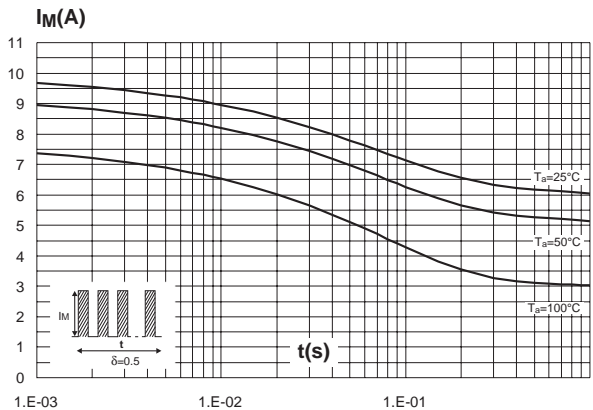
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



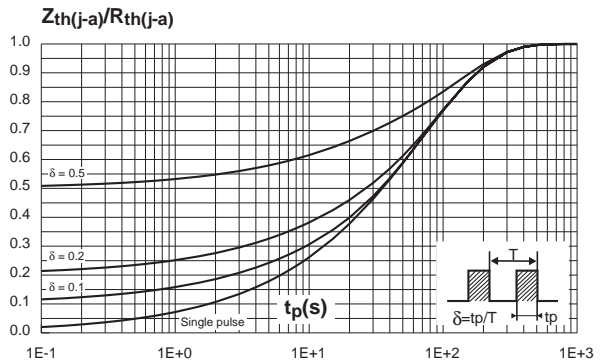
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (maximum values) (DO-201AD, SMB).



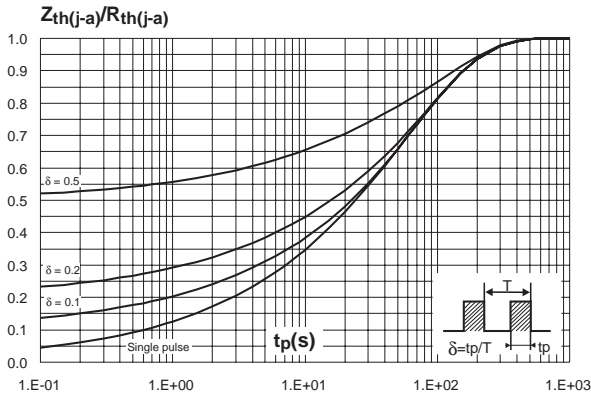
**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (maximum values) (DO-15).



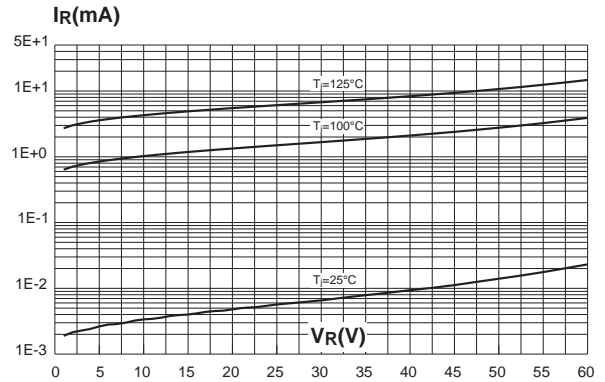
**Fig. 6-1:** Relative variation of thermal impedance junction to ambient versus pulse duration (DO-201AD, SMB).



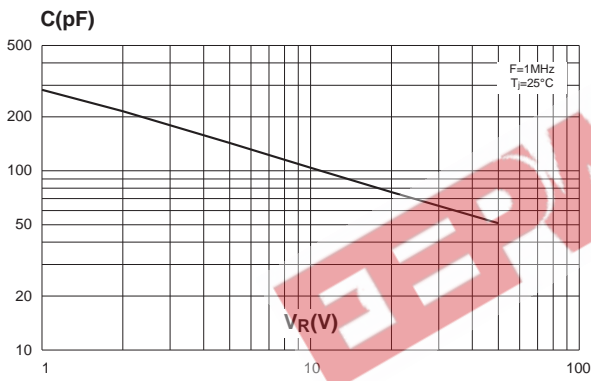
**Fig. 6-2:** Relative variation of thermal impedance junction to ambient versus pulse duration (DO-15).



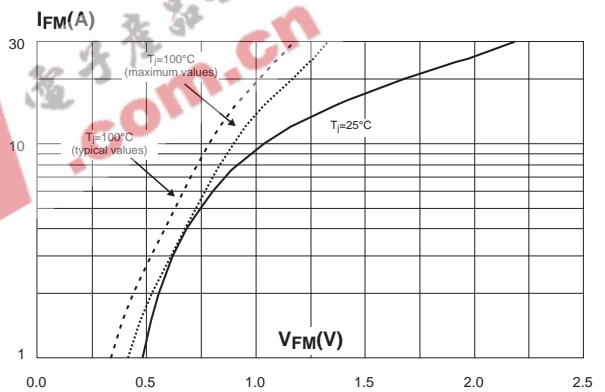
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).



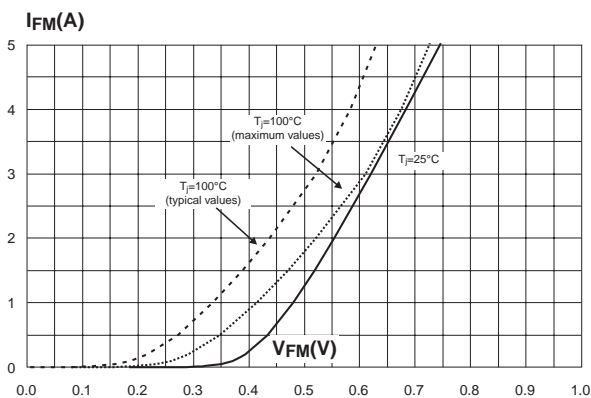
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).



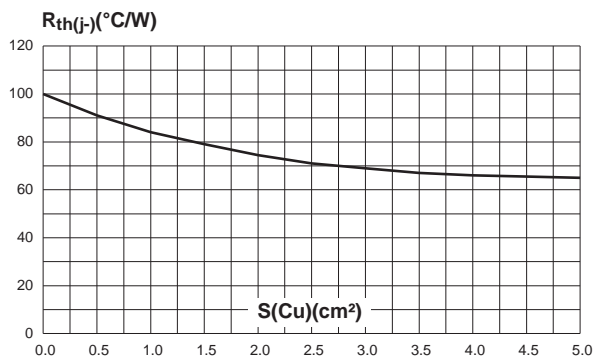
**Fig. 9-1:** Forward voltage drop versus forward current (high level, maximum values).



**Fig. 9-2:** Forward voltage drop versus forward current (low level, maximum values).

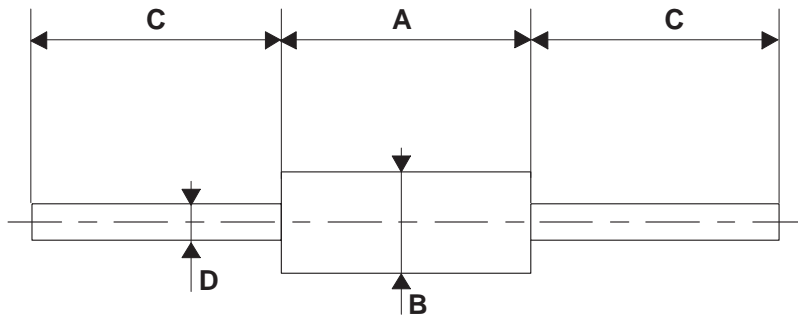


**Fig. 10:** Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, Cu: 35 $\mu m$ ) (SMB).



## PACKAGE MECHANICAL DATA

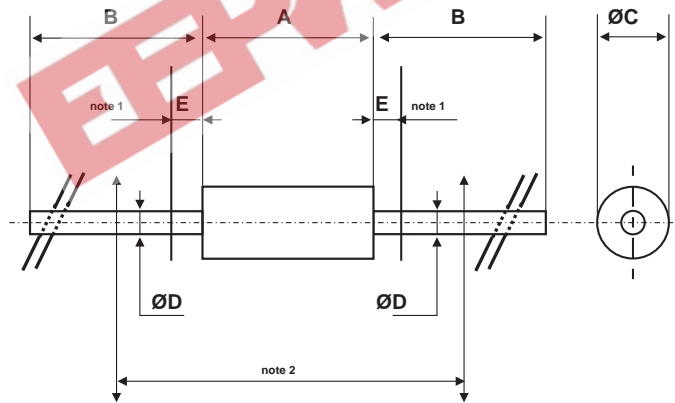
DO-15 plastic



| REF. | DIMENSIONS  |      |        |       |
|------|-------------|------|--------|-------|
|      | Millimeters |      | Inches |       |
|      | Min.        | Max. | Min.   | Max.  |
| A    | 6.05        | 6.75 | 0.238  | 0.266 |
| B    | 2.95        | 3.53 | 0.116  | 0.139 |
| C    | 26          | 31   | 1.024  | 1.220 |
| D    | 0.71        | 0.88 | 0.028  | 0.035 |

## PACKAGE MECHANICAL DATA

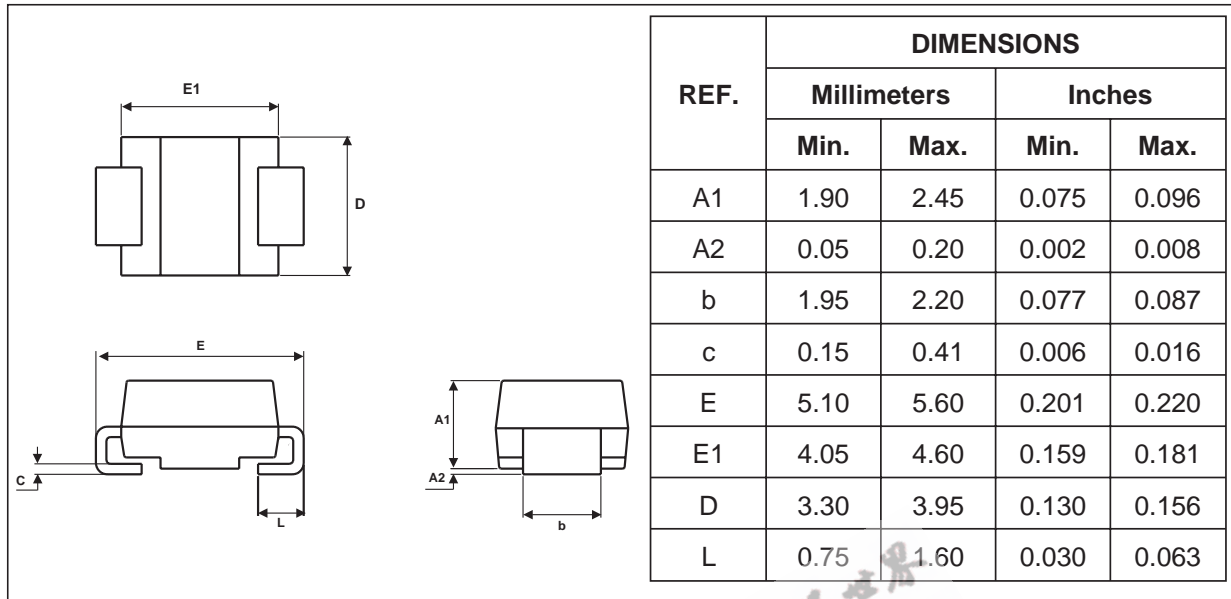
DO-201AD plastic



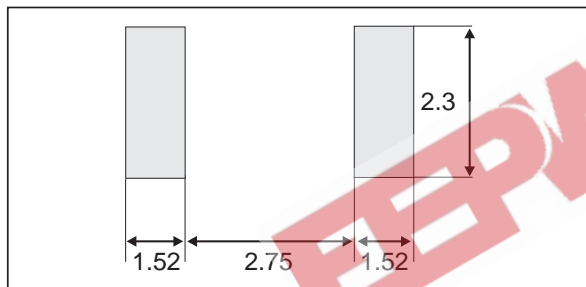
| REF.            | DIMENSIONS  |      |        |       | NOTES                                                                                                                                                                                         |
|-----------------|-------------|------|--------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Millimeters |      | Inches |       |                                                                                                                                                                                               |
|                 | Min.        | Max. | Min.   | Max.  |                                                                                                                                                                                               |
| A               |             | 9.50 |        | 0.374 | 1 - The lead diameter $\varnothing D$ is not controlled over zone E<br>2 - The minimum axial length within which the device may be placed with its leads bent at right angles is 0.59"(15 mm) |
| B               | 25.40       |      | 1.000  |       |                                                                                                                                                                                               |
| $\varnothing C$ |             | 5.30 |        | 0.209 |                                                                                                                                                                                               |
| $\varnothing D$ |             | 1.30 |        | 0.051 |                                                                                                                                                                                               |
| E               |             | 1.25 |        | 0.049 |                                                                                                                                                                                               |

# STPS3L60/Q/U

## PACKAGE MECHANICAL DATA SMB (JEDEC DO-214AA)



### FOOT PRINT DIMENSIONS (in millimeters)



| Ordering type | Marking  | Package  | Weight  | Base qty | Delivery mode |
|---------------|----------|----------|---------|----------|---------------|
| STPS3L60      | STPS3L60 | DO-201AD | 1.12g   | 600      | Ammopack      |
| STPS3L60RL    | STPS3L60 | DO-201AD | 1.12g   | 1900     | Tape & Reel   |
| STPS3L60Q     | STPS3L60 | DO-15    | 0.4 g   | 1000     | Ammopack      |
| STPS3L60QRL   | STPS3L60 | DO-15    | 0.4 g   | 6000     | Tape & Reel   |
| STPS3L60U     | G36      | SMB      | 0.107 g | 2500     | Tape & Reel   |

- White band indicates cathode
- Epoxy meets UL94,V0

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