



# 2SK3746 — High-Voltage, High-Speed Switching Applications

N-Channel Silicon MOSFET

## Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching
- High reliability (Adoption of HVP process)
- Avalanche resistance guarantee

## Specifications

### Absolute Maximum Ratings at Ta=25°C

| Parameter                          | Symbol          | Conditions             | Ratings     | Unit |
|------------------------------------|-----------------|------------------------|-------------|------|
| Drain-to-Source Voltage            | VDSS            |                        | 1500        | V    |
| Gate-to-Source Voltage             | VGSS            |                        | ±20         | V    |
| Drain Current (DC)                 | ID              |                        | 2           | A    |
| Drain Current (Pulse)              | IDP             | PW≤10μs, duty cycle≤1% | 4           | A    |
| Allowable Power Dissipation        | PD              |                        | 2.5         | W    |
|                                    |                 | Tc=25°C                | 110         | W    |
| Channel Temperature                | Tch             |                        | 150         | °C   |
| Storage Temperature                | Tstg            |                        | -55 to +150 | °C   |
| Avalanche Energy (Single Pulse) *1 | EAS             |                        | 41          | mJ   |
| Avalanche Current *2               | I <sub>AV</sub> |                        | 2           | A    |

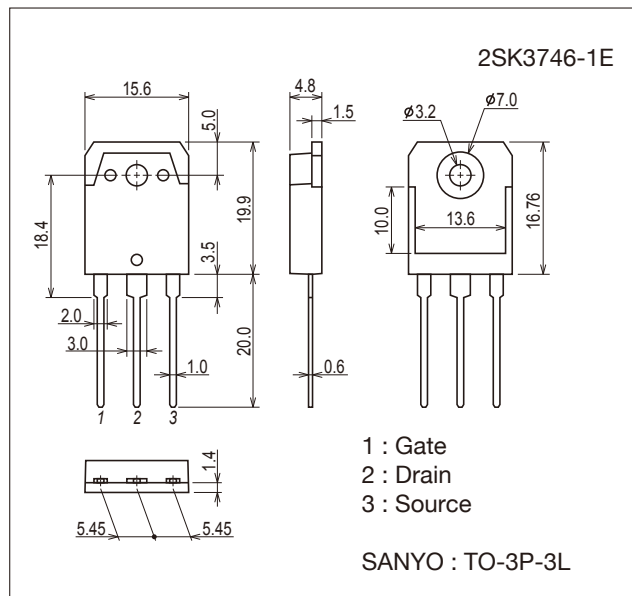
\*1 V<sub>DD</sub>=50V, L=20mH, I<sub>AV</sub>=2A (Fig.1)

\*2 L≤20mH, single pulse

## Package Dimensions

unit : mm (typ)

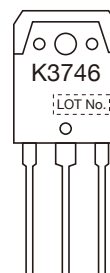
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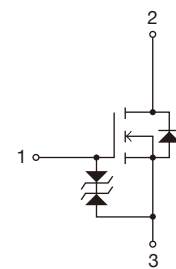
## Product & Package Information

- Package : TO-3P-3L
- JEITA, JEDEC : SC-65, TO-247, SOT-199
- Minimum Packing Quantity : 30 pcs./magazine

## Marking



## Electrical Connection

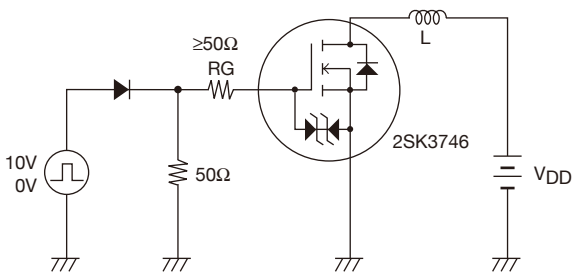


# 2SK3746

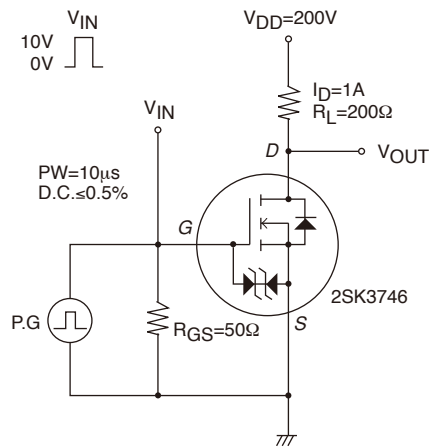
## Electrical Characteristics at Ta=25°C

| Parameter                                  | Symbol        | Conditions                        | Ratings |      |          | Unit     |    |
|--|---------------|-----------------------------------|---------|------|----------|----------|----|
|  |               |                                   | min     | typ  | max      |          |    |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=1mA, V_{GS}=0V$              | 1500    |      |          | V        |    |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=1200V, V_{GS}=0V$         |         |      | 100      | $\mu A$  |    |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS}=16V, V_{DS}=0V$           |         |      | $\pm 10$ | $\mu A$  |    |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=10V, I_D=1mA$             | 2.5     |      | 3.5      | V        |    |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=20V, I_D=1A$              | 0.7     | 1.4  |          | S        |    |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)}$  | $I_D=1A, V_{GS}=10V$              |         | 10   | 13       | $\Omega$ |    |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=30V, f=1MHz$              |         | 380  |          | pF       |    |
| Output Capacitance                         | $C_{oss}$     |                                   |         |      | 70       |          | pF |
| Reverse Transfer Capacitance               | $C_{rss}$     |                                   |         |      | 40       |          | pF |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See Fig.2                         |         | 12   |          | ns       |    |
| Rise Time                                  | $t_r$         |                                   |         | 37   |          | ns       |    |
| Turn-OFF Delay Time                        | $t_{d(off)}$  |                                   |         | 152  |          | ns       |    |
| Fall Time                                  | $t_f$         |                                   |         | 59   |          | ns       |    |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=200V, V_{GS}=10V, I_D=2A$ |         | 37.5 |          | nC       |    |
| Gate-to-Source Charge                      | $Q_{gs}$      |                                   |         | 2.7  |          | nC       |    |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      |                                   |         | 20   |          | nC       |    |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=2A, V_{GS}=0V$               |         | 0.88 | 1.2      | V        |    |

**Fig.1 Avalanche Resistance Test Circuit**

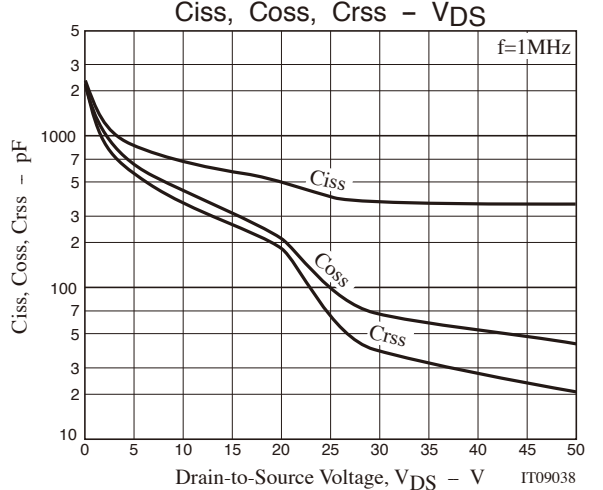
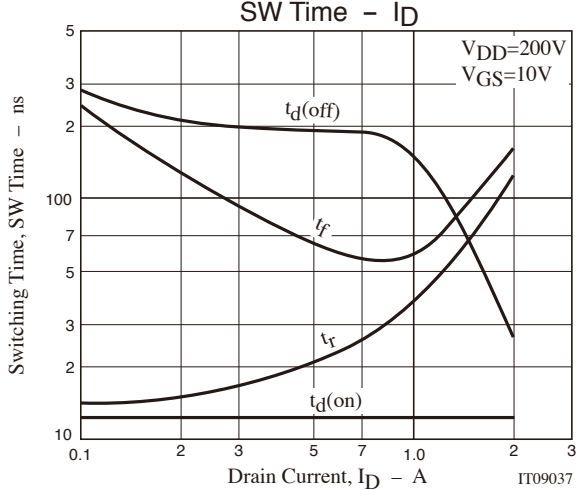
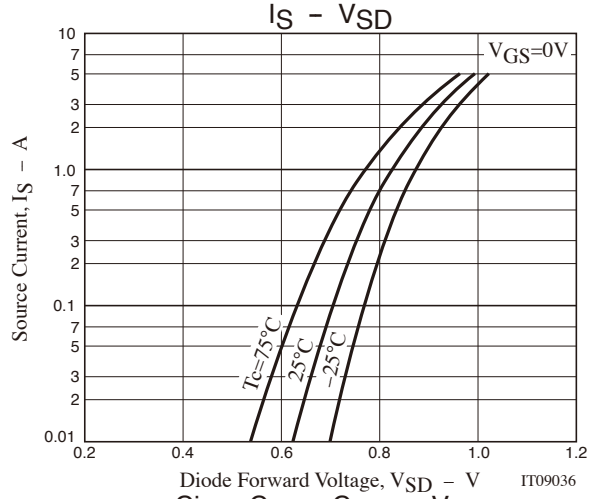
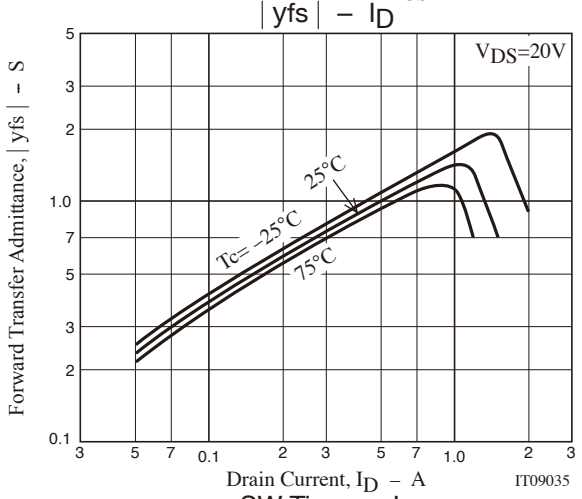
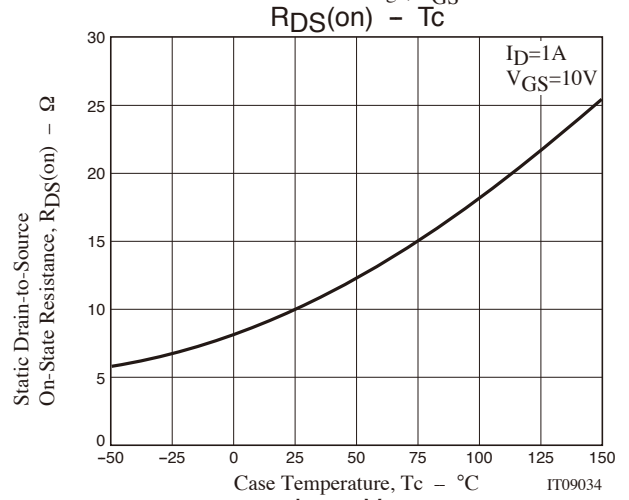
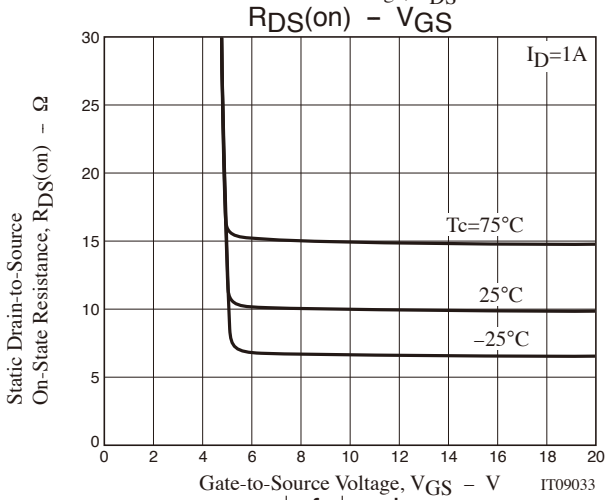
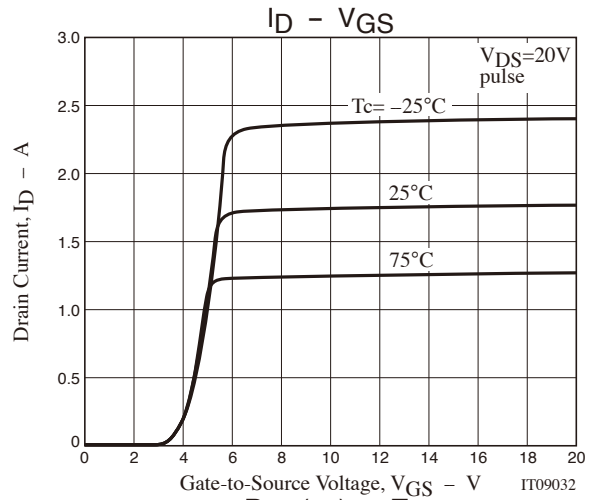
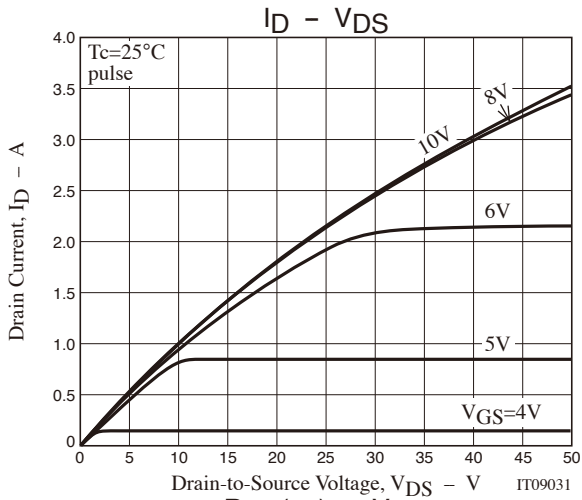


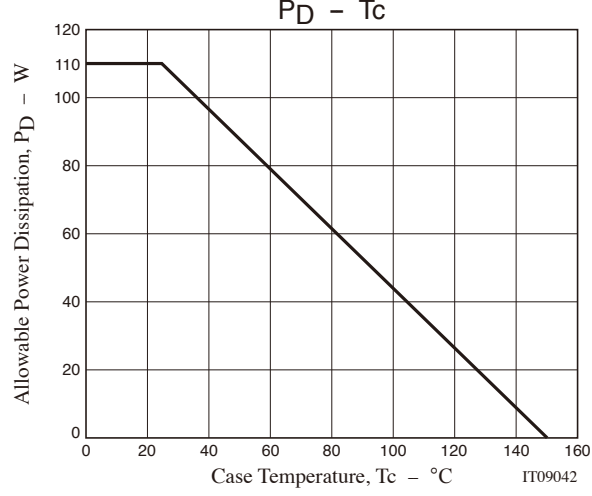
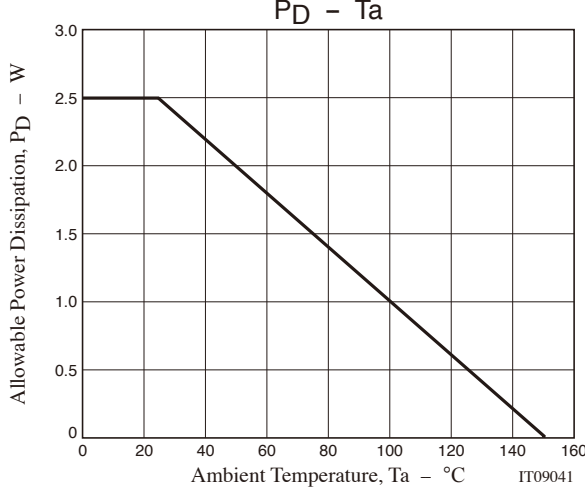
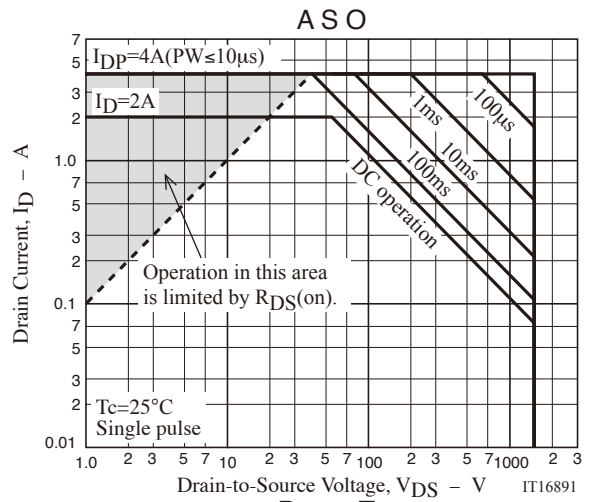
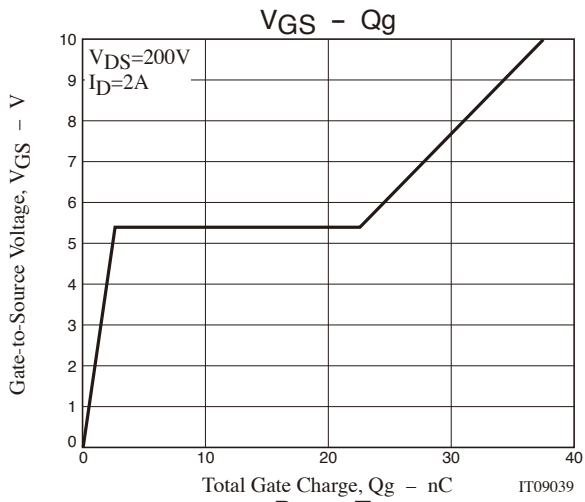
**Fig.2 Switching Time Test Circuit**



## Ordering Information

| Device     | Package  | Shipping        | memo    |
|------------|----------|-----------------|---------|
| 2SK3746-1E | TO-3P-3L | 30pcs./magazine | Pb Free |





Magazine Specification

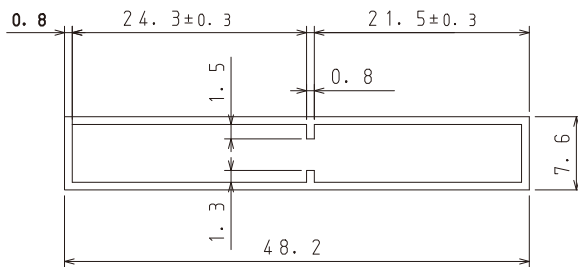
2SK3746-1E

1. Packing Format

| Package Name | Maximum Number of devices contained (pcs) |           |           | Packing format   |  |
|--------------|---|-----------|-----------|--|--|
|              | Magazine                                  | Inner box | Outer box | Inner BOX  | Outer BOX  |
| TO-3P-3L     | 30  | 450       | 1800      | SPD-0V0001<br>15 magazines contained<br>Dimensions:mm (external)<br>568×150×55 | SPD-LV0010<br>4 inner boxes contained<br>Dimensions:mm (external)<br>590×225×178 |

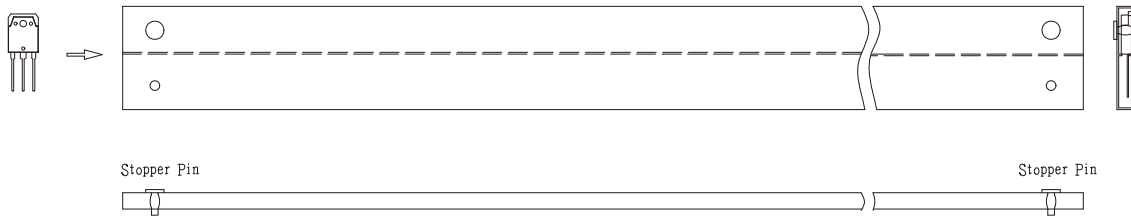
2. Magazine dimensions

(unit:mm)



Tolerance=±0.2mm  
 Thickness=0.8±0.2mm  
 Length =508.0±1mm  
 Material =PVC or PET  
 (Antistatic treatment)

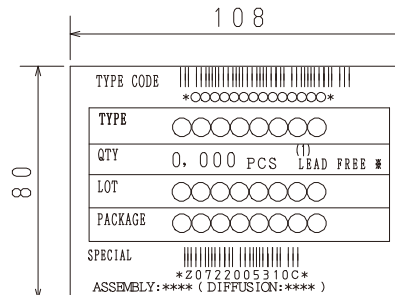
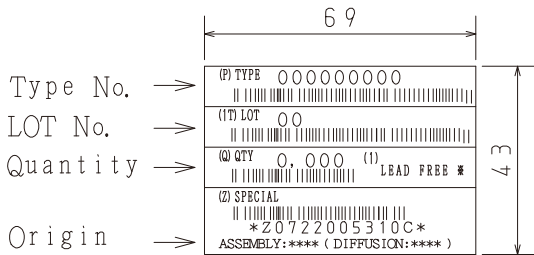
3. Storage method to magazine



4. Inner box label (unit:mm)

5. Outer box label (unit:mm)

It is a label at the time of factory shipments.  
 The form of a label may change in physical distribution process.



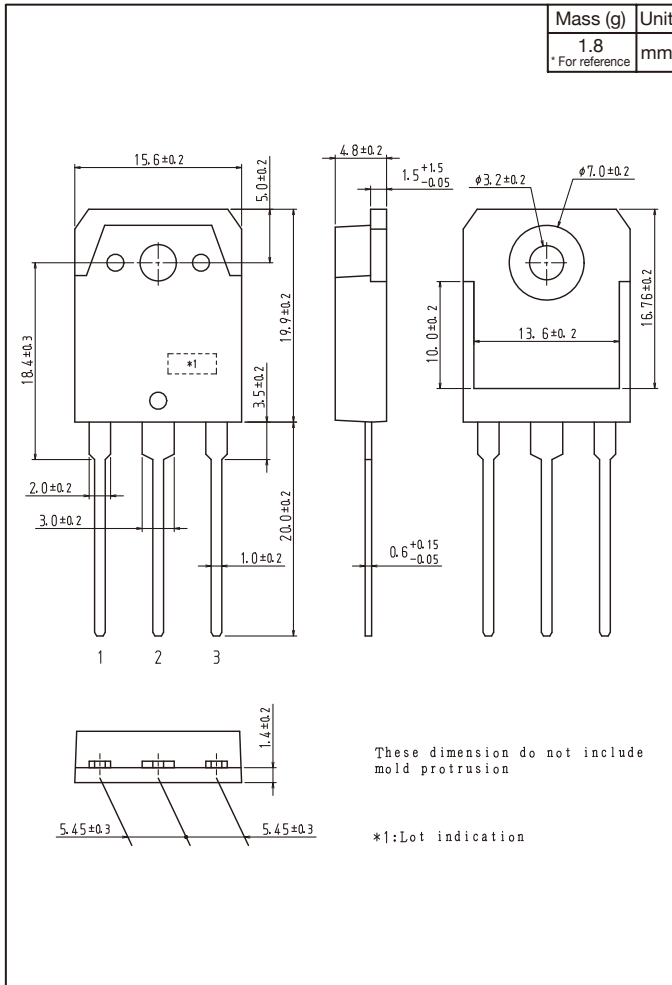
NOTE (1)  
 The LEAD FREE \* description shows that the surface treatment of the terminal is lead free,

|             |                |
|-------------|----------------|
| Label       | JEITA Phase    |
| LEAD FREE 3 | JEITA Phase 3A |

# 2SK3746

## Outline Drawing

2SK3746-1E



Note on usage : Since the 2SK3746 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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- Техническую поддержку проекта.
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- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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