

## 1. Description

These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent  $R_{DS(ON)}$  and low gate charge. Which accords with the RoHS standard.

## 2.2 Features

- Fast switching
- Low reverse transfer capacitances

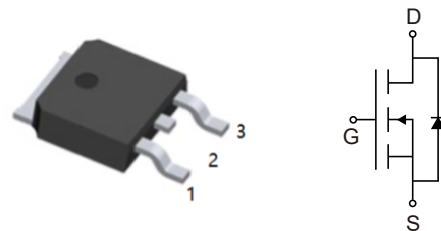
## 2.1 Features

- $V_{DS(V)}=30V$
- $I_D=100A$
- $R_{DS(ON)}=3.8m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}=6.4m\Omega(V_{GS}=4.5V)$

## 3. Pinning Information

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | G      | GATE        |
| 3   | S      | SOURCE      |
| 2   | D      | DRAIN       |

TO-252(DPAK)  
top view



## 4. Absolute Maximum Ratings $T_A=25^\circ C$

| Parameter                                 |                   | Symbol    | Rating     | Units      |
|-------------------------------------------|-------------------|-----------|------------|------------|
| Drain-Source Voltage                      |                   | $V_{DS}$  | 30         | V          |
| Gate-Source Voltage                       |                   | $V_{GS}$  | $\pm 20$   |            |
| Drain Current-Continuous <sup>Note3</sup> | $T_C=25^\circ C$  | $I_D$     | 100        | A          |
|                                           | $T_C=100^\circ C$ |           | 63         |            |
| Drain Current-Pulsed <sup>Note1</sup>     |                   | $I_{DM}$  | 200        |            |
| Avalanche Energy <sup>Note4</sup>         |                   | $E_{AS}$  | 280        | mJ         |
| Avalanche Energy                          |                   | $I_{AS}$  | 33         | A          |
| Maximum Power Dissipation                 | $T_C=25^\circ C$  | $P_D$     | 105        | W          |
| Storage Temperature Range                 |                   | $T_{STG}$ | -55 to 150 | $^\circ C$ |
| Operating Junction Temperature Range      |                   | $T_J$     | -55 to 150 | $^\circ C$ |



## 5. Thermal Resistance Rating

| Parameter                            | Symbol          | Min | Typ | Max | Units                |
|--------------------------------------|-----------------|-----|-----|-----|----------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ |     | 3.3 |     | $^{\circ}\text{C/W}$ |

## 6. Specifications ( $T_J = 25^{\circ}\text{C}$ , unless otherwise noted)

| Parameter                        | Symbol       | Conditions                                             | Min | Typ  | Max       | Units      |
|----------------------------------|--------------|--------------------------------------------------------|-----|------|-----------|------------|
| OFF CHARACTERISTICS              |              |                                                        |     |      |           |            |
| Drain-Source Breakdown Voltage   | $BV_{DSS}$   | $V_{GS}=0V, I_{DS}=250\mu A$                           | 30  |      |           | V          |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    | $V_{DS}=30V, V_{GS}=0V$                                |     |      | 1         | $\mu A$    |
| Gate-Body Leakage                | $I_{GSS}$    | $V_{GS}=\pm 20V, V_{DS}=0V$                            |     |      | $\pm 100$ | nA         |
| ON CHARACTERISTIC                |              |                                                        |     |      |           |            |
| Gate Threshold Voltage           | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_{DS}=250\mu A$                       | 1   | 1.7  | 2.5       | V          |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_{DS}=30A$                               |     | 3.8  | 4.9       | m $\Omega$ |
|                                  |              | $V_{GS}=4.5V, I_{DS}=20A$                              |     | 6.4  | 7.9       | m $\Omega$ |
| DYNAMIC CHARACTERISTICS          |              |                                                        |     |      |           |            |
| Input Capacitance                | $C_{iss}$    | $V_{DS}=15V, V_{GS}=0V, f=1MHz$                        |     | 1963 |           | pF         |
| Output Capacitance               | $C_{oss}$    |                                                        |     | 248  |           | pF         |
| Reverse Transfer Capacitance     | $C_{rss}$    |                                                        |     | 221  |           | pF         |
| Gate Resisistance                | $R_g$        | $V_{DD}=0V, V_{GS}=1V, f=1MHz$                         |     | 1.43 |           | $\Omega$   |
| SWITCHING CHARACTERISTICS        |              |                                                        |     |      |           |            |
| Turn-On Delay Time               | $t_{D(on)}$  | $V_{GS}=10V, V_{DS}=15V$<br>$R_{GEN}=3\Omega, I_D=20A$ |     | 55   |           | ns         |
| Rise Time                        | $t_r$        |                                                        |     | 36.4 |           | ns         |
| Turn-Off Delay Time              | $t_{D(off)}$ |                                                        |     | 37.5 |           | ns         |
| Fall Time                        | $t_f$        |                                                        |     | 14   |           | ns         |
| Total Gate Charge at 10V         | $Q_g$        | $V_{DS}=15V, I_{DS}=45A, V_{GS}=10V$                   |     | 41   |           | nC         |
| Gate to Source Gate Charge       | $Q_{gs}$     |                                                        |     | 6.4  |           | nC         |
| Gate to Drain“Miller”Charge      | $Q_{gd}$     |                                                        |     | 11   |           | nC         |



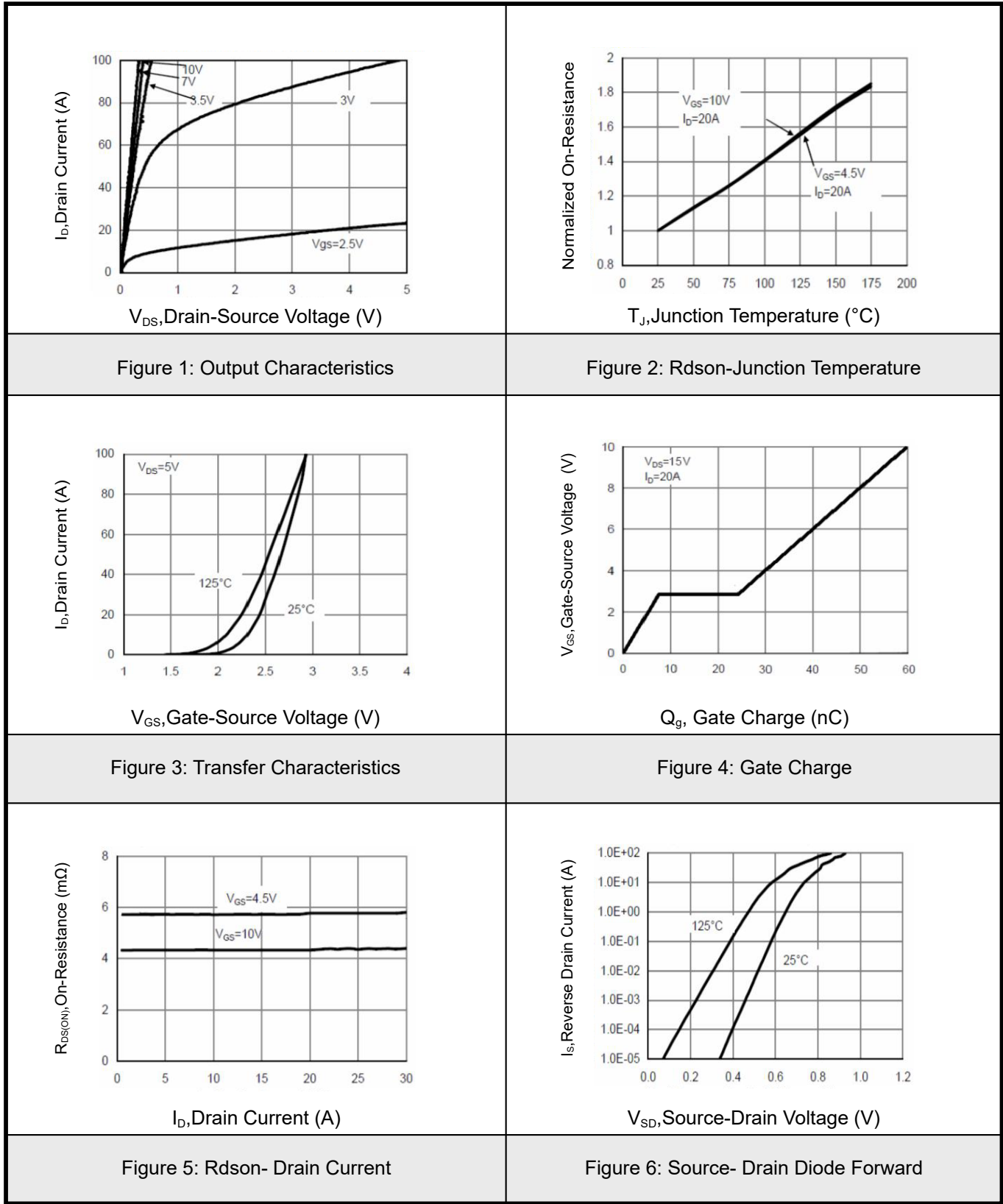
| DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS |          |                            |  |      |     |    |
|--------------------------------------------------------|----------|----------------------------|--|------|-----|----|
| Drain-Source Diode Forward Voltage                     | $V_{SD}$ | $V_{GS}=0V, I_{DS}=20A$    |  |      | 1.2 | V  |
| Reverse Recovery Time                                  | $t_{rr}$ | $T_J=25^{\circ}C, I_F=20A$ |  | 21.7 |     | nS |
| Reverse Recovery Charge                                | $Q_{rr}$ |                            |  | 7.2  |     | nC |

Notes:

- 1: Repetitive rating; pulse width limited by maximum junction temperature .
- 2: Surface mounted on FR4 Board,  $t_s \leq 10sec$ .
- 3: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 4:  $E_{AS}$  condition:  $L=0.5mH, V_{DD}=15V, V_G=10V, V_{GATE}=30V$ , Start  $T_J=25^{\circ}C$ .



7.1Typical Characteristics





## 7.2 Typical Characteristics

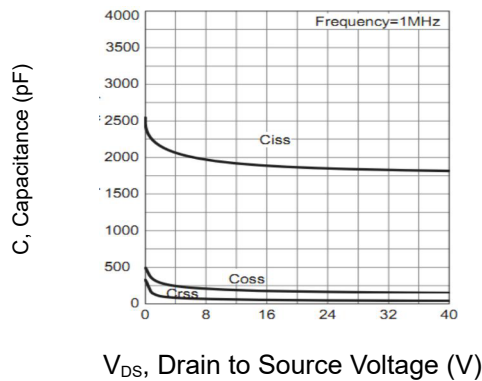
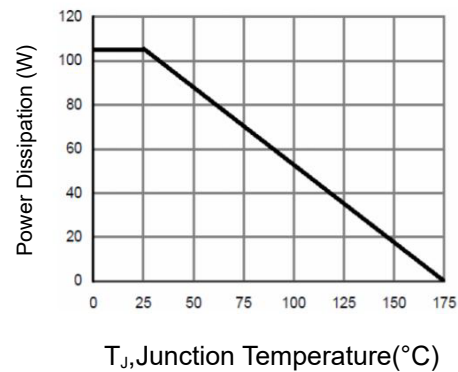
Figure 7: Capacitance vs  $V_{DS}$ 

Figure 8: Power De-rating

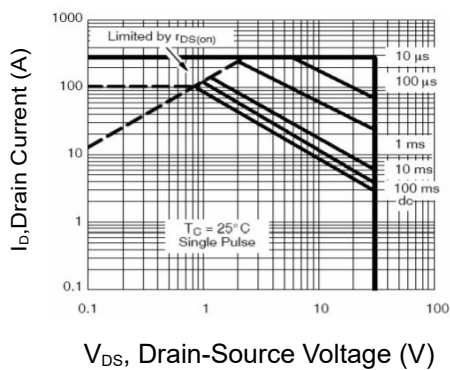


Figure 9: Safe Operation Area

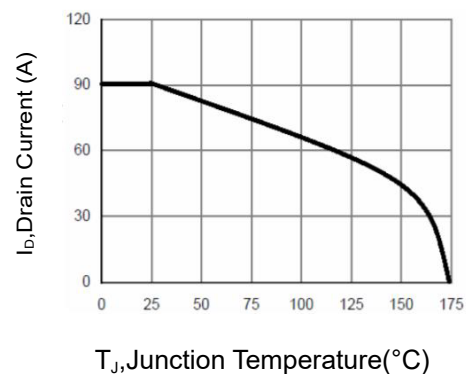
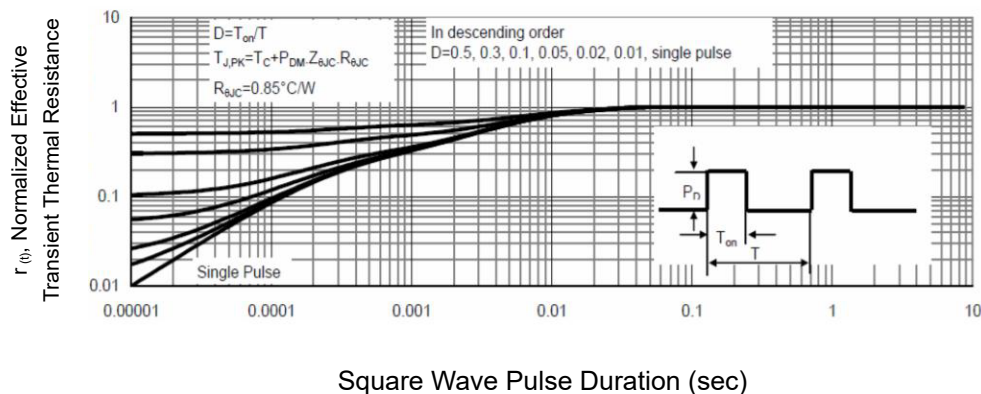
Figure 10:  $I_D$  Current Derating

Figure 11: Normalized Maximum Transient Thermal impedance



## 7.3 Typical Characteristics

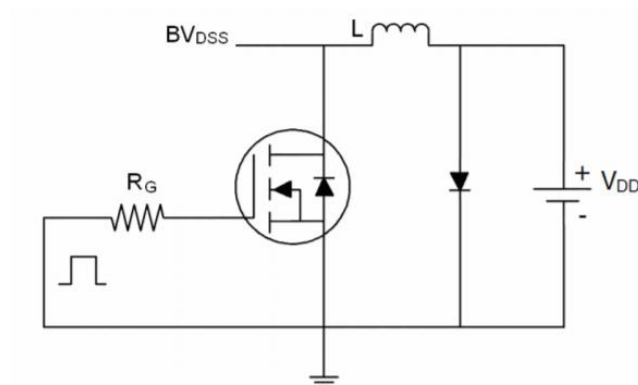
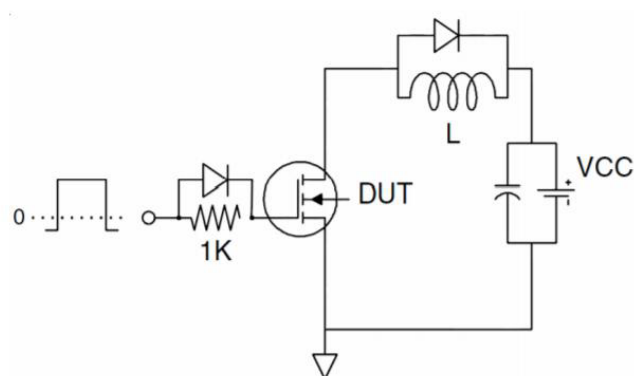
Figure 12:  $E_{AS}$  Test Circuit

Figure 13: Gate Charge Test Circuit

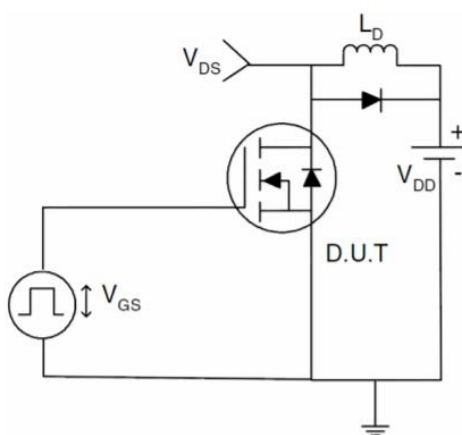
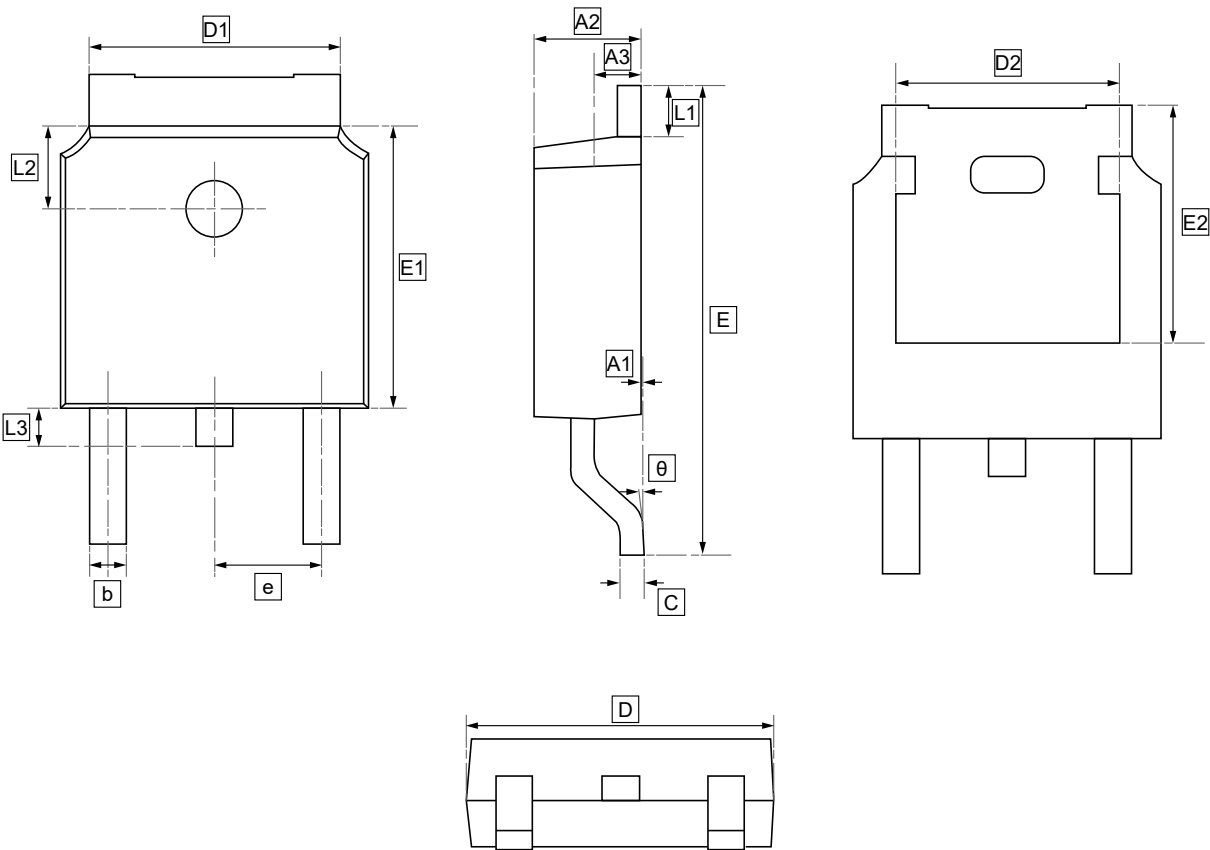


Figure 14: Switch Time Test Circuit



8.TO-252 Package Outline Dimensions

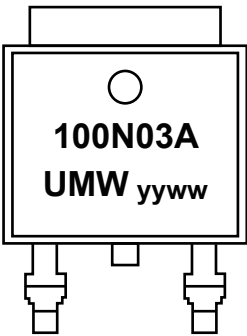


DIMENSIONS (mm are the original dimensions)

| Symbol | A1   | A2   | A3   | b    | c    | D    | D1   | D2   | E     | E1   | E2   | e     | L1   | L2   | L3   | θ    |
|--------|------|------|------|------|------|------|------|------|-------|------|------|-------|------|------|------|------|
| Min    | 0.00 | 2.18 | 0.90 | 0.65 | 0.46 | 6.35 | 4.95 | 4.32 | 9.40  | 5.97 | 5.21 | 2.286 | 0.89 | 1.70 | 0.60 | 0.00 |
| Max    | 0.13 | 2.39 | 1.10 | 0.85 | 0.61 | 6.73 | 5.46 | 4.90 | 10.41 | 6.22 | 5.38 |       | BSC  | 1.27 | 1.90 | 1.00 |



9.Ordering Information



yy: Year Code  
ww: Week Code

| Order Code  | Package | Base QTY | Delivery Mode |
|-------------|---------|----------|---------------|
| UMW 100N03A | TO-252  | 2500     | Tape and reel |



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