

30V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ max | I_D max $T_A = +25^\circ C$ |
|---------------|--------------------------------|----------------------------------|
| 30V | 22m Ω @ $V_{GS} = 10V$ | 6.7A |
| | 30m Ω @ $V_{GS} = 4.5V$ | 5.2A |

Description

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.


Applications

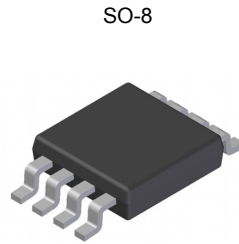
- Backlighting
- Power Management Functions
- DC-DC Converters

Features

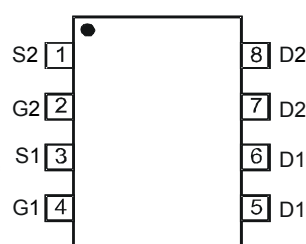
- Low On-Resistance
- 100% UIS (Avalanche) Rated
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

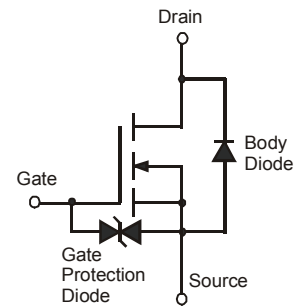
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe.
Solderable per MIL-STD-202, Method 208 
- Weight: 0.008 grams (approximate)



Top View



Top View
Pin Configuration



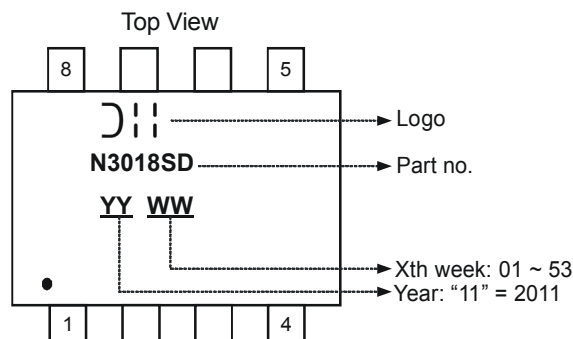
Equivalent Circuit per Element

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|------|------------------|
| DMN3018SSD-13 | SO-8 | 2500/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|---|--------------|------------------------|------------------|-------|-------|
| Drain-Source Voltage | | | V _{DSS} | 30 | V |
| Gate-Source Voltage | | | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) V _{GS} = 10V | Steady State | T _A = +25°C | I _D | 6.7 | A |
| | | T _A = +70°C | | 5.3 | |
| | t < 10s | T _A = +25°C | I _D | 8.7 | A |
| | | T _A = +70°C | | 6.9 | |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | | | I _{DM} | 60 | A |
| Maximum Body Diode continuous Current | | | I _S | 2.0 | A |
| Avalanche Current (Note 6) L = 0.1mH | | | I _{AR} | 19 | A |
| Repetitive Avalanche Energy (Note 6) L = 0.1mH | | | E _{AR} | 18 | mJ |

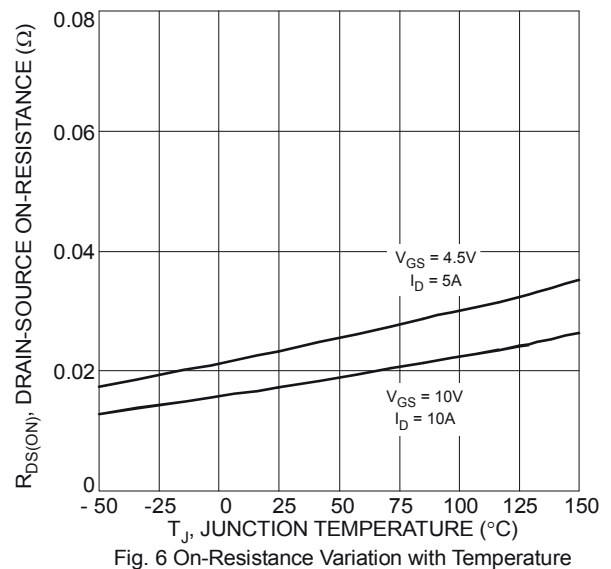
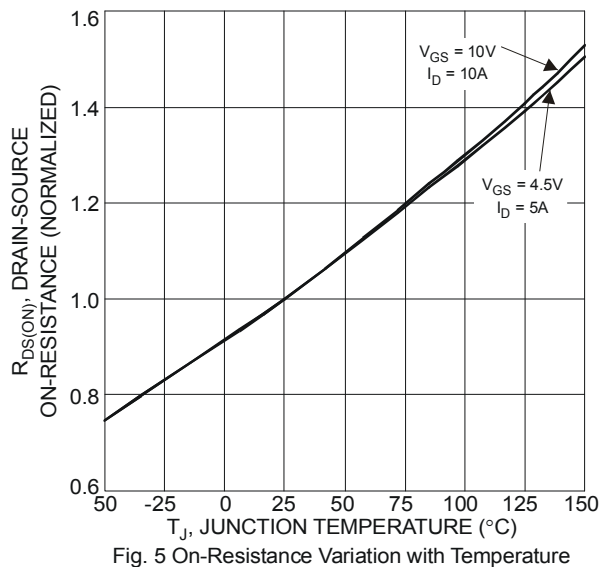
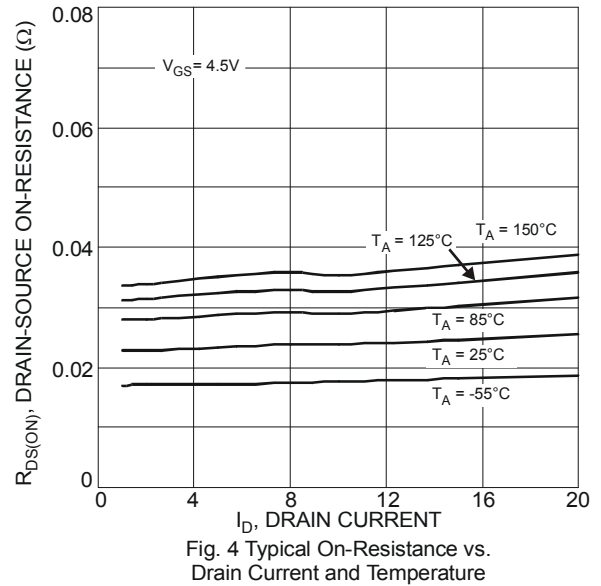
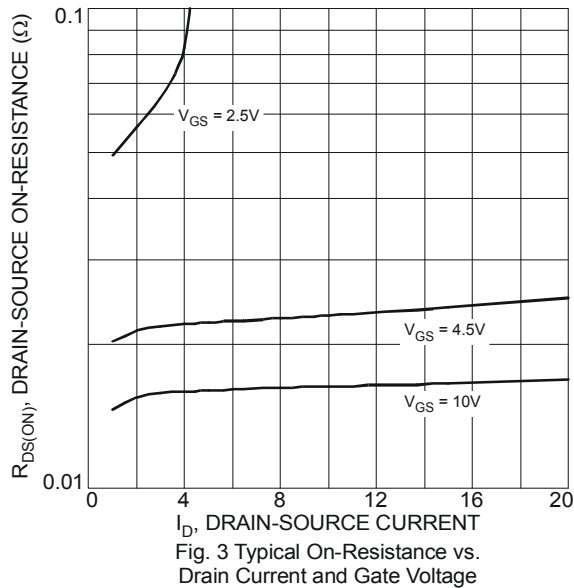
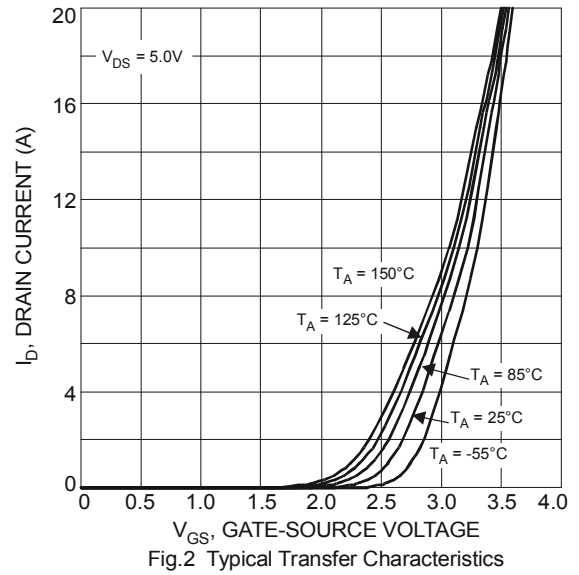
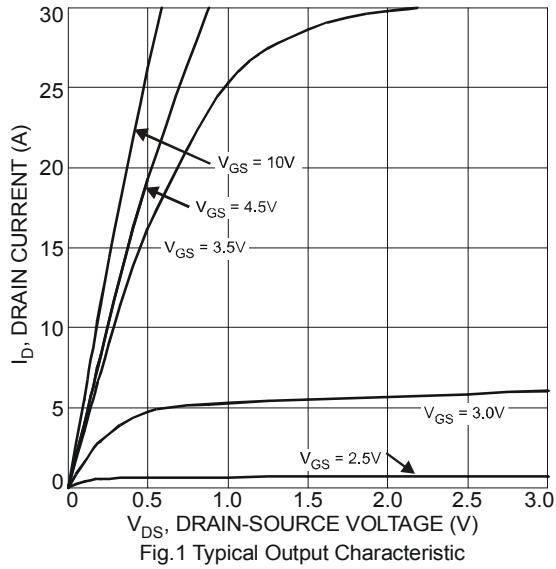
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Units |
|--|--------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5) | | P _D | 1.5 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state | R _{θJA} | 83 | °C/W |
| | t < 10s | | 50 | °C/W |
| Thermal Resistance, Junction to Case (Note 5) | | R _{θJC} | 14.5 | °C/W |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|------|-----|------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 30 | — | — | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 24V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | µA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 1 | 1.7 | 2.1 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | 16 | 22 | mΩ | V _{GS} = 10V, I _D = 10A |
| | | — | 23 | 30 | | V _{GS} = 4.5V, I _D = 6A |
| Forward Transfer Admittance | Y _{fs} | — | 8.3 | — | S | V _{DS} = 5V, I _D = 6.9A |
| Diode Forward Voltage | V _{SD} | 0.5 | — | 1.2 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 697 | — | pF | V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 97 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 67 | — | | |
| Gate resistance | R _g | — | 1.47 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 6.0 | — | nC | V _{GS} = 10V, V _{DS} = 15V, I _D = 9A |
| Total Gate Charge (V _{GS} = 10V) | Q _g | — | 13.2 | — | | |
| Gate-Source Charge | Q _{gs} | — | 2.2 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 1.8 | — | | |
| Turn-On Delay Time | t _{D(on)} | — | 4.3 | — | ns | V _{DD} = 15V, V _{GS} = 10V, R _L = 15Ω, I _D = 1A, R _G = 6Ω |
| Turn-On Rise Time | t _r | — | 4.4 | — | | |
| Turn-Off Delay Time | t _{D(off)} | — | 20.1 | — | | |
| Turn-Off Fall Time | t _f | — | 4.1 | — | | |
| Reverse Recovery Time | t _{rr} | — | 7.3 | — | ns | I _F = 9A, di/dt = 500A/µs |
| Reverse Recovery Charge | Q _{rr} | — | 7.9 | — | nC | |

- Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
6. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = +25°C
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.



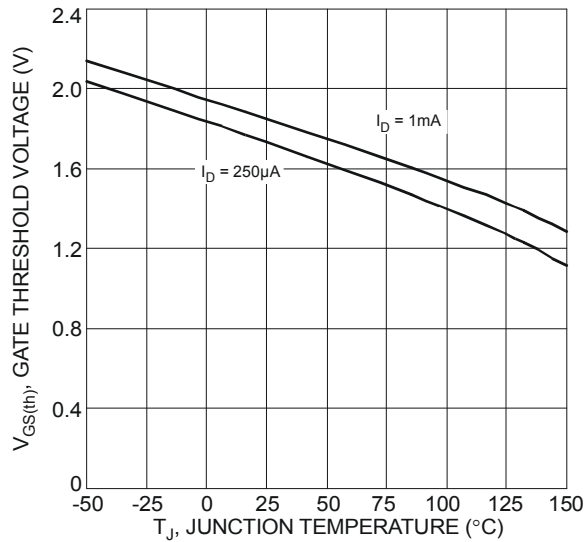


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

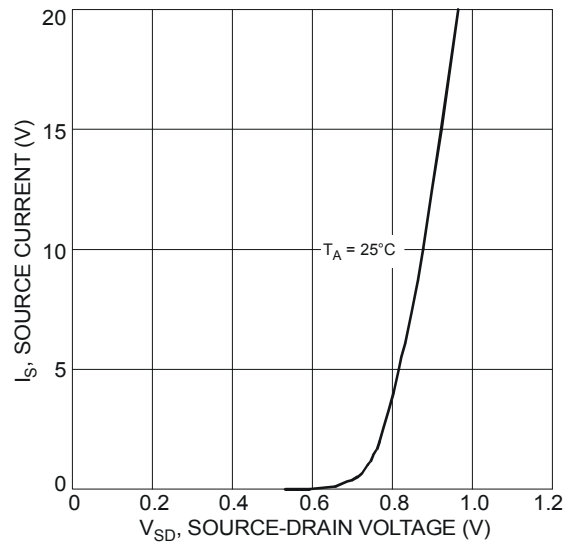


Fig. 8 Diode Forward Voltage vs. Current

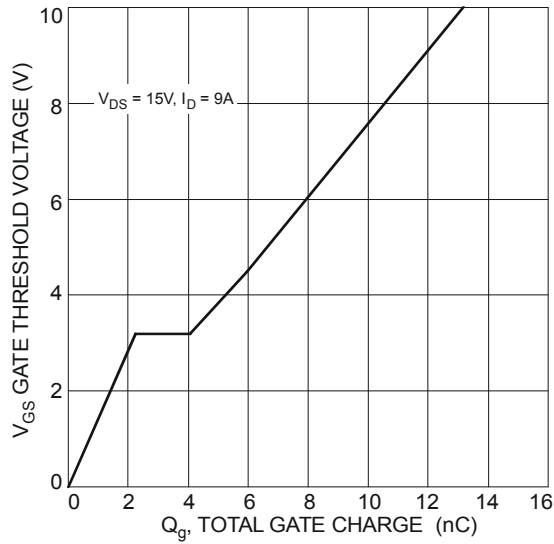


Fig. 9 Gate Charge

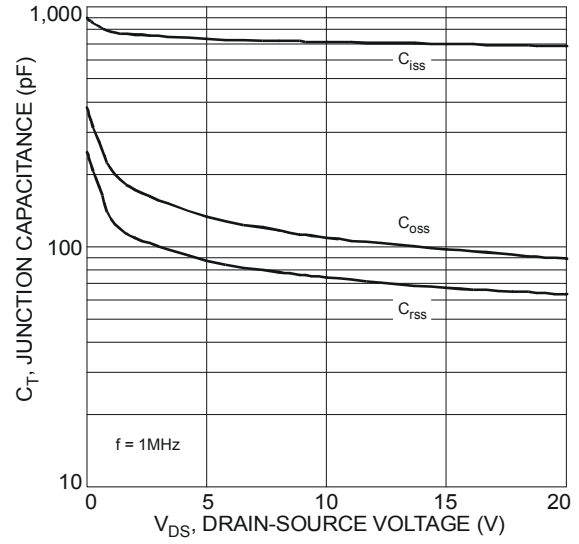


Fig. 10 Typical Junction Capacitance

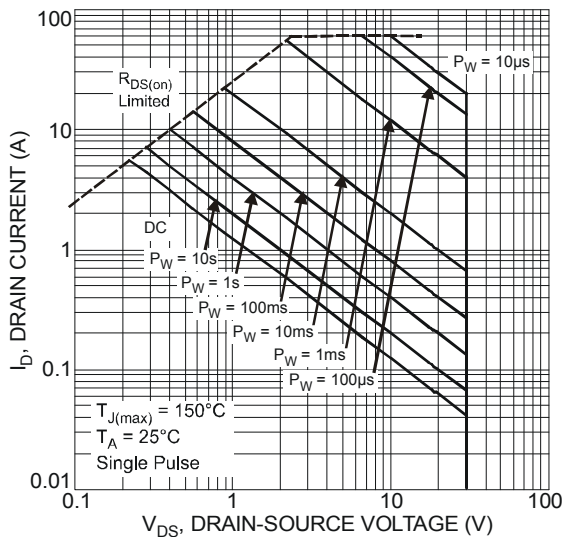
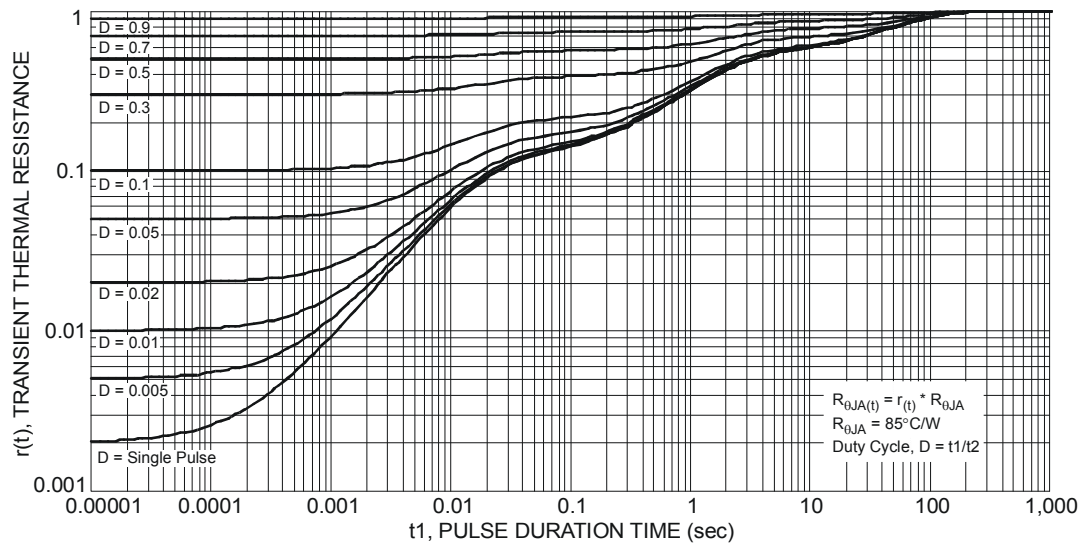
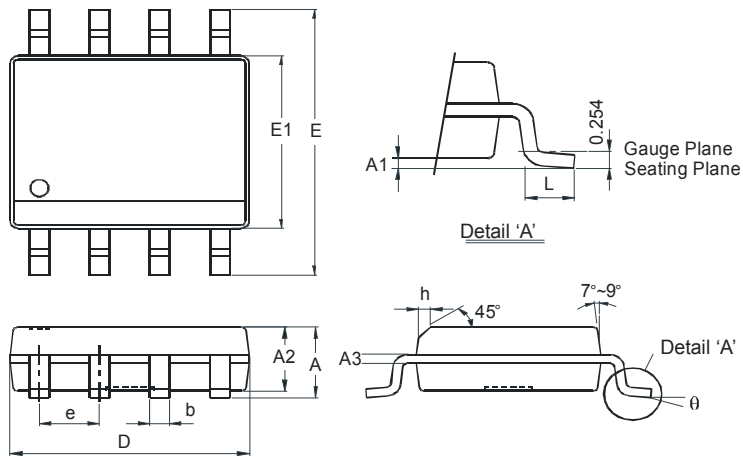


Fig. 11 SOA, Safe Operation Area



Package Outline Dimensions

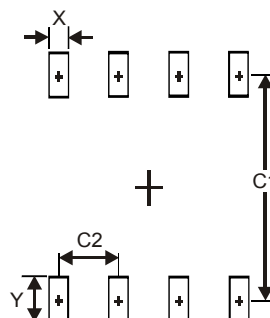
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SO-8 | | |
|----------------------|----------|------|
| Dim | Min | Max |
| A | - | 1.75 |
| A1 | 0.10 | 0.20 |
| A2 | 1.30 | 1.50 |
| A3 | 0.15 | 0.25 |
| b | 0.3 | 0.5 |
| D | 4.85 | 4.95 |
| E | 5.90 | 6.10 |
| E1 | 3.85 | 3.95 |
| e | 1.27 Typ | |
| h | - | 0.35 |
| L | 0.62 | 0.82 |
| θ | 0° | 8° |
| All Dimensions in mm | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| X | 0.60 |
| Y | 1.55 |
| C1 | 5.4 |
| C2 | 1.27 |

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