

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ max | I_D max $T_A = 25^\circ\text{C}$ |
|---------------|---------------------------------------|---------------------------------------|
| 30V | 21m Ω @ $V_{GS} = 10\text{V}$ | 7.3A |
| | 35m Ω @ $V_{GS} = 4.5\text{V}$ | 5.5A |

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **"Green" component and RoHS compliant (Notes 1 & 2)**
- **Qualified to AEC-Q101 standards for High Reliability**

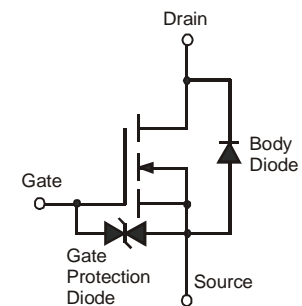
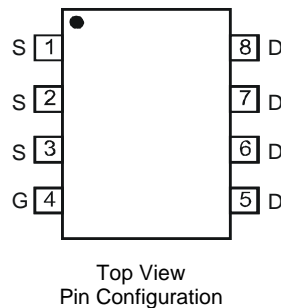
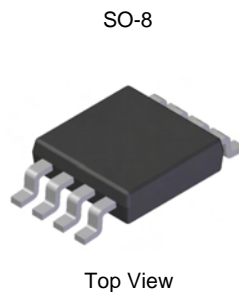
Description and Applications

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.

- Backlighting
- Power Management Functions
- DC-DC Converters

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)

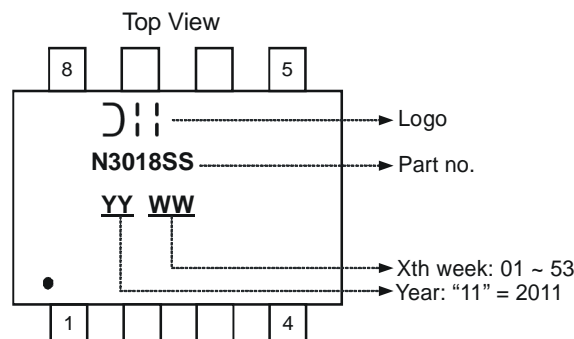


Ordering Information (Note 3)

| Part Number | Case | Packaging |
|---------------|------|------------------|
| DMN3018SSS-13 | SO-8 | 2500/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free.
 2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
 3. 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} | ±25 | V |
| Continuous Drain Current (Note 5) V _{GS} = 10V | Steady State | T _A = 25°C T _A = 70°C | I _D | 7.3 5.7 | A |
| | t<10s | T _A = 25°C T _A = 70°C | I _D | 9.7 7.8 | A |
| Continuous Drain Current (Note 5) V _{GS} = 4.5V | Steady State | T _A = 25°C T _A = 70°C | I _D | 5.5 4.3 | A |
| | t<10s | T _A = 25°C T _A = 70°C | I _D | 7.6 5.8 | A |
| Pulsed Drain Current (10μs pulse, duty cycle = 1%) | | | I _{DM} | 60 | A |
| Maximum Body Diode continuous Current | | | I _S | 2.5 | A |

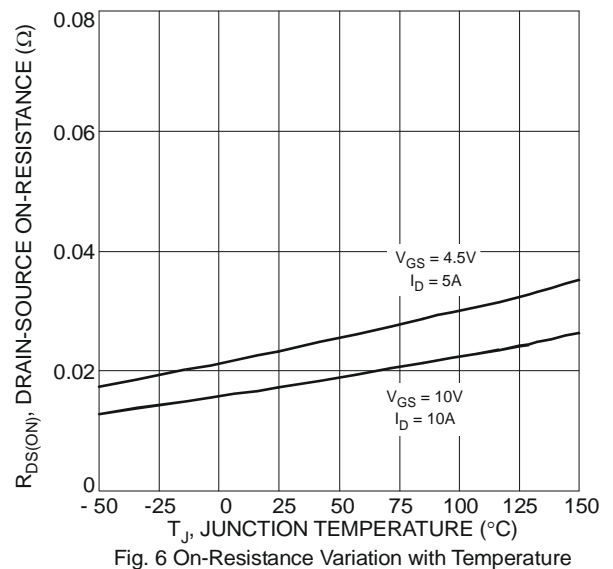
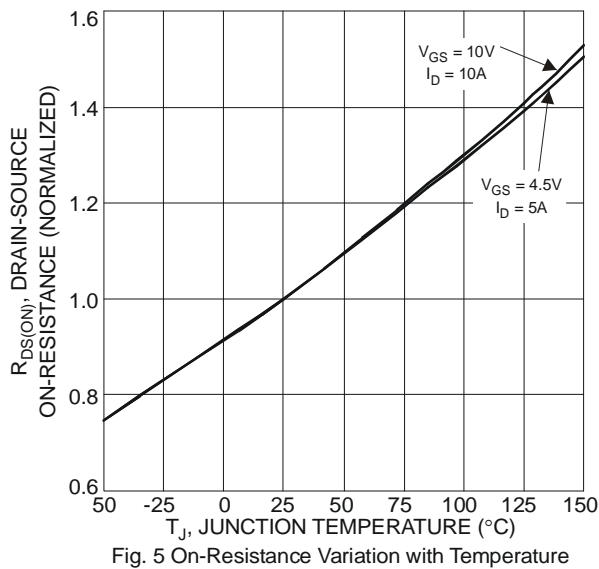
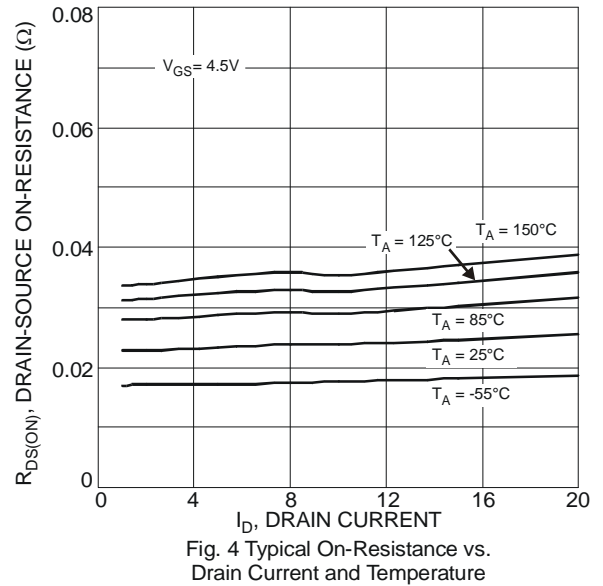
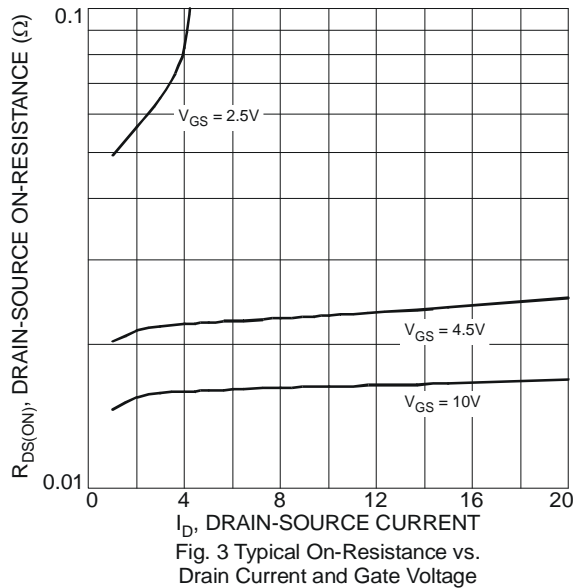
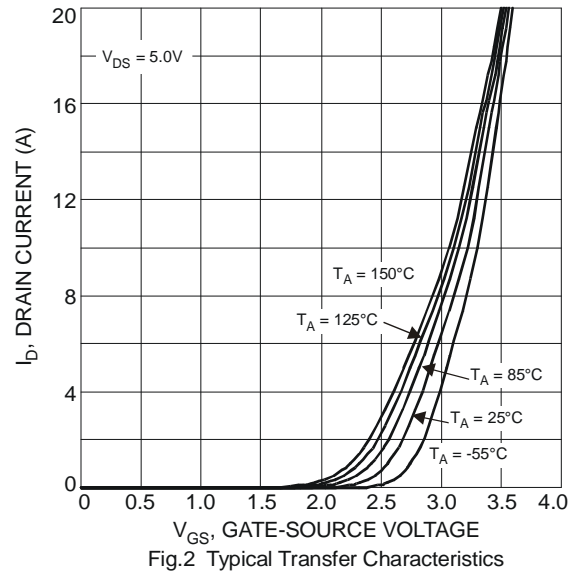
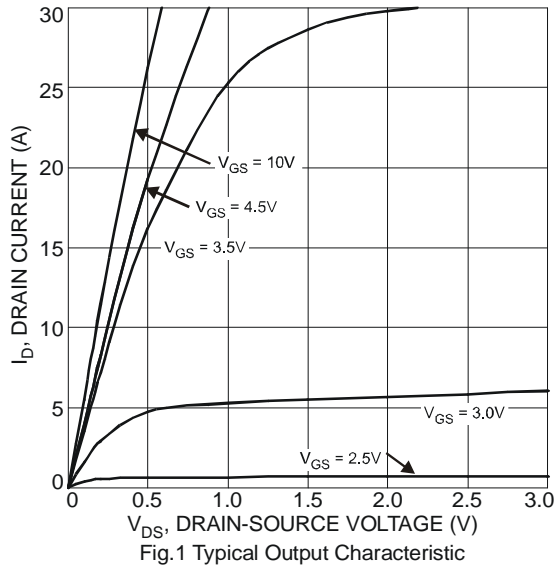
Thermal Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Value | Units |
|--|-----------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 4) | T _A = 25°C | P _D | 1.4 | W |
| | T _A = 70°C | | 0.9 | |
| Thermal Resistance, Junction to Ambient (Note 4) | Steady state | R _{θJA} | 90 | °C/W |
| | t<10s | | 50 | °C/W |
| Total Power Dissipation (Note 5) | T _A = 25°C | P _D | 1.7 | W |
| | T _A = 70°C | | 1.1 | |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state | R _{θJA} | 75 | °C/W |
| | t<10s | | 42 | °C/W |
| Thermal Resistance, Junction to Case (Note 5) | | R _{θJC} | 7.6 | °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 6) | | | | | | |
| 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 6) | | | | | | |
| 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)} | - | 15 | 21 | mΩ | V _{GS} = 10V, I _D = 10A |
| | | - | 20 | 35 | | V _{GS} = 4.5V, I _D = 8.5A |
| 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 7) | | | | | | |
| Input Capacitance | C _{iss} | - | 697 | - | pF | V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | - | 97 | - | pF | |
| Reverse Transfer Capacitance | C _{riss} | - | 67 | - | pF | |
| 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 | - | nC | |
| Gate-Source Charge | Q _{gs} | - | 2.2 | - | nC | |
| Gate-Drain Charge | Q _{gd} | - | 1.8 | - | nC | |
| 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 | - | ns | |
| Turn-Off Delay Time | t _{D(off)} | - | 20.1 | - | ns | |
| Turn-Off Fall Time | t _f | - | 4.1 | - | ns | |
| Reverse Recovery Time | T _{rr} | - | 7.3 | - | ns | |
| Reverse Recovery Charge | Q _{rr} | - | 7.9 | - | nC | I _F = 9A, di/dt = 500A/μs |

- Notes: 4. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to product testing.



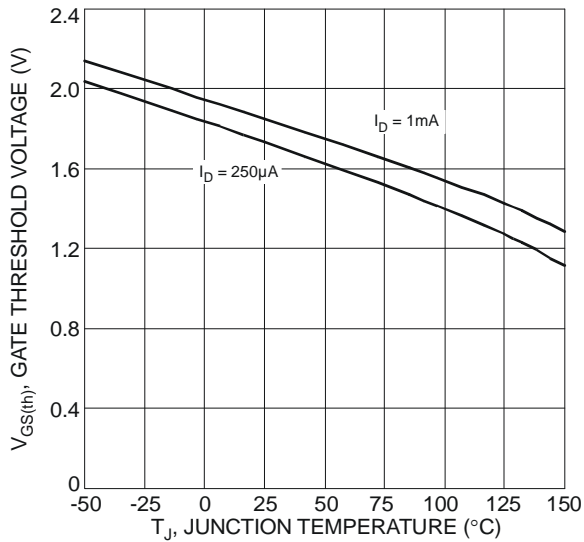


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

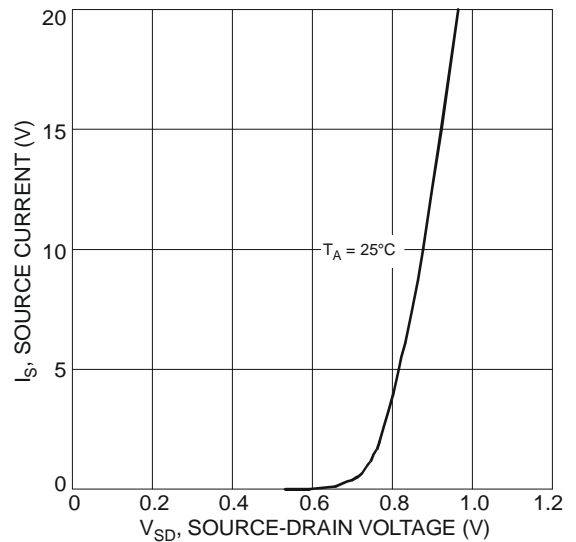


Fig.8 Diode Forward Voltage vs. Current

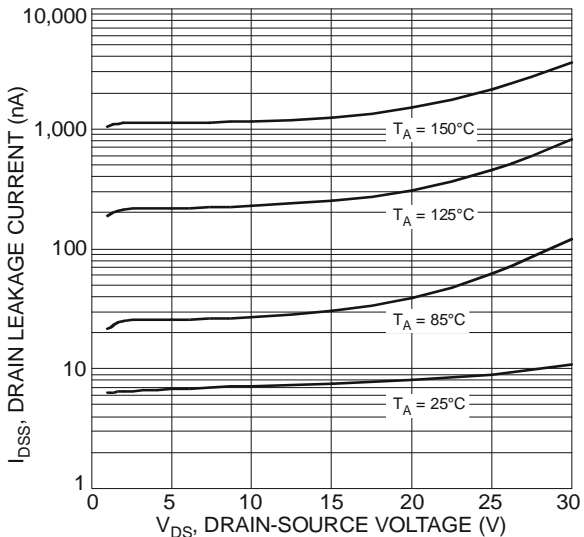


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

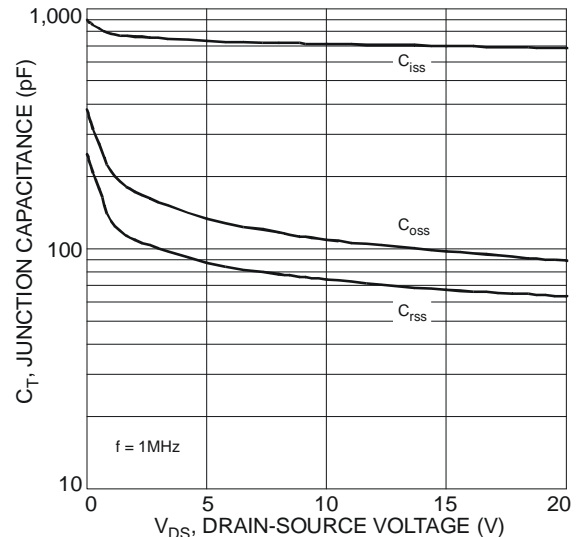


Fig. 10 Typical Junction Capacitance

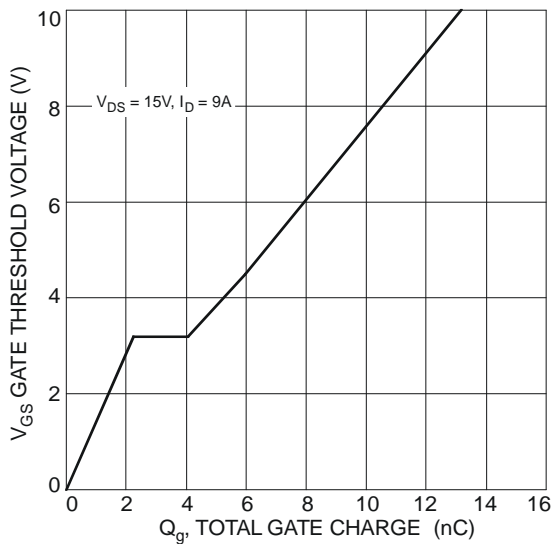


Fig. 11 Gate Charge

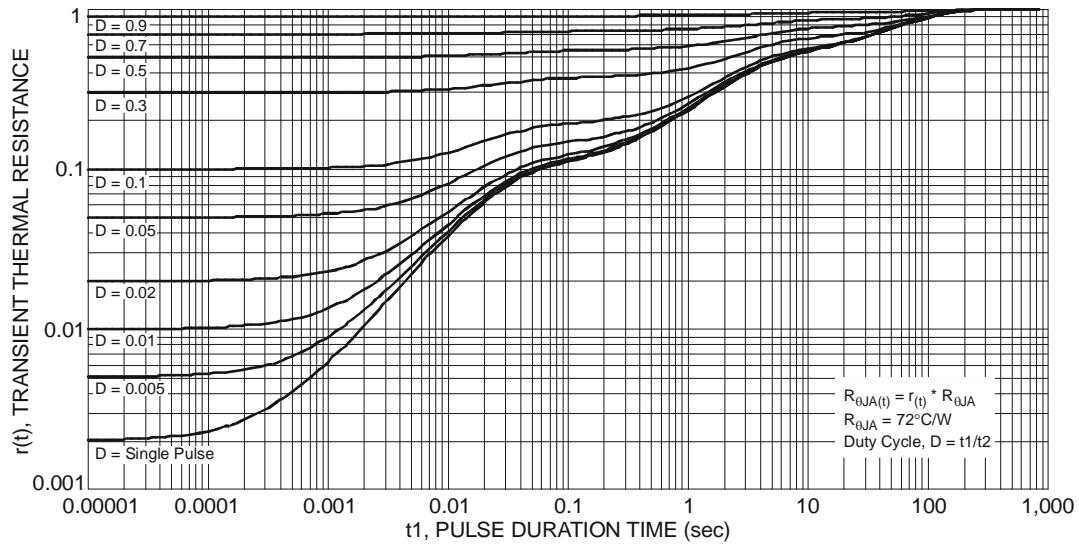
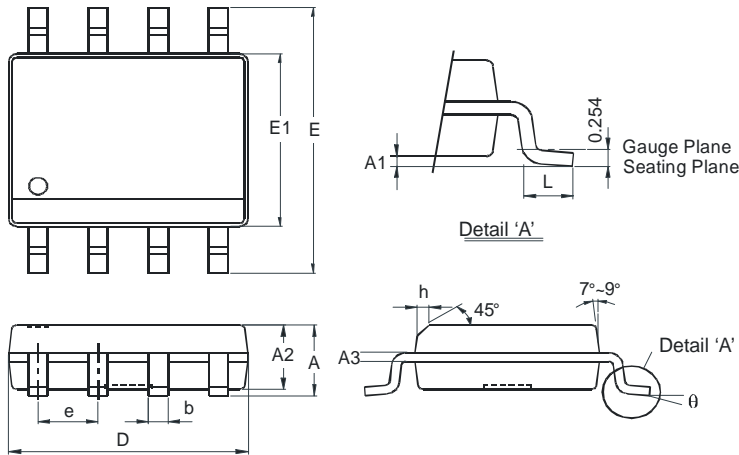


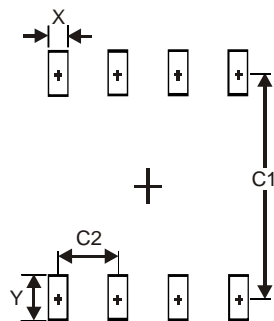
Fig. 12 Transient Thermal Resistance

Package Outline Dimensions



| 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



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

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