

MOS FIELD EFFECT TRANSISTOR
2SK2157

N-CHANNEL MOS FET
FOR HIGH-SPEED SWITCHING

The 2SK2157 is a N-channel MOS FET of a vertical type and is a switching element that can be directly driven by the output of an IC operating at 5 V. This product has a low ON resistance and superb switching characteristics and is ideal for driving the actuators and DC/DC converters.

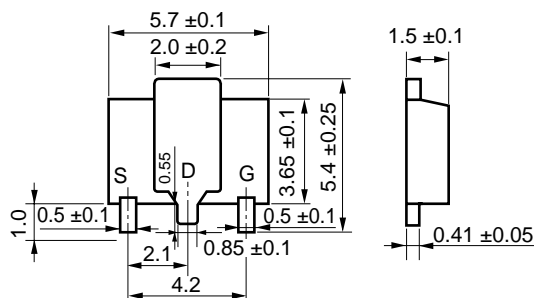
FEATURES

- New package intermediate between small-signal and power models
- Can be directly driven by output of 5-V IC
- Low ON resistance

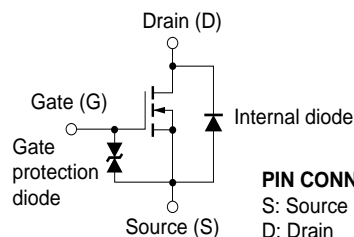
$R_{DS(on)} \leq 0.15 \Omega$ @ $V_{GS} = 4 V$, $I_D = 2.5 A$

$R_{DS(on)} \leq 0.10 \Omega$ @ $V_{GS} = 10 V$, $I_D = 2.5 A$

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



PIN CONNECTIONS

S: Source
D: Drain
G: Gate

Marking: NA4

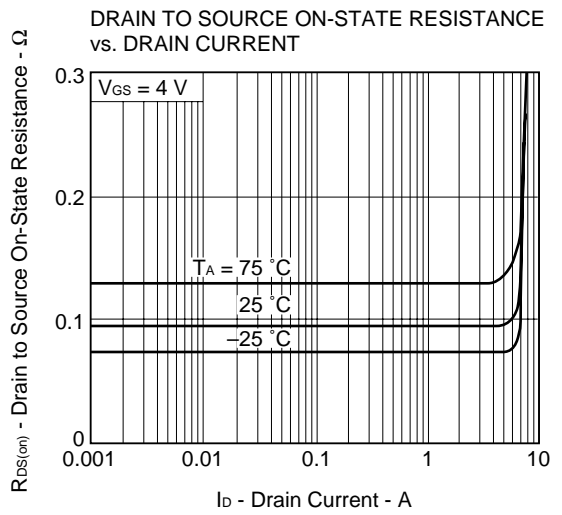
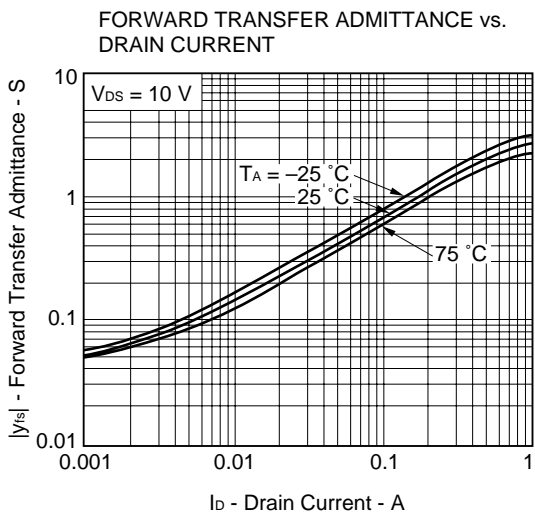
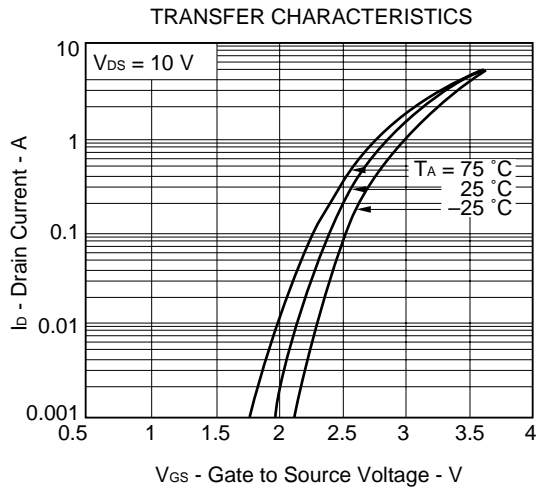
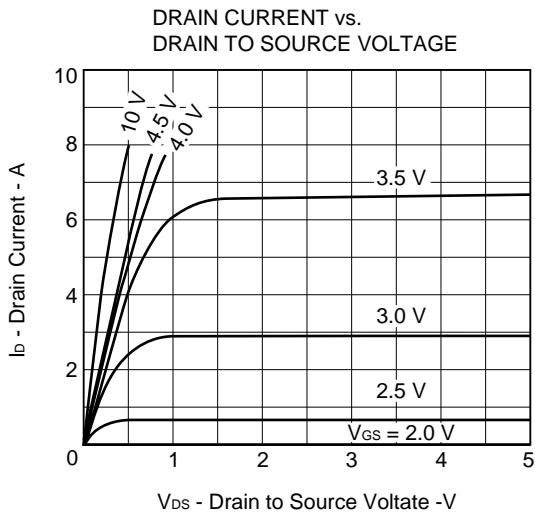
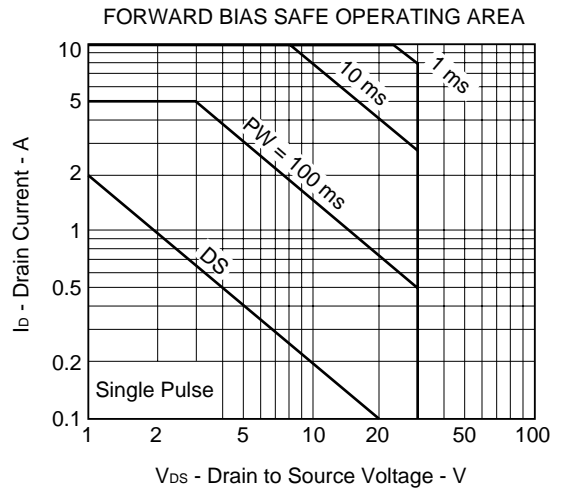
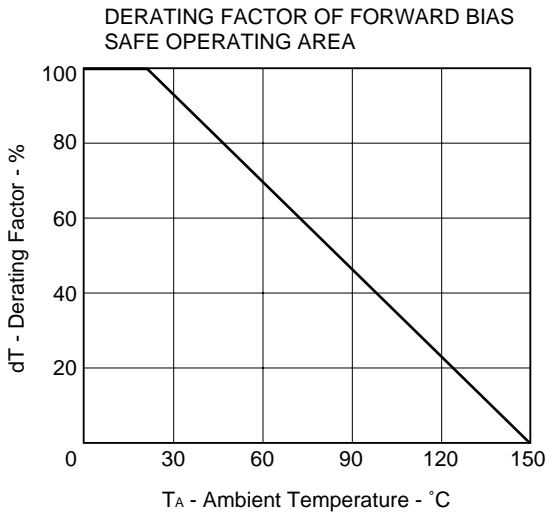
ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \text{ }^\circ\text{C}$)

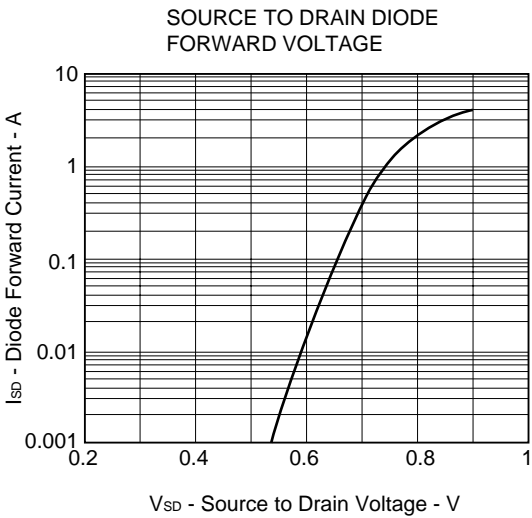
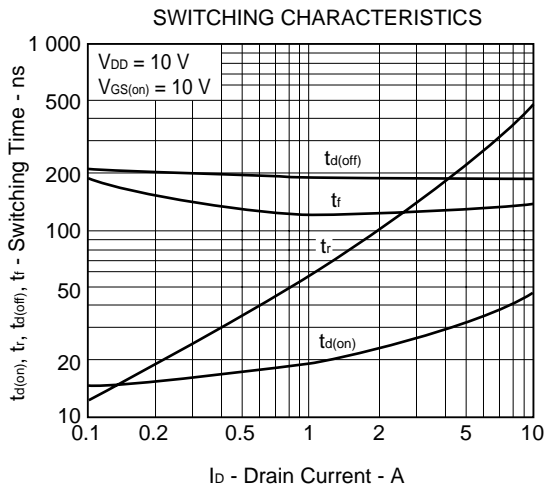
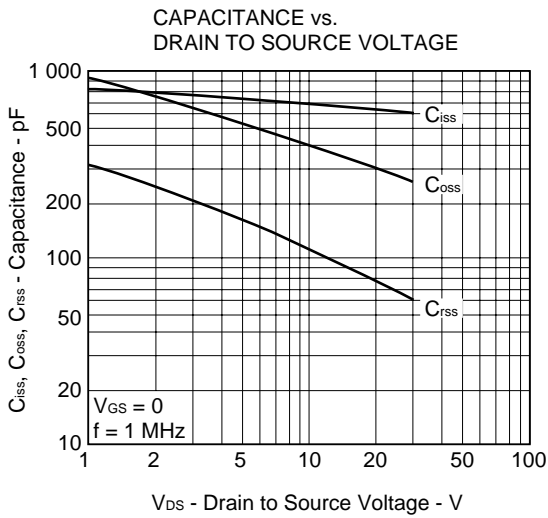
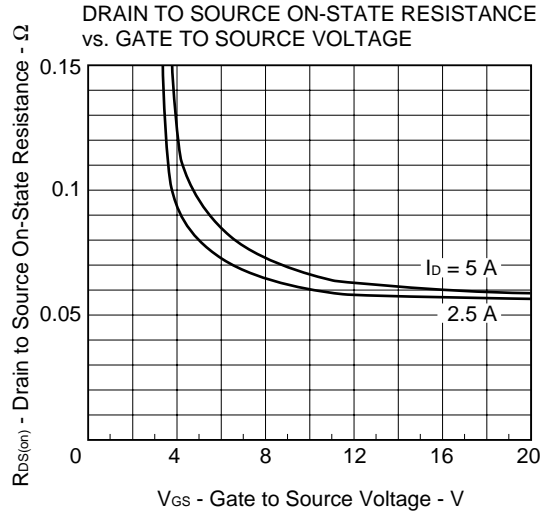
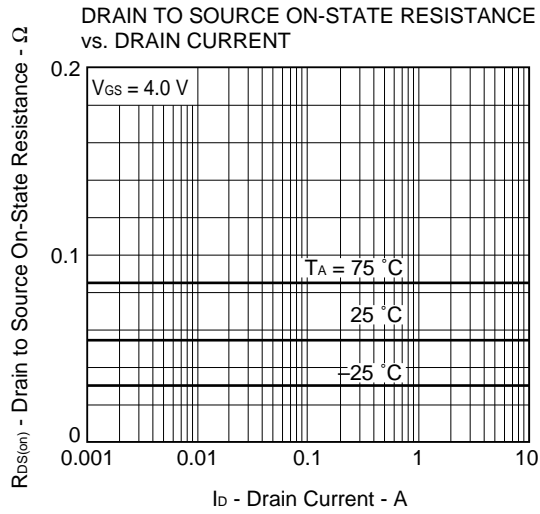
| PARAMETER | SYMBOL | TEST CONDITIONS | RATING | UNIT |
|-------------------------|----------------|---|-------------|------------------|
| Drain to Source Voltage | V_{BSS} | $V_{GS} = 0$ | 30 | V |
| Gate to Source Voltage | V_{GSS} | $V_{DS} = 0$ | ± 20 | V |
| Drain Current (DC) | $I_{D(DC)}$ | | ± 5.0 | A |
| Drain Current (Pulse) | $I_{D(pulse)}$ | $PW \leq 10 \text{ ms}$, Duty cycle $\leq 50 \%$ | ± 10.0 | A |
| Total Power Dissipation | P_T | $7.5 \text{ cm}^2 \times 0.7 \text{ mm}$, ceramic substrate used | 2.0 | W |
| Channel Temperature | T_{ch} | | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|----------------------|---|------|------|------|------|
| Drain Cut-Off Current | I _{DSS} | V _{DS} = 30 V, V _{GS} = 0 | | | 1.0 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±20 V, V _{DS} = 0 | | | ±10 | μA |
| Gate Cut-Off Voltage | V _{GS(off)} | V _{DS} = 10 V, I _D = 1 mA | 1.5 | 1.9 | 2.5 | V |
| Forward Transfer Admittance | y _{ts} | V _{DS} = 10 V, I _D = 2.5 A | 2.0 | | | S |
| Drain to Source On-State Resistance | R _{DS(on)1} | V _{GS} = 4 V, I _D = 2.5 A | | 0.09 | 0.15 | Ω |
| Drain to Source On-State Resistance | R _{DS(on)2} | V _{GS} = 10 V, I _D = 2.5 A | | 0.06 | 0.10 | Ω |
| Input Capacitance | C _{iSS} | V _{DS} = 10 V, V _{GS} = 0, f = 1.0 MHz | | 650 | | pF |
| Output Capacitance | C _{oSS} | | | 400 | | pF |
| Reverse Transfer Capacitance | C _{rSS} | | | 120 | | pF |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 10 V, I _D = 2.5 A V _{GS(on)} = 10 V, R _G = 10 Ω R _L = 4 Ω | | 85 | | ns |
| Rise Time | t _r | | | 450 | | ns |
| Turn-Off Delay Time | t _{d(off)} | | | 285 | | ns |
| Fall Time | t _f | | | 315 | | ns |

TYPICAL CHARACTERISTICS (T_A = 25 °C)





REFERENCE

| Document Name | Document No. |
|---|--------------|
| NEC semiconductor device reliability/quality control system | TEI-1202 |
| Quality grade on NEC semiconductor devices | IEI-1209 |
| Semiconductor device mounting technology manual | C10535E |
| Guide to quality assurance for semiconductor devices | MEI-1202 |
| Semiconductor selection guide | X10679E |

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Anti-radioactive design is not implemented in this product.