

MOS FIELD EFFECT TRANSISTOR

2SK2053

N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

The 2SK2053 is an N-channel vertical MOS FET. Because it can be driven by a voltage as low as 1.5 V and it is not necessary to consider a drive current, this FET is ideal as an actuator for low-current portable systems such as headphone stereos and video cameras.

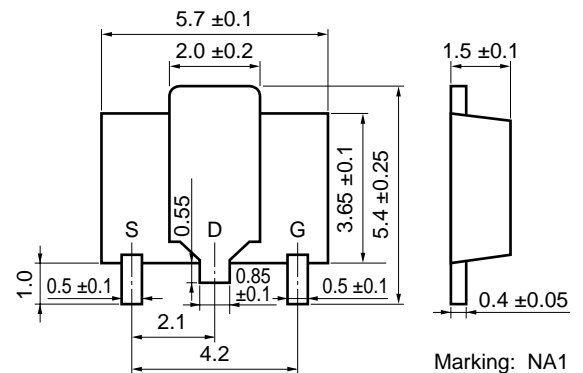
FEATURES

- New package intermediate between small signal and power types
- Gate can be driven by 1.5 V
- Low ON resistance

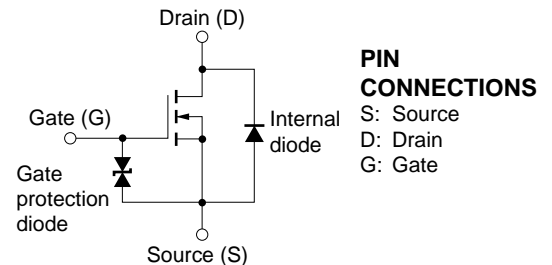
$R_{DS(on)} = 0.40 \Omega$ MAX. @ $V_{GS} = 1.5 V$, $I_D = 1.0 A$

$R_{DS(on)} = 0.12 \Omega$ MAX. @ $V_{GS} = 4.0 V$, $I_D = 2.5 A$

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CURCUIT



PIN CONNECTIONS
 S: Source
 D: Drain
 G: Gate

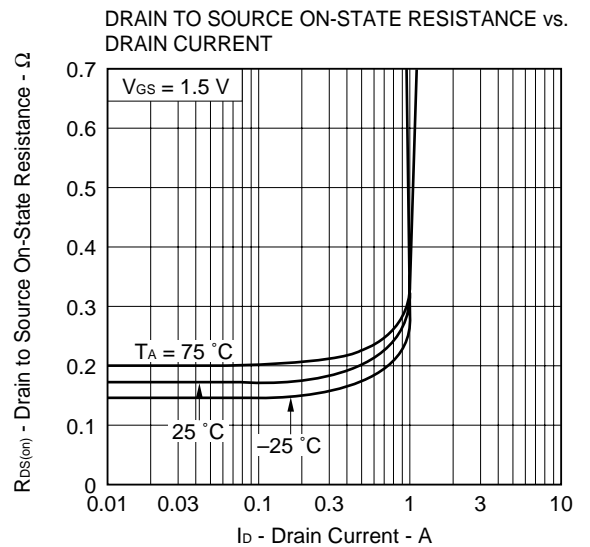
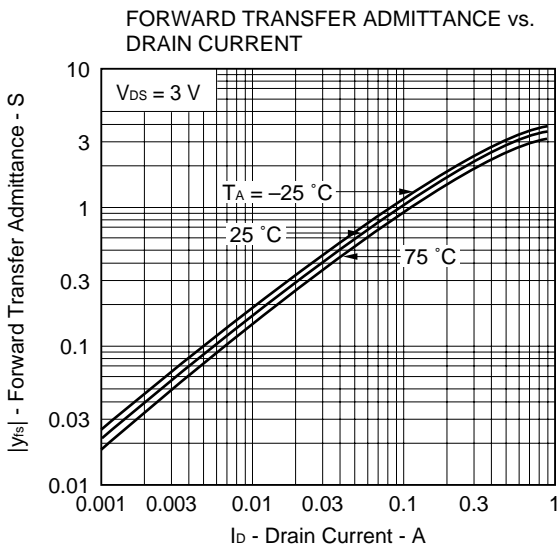
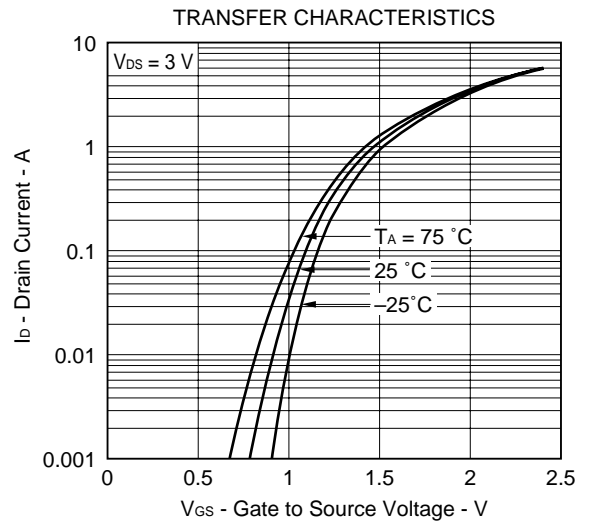
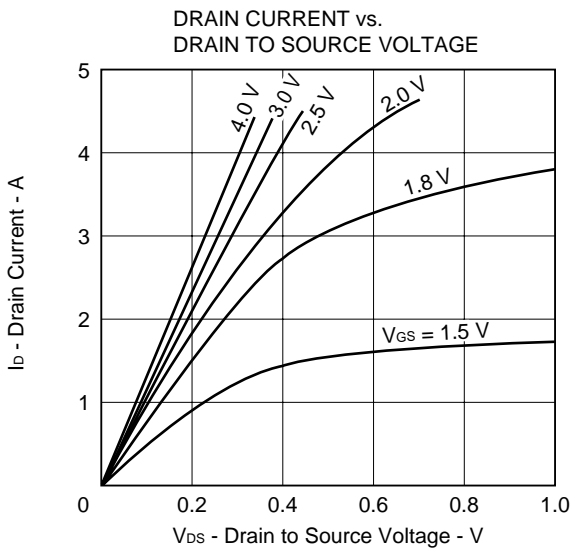
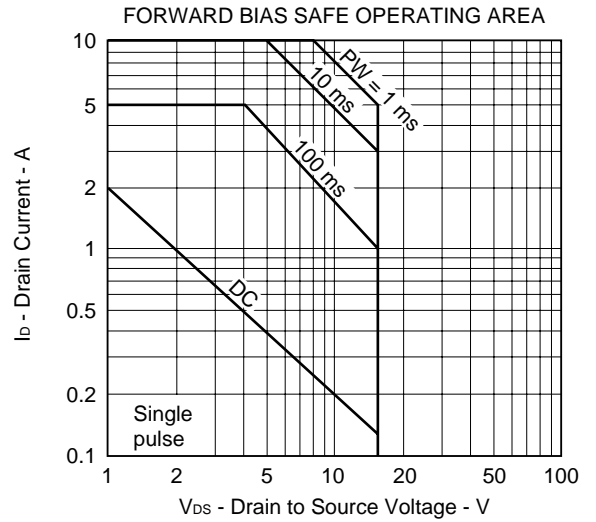
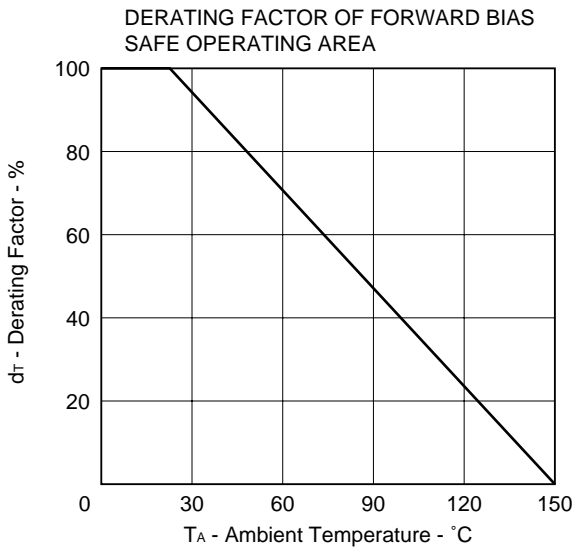
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$)

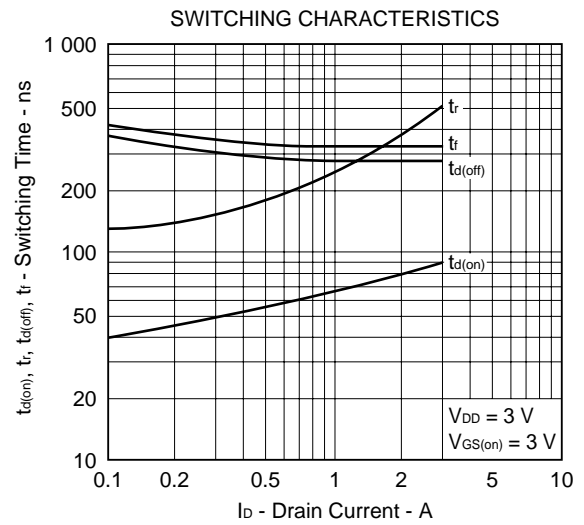
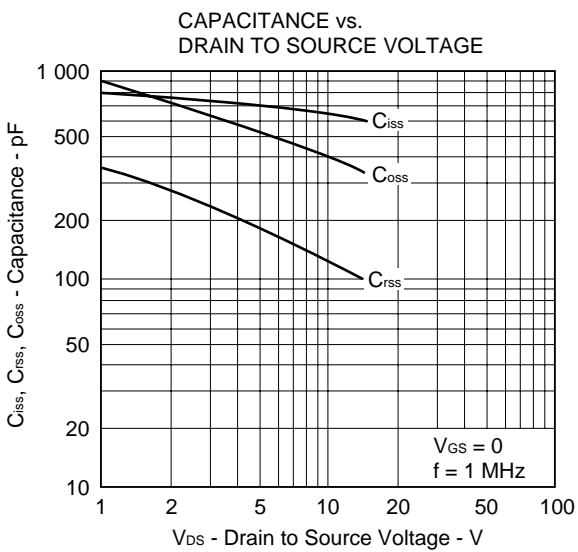
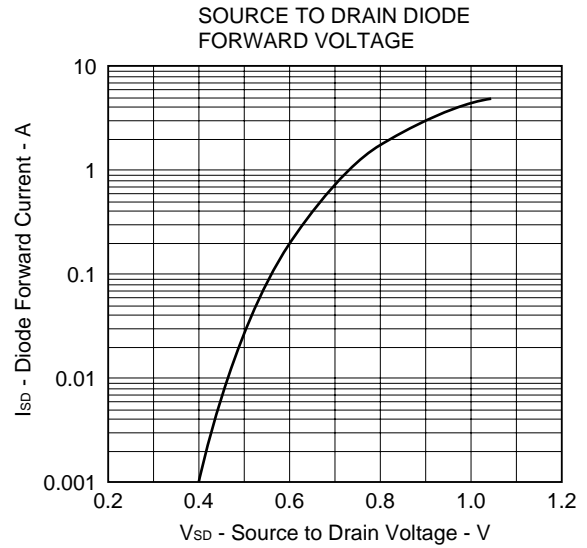
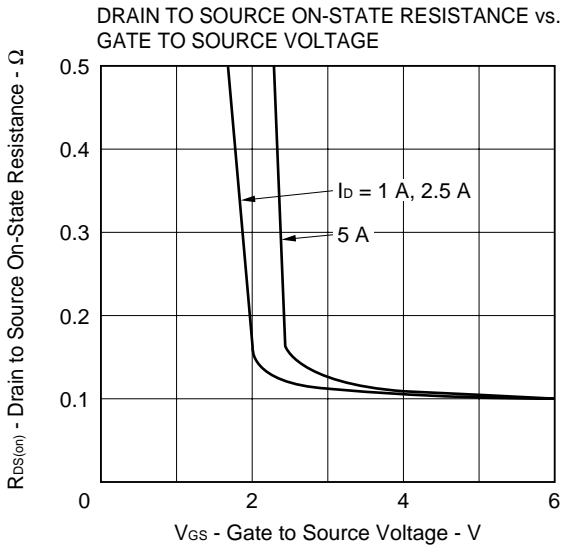
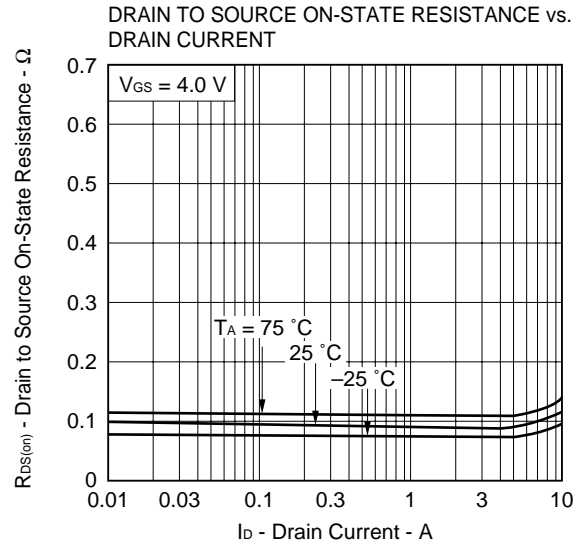
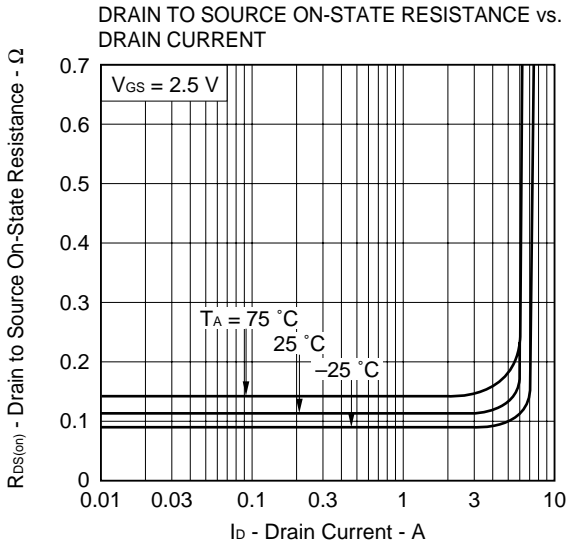
| PARAMETER | SYMBOL | TEST CONDITIONS | RATING | UNIT |
|-------------------------|----------------|---|-------------|------|
| Drain to Source Voltage | V_{DSS} | $V_{GS} = 0$ | 16 | V |
| Gate to Source Voltage | V_{GSS} | $V_{DS} = 0$ | ± 7.0 | V |
| Drain Current (DC) | $I_{D(DC)}$ | | ± 5.0 | A |
| Drain Current (Pulse) | $I_{D(pulse)}$ | $PW \leq 10$ ms, duty cycle ≤ 50 % | ± 10.0 | A |
| Total Power Dissipation | P_T | 7.5 cm ² × 0.7 mm ceramic substrate used | 2.0 | W |
| Channel Temperature | T_{ch} | | 150 | °C |
| Operating Temperature | T_{opt} | | -20 to +60 | °C |
| Storage Temperature | T_{stg} | | -55 to +150 | °C |

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|----------------------|--|------|------|------|------|
| Drain Cut-Off Current | I _{DSS} | V _{DS} = 16 V, V _{GS} = 0 | | | 1.0 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±7.0 V, V _{DS} = 0 | | | ±3.0 | μA |
| Gate Cut-Off Voltage | V _{GS(off)} | V _{DS} = 3 V, I _D = 1 mA | 0.5 | 0.8 | 1.1 | V |
| Forward Transfer Admittance | y _{fs} | V _{DS} = 3 V, I _D = 2.5 A | 4 | | | S |
| Drain to Source On-State Resistance | R _{DS(on)1} | V _{GS} = 1.5 V, I _D = 0.5 A | | 0.19 | 0.40 | Ω |
| Drain to Source On-State Resistance | R _{DS(on)2} | V _{GS} = 2.5 V, I _D = 2.5 A | | 0.08 | 0.15 | Ω |
| Drain to Source On-State Resistance | R _{DS(on)3} | V _{GS} = 4.0 V, I _D = 2.5 A | | 0.06 | 0.12 | Ω |
| Input Capacitance | C _{iss} | V _{DS} = 3 V, V _{GS} = 0, f = 1.0 MHz | | 730 | | pF |
| Output Capacitance | C _{oss} | | | 640 | | pF |
| Reverse Transfer Capacitance | C _{rss} | | | 230 | | pF |
| Turn-ON Delay Time | t _{d(on)} | V _{DD} = 3 V, I _D = 2.5 A, V _{GS(on)} = 3 V, R _G = 10 Ω, R _L = 1.2 Ω | | 85 | | ns |
| Rise Time | t _r | | | 450 | | ns |
| Turn-OFF Delay Time | t _{d(off)} | | | 280 | | ns |
| Fall Time | t _f | | | 310 | | ns |

TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$)





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.

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