

N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

DESCRIPTION

The 2SK3749 is an N-channel vertical MOS FET. Because it can be driven by a voltage as low as 2.5 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

- Gate can be driven by 2.5 V
- Because of its high input impedance, there's no need to consider drive current

ORDERING INFORMATION

| PART NUMBER | PACKAGE |
|-------------|-------------|
| 2SK3749 | SC-70 (SSP) |

Marking: G27

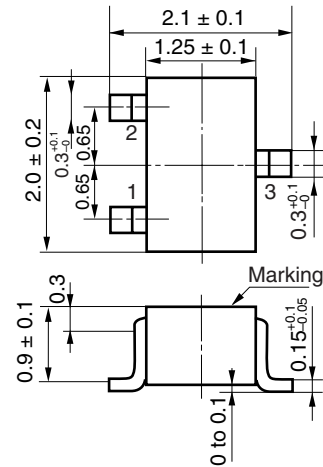
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

| | | | |
|---|-----------------------|-------------|----|
| Drain to Source Voltage (V _{GS} = 0 V) | V _{DSS} | 50 | V |
| Gate to Source Voltage (V _{DS} = 0 V) | V _{GSS} | ±7.0 | V |
| Drain Current (DC) | I _{D(DC)} | ±100 | mA |
| Drain Current (pulse) ^{Note} | I _{D(pulse)} | ±200 | mA |
| Total Power Dissipation | P _T | 150 | mW |
| Channel Temperature | T _{ch} | 150 | °C |
| Storage Temperature | T _{stg} | -55 to +150 | °C |

Note PW ≤ 10 ms, Duty Cycle ≤ 50%

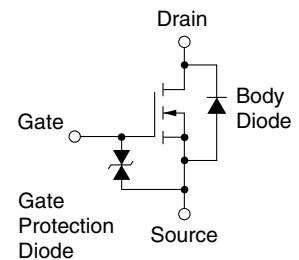
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

PACKAGE DRAWING (Unit: mm)



- 1 : Source
- 2 : Gate
- 3 : Drain

EQUIVALENT CIRCUIT



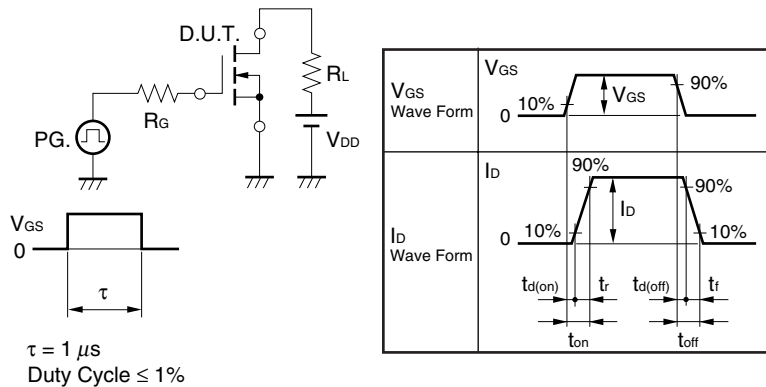
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

| CHARACTERISTICS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|----------------------|--|------|------|------|------|
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 50 V, V _{GS} = 0 V | | | 1.0 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±7.0 V, V _{DS} = 0 V | | | ±5.0 | μA |
| Gate Cut-off Voltage | V _{GS(off)} | V _{DS} = 3.0 V, I _D = 1.0 μA | 0.9 | 1.2 | 1.5 | V |
| Forward Transfer Admittance Note | y _{fs} | V _{DS} = 3.0 V, I _D = 10 mA | 20 | | | mS |
| Drain to Source On-state Resistance Note | R _{DS(on)1} | V _{GS} = 2.5 V, I _D = 10 mA | | 20 | 40 | Ω |
| | R _{DS(on)2} | V _{GS} = 4.0 V, I _D = 10 mA | | 15 | 20 | Ω |
| Input Capacitance | C _{iss} | V _{DS} = 3.0 V | | 6.0 | | pF |
| Output Capacitance | C _{oss} | V _{GS} = 0 V | | 8.0 | | pF |
| Reverse Transfer Capacitance | C _{rss} | f = 1 MHz | | 1.2 | | pF |
| Turn-on Delay Time | t _{d(on)} | V _{DD} = 3.0 V, I _D = 20 mA | | 9.0 | | ns |
| Rise Time | t _r | V _{GS} = 3.0 V | | 50 | | ns |
| Turn-off Delay Time | t _{d(off)} | R _G = 10 Ω | | 20 | | ns |
| Fall Time | t _f | | | 40 | | ns |

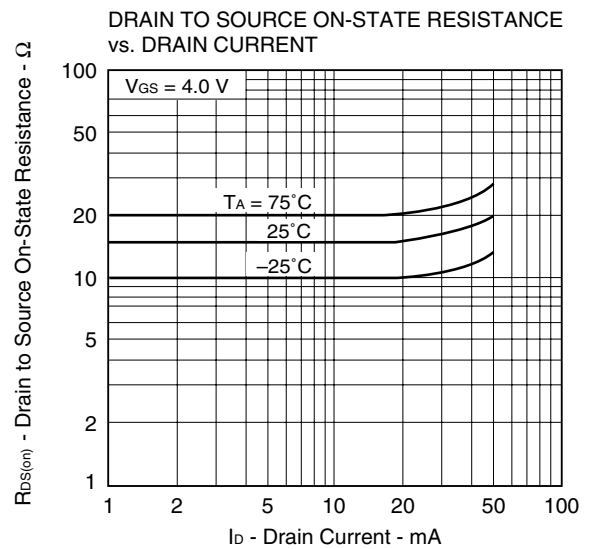
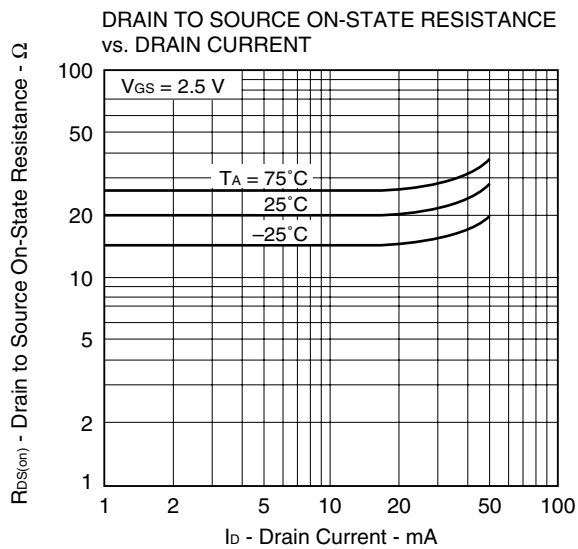
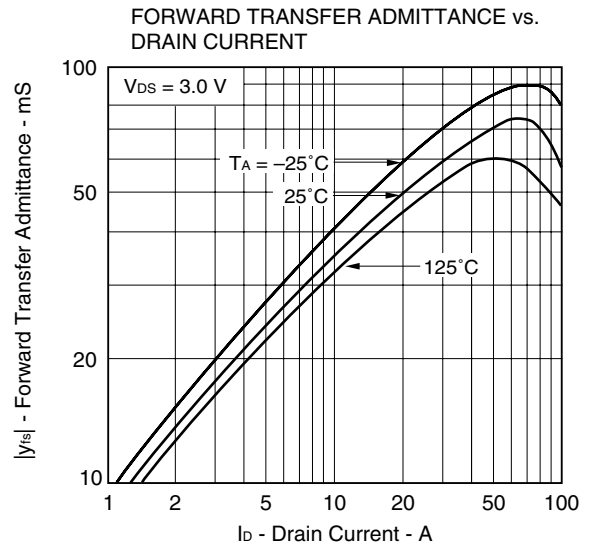
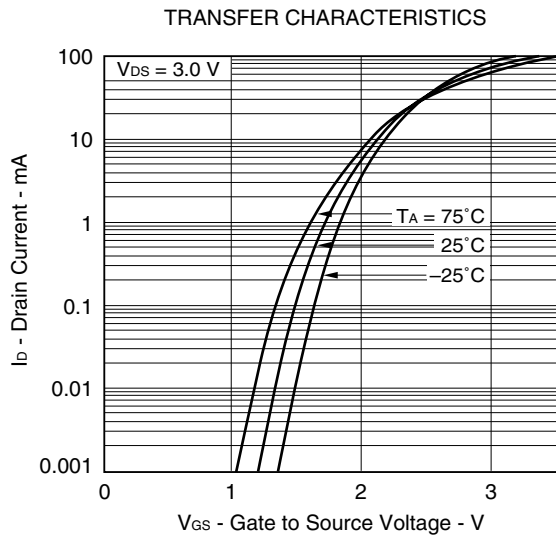
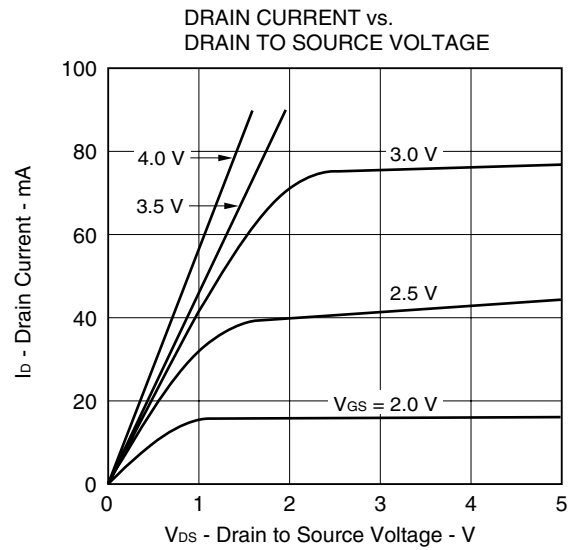
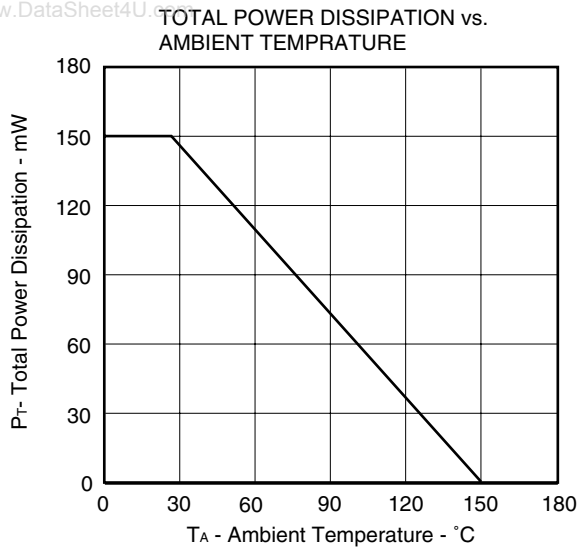
Note Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2%

TEST CIRCUIT SWITCHING TIME

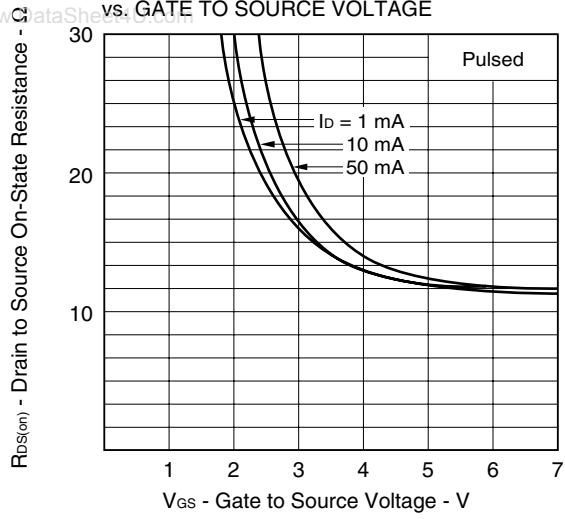


TYPICAL CHARACTERISTICS (TA = 25°C)

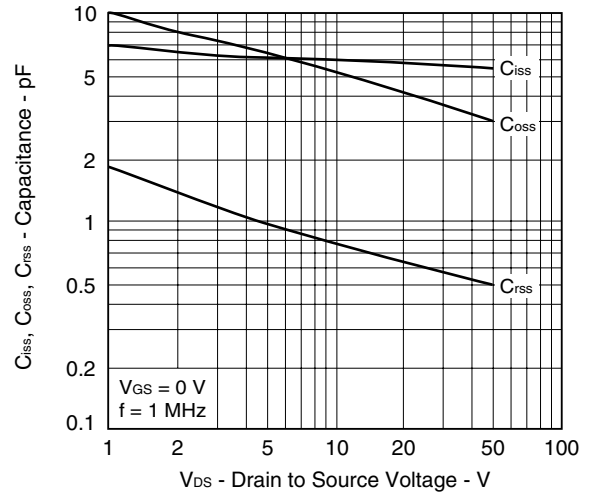
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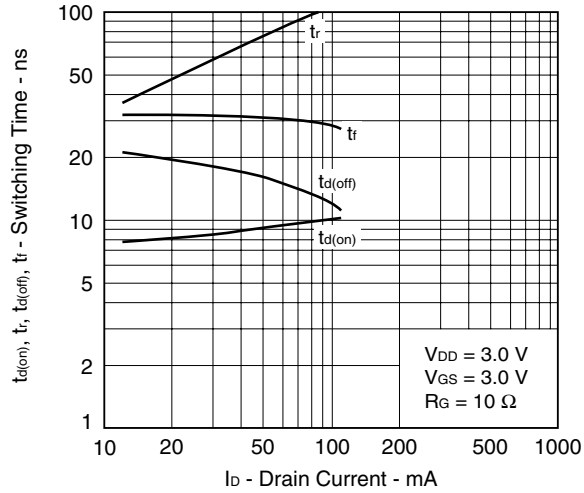
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



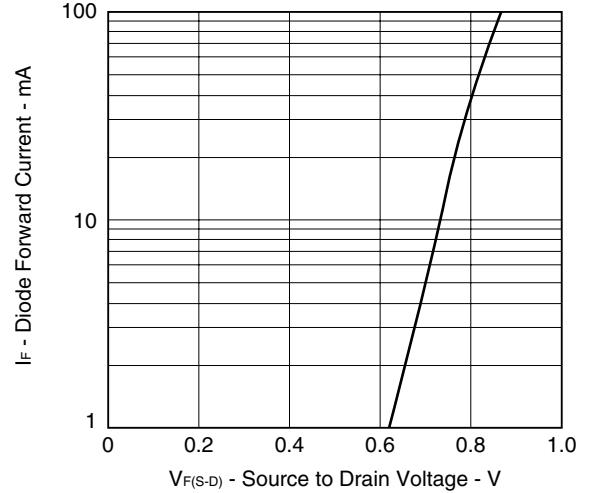
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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