SONY

# 2SK300

## Silicon N-Channel Junction FET

### Description

Making the best of Epitaxy and Pattern latest technology, 2SK300 accomplishes so far unattainable levels of performance.

Usage with head amplifiers for video cameras and the like, ensures the highest efficiency.

### Features

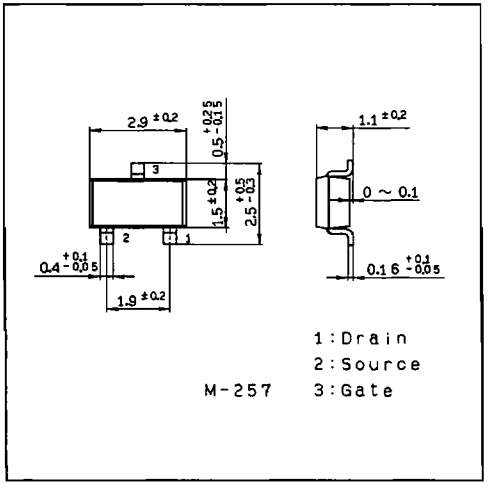
- High figure of merit
  $V_{DS}$=5V $|Y_{fs}|/C_{iss}$ 3.5 (Typ.)
  $I_D$=10mA
- High $|Y_{fs}|$
  $V_{DS}$=5V $|Y_{fs}|$ 30mS (Typ.)
  $V_{GS}$=0V
- Low input capacitance
  $C_{iss}$ 8pF (Typ.)

### Absolute Maximum Ratings (Ta=25°C)

| | | | |
|---|---|---|---|
| • Drain to gate voltage | $V_{DGO}$ | 15 | V |
| • Source to gate voltage | $V_{SGO}$ | 15 | V |
| • Drain current | $I_D$ | 50 | mA |
| • Gate current | $I_G$ | 5 | mA |
| • Junction temperature | Tj | 150 | °C |
| • Storage temperature | Tstg | −55 to +150 | °C |
| • Allowable power dissipation | $P_D$ | 150 | mW |

### Package Outline

Unit : mm




### Structure

Silicon N-Channel junction FET

### Electrical Characteristics

(Ta=25°C)

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain to gate voltage | $V_{DGO}$ | $I_G$=10 μA | 15 | | | V |
| Source to gate voltage | $V_{SGO}$ | $I_G$=10 μA | 15 | | | V |
| Gate cutoff current | $I_{GSS}$ | $V_{GS}$=−7V, $V_{DS}$=0V | | | −2 | nA |
| Drain current | $I_{DSS}$ | $V_{DS}$=5V, $V_{GS}$=0V | 9.5 | | 42 | mA * |
| Gate to source cutoff voltage | $V_{GS\ (OFF)}$ | $V_{DS}$=5V, $I_D$=100 μA | −0.55 | | −2.0 | V |
| Forward transfer admittance | $\|Y_{fs}\|$ | $V_{DS}$=5V, $V_{GS}$=0V, f=1kHz | 21 | 30 | | mS |
| Input capacitance | $C_{iss}$ | $V_{DS}$=5V, $V_{GS}$=0V, f=1MHz | | 8 | 9 | pF |

* Drain current detail specification as follows.

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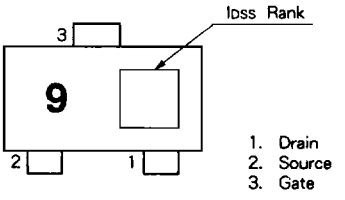
## Classification (VDS=5V, VGS=0V)

| Rank | IDSS (mA) |
|---|---|
| 1 | 9.5 to 14.8 |
| 2 | 13.4 to 21.0 |
| 3 | 19.0 to 30.2 |
| 4 | 27.4 to 42.0 |
| 3/4 * | 19.0 to 42.0 |

* Rank 3 or 4 is indicated on IDSS rank of Rank 3/4.

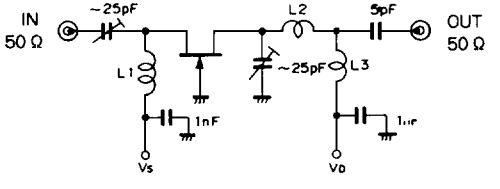
## Mark




## Standard Circuit Design Data (Ta=25°C)

| Item | Symbol | Condition | Typ. | Unit |
|---|---|---|---|---|
| Forward transfer admittance | \|Yfs\| | VDS=5V, ID=10mA, f=1kHz | 25 | mS |
| Input capacitance | Ciss | VDS=5V, ID=10mA, f=1MHz | 7.2 | pF |
| Gate cutoff current | IG | VDS=5V, ID=10mA | 40 | pA |
| Input resistance | ris | VDS=5V, ID=10mA, f=100MHz | 3.5 | kΩ |
| Input capacitance | Cis | | 7.2 | pF |
| Output resistance | ros | | 3 | kΩ |
| Output capacitance | Cos | | 2.5 | pF |
| Power gain | PG | VDS=5V, ID=10mA, f=100MHz | 15 | dB |
| Noise figure | NF | | 1.8 | dB |
| Equivalent input noise voltage | $\bar{e}n$ | VDS=5V, ID=10mA, f=1kHz, RG=0Ω | 1.2 | $nV/\sqrt{Hz}$ |
| Reverse transfer capacitance | Crss | VDS=5V, VGS=0V, f=1MHz | 2.0 | pF |

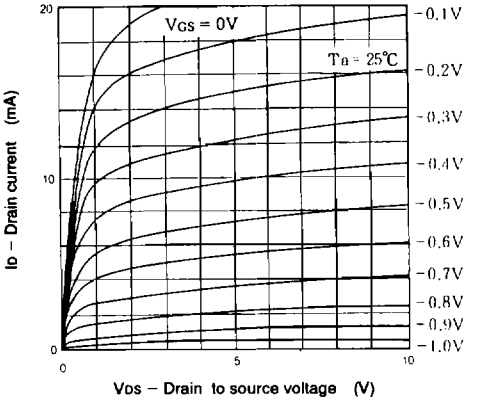
## 100MHz PG, NF Test Circuit



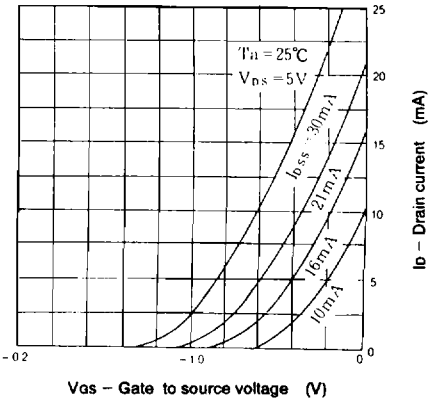

| | | | |
|---|---|---|---|
| L1 | φ 0.45mm Polyurethane Wire | φ 3mm | 10.5t |
| L2, L3 | φ 0.45mm Polyurethane Wire | φ 3mm | 5.5t |

## Example of Representative Characteristics

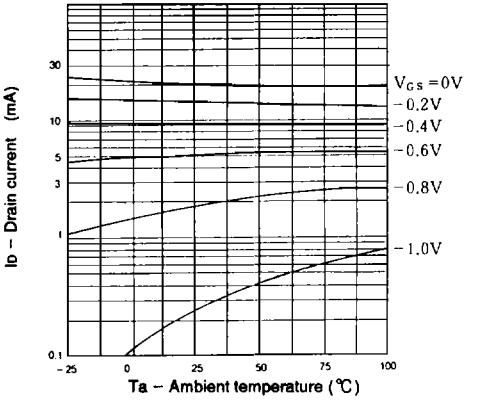
**Drain current vs. Drain to source voltage**



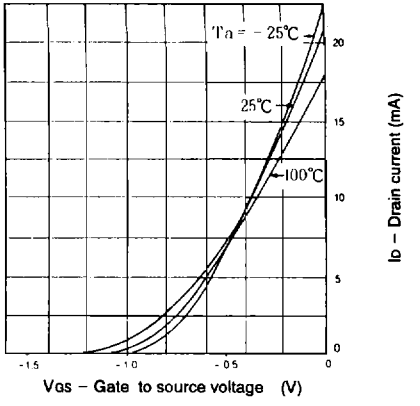

**Drain current vs. Gate to source voltage**



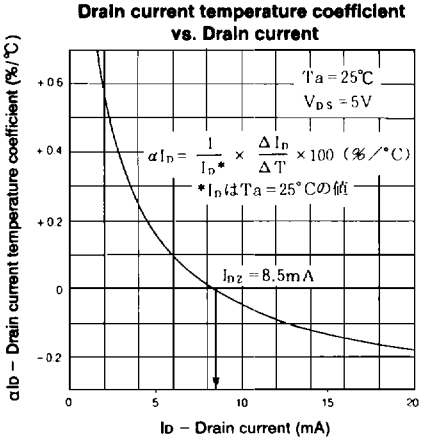

**Drain current vs. Ambient temperature**



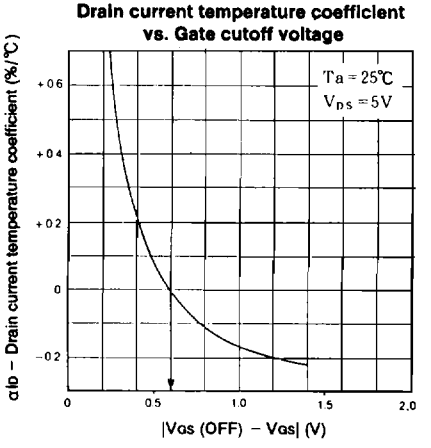

**Transfer characteristics vs. Ambient temperature**



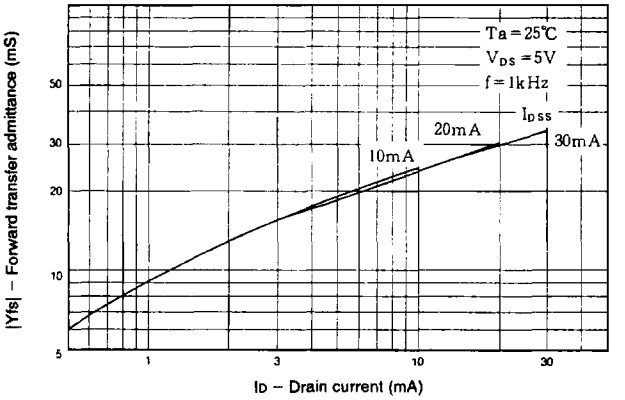

**Drain current temperature coefficient vs. Drain current**



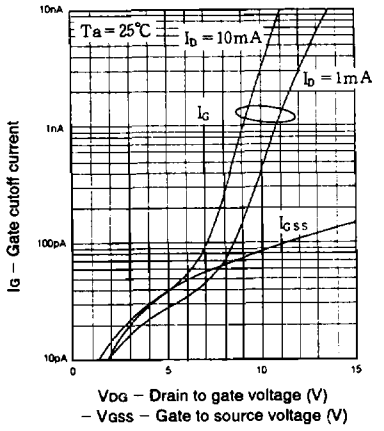

**Drain current temperature coefficient vs. Gate cutoff voltage**



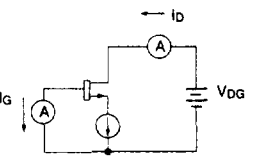
**Forward transfer admittance vs. Drain current**



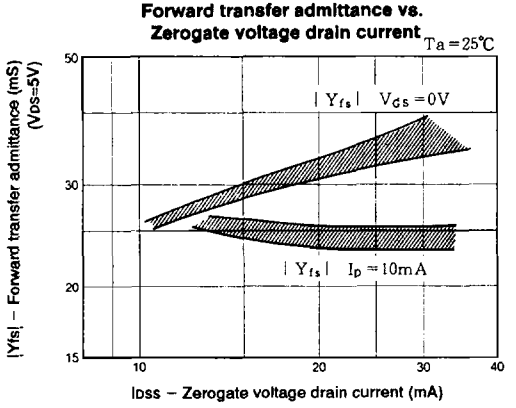

**Gate cutoff vs. Supply voltage**



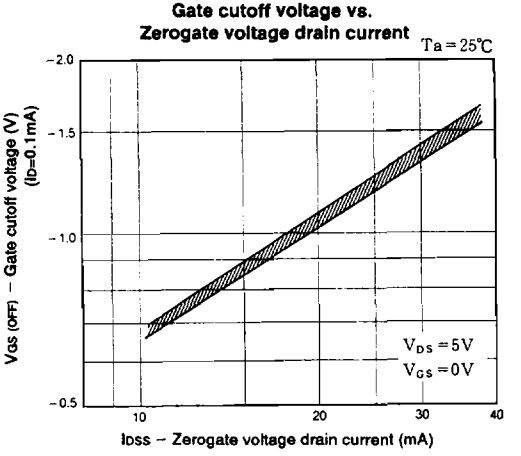

**IG Test Circuit**



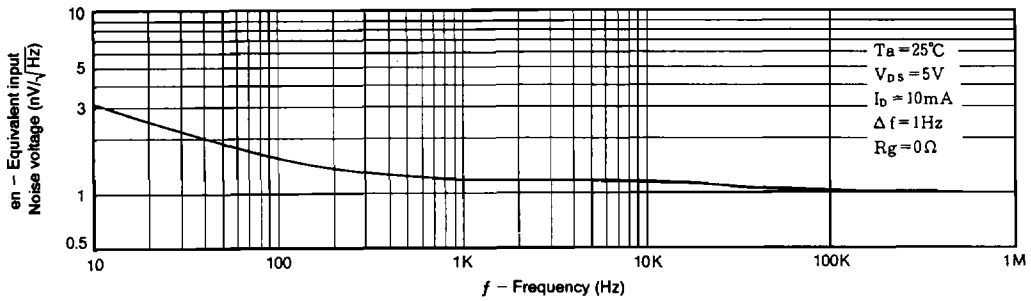

**Forward transfer admittance vs. Zerogate voltage drain current**



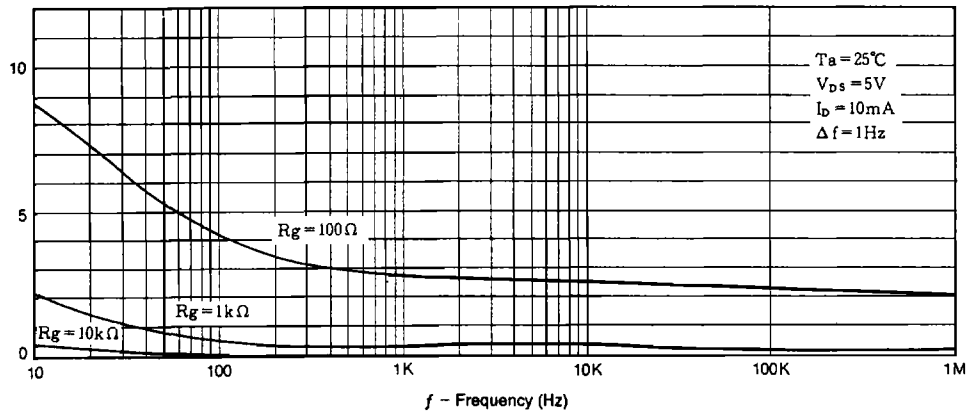

**Gate cutoff voltage vs. Zerogate voltage drain current**



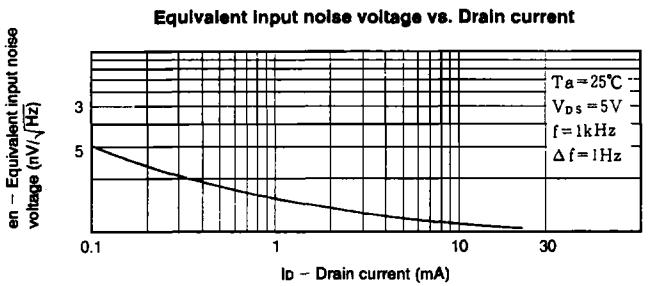
**Equivalent input noise voltage vs. Frequency**



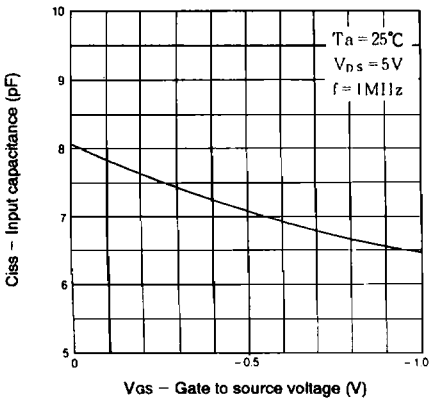

**Noise figure vs. Frequency**



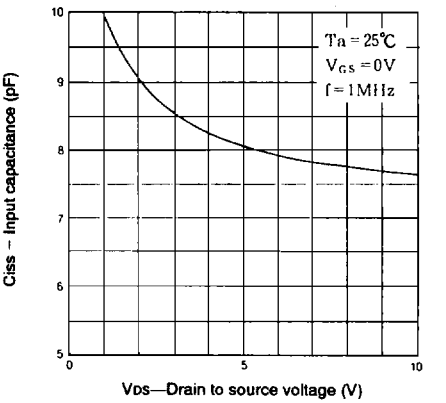

**Equivalent input noise voltage vs. Drain current**



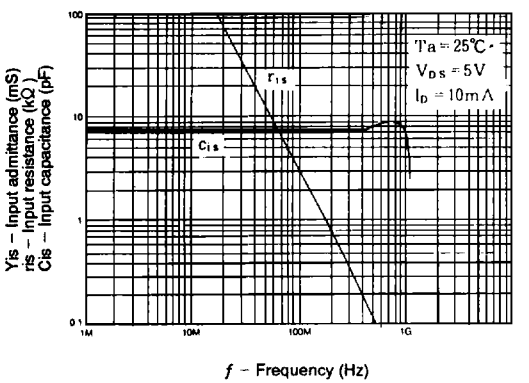
**Input capacitance vs. Gate to source voltage**



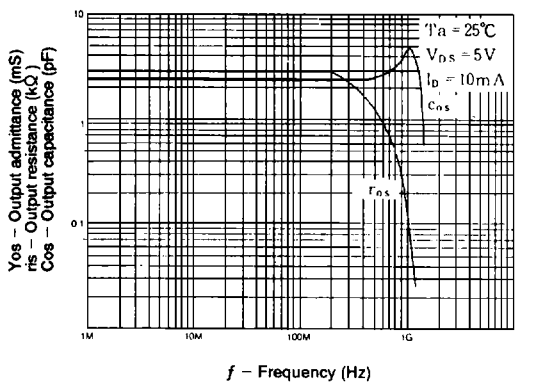

**Input capacitance vs. Drain to source voltage**



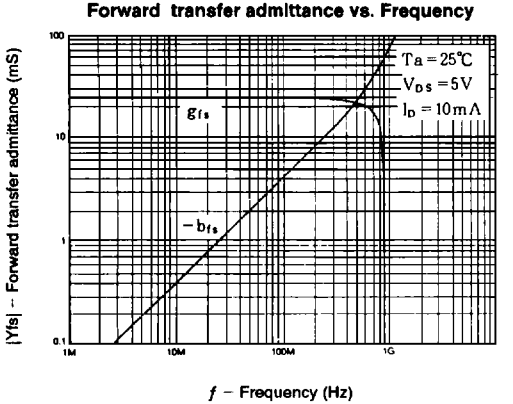

**Input admittance vs. Frequency**




**Transfer characteristics vs. Ambient temperature**




**Forward transfer admittance vs. Frequency**




**Reverse transfer admittance vs. Frequency**