

2SK369

For Low Noise Audio Amplifier Applications

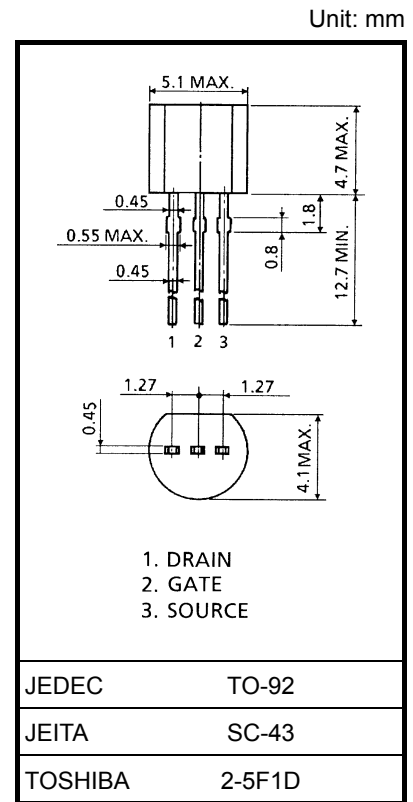
- Suitable for use as first stage for equalizer and MC head amplifiers.
- High $|Y_{fs}|$: $|Y_{fs}| = 40 \text{ mS (typ.)}$ ($V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $I_{DSS} = 5 \text{ mA}$)
- High breakdown voltage: $V_{GDS} = -40 \text{ V (min)}$
- Super low noise: $NF = 1.0\text{dB (typ.)}$
($V_{DS} = 10 \text{ V}$, $I_D = 5 \text{ mA}$, $f = 1 \text{ kHz}$, $R_G = 100 \Omega$)
- High input impedance: $I_{GSS} = -1 \text{ nA (max)}$ ($V_{GS} = -30 \text{ V}$)

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Characteristics | Symbol | Rating | Unit |
|---------------------------|-----------|---------|------------------|
| Gate-drain voltage | V_{GDS} | -40 | V |
| Gate current | I_G | 10 | mA |
| Drain power dissipation | P_D | 400 | mW |
| Junction temperature | T_j | 125 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -55~125 | $^\circ\text{C}$ |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



Weight: 0.21 g (typ.)

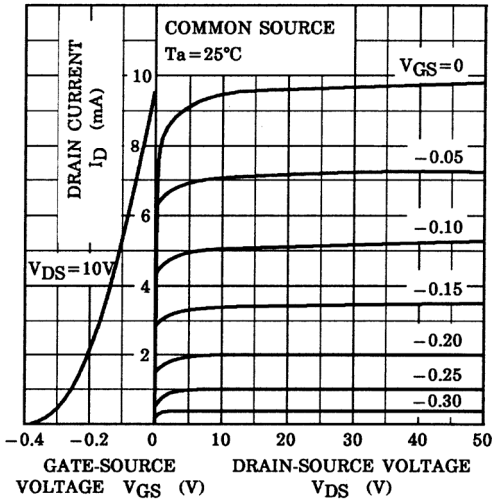
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|------------------------------|-----------------------|--|------|------|------|------|
| Gate cut-off current | I_{GSS} | $V_{GS} = -30 \text{ V}$, $V_{DS} = 0$ | — | — | -1.0 | nA |
| Gate-drain breakdown voltage | $V_{(BR)GDS}$ | $V_{DS} = 0$, $I_G = -100 \mu\text{A}$ | -40 | — | — | V |
| Drain current | I_{DSS} (Note 1) | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$ | 5.0 | — | 30 | mA |
| Gate-source cut-off voltage | $V_{GS(OFF)}$ | $V_{DS} = 10 \text{ V}$, $I_D = 0.1 \mu\text{A}$ | -0.3 | — | -1.2 | V |
| Forward transfer admittance | $ Y_{fs} $ | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ kHz}$, ($I_{DSS} = 5 \text{ mA}$) | 25 | 40 | — | mS |
| Input capacitance | C_{iss} | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$ | — | 75 | — | pF |
| Reverse transfer capacitance | C_{rss} | $V_{GD} = -10 \text{ V}$, $I_D = 0$, $f = 1 \text{ MHz}$ | — | 15 | — | pF |
| Noise figure (Note 2) | NF (1) | $V_{DS} = 10 \text{ V}$, $R_G = 100 \Omega$, $I_D = 5 \text{ mA}$, $f = 100 \text{ Hz}$ | — | 5 | 10 | dB |
| | NF (2) | $V_{DS} = 10 \text{ V}$, $R_G = 100 \Omega$, $I_D = 5 \text{ mA}$, $f = 1 \text{ kHz}$ | — | 1 | 2 | |

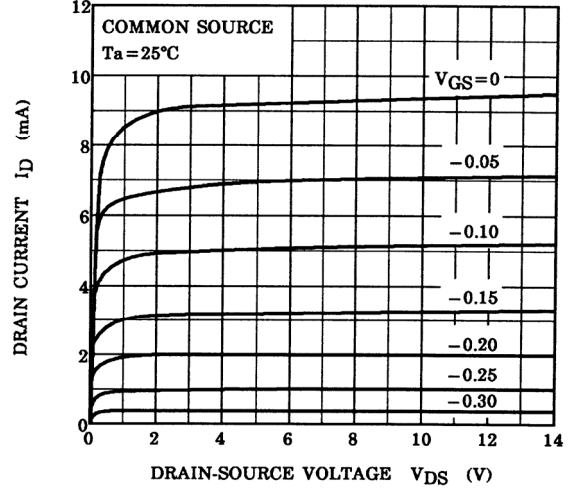
Note 1: I_{DSS} classification GR: 5.0~10.0 mA, BL: 8.0~16.0 mA, V: 14.0~30.0 mA

Note 2: Use this in the low voltage region ($V_{DS} < 15 \text{ V}$) for low noise applications.

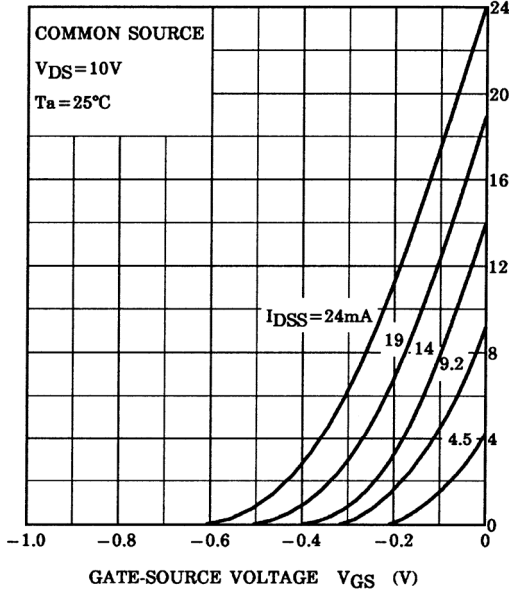
STATIC CHARACTERISTICS



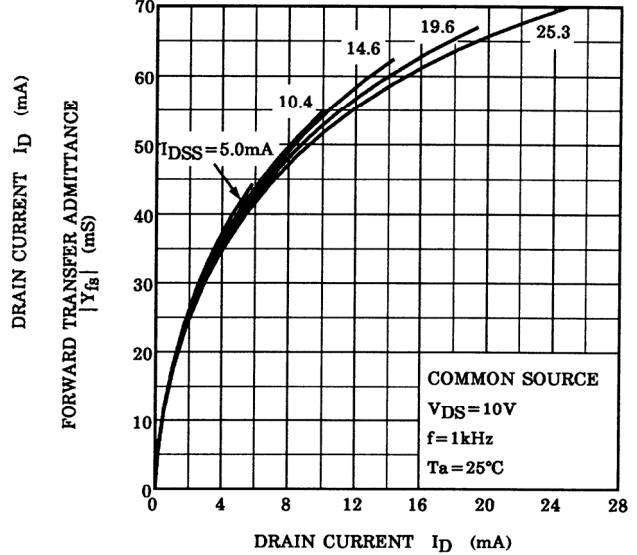
$I_D - V_{DS}$ (LOW VOLTAGE REGION)



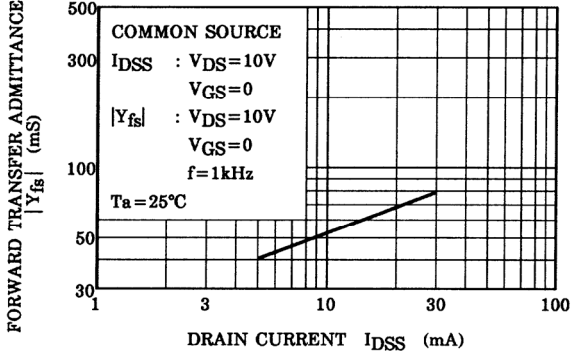
$I_D - V_{GS}$



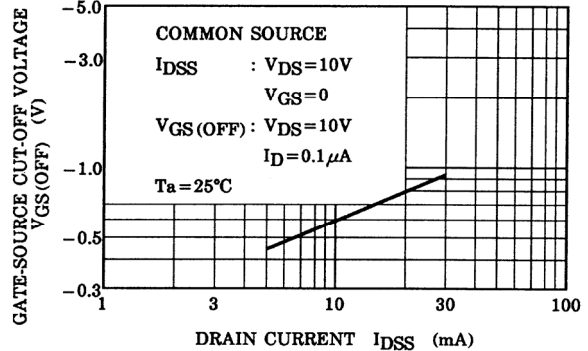
$|Y_{fs}| - I_D$

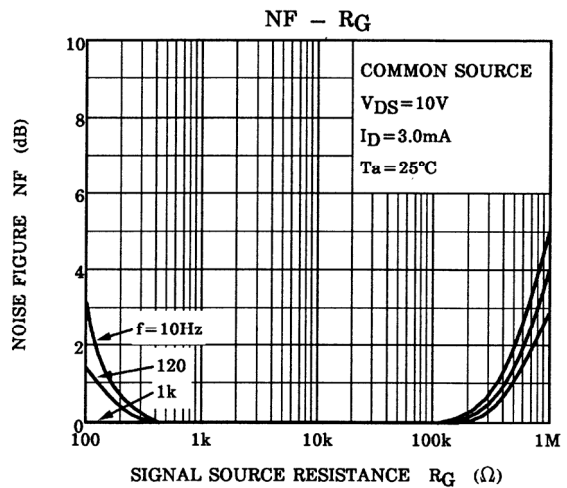
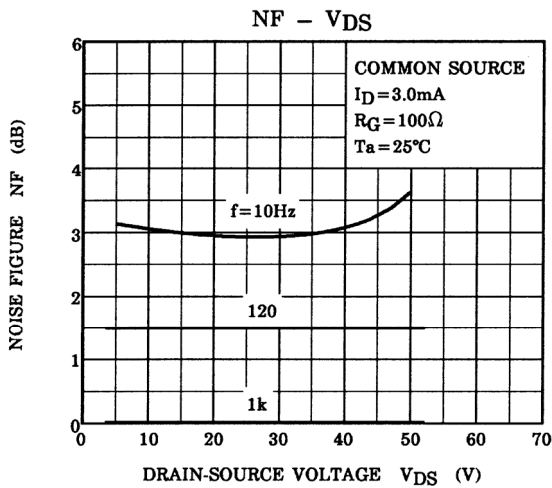
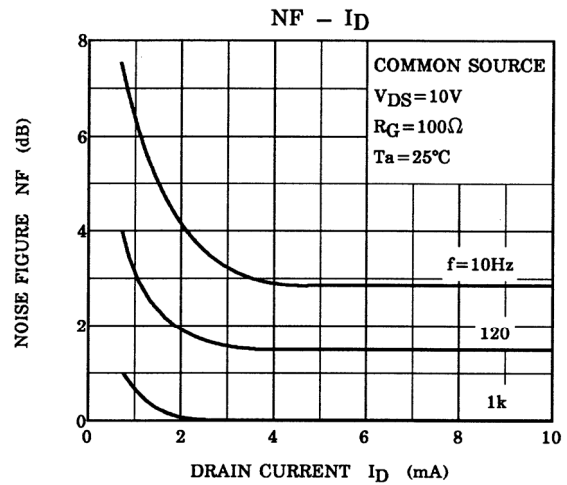
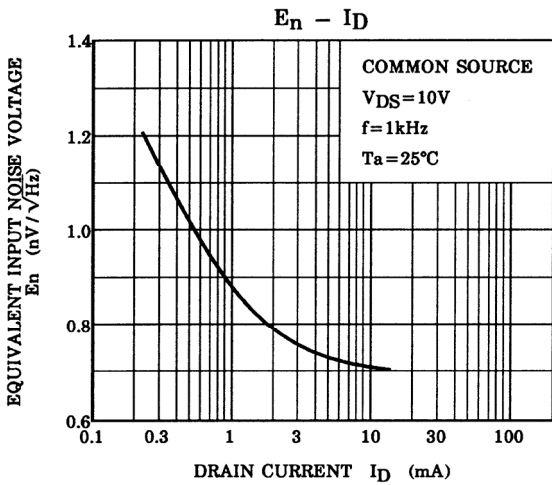
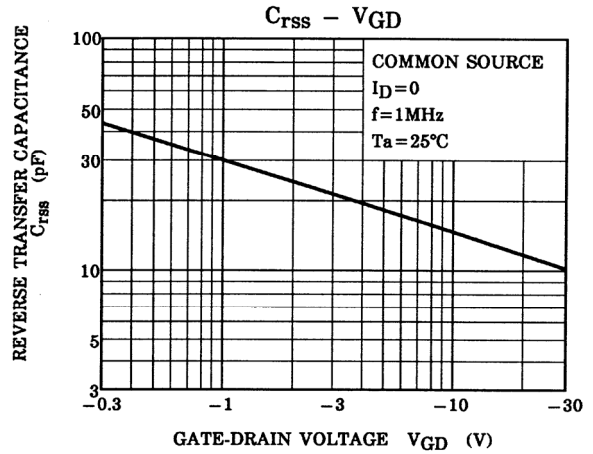
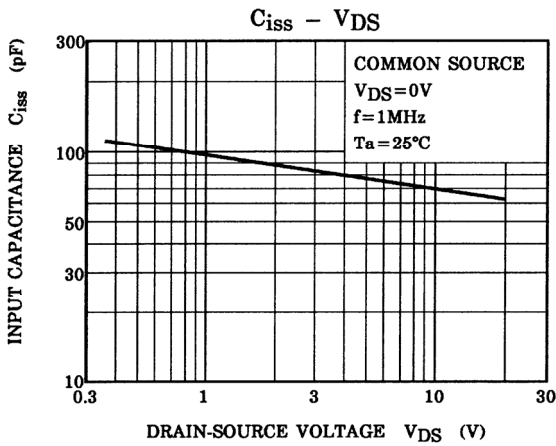


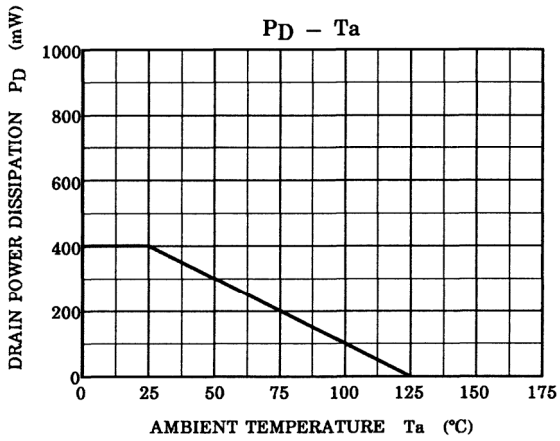
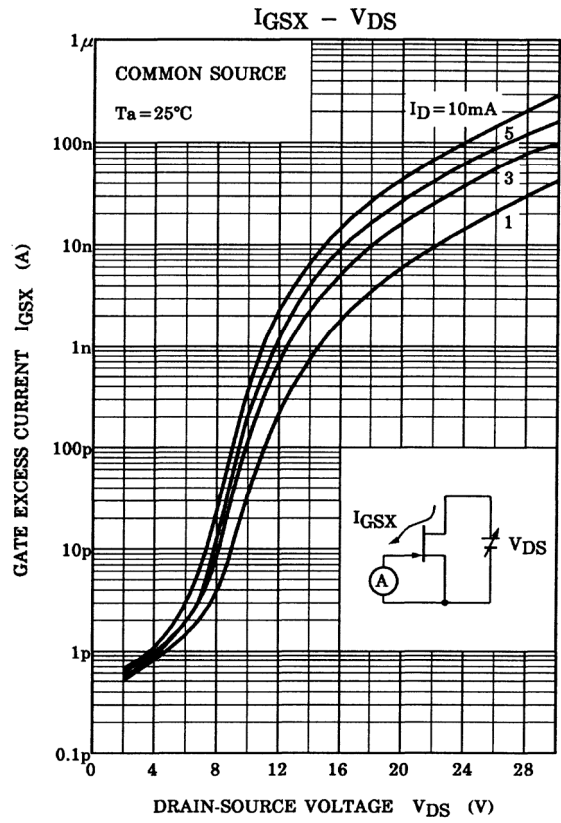
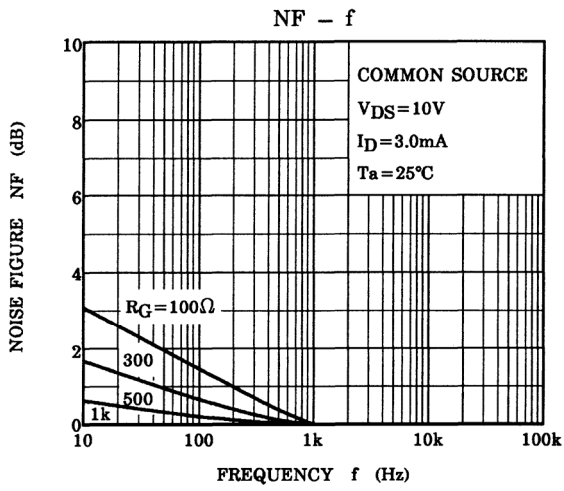
$|Y_{fs}| - I_{DSS}$



$V_{GS(OFF)} - I_{DSS}$







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20070701-EN GENERAL

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