

2SK209

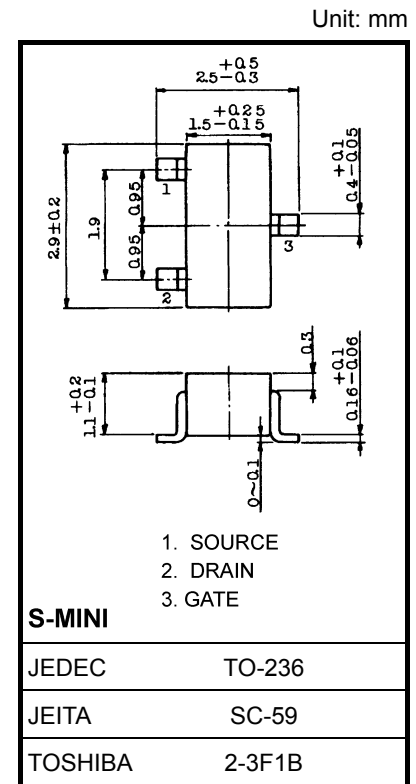
Audio Frequency Low Noise Amplifier Applications

- High $|Y_{fs}|$: $|Y_{fs}| = 15 \text{ mS (typ.)}$ at $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$
- High breakdown voltage: $V_{GDS} = -50 \text{ V}$
- Low noise: $NF = 1.0\text{dB (typ.)}$
at $V_{DS} = 10 \text{ V}$, $I_D = 0.5 \text{ mA}$, $f = 1 \text{ kHz}$, $R_G = 1 \text{ k}\Omega$
- High input impedance: $I_{GSS} = -1 \text{ nA (max)}$ at $V_{GS} = -30 \text{ V}$
- Small package

Absolute Maximum Ratings (Ta = 25°C)

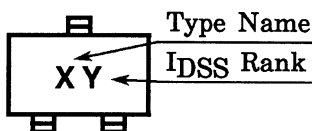
| Characteristics | Symbol | Rating | Unit |
|---------------------------|-----------|---------|------|
| Gate-drain voltage | V_{GDS} | -50 | V |
| Gate current | I_G | 10 | mA |
| Drain power dissipation | P_D | 150 | mW |
| Junction temperature | T_j | 125 | °C |
| Storage temperature range | T_{stg} | -55~125 | °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: 0.012 g (typ.)

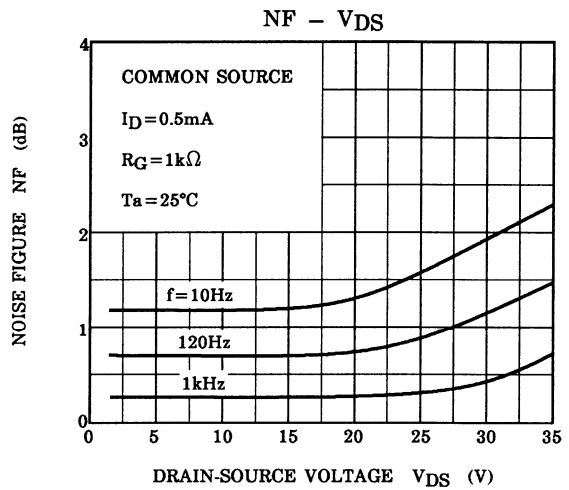
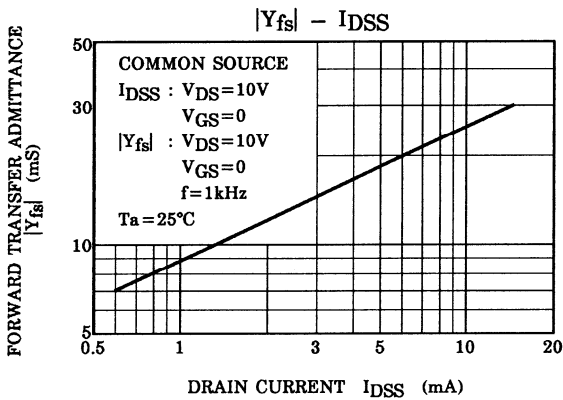
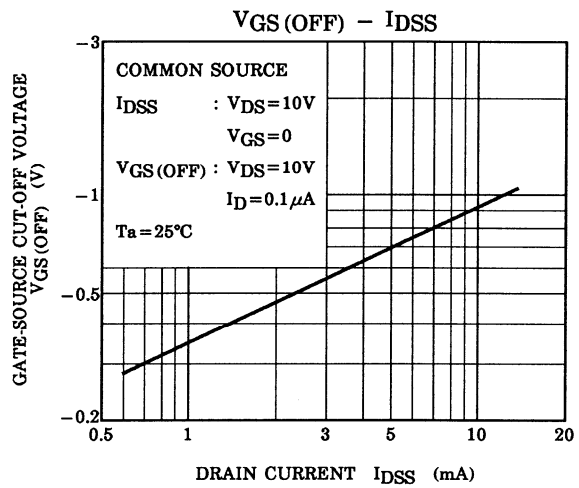
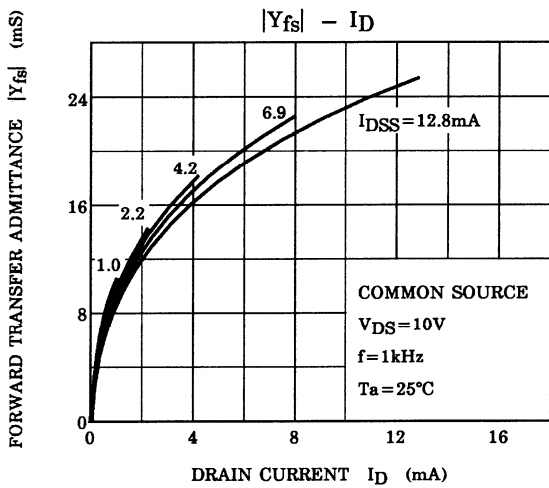
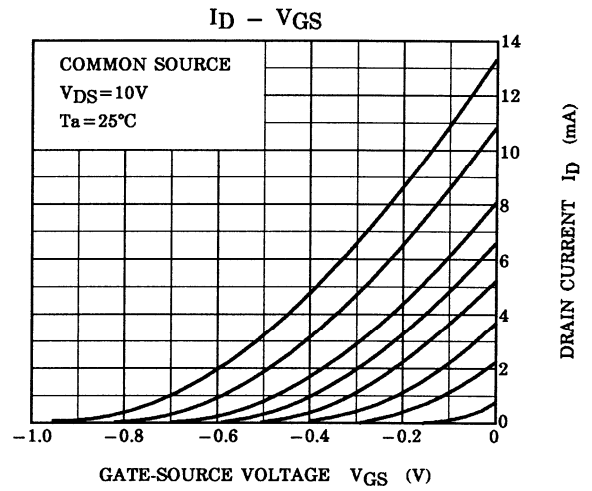
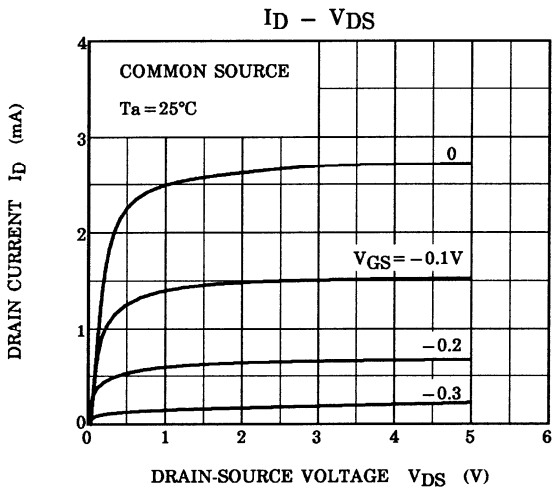
Marking

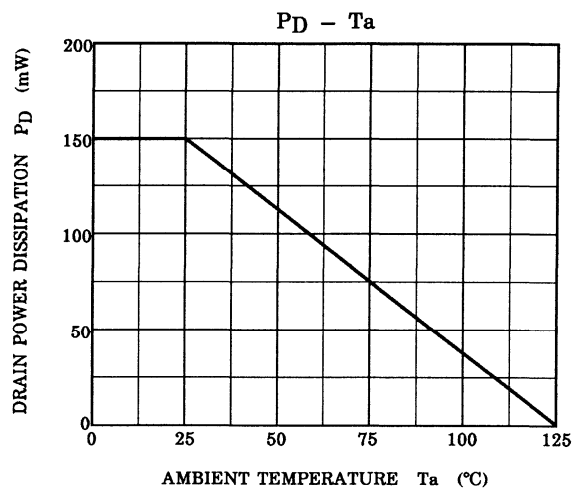
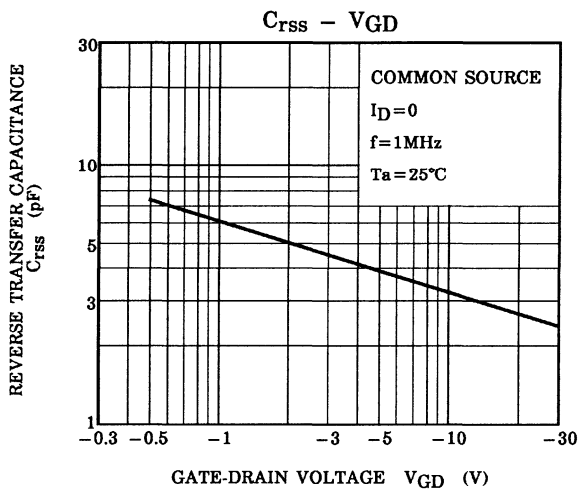
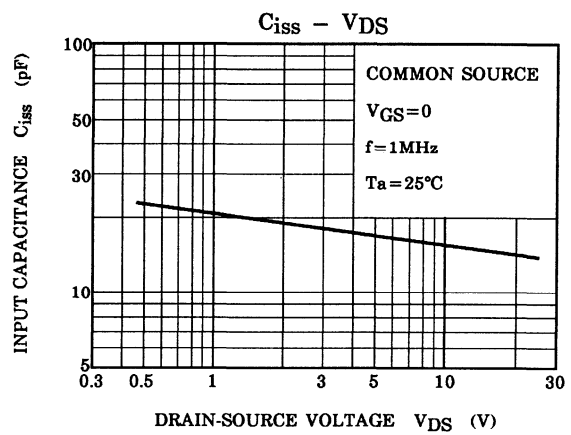
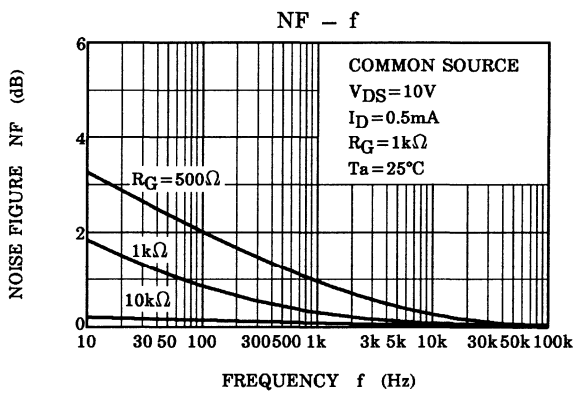
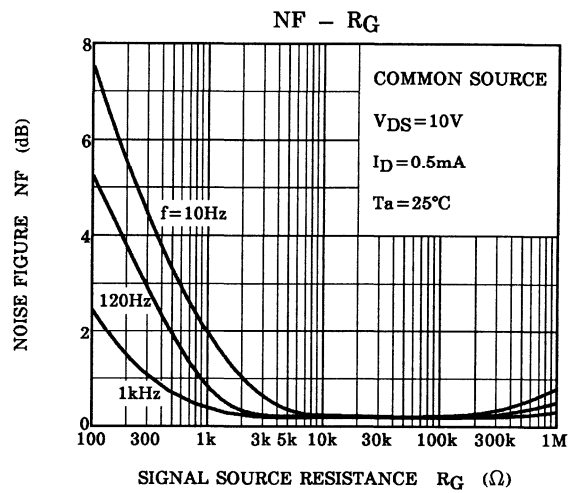
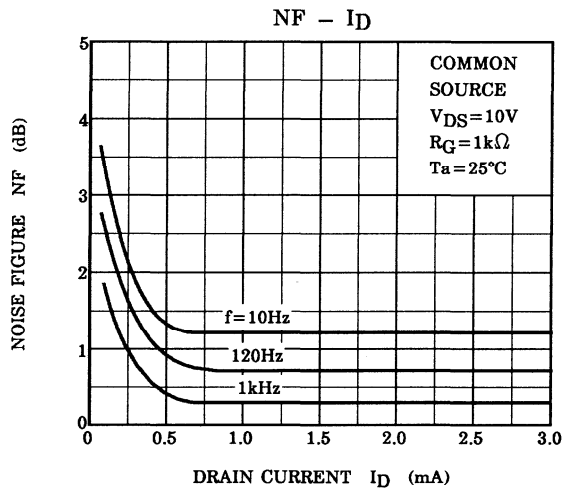


Electrical Characteristics (Ta = 25°C)

| 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 | $V_{(BR)GDS}$ | $V_{DS} = 0$, $I_G = -100 \mu\text{A}$ | -50 | — | — | V |
| Drain current | I_{DSS} (Note) | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$ | 1.2 | — | 14.0 | mA |
| Gate-source cut-off voltage | $V_{GS(OFF)}$ | $V_{DS} = 10 \text{ V}$, $I_D = 0.1 \mu\text{A}$ | -0.2 | — | -1.5 | V |
| Forward transfer admittance | $ Y_{fs} $ | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ kHz}$ | 4.0 | 15 | — | mS |
| Input capacitance | C_{iss} | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$ | — | 13 | — | pF |
| Reverse transfer capacitance | C_{rss} | $V_{DG} = 10 \text{ V}$, $I_D = 0$, $f = 1 \text{ MHz}$ | — | 3 | — | pF |
| Noise figure | NF (1) | $V_{DS} = 10 \text{ V}$, $R_G = 1 \text{ k}\Omega$ $I_D = 0.5 \text{ mA}$, $f = 10 \text{ Hz}$ | — | 5 | — | dB |
| Noise figure | NF (2) | $V_{DS} = 10 \text{ V}$, $R_G = 1 \text{ k}\Omega$ $I_D = 0.5 \text{ mA}$, $f = 1 \text{ kHz}$ | — | 1 | — | dB |

Note: I_{DSS} classification Y: 1.2~3.0 mA, GR: 2.6~6.5 mA, BL: 6.0~14 mA





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