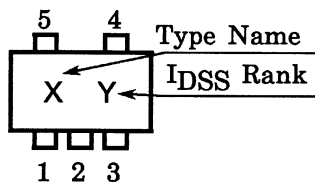


# 2SK2145

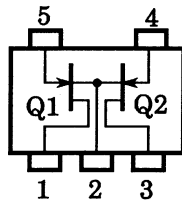
## Audio Frequency Low Noise Amplifier Applications

- Including two devices in SM5 (super mini type with 5 leads.)
- 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  $V_{GS} = -30 \text{ V}$

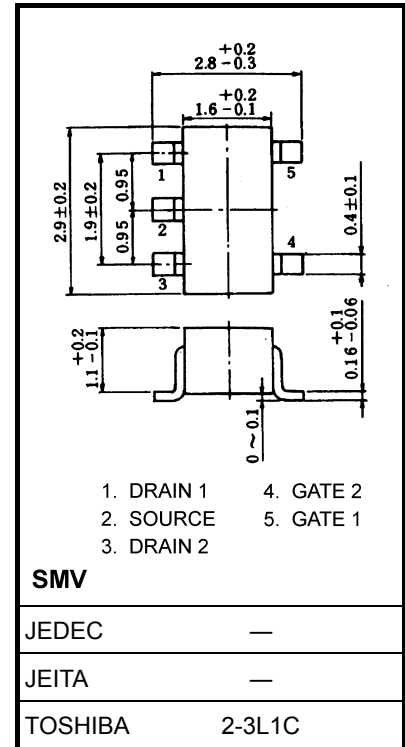
### Marking



### Pin Assignment (top view)



Unit: mm



Weight: 0.016 g (typ.)

### Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 common)

| Characteristics         | Symbol            | Rating     | Unit |
|-------------------------|-------------------|------------|------|
| Gate-drain voltage      | $V_{GDS}$         | -50        | V    |
| Gate current            | $I_G$             | 10         | mA   |
| Drain power dissipation | $P_D$<br>(Note 1) | 300        | mW   |
| Junction temperature    | $T_j$             | 125        | °C   |
| Storage temperature     | $T_{stg}$         | -55 to 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).

Note 1: Total rating

Start of commercial production  
1993-03

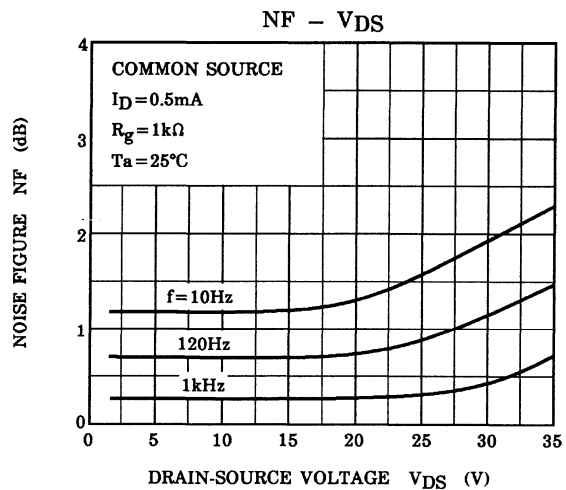
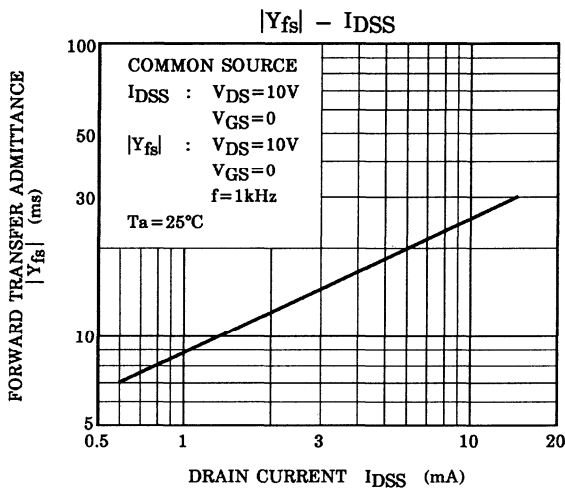
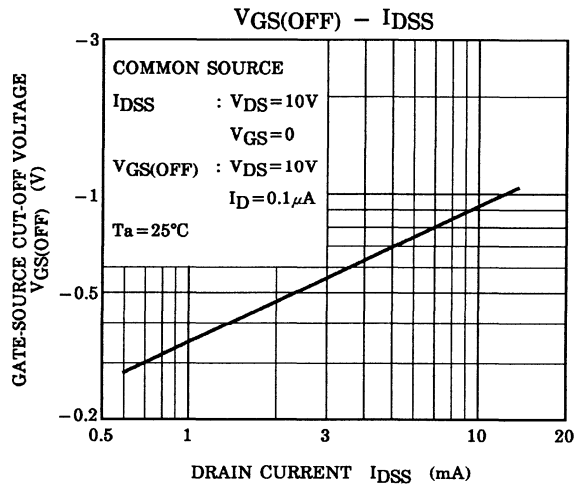
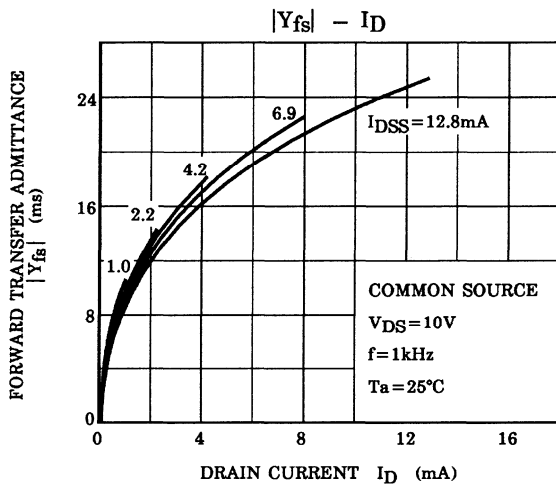
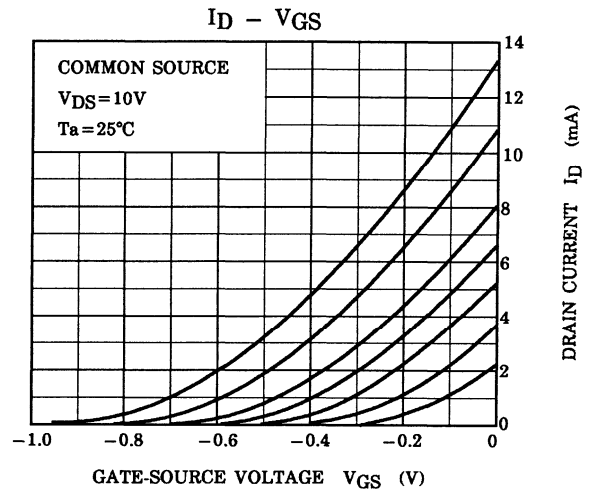
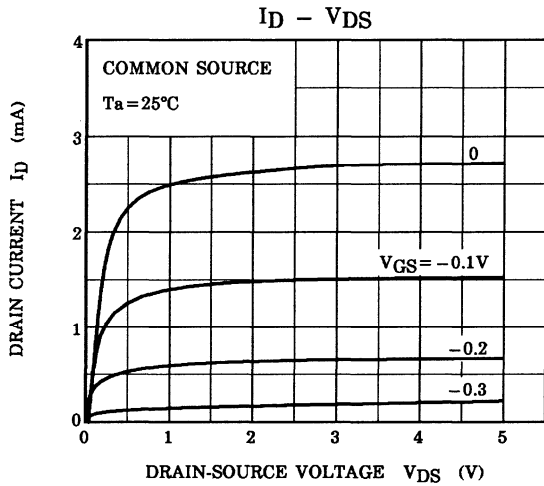
## Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

| Characteristics              | Symbol                | Test Condition  | Min  | Typ. | Max  | Unit |
|------------------------------|-----------------------|---|------|------|------|------|
| Gate-leakage 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                | $I_{DSS}$<br>(Note 2) | $V_{DS} = 10\text{ V}, V_{GS} = 0$  | 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)                | $V_{DS} = 10\text{ V}, R_g = 1\text{ k}\Omega$<br>$I_D = 0.5\text{ mA}, f = 10\text{ Hz}$ | —    | 5    | —    | dB   |
|                              | NF (2)                | $V_{DS} = 10\text{ V}, R_g = 1\text{ k}\Omega$<br>$I_D = 0.5\text{ mA}, f = 1\text{ kHz}$ | —    | 1    | —    |      |

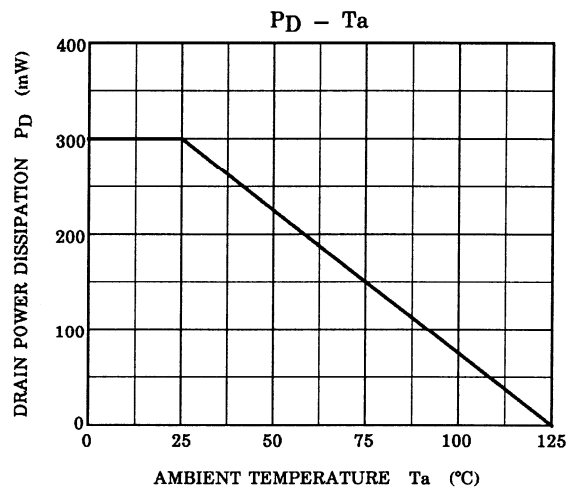
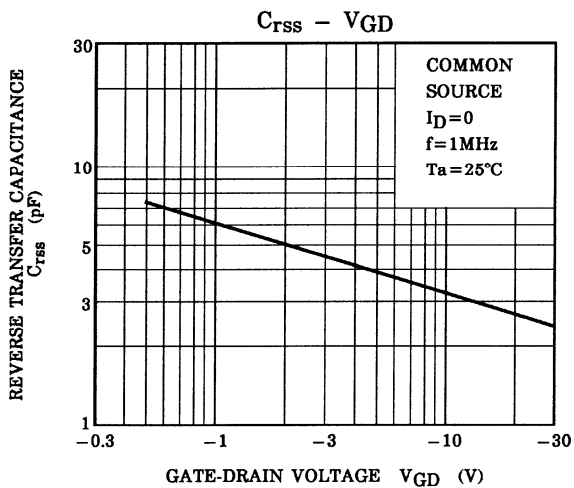
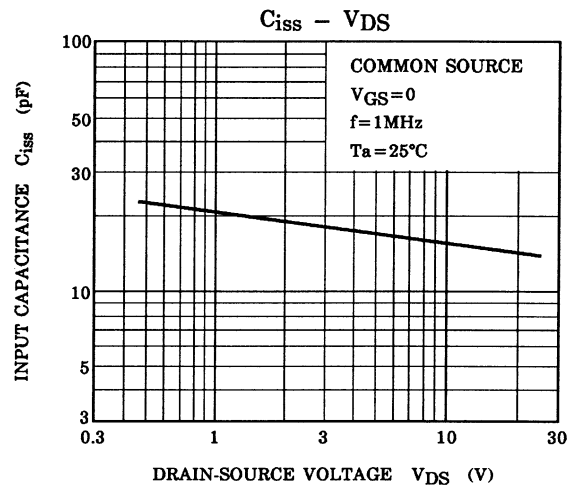
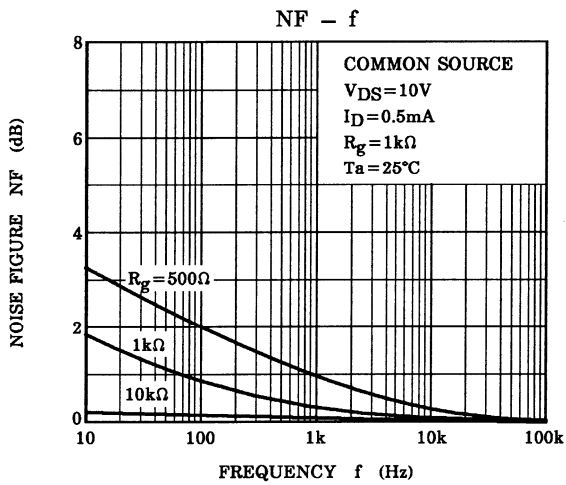
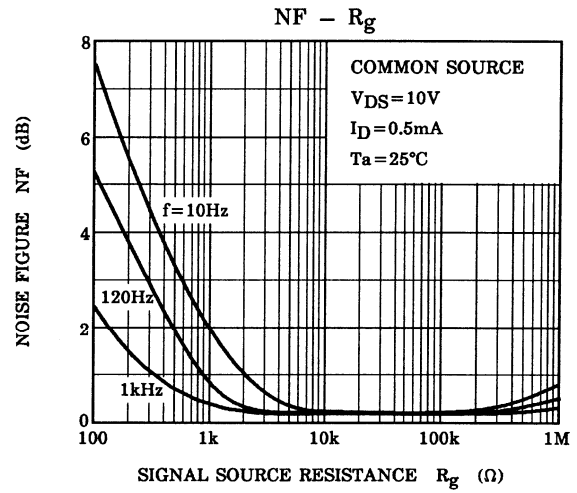
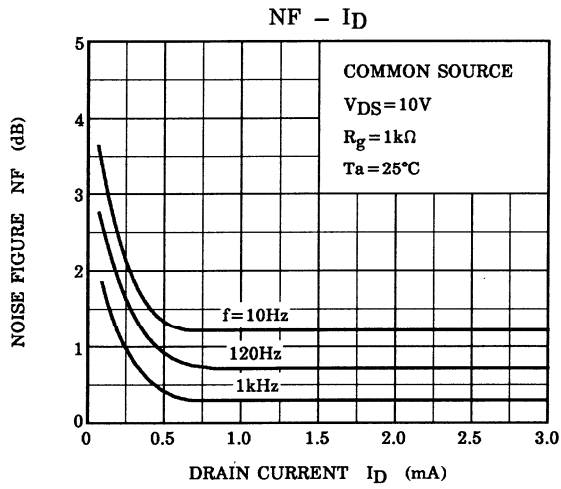
Note 2:  $I_{DSS}$  classification Y (Y): 1.2 to 3.0 mA, GR (G): 2.6 to 6.5 mA, BL (L): 6.0 to 14.0 mA

( ) Marking symbol

(Q1, Q2 common)



(Q1, Q2 common)



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