

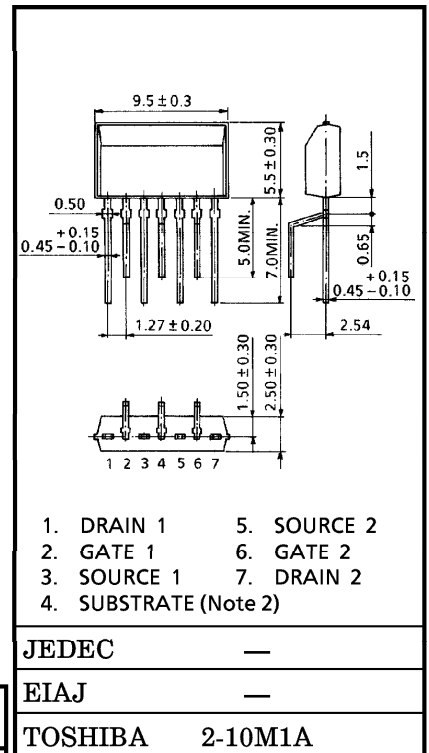
TOSHIBA DUAL FIELD EFFECT TRANSISTOR SILICON MONOLITHIC N CHANNEL JUNCTION TYPE

2SK389

LOW NOISE AUDIO AND DIFFERENTIAL AMPLIFIER APPLICATIONS.

Unit in mm

- 1 Chip Dual Type.
- Recommended for First Differential Stages of DC Amplifiers.
- Very High $|Y_{fs}|$: $|Y_{fs}|=20\text{mS}$ (Typ.)
($V_{DS}=10\text{V}$, $V_{GS}=0$, $f=1\text{kHz}$, $I_{DSS}=3\text{mA}$)
- Good Pair Characteristics
- High Breakdown Voltage : $V_{GDS}=-50\text{V}$ (Min.)
- Very Low Noise : $NF=0.5\text{dB}$ (Typ.)
($V_{DS}=10\text{V}$, $I_D=1\text{mA}$, $R_G=1\text{k}\Omega$, $f=1\text{kHz}$)
- High Input Impedance : $I_{GSS}=-1.0\text{nA}$ (Max.) ($V_{GS}=-30\text{V}$)
- Complementary to 2SJ109



MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---------------------------|-----------|---------|------------------|
| Gate-Drain Voltage | V_{GDS} | -50 | V |
| Gate Current | I_G | 10 | mA |
| Drain Power Dissipation | P_D | 200 | mW |
| Junction Temperature | T_j | 125 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -55~125 | $^\circ\text{C}$ |

Weight : 0.37g (Typ.)

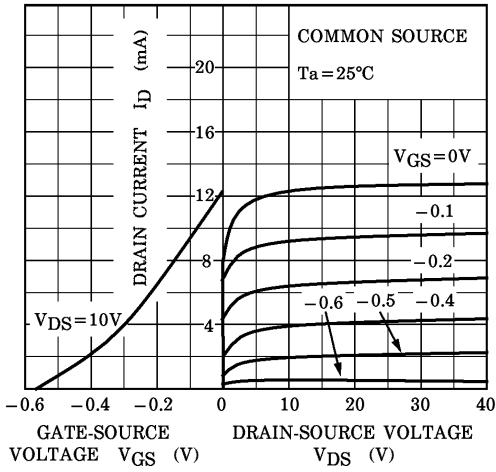
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------------|--|---|-------|------|------|------|
| Gate Cut-off Current | I_{GSS} | $V_{GS} = -30V, V_{DS} = 0$ | — | — | -1.0 | nA |
| Gate-Drain Breakdown Voltage | $V_{(BR)GDS}$ | $V_{DS} = 0, I_G = -100\mu A$ | -50 | — | — | V |
| Drain Current | I_{DSS} (Note 1) | $V_{DS} = 10V, V_{GS} = 0$ | 2.6 | — | 20 | mA |
| Drain Current Ratio | I_{DSS} / I_{DSS} (small) (large) | $V_{DS} = 10V, V_{GS} = 0$ | 0.9 | — | — | — |
| Gate-Source Cut-off Voltage | $V_{GS(OFF)}$ | $V_{DS} = 10V, I_D = 0.1\mu A$ | -0.15 | — | -2.0 | V |
| Forward Transfer Admittance | $ Y_{fs} $ | $V_{DS} = 10V, V_{GS} = 0$ $f = 1kHz, I_{DSS} = 3mA$ | 8 | 20 | — | mS |
| Forward Transfer Admittance Ratio | $ Y_{fs} / Y_{fs} $ (small) (large) | $V_{DS} = 10V, V_{GS} = 0,$ $f = 1kHz$ | 0.9 | — | — | — |
| Differential Gate-Source Voltage | $ V_{GS1} - V_{GS2} $ | $V_{DS} = 10V, I_D = 1mA$ | — | — | 20 | mV |
| Input Capacitance | C_{iss} | $V_{DS} = 10V, V_{GS} = 0,$ $f = 1MHz$ | — | 25 | — | pF |
| Reverse Transfer Capacitance | C_{rss} | $V_{GD} = -10V, I_D = 0,$ $f = 1MHz$ | — | 5.5 | — | pF |
| Noise Figure | NF (1) | $V_{DS} = 10V, R_G = 1k\Omega$ $I_D = 1mA, f = 10Hz$ | — | 1.5 | 10 | dB |
| | NF (2) | $V_{DS} = 10V, R_G = 1k\Omega$ $I_D = 1mA, f = 1kHz$ | — | 0.5 | 2 | dB |

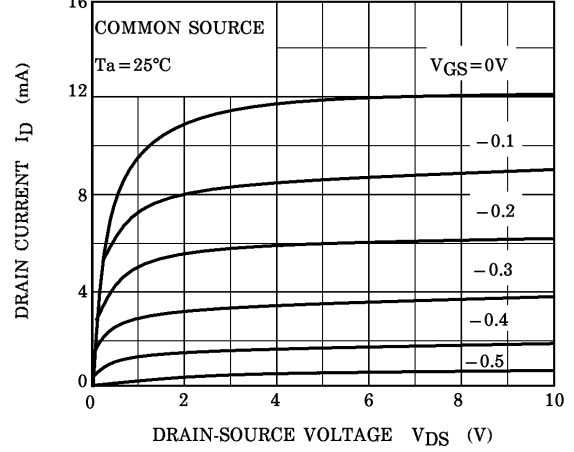
Note 1 : I_{DSS} Classification GR: 2.6~6.5mA, BL: 6~12mA, V: 10~20mA

Note 2 : Use the substrate lead with open.

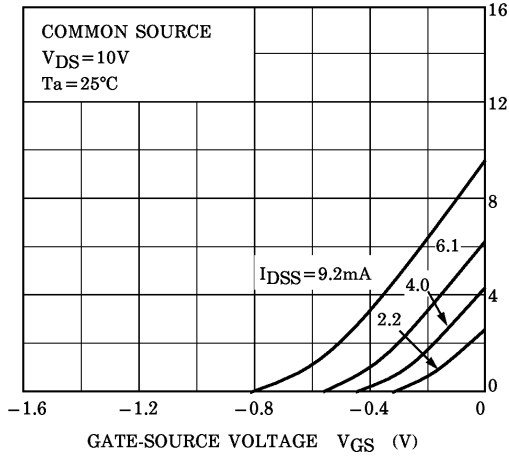
STATIC CHARACTERISTICS



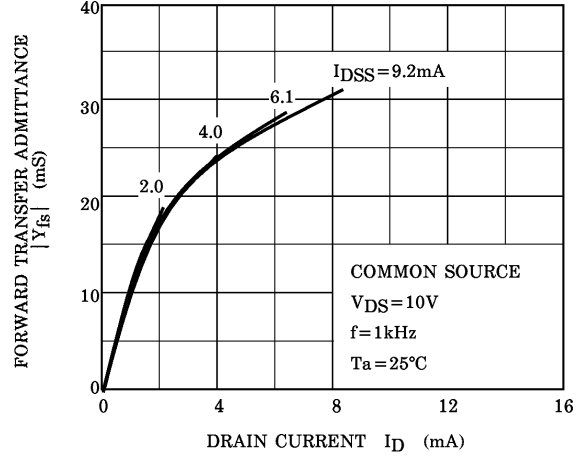
I_D - V_{DS} (LOW VOLTAGE REGION)



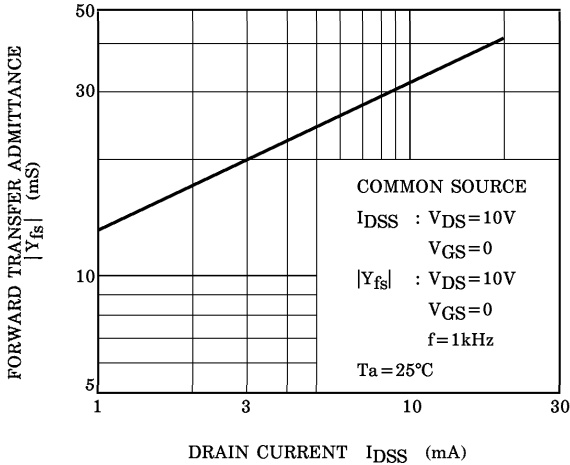
I_D - V_{GS}



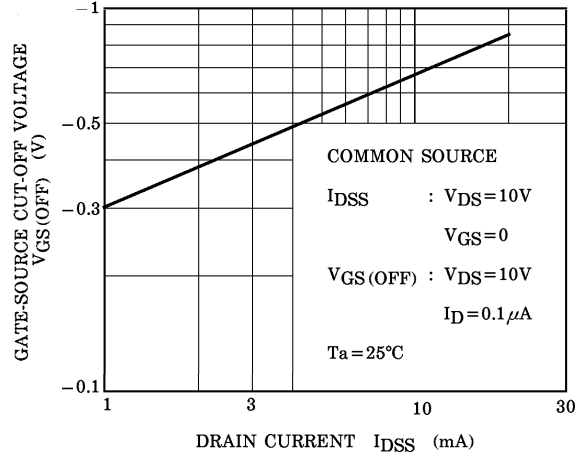
|Y_{fs}| - I_D

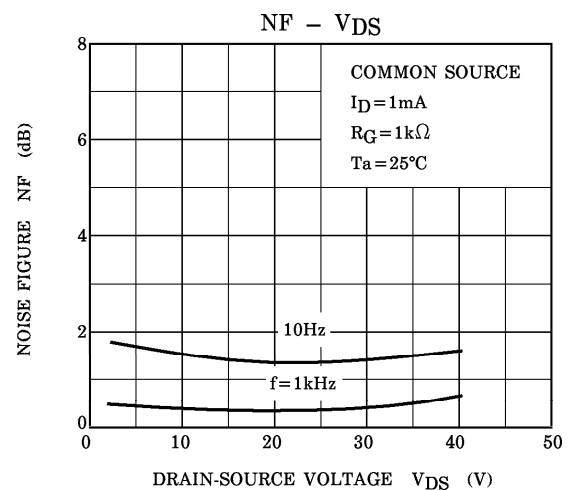
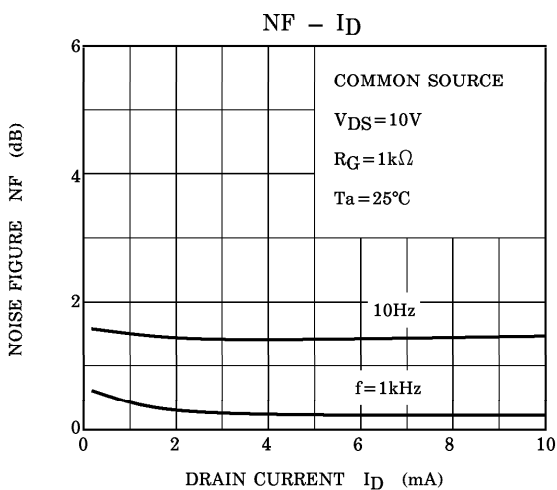
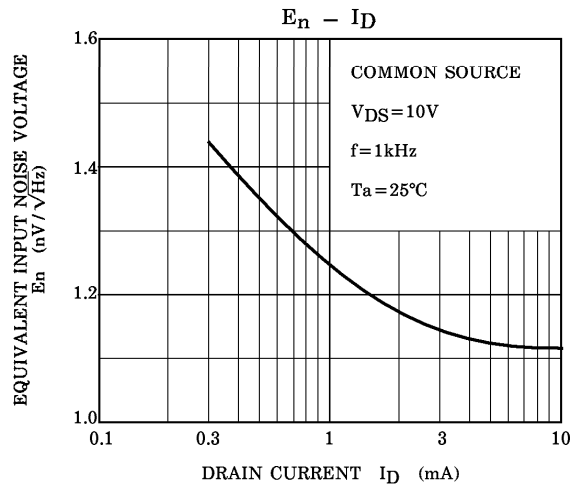
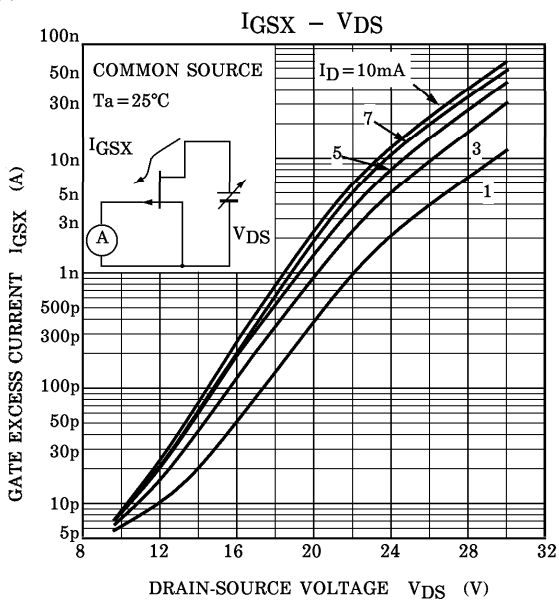
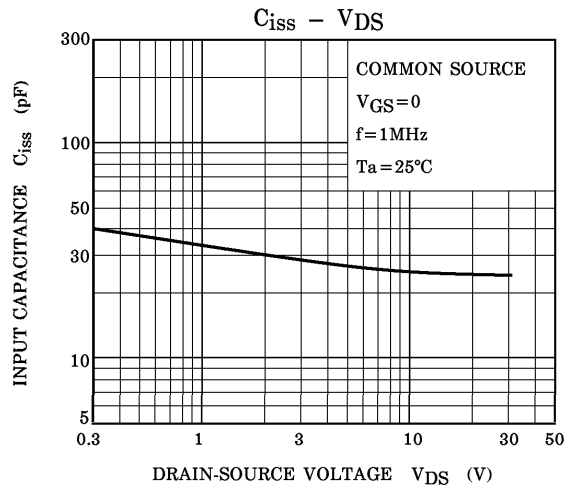
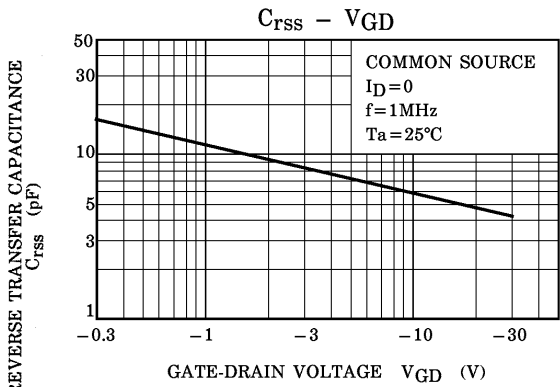


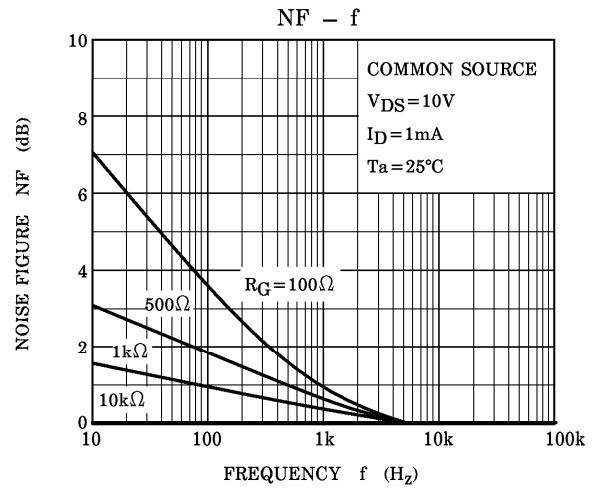
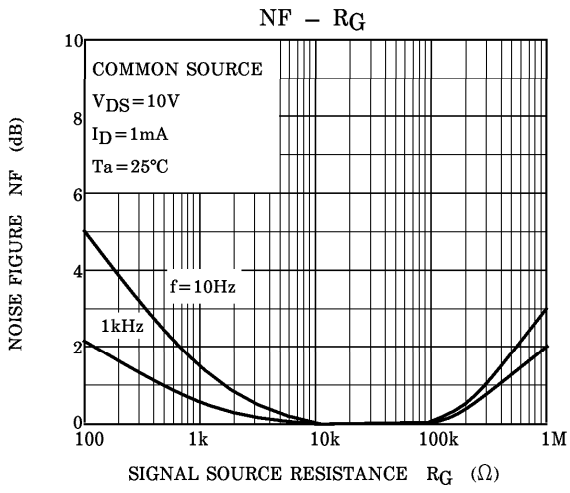
|Y_{fs}| - I_{DSS}



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







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