

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL JUNCTION TYPE

## 2SK170

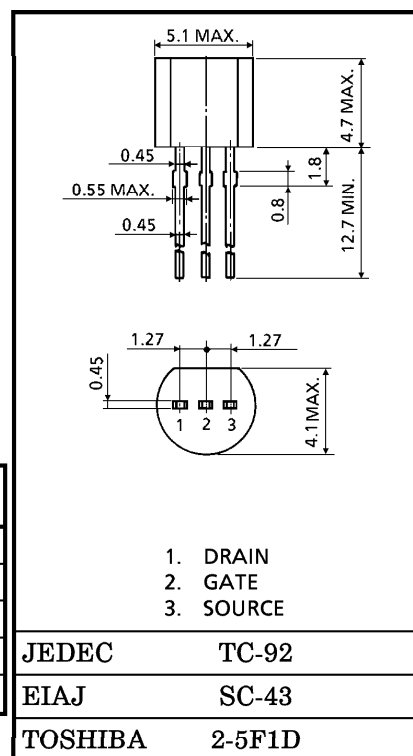
LOW NOISE AUDIO AMPLIFIER APPLICATIONS

Unit in mm

- Recommended for first stages of EQ and M.C. Head Amplifiers.
- High  $|Y_{fs}|$  :  $|Y_{fs}| = 22 \text{ mS (typ.)}$   
( $V_{DS} = 10 \text{ V}$ ,  $V_{GS} = 0$ ,  $I_{DSS} = 3 \text{ mA}$ )
- High Breakdown Voltage :  $V_{GDS} = -40 \text{ V}$
- Low Noise :  $E_n = 0.95 \text{ nV} / \sqrt{\text{Hz}}$  (typ.)  
( $V_{DS} = 10 \text{ V}$ ,  $I_D = 1 \text{ mA}$ ,  $f = 1 \text{ kHz}$ )
- High Input Impedance :  $I_{GSS} = -1 \text{ nA (max.)}$  ( $V_{GS} = -30 \text{ V}$ )

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

| CHARACTERISTIC            | 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 | $^\circ\text{C}$ |



Weight : 0.21 g

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTIC               | 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                | $I_{DSS}$<br>(Note) | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$  | 2.6  | —    | 20   | 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} $          | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ kHz}$  | —    | 22   | —    | mS   |
| Input Capacitance            | $C_{iss}$           | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$  | —    | 30   | —    | pF   |
| Reverse Transfer Capacitance | $C_{rss}$           | $V_{DG} = 10 \text{ V}$ , $I_D = 0$ , $f = 1 \text{ MHz}$   | —    | 6    | —    | pF   |
| Noise Figure                 | NF (1)              | $V_{DS} = 10 \text{ V}$ , $I_D = 1.0 \text{ mA}$ ,<br>$R_G = 1 \text{ k}\Omega$ , $f = 1 \text{ kHz}$ | —    | 1.0  | 10   | dB   |
|                              | NF (2)              | $V_{DS} = 10 \text{ V}$ , $I_D = 1.0 \text{ mA}$ ,<br>$R_G = 1 \text{ k}\Omega$ , $f = 1 \text{ kHz}$ | —    | 0.5  | 2    |      |

(Note) :  $I_{DSS}$  Classification GR : 2.6~6.5 mA, BL : 6.0~12 mA, V : 10~20 mA

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