

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL JUNCTION TYPE

# 2SK117

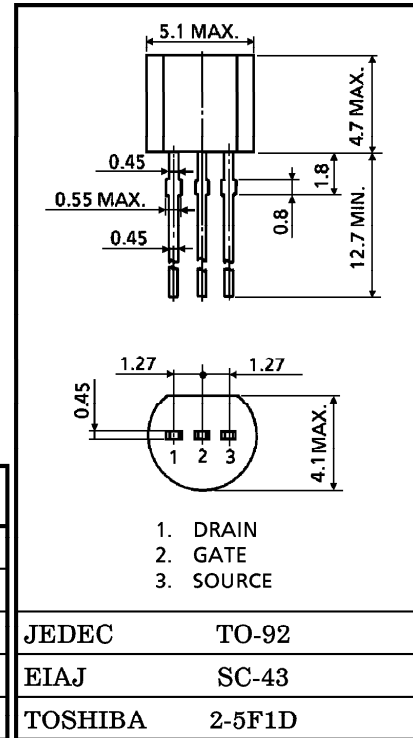
LOW NOISE AUDIO AMPLIFIER APPLICATIONS

Unit in mm

- High  $|Y_{fs}|$  :  $|Y_{fs}| = 15\text{mS}$  (Typ.)  
( $V_{DS} = 10\text{V}$ ,  $V_{GS} = 0$ )
- High Breakdown Voltage :  $V_{GDS} = -50\text{V}$
- Low Noise :  $NF = 1.0\text{dB}$  (Typ.) ( $V_{DS} = 10\text{V}$ ,  
 $I_D = 0.5\text{mA}$ ,  $f = 1\text{kHz}$ ,  $R_G = 1\text{k}\Omega$ )
- High Input Impedance :  $I_{GSS} = -1\text{nA}$  (Max.) ( $V_{GS} = -30\text{V}$ )

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   | $P_D$     | 300     | mW               |
| Junction Temperature      | $T_j$     | 125     | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{stg}$ | -55~125 | $^\circ\text{C}$ |



Weight : 0.21g

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

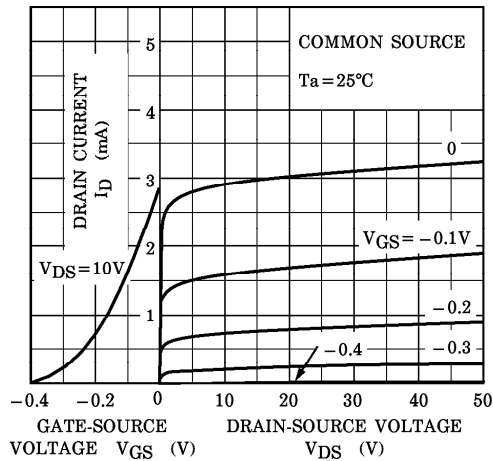
| CHARACTERISTIC               | SYMBOL           | TEST CONDITION                                                                              | MIN. | TYP. | MAX. | UNIT |
|------------------------------|------------------|---------------------------------------------------------------------------------------------|------|------|------|------|
| Gate Cut-off Current         | $I_{GSS}$        | $V_{GS} = -30\text{V}$ , $V_{DS} = 0$                                                       | —    | —    | -1.0 | nA   |
| Gate-Drain Breakdown Voltage | $V_{(BR)GDS}$    | $V_{DS} = 0$ , $I_G = -100\mu\text{A}$                                                      | -50  | —    | —    | V    |
| Drain Current                | $I_{DSS}$ (Note) | $V_{DS} = 10\text{V}$ , $V_{GS} = 0$                                                        | 1.2  | —    | 14   | 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 | $C_{rss}$        | $V_{GD} = -10\text{V}$ , $I_D = 0$ , $f = 1\text{MHz}$                                      | —    | 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    | 10   | 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    | 2    |      |

Note :  $I_{DSS}$  Classification Y : 1.2~3.0mA, GR : 2.6~6.5mA, BL : 6~14mA

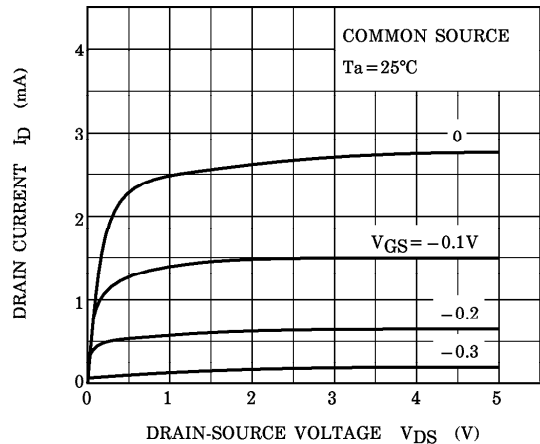
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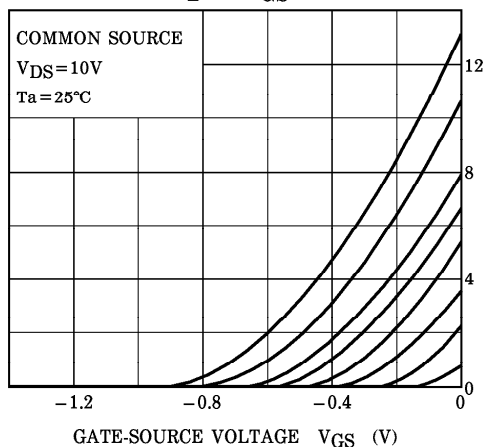
STATIC CHARACTERISTICS



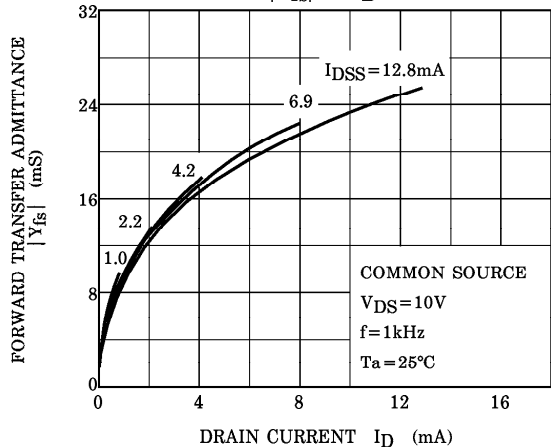
$I_D - V_{DS}$  (LOW VOLTAGE REGION)



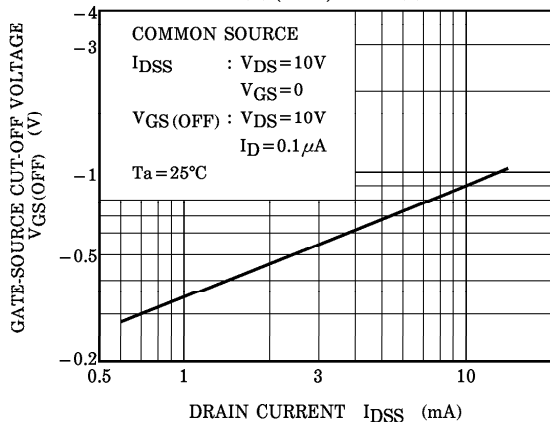
$I_D - V_{GS}$



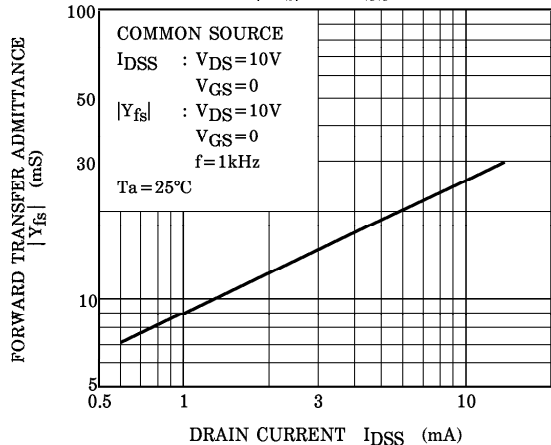
$|Y_{fs}| - I_D$



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



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



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