

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL JUNCTION TYPE

# 2SK170

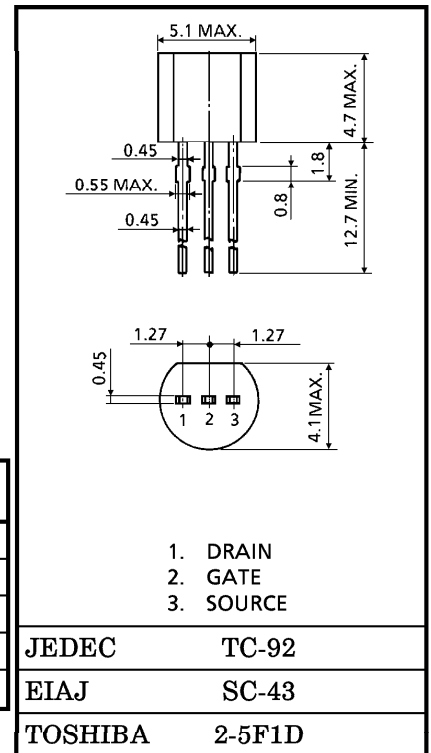
LOW NOISE AUDIO AMPLIFIER APPLICATIONS

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	$^\circ\text{C}$



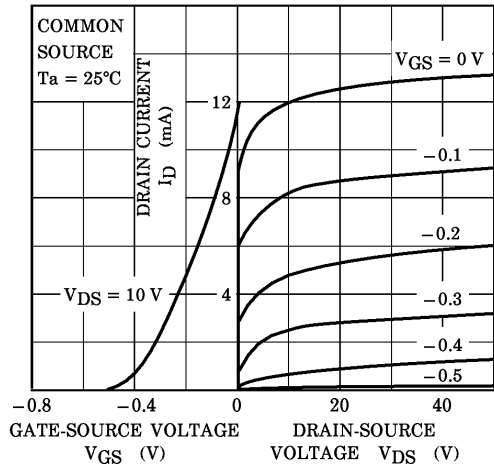
Weight : 0.21 g

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

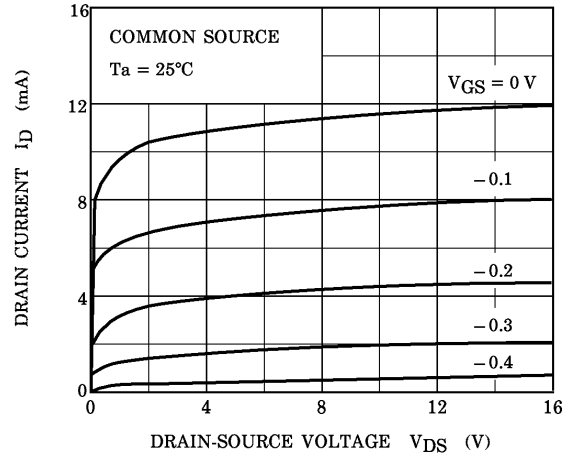
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Cut-off Current	$I_{GSS}$	$V_{GS} = -30 \text{ V}$ , $V_{DS} = 0$	—	—	-1.0	nA
Gate-Drain Breakdown Voltage	$V_{(BR)GDS}$	$V_{DS} = 0$ , $I_G = -100 \mu\text{A}$	-40	—	—	V
Drain Current	$I_{DSS}$ (Note)	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$	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)	$V_{DS} = 10 \text{ V}$ , $I_D = 1.0 \text{ mA}$ , $R_G = 1 \text{ k}\Omega$ , $f = 1 \text{ kHz}$	—	1.0	10	dB
	NF (2)	$V_{DS} = 10 \text{ V}$ , $I_D = 1.0 \text{ mA}$ , $R_G = 1 \text{ k}\Omega$ , $f = 1 \text{ kHz}$	—	0.5	2	

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

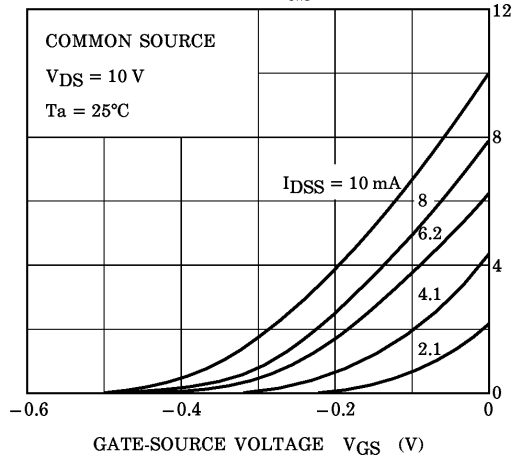
STATIC CHARACTERISTICS



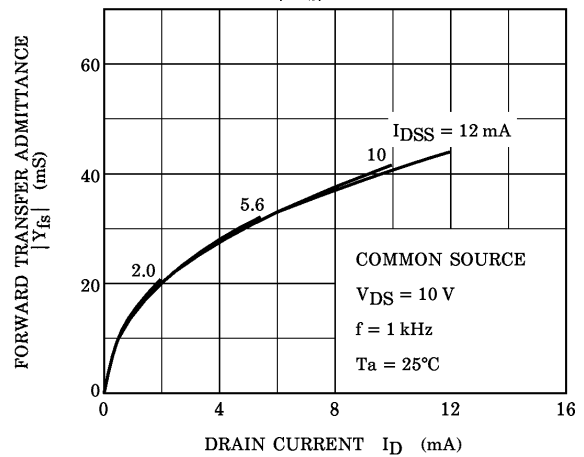
$I_D - V_{DS}$  (LOW VOLTAGE REGION)



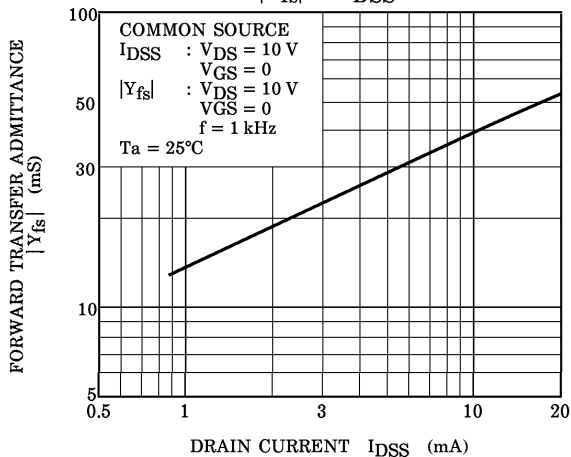
$I_D - V_{GS}$



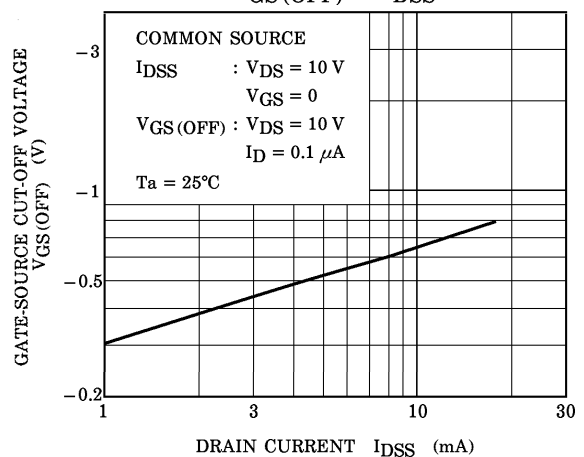
$|Y_{fs}| - I_D$

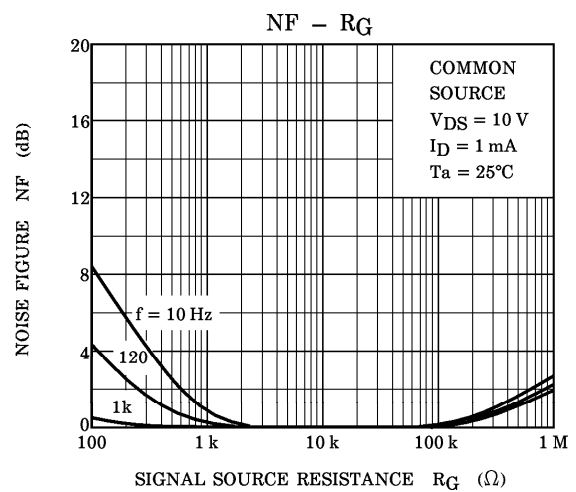
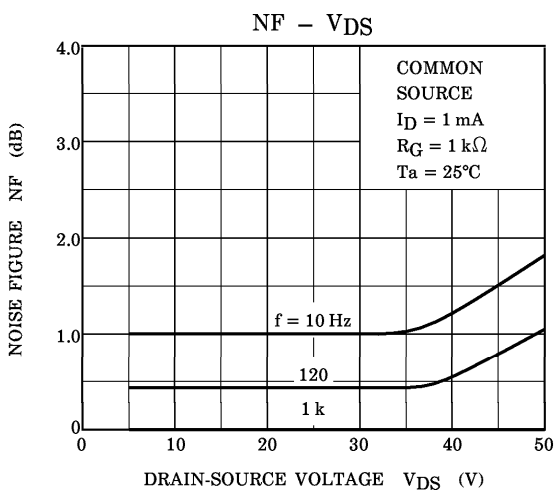
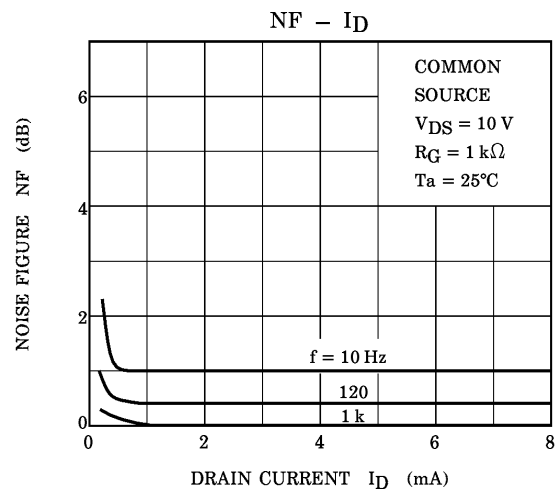
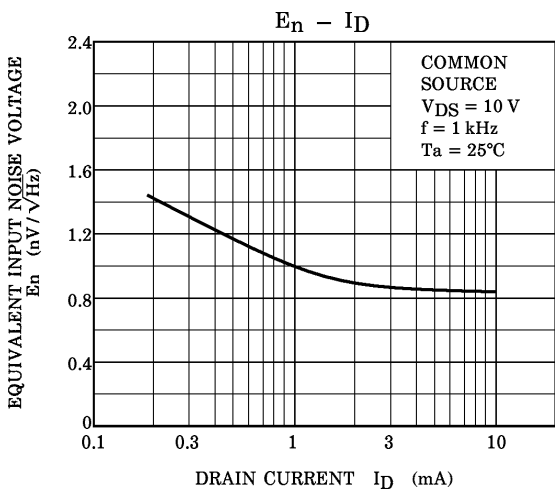
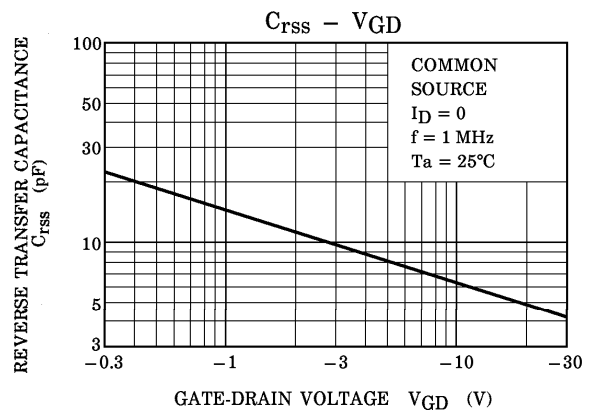
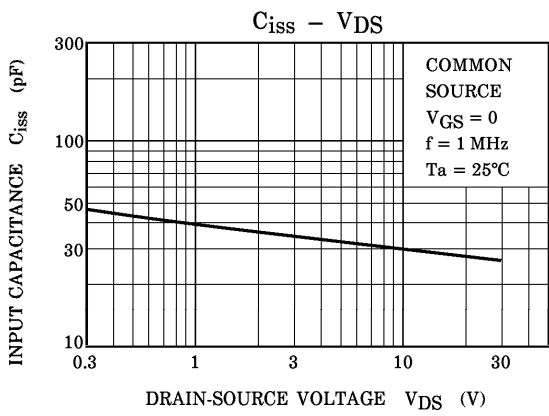


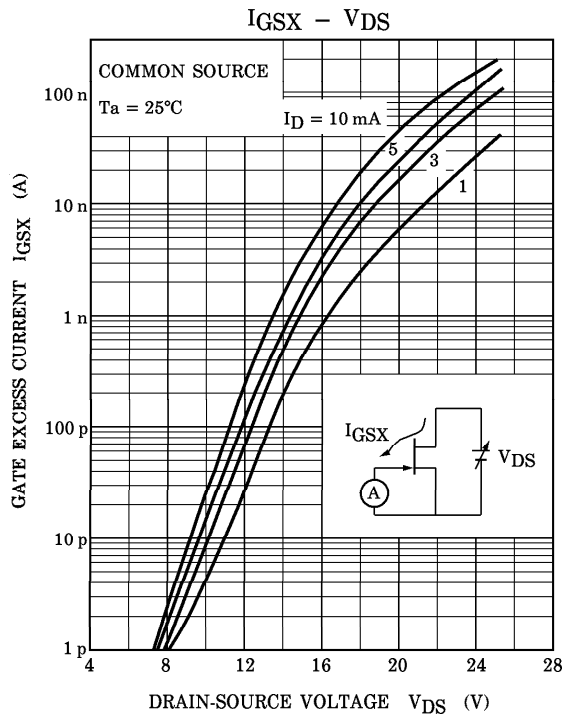
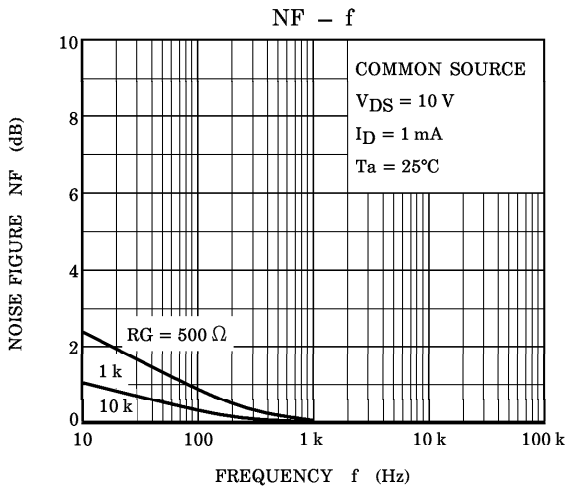
$|Y_{fs}| - I_{DSS}$



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







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