

TOSHIBA FIELD EFFECT TRANSISTOR SILICON MONOLITHIC P CHANNEL JUNCTION TYPE

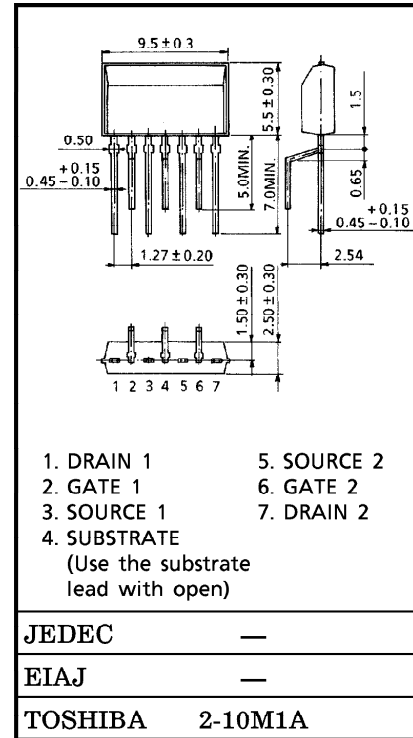
# 2SJ109

LOW NOISE AUDIO AMPLIFIER APPLICATIONS

DIFFERENTIAL AMPLIFIER APPLICATIONS

- 1 Chip Dual Type
- High  $|Y_{fs}|$  :  $|Y_{fs}| = 22\text{mS (Typ.)}$   
( $V_{DS} = -10\text{V}$ ,  $V_{GS} = 0$ ,  $f = 1\text{kHz}$ ,  
 $I_{DSS} = -3\text{mA}$ )
- Good Pair Characteristics :  $|V_{GS1} - V_{GS2}| = 20\text{mV (Max.)}$   
( $V_{DS} = -10\text{V}$ ,  $I_D = -1\text{mA}$ )
- Very Low Noise :  $NF = 0.5\text{dB (Typ.)}$   
( $V_{DS} = -10\text{V}$ ,  $I_D = -1\text{mA}$ ,  
 $R_G = 1\text{k}\Omega$ ,  $f = 1\text{kHz}$ )
- Very High Input Impedance :  $I_{GSS} = 1.0\text{nA (Max.)}$   
( $V_{GS} = 30\text{V}$ ,  $V_{DS} = 0$ )
- Complementary to 2SK389

Unit in mm



**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Gate-Drain Voltage	$V_{GDS}$	30	V
Gate Current	$I_G$	-10	mA
Drain Power Dissipation	$P_D$	200	mW
Junction Temperature	$T_j$	125	°C
Storage Temperature Range	$T_{stg}$	-55~125	°C

Weight : 0.37g (Typ.)

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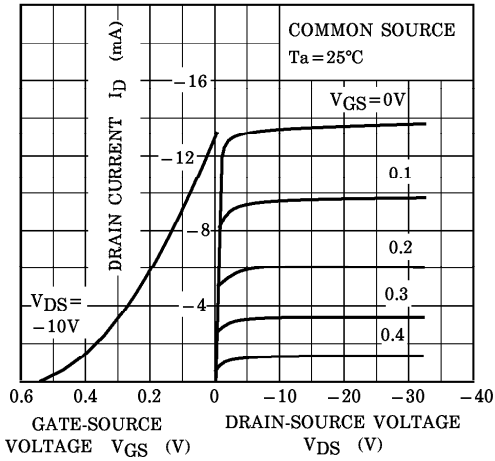
● The information contained herein is subject to change without notice.

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

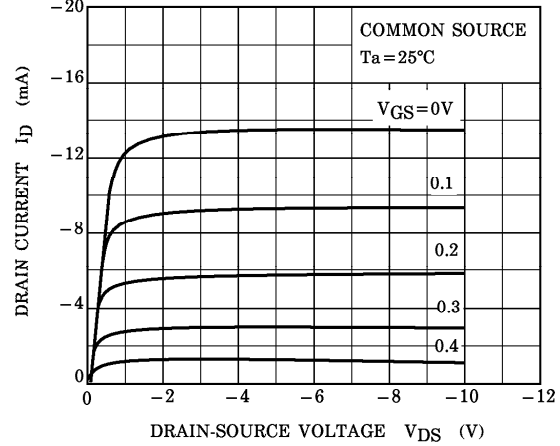
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Cut-off Current	$I_{GSS}$	$V_{GS}=30V, V_{DS}=0$	—	—	1.0	nA
Gate-Drain Breakdown Voltage	$V(BR)_{GDS}$	$V_{DS}=0, I_G=100\mu A$	30	—	—	V
Drain Current	$I_{DSS}^*$	$V_{DS}=-10V, V_{GS}=0$	-2.6	—	-20	mA
Gate-Source Cut-off Voltage	$V_{GS(OFF)}$	$V_{DS}=-10V, I_D=-0.1\mu A$	0.2	—	2.0	V
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS}=-10V, V_{GS}=0, f=1kHz, I_{DSS}=-3mA$	8	22	—	mS
Drain Current Ratio	$I_{DSS}/I_{DSS}$ (small) (large)	$V_{DS}=-10V, V_{GS}=0$	0.9	—	—	—
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	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0, f=1MHz$	—	95	—	pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{GD}=10V, I_D=0, f=1MHz$	—	25	—	pF
Noise Figure	NF (1)	$V_{DS}=-10V, I_D=-1mA, R_G=1k\Omega, f=10Hz$	—	1.5	11	dB
	NF (2)	$V_{DS}=-10V, I_D=-1mA, R_G=1k\Omega, f=1kHz$	—	0.5	2	

\*  $I_{DSS}$  Classification : GR = -2.6 ~ -6.5mA, BL = -6 ~ -12mA, V = -10 ~ -20mA

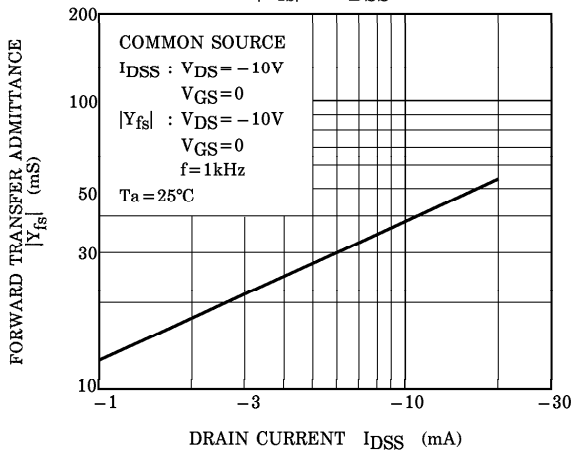
STATIC CHARACTERISTICS



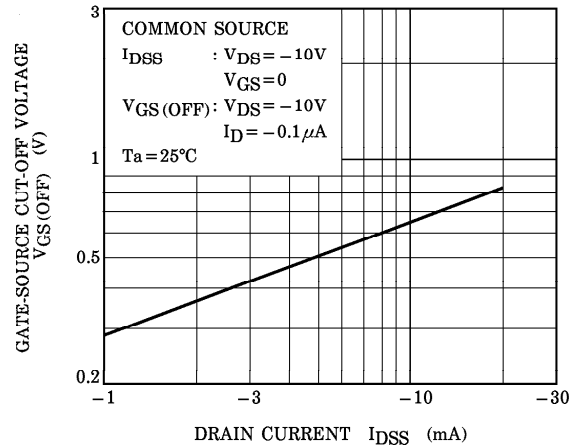
$I_D - V_{DS}$  (LOW VOLTAGE REGION)



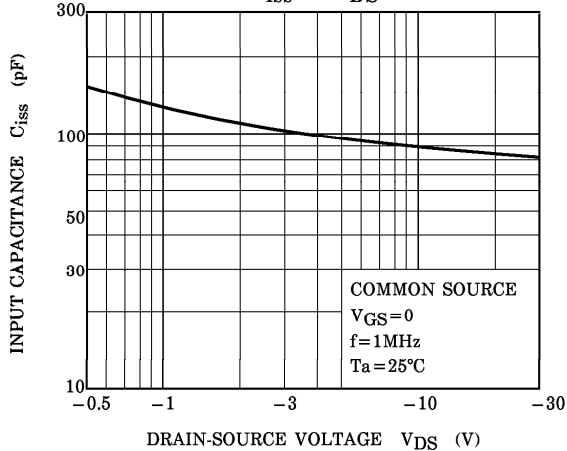
$|Y_{fs}| - I_{DSS}$



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



$C_{iss} - V_{DS}$



$C_{rss} - V_{GD}$

