

TOSHIBA FIELD EFFECT TRANSISTOR SILICON MONOLITHIC P CHANNEL JUNCTION TYPE

2SJ109

LOW NOISE AUDIO AMPLIFIER APPLICATIONS

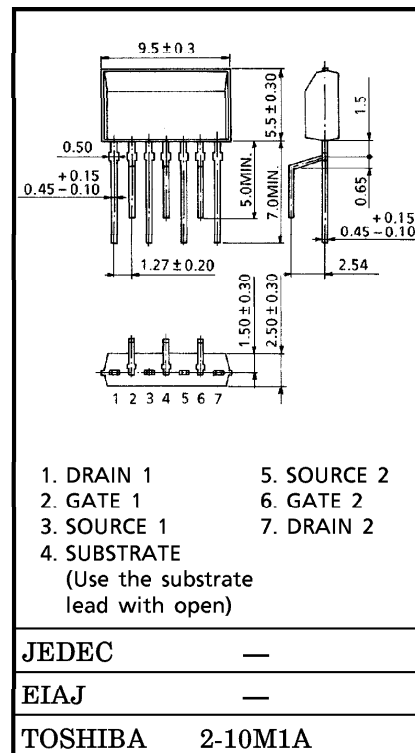
DIFFERENTIAL AMPLIFIER APPLICATIONS

- 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

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

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	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~125	$^\circ\text{C}$

Unit in mm



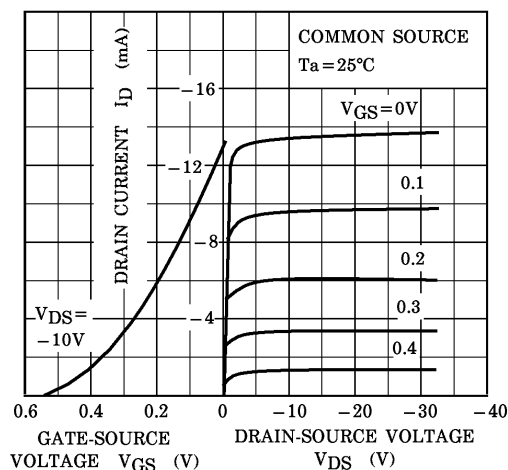
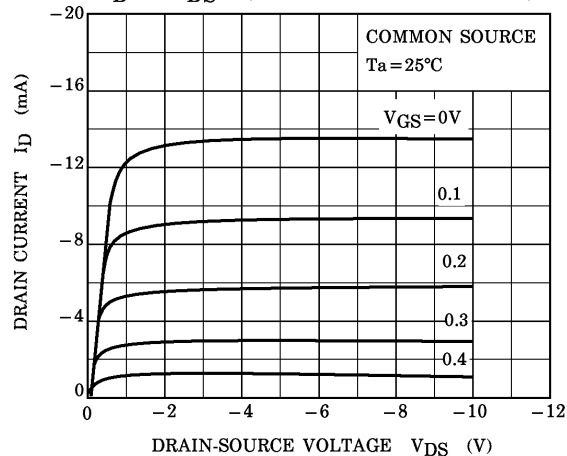
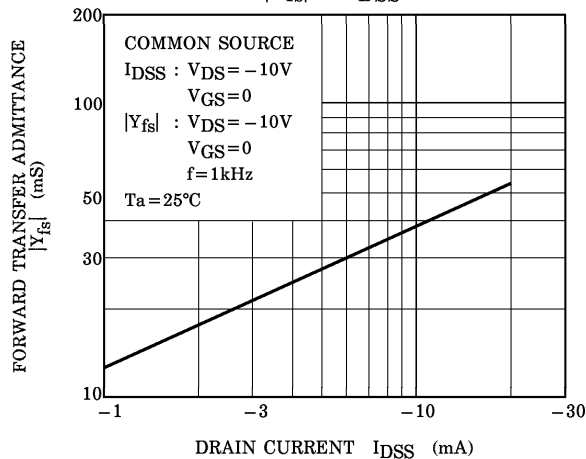
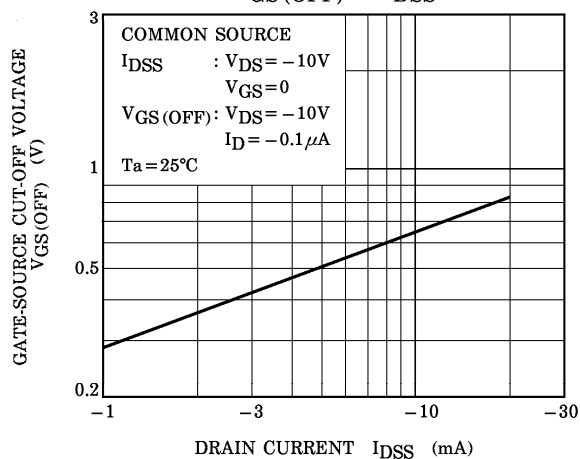
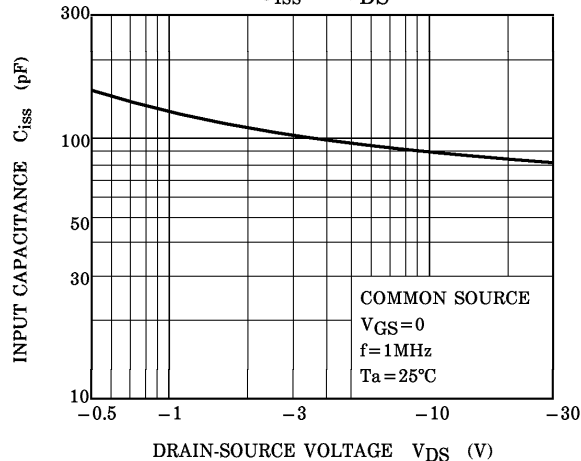
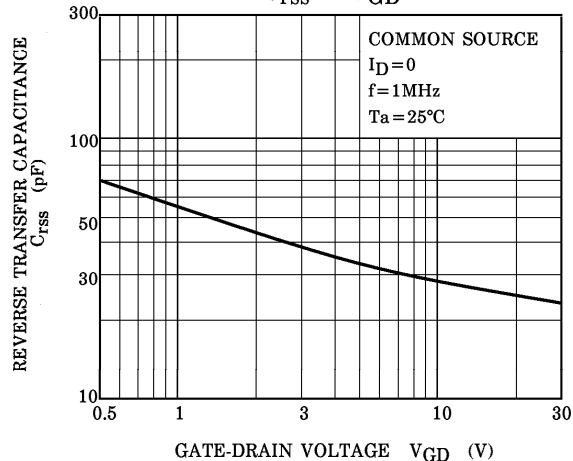
Weight : 0.37g (Typ.)

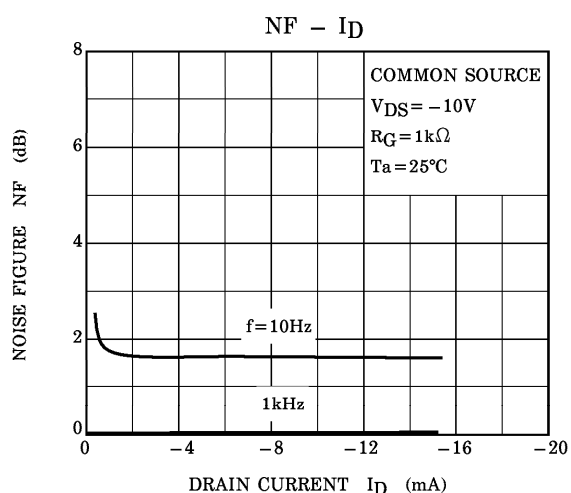
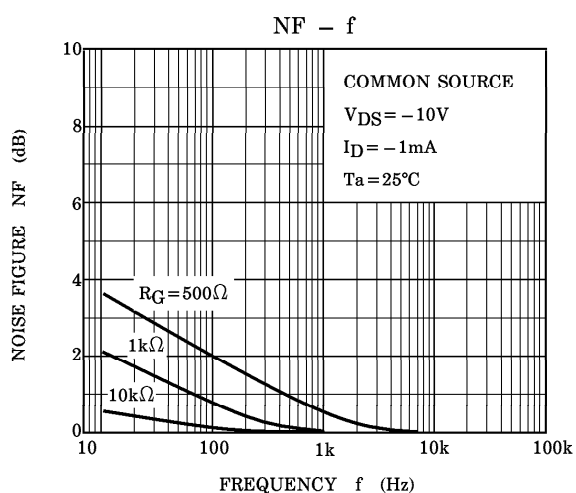
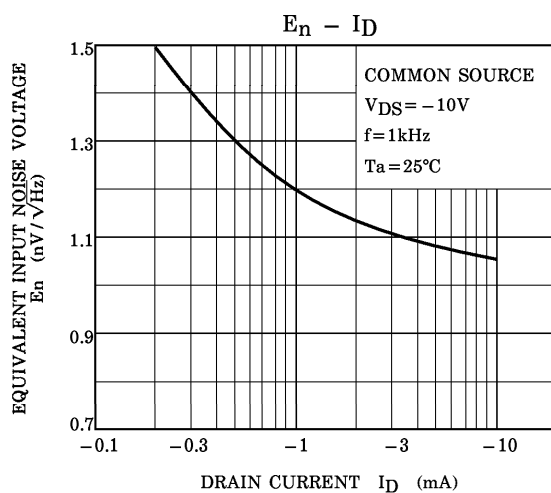
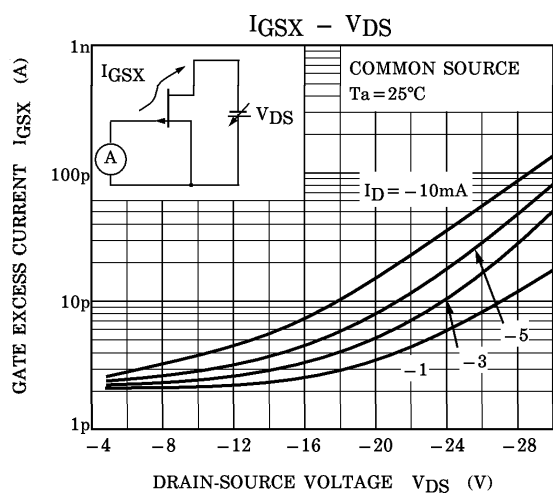
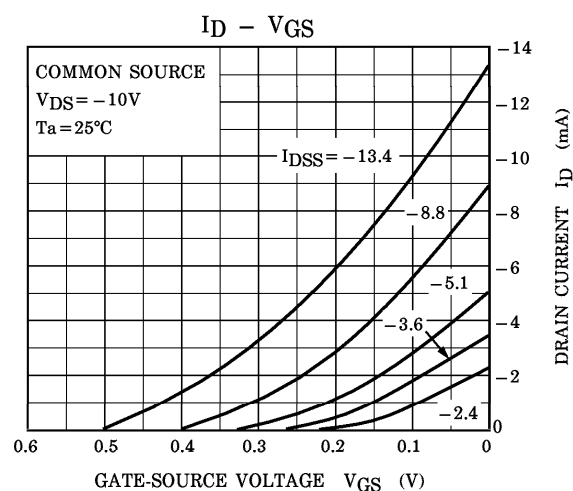
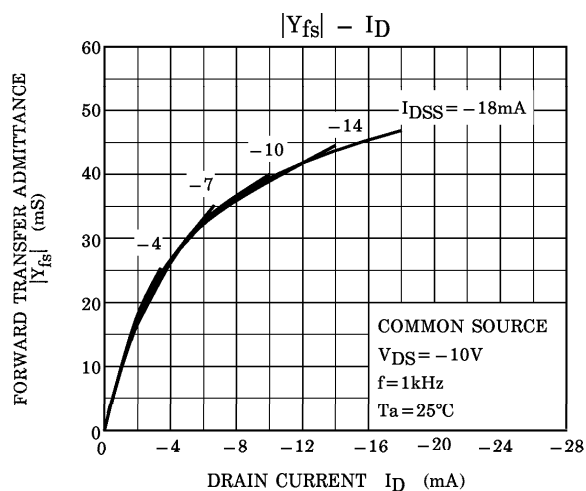
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

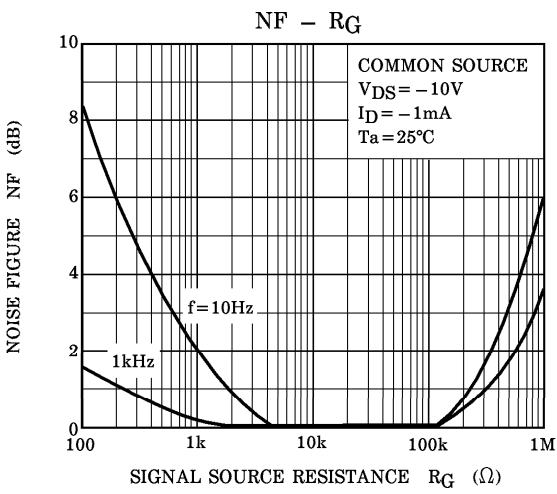
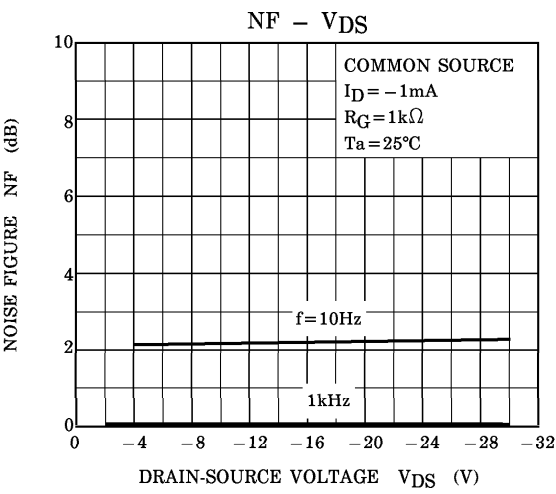
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Cut-off Current	I_{GSS}	$V_{GS}=30V, V_{DS}=0$	—	—	1.0	nA
Gate-Drain Breakdown Voltage	$V_{(BR)GDS}$	$V_{DS}=0, I_G=100\mu A$	30	—	—	V
Drain Current	I_{DSS}^*	$V_{DS}=-10V, V_{GS}=0$	-2.6	—	-20	mA
Gate-Source Cut-off Voltage	$V_{GS(OFF)}$	$V_{DS}=-10V, I_D=-0.1\mu A$	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) $|Y_{fs}| - I_{DSS}$  $V_{GS(Off)} - I_{DSS}$  $C_{iss} - V_{DS}$  $C_{rss} - V_{GD}$ 





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