TOSHIBA Field Effect Transistor Silicon N Channel Junction Type

2SK209

Audio Frequency Low Noise Amplifier Applications

• High $|Y_{fs}|$: $|Y_{fs}| = 15 \text{ mS (typ.)}$ at $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$

• High breakdown voltage: $V_{GDS} = -50 \text{ V}$

• Low noise: NF = 1.0dB (typ.)

at V_{DS} = 10 V, I_{D} = 0.5 mA, f = 1 kHz, R_{G} = 1 k Ω

• High input impedance: $I_{GSS} = -1$ nA (max) at $V_{GS} = -30$ V

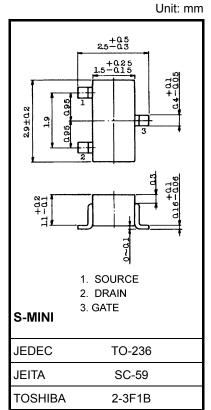
· Small package

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Gate-drain voltage	V_{GDS}	-50	V
Gate current	IG	10	mA
Drain power dissipation	P_{D}	150	mW
Junction temperature	Tj	125	°C
Storage temperature range	T _{stg}	-55~125	°C

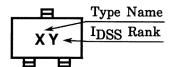
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



Weight: 0.012 g (typ.)

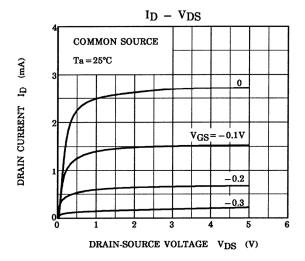
Marking

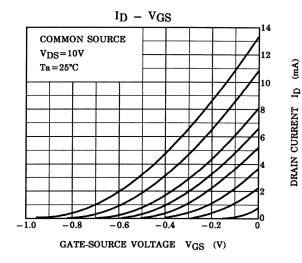


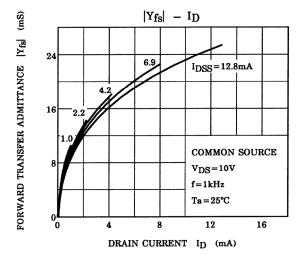
Electrical Characteristics (Ta = 25°C)

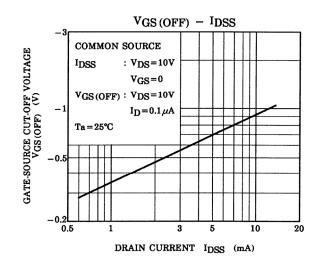
Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate cut-off current	I _{GSS}	$V_{GS} = -30 \text{ V}, V_{DS} = 0$	_	_	-1.0	nA
Gate-drain breakdown voltage	V (BR) GDS	$V_{DS} = 0$, $I_G = -100 \mu A$	-50	_	_	V
Drain current	I _{DSS} (Note)	V _{DS} = 10 V, V _{GS} = 0	1.2	_	14.0	mA
Gate-source 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 V, V _{GS} = 0, f = 1 MHz	_	13		pF
Reverse transfer capacitance	C _{rss}	V _{DG} = 10 V, I _D = 0, f = 1 MHz	_	3		pF
Noise figure	NF (1)	V_{DS} = 10 V, R_G = 1 k Ω I_D = 0.5 mA, f = 10 Hz	_	5	_	dB
Noise figure	NF (2)	$V_{DS} = 10 \text{ V}, R_G = 1 \text{ k}\Omega$ $I_D = 0.5 \text{ mA}, f = 1 \text{ kHz}$	_	1	_	dB

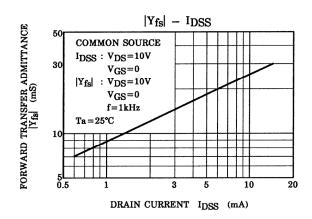
Note: IDSS classification Y: 1.2~3.0 mA, GR: 2.6~6.5 mA, BL: 6.0~14 mA

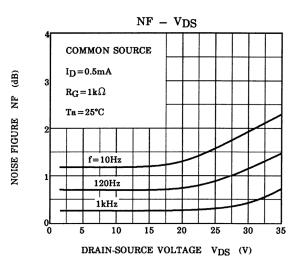




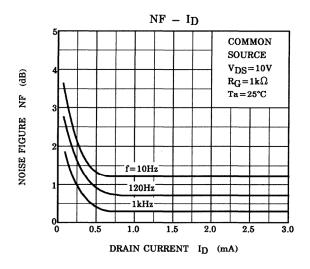


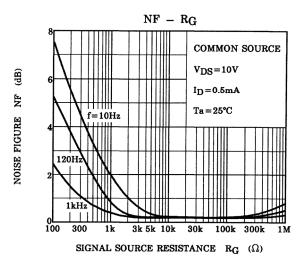


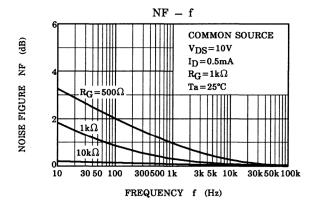


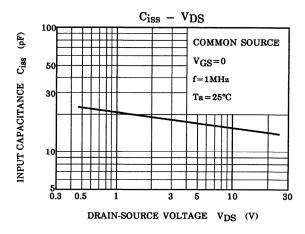


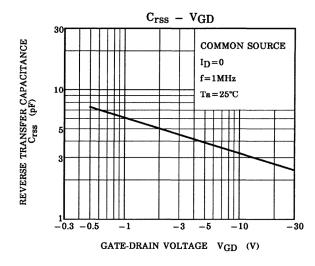
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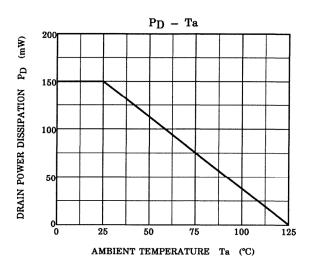












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20070701-EN GENERAL

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