



QNHCHIP

2SK209

Product Specification

2SK209

Silicon N Channel Junction Type



Description

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: $NF = 1.0\text{dB (typ.)}$
at $V_{DS} = 10 \text{ V}$, $I_D = 0.5 \text{ mA}$, $f = 1 \text{ kHz}$, $R_G = 1 \text{ k}\Omega$
- High input impedance: $I_{GSS} = -1 \text{ nA (max)}$ at $V_{GS} = -30 \text{ V}$
- Small package

Absolute Maximum Ratings

($T_A = 25^\circ\text{C}$)

Symbol	Characteristics	Rating	Unit
V_{GDS}	Gate-drain voltage	-50	V
I_G	Gate current	10	mA
P_D	Drain power dissipation	150	mW
T_j	Junction temperature	125	$^\circ\text{C}$
T_{stg}	Storage temperature range	-55~125	$^\circ\text{C}$

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).



Electrical Characteristics

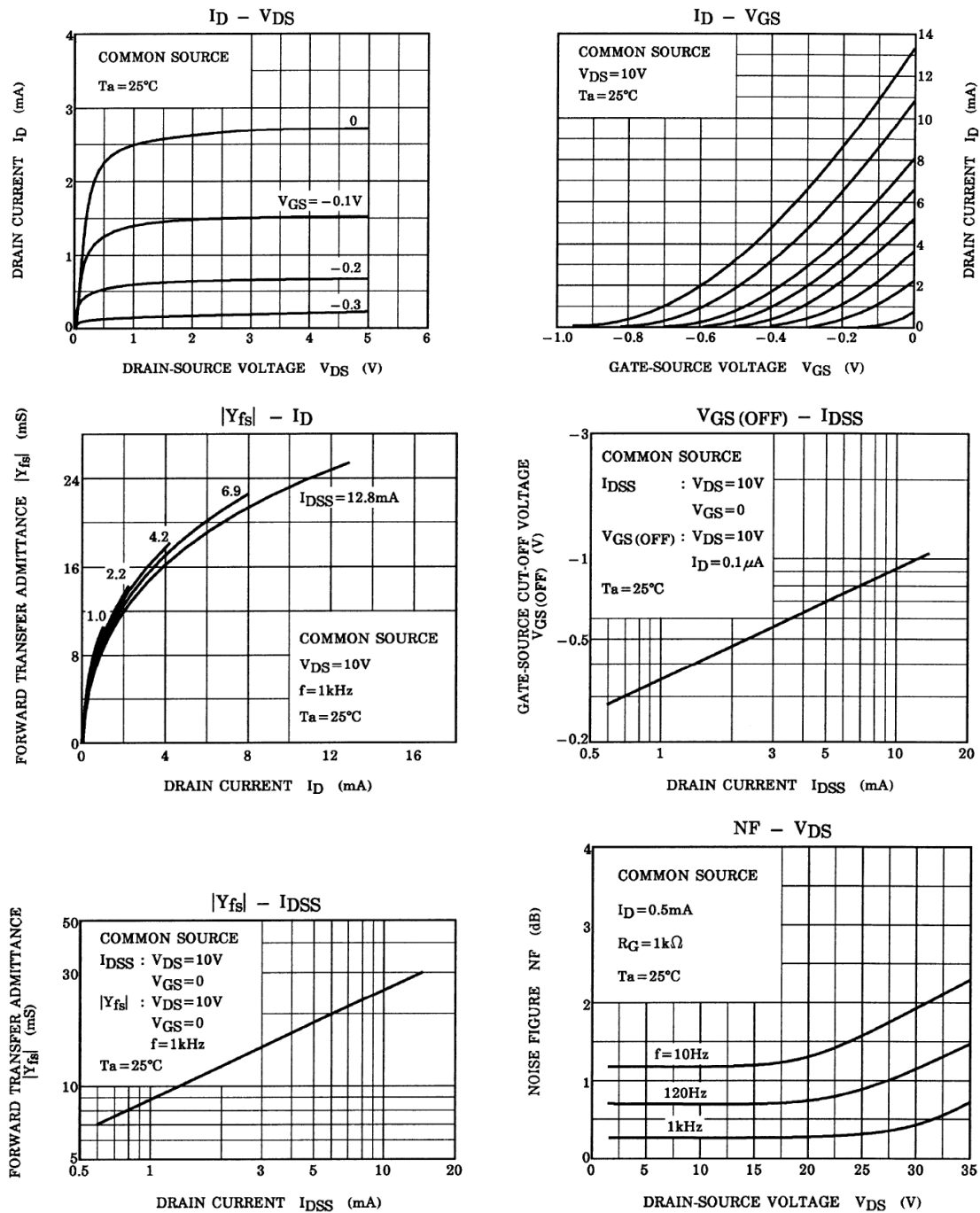
($T_A = 25^\circ\text{C}$)

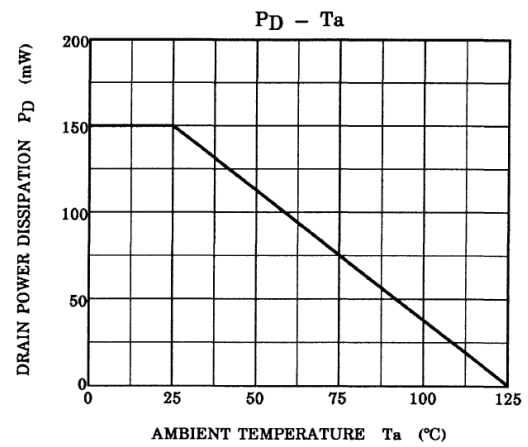
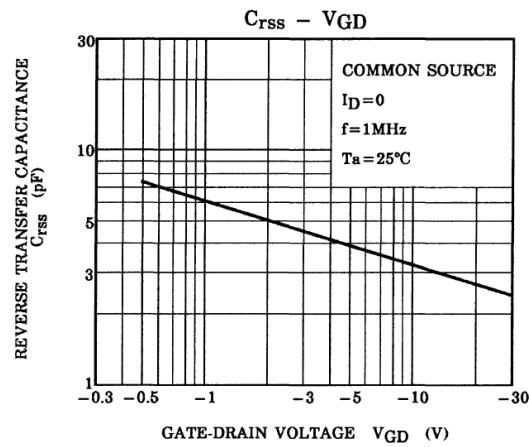
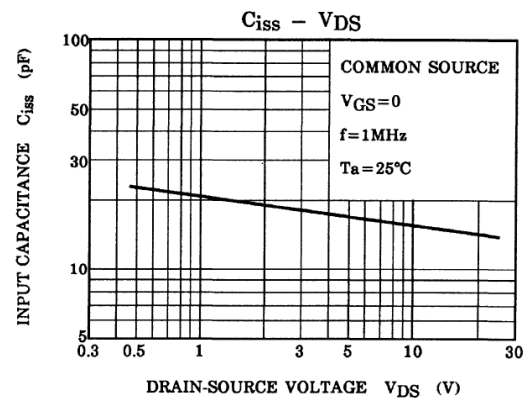
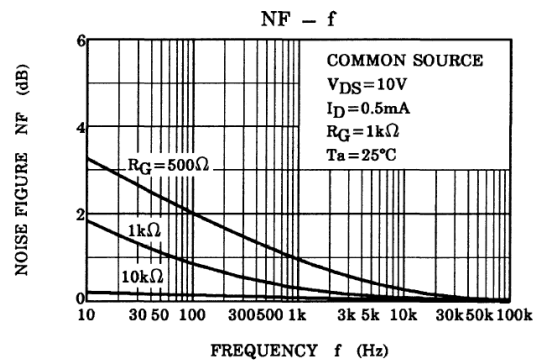
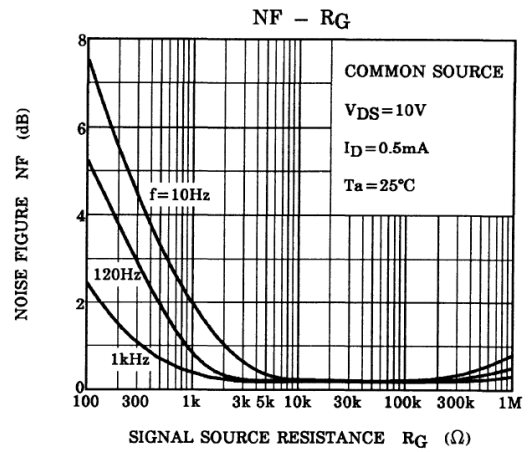
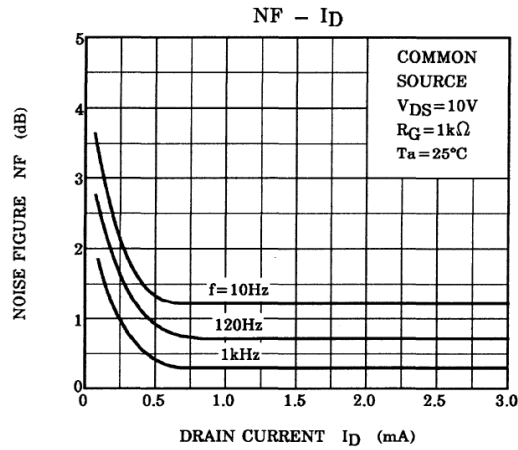
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate cut-off current	I_{GSS}	$V_{GS} = -30\text{ V}, V_{DS} = 0$			1.0	nA
Gate-drain breakdown voltage	$V_{(BR)GDS}$	$V_{DS} = 0, I_G = -100\mu\text{A}$	50			V
Drain current	$I_{DSS(\text{Note})}$	$V_{DS} = 10\text{ V}, V_{GS} = 0$	1.2		14.0	mA
Gate-source cut-off voltage	$V_{GS(\text{OFF})}$	$V_{DS} = 10\text{ V}, I_D = 0.1\mu\text{A}$	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}	$V_{DG} = 10\text{ V}, I_D = 0, f = 1\text{ MHz}$		3		pF
Noise figure	NF (1)	$V_{DS} = 10\text{ V}, R_G = 1\text{ k}\Omega$ $I_D = 0.5\text{ mA}, f = 10\text{ Hz}$		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: I_{DSS} classification Y: 1.2~3.0 mA, GR: 2.6~6.5 mA, BL: 6.0~14 mA



Typical Application Circuit

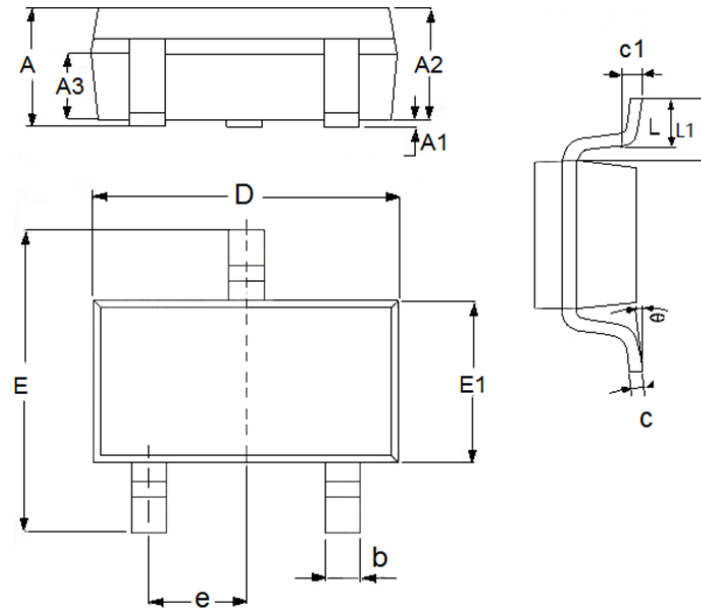






Packaging Information

TO-236 (SOT-23)



参数	尺寸 (mm)		尺寸 (Inch)	
	最小值	最大值	最小值	最大值
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.25	0.0039	0.0098
D	2.8	3.1	0.1102	0.1220
E	2.6	3.1	0.1023	0.1220
E1	1.5	1.8	0.0591	0.0709
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

Ordering information

Order Code	I _{DSS} (mA)	Package Type	Minimum Packing QTY	Belivery Mode
2SK209-Y	1.2~3.0	TO-236(SOT-23)	3000	Tape & Reel
2SK209-GR	2.6~6.5	TO-236(SOT-23)	3000	Tape & Reel
2SK209-BL	6.0~14	TO-236(SOT-23)	3000	Tape & Reel