

# 2SK210

FM Tuner Applications  
VHF Band Amplifier Applications

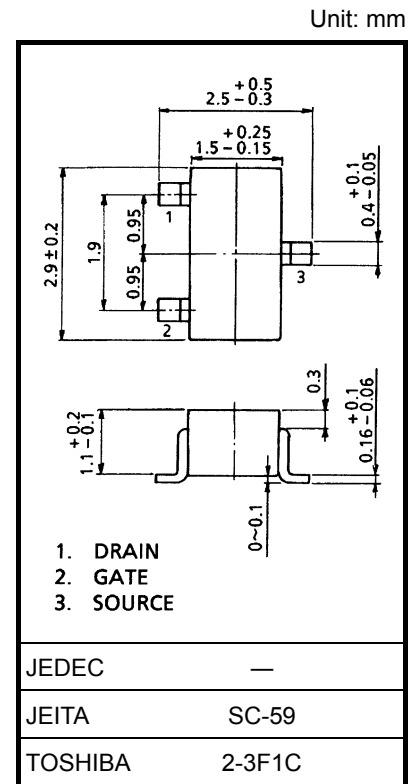
- High power gain:  $G_{PS} = 24\text{dB}$  (typ.) ( $f = 100\text{ MHz}$ )
- Low noise figure:  $NF = 1.8\text{dB}$  (typ.) ( $f = 100\text{ MHz}$ )
- High forward transfer admittance:  $|Y_{fs}| = 7\text{ mS}$  (typ.) ( $f = 1\text{ kHz}$ )

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Gate-drain voltage	$V_{GDO}$	-18	V
Gate current	$I_G$	10	mA
Drain power dissipation	$P_D$	100	mW
Junction temperature	$T_j$	125	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-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).

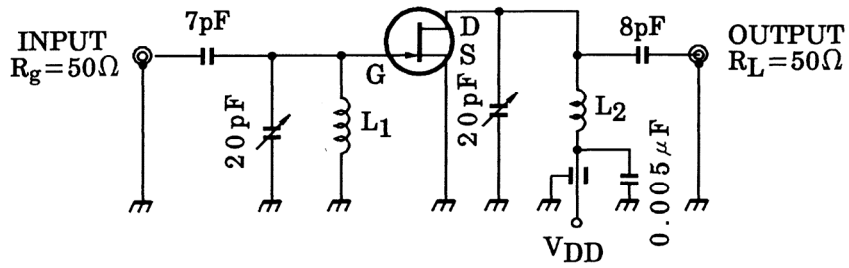


Weight: 0.012 g (typ.)

### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = -1.0\text{ V}, V_{DS} = 0\text{ V}$	—	—	-10	nA
Gate-drain breakdown voltage	$V_{(BR) GDO}$	$I_G = -100\ \mu\text{A}$	-18	—	—	V
Drain current	$I_{DSS}$ (Note)	$V_{GS} = 0\text{ V}, V_{DS} = 10\text{ V}$	3	—	24	mA
Gate-source cut-off voltage	$V_{GS (OFF)}$	$V_{DS} = 10\text{ V}, I_D = 1\ \mu\text{A}$	-1.2	-3	—	V
Forward transfer admittance	$ Y_{fs} $	$V_{GS} = 0\text{ V}, V_{DS} = 10\text{ V}, f = 1\text{ kHz}$	—	7	—	mS
Input capacitance	$C_{iss}$	$V_{DS} = 10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	3.5	—	pF
Reverse transfer capacitance	$C_{rss}$	$V_{GD} = -10\text{ V}, f = 1\text{ MHz}$	—	—	0.65	pF
Power gain	$G_{PS}$	$V_{DD} = 10\text{ V}, f = 100\text{ MHz}$ (Figure 1)	—	24	—	dB
Noise figure	NF	$V_{DD} = 10\text{ V}, f = 100\text{ MHz}$ (Figure 1)	—	1.8	3.5	dB

Note:  $I_{DSS}$  classification: Y: 3.0~7.0 mA, GR (R): 6.0~14.0 mA, BL (L): 12.0~24.0 mA

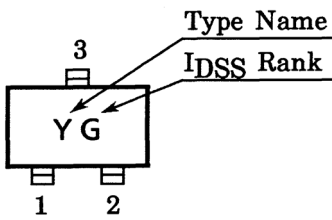


L<sub>1</sub>: 0.8 mmφ A<sub>g</sub> plated Cu wire 3 turns, 10 mm ID, 10 mm length

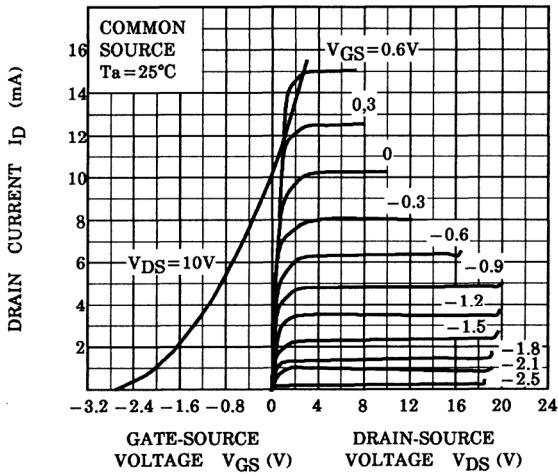
L<sub>2</sub>: 0.8 mmφ A<sub>g</sub> plated Cu wire 3.5 turns, 10 mm ID, 10 mm length

**Figure 1 100 MHz G<sub>ps</sub> NF Test Circuit**

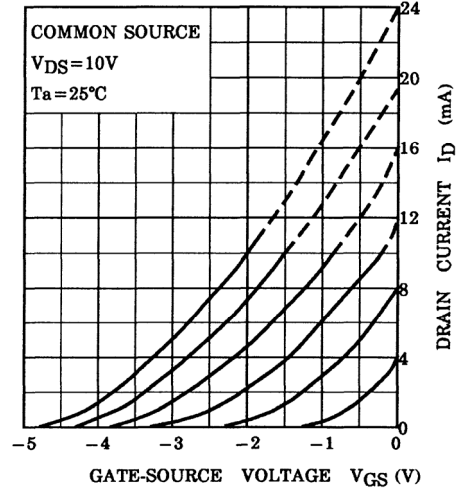
**Marking**



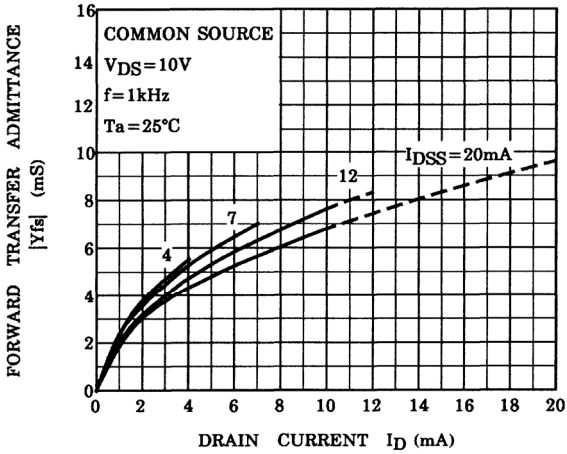
**STATIC CHARACTERISTICS**



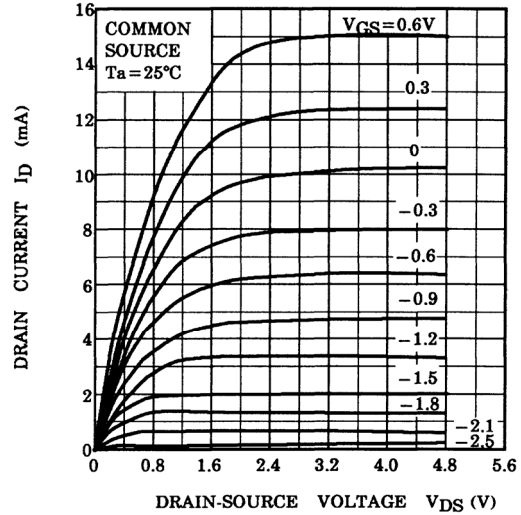
**I<sub>D</sub> - V<sub>GS</sub>**



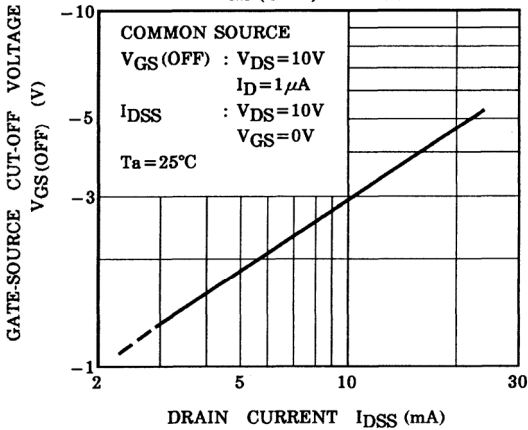
**|Y<sub>fs</sub>| - I<sub>D</sub>**



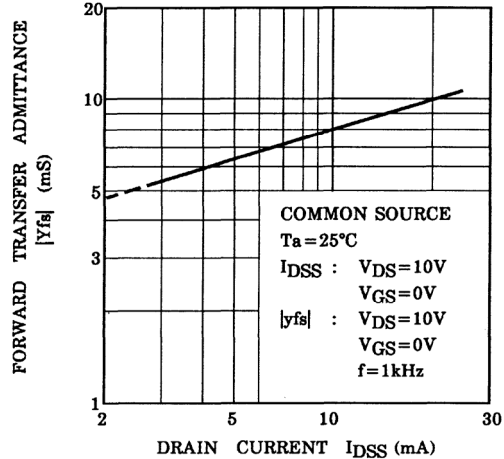
**I<sub>D</sub> - V<sub>DS</sub> (LOW VOLTAGE REGION)**

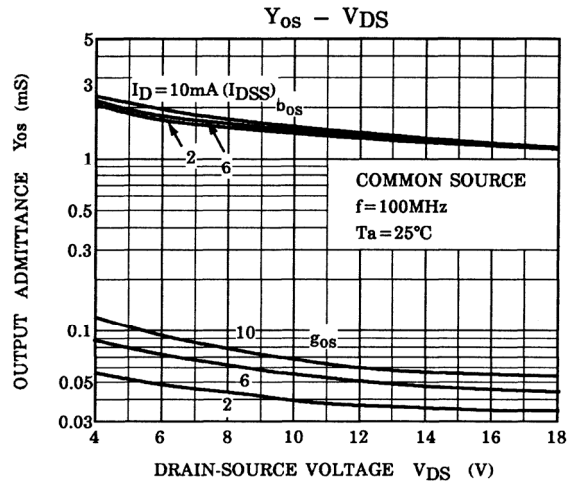
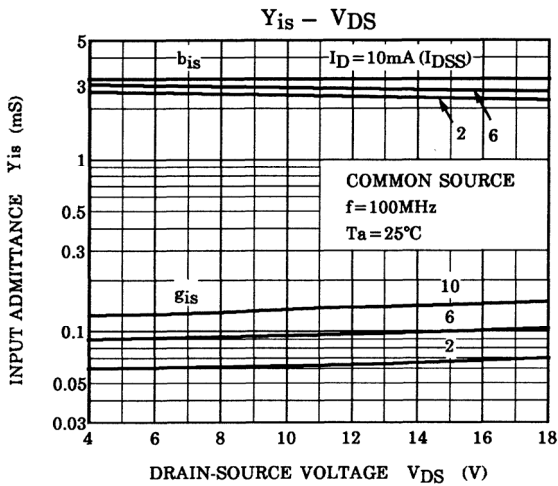
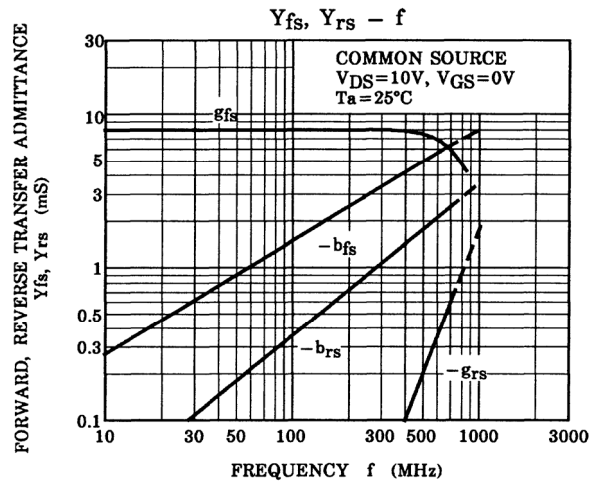
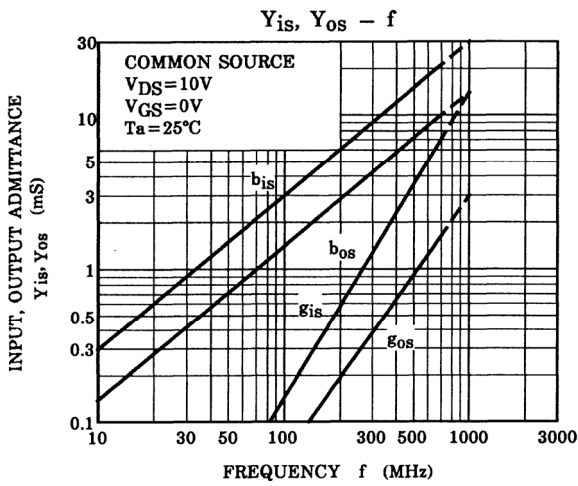
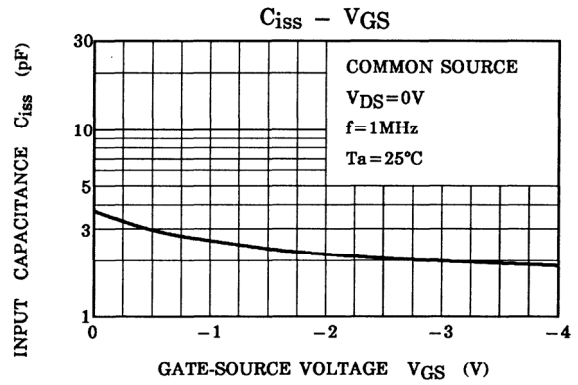
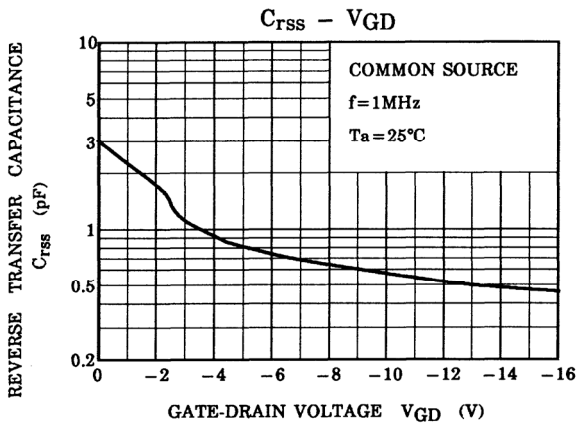


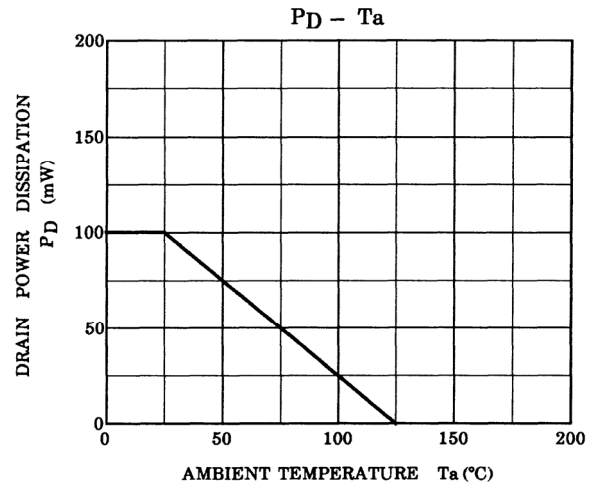
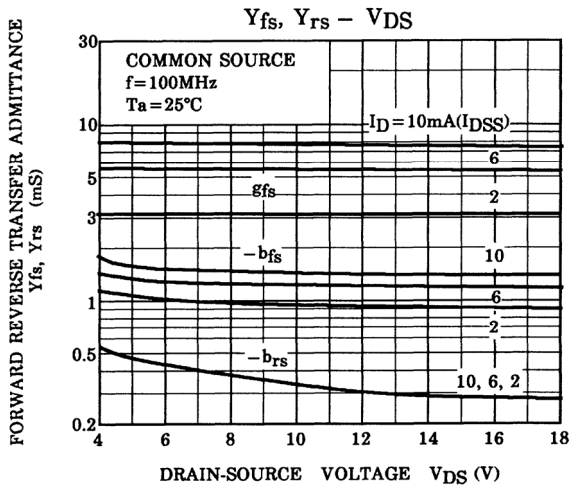
**V<sub>GS</sub> (OFF) - I<sub>DSS</sub>**



**|Y<sub>fs</sub>| - I<sub>DSS</sub>**







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20070701-EN GENERAL

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