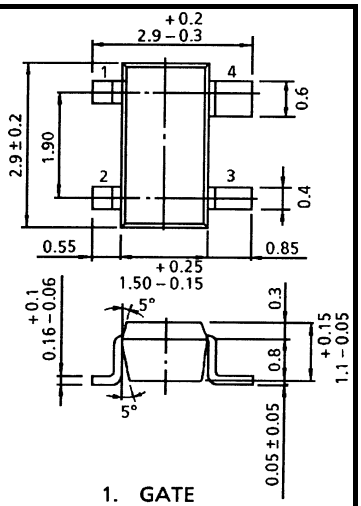
TOSHIBA Field Effect Transistor Silicon N-Channel MOS Type

2SK1771

FM Tuner, VHF RF Amplifier Applications

- Superior inter modulation performance.
- Low noise figure: NF = 1.0dB (typ.)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3J1D

Weight: 0.013 g (typ.)

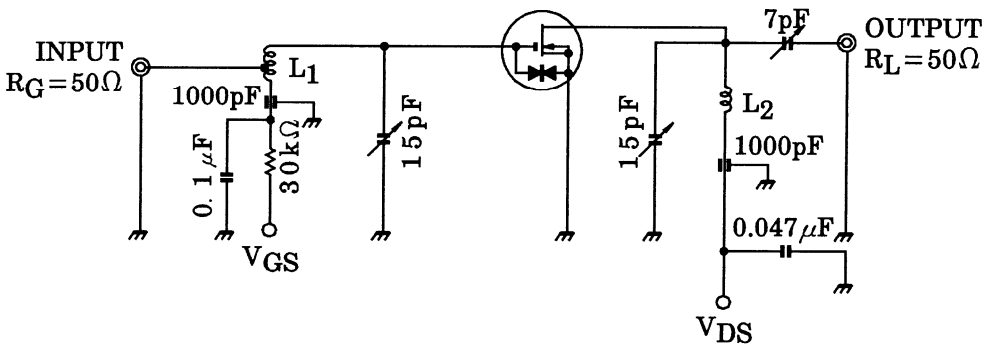
Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	12.5	V
Gate-source voltage	V_{GS}	±8	V
Drain current	I_D	30	mA
Drain power dissipation	P_D	150	mW
Channel temperature	T_{ch}	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).

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	V_{DS} = 0, V_{GS} = ±6 V	—	—	±50	nA
Drain-source voltage	$V_{(BR)\ DSX}$	V_{GS} = −4 V, I_D = 100 μA	12.5	—	—	V
Drain current	I_{DSS}	V_{DS} = 8 V, V_{GS} = 0	0	—	0.1	mA
Gate-source cut-off voltage	$V_{GS\ (OFF)}$	V_{DS} = 8 V, I_D = 100 μA	0.5	1.0	1.5	V
Forward transfer admittance	$\|Y_{fs}\|$	V_{DS} = 8 V, I_D = 10 mA, f = 1 kHz	—	15	20	mS
Input capacitance	C_{iss}	V_{DS} = 8 V, I_D = 10 mA, f = 1 MHz	2.9	3.5	4.1	pF
Reverse transfer capacitance	C_{rss}		—	0.3	0.8	pF
Power gain	G_{ps}	V_{DS} = 8 V, I_D = 10 mA, f = 100 MHz	18	23	28	dB
Noise figure	NF		—	1.0	2.2	dB

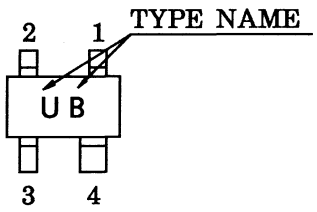


L_1: 1.0 mmϕ silver plated copper wire 4.0 T, 8 mmϕ ID TAP at 1.0 T from coil end

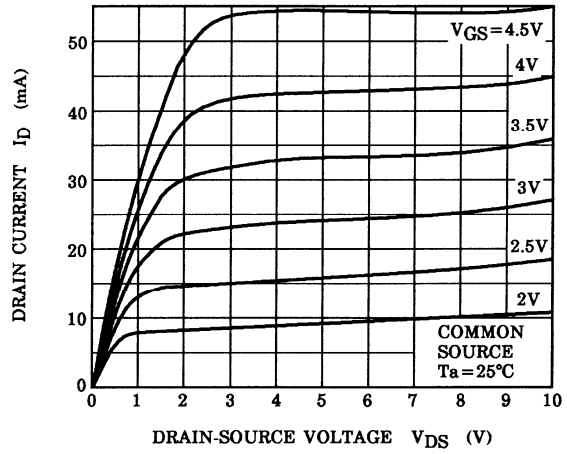
L_2: 1.0 mmϕ silver plated copper wire 3.0 T, 8 mmϕ ID, 10 mm length

Figure 1 100 MHz G_{ps}, NF Test Circuit

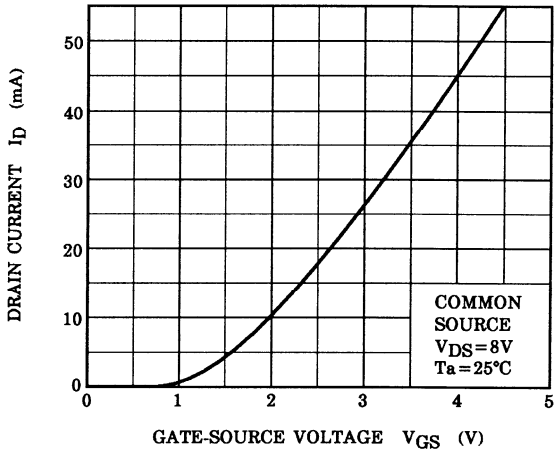
Marking



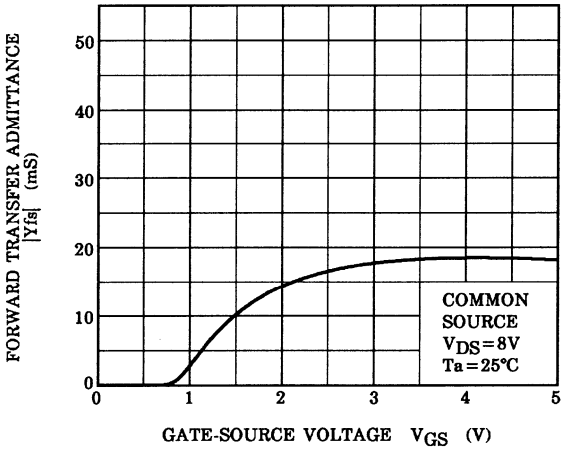
I_D – V_{DS}



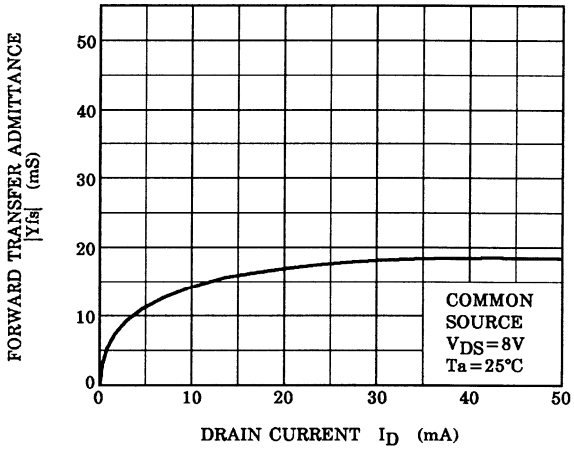
I_D – V_{GS}



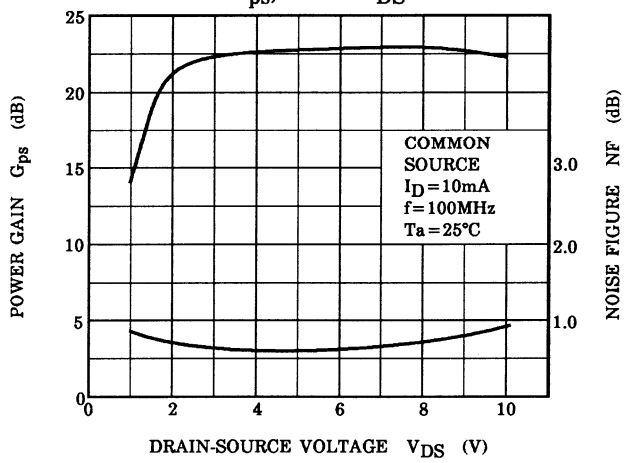
$|Y_{fs}|$ – V_{GS}



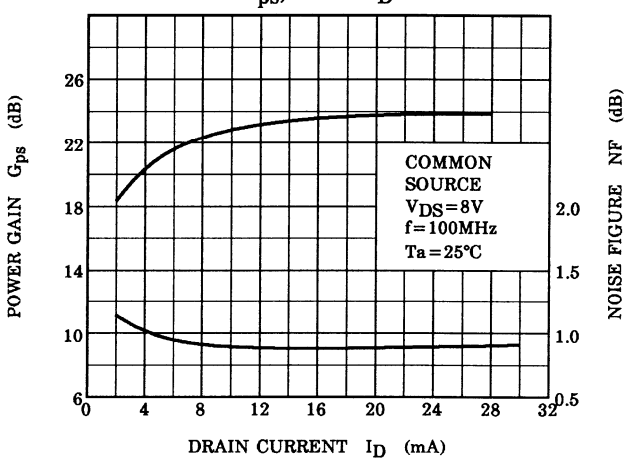
$|Y_{fs}|$ – I_D



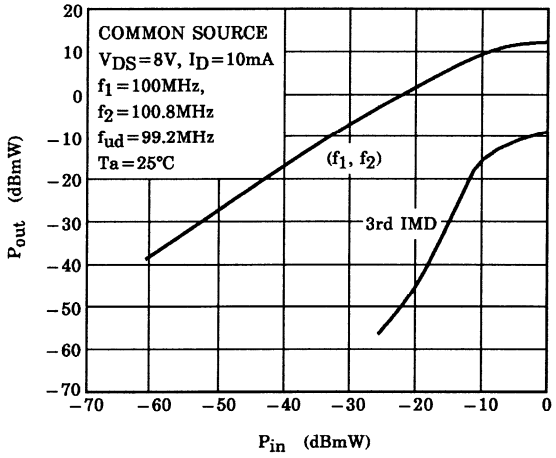
G_{ps}, NF – V_{DS}



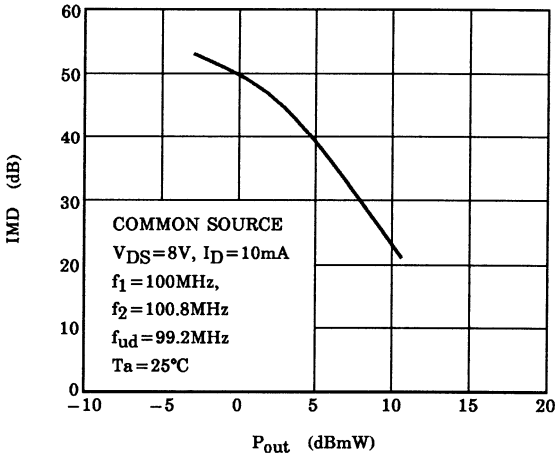
G_{ps}, NF – I_D



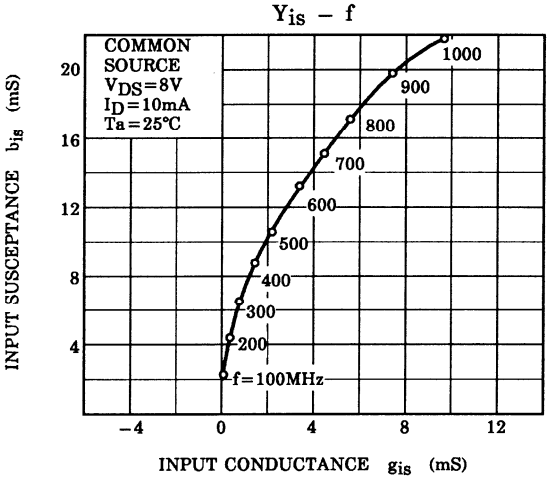
P_{out} – P_{in}



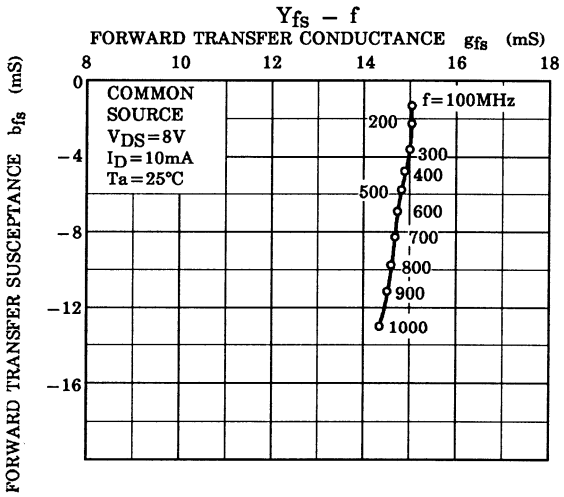
IMD – P_{out}



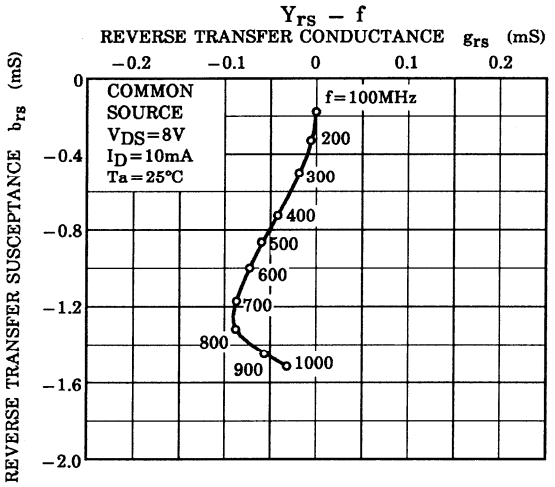
Y_{is} – f



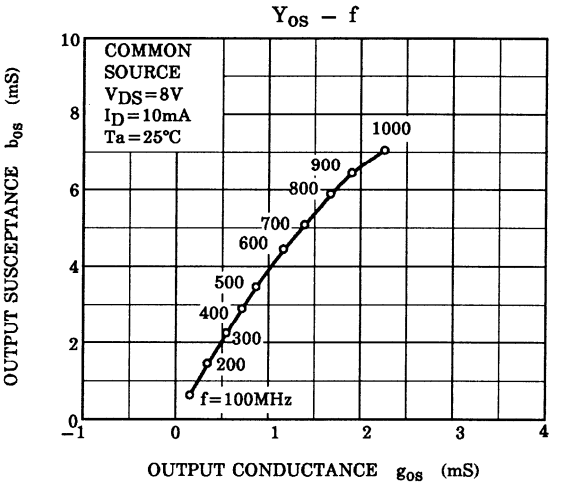
Y_{fs} – f

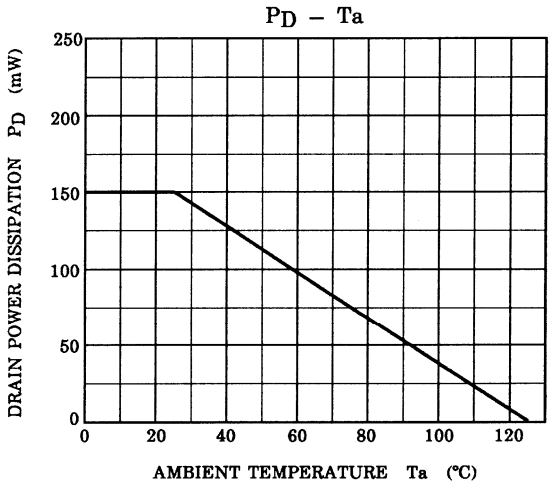


Y_{rs} – f



Y_{os} – f




P_D – Ta
DRAIN POWER DISSIPATION P_D (mW)
250
200
150
100
50
0
0
20
40
60
80
100
120
AMBIENT TEMPERATURE Ta (°C)

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