TOSHIBA Field Effect Transistor Silicon N Channel Junction Type

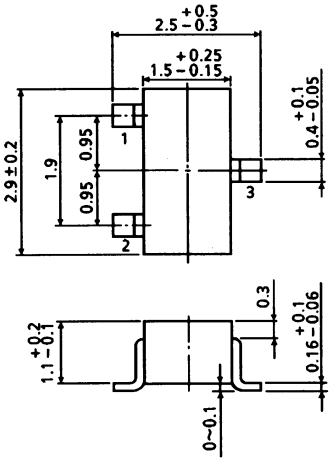
2SK211

FM Tuner Applications

VHF Band Amplifier Applications

- Low noise figure: NF = 2.5dB (typ.) (f = 100 MHz)
- High forward transfer admitance: $|Y_{fs}|$ = 9 mS (typ.)
- Extremely low reverse transfer capacitance: C_{rss} = 0.1 pF (typ.)

Unit: mm



S-MINI

JEDEC	TO-236MOD
JEITA	SC-59
TOSHIBA	2-3F1C

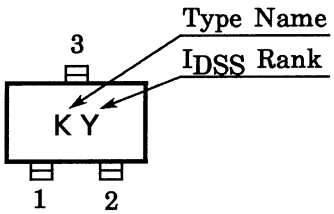
Weight: 12mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Gate-drain voltage	V_{GDO}	−18	V
Gate current	I_G	10	mA
Drain power dissipation	P_D	150	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55 to 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).

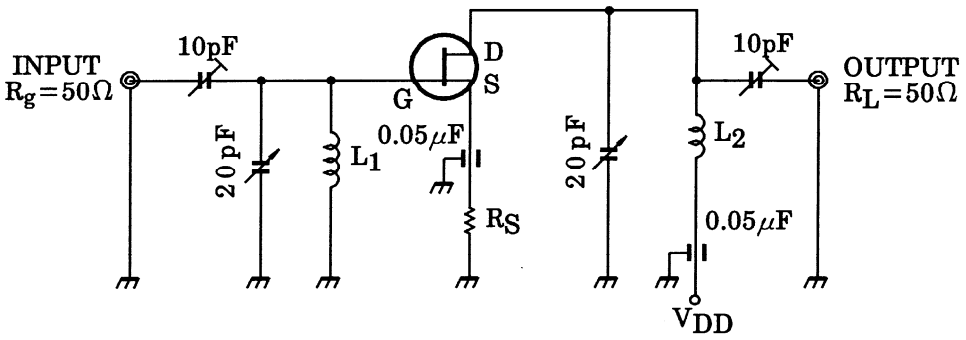
Marking



Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	V_{GS} = −0.5 V, V_{DS} = 0 V	—	—	−10	nA
Gate-drain breakdown voltage	$V_{(BR)\ GDO}$	I_G = −100 μA	−18	—	—	V
Drain current	I_{DSS} (Note)	V_{GS} = 0 V, V_{DS} = 10 V	1.0	—	10	mA
Gate-source cut-off voltage	$V_{GS\ (OFF)}$	V_{DS} = 10 V, I_D = 1 μA	−0.4	—	−4.0	V
Forward transfer admittance	$\|Y_{fs}\|$	V_{GS} = 0 V, V_{DS} = 10 V, f = 1 kHz	—	9	—	mS
Input capacitance	C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	6.0	—	pF
Reverse transfer capacitance	C_{rss}	V_{GD} = −10 V, f = 1 MHz	—	0.1	0.15	pF
Power gain	G_{PS}	V_{DD} = 10 V, f = 100 MHz (Figure)	—	18	—	dB
Noise figure	NF	V_{DD} = 10 V, f = 100 MHz (Figure)	—	2.5	3.5	dB

Note: I_{DSS} classification O: 1.0 to 3.0 mA, Y: 2.5 to 6.0 mA, GR: 5.0 to 10.0 mA



L_1: 0.8 mmϕ Ag PLATED Cu WIRE 3 TURNS, 10 mmϕ ID, 10 mm LENGTH

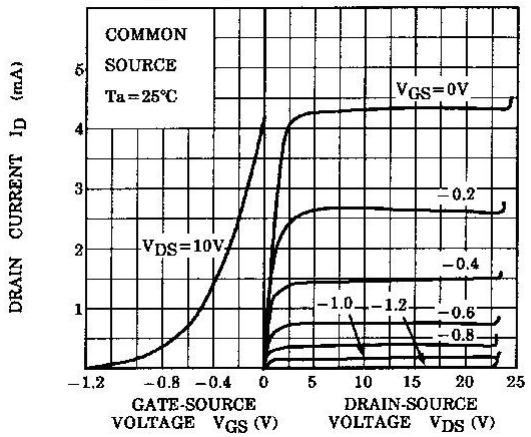
L_2: 0.8 mmϕ Ag PLATED Cu WIRE 3.5 TURNS, 10 mmϕ ID, 10 mm LENGTH

Figure 100 MHz G_{PS}, NF Test Circuit

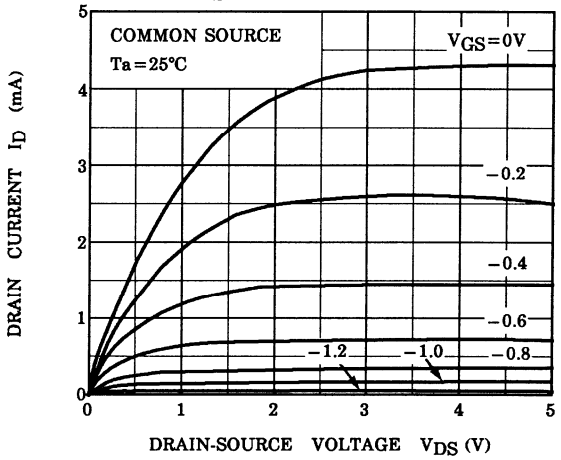
2SK211 is measured at each group by changing R_S.

Group	RS (Ω)
2SK211-O	0
2SK211-Y	18 Ω ± 5%
2SK211-GR	100 Ω ± 5%

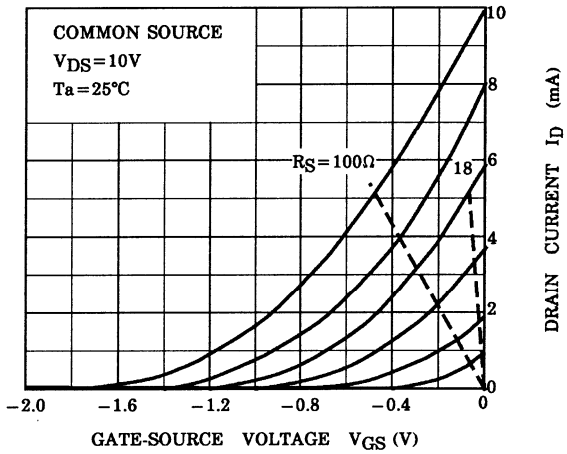
STATIC CHARACTERISTICS



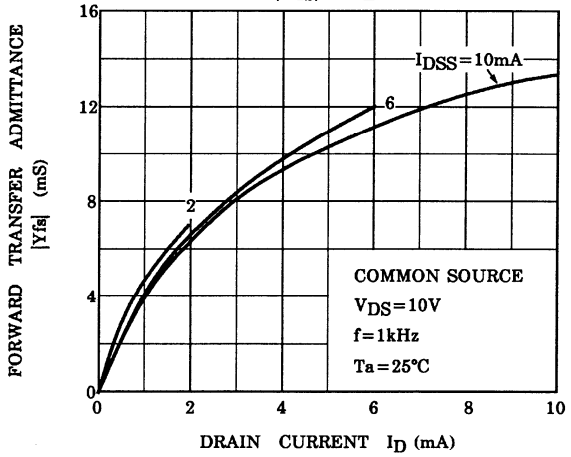
ID – VDS (LOW VOLTAGE REGION)



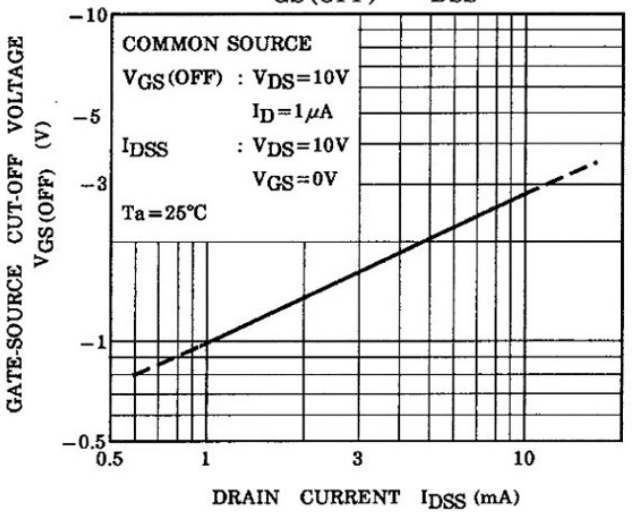
ID – VGS



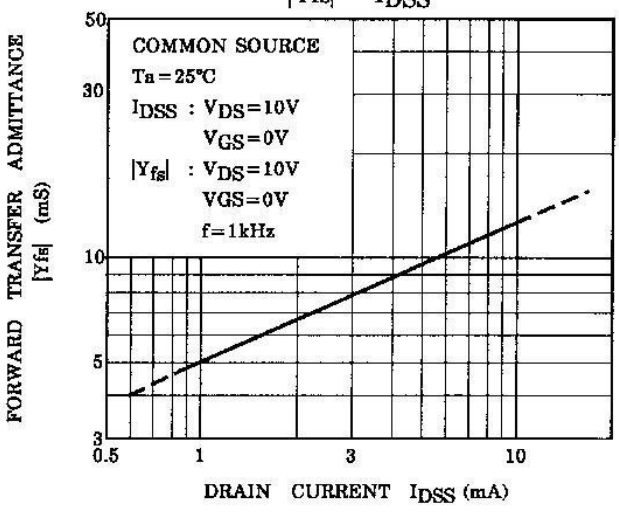
|Yfs| – ID



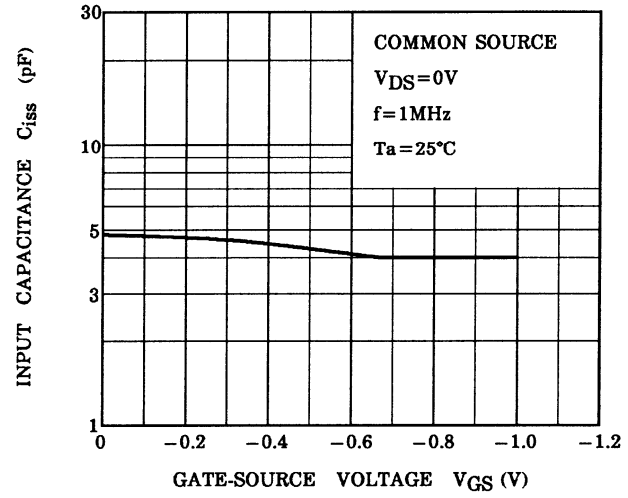
VGS (OFF) – IDSS



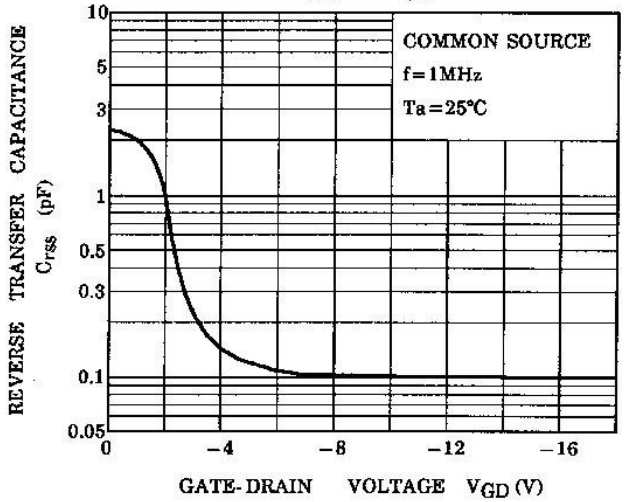
|Yfs| – IDSS



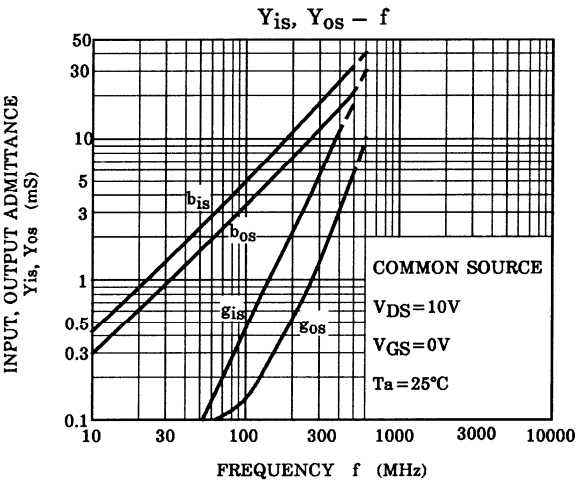
C_{iss} – V_{GS}



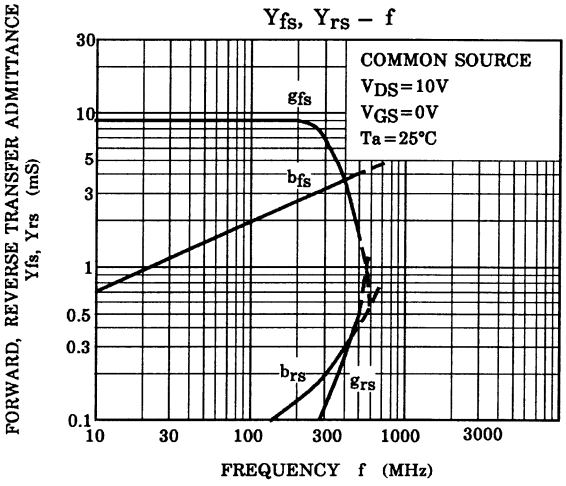
C_{rss} – V_{GD}



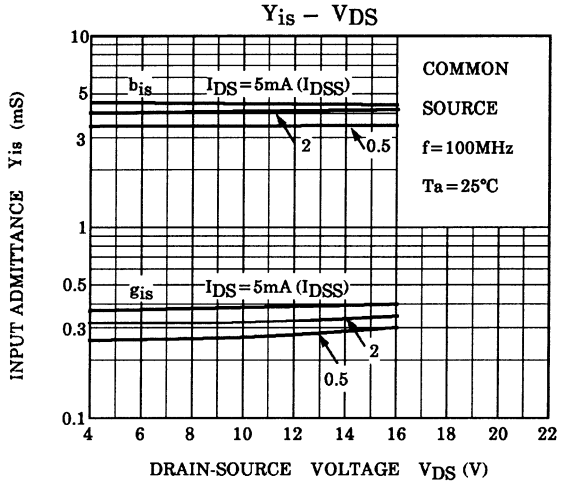
Y_{is}, Y_{os} – f



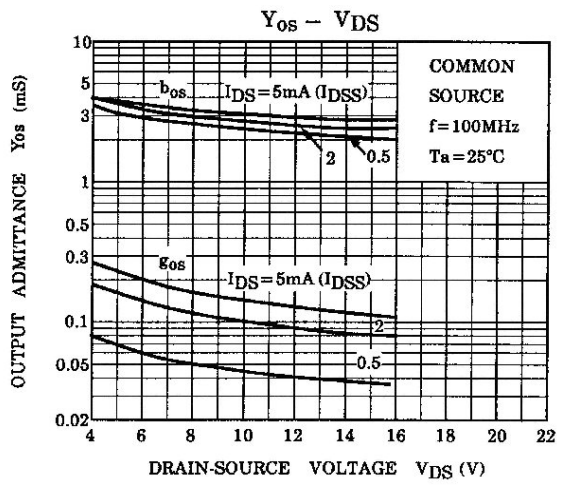
Y_{fs}, Y_{rs} – f



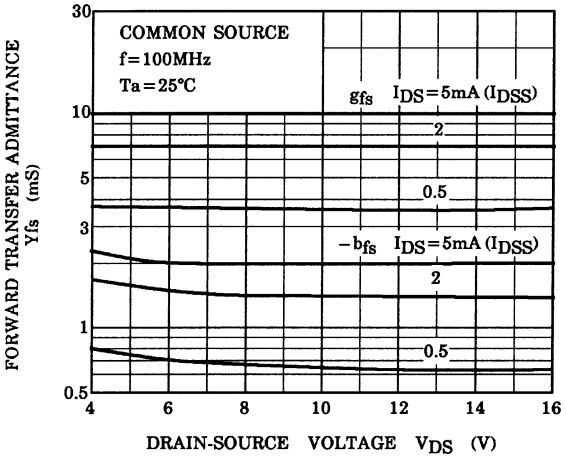
Y_{is} – V_{DS}



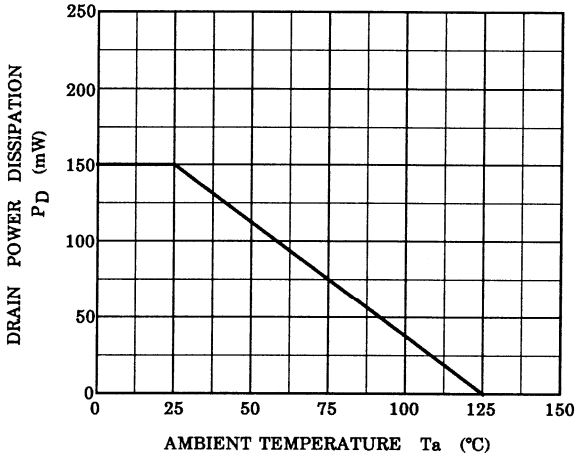
Y_{os} – V_{DS}



Y_{fs} – V_{DS}


COMMON SOURCE
f=100MHz
Ta=25°C
gfs IDS=5mA (IDSS)
2
0.5
−bfs IDS=5mA (IDSS)
2
0.5
FORWARD TRANSFER ADMITTANCE Yfs (mS)
30
10
5
3
1
0.5
4
6
8
10
12
14
16
DRAIN-SOURCE VOLTAGE VDS (V)

P_D – Ta


DRAIN POWER DISSIPATION PD (mW)
250
200
150
100
50
0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE Ta (°C)

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