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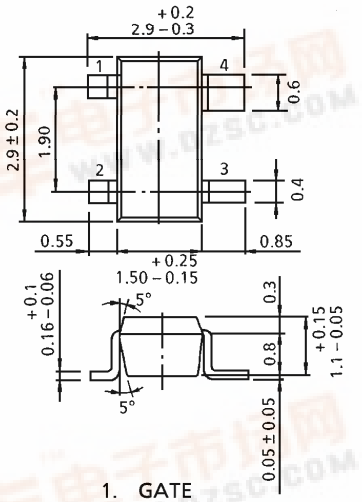
TOSHIBA FIELD EFFECT TRANSISTOR SILICON N-CHANNEL MOS TYPE

2SK1771

FM TUNER, VHF RF AMPLIFIER APPLICATIONS

Unit in mm

- Superior Inter Modulation Performance.
- Low Noise Figure : NF = 1.0dB (Typ.)



1. GATE
2. OPEN
3. DRAIN
4. SOURCE

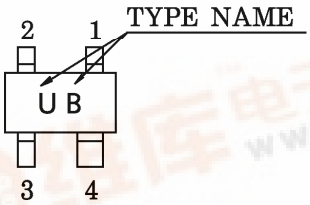
SMQ	
JEDEC	—
EIAJ	—
TOSHIBA	2-3J1D

Weight : 0.013g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	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
Chanel Temperature	T_{ch}	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

Marking



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I_{GSS}	$V_{DS}=0$, $V_{GS}=\pm6V$	—	—	±50	nA
Drain-Source Voltage	$V_{(BR)DSX}$	$V_{GS}=-4V$, $I_D=100\mu A$	12.5	—	—	V
Drain Current	I_{DSS}	$V_{DS}=8V$, $V_{GS}=0$	0	—	0.1	mA
Gate-Source Cut-off Voltage	$V_{GS(OFF)}$	$V_{DS}=8V$, $I_D=100\mu A$	0.5	1.0	1.5	V
Forward Transfer Admittance	$\|Y_{fs}\|$	$V_{DS}=8V$, $I_D=10mA$, f=1kHz	—	15	20	mS
Input Capacitance	C_{iss}	$V_{DS}=8V$, $I_D=10mA$, f=1MHz	2.9	3.5	4.1	pF
Reverse Transfer Capacitance	C_{rss}		—	0.3	0.8	
Power Gain	G_{ps}	$V_{DS}=8V$, $I_D=10mA$, f=100MHz	18	23	28	dB
Noise Figure	NF		—	1.0	2.2	

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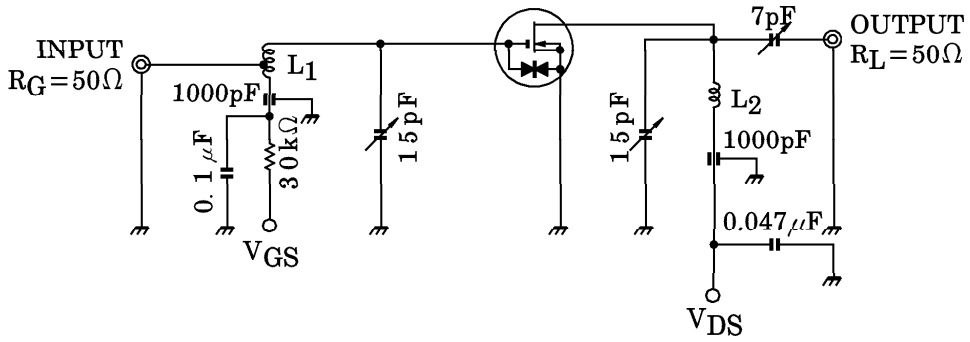
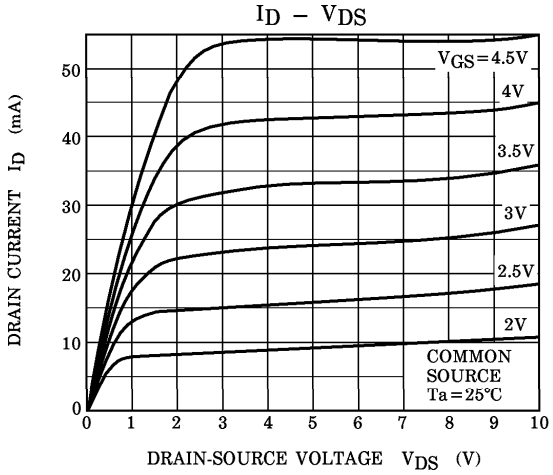
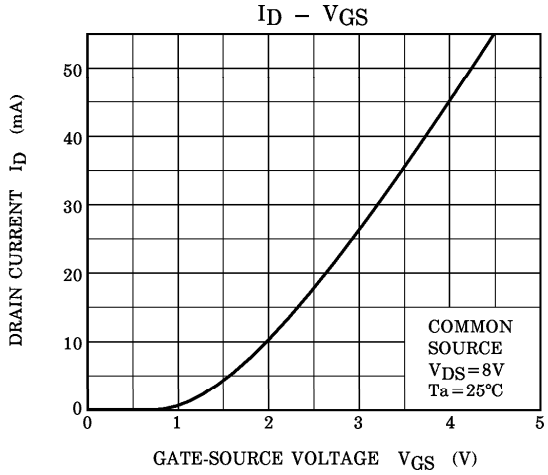
Fig.1 100MHz G_{ps}, NF Test Circuit

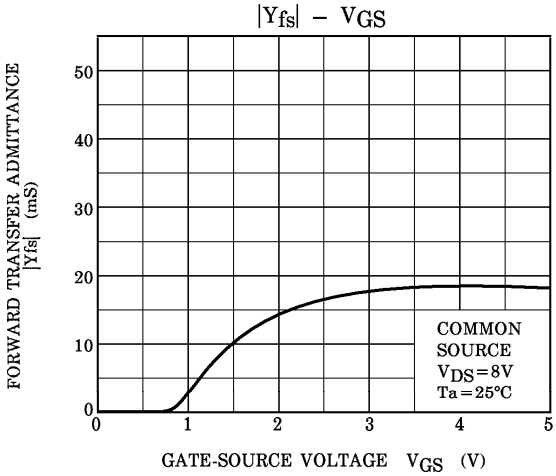


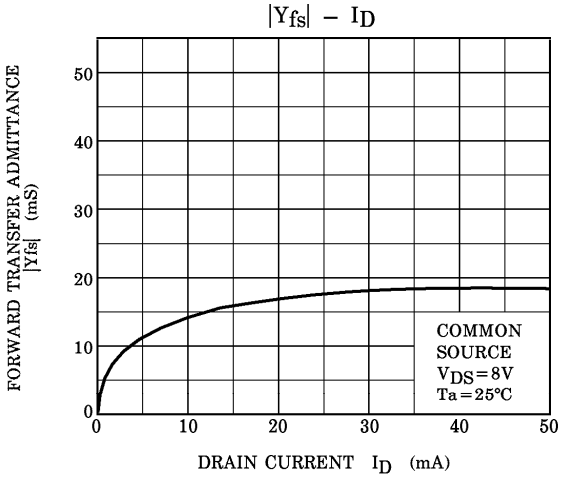
L_1 : 1.0mmϕ SILVER PLATED COPPER WIRE
4.0T, 8mmϕ ID
TAP at 1.0T FROM COIL END

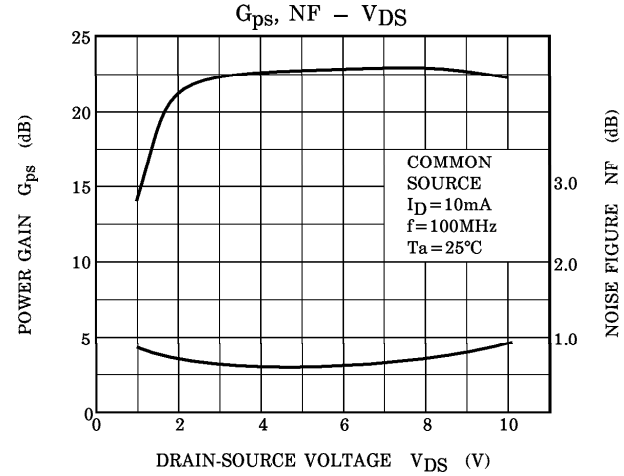
L_2 : 1.0mmϕ SILVER PLATED COPPER WIRE
3.0T, 8mmϕ ID, 10mm LENGTH

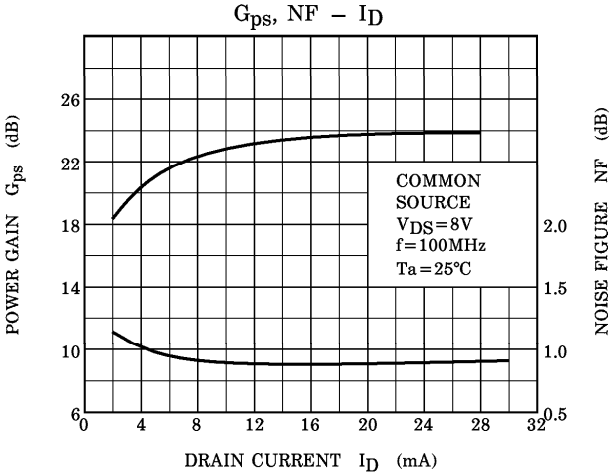

I_D – V_{DS}
DRAIN CURRENT I_D (mA)
DRAIN-SOURCE VOLTAGE V_{DS} (V)
V_{GS}=4.5V
4V
3.5V
3V
2.5V
2V
COMMON SOURCE
Ta=25°C

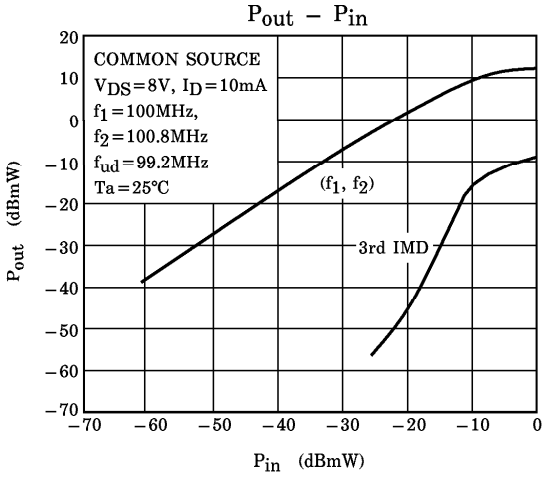

I_D – V_{GS}
DRAIN CURRENT I_D (mA)
GATE-SOURCE VOLTAGE V_{GS} (V)
COMMON SOURCE
V_{DS}=8V
Ta=25°C

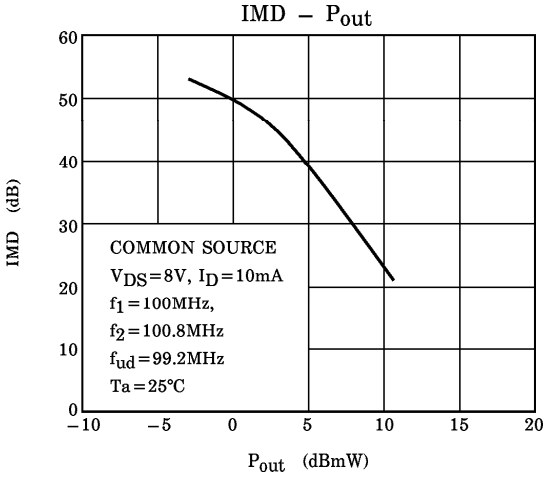

$|Y_{fs}|$ – V_{GS}
FORWARD TRANSFER ADMITTANCE $|Y_{fs}|$ (mS)
GATE-SOURCE VOLTAGE V_{GS} (V)
COMMON SOURCE
V_{DS}=8V
Ta=25°C

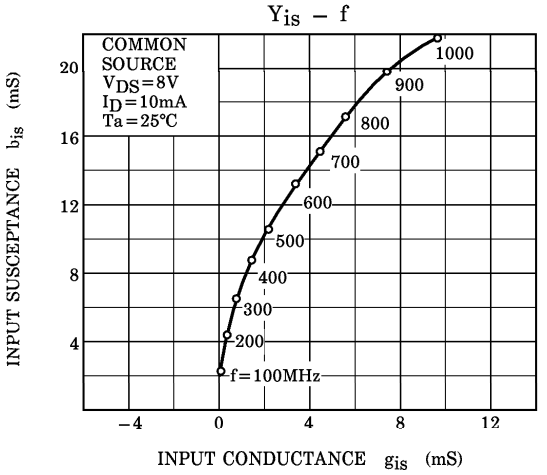

$|Y_{fs}|$ – I_D
FORWARD TRANSFER ADMITTANCE $|Y_{fs}|$ (mS)
DRAIN CURRENT I_D (mA)
COMMON SOURCE
V_{DS}=8V
Ta=25°C

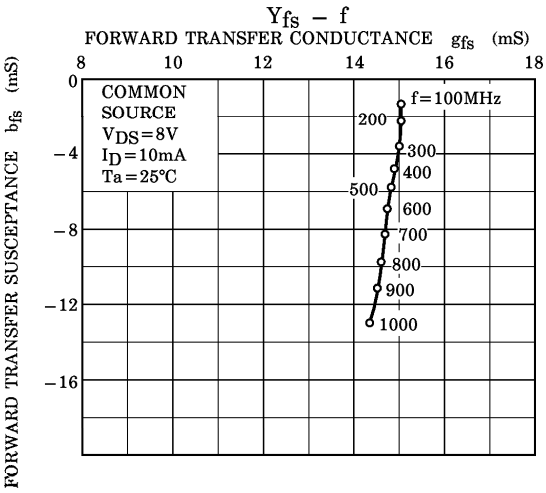

G_{ps}, NF – V_{DS}
POWER GAIN G_{ps} (dB)
NOISE FIGURE NF (dB)
DRAIN-SOURCE VOLTAGE V_{DS} (V)
COMMON SOURCE
I_D=10mA
f=100MHz
Ta=25°C

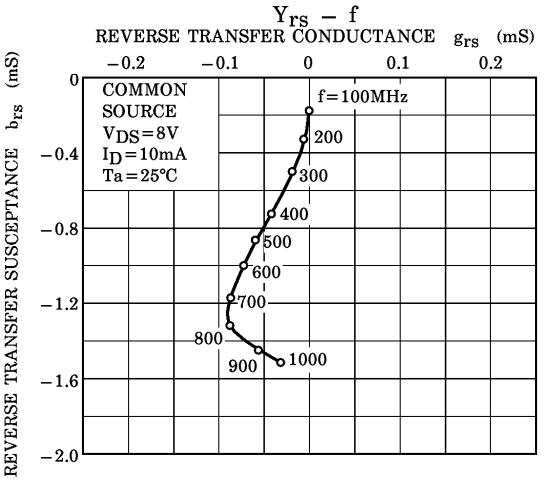

G_{ps}, NF – I_D
POWER GAIN G_{ps} (dB)
NOISE FIGURE NF (dB)
DRAIN CURRENT I_D (mA)
COMMON SOURCE
V_{DS}=8V
f=100MHz
Ta=25°C

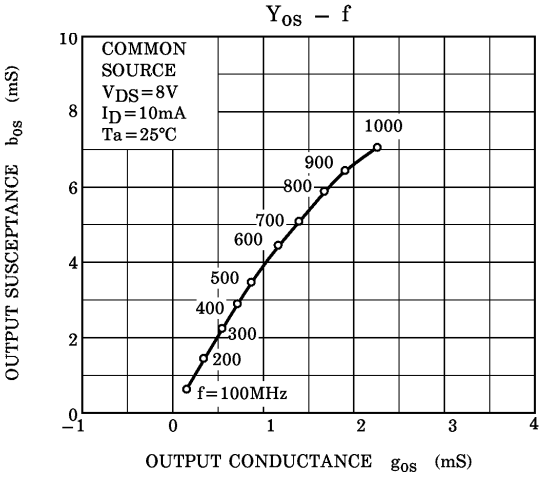

Pout − Pin
COMMON SOURCE
VDS=8V, ID=10mA
f1=100MHz,
f2=100.8MHz
fud=99.2MHz
Ta=25°C
(f1, f2)
3rd IMD
Pout (dBmW)
Pin (dBmW)

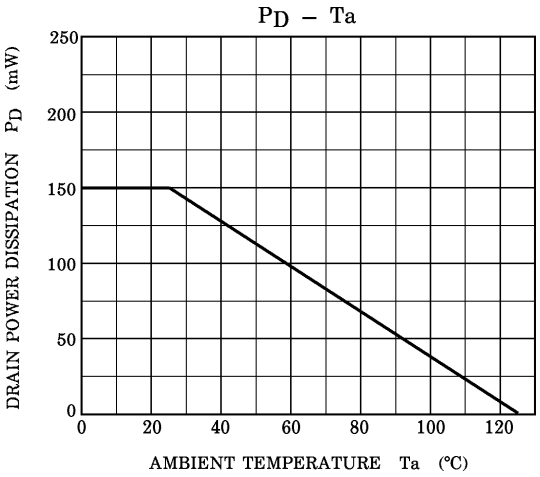

IMD − Pout
COMMON SOURCE
VDS=8V, ID=10mA
f1=100MHz,
f2=100.8MHz
fud=99.2MHz
Ta=25°C
IMD (dB)
Pout (dBmW)


Yis − f
COMMON SOURCE
VDS=8V
ID=10mA
Ta=25°C
f=100MHz
INPUT SUSCEPTANCE bis (mS)
INPUT CONDUCTANCE gis (mS)


Yfs − f
FORWARD TRANSFER CONDUCTANCE gfs (mS)
COMMON SOURCE
VDS=8V
ID=10mA
Ta=25°C
f=100MHz
FORWARD TRANSFER SUSCEPTANCE bfs (mS)


Yrs − f
REVERSE TRANSFER CONDUCTANCE grs (mS)
COMMON SOURCE
VDS=8V
ID=10mA
Ta=25°C
f=100MHz
REVERSE TRANSFER SUSCEPTANCE brs (mS)


Yos − f
COMMON SOURCE
VDS=8V
ID=10mA
Ta=25°C
f=100MHz
OUTPUT SUSCEPTANCE bos (mS)
OUTPUT CONDUCTANCE gos (mS)


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