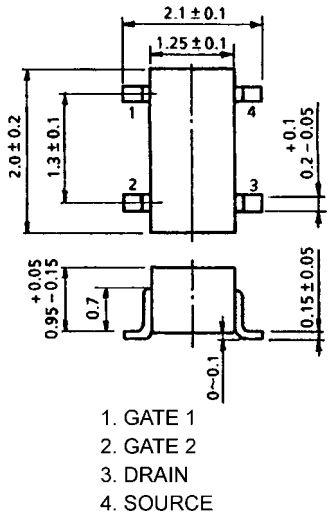
TOSHIBA Field Effect Transistor GaAs N-Channel Dual Gate MES Type

3SK274

TV Tuner, UHF RF Amplifier Applications

Unit: mm



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

USQ

JEDEC	—
JEITA	—
TOSHIBA	2-2K1B

Weight: 0.006 g (typ.)

Maximum Ratings (Ta = 25°C)

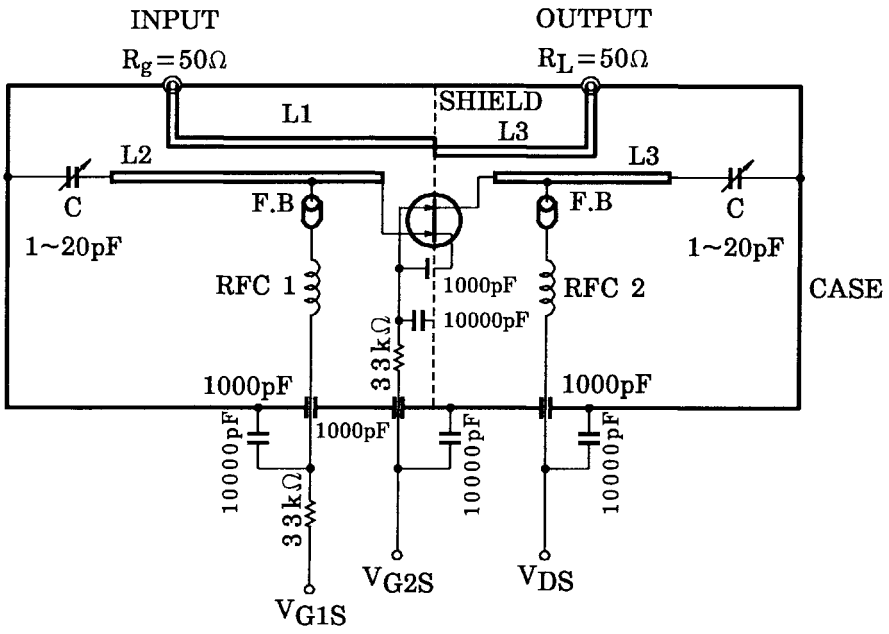
Characteristics	Symbol	Rating	Unit
Gate 1-drain voltage	V_{G1DO}	−9	V
Gate 2-drain voltage	V_{G2DO}	−9	V
Gate 1-source voltage	V_{G1S}	−4	V
Gate 2-source voltage	V_{G2S}	−4	V
Gate 1 current	I_{G1}	1	mA
Gate 2 current	I_{G2}	1	mA
Power dissipation	P_D	100	mW
Channel temperature	T_{ch}	125	°C
Storage temperature range	T_{stg}	−55~125	°C

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate 1 leakage current	I_{G1SS}	V_{DS} = 0, V_{G1S} = −3 V, V_{G2S} = 0	—	—	−4	μA
Gate 2 leakage current	I_{G2SS}	V_{DS} = 0, V_{G1S} = 0, V_{G2S} = −3 V	—	—	−4	μA
Drain current	I_{DSS}	V_{DS} = 3 V, V_{G1S} = 0, V_{G2S} = 0	6	—	20	mA
Gate 1-source cut-off voltage	$V_{G1S\ (OFF)}$	V_{DS} = 3 V, V_{G2S} = 0, I_D = 100 μA	−0.7	—	−1.8	V
Gate 2-source cut-off voltage	$V_{G2S\ (OFF)}$	V_{DS} = 3 V, V_{G1S} = 0, I_D = 100 μA	−0.7	—	−1.8	V
Forward transfer admittance	$\lvert Y_{fs} \rvert$	V_{DS} = 3 V, V_{G2S} = 1 V I_D = 5 mA, f = 1 kHz	—	19	—	mS
Input capacitance	C_{iss}	V_{DS} = 3 V, V_{G2S} = 1 V	—	0.6	1.4	pF
Reverse transfer capacitance	C_{rss}	I_D = 5 mA, f = 1 MHz	—	0.013	0.030	pF
Power gain	G_{ps}	V_{DS} = 3 V, V_{G2S} = 1 V	17	20.5	—	dB
Noise figure	NF	I_D = 5 mA, f = 800 MHz (Figure 1)	—	1.0	2.0	dB

Caution

GaAs (Gallium Arsenide) is used in this product. The dust or vapor can be dangerous to humans. Do not break, cut, crush or dissolve chemically. Dispose of this product properly according to law. Do not intermingle with normal industrial or domestic waste.



L1~L4: ϕ0.8 mm silver plated copper wire

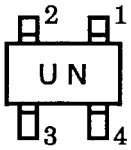
C: Air trimmer TTA25A 200A (MURATA Manufacturing. Co., Ltd.)

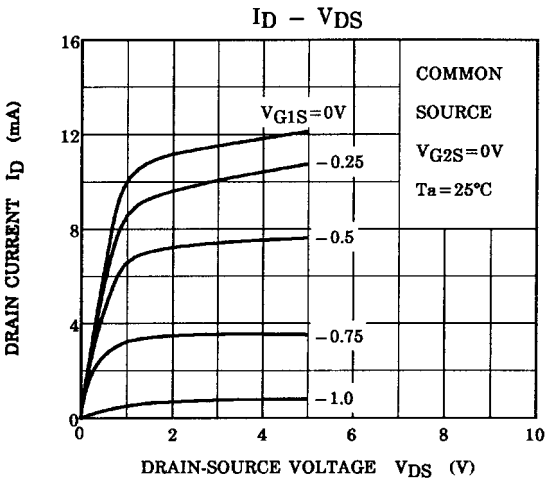
RFC 1: ϕ0.35 mm UEW 3 mm ID, 7 T

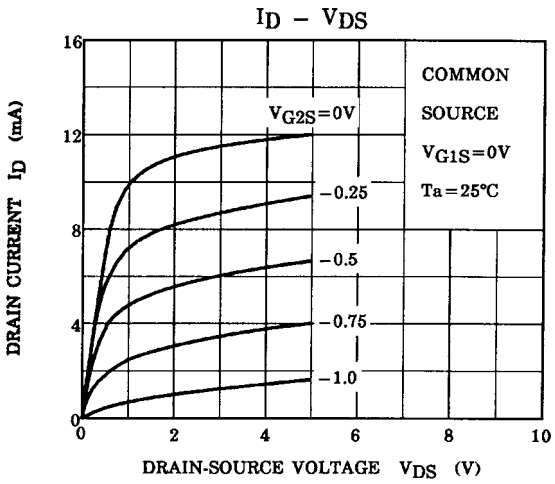
RFC 2: ϕ0.35 mm UEW 3 mm ID, 10 T

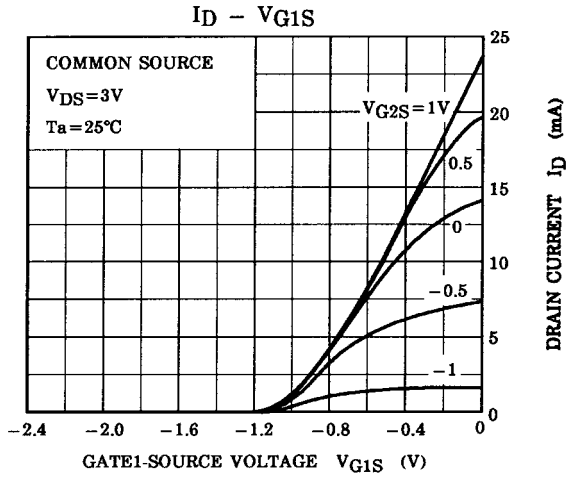
Figure 1 800 MHz Gps, NF Test Circuit

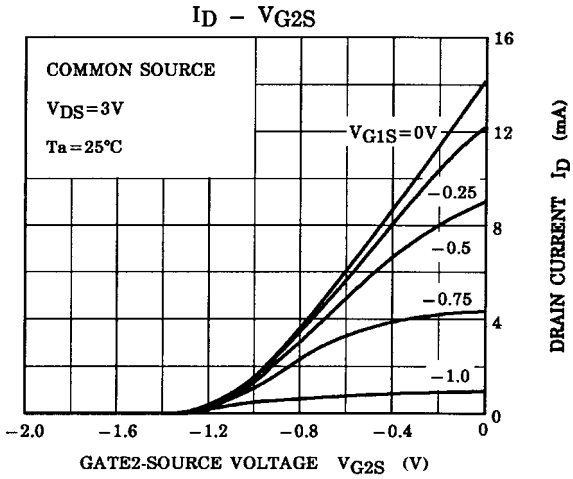
Marking



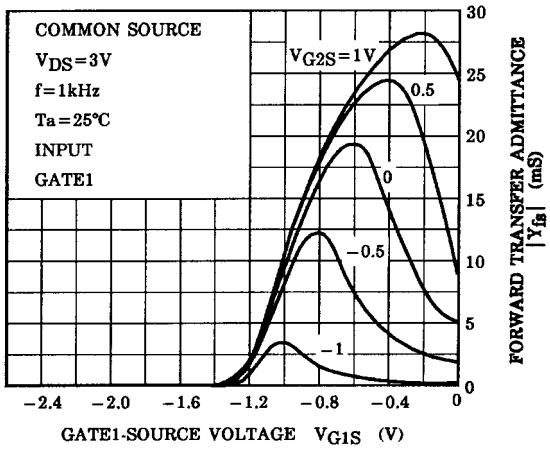

I_D – V_{DS}
COMMON SOURCE
V_{G2S}=0V
Ta=25°C
V_{G1S}=0V
−0.25
−0.5
−0.75
−1.0
DRAIN CURRENT I_D (mA)
DRAIN-SOURCE VOLTAGE V_{DS} (V)
0
2
4
6
8
10
0
4
8
12
16


I_D – V_{DS}
COMMON SOURCE
V_{G1S}=0V
Ta=25°C
V_{G2S}=0V
−0.25
−0.5
−0.75
−1.0
DRAIN CURRENT I_D (mA)
DRAIN-SOURCE VOLTAGE V_{DS} (V)
0
2
4
6
8
10
0
4
8
12
16

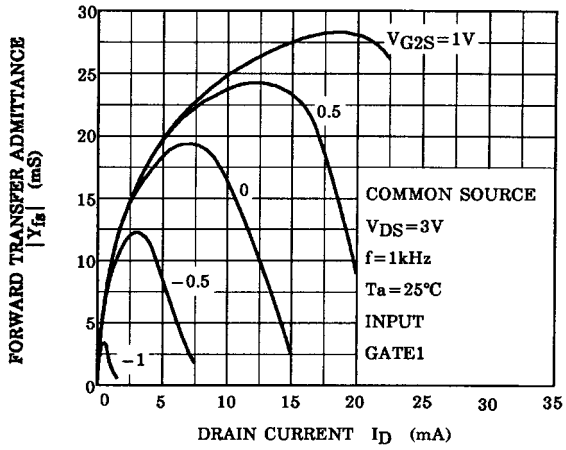

I_D – V_{G1S}
COMMON SOURCE
V_{DS}=3V
Ta=25°C
V_{G2S}=1V
0.5
0
−0.5
−1
DRAIN CURRENT I_D (mA)
GATE1-SOURCE VOLTAGE V_{G1S} (V)
−2.4
−2.0
−1.6
−1.2
−0.8
−0.4
0
0
5
10
15
20
25


I_D – V_{G2S}
COMMON SOURCE
V_{DS}=3V
Ta=25°C
V_{G1S}=0V
−0.25
−0.5
−0.75
−1.0
DRAIN CURRENT I_D (mA)
GATE2-SOURCE VOLTAGE V_{G2S} (V)
−2.0
−1.6
−1.2
−0.8
−0.4
0
0
4
8
12
16

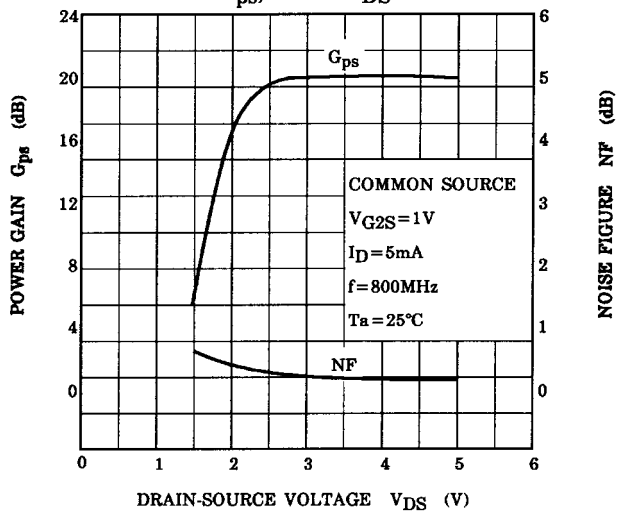
$|Y_{fs}|$ – V_{G1S}



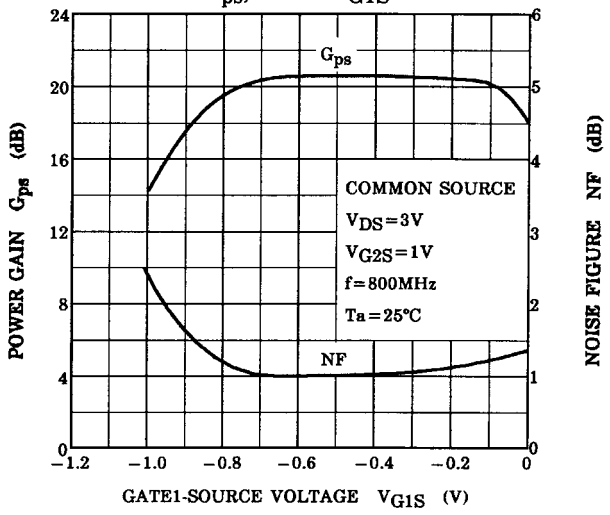
$|Y_{fs}|$ – I_D



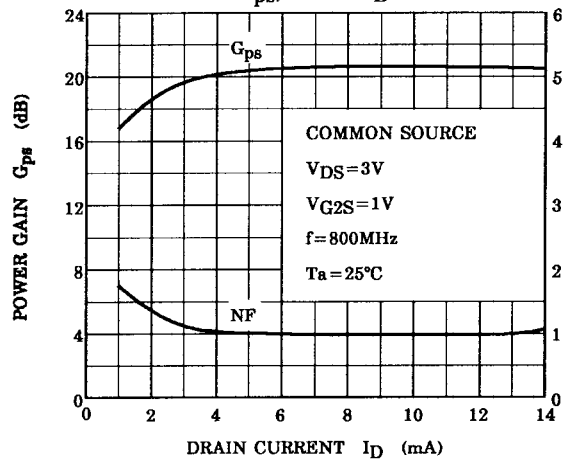
G_{ps}, NF – V_{DS}



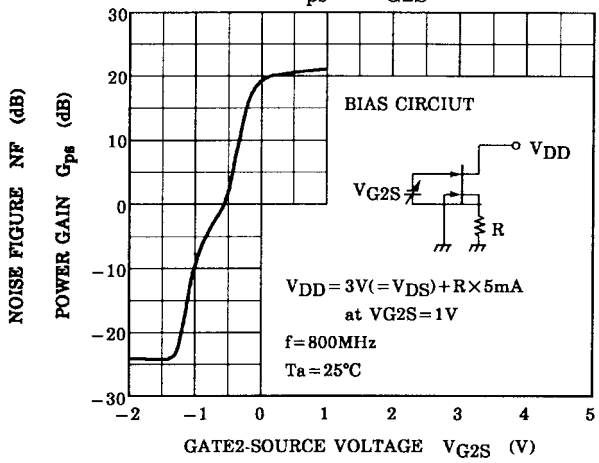
G_{ps}, NF – V_{G1S}



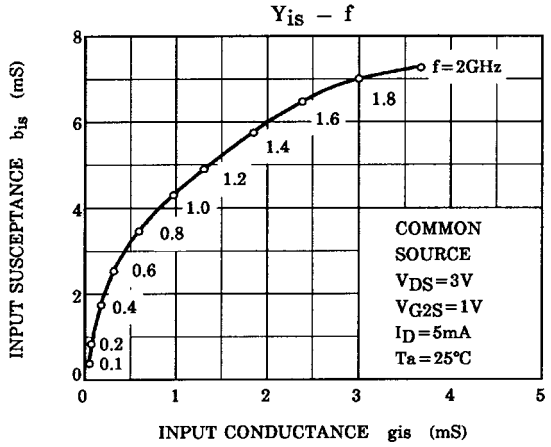
G_{ps}, NF – I_D



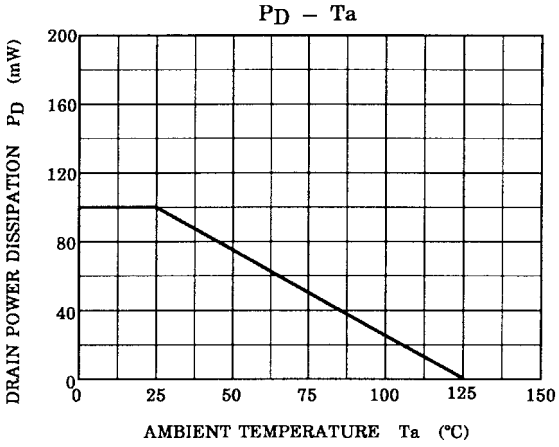
G_{ps} – V_{G2S}



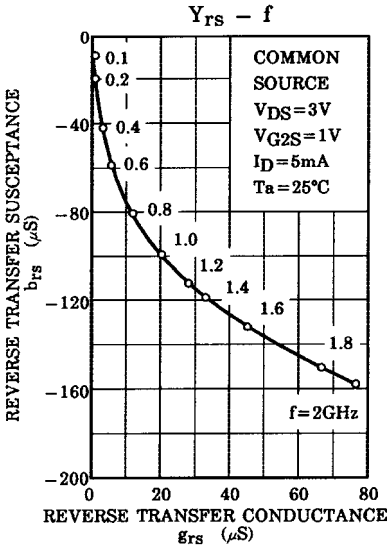
Y_{is} – f



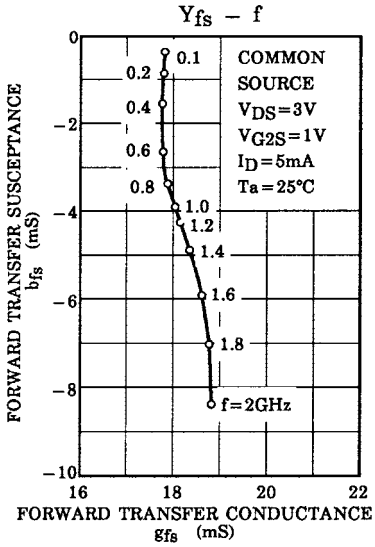
P_D – Ta



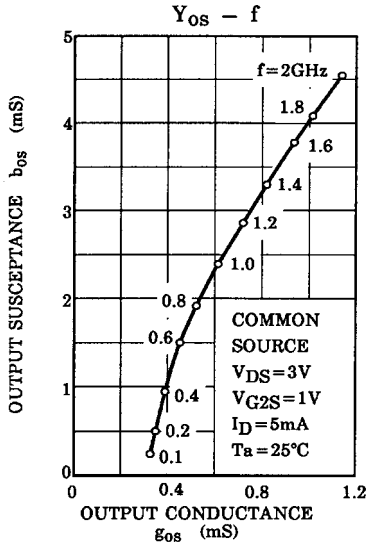
Y_{rs} – f



Y_{fs} – f



Y_{os} – f



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