TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL DUAL GATE MOS TYPE

# 3SK195

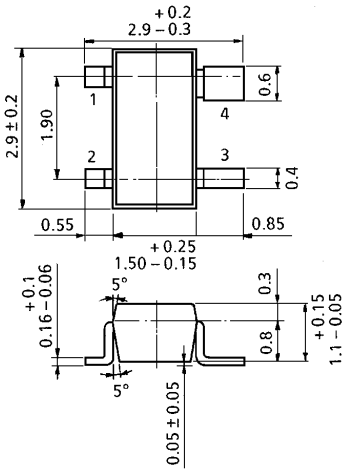
TV TUNER, VHF RF AMPLIFIER APPLICATIONS
FM TUNER APPLICATIONS

- Superior Cross Modulation Performance.
- Low Reverse Transfer Capacitance : $C_{rss}$ = 0.015pF (Typ.)
- Low Noise Figure : NF = 1.1dB (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 13.5 | V |
| Gate 1-Source Voltage | $V_{G1S}$ | ±8 | V |
| Gate 2-Source Voltage | $V_{G2S}$ | ±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 |

Unit in mm

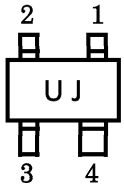



SMQ

| | |
|---|---|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | 2-3J1A |

Weight : 0.013g

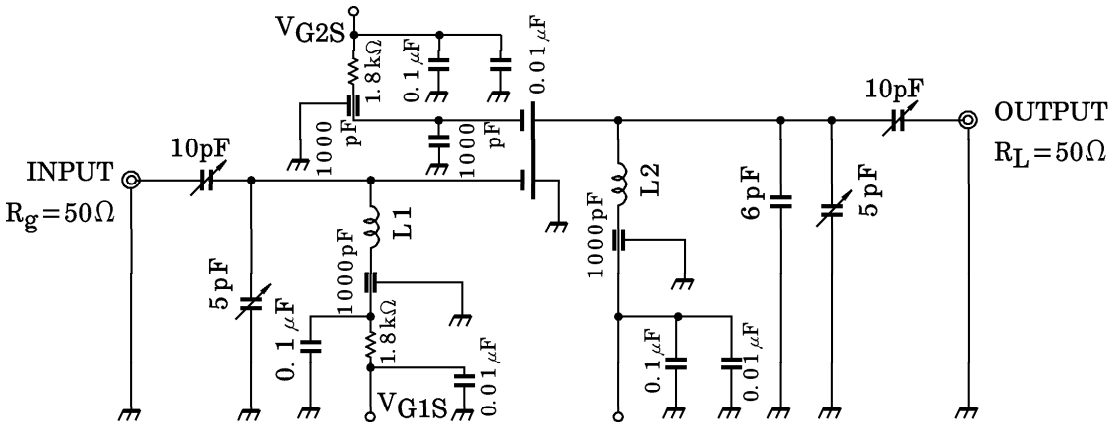
Marking




ELECTRICAL CHARACTERISTICS (Ta = 25°C)

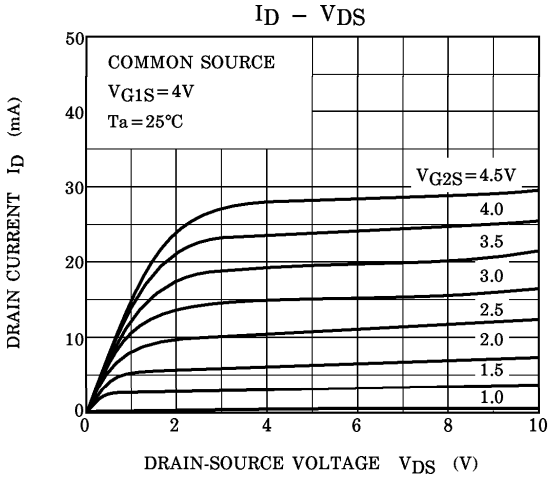
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Gate 1 Leakage Current | $I_{G1SS}$ | $V_{DS}$=0, $V_{G1S}$=±4V, $V_{G2S}$=0 | — | — | ±50 | nA |
| Gate 2 Leakage Current | $I_{G2SS}$ | $V_{DS}$=0, $V_{G1S}$=0, $V_{G2S}$=±4V | — | — | ±50 | nA |
| Drain-Source Voltage | $V_{(BR)DSX}$ | $V_{G1S}$=−4V, $V_{G2S}$=−4V, $I_D$=100μA | 13.5 | — | — | V |
| Drain Current | $I_{DSS}$ | $V_{DS}$=6V, $V_{G1S}$=0, $V_{G2S}$=4V | 0 | — | 0.1 | mA |
| Gate 1-Source Cut-off Voltage | $V_{G1S(OFF)}$ | $V_{DS}$=6V, $V_{G2S}$=4V, $I_D$=100μA | 0 | — | 1.0 | V |
| Gate 2-Source Cut-off Voltage | $V_{G2S(OFF)}$ | $V_{DS}$=6V, $V_{G1S}$=4V, $I_D$=100μA | 0 | — | 1.2 | V |
| Forward Transfer Admittance | $\|Y_{fs}\|$ | $V_{DS}$=6V, $V_{G2S}$=4V, $I_D$=10mA, f=1kHz | — | 13 | — | mS |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=6V, $V_{G2S}$=4V, $I_D$=10mA, f=1MHz | 2.0 | 2.7 | 3.4 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | — | 0.015 | 0.03 | pF |
| Power Gain | $G_{ps}$ | $V_{DS}$=6V, $V_{G2S}$=4V, $I_D$=10mA, f=200MHz (Fig.1) | 22 | 27 | — | dB |
| Noise Figure | NF | | — | 1.1 | 2.2 | dB |

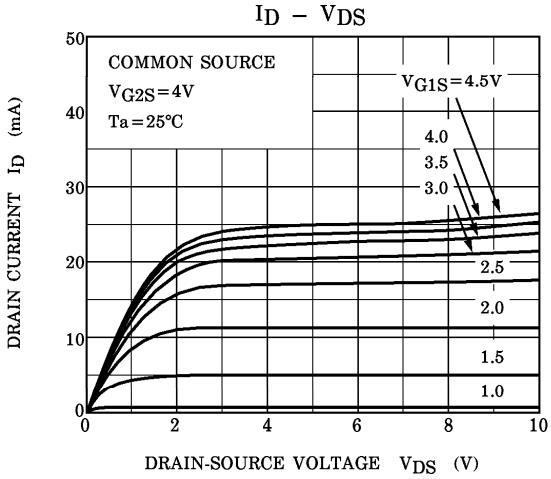
961001EAA2

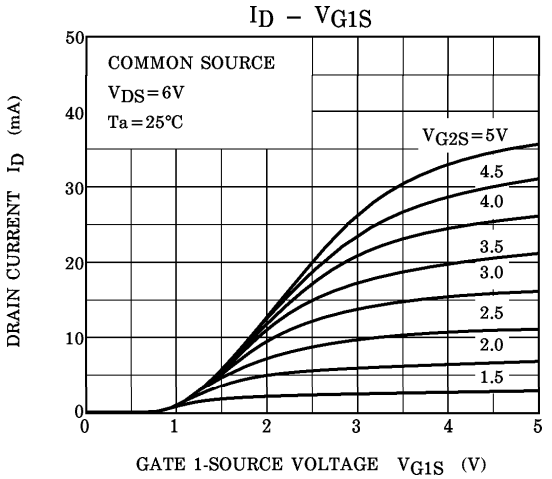


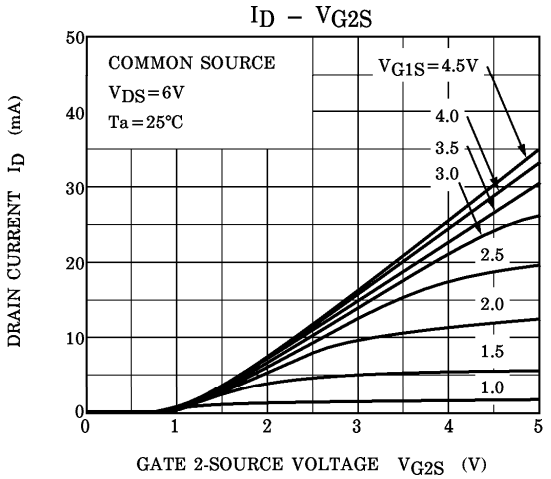

L1 : 1mm$\phi$ Silver Plated Copper Wire, 2 Turns, 8mm ID
L2 : 1mm$\phi$ Silver Plated Copper Wire, 2.5 Turns, 8mm ID

Fig.1 200MHz, Gps NF TEST CIRCUIT

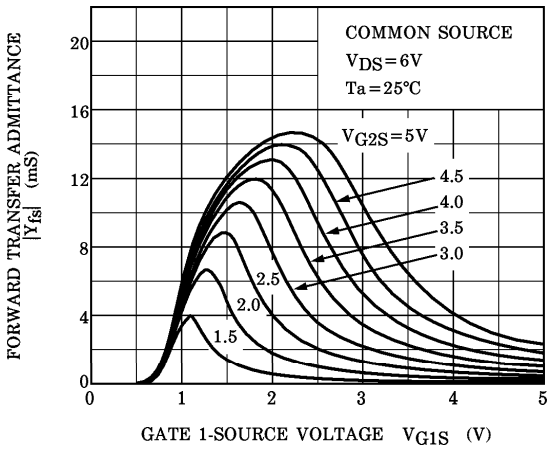


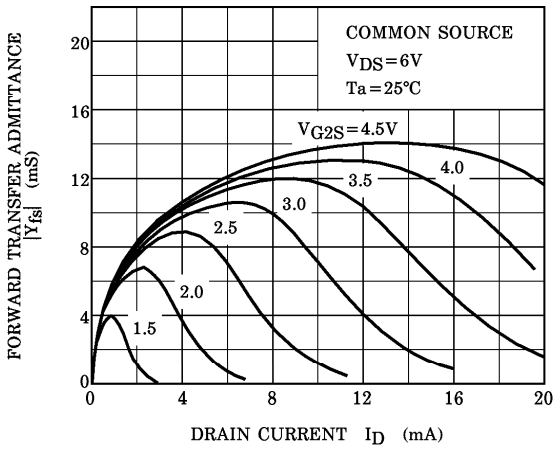



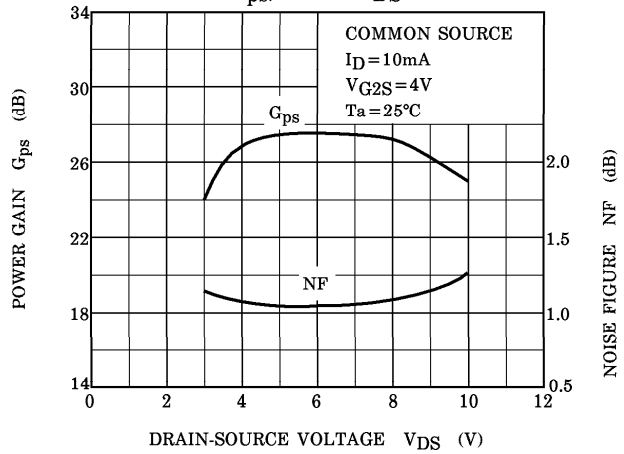
$|Y_{fs}|$ – $V_{G1S}$



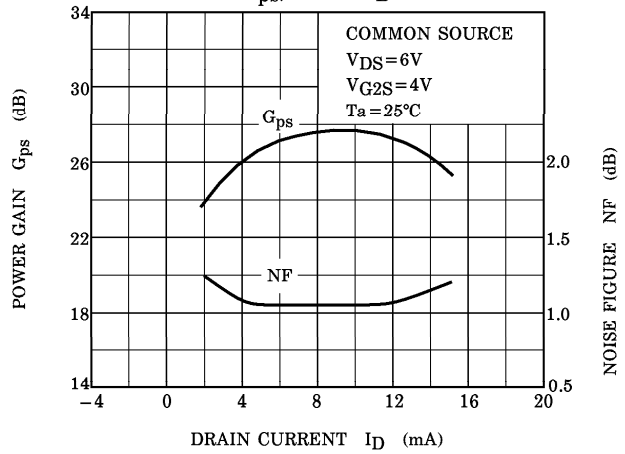

$|Y_{fs}|$ – $I_D$



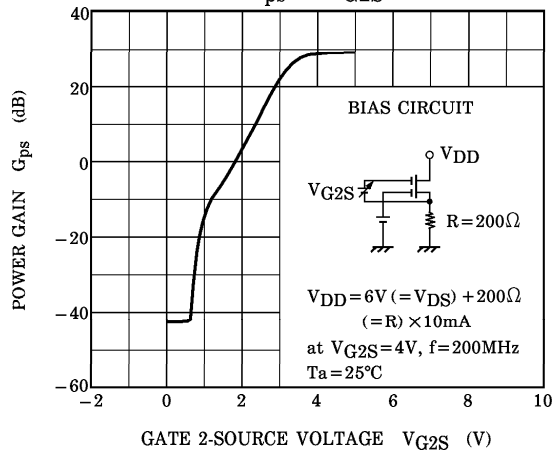

$G_{ps}$, NF – $V_{DS}$



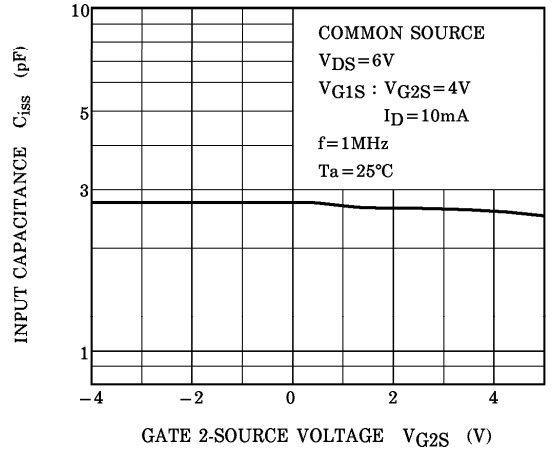

$G_{ps}$, NF – $I_D$



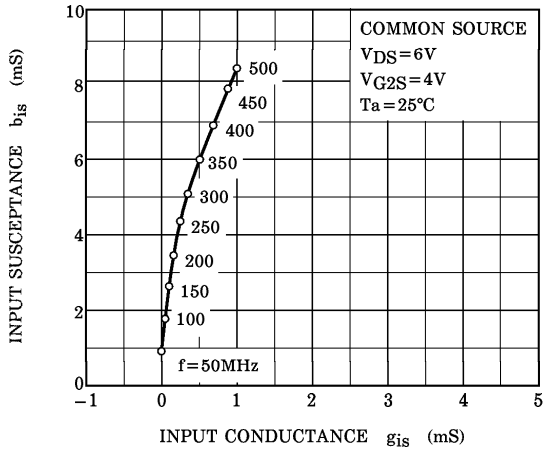

$G_{ps}$ – $V_{G2S}$



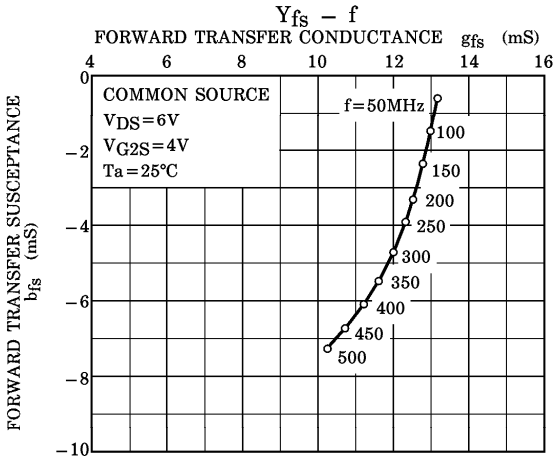

$C_{iss}$ – $V_{G2S}$



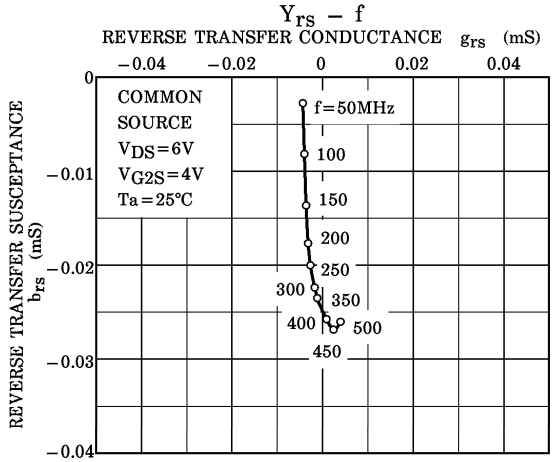
$Y_{is}$ – f



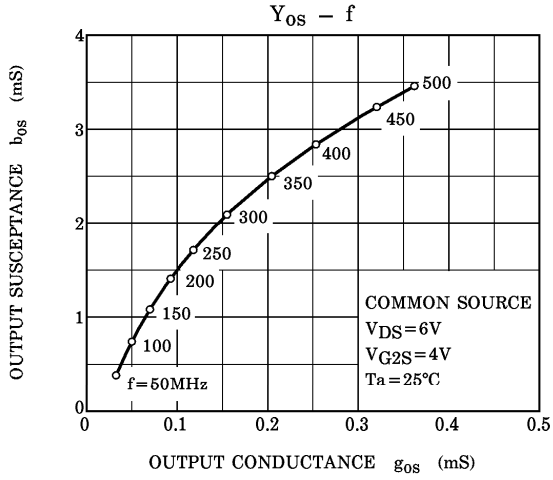

$Y_{fs}$ – f




$Y_{rs}$ – f




$Y_{os}$ – f




$P_D$ – Ta