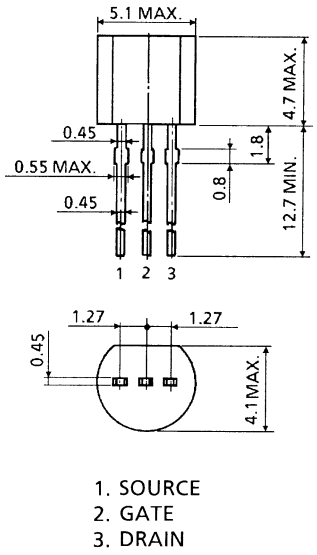
TOSHIBA Field Effect Transistor Silicon N Channel Junction Type

2SK30ATM

Low Noise Pre-Amplifier, Tone Control Amplifier and DC-AC High Input Impedance Amplifier Circuit Applications

- High breakdown voltage: V_{GDS} = −50 V
- High input impedance: I_{GSS} = −1 nA (max) (V_{GS} = −30 V)
- Low noise: NF = 0.5 dB (typ.)
  (V_{DS} = 15 V, V_{GS} = 0, R_G = 100 kΩ, f = 120 Hz)

Unit: mm



1. SOURCE
2. GATE
3. DRAIN

JEDEC	TO-92
JEITA	SC-43
TOSHIBA	2-5F1C

Weight: 0.21 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Gate-drain voltage	V_{GDS}	−50	V
Gate current	I_G	10	mA
Drain power dissipation	P_D	100	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

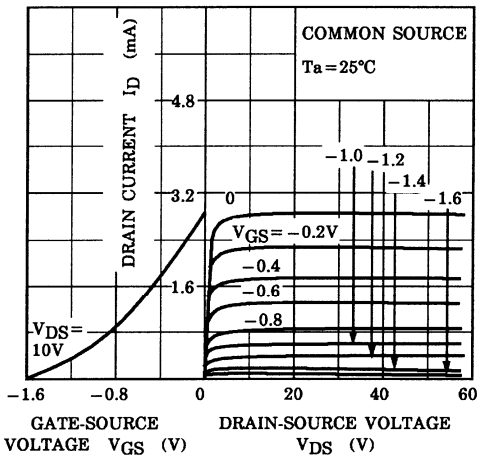
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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)

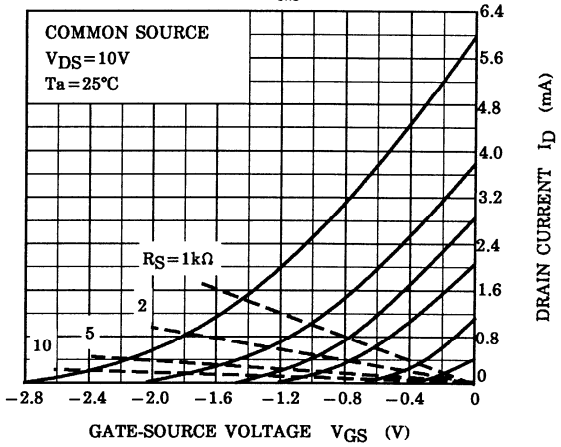
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate cut-off current	I_{GSS}	V_{GS} = −30 V, V_{DS} = 0	—	—	−1.0	nA
Gate-drain breakdown voltage	$V_{(BR)\ GDS}$	V_{DS} = 0, I_G = −100 μA	−50	—	—	V
Drain current	I_{DSS} (Note)	V_{DS} = 10 V, V_{GS} = 0	0.3	—	6.5	mA
Gate-source cut-off voltage	$V_{GS\ (OFF)}$	V_{DS} = 10 V, I_D = 0.1 μA	−0.4	—	−5.0	V
Forward transfer admittance	$\|Y_{fs}\|$	V_{DS} = 10 V, V_{GS} = 0, f = 1 kHz	1.2	—	—	mS
Input capacitance	C_{iss}	V_{GS} = 0, V_{DS} = 0, f = 1 MHz	—	8.2	—	pF
Reverse transfer capacitance	C_{rss}	V_{GD} = −10 V, V_{DS} = 0, f = 1 MHz	—	2.6	—	pF
Noise figure	NF	V_{DS} = 15 V, V_{GS} = 0 R_G = 100 kΩ, f = 120 Hz	—	0.5	5.0	dB

Note: I_{DSS} classification R: 0.30~0.75, O: 0.60~1.40, Y: 1.20~3.00, GR: 2.60~6.50

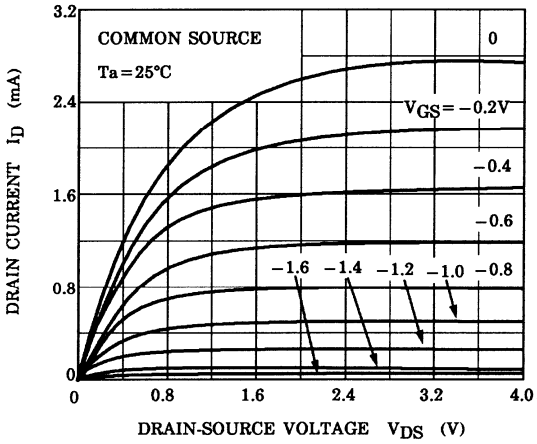
STATIC CHARACTERISTICS



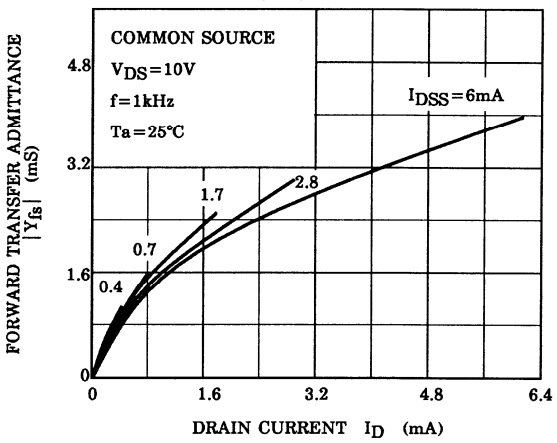
I_D – V_{GS}



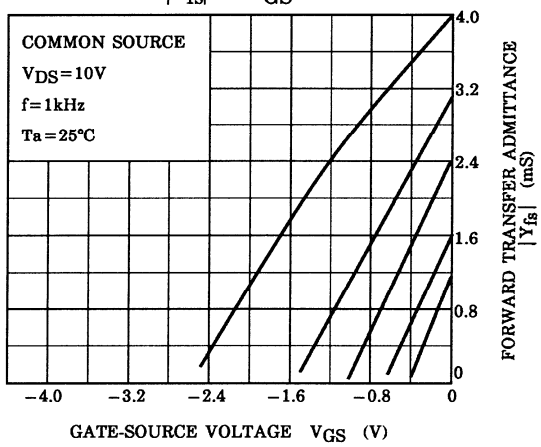
I_D – V_{DS} (LOW VOLTAGE REGION)



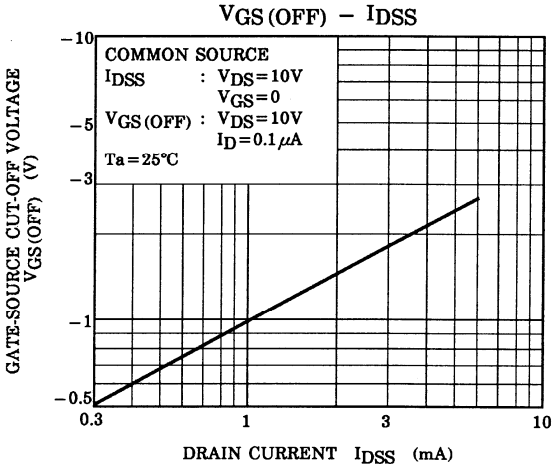
$|Y_{fs}|$ – I_D

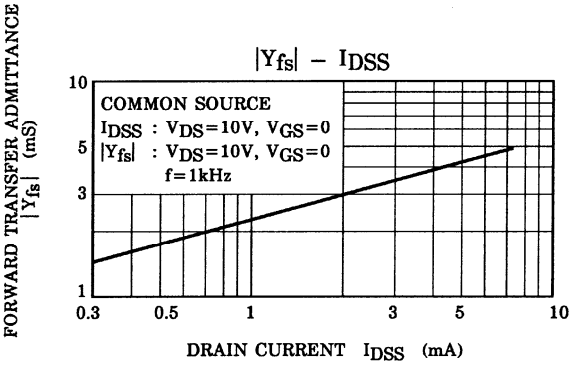


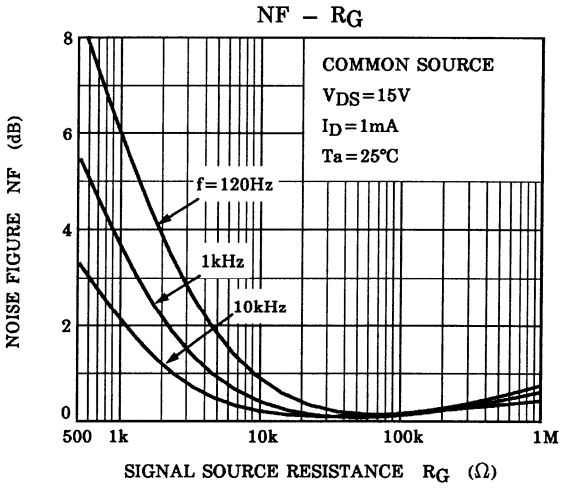
$|Y_{fs}|$ – V_{GS}

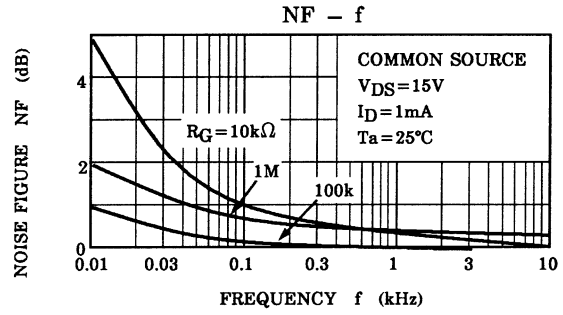


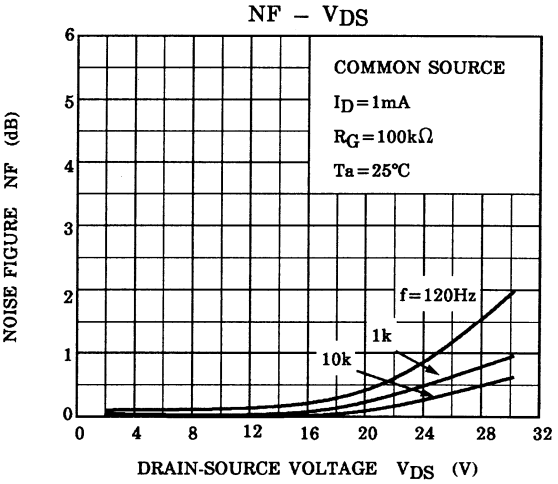
$V_{GS\,(OFF)}$ – I_{DSS}

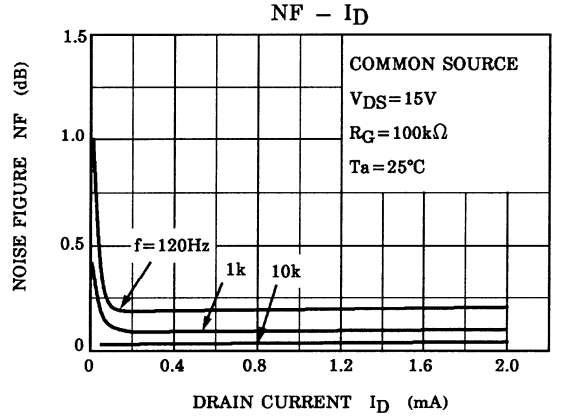


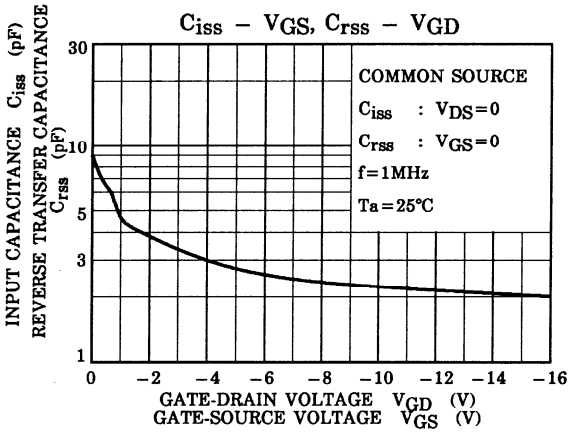

|Yfs| – IDSS
COMMON SOURCE
IDSS : VDS=10V, VGS=0
|Yfs| : VDS=10V, VGS=0
f=1kHz
FORWARD TRANSFER ADMITTANCE |Yfs| (mS)
DRAIN CURRENT IDSS (mA)

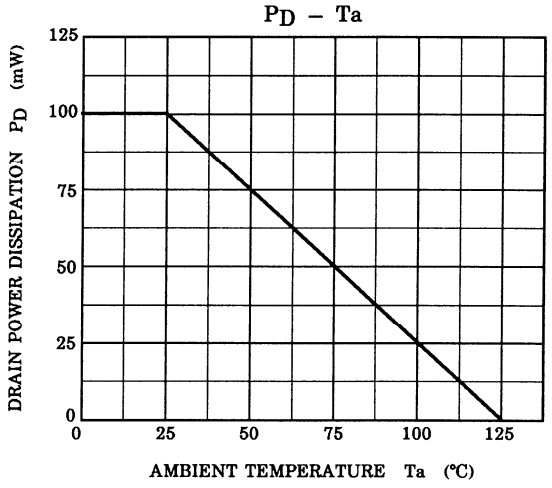

NF – RG
COMMON SOURCE
VDS=15V
ID=1mA
Ta=25°C
f=120Hz
1kHz
10kHz
NOISE FIGURE NF (dB)
SIGNAL SOURCE RESISTANCE RG (Ω)


NF – f
COMMON SOURCE
VDS=15V
ID=1mA
Ta=25°C
RG=10kΩ
1M
100k
NOISE FIGURE NF (dB)
FREQUENCY f (kHz)


NF – VDS
COMMON SOURCE
ID=1mA
RG=100kΩ
Ta=25°C
f=120Hz
1k
10k
NOISE FIGURE NF (dB)
DRAIN-SOURCE VOLTAGE VDS (V)


NF – ID
COMMON SOURCE
VDS=15V
RG=100kΩ
Ta=25°C
f=120Hz
1k
10k
NOISE FIGURE NF (dB)
DRAIN CURRENT ID (mA)


Ciss – VGS, Crss – VGD
COMMON SOURCE
Ciss : VDS=0
Crss : VGS=0
f=1MHz
Ta=25°C
INPUT CAPACITANCE Ciss (pF)
REVERSE TRANSFER CAPACITANCE Crss (pF)
GATE-DRAIN VOLTAGE VGD (V)
GATE-SOURCE VOLTAGE VGS (V)


PD – Ta
DRAIN POWER DISSIPATION PD (mW)
AMBIENT TEMPERATURE Ta (°C)

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