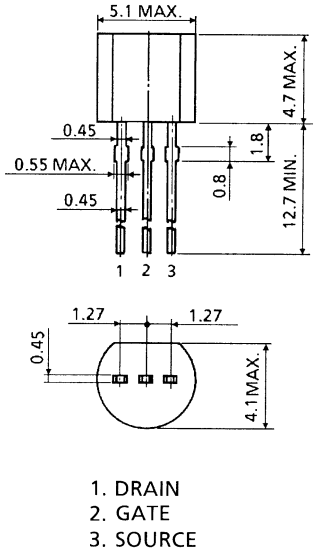
TOSHIBA Field Effect Transistor Silicon N Channel Junction Type

2SK369

For Low Noise Audio Amplifier Applications

- Suitable for use as first stage for equalizer and MC head amplifiers.
- High $|Y_{fs}|$: $|Y_{fs}| = 40$ mS (typ.) ($V_{DS} = 10$ V, $V_{GS} = 0$, $I_{DSS} = 5$ mA)
- High breakdown voltage: $V_{GDS} = -40$ V (min)
- Super low noise: NF = 1.0dB (typ.)
  ($V_{DS} = 10$ V, $I_D = 5$ mA, f = 1 kHz, $R_G = 100\ \Omega$)
- High input impedance: $I_{GSS} = -1$ nA (max) ($V_{GS} = -30$ V)

Unit: mm



JEDEC	TO-92
JEITA	SC-43
TOSHIBA	2-5F1D

Weight: 0.21 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Gate-drain voltage	V_{GDS}	−40	V
Gate current	I_G	10	mA
Drain power dissipation	P_D	400	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).

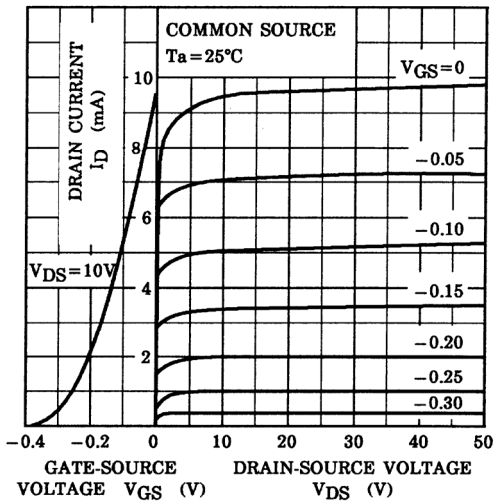
Electrical Characteristics (Ta = 25°C)

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	$V_{(BR)\ GDS}$	$V_{DS} = 0$, $I_G = -100\ \mu A$	−40	—	—	V
Drain current	I_{DSS} (Note 1)	$V_{DS} = 10$ V, $V_{GS} = 0$	5.0	—	30	mA
Gate-source cut-off voltage	$V_{GS\ (OFF)}$	$V_{DS} = 10$ V, $I_D = 0.1\ \mu A$	−0.3	—	−1.2	V
Forward transfer admittance	$\|Y_{fs}\|$	$V_{DS} = 10$ V, $V_{GS} = 0$, f = 1 kHz, ($I_{DSS} = 5$ mA)	25	40	—	mS
Input capacitance	C_{iss}	$V_{DS} = 10$ V, $V_{GS} = 0$, f = 1 MHz	—	75	—	pF
Reverse transfer capacitance	C_{rss}	$V_{GD} = -10$ V, $I_D = 0$, f = 1 MHz	—	15	—	pF
Noise figure (Note 2)	NF (1)	$V_{DS} = 10$ V, $R_G = 100\ \Omega$, $I_D = 5$ mA, f = 100 Hz	—	5	10	dB
	NF (2)	$V_{DS} = 10$ V, $R_G = 100\ \Omega$, $I_D = 5$ mA, f = 1 kHz	—	1	2	

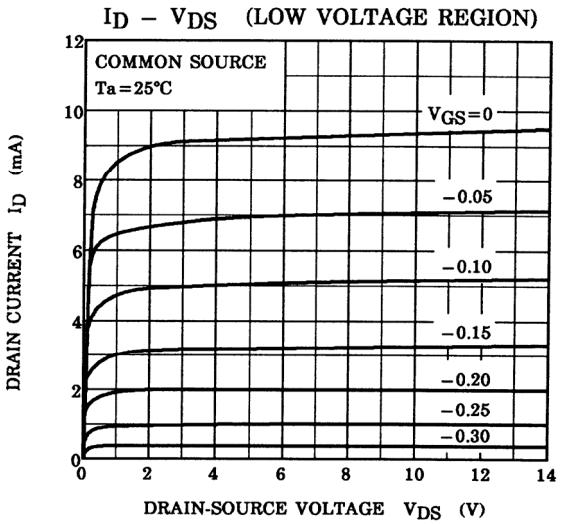
Note 1: I_{DSS} classification GR: 5.0~10.0 mA, BL: 8.0~16.0 mA, V: 14.0~30.0 mA

Note 2: Use this in the low voltage region (VDS < 15 V) for low noise applications.

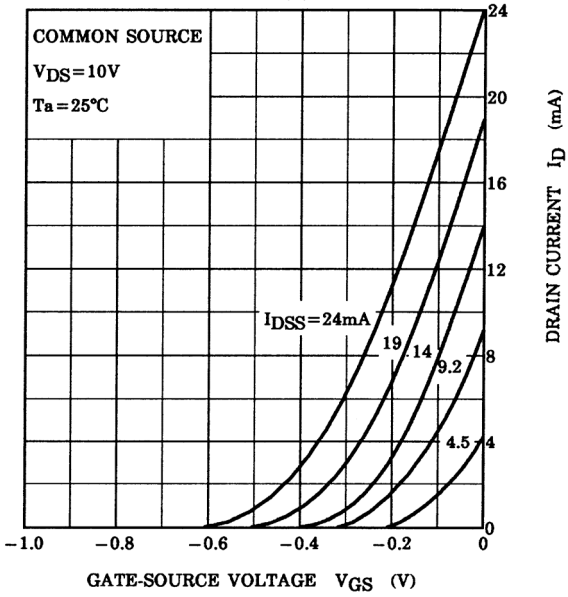
STATIC CHARACTERISTICS



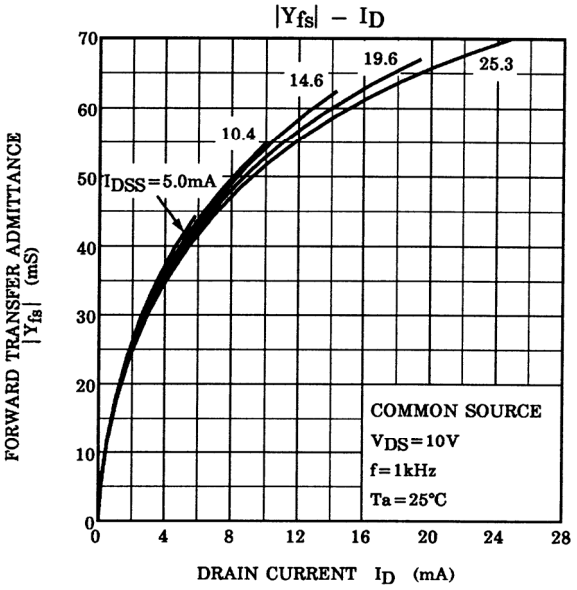
I_D – V_{DS} (LOW VOLTAGE REGION)



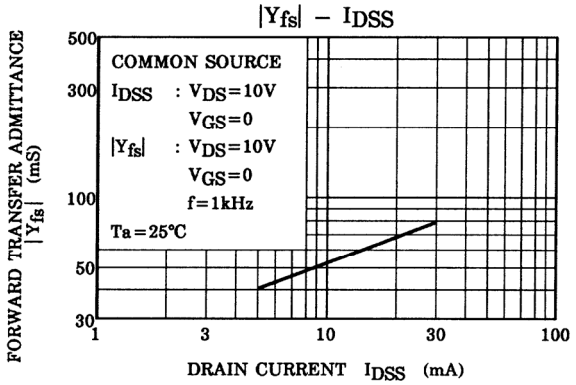
I_D – V_{GS}



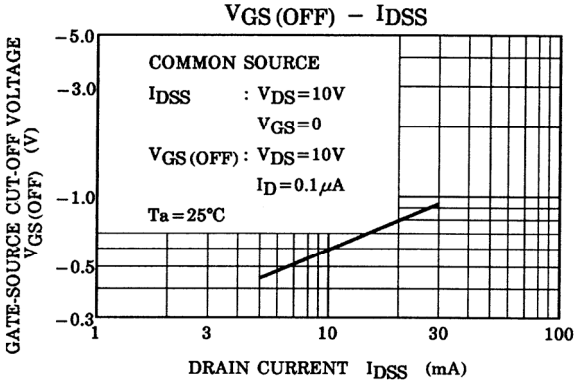
$|Y_{fs}|$ – I_D



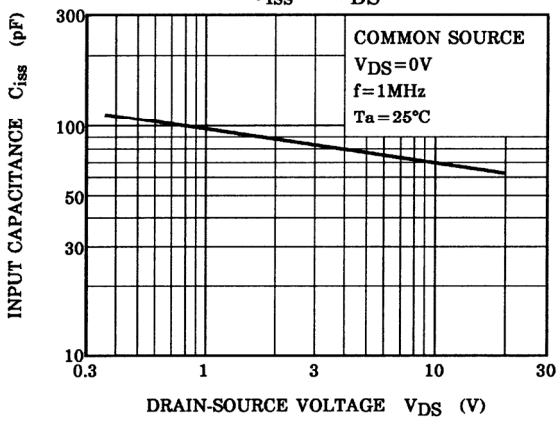
$|Y_{fs}|$ – I_{DSS}



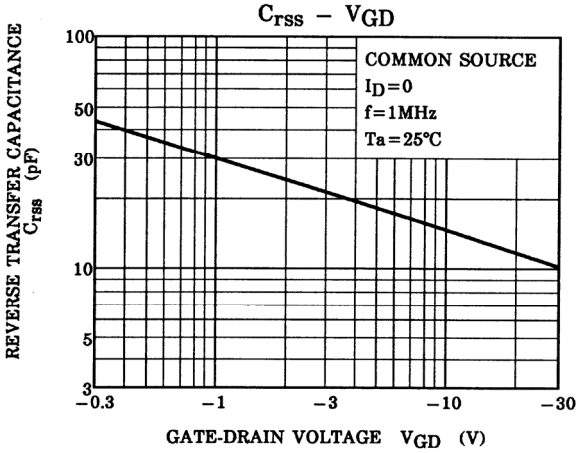
$V_{GS(OFF)}$ – I_{DSS}



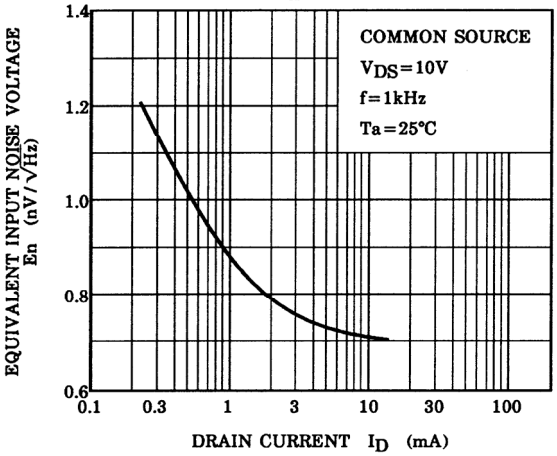
C_{iss} – V_{DS}



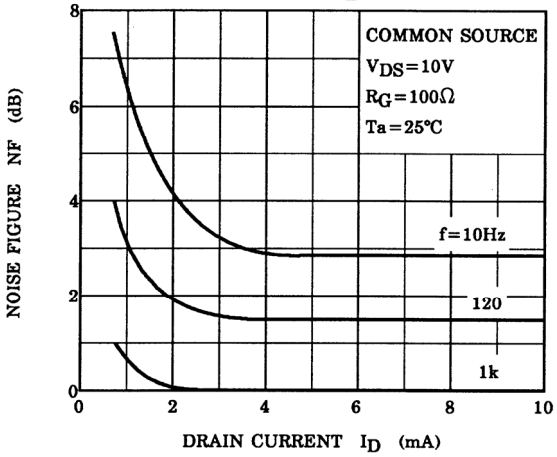
C_{rss} – V_{GD}



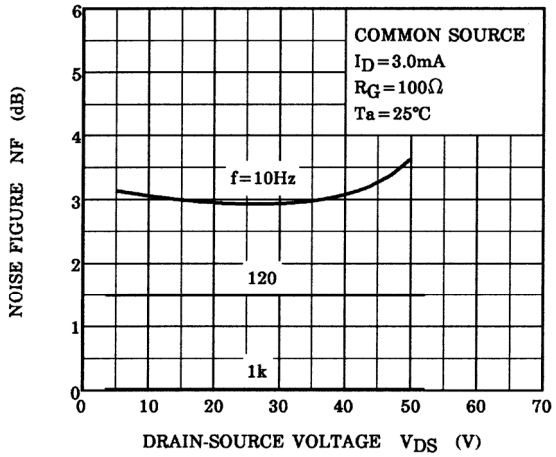
E_n – I_D



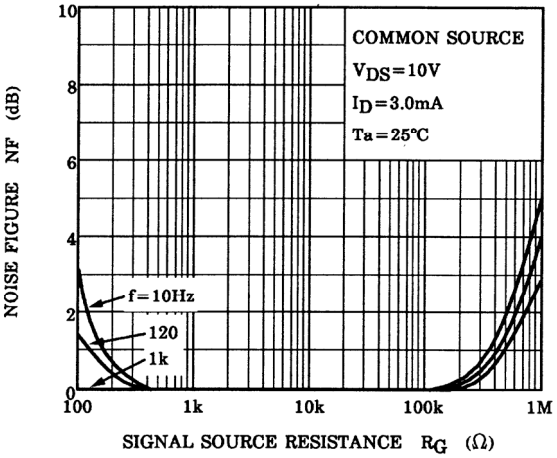
NF – I_D



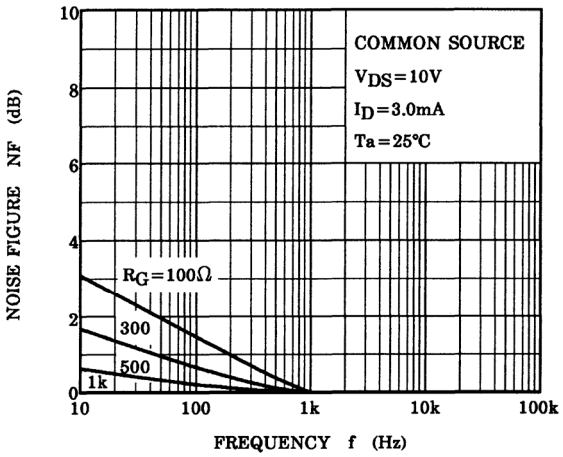
NF – V_{DS}



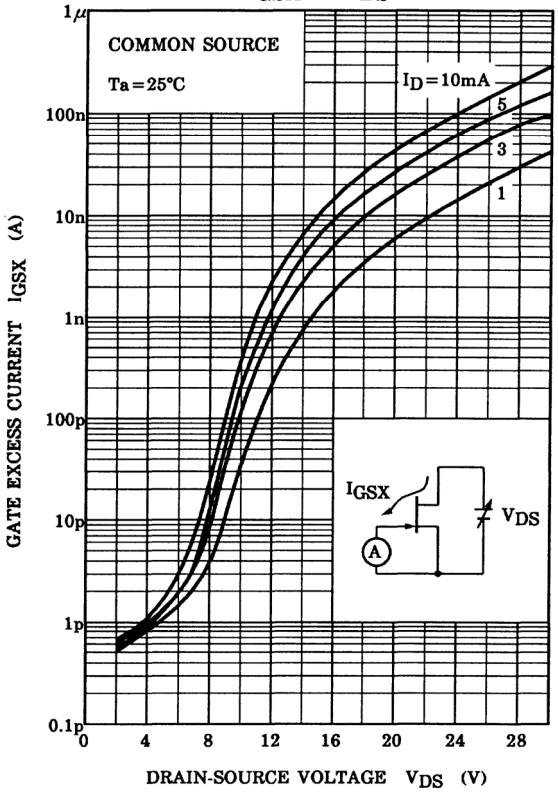
NF – R_G



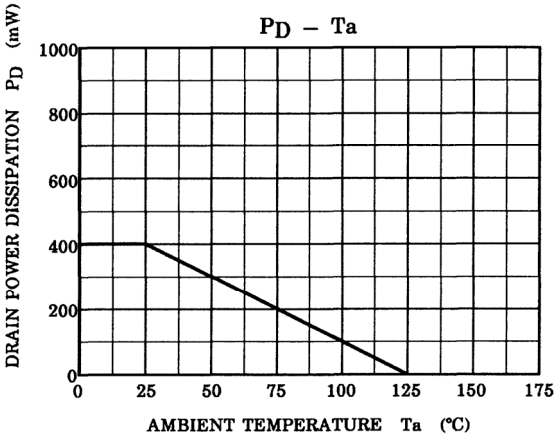
NF – f



IGSX – VDS



PD – Ta



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20070701-EN GENERAL

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