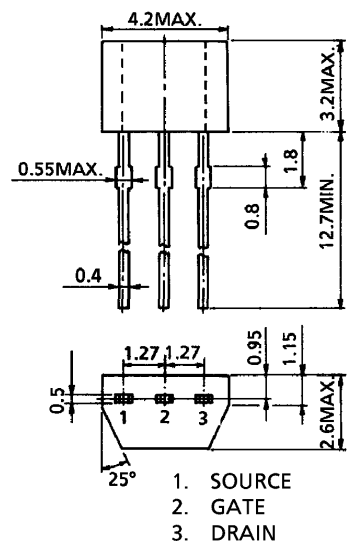
TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL JUNCTION TYPE

2SK118

GENERAL PURPOSE AND IMPEDANCE CONVERTER AND CONDENSER MICROPHONE APPLICATIONS

- High Breakdown Voltage : $V_{GDS} = -50V$
- High Input Impedance : $I_{GSS} = -1nA$ (Max.) ($V_{GS} = -30V$)
- Low Noise : NF = 0.5dB (Typ.) ($R_G = 100k\Omega$, f = 120Hz)
- Small Package

Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-4E1B

Weight : 0.13g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

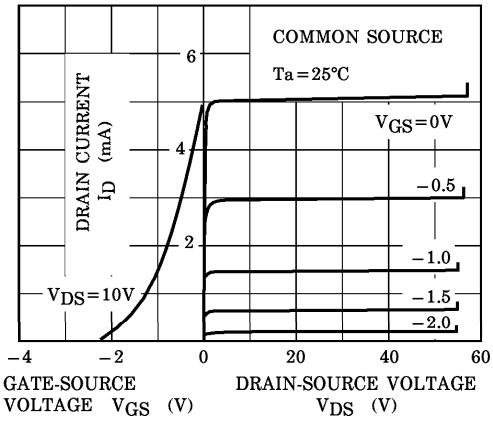
CHARACTERISTIC	SYMBOL	RATING	UNIT
Gate-Drain Voltage	V_{GDS}	−50	V
Gate Current	I_G	10	mA
Drain Power Dissipation	P_D	100	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

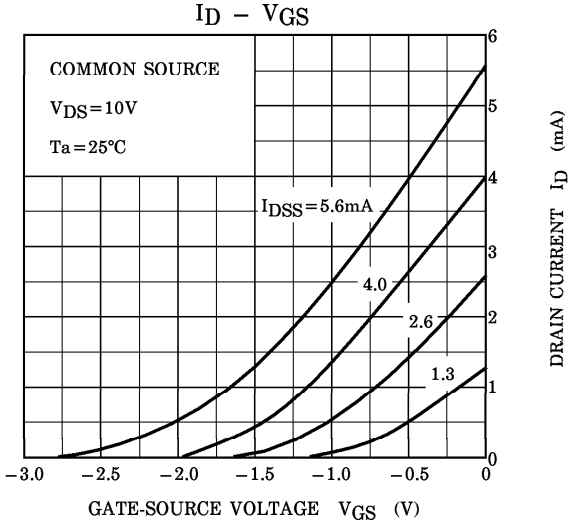
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Cut-off Current	I_{GSS}	$V_{GS} = -30V$, $V_{DS} = 0$	—	—	−1.0	nA
Gate-Drain Breakdown Voltage	$V_{(BR)GDS}$	$V_{DS} = 0$, $I_G = -100\mu A$	−50	—	—	V
Drain Current	I_{DSS} (Note)	$V_{DS} = 10V$, $V_{GS} = 0$	0.3	—	6.5	mA
Gate-Source Cut-off Voltage	$V_{GS(OFF)}$	$V_{DS} = 10V$, $I_D = 0.1\mu A$	−0.4	—	−5.0	V
Forward Transfer Admittance	$\|Y_{fs}\|$	$V_{DS} = 10V$, $V_{GS} = 0$, f = 1kHz	1.2	—	—	mS
Input Capacitance	C_{iss}	$V_{DS} = 10V$, $V_{GS} = 0$, f = 1MHz	—	8.2	—	pF
Reverse Transfer Capacitance	C_{rss}	$V_{GD} = -10V$, $I_D = 0$, f = 1MHz	—	2.6	—	pF
Noise Figure	NF	$V_{DS} = 15V$, $V_{GS} = 0$, $R_G = 100k\Omega$, f = 120Hz	—	0.5	5.0	dB

Note : I_{DSS} Classification R : 0.3~0.75mA, O : 0.6~1.4mA, Y : 1.2~3.0mA, GR : 2.6~6.5mA

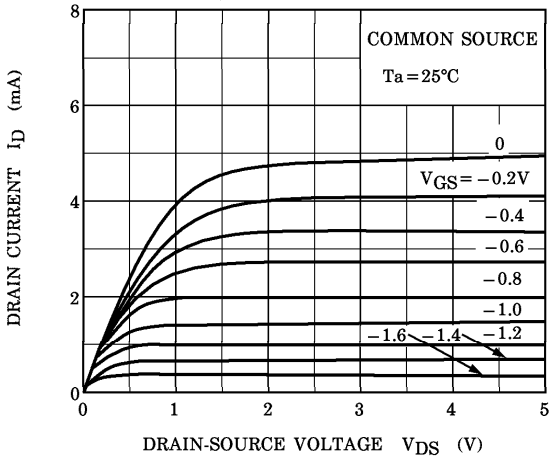
STATIC CHARACTERISTICS



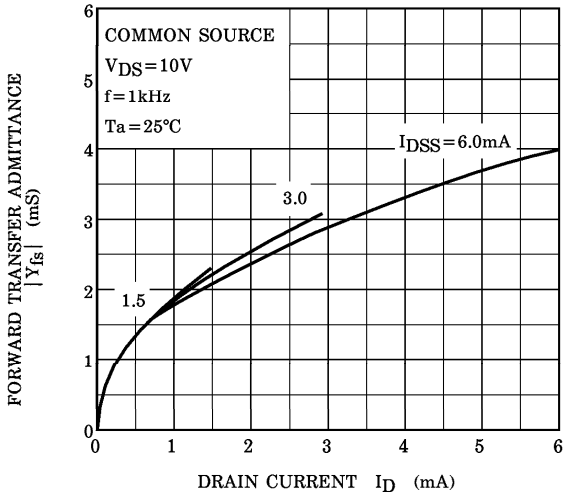
I_D − V_{GS}



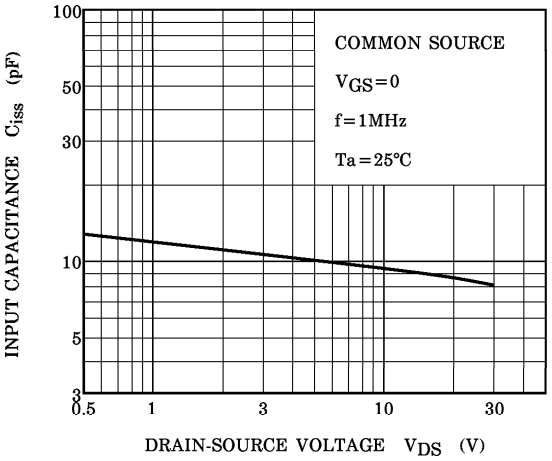
I_D − V_{DS} (LOW VOLTAGE REGION)



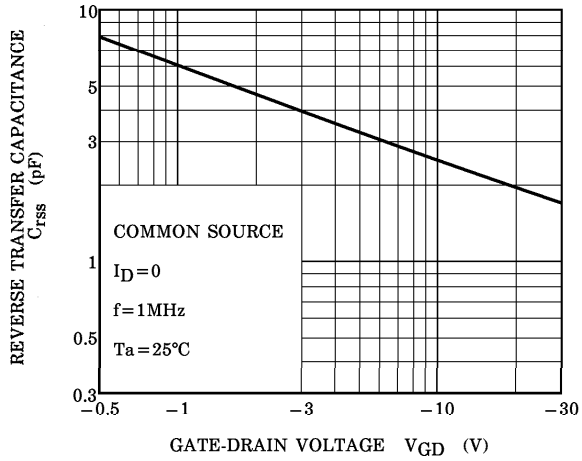
$|Y_{fs}|$ − I_D

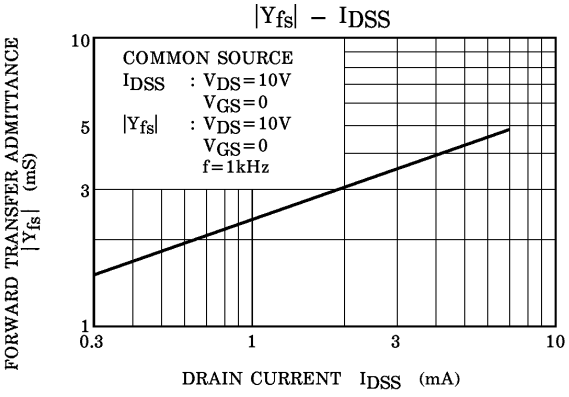


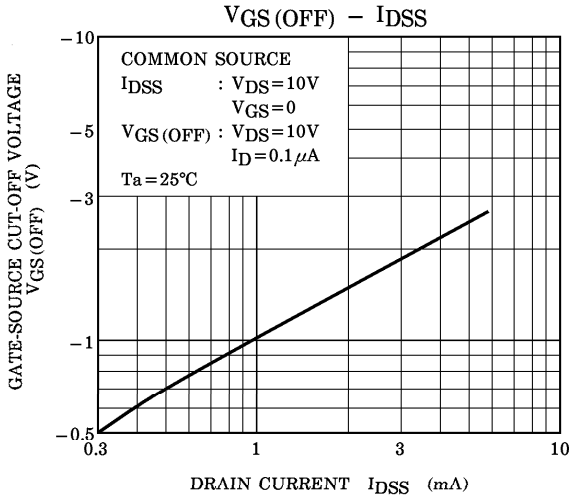
C_{iss} − V_{DS}

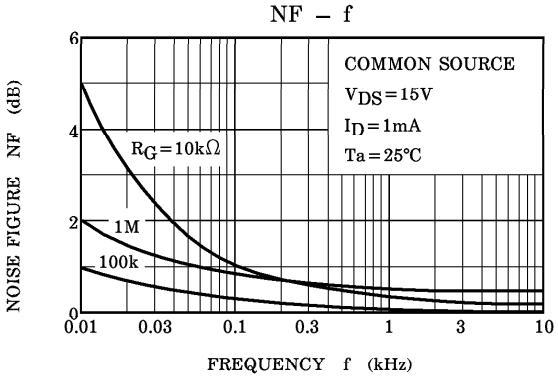


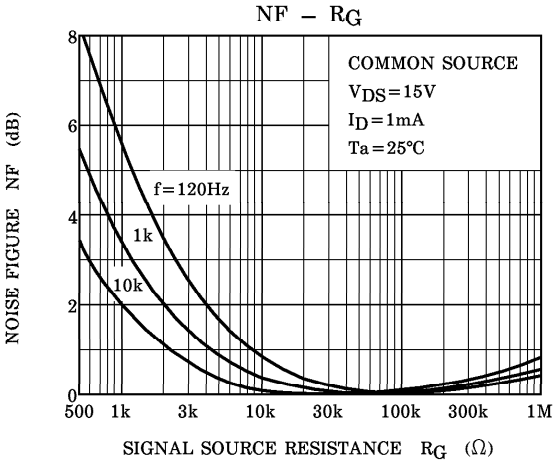
C_{rss} − V_{GD}

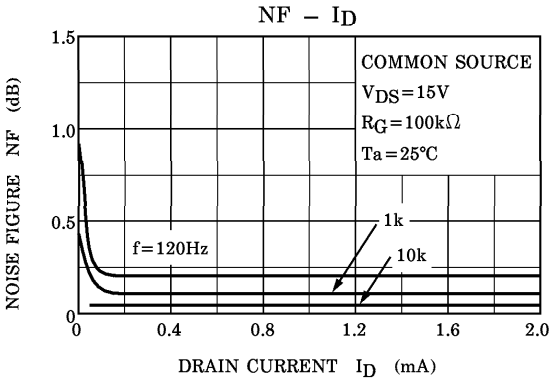


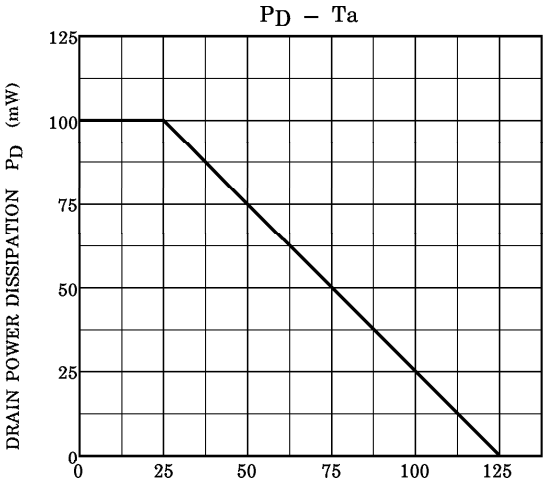

|Yfs| – IDSS
COMMON SOURCE
IDSS : VDS=10V
VGS=0
|Yfs| : VDS=10V
VGS=0
f=1kHz
FORWARD TRANSFER ADMITTANCE |Yfs| (mS)
DRAIN CURRENT IDSS (mA)

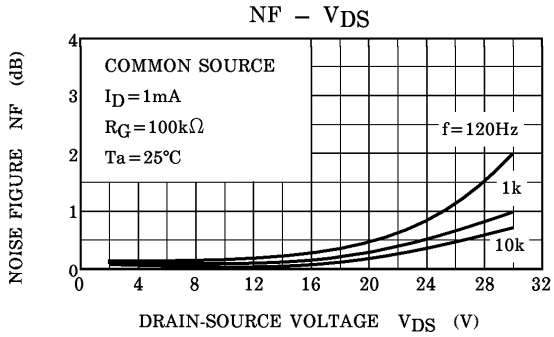

VGS (OFF) – IDSS
COMMON SOURCE
IDSS : VDS=10V
VGS=0
VGS (OFF) : VDS=10V
ID=0.1μA
Ta=25°C
GATE-SOURCE CUT-OFF VOLTAGE VGS (OFF) (V)
DRAIN CURRENT IDSS (mA)


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


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


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


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


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

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