Ordering number:EN659K

N-Channel Junction Silicon FET

# 2SK223

## High Voltage Driver Applications

## Features

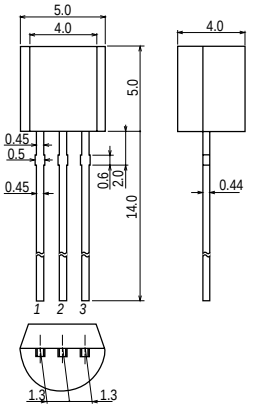
- Ultrahigh withstand voltage ($V_{GDS}$≥–80V).
- Due to low gate leakage currents even at high voltage, the 2SK223 is suitable for a wide range of application ($I_{GDL}$=1nA/$V_{DS}$=50V, $I_D$=1mA).
- High $|y_{fs}|$ ($|y_{fs}|$=20mS/$V_{DS}$=30V, f=1kHz).

## Package Dimensions

unit:mm

2019B

[2SK223]




1 : Source
2 : Gate
3 : Drain
SANYO : NP
JEDEC : TO-92
EIAJ : SC-43

## Specifications

### Absolute Maximum Ratings at Ta = 25˚C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSS}$ | | 80 | V |
| Gate-to-Drain Voltage | $V_{GDS}$ | | –80 | V |
| Gate Current | $I_G$ | | 10 | mA |
| Allowable Power Dissipation | $P_D$ | | 400 | mW |
| Junction Temperature | Tj | | 125 | ˚C |
| Storage Temperature | Tstg | | –40 to +125 | ˚C |

### Electrical Characteristics at Ta = 25˚C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Gate-to-Drain Breakdown Voltage | $V_{(BR)GDS}$ | $I_G$=–100μA | –80 | | | V |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=–30V, $V_{DS}$=0 | | | –1.0 | nA |
| Zero-Gate Voltage Drain Current | $I_{DSS}$* | $V_{DS}$=30V, $V_{GS}$=0 | 1.2* | | 24* | mA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}$=30V, $I_D$=10μA | | –0.75 | | V |
| Forward Transfer Admittance | \| yfs \| | $V_{DS}$=30V, $V_{GS}$=0, f=1kHz | | 20 | | mS |
| Input Capacitance | Ciss | $V_{DS}$=30V, $V_{GS}$=0, f=1MHz | | 12 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=30V, $V_{GS}$=0, f=1MHz | | 2.5 | | pF |
| Noise Figure | NF | $V_{DS}$=10V, $I_D$=3mA, Rg=10kΩ, f=1kHz | | 1.5 | | dB |

* : The 2SK223 is classified by $I_{DSS}$ as follows (unit : mm) :

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.2 | D | 3.0 | 2.5 | E | 6.0 | 5.0 | F | 12.0 | 10.0 | G | 24.0 |

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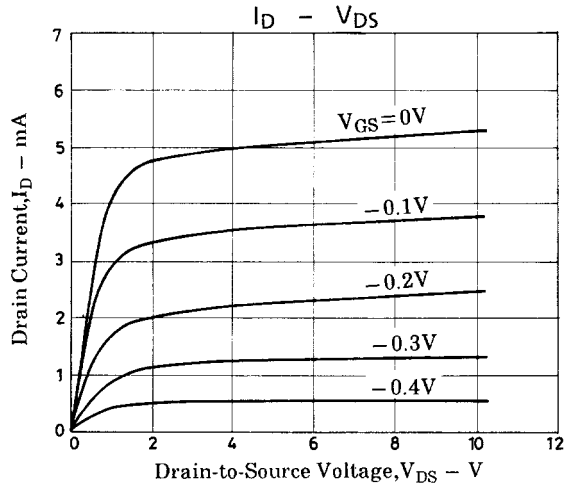
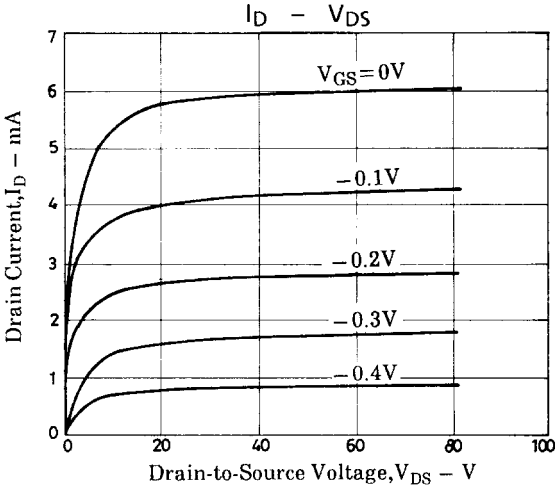
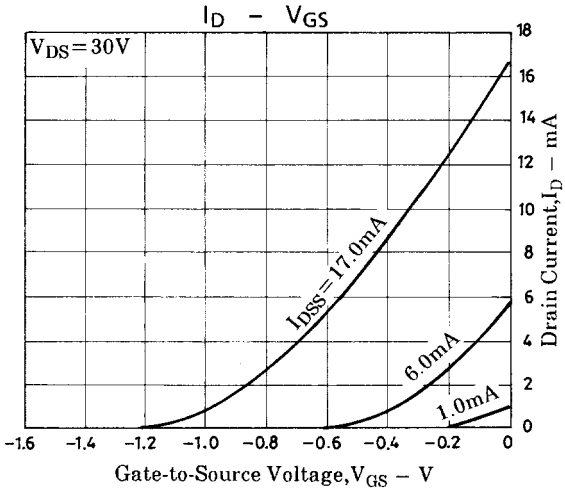
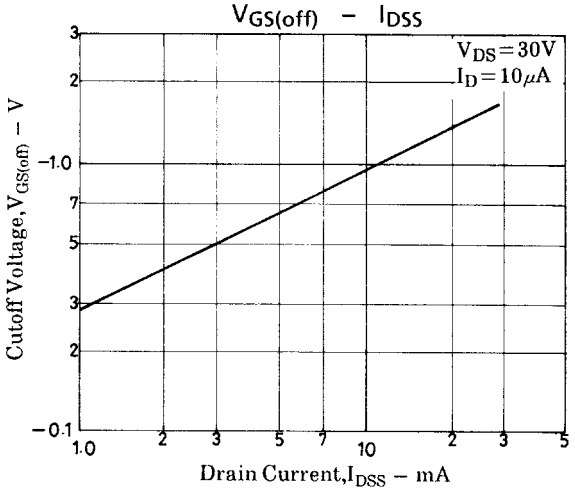
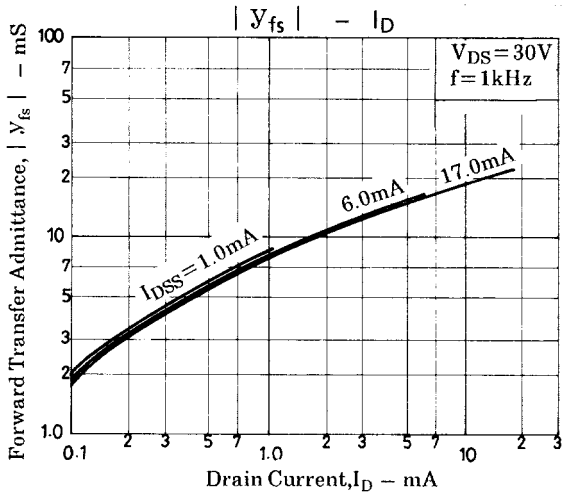
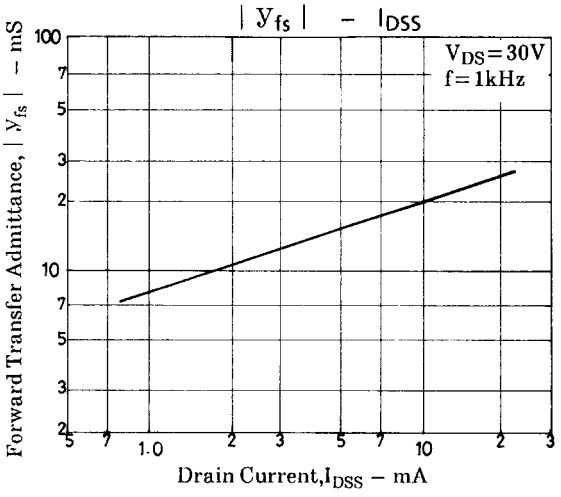

$I_D$ – $V_{DS}$
Drain Current,$I_D$ – mA
$V_{GS}$=0V
–0.1V
–0.2V
–0.3V
–0.4V
Drain-to-Source Voltage,$V_{DS}$ – V

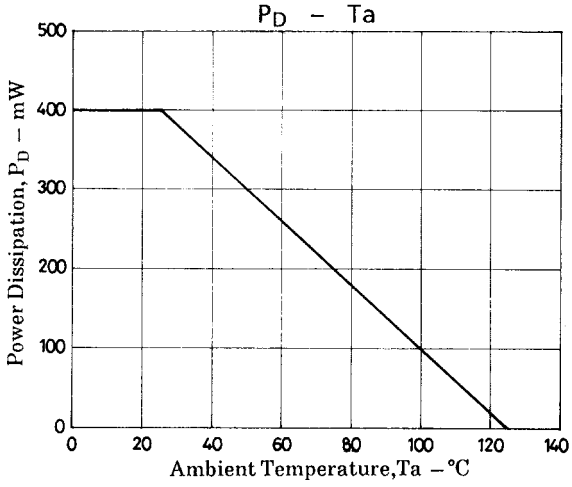

$I_D$ – $V_{DS}$
Drain Current,$I_D$ – mA
$V_{GS}$=0V
–0.1V
–0.2V
–0.3V
–0.4V
Drain-to-Source Voltage,$V_{DS}$ – V


$I_D$ – $V_{GS}$
$V_{DS}$=30V
$I_{DSS}$=17.0mA
6.0mA
1.0mA
Drain Current,$I_D$ – mA
Gate-to-Source Voltage,$V_{GS}$ – V

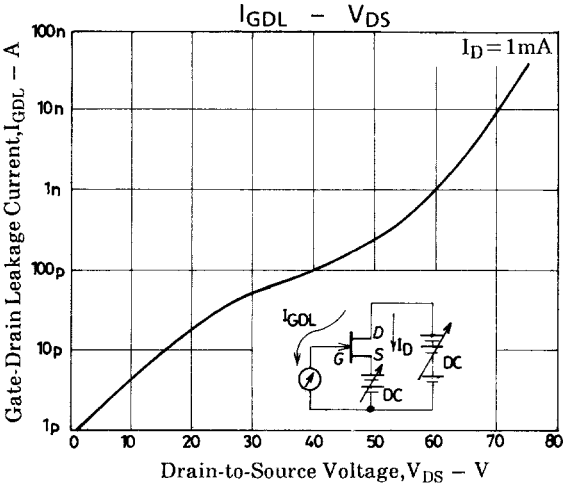

$V_{GS(off)}$ – $I_{DSS}$
$V_{DS}$=30V
$I_D$=10μA
Cutoff Voltage,$V_{GS(off)}$ – V
Drain Current,$I_{DSS}$ – mA


$|y_{fs}|$ – $I_D$
$V_{DS}$=30V
f=1kHz
$I_{DSS}$=1.0mA
6.0mA
17.0mA
Forward Transfer Admittance, $|y_{fs}|$ – mS
Drain Current,$I_D$ – mA

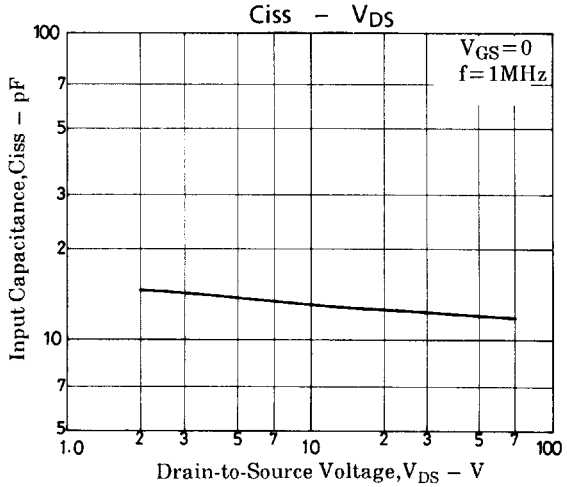

$|y_{fs}|$ – $I_{DSS}$
$V_{DS}$=30V
f=1kHz
Forward Transfer Admittance, $|y_{fs}|$ – mS
Drain Current,$I_{DSS}$ – mA


$P_D$ – Ta
Power Dissipation, $P_D$ – mW
Ambient Temperature,Ta – °C

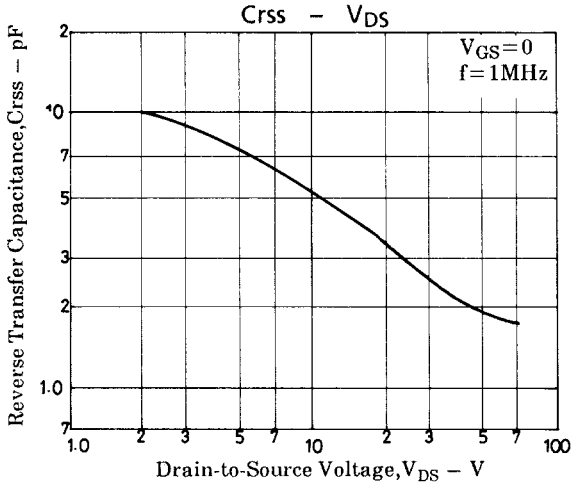
$I_{GDL}$ – $V_{DS}$



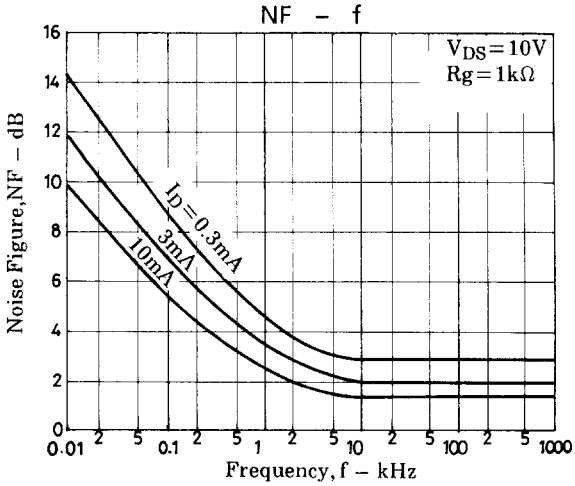

Ciss – $V_{DS}$



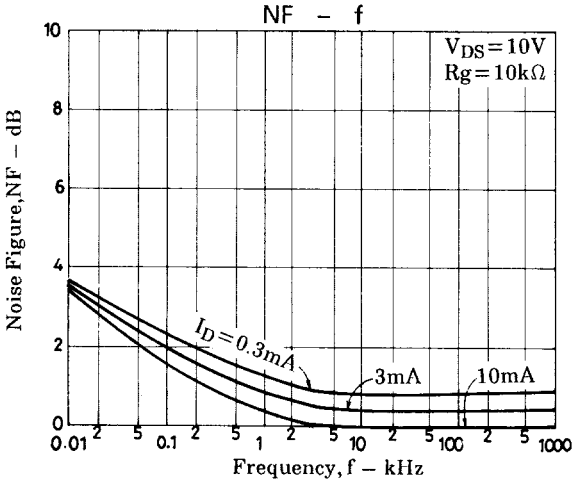

Crss – $V_{DS}$




NF – f




NF – f




NF – f