NEC



# JUNCTION FIELD EFFECT TRANSISTOR
# 2SK3783

## N-CHANNEL SILICON JUNCTION FIELD EFFECT TRANSISTOR FOR IMPEDANCE CONVERTER OF ECM

### DESCRIPTION

The 2SK3783 is suitable for converter of ECM.

### FEATURES

- High gain

  –0.5 dB ($V_{DS}$ = 2.0 V, C = 5 pF, $R_L$ = 2.2 kΩ)

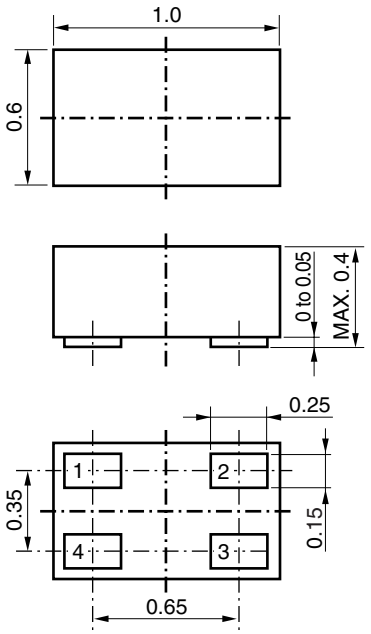
- Low noise

  –109 dB ($V_{DS}$ = 2.0 V, C = 5 pF, $R_L$ = 2.2 kΩ)

- Super small area package

  1006 TYP. lead less

### PACKAGE DRAWING (Unit: mm)



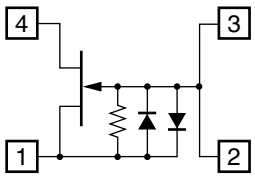

### ORDERING INFORMATION

| PART NUMBER | PACKAGE |
|---|---|
| 2SK3783 | 4pXSLP04 (1006) |

### ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C)

| | | | |
|---|---|---|---|
| Drain to Source Voltage ($V_{GS}$ = –1.0 V) | $V_{DSX}$ | 20 | V |
| Gate to Drain Voltage | $V_{GDO}$ | –20 | V |
| Drain Current | $I_D$ | 10 | mA |
| Gate Current | $I_G$ | 10 | mA |
| Total Power Dissipation | $P_T$ | 100 | mW |
| Junction Temperature | $T_j$ | 125 | °C |
| Storage Temperature | $T_{stg}$ | –55 to +125 | °C |

### EQUIVALENT CIRCUIT (Top View)




1: Source
2: Gate
3: Gate
4: Drain

**Caution Please take care of ESD (Electro Static Discharge) when you handle the device in this document.**



Document No. D17002EJ1V0DS00 (1st edition)
Date Published April 2004 NS CP(K)
Printed in Japan

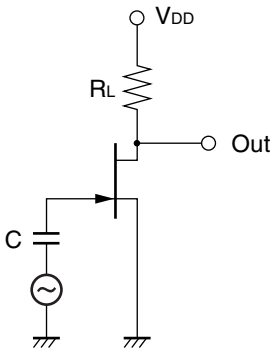
## ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C)

| CHARACTERISTICS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Zero Gate Voltage Drain Cut-off Current | $I_{DSS}$ | $V_{DS}$ = 2.0 V, $V_{GS}$ = 0 V | 90 | 250 | 430 | $\mu$A |
| Gate Cut-off Voltage | $V_{GS(off)}$ | $V_{DS}$ = 2.0 V, $I_D$ = 1.0 $\mu$A | | –0.37 | –1.0 | V |
| Forward Transfer Admittance | $\lvert y_{fs1} \rvert$ | $V_{DS}$ = 2.0 V, $I_D$ = 30 $\mu$A, f = 1.0 kHz | 320 | 470 | | $\mu$S |
| | $\lvert y_{fs2} \rvert$ | $V_{DS}$ = 2.0 V, $V_{GS}$ = 0 V, f = 1.0 kHz | 800 | 1600 | | $\mu$S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 2.0 V, $V_{GS}$ = 0 V, f = 1.0 MHz | | 4.0 | | pF |
| Voltage Gain | $G_V$ | $V_{DD}$ = 2.0 V, C = 5 pF, $R_L$ = 2.2 kΩ, $V_{IN}$ = 10 mV, f = 1 kHz | | –0.5 | | dB |
| Noise Voltage | NV | $V_{DD}$ = 2.0 V, C = 5 pF, $R_L$ = 2.2 kΩ, A-curve | | –109 | | dB |

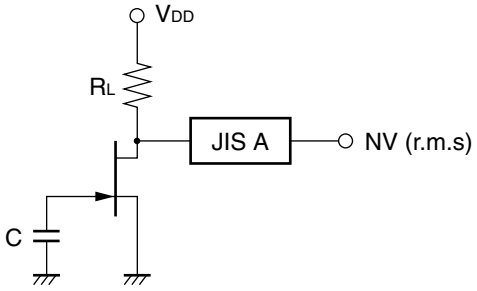
## $I_{DSS}$ CLASSIFICATION

| MARKING | BE | BF | BH | BJ |
|---|---|---|---|---|
| $I_{DSS}$ ($\mu$A) | 90 to 180 | 150 to 240 | 210 to 350 | 320 to 430 |

## GAIN TEST CIRCUIT

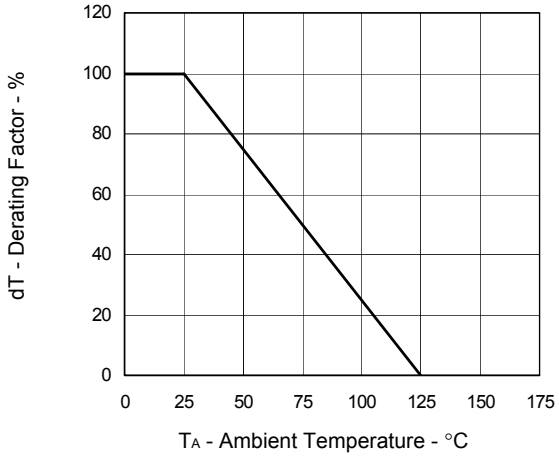



## NOISE VOLTAGE TEST CIRCUIT

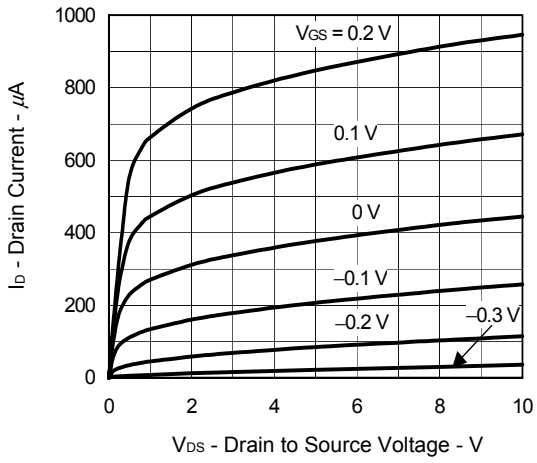


## TYPICAL CHARACTERISTICS ($T_A$ = 25°C)

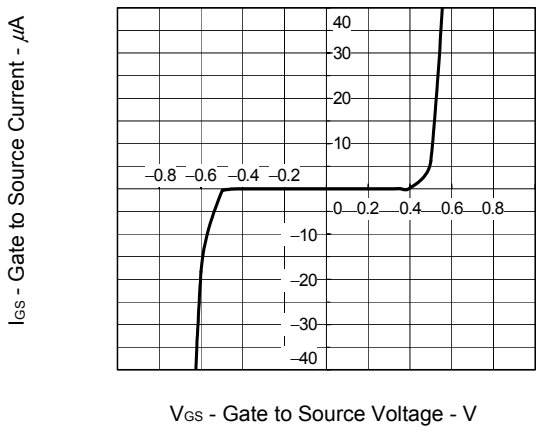
DERATING FACTOR OF POWER DISSIPATION



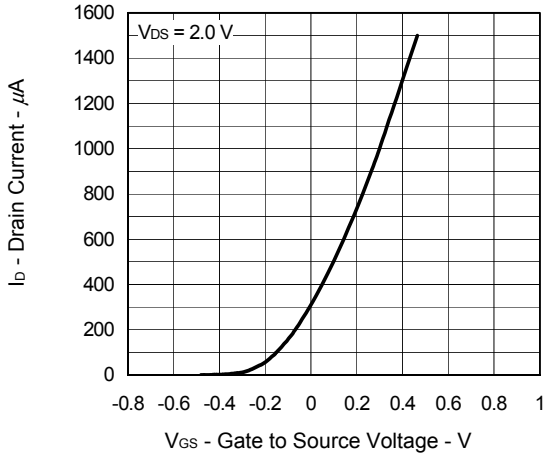

DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



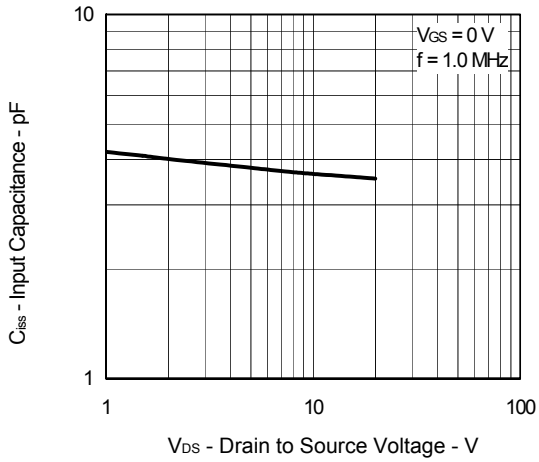

GATE TO SOURCE CURRENT vs.
GATE TO SOURCE VOLTAGE



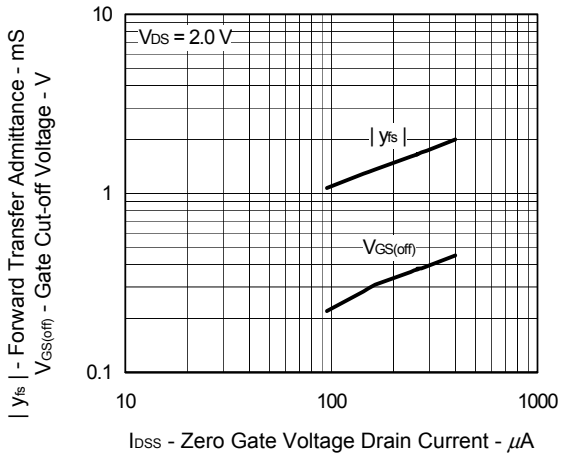

DRAIN CURRENT vs.
GATE TO SOURCE VOLTAGE



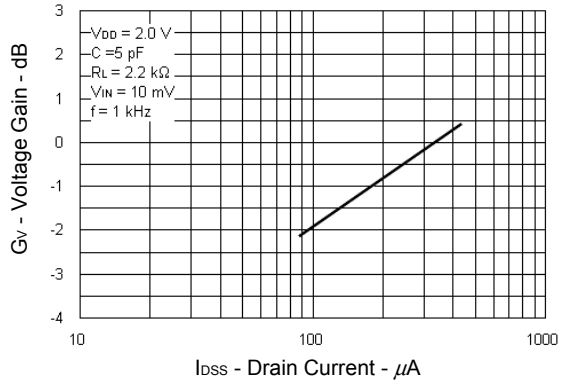

INPUT CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



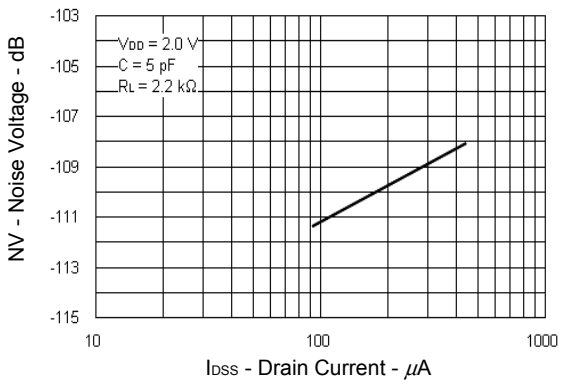

FORWARD TRANSFER ADMITTANCE AND GATE
CUT-OFF VOLTAGE vs. ZERO GATE VOLTAGE
DRAIN CURRENT



VOLTAGE GAIN vs. DRAIN CURRENT




NOISE VOLTAGE vs. DRAIN CURRENT



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