

# MOS FIELD EFFECT TRANSISTOR

## 2SK1960

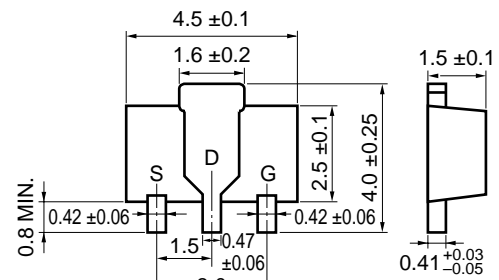
### N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

The 2SK1960 is an N-channel vertical MOSFET. Because it can be driven by a voltage as low as 1.5 V and it is not necessary to consider a drive current, this FET is ideal as an actuator for low-current portable systems such as headphone stereos and video cameras.

#### FEATURES

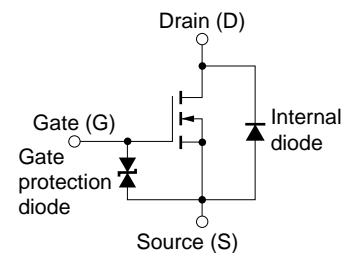
- Gate can be driven by 1.5 V
- Low ON resistance  
 $R_{DS(on)} = 0.8 \Omega$  MAX. @  $V_{GS} = 1.5 \text{ V}$ ,  $I_D = 0.1 \text{ A}$   
 $R_{DS(on)} = 0.2 \Omega$  MAX. @  $V_{GS} = 4.0 \text{ V}$ ,  $I_D = 1.5 \text{ A}$

#### PACKAGE DIMENSIONS (in mm)



Marking: NR

#### EQUIVALENT CIRCUIT



#### PIN CONNECTIONS

S: Source  
D: Drain  
G: Gate

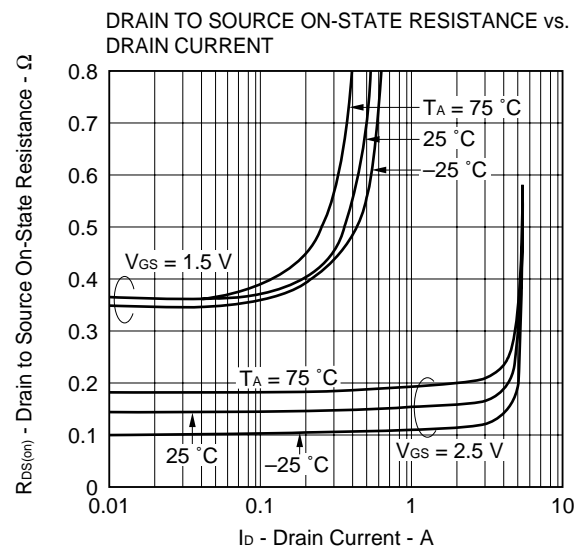
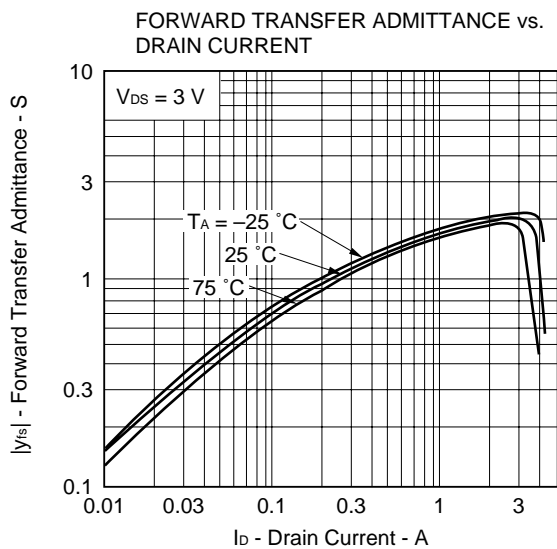
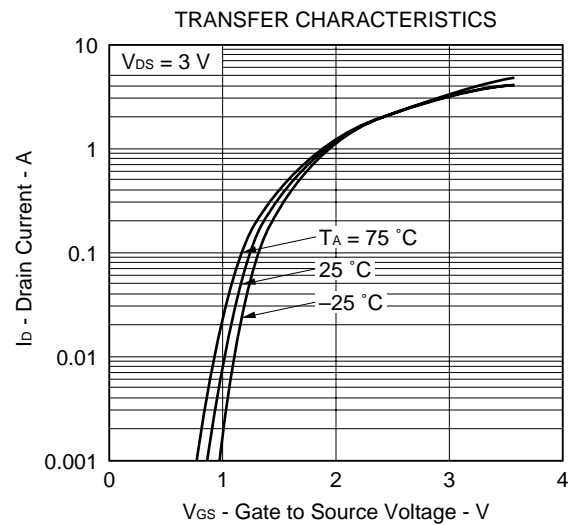
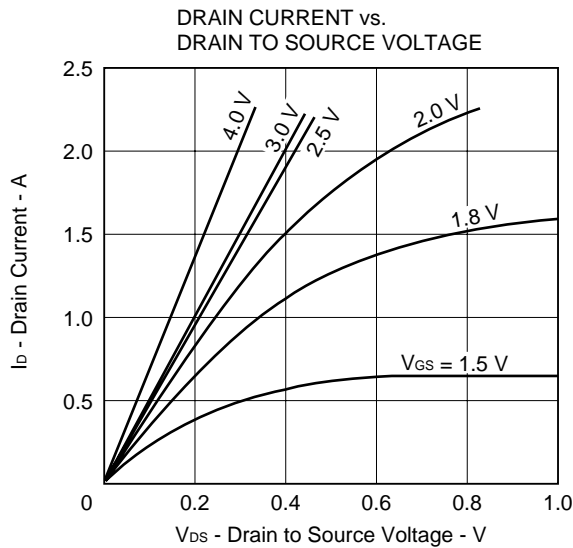
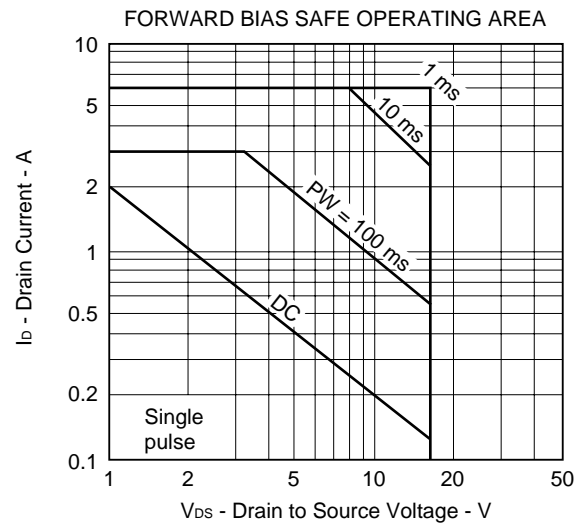
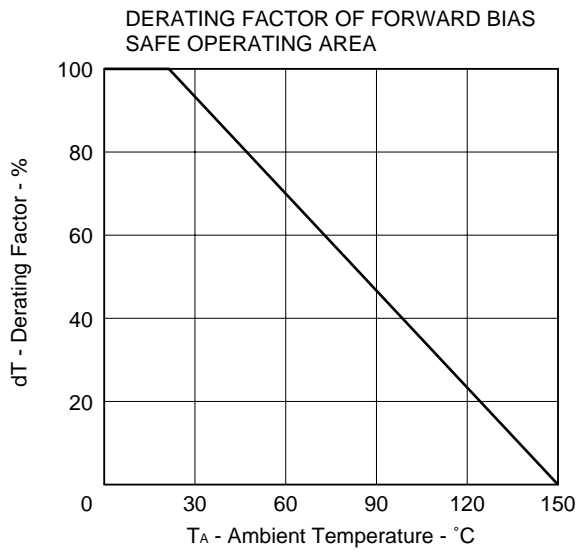
#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

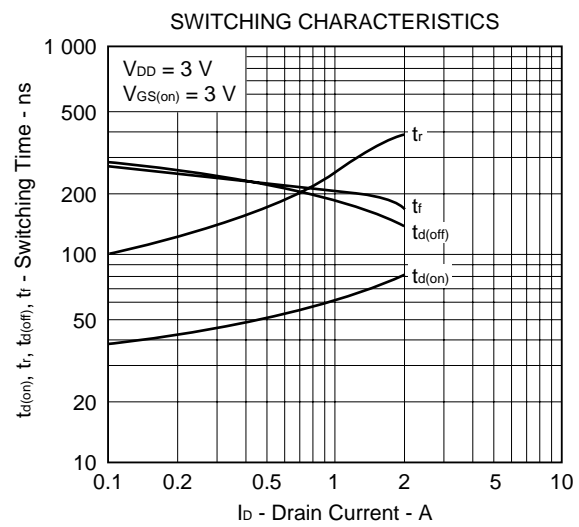
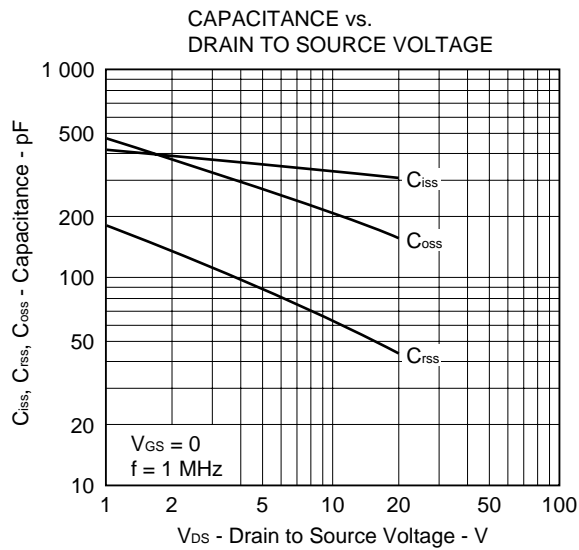
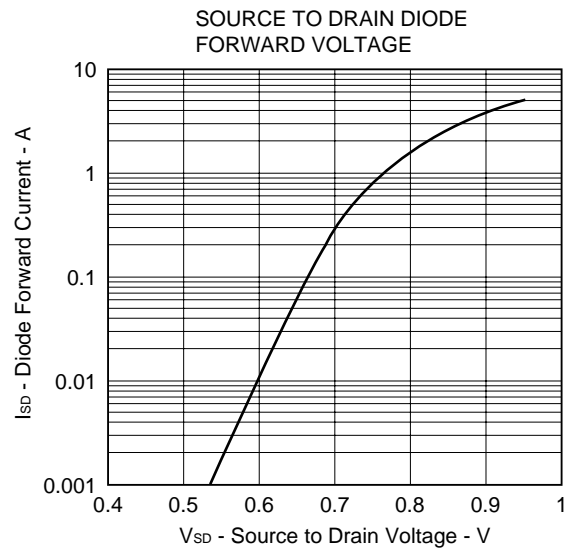
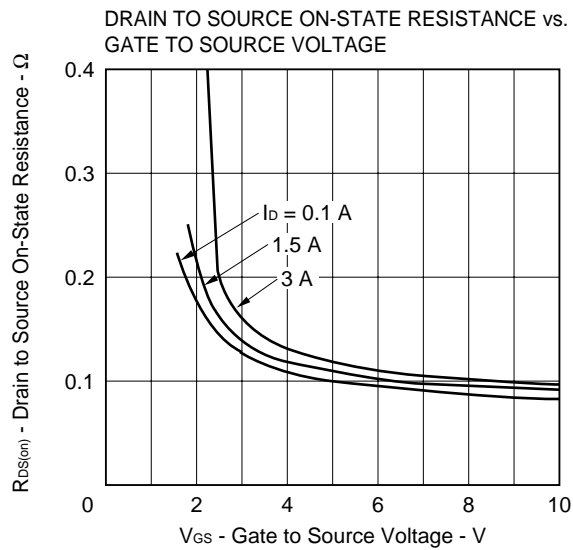
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	$V_{DS}$	$V_{GS} = 0$	16	V
Gate to Source Voltage	$V_{GS}$	$V_{DS} = 0$	$\pm 7.0$	V
Drain Current (DC)	$I_{D(PC)}$		$\pm 3.0$	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$ , duty cycle $\leq 50 \%$	$\pm 6.0$	A
Total Power Dissipation	$P_T$	$16 \text{ cm}^2 \times 0.7 \text{ mm}$ ceramic substrate used	2.0	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±7.0 V, V <sub>DS</sub> = 0			±3.0	μA
Gate Cut-Off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 1 mA	0.5	0.8	1.1	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 1.5 A	2.0			S
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 1.5 V, I <sub>D</sub> = 0.1 A		0.35	0.8	Ω
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1.5 A		0.17	0.3	Ω
Drain to Source On-State Resistance	R <sub>DS(on)3</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 1.5 A		0.12	0.2	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0, f = 1.0 MHz		370		pF
Output Capacitance	C <sub>oss</sub>			320		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			115		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3 V, I <sub>D</sub> = 1.5 A, V <sub>GS(on)</sub> = 3 V, R <sub>G</sub> = 10 Ω, R <sub>L</sub> = 2 Ω		70		ns
Rise Time	t <sub>r</sub>			200		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>			150		ns
Fall Time	t <sub>f</sub>			200		ns

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )





## REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

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Anti-radioactive design is not implemented in this product.