

MOS FIELD EFFECT TRANSISTOR  
**2SK2090**

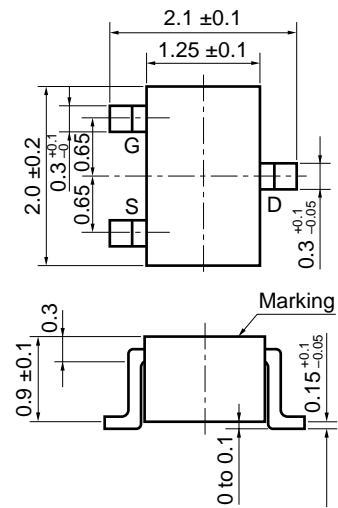
**N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING**

The 2SK2090 is an N-channel vertical MOSFET. Because it can be driven by a voltage as low as 2.5 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**

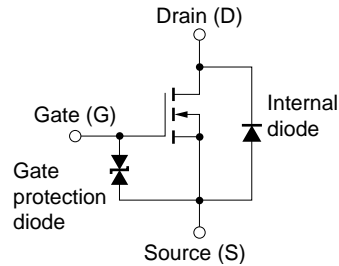
- Gate can be driven by 2.5 V
- Because of its high input impedance, there's no need to consider drive current

**PACKAGE DIMENSIONS (in mm)**



Marking: G22

**EQUIVALENT CURCUIT**



**PIN CONNECTIONS**  
S: Source  
D: Drain  
G: Gate

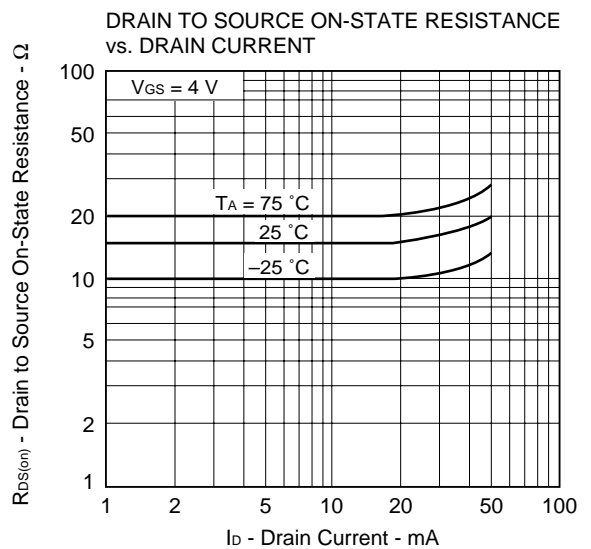
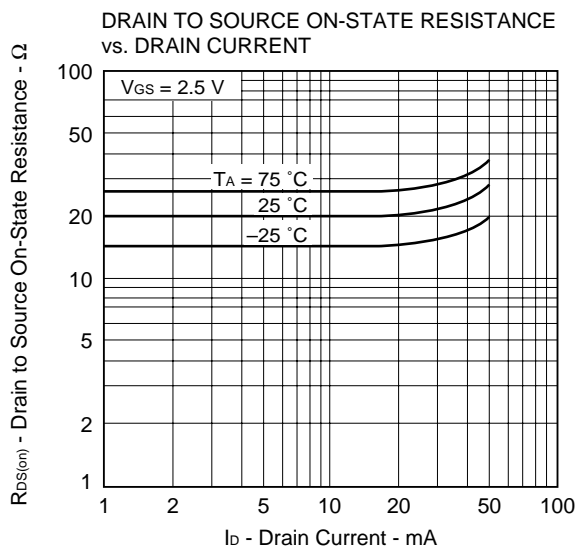
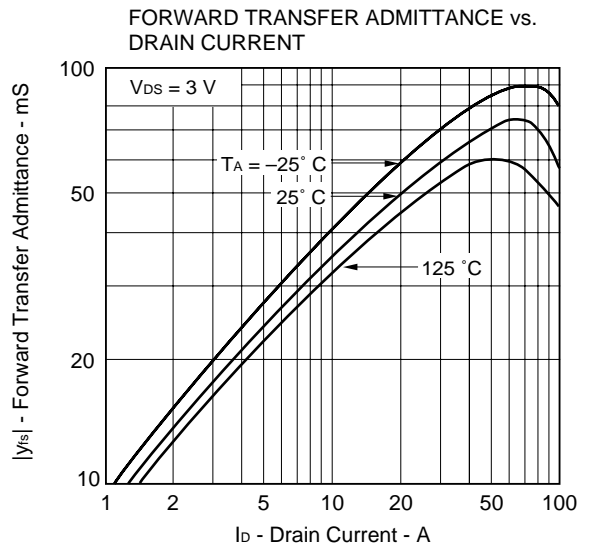
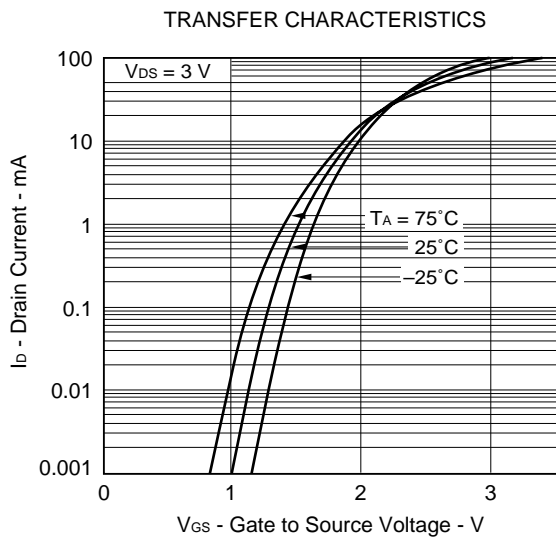
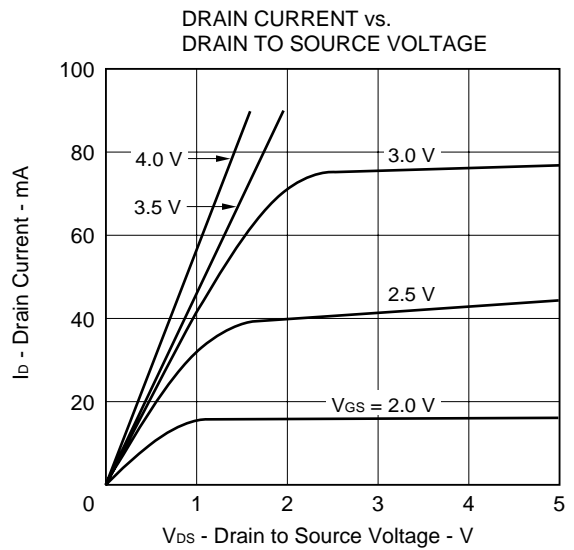
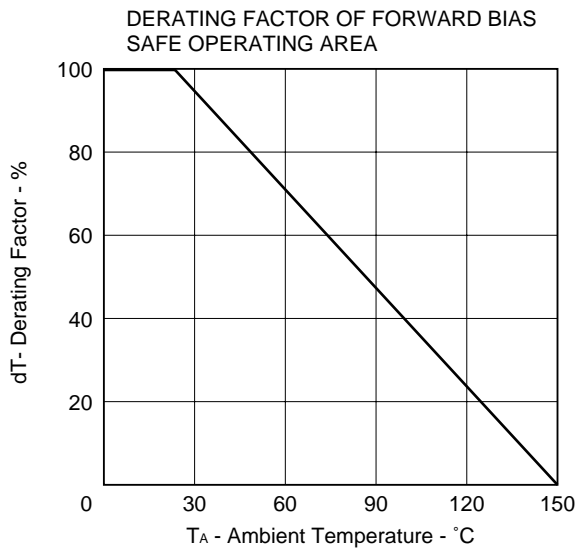
**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C)**

PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V <sub>DSS</sub>	V <sub>GS</sub> = 0	50	V
Gate to Source Voltage	V <sub>GSS</sub>	V <sub>DS</sub> = 0	±7.0	V
Drain Current (DC)	I <sub>D(DC)</sub>		±100	mA
Drain Current (Pulse)	I <sub>D(pulse)</sub>	PW ≤ 10 ms, duty cycle ≤ 50 %	±200	mA
Total Power Dissipation	P <sub>T</sub>		150	mW
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

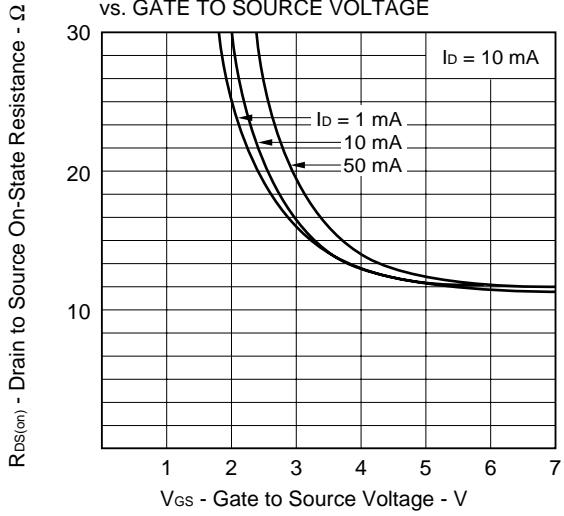
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 50 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			±5.0	μA
Gate Cut-Off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 1.0 μA	0.7	1.0	1.5	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 10 mA	20			mS
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 10 mA		20	40	Ω
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 10 mA		15	20	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0, f = 1.0 MHz		6		pF
Output Capacitance	C <sub>oss</sub>			8		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			1.2		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3 V, I <sub>D</sub> = 20 mA, V <sub>GS(on)</sub> = 3 V, R <sub>G</sub> = 10 Ω, R <sub>L</sub> = 120 Ω		9		ns
Rise Time	t <sub>r</sub>			50		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>			20		ns
Fall Time	t <sub>f</sub>			40		ns

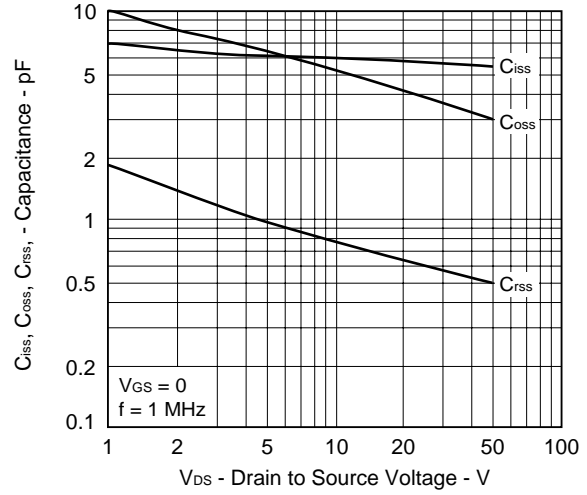
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)



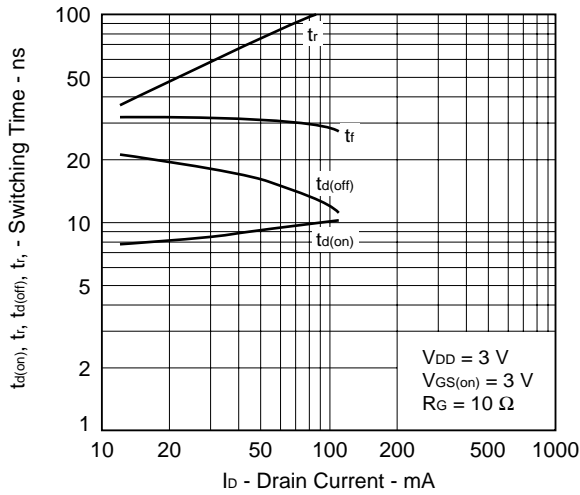
DRAIN TO SOURCE ON-STAGE RESISTANCE vs. GATE TO SOURCE VOLTAGE



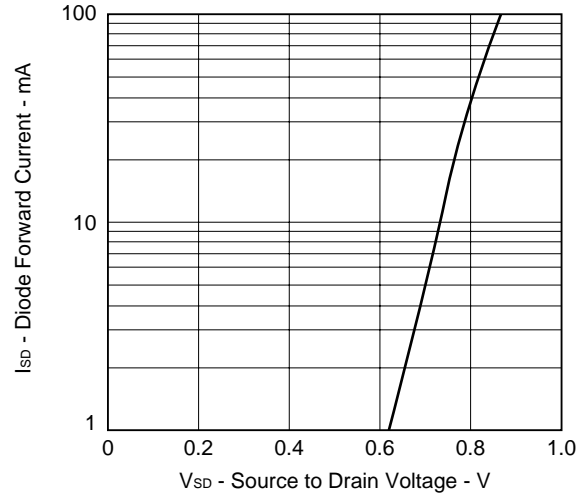
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



**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.