NEC

DATA SHEET

MOS FIELD EFFECT TRANSISTOR

2SK2090

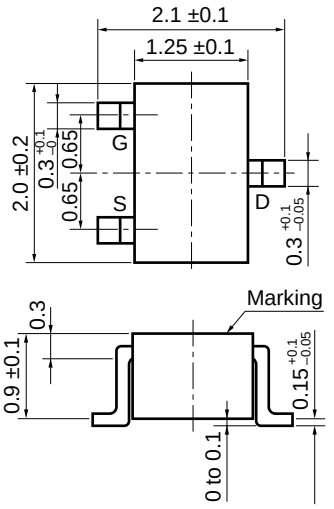
N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

The 2SK2090 is an N-channel vertical MOS FET. 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

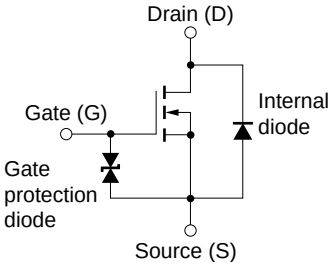
- Gate can be driven by 2.5 V
- Because of its high input impedance, there's no need to consider drive current

PACKAGE DIMENSIONS (in mm)



Marking: G22

EQUIVALENT CURCUIT



PIN CONNECTIONS
S: Source
D: Drain
G: Gate

ABSOLUTE MAXIMUM RATINGS (T_A = 25 ˚C)

PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DSS}	V_{GS} = 0	50	V
Gate to Source Voltage	V_{GSS}	V_{DS} = 0	±7.0	V
Drain Current (DC)	$I_{D(DC)}$		±100	mA
Drain Current (Pulse)	$I_{D(pulse)}$	PW ≤ 10 ms, duty cycle ≤ 50 %	±200	mA
Total Power Dissipation	P_T		150	mW
Channel Temperature	T_{ch}		150	˚C
Storage Temperature	T_{stg}		–55 to +150	˚C

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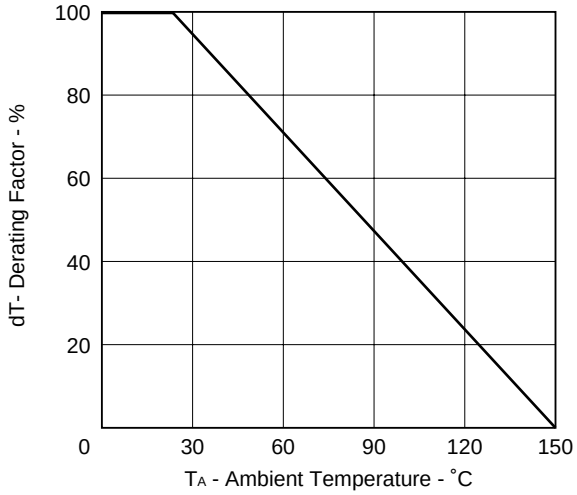
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

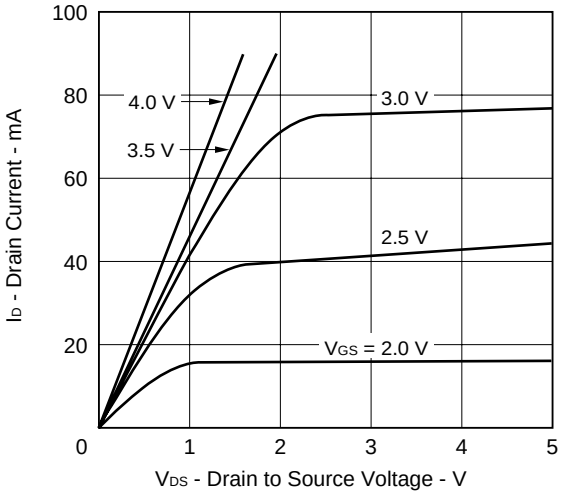
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I_{DSS}	V_{DS} = 50 V, V_{GS} = 0			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±7.0 V, V_{DS} = 0			±5.0	μA
Gate Cut-Off Voltage	$V_{GS(off)}$	V_{DS} = 3.0 V, I_D = 1.0 μA	0.7	1.0	1.5	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 3 V, I_D = 10 mA	20			mS
Drain to Source On-State Resistance	$R_{DS(on)1}$	V_{GS} = 2.5 V, I_D = 10 mA		20	40	Ω
Drain to Source On-State Resistance	$R_{DS(on)2}$	V_{GS} = 4.0 V, I_D = 10 mA		15	20	Ω
Input Capacitance	C_{iss}	V_{DS} = 3 V, V_{GS} = 0, f = 1.0 MHz		6		pF
Output Capacitance	C_{oss}			8		pF
Reverse Transfer Capacitance	C_{rss}			1.2		pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} = 3 V, I_D = 20 mA, $V_{GS(on)}$ = 3 V, R_G = 10 Ω, R_L = 120 Ω		9		ns
Rise Time	t_r			50		ns
Turn-OFF Delay Time	$t_{d(off)}$			20		ns
Fall Time	t_f			40		ns

TYPICAL CHARACTERISTICS (T_A = 25 ˚C)

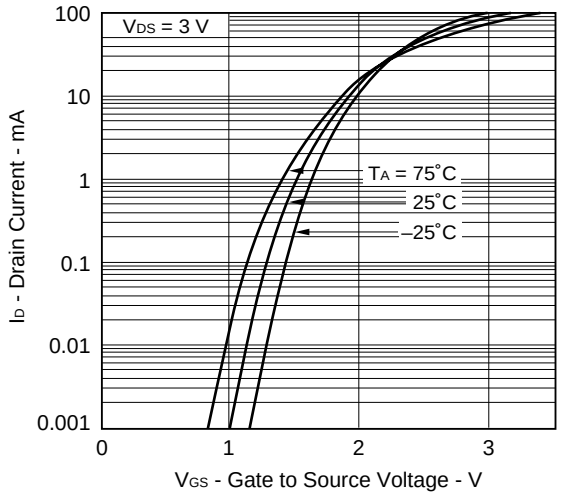
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



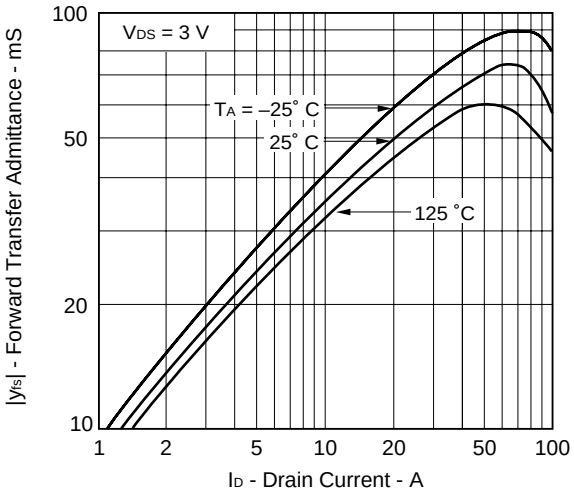
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



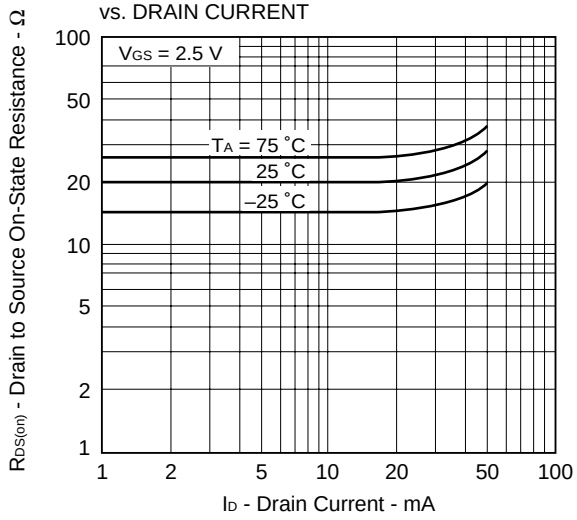
TRANSFER CHARACTERISTICS



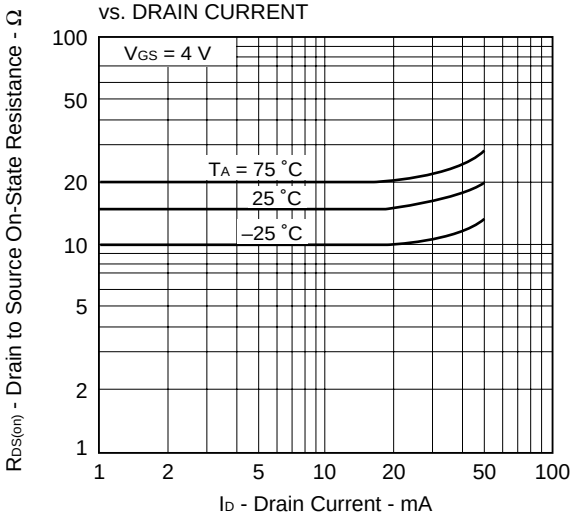
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



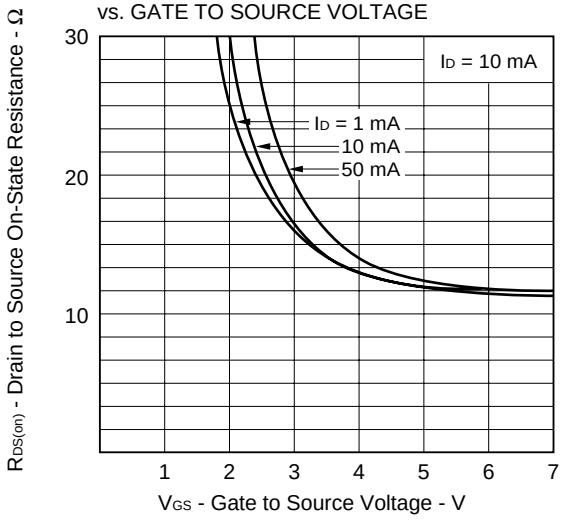
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



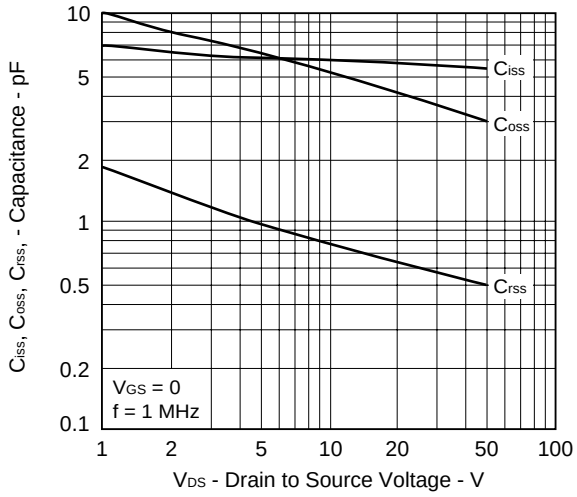
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



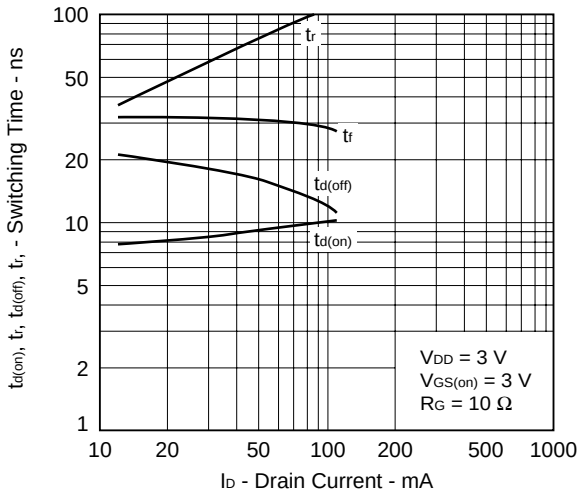
DRAIN TO SOURCE ON-STAGE RESISTANCE vs. GATE TO SOURCE VOLTAGE



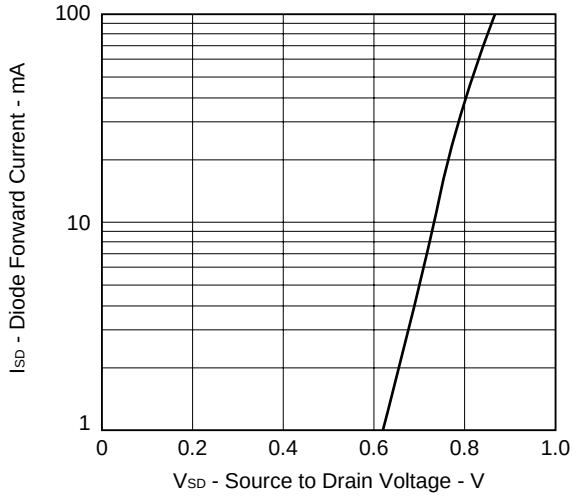
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



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

[MEMO]