

MOS FIELD EFFECT TRANSISTOR

2SK2109

N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

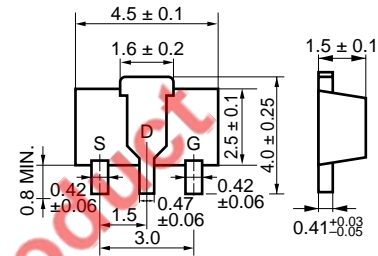
The 2SK2109 is a N-channel MOS FET of a vertical type and is a switching element that can be directly driven by the output of an IC operating at 5 V.

This product has a low ON resistance and superb switching characteristics and is ideal for driving the actuator, such as motors and DC/DC converters.

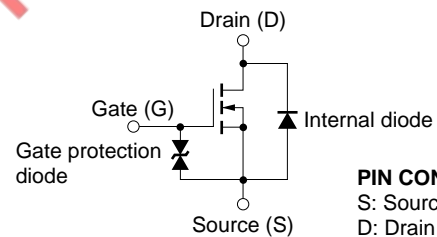
FEATURES

- Low ON resistance
 $R_{DS(on)} = 1.0 \, \Omega \text{ MAX. @ } V_{GS} = 4.0 \text{ V, } I_D = 0.3 \text{ A}$
- High switching speed
 $t_{on} + t_{off} < 100 \text{ ns}$
- Low parasitic capacitance

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



PIN CONNECTIONS
 S: Source
 D: Drain
 G: Gate

Marking: NS

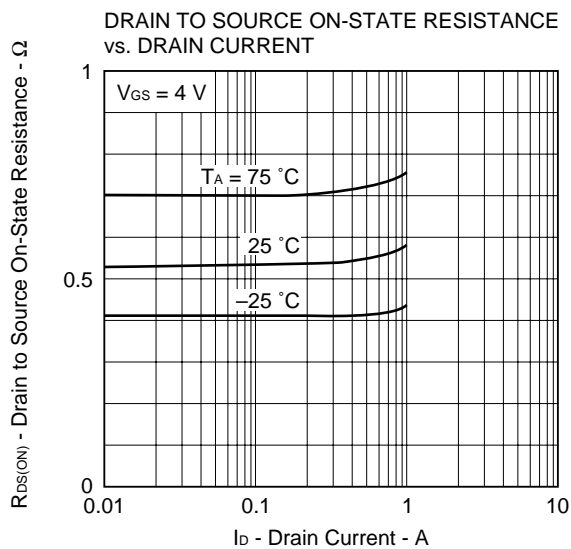
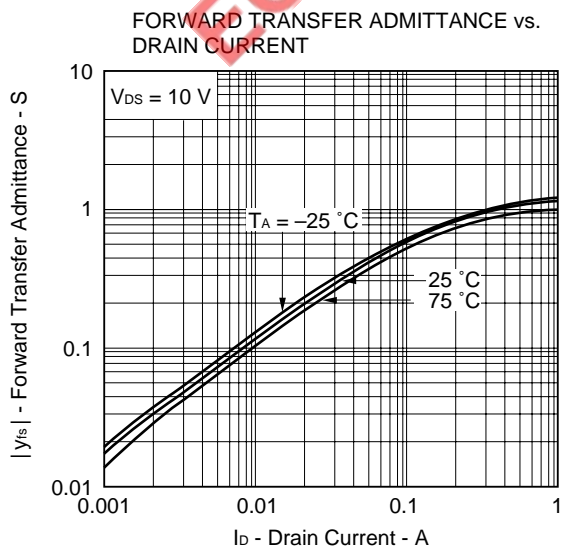
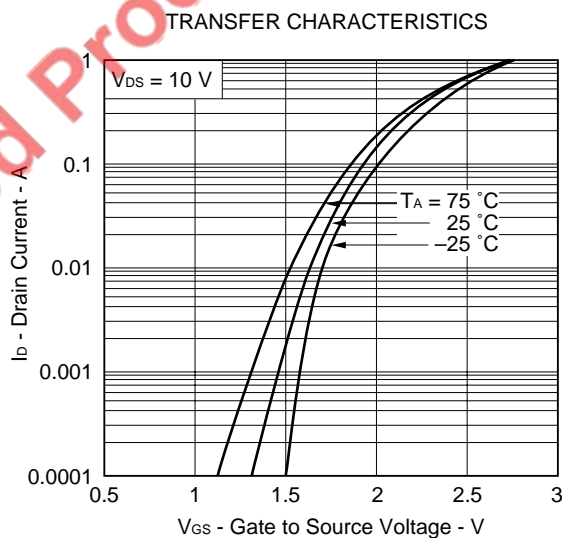
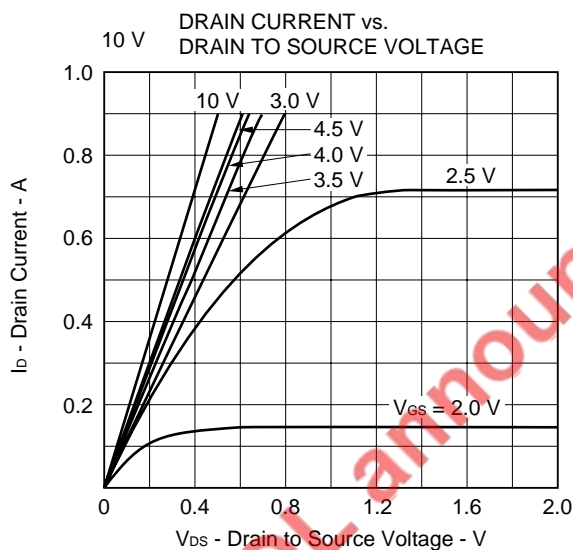
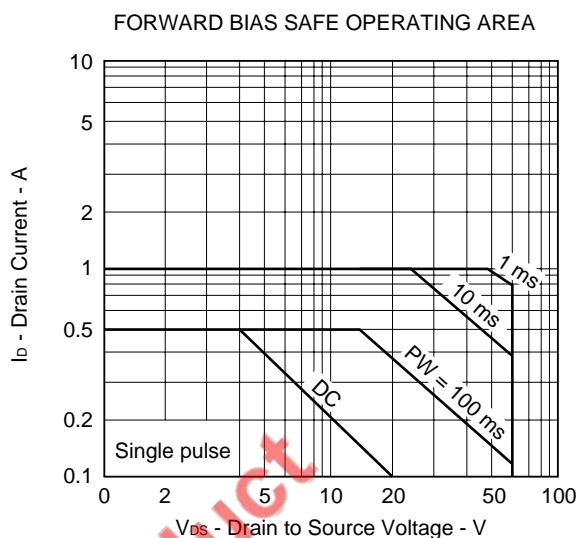
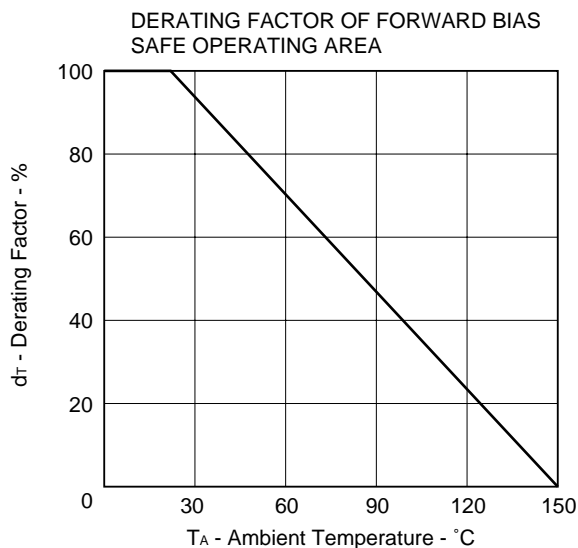
ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \, ^\circ\text{C}$)

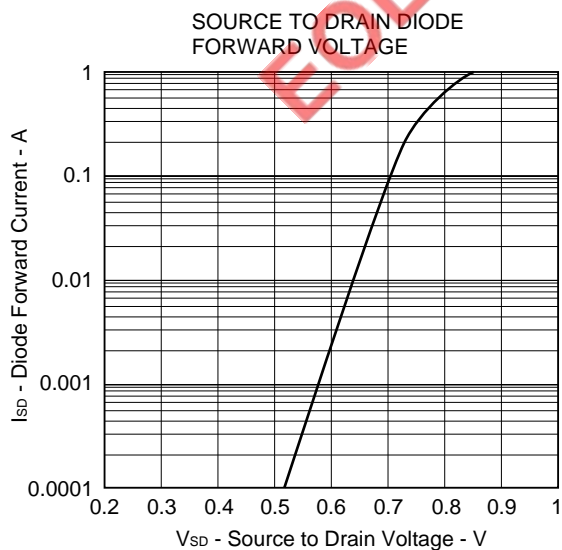
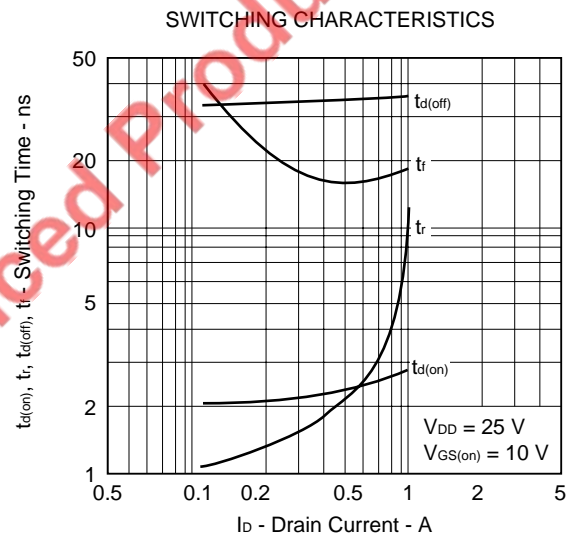
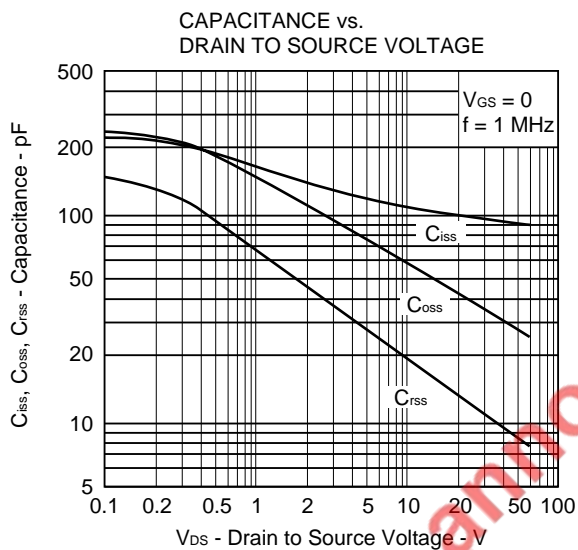
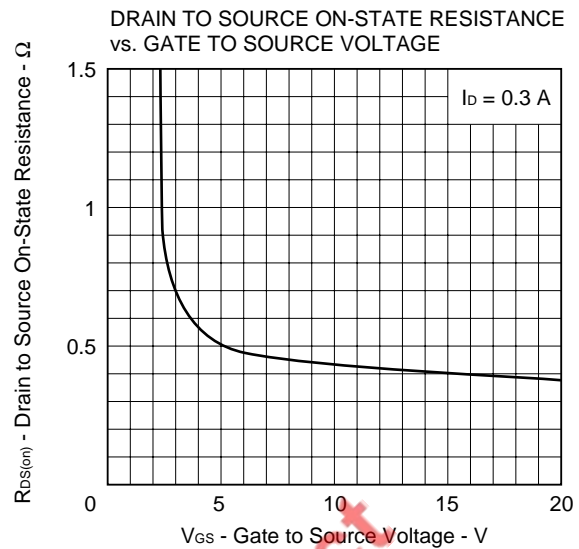
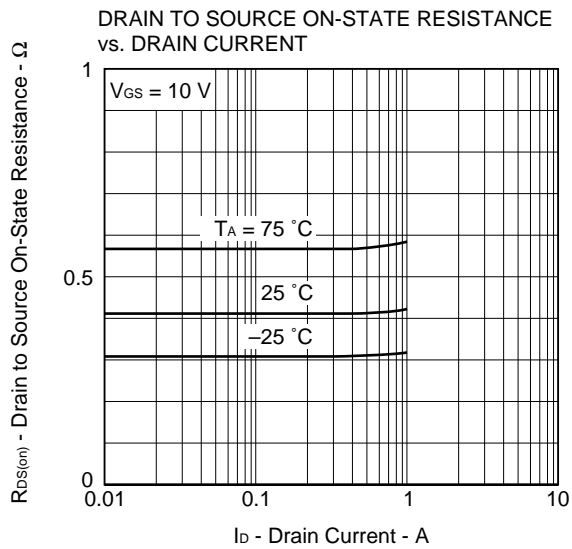
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DS}	$V_{GS} = 0$	60	V
Gate to Source Voltage	V_{GS}	$V_{DS} = 0$	± 20	V
Drain Current (DC)	$I_{D(DC)}$		± 0.5	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$, Duty cycle $\leq 50 \%$	± 1.0	A
Total Power Dissipation	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}		$-55 \text{ to } +150$	$^\circ\text{C}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 60\text{ V}$, $V_{GS} = 0$			1.0	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0$			± 10	μA
Gate Cut-Off Voltage	$V_{GS(off)}$	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$	0.8	1.5	2.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 10\text{ V}$, $I_D = 0.3\text{ A}$	0.4			S
Drain to Source On-State Resistance	$R_{DS(on)1}$	$V_{GS} = 4.0\text{ V}$, $I_D = 0.3\text{ A}$		0.55	1.0	Ω
Drain to Source On-State Resistance	$R_{DS(on)2}$	$V_{GS} = 10\text{ V}$, $I_D = 0.3\text{ A}$		0.41	0.8	Ω
Input Capacitance	C_{iss}	$V_{DS} = 10\text{ V}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$		111		pF
Output Capacitance	C_{oss}			55		pF
Reverse Transfer Capacitance	C_{rss}			19		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 25\text{ V}$, $I_D = 0.3\text{ A}$ $V_{GS(on)} = 10\text{ V}$, $R_G = 10\text{ }\Omega$ $R_L = 83\text{ }\Omega$		2.2		ns
Rise Time	t_r			1.5		ns
Turn-Off Delay Time	$t_{d(off)}$			35		ns
Fall Time	t_f			19		ns

EOL announced Product

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



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

EOL announced Product

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Anti-radioactive design is not implemented in this product.