

N-CHANNEL MOS FET
FOR HIGH-SPEED SWITCHING

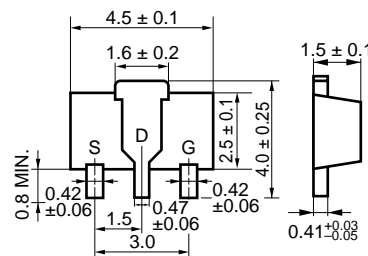
The 2SK2109 is a N-channel MOS FET of a vertical type and is a switching element that can be directly driven by the output of an IC operating at 5 V.

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.

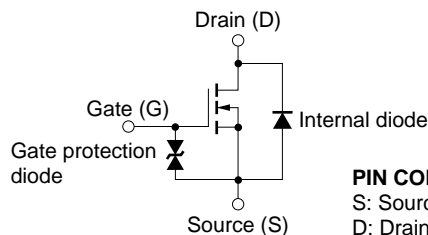
FEATURES

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

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



PIN CONNECTIONS
S: Source
D: Drain
G: Gate

Marking: NS

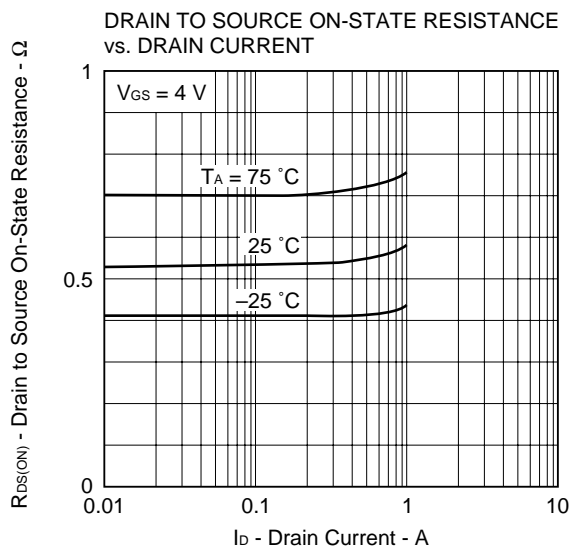
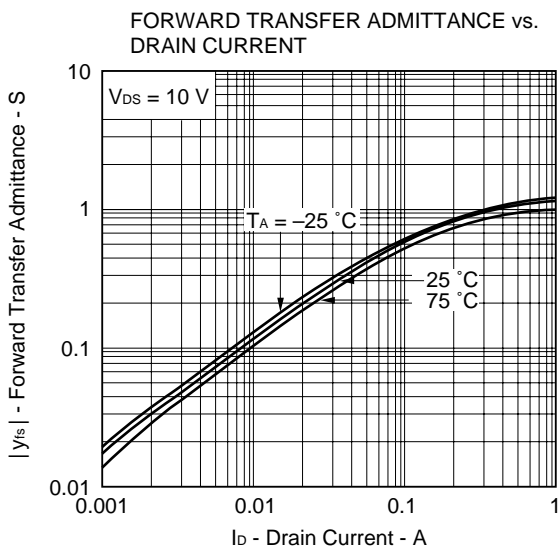
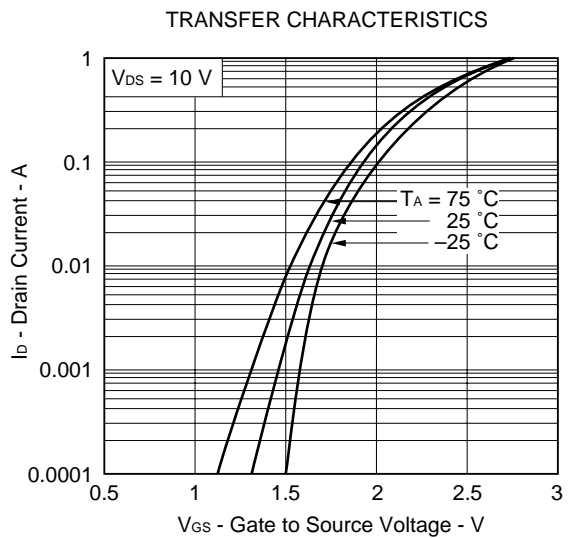
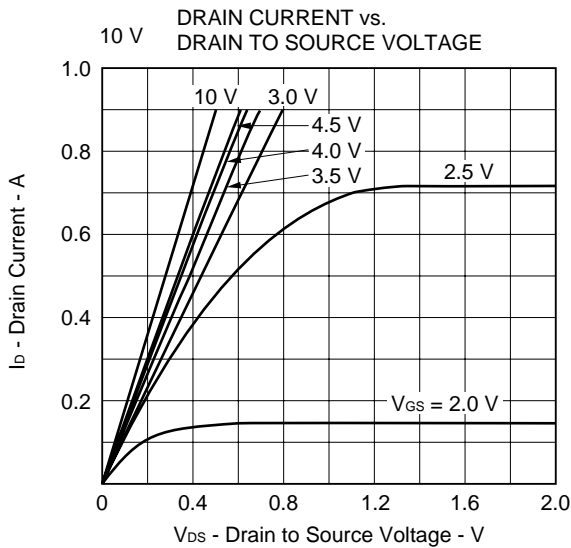
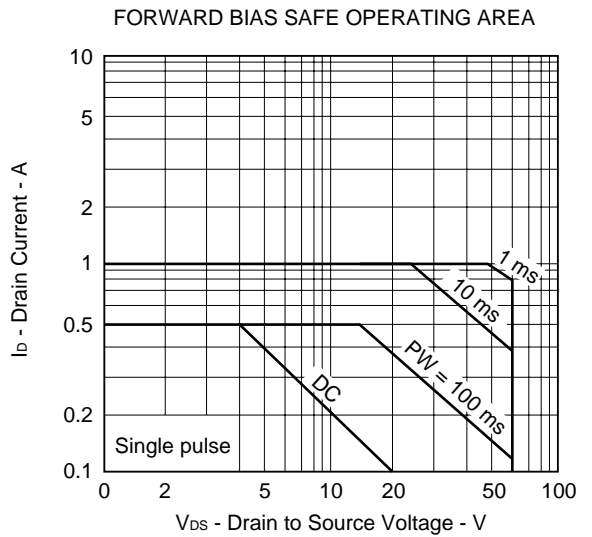
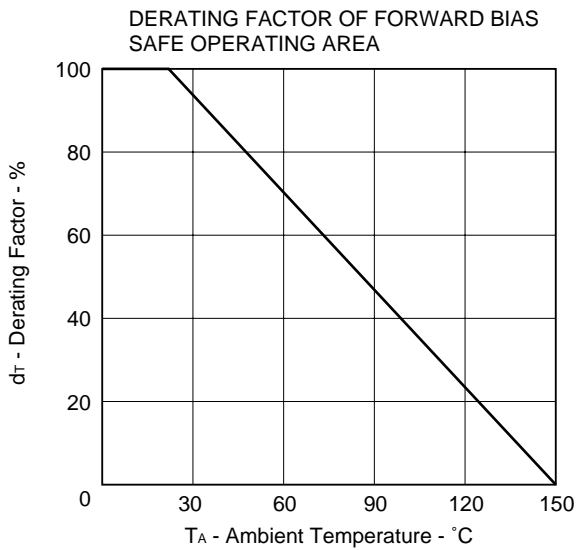
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$)

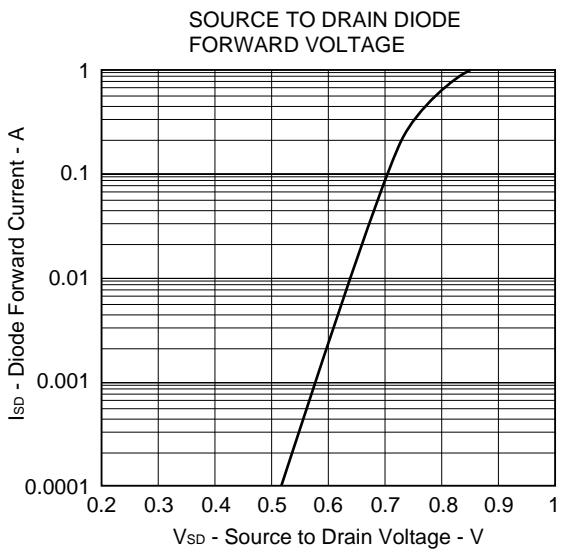
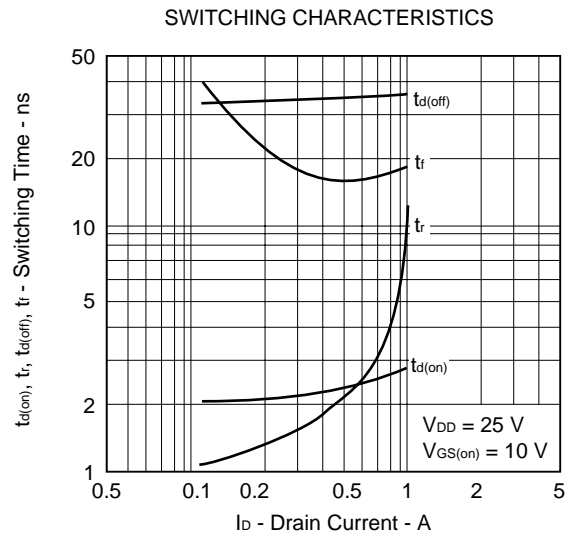
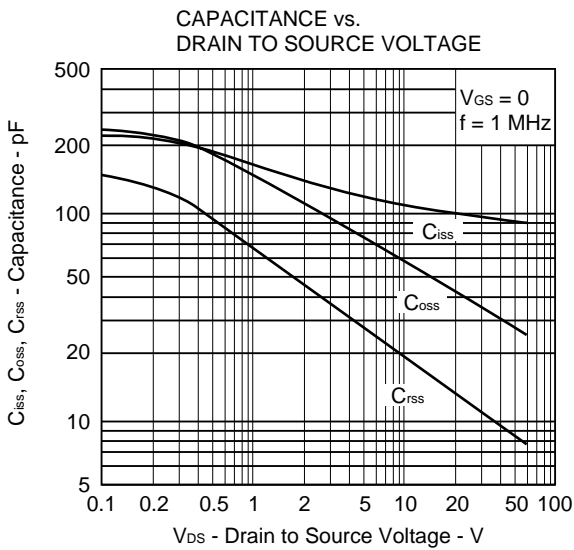
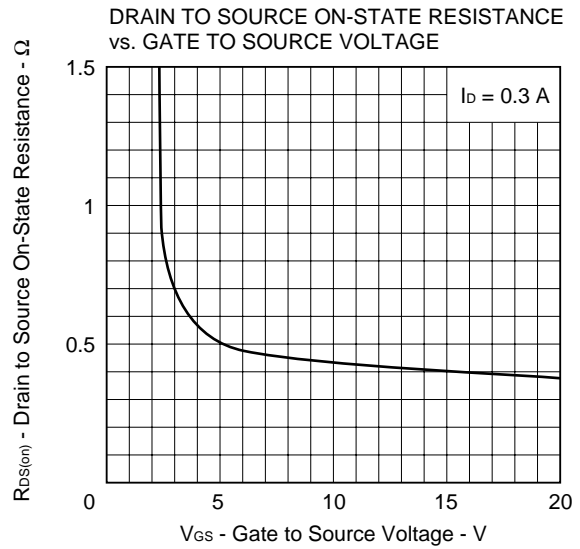
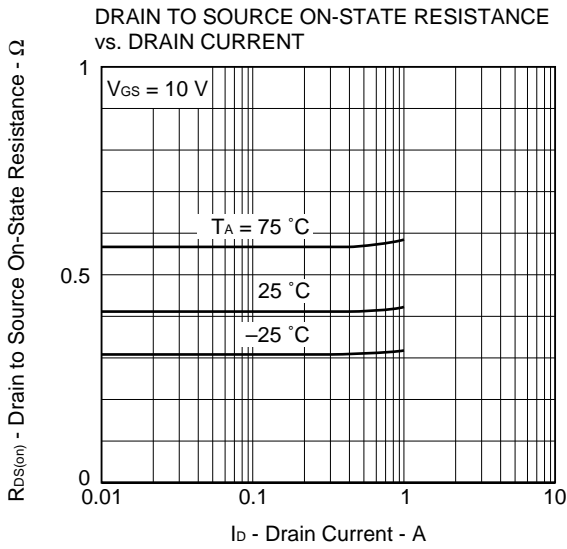
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DSS}	$V_{GS} = 0$	60	V
Gate to Source Voltage	V_{GSS}	$V_{DS} = 0$	± 20	V
Drain Current (DC)	$I_{D(DC)}$		± 0.5	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 ms,$ $Duty\ cycle \leq 50 \%$	± 1.0	A
Total Power Dissipation	P_T	$16\ cm^2 \times 0.7\ mm,$ ceramic substrate used	2.0	W
Channel Temperature	T_{ch}		150	$^\circ C$
Storage Temperature	T_{stg}		-55 to +150	$^\circ C$

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0			1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0			±10	μA
Gate Cut-Off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.8	1.5	2.0	V
Forward Transfer Admittance	y _{ts}	V _{DS} = 10 V, I _D = 0.3 A	0.4			S
Drain to Source On-State Resistance	R _{DS(on)1}	V _{GS} = 4.0 V, I _D = 0.3 A		0.55	1.0	Ω
Drain to Source On-State Resistance	R _{DS(on)2}	V _{GS} = 10 V, I _D = 0.3 A		0.41	0.8	Ω
Input Capacitance	C _{iSS}	V _{DS} = 10 V, V _{GS} = 0, f = 1.0 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 V, I _D = 0.3 A V _{GS(on)} = 10 V, R _G = 10 Ω R _L = 83 Ω		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

TYPICAL CHARACTERISTICS (T_A = 25 °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.