RENESAS

MOS FIELD EFFECT TRANSISTOR
2SK1959

N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

EOL announced Product

The 2SK1959 is an N-channel vertical MOS FET. 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.

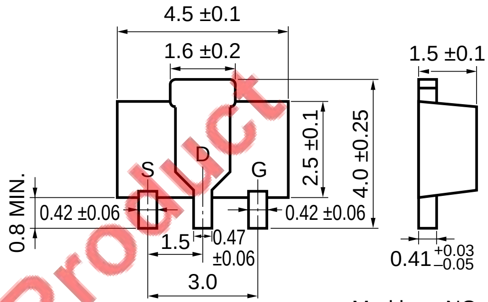
FEATURES

- Gate can be driven by 1.5 V
- Low ON resistance

  $R_{DS(on)}$ = 3.2 Ω MAX. @ V_{GS} = 1.5 V, I_D = 50 mA

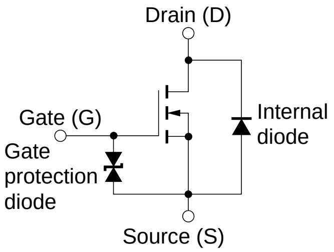
  $R_{DS(on)}$ = 0.5 Ω MAX. @ V_{GS} = 4.0 V, I_D = 1.0 A

PACKAGE DIMENSIONS (in mm)



Marking: NQ

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	16	V
Gate to Source Voltage	V_{GSS}	V_{DS} = 0	±7.0	V
Drain Current (DC)	$I_{D(DC)}$		±2.0	A
Drain Current (Pulse)	$I_{D(pulse)}$	PW ≤ 10 ms, duty cycle ≤ 50 %	±4.0	A
Total Power Dissipation	P_T	16 cm^2 × 0.7 mm ceramic substrate used	2.0	W
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} = 16 V, V_{GS} = 0			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±7.0 V, V_{DS} = 0			±3.0	μA
Gate Cut-Off Voltage	$V_{GS(off)}$	V_{DS} = 3 V, I_D = 100 μA	0.5	0.8	1.1	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 3 V, I_D = 1.0 A	1.0			S
Drain to Source On-State Resistance	$R_{DS(on)1}$	V_{GS} = 1.5 V, I_D = 50 mA		0.8	3.2	Ω
Drain to Source On-State Resistance	$R_{DS(on)2}$	V_{GS} = 2.5 V, I_D = 0.5 A		0.36	0.6	Ω
Drain to Source On-State Resistance	$R_{DS(on)3}$	V_{GS} = 4.0 V, I_D = 1.0 A		0.28	0.5	Ω
Input Capacitance	C_{iss}	V_{DS} = 3 V, V_{GS} = 0, f = 1.0 MHz		160		pF
Output Capacitance	C_{oss}			150		pF
Reverse Transfer Capacitance	C_{rss}			50		pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} = 3 V, I_D = 0.5 A, $V_{GS(on)}$ = 3 V, R_G = 10 Ω, R_L = 6 Ω		45		ns
Rise Time	t_r			190		ns
Turn-OFF Delay Time	$t_{d(off)}$			180		ns
Fall Time	t_f			210		ns

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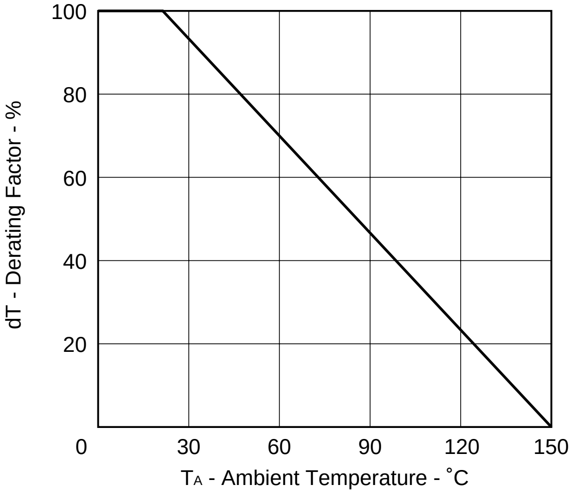
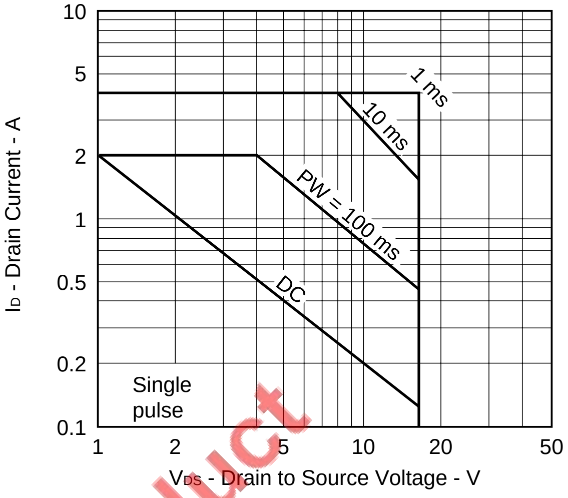
TYPICAL CHARACTERISTICS (T_A = 25 ˚C)

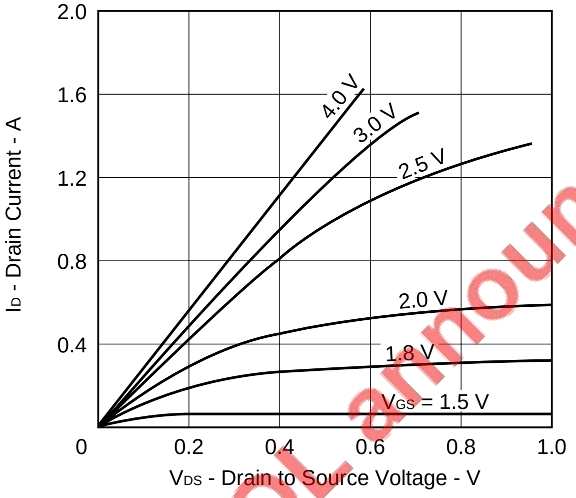
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



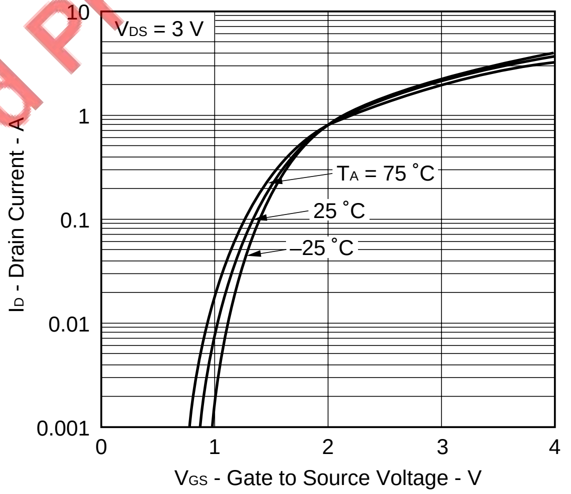
FORWARD BIAS SAFE OPERATING AREA



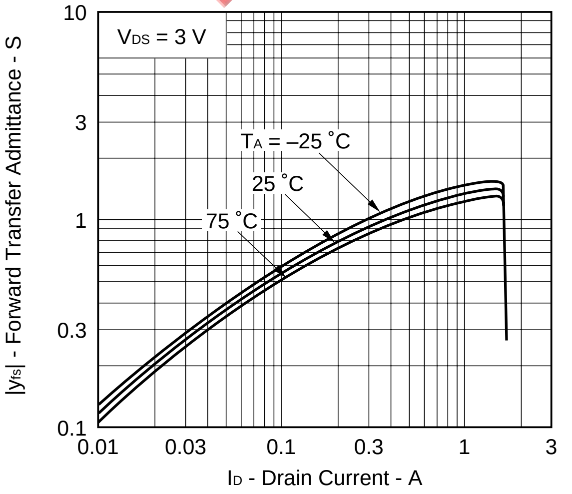
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



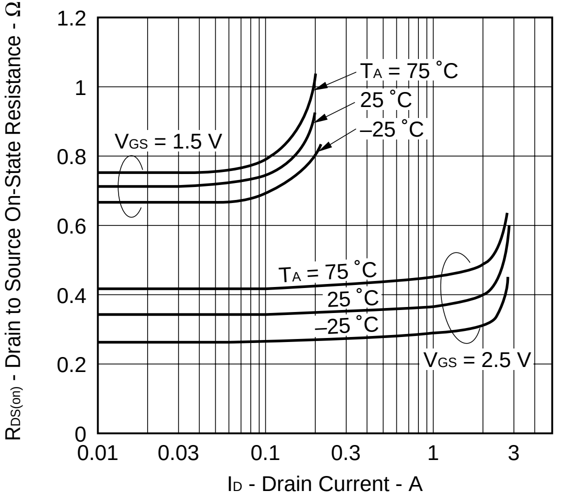
TRANSFER CHARACTERISTICS



FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



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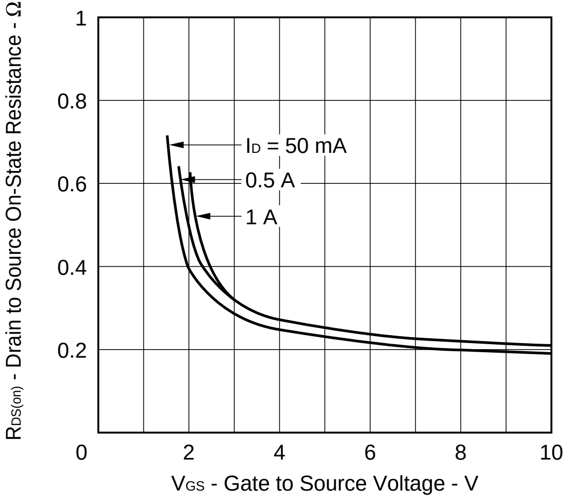
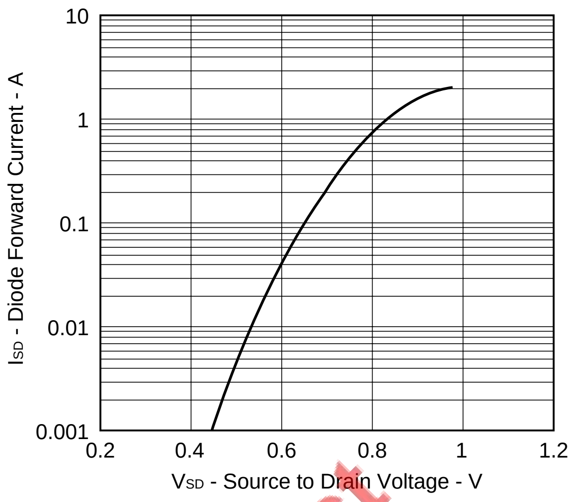
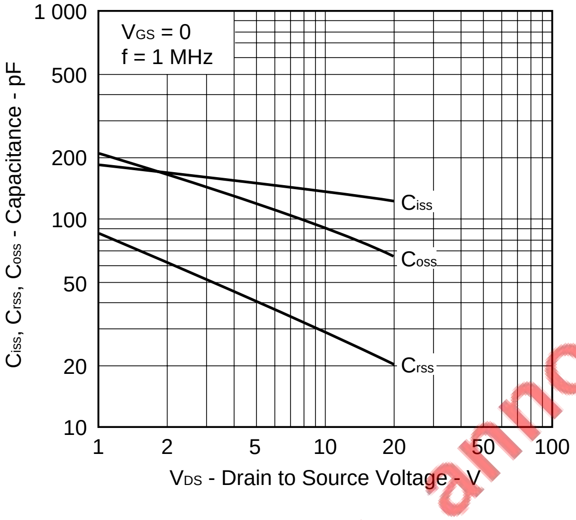
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



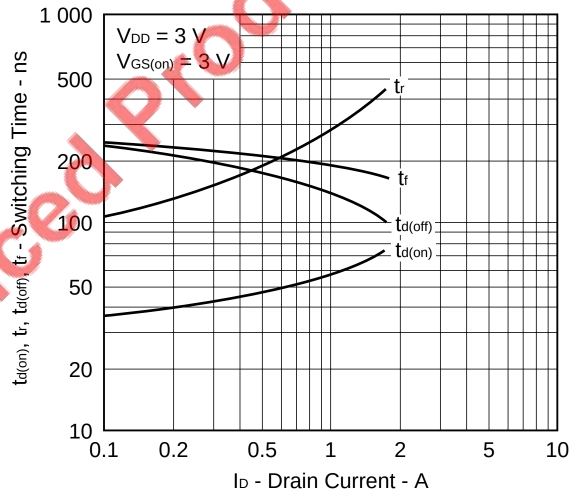
SOURCE TO DRAIN DIODE
FORWARD VOLTAGE



CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



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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.

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