

N-CHANNEL MOS FET
FOR HIGH-SPEED SWITCHING

The 2SK2159 is an N-channel vertical type MOS FET featuring an operating voltage as low as 1.5 V. Because it can be driven on a low voltage and it is not necessary to consider driving current, the 2SK2159 is suitable for driving actuators of low-voltage portable systems such as headphone stereo sets and camcorders.

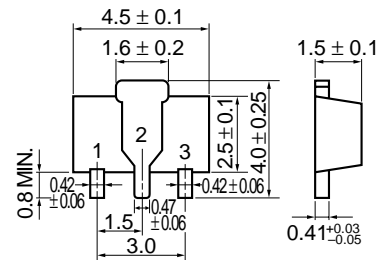
FEATURES

- Capable of drive gate with 1.5 V
- Small $R_{DS(on)}$

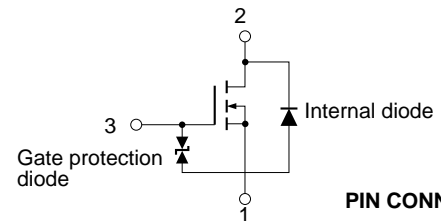
$R_{DS(on)} = 0.7 \Omega$ MAX. @ $V_{GS} = 1.5 V$, $I_D = 0.1 A$

$R_{DS(on)} = 0.3 \Omega$ MAX. @ $V_{GS} = 4.0 V$, $I_D = 1.0 A$

PACKAGE DIMENSIONS
(in millimeters)



EQUIVALENT CIRCUIT



PIN CONNECTION

1. Source (S)
2. Drain (D)
3. Gate (G)

Marking: NW

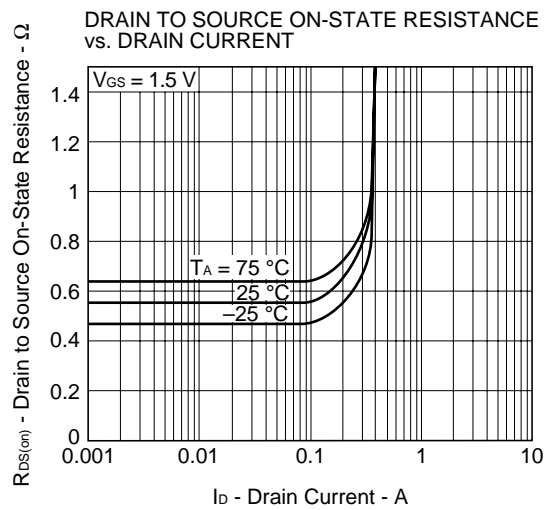
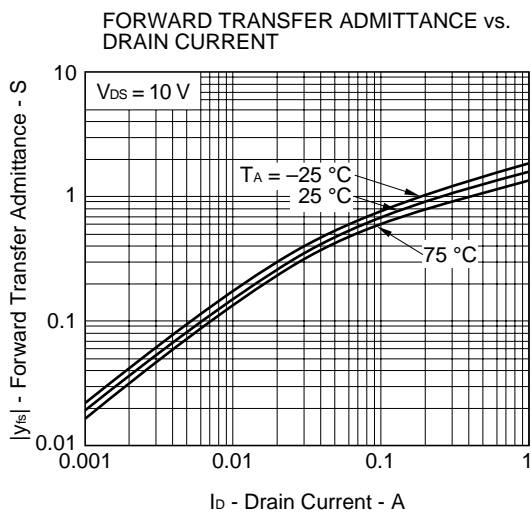
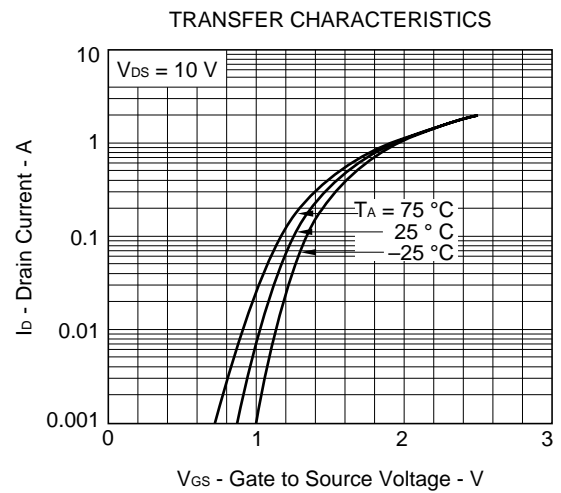
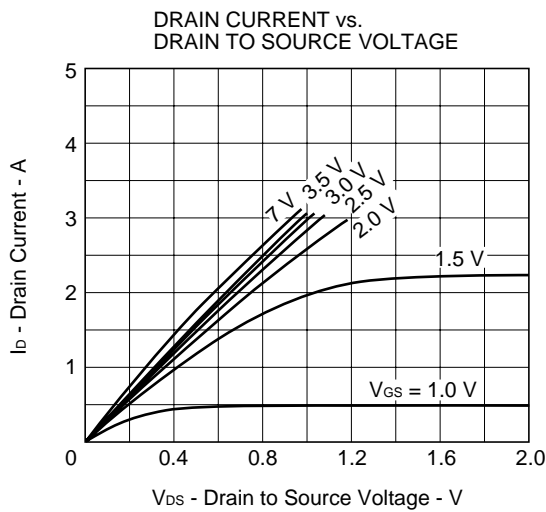
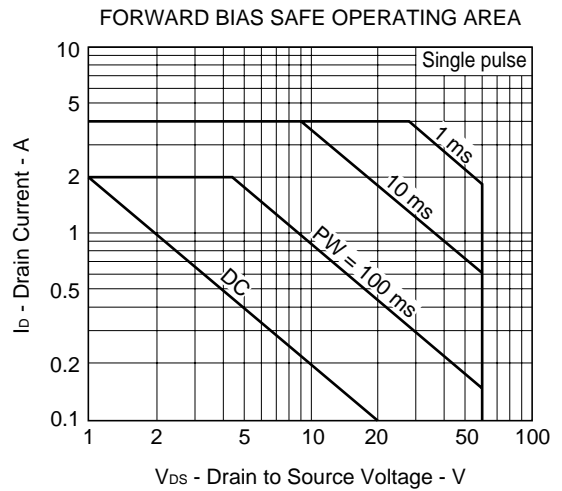
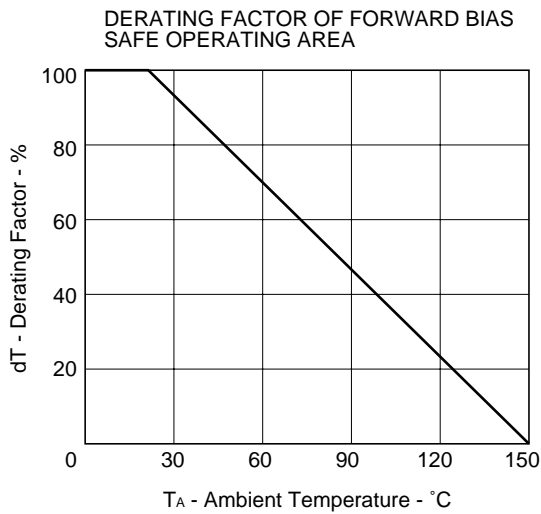
ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \text{ }^\circ\text{C}$)

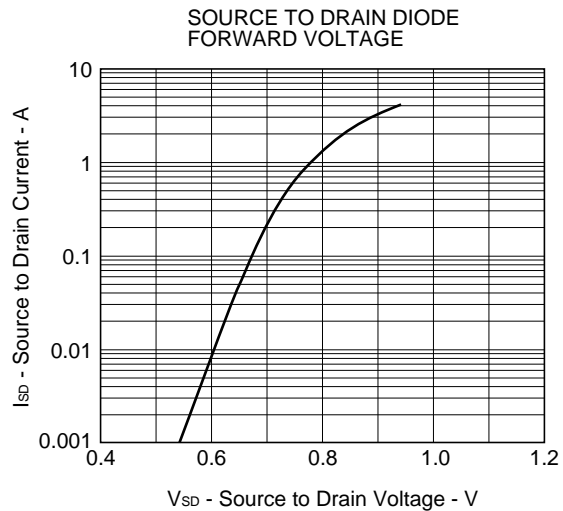
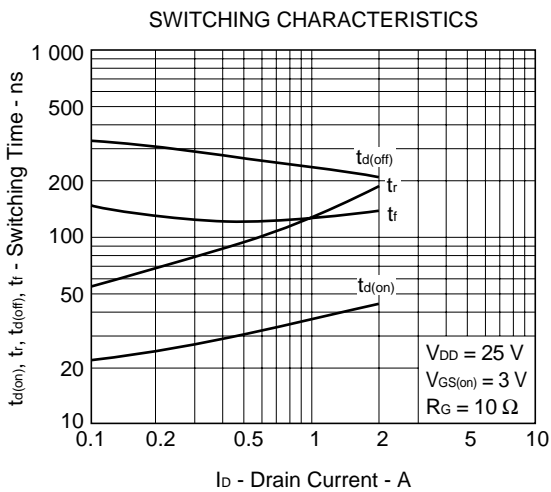
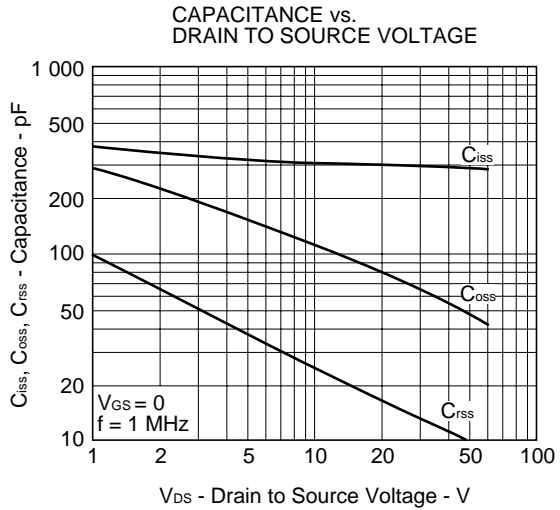
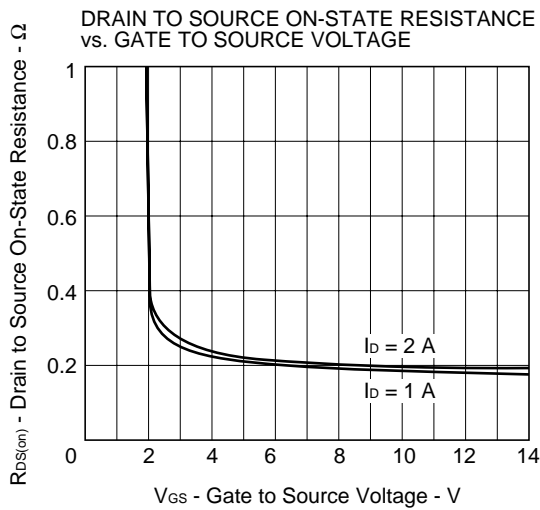
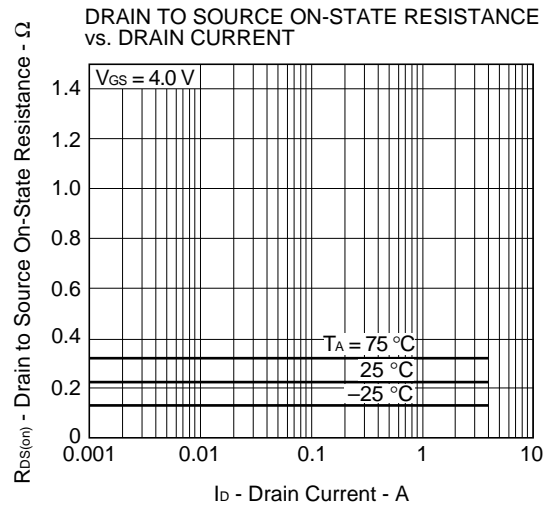
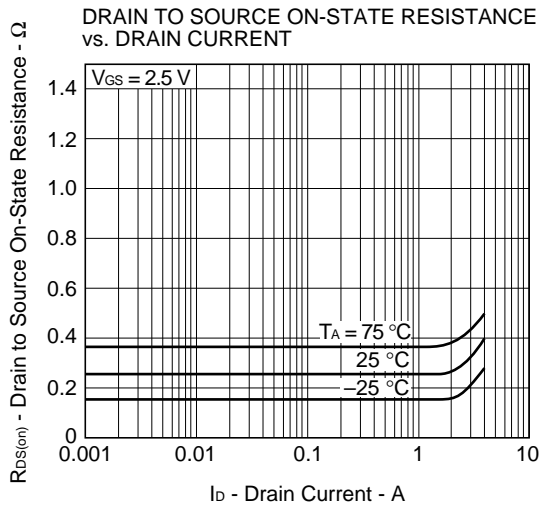
PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Drain to Source Voltage	V_{DS}	$V_{GS} = 0$	60	V
Gate to Source Voltage	V_{GS}	$V_{DS} = 0$	± 14	V
Drain Current (DC)	$I_{D(DC)}$		± 2.0	A
Drain Current (pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$, Duty Cycle $\leq 50 \%$	± 4.0	A
Total Power Dissipation	P_T	Mounted on $16 \text{ cm}^2 \times 0.7 \text{ mm}$ ceramic substrate.	2.0	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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} = ±14 V, V _{DS} = 0			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.5	0.9	1.1	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 1.0 A	0.4			S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = 1.5 V, I _D = 0.1 A		0.55	0.7	Ω
Drain to Source On-state Resistance	R _{DS(on)2}	V _{GS} = 2.5 V, I _D = 1.0 A		0.27	0.5	Ω
Drain to Source On-state Resistance	R _{DS(on)3}	V _{GS} = 4.0 V, I _D = 1.0 A		0.22	0.3	Ω
Input Capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0, f = 1.0 MHz		319		pF
Output Capacitance	C _{oss}			109		pF
Reverse Transfer Capacitance	C _{rss}			22		pF
Turn-On Delay Time	t _{d(on)}	V _{DD} = 25 V, I _D = 1.0 A		38		ns
Rise Time	t _r	V _{GS(on)} = 3 V, R _G = 10 Ω		128		ns
Turn-Off Delay Time	t _{d(off)}	R _L = 25 Ω		237		ns
Fall Time	t _f			130		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.