

N-CHANNEL MOS FIELD EFFECT TRANSISTOR
FOR HIGH SPEED SWITCHING

DESCRIPTION

The 2SK2541 is a switching device which can be driven directly by a 1.5 V power source.

The MOS FET has excellent switching characteristics and is suitable for use as a high-speed switching device in digital circuits.

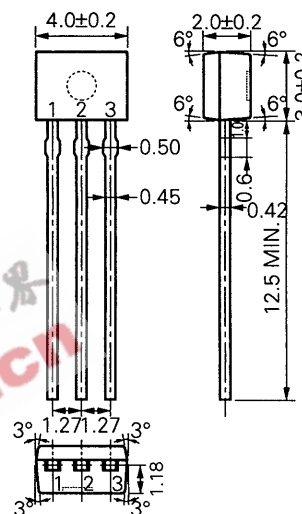
FEATURES

- Can be driven by a 1.5 V power source.
- Not necessary to consider driving current because of its high input impedance.
- Possible to reduce the number of parts by omitting the bias resistor.

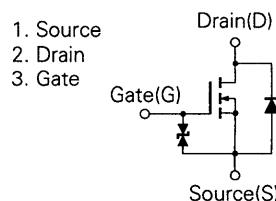
ABSOLUTE MAXIMUM RATINGS (T_A = +25 °C)

Drain to Source Voltage	V _{DSS}	50	V
Gate to Source Voltage	V _{GSS}	±7.0	V
Drain Current (DC)	I _{D(DC)}	±0.1	A
Drain Current (pulse)	I _{D(pulse)}	±0.2*	A
Total Power Dissipation	P _T	250	mW
Channel Temperature	T _{CH}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

*PW ≤ 10 ms, Duty cycle ≤ 1 %

PACKAGE DRAWINGS
(in millimeter)

EQUIVALENT CIRCUIT



(Diode in the figure is the parasitic diode.)

The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

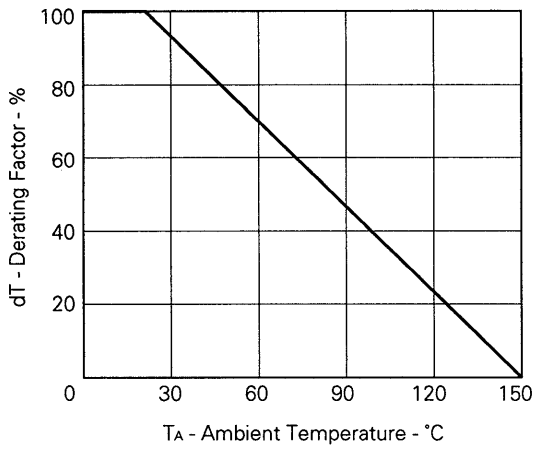
ELECTRICAL CHARACTERISTICS (T_A = +25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Cut-off Current	I _{DSS}			1.0	μA	V _{DS} = 50 V, V _{GS} = 0
Gate Leakage Current	I _{GSS}			±3.0	μA	V _{GS} = ±7.0 V, V _{DS} = 0
Gate Cut-off Voltage	V _{GS(off)}	0.5	0.7	1.1	V	V _{DS} = 3.0 V, I _D = 1.0 μA
Forward Transfer Admittance	y _{fs}	20			mS	V _{DS} = 3.0 V, I _D = 10 mA
Drain to Source On-State Resistance	R _{DS(on)1}		32	50	Ω	V _{GS} = 1.5 V, I _D = 1 mA
Drain to Source On-State Resistance	R _{DS(on)2}		16	20	Ω	V _{GS} = 2.5 V, I _D = 10 mA
Drain to Source On-State Resistance	R _{DS(on)3}		12	15	Ω	V _{GS} = 4.0 V, I _D = 10 mA
Input Capacitance	C _{iss}		6		pF	V _{DS} = 3.0 V, V _{GS} = 0 f = 1.0 MHz
Output Capacitance	C _{oss}		8		pF	
Reverse Transfer Capacitance	C _{rss}		1		pF	
Turn-On Delay Time	t _{d(on)}		9		ns	V _{DD} = 3.0 V, I _D = 20 mA
Rise Time	t _r		48		ns	
Turn-Off Delay Time	t _{d(off)}		21		ns	V _{GS(on)} = 3.0 V, R _G = 10 Ω
Fall Time	t _f		31		ns	R _L = 150 Ω

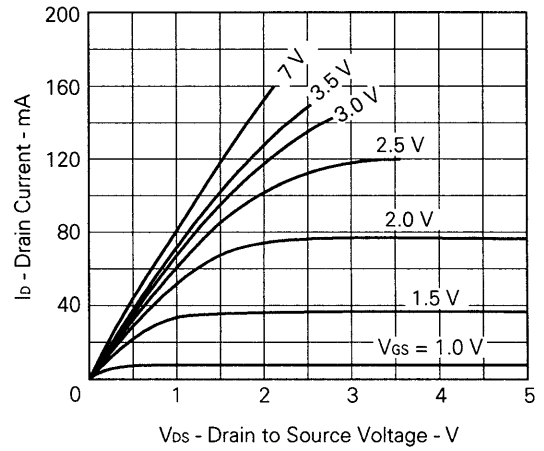
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TYPICAL CHARACTERISTICS (T_A = 25 °C)

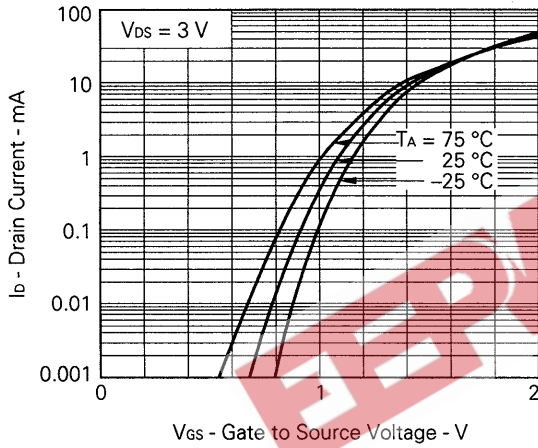
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



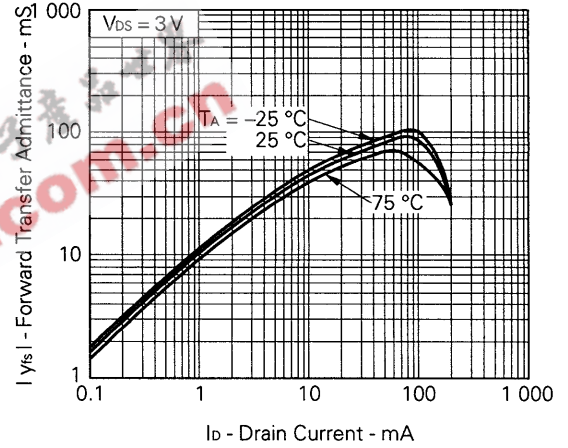
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



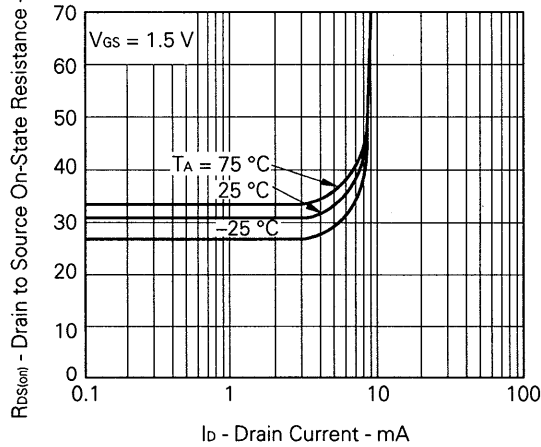
TRANSFER CHARACTERISTICS



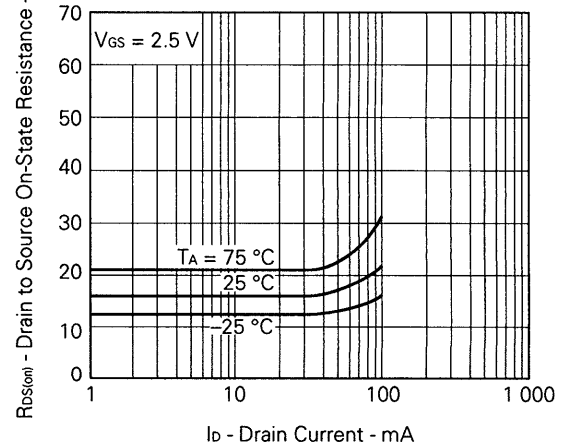
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT

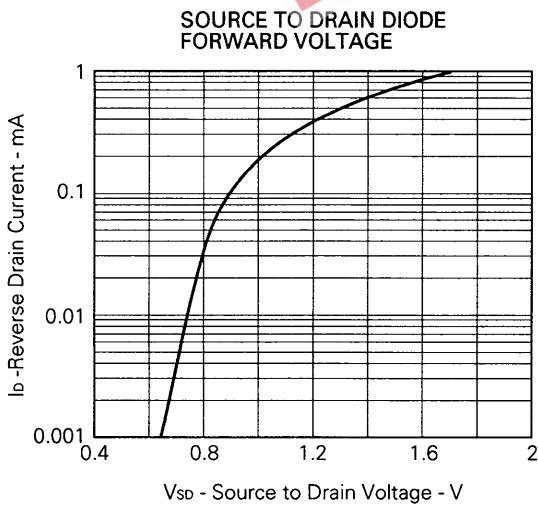
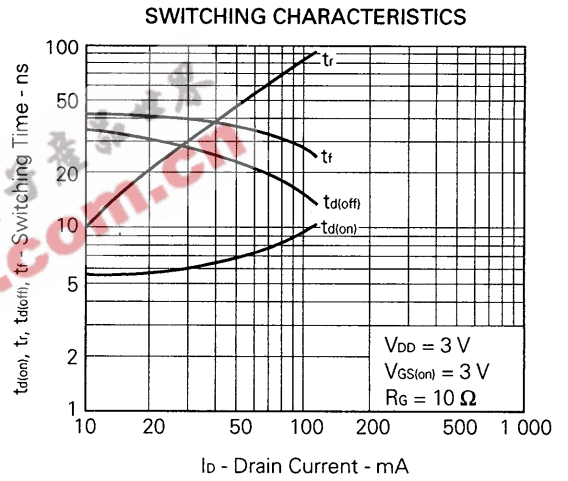
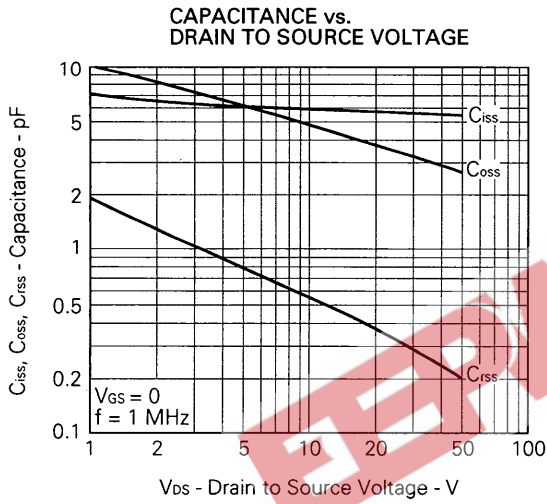
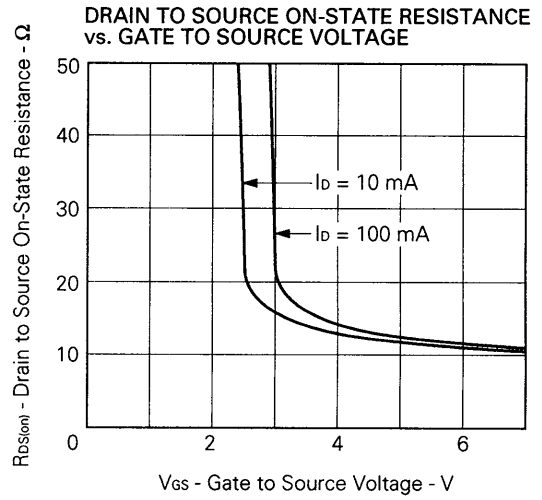
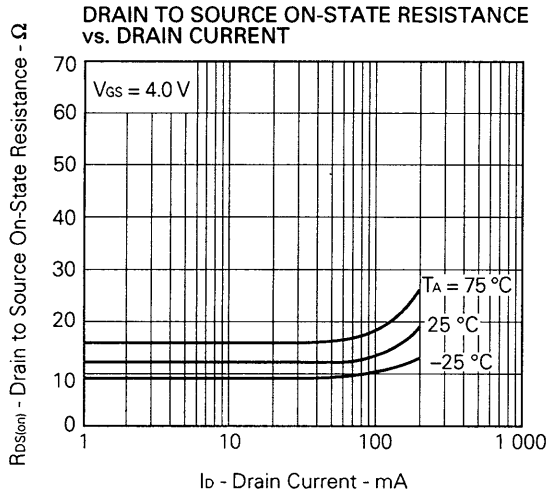


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT





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	IEI-1207
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	MF-1134

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Anti-radioactive design is not implemented in this product.