

MOS FIELD EFFECT TRANSISTOR  
2SK2054

N-CHANNEL MOS FET  
FOR HIGH-SPEED SWITCHING

The 2SK2054 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 actuators and DC/DC converters.

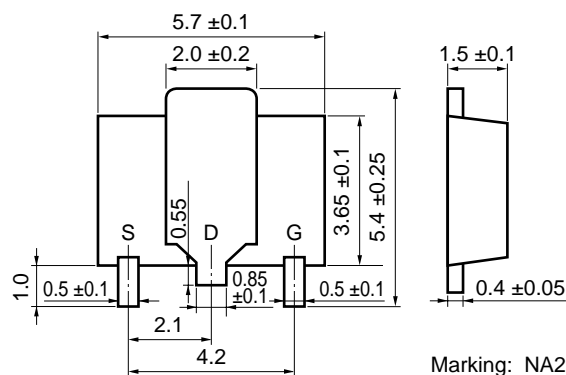
FEATURES

- New package intermediate between small-signal and power models
- Can be directly driven by output of 5-V IC
- Low ON resistance

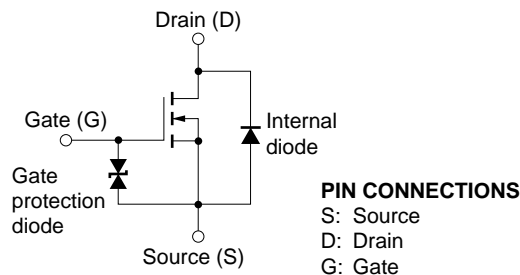
$R_{DS(on)} = 0.25 \Omega$  MAX. @  $V_{GS} = 4 V, I_D = 1.5 A$

$R_{DS(on)} = 0.20 \Omega$  MAX. @  $V_{GS} = 10 V, I_D = 1.5 A$

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



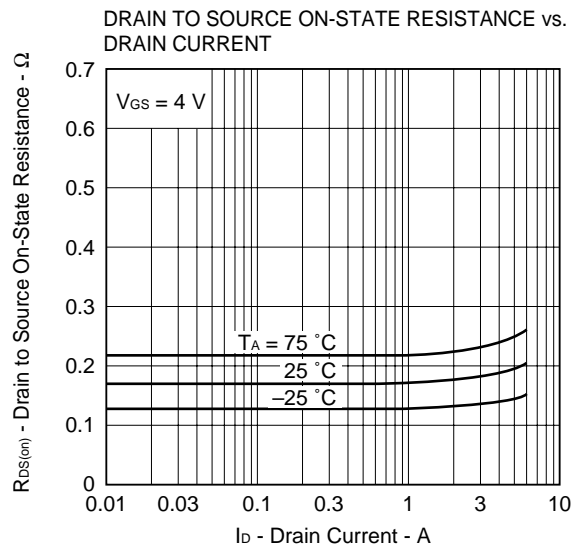
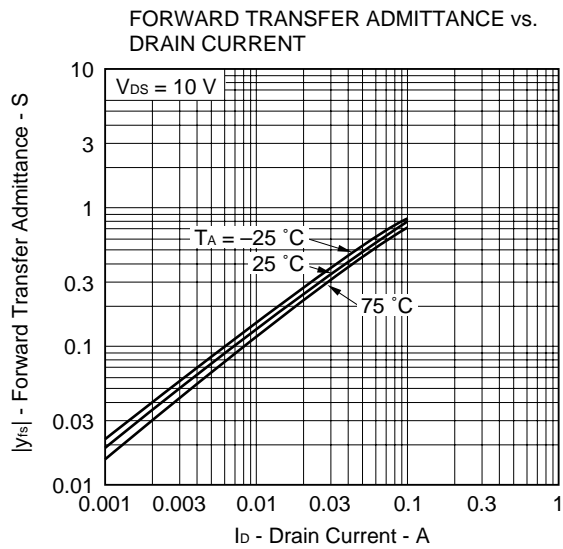
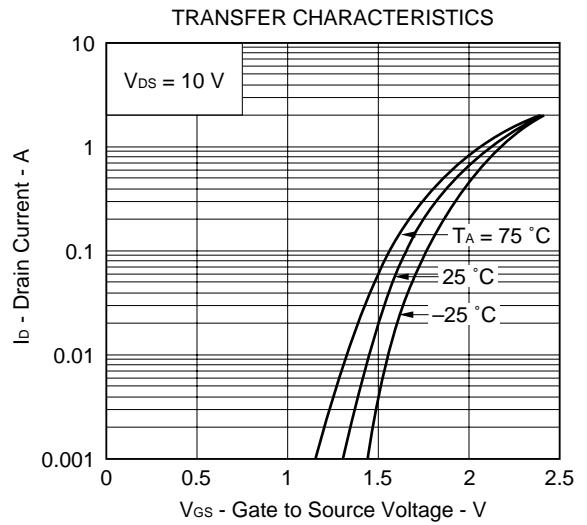
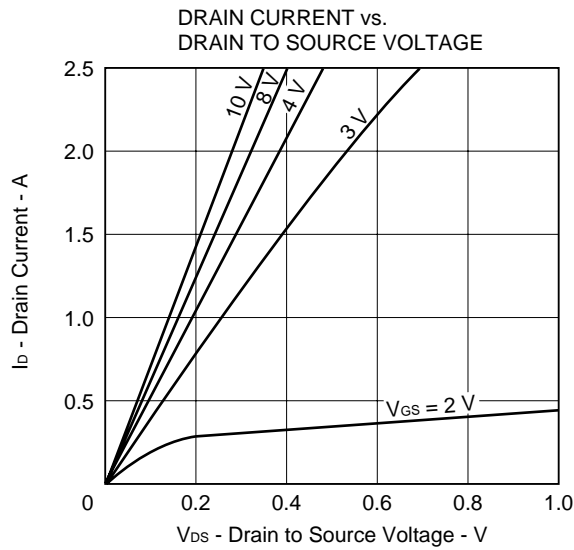
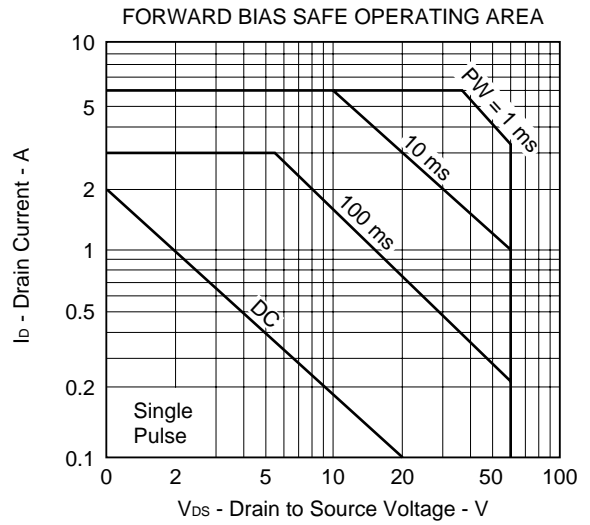
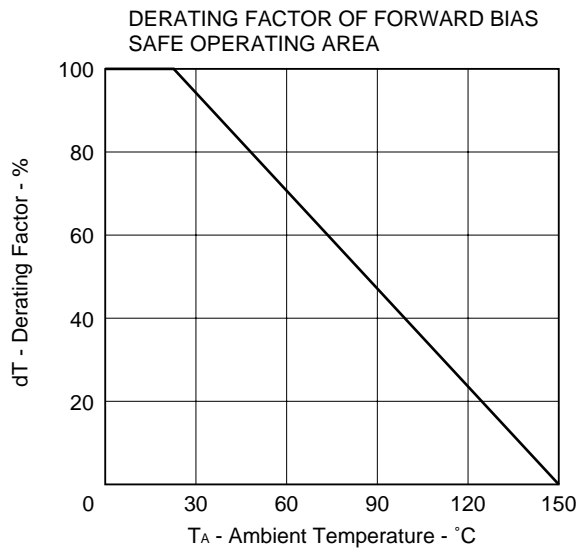
ABSOLUTE MAXIMUM RATINGS ( $T_A = 25 \text{ }^\circ\text{C}$ )

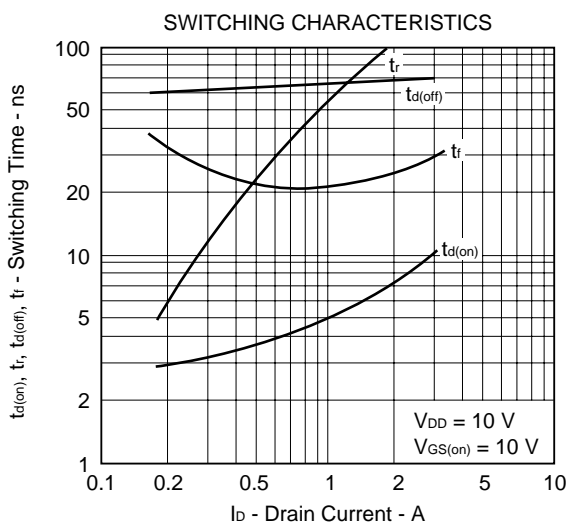
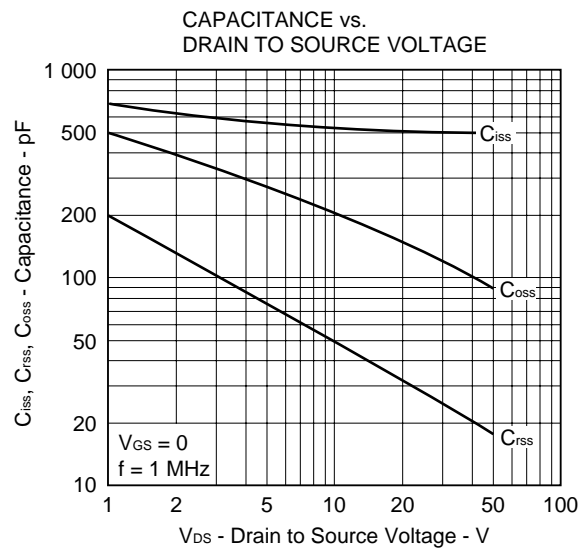
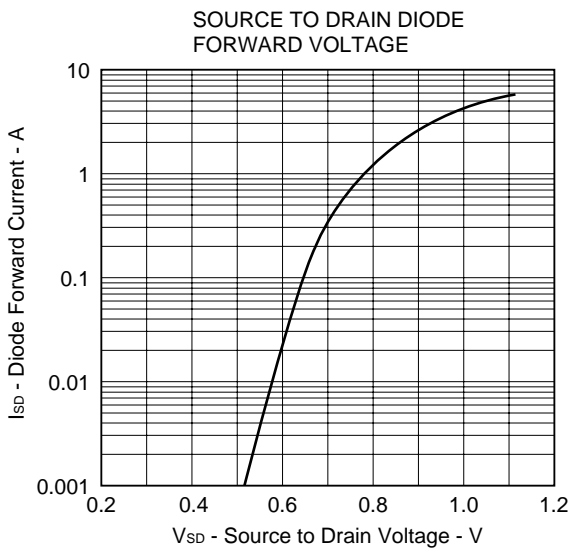
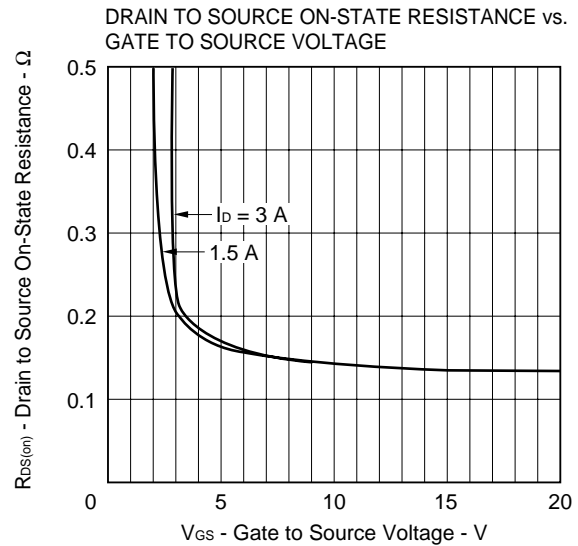
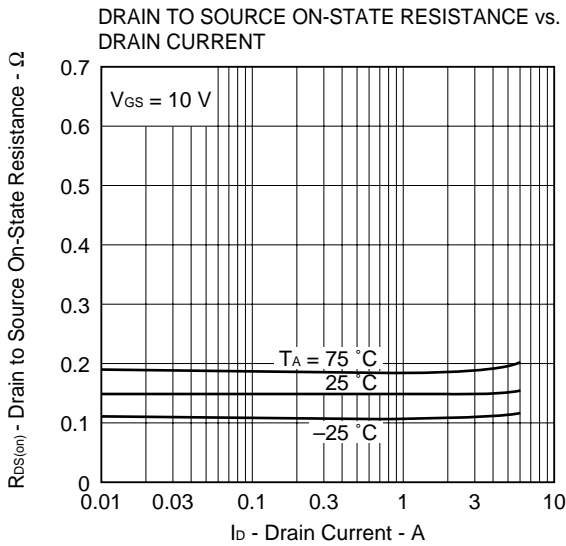
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	$V_{DS}$	$V_{GS} = 0$	60	V
Gate to Source Voltage	$V_{GS}$	$V_{DS} = 0$	$\pm 20$	V
Drain Current (DC)	$I_{D(DC)}$		$\pm 3.0$	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$ , Duty cycle $\leq 50 \%$	$\pm 6.0$	A
Total Power Dissipation	$P_T$	$7.5 \text{ cm}^2 \times 0.7 \text{ mm}$ , ceramic substrate used	2.0	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0			±10	μA
Gate Cut-Off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA	0.8	1.3	2.0	V
Forward Transfer Admittance	y <sub>ts</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1.5 A	2.0			S
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 4 V, I <sub>D</sub> = 1.5 A		0.18	0.25	Ω
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 1.5 A		0.15	0.20	Ω
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0, f = 1.0 MHz		530		pF
Output Capacitance	C <sub>oSS</sub>			200		pF
Reverse Transfer Capacitance	C <sub>rSS</sub>			50		pF
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 10 V, I <sub>D</sub> = 1.5 A V <sub>GS(on)</sub> = 10 V, R <sub>G</sub> = 10 Ω R <sub>L</sub> = 6 Ω		6		ns
Rise Time	t <sub>r</sub>			80		ns
Turn-Off Delay Time	t <sub>d(off)</sub>			70		ns
Fall Time	t <sub>f</sub>			25		ns

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 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.