

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

Send any inquiries to <http://www.renesas.com/inquiry>.

EOL announced Product

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DATA SHEET



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.

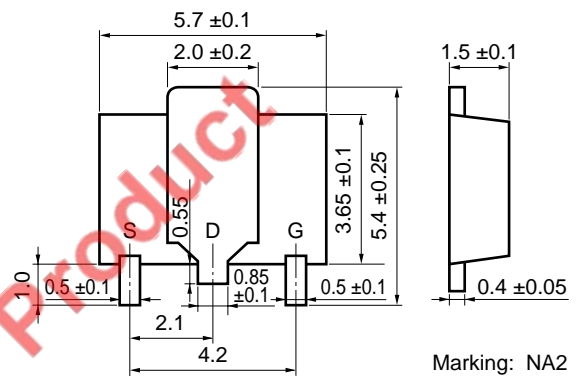
FEATURES

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

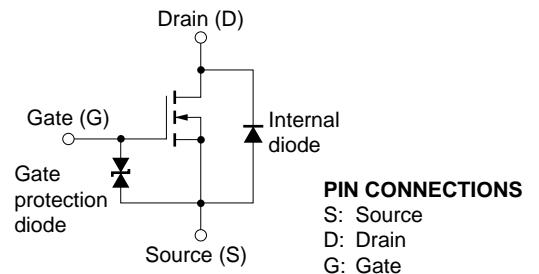
$R_{DS(on)} = 0.25 \Omega$ MAX. @ $V_{GS} = 4 V$, $I_D = 1.5 A$

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

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



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

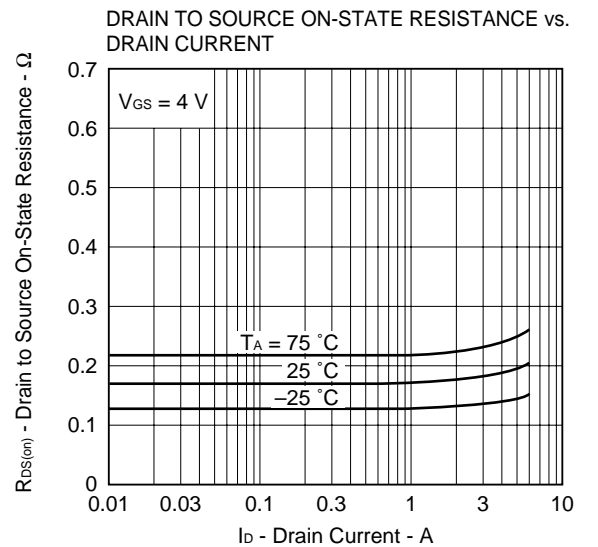
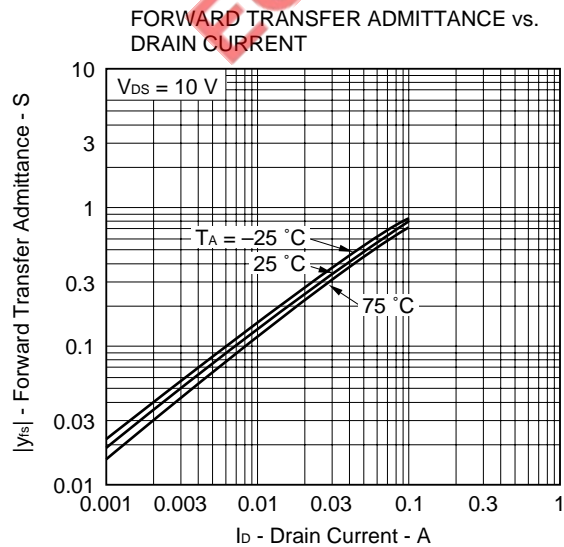
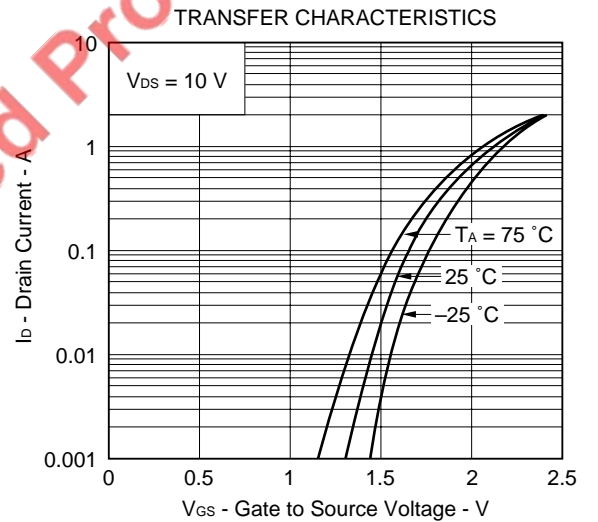
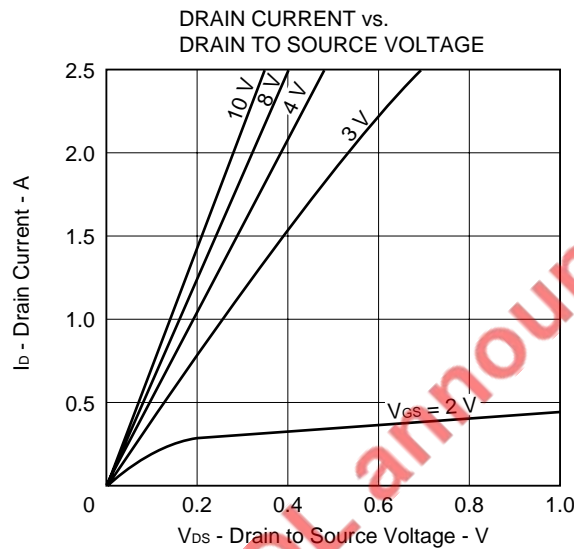
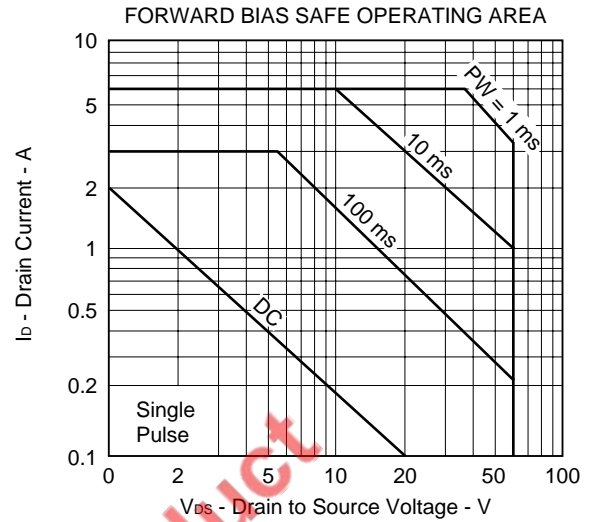
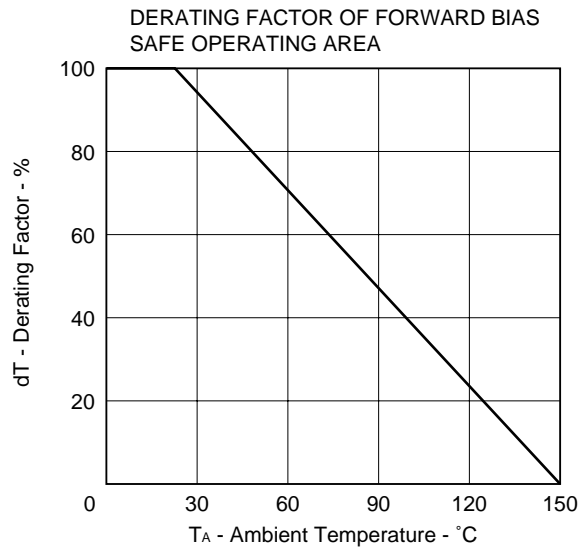
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DSS}	$V_{GS} = 0$	60	V
Gate to Source Voltage	V_{GSS}	$V_{DS} = 0$	± 20	V
Drain Current (DC)	$I_{D(DC)}$		± 3.0	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10$ ms, Duty cycle ≤ 50 %	± 6.0	A
Total Power Dissipation	P_T	$7.5 \text{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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

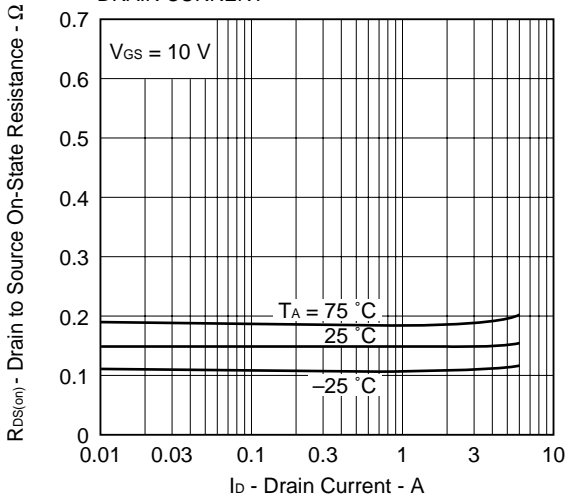
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0			1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0			±10	μA
Gate Cut-Off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.8	1.3	2.0	V
Forward Transfer Admittance	y _{fs}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

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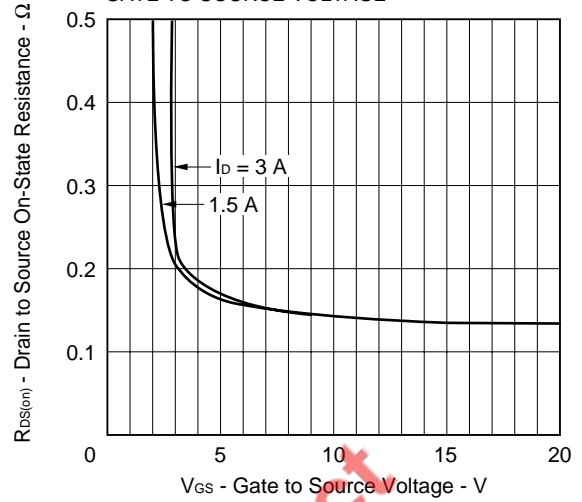
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$)



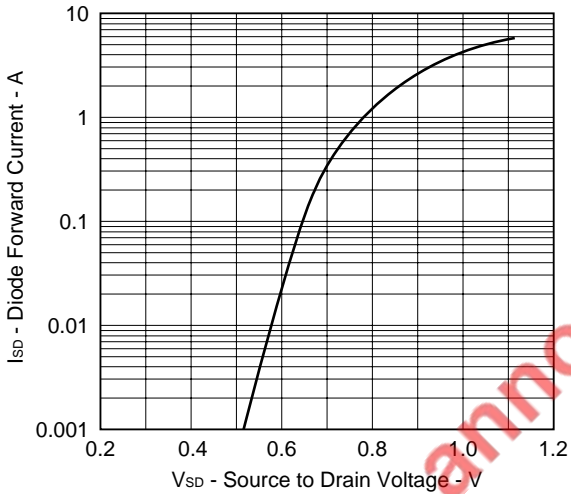
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



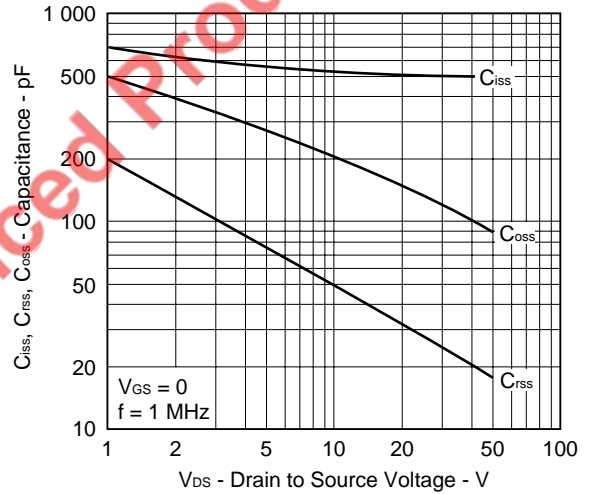
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



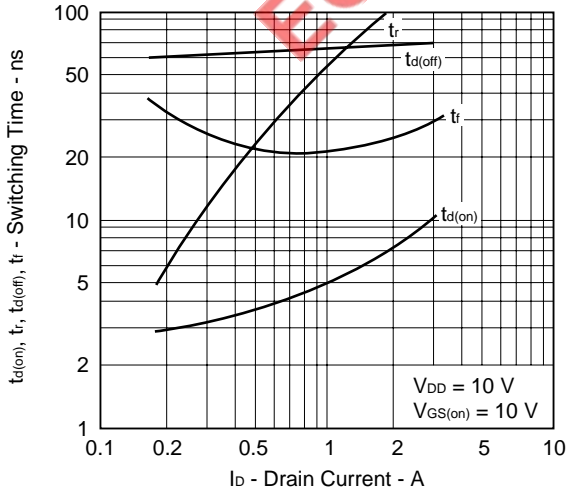
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



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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Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.

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[2SK1691-DL-E](#) [2SK2545\(Q,T\)](#) [405094E](#) [423220D](#) [MCH6646-TL-E](#) [TPCC8103,L1Q\(CM](#) [367-8430-0972-503](#) [VN1206L](#) [424134F](#)
[026935X](#) [051075F](#) [SBVS138LT1G](#) [614234A](#) [715780A](#) [NTNS3166NZT5G](#) [751625C](#) [873612G](#) [IRF7380TRHR](#) [IPS70R2K0CEAKMA1](#)
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[JANTX2N6784U](#) [JANTXV2N5416U4](#) [SQM110N05-06L-GE3](#) [SIHF35N60E-GE3](#) [2SK2614\(TE16L1,Q\)](#)