

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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

April 1st, 2010
Renesas Electronics Corporation

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

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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.

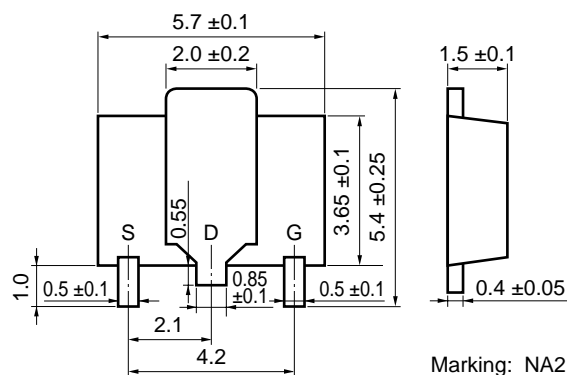
FEATURES

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

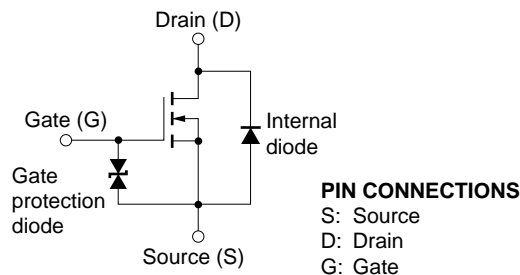
$R_{DS(on)} = 0.25 \Omega$ MAX. @ $V_{GS} = 4 V$, $I_D = 1.5 A$

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

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



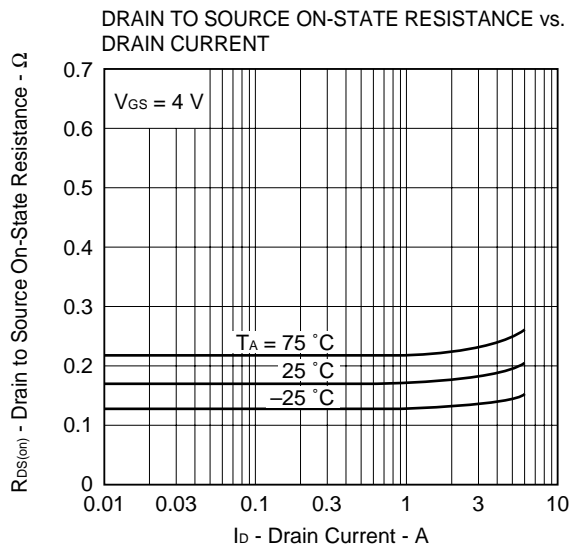
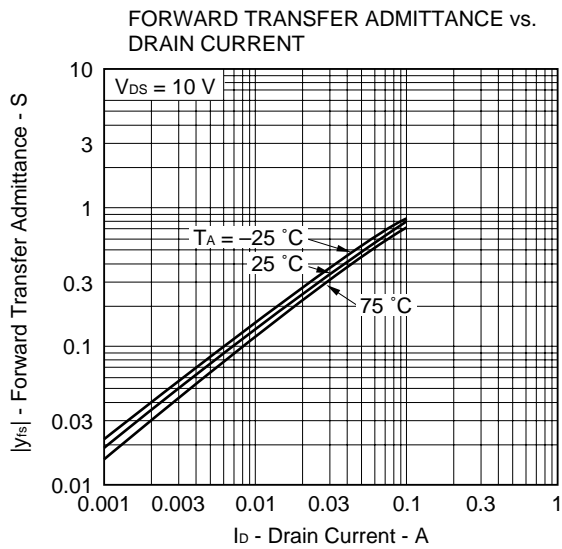
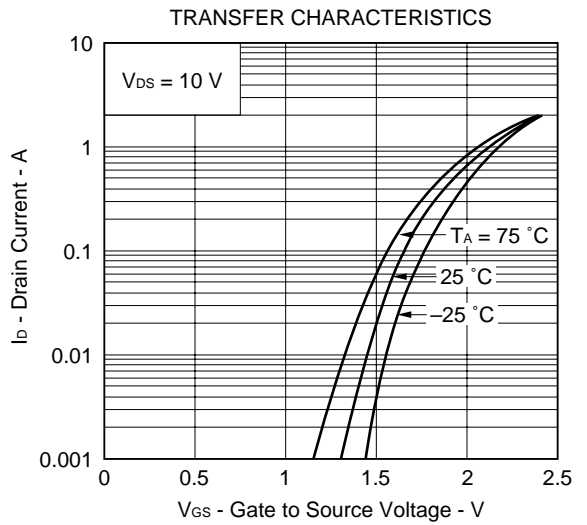
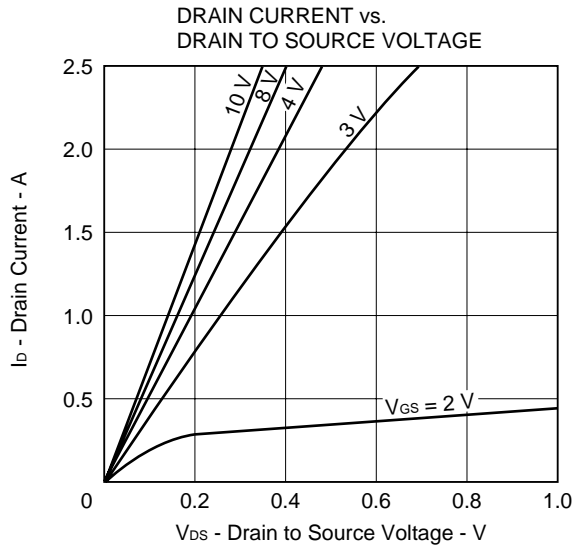
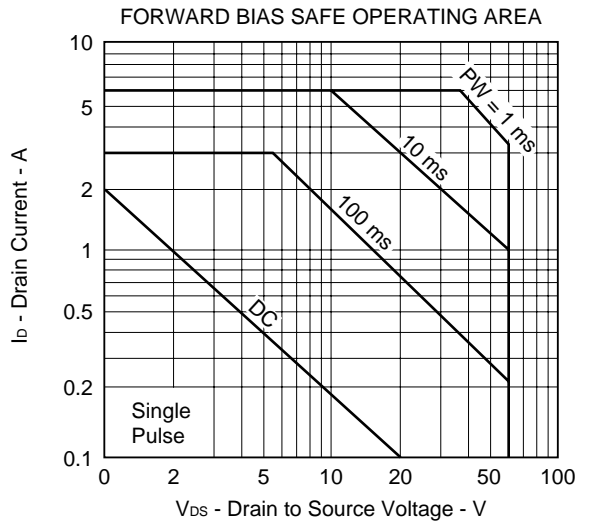
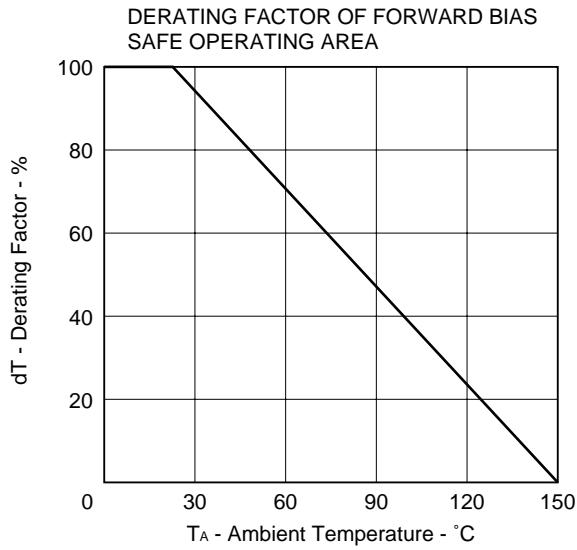
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$)

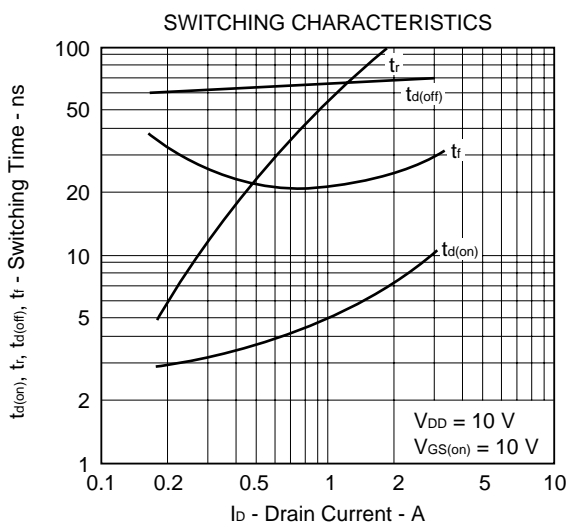
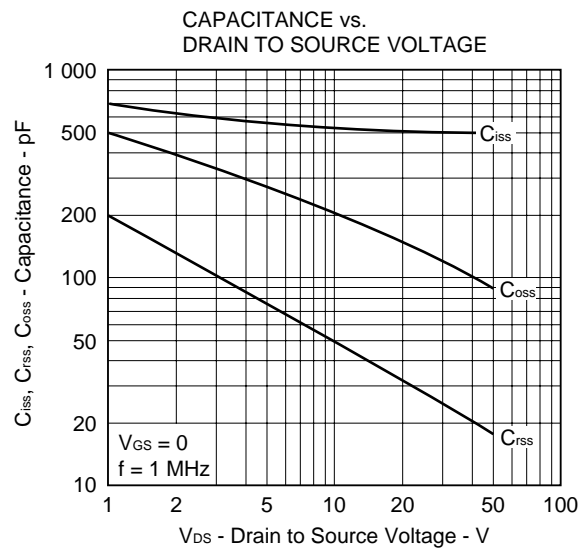
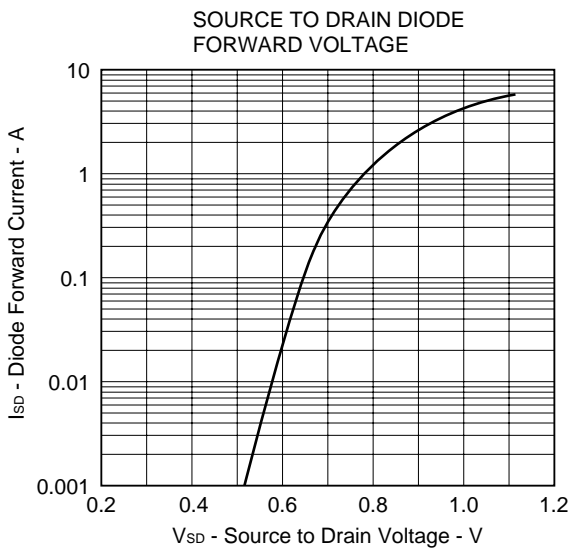
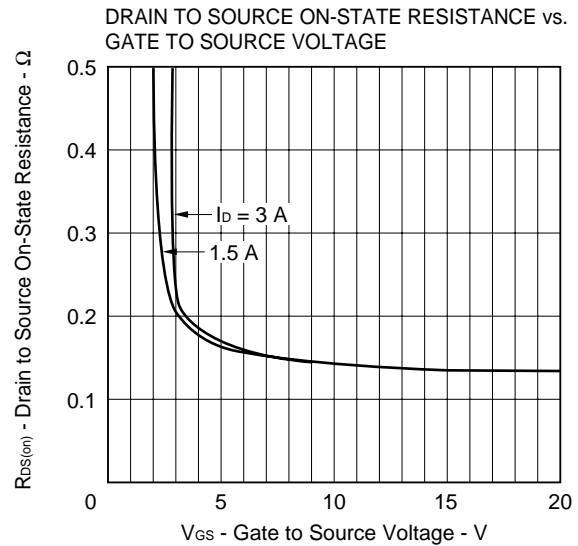
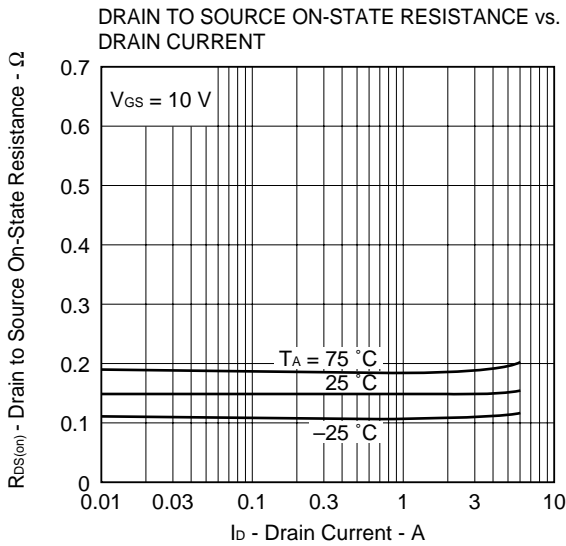
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DS}	$V_{GS} = 0$	60	V
Gate to Source Voltage	V_{GS}	$V_{DS} = 0$	± 20	V
Drain Current (DC)	$I_{D(DC)}$		± 3.0	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$, Duty cycle $\leq 50 \%$	± 6.0	A
Total Power Dissipation	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 _{ts}	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

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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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.