

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>.

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(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

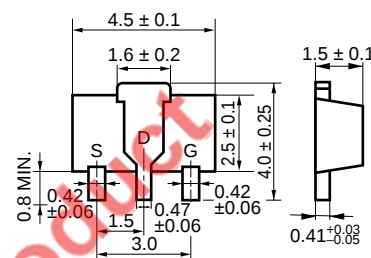
The 2SK2111 is a N-channel MOS FET of a vertical type and is a switching element that can be directly driven by the output of an IC operating at 5 V.

This product has a low ON resistance and superb switching characteristics and is ideal for driving the actuators, such as motors and DC/DC converters.

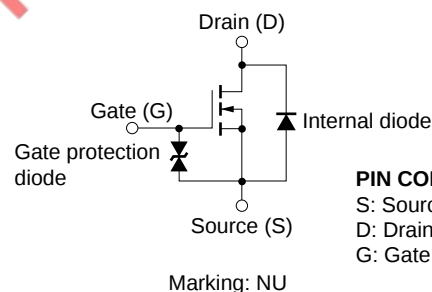
FEATURES

- Low ON resistance
 $R_{DS(on)} = 0.6 \Omega$ MAX. @ $V_{GS} = 4.0 \text{ V}$, $I_D = 0.5 \text{ A}$
- High switching speed
 $t_{on} + t_{off} < 100 \text{ ns}$
- Low parasitic capacitance

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



PIN CONNECTIONS

S: Source
D: Drain
G: Gate

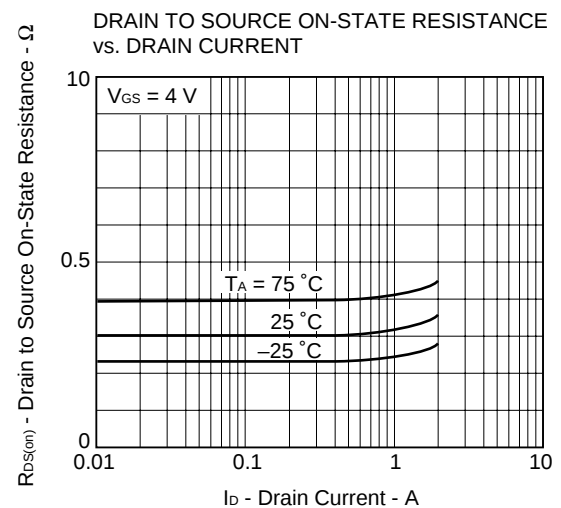
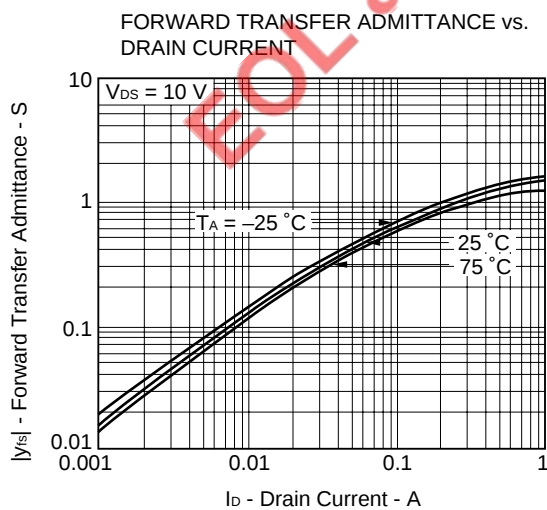
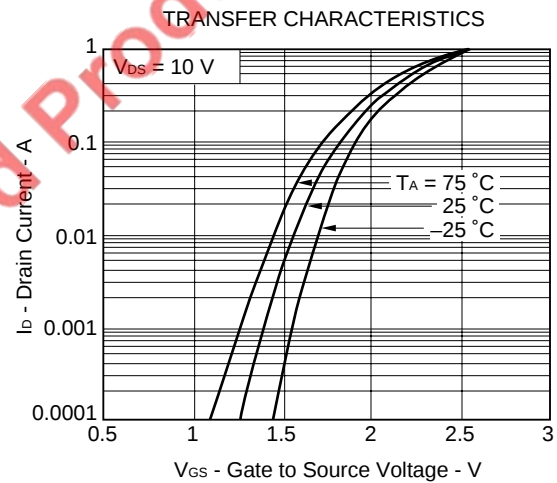
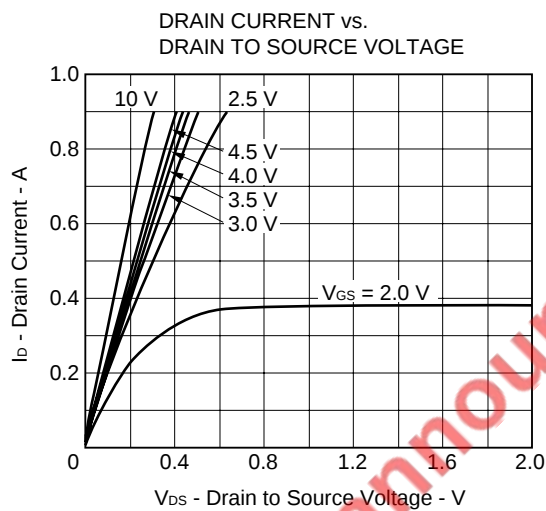
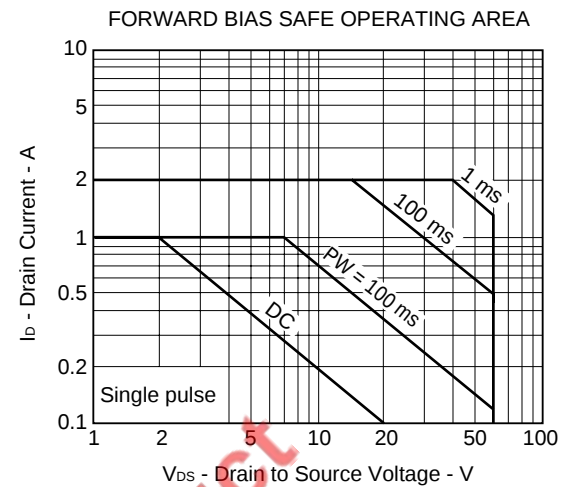
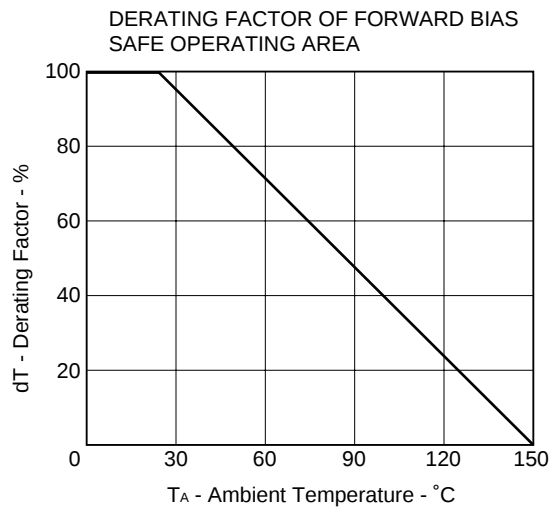
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

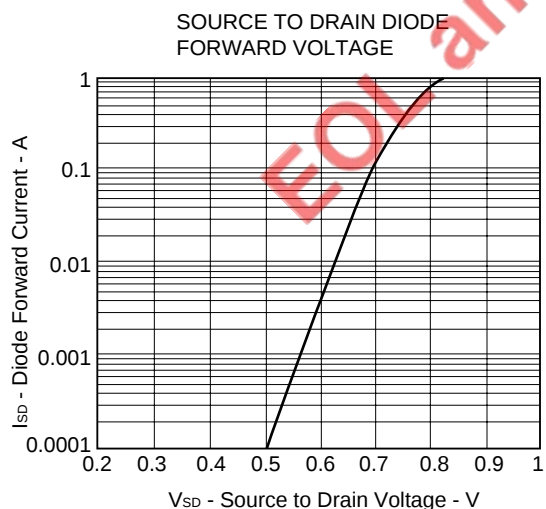
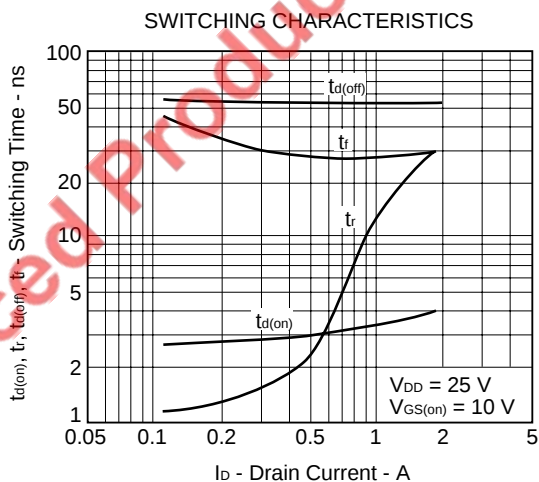
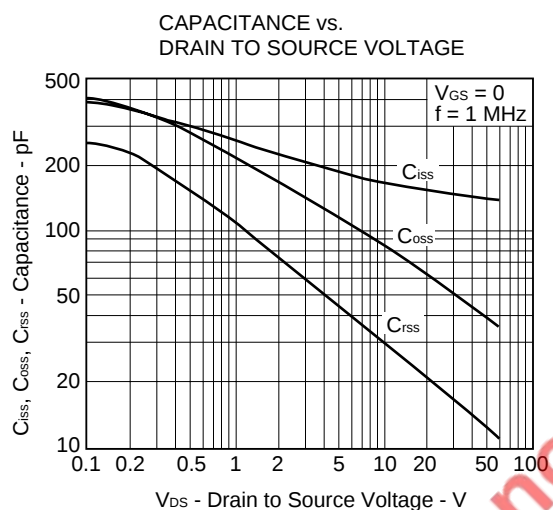
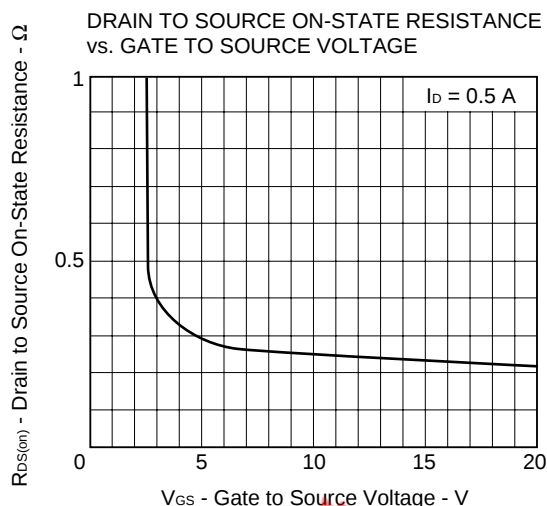
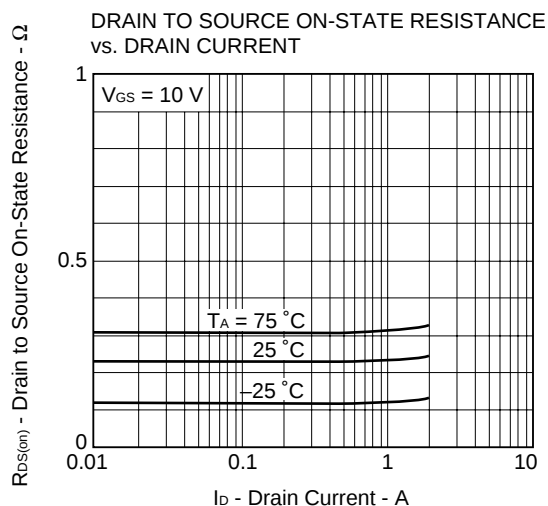
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DS}	$V_{GS} = 0$	60	V
Gate to Source Voltage	V_{GS}	$V_{DS} = 0$	± 20	V
Drain Current (DC)	$I_{D(DC)}$		± 1.0	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$, Duty cycle $\leq 50 \%$	± 2.0	A
Total Power Dissipation	P_T	$16 \text{ cm}^2 \times 0.7 \text{ mm}$, ceramic substrate used	2.0	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		$-55 \text{ to } +150$	$^\circ\text{C}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0$			1.0	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0$			± 10	μA
Gate Cut-Off Voltage	$V_{GS(off)}$	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	0.8	1.4	2.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 0.5\text{ A}$	0.4			S
Drain to Source On-State Resistance	$R_{DS(on)1}$	$V_{GS} = 4.0\text{ V}, I_D = 0.5\text{ A}$		0.32	0.6	Ω
Drain to Source On-State Resistance	$R_{DS(on)2}$	$V_{GS} = 10\text{ V}, I_D = 0.5\text{ A}$		0.24	0.45	Ω
Input Capacitance	C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0,$ $f = 1.0\text{ MHz}$		170		pF
Output Capacitance	C_{oss}			87		pF
Reverse Transfer Capacitance	C_{rss}			32		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 25\text{ V}, I_D = 0.5\text{ A}$ $V_{GS(on)} = 10\text{ V}, R_G = 10\text{ }\Omega$ $R_L = 50\text{ }\Omega$		2.8		ns
Rise Time	t_r			2.3		ns
Turn-Off Delay Time	$t_{d(off)}$			55		ns
Fall Time	t_f			27		ns

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



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.