

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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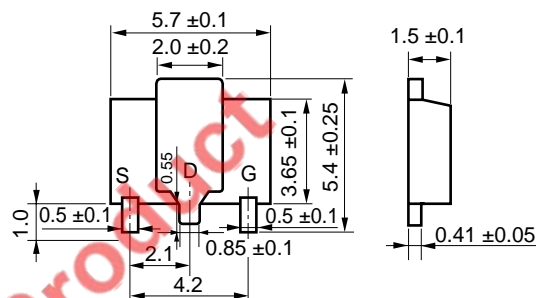
N-CHANNEL MOS FET
FOR HIGH-SPEED SWITCHING

The 2SK2157 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.

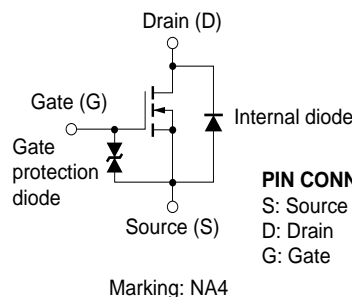
FEATURES

- New package intermediate between small-signal and power models
- Can be directly driven by output of 5-V IC
- Low ON resistance
 $R_{DS(on)} \leq 0.15 \Omega$ @ $V_{GS} = 4 V, I_D = 2.5 A$
 $R_{DS(on)} \leq 0.10 \Omega$ @ $V_{GS} = 10 V, I_D = 2.5 A$

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CIRCUIT



PIN CONNECTIONS
 S: Source
 D: Drain
 G: Gate

Marking: NA4

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

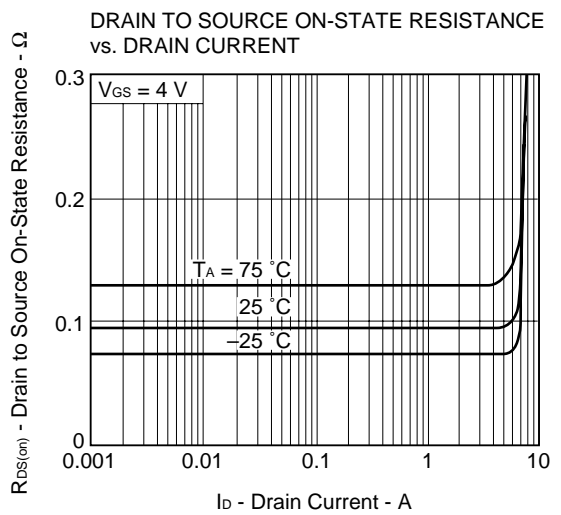
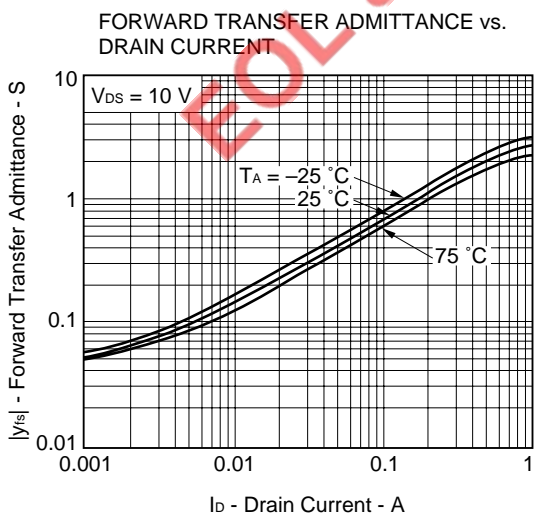
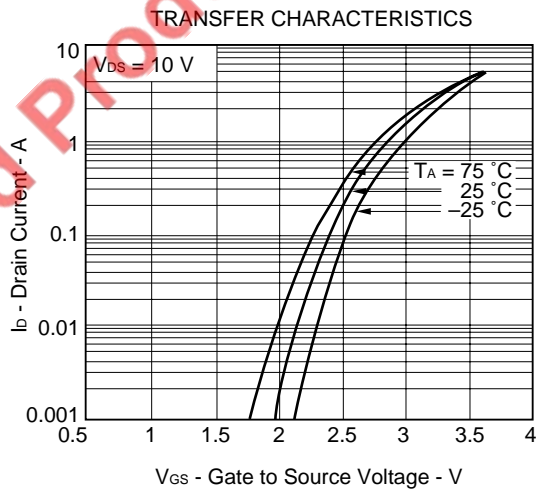
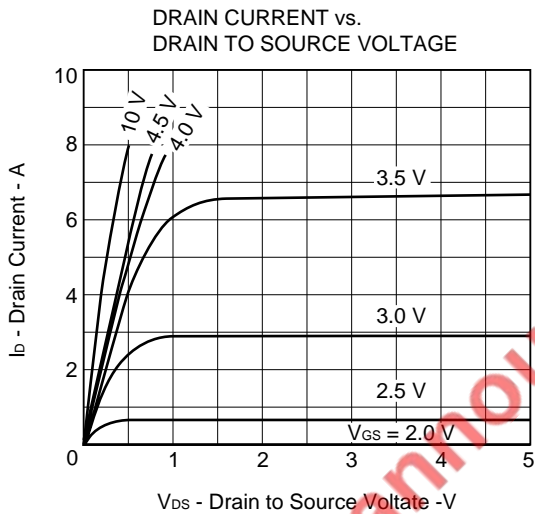
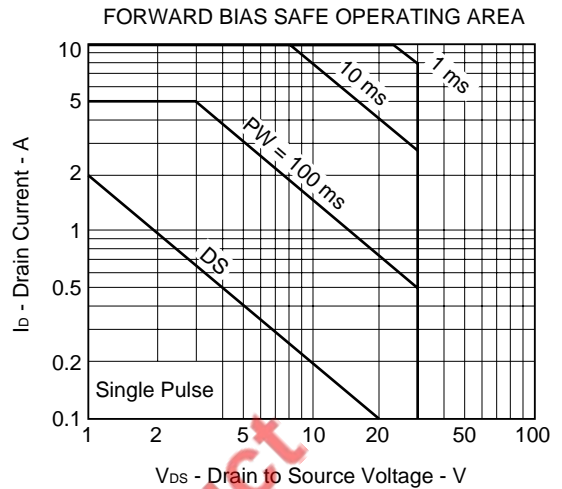
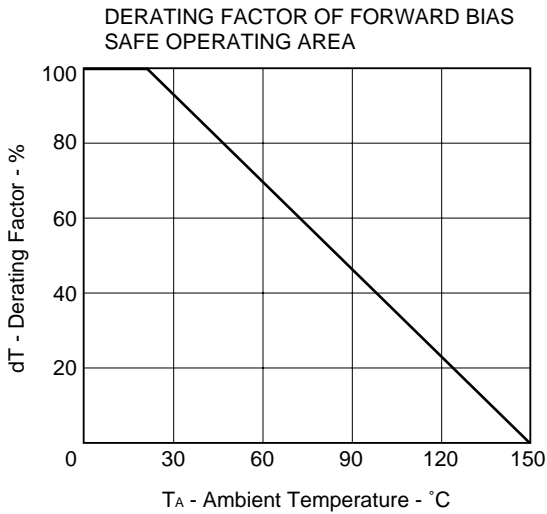
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DS}	$V_{GS} = 0$	30	V
Gate to Source Voltage	V_{GS}	$V_{DS} = 0$	± 20	V
Drain Current (DC)	$I_{D(DC)}$		± 5.0	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$, Duty cycle $\leq 50 \%$	± 10.0	A
Total Power Dissipation	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	$^\circ\text{C}$

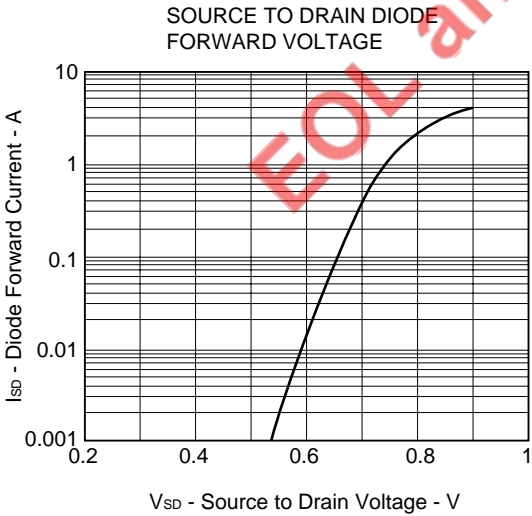
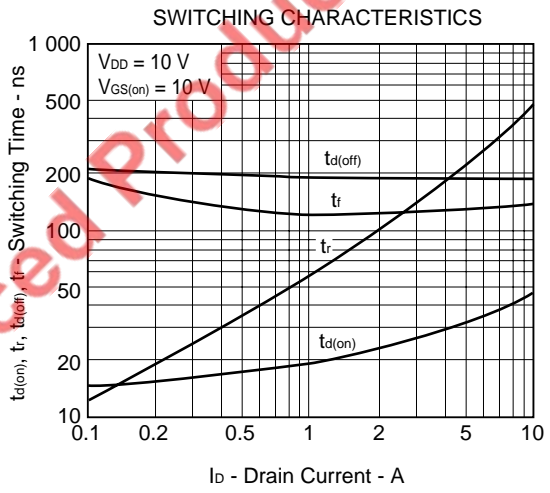
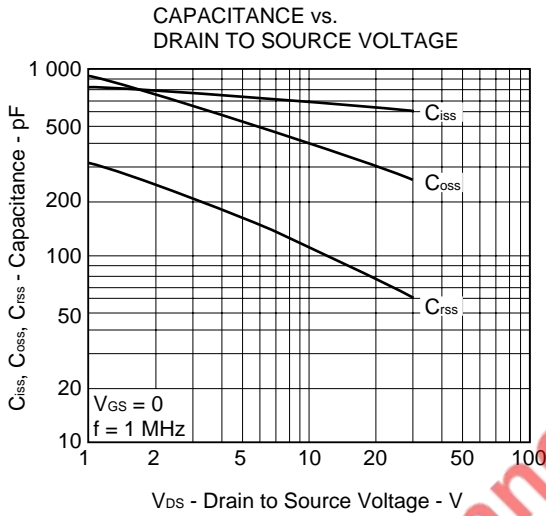
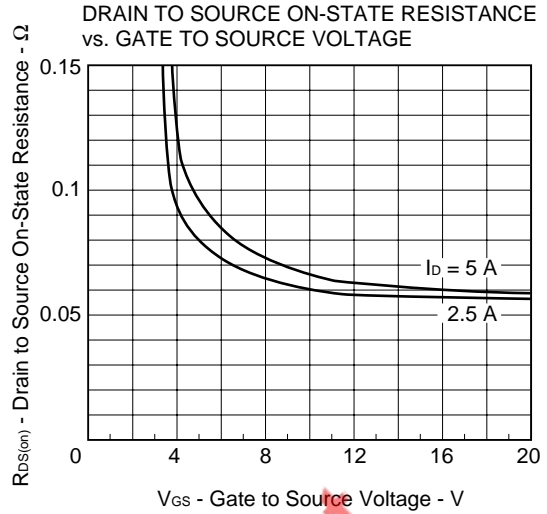
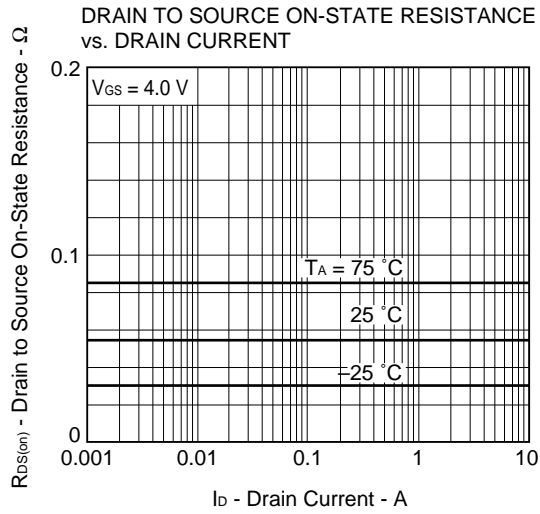
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I _{DSS}	V _{DS} = 30 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	1.5	1.9	2.5	V
Forward Transfer Admittance	y _{ts}	V _{DS} = 10 V, I _D = 2.5 A	2.0			S
Drain to Source On-State Resistance	R _{DS(on)1}	V _{GS} = 4 V, I _D = 2.5 A		0.09	0.15	Ω
Drain to Source On-State Resistance	R _{DS(on)2}	V _{GS} = 10 V, I _D = 2.5 A		0.06	0.10	Ω
Input Capacitance	C _{iSS}	V _{DS} = 10 V, V _{GS} = 0, f = 1.0 MHz		650		pF
Output Capacitance	C _{oSS}			400		pF
Reverse Transfer Capacitance	C _{rSS}			120		pF
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, I _D = 2.5 A		85		ns
Rise Time	t _r	V _{GS(on)} = 10 V, R _G = 10 Ω		450		ns
Turn-Off Delay Time	t _{d(off)}	R _L = 4 Ω		285		ns
Fall Time	t _f			315		ns

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TYPICAL CHARACTERISTICS (T_A = 25 °C)





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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.