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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>)

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H5N2509P

Silicon N Channel MOS FET
High Speed Power Switching

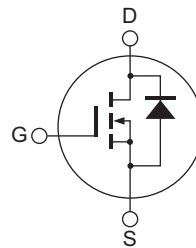
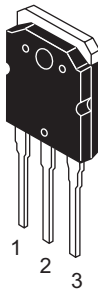
REJ03G1109-0200
(Previous: ADE-208-1378)
Rev.2.00
Sep 07, 2005

Features

- Low on-resistance: $R_{DS(on)} = 0.053 \Omega$ typ.
- Low leakage current: $I_{DSS} = 1 \mu\text{A}$ max (at $V_{DS} = 250 \text{ V}$, $V_{GS} = 0 \text{ V}$)
- High speed switching: $t_f = 110 \text{ ns}$ typ (at $I_D = 15 \text{ A}$, $R_L = 8.3 \Omega$, $V_{GS} = 10 \text{ V}$)
- Low gate charge: $Q_g = 110 \text{ nC}$ typ (at $V_{DD} = 200 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 30 \text{ A}$)
- Avalanche ratings

Outline

RENESAS Package code: PRSS0004ZE-A
(Package name: TO-3P)



1. Gate
2. Drain (Flange)
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V _{DSS}	250	V
Gate to source voltage	V _{GSS}	±30	V
Drain current	I _D	30	A
Drain peak current	I _{D (pulse)} ^{Note 1}	120	A
Body-drain diode reverse drain current	I _{DR}	30	A
Body-drain diode reverse drain peak current	I _{DR (pulse)} ^{Note 1}	120	A
Avalanche current	I _{AP} ^{Note 3}	30	A
Channel dissipation	P _{ch} ^{Note 2}	150	W
Channel to case thermal impedance	θ _{ch-c}	0.833	°C/W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

- Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
 2. Value at T_c = 25°C
 3. T_{ch} ≤ 150°C

Electrical Characteristics

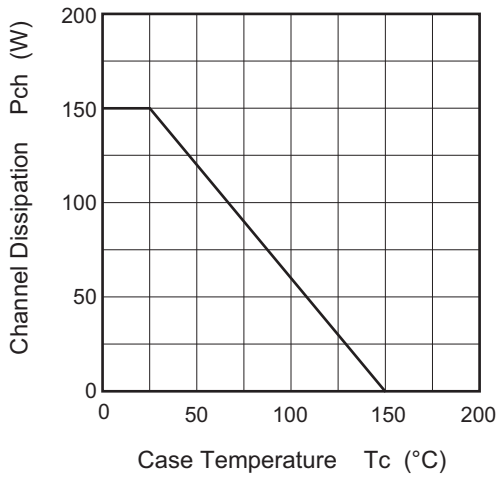
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR) DSS}	250	—	—	V	I _D = 10 mA, V _{GS} = 0
Gate to source leak current	I _{GSS}	—	—	±0.1	μA	V _{GS} = ±30 V, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	1	μA	V _{DS} = 250 V, V _{GS} = 0
Gate to source cutoff voltage	V _{GS (off)}	3.0	—	4.0	V	V _{DS} = 10 V, I _D = 1 mA
Static drain to source on state resistance	R _{DS (on)}	—	0.053	0.069	Ω	I _D = 15 A, V _{GS} = 10 V ^{Note 4}
Forward transfer admittance	y _{fs}	17	28	—	S	I _D = 15 A, V _{DS} = 10 V ^{Note 4}
Input capacitance	C _{iss}	—	3600	—	pF	V _{DS} = 25 V
Output capacitance	C _{oss}	—	450	—	pF	V _{GS} = 0
Reverse transfer capacitance	C _{rss}	—	115	—	pF	f = 1 MHz
Turn-on delay time	t _{d (on)}	—	48	—	ns	I _D = 15 A
Rise time	t _r	—	120	—	ns	V _{GS} = 10 V
Turn-off delay time	t _{d (off)}	—	190	—	ns	R _L = 8.3 Ω
Fall time	t _f	—	110	—	ns	R _g = 10 Ω
Total gate charge	Q _g	—	110	—	nC	V _{DD} = 200 V
Gate to source charge	Q _{gs}	—	19	—	nC	V _{GS} = 10 V
Gate to drain charge	Q _{gd}	—	53	—	nC	I _D = 30 A
Body-drain diode forward voltage	V _{DF}	—	0.9	1.35	V	I _F = 30 A, V _{GS} = 0
Body-drain diode reverse recovery time	t _{rr}	—	210	—	ns	I _F = 30 A, V _{GS} = 0
Body-drain diode reverse recovery charge	Q _{rr}	—	1.8	—	μC	di _F /dt = 100 A/μs

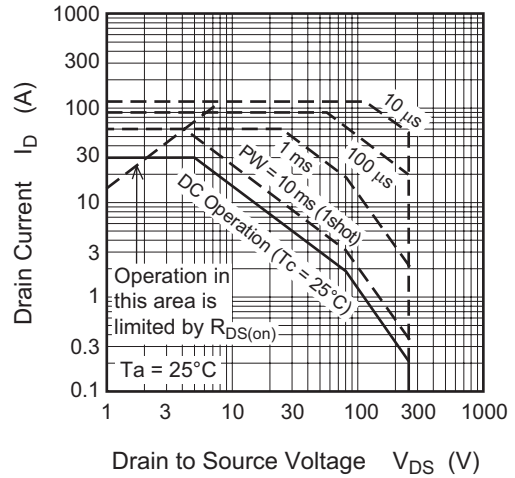
Note: 4. Pulse test

Main Characteristics

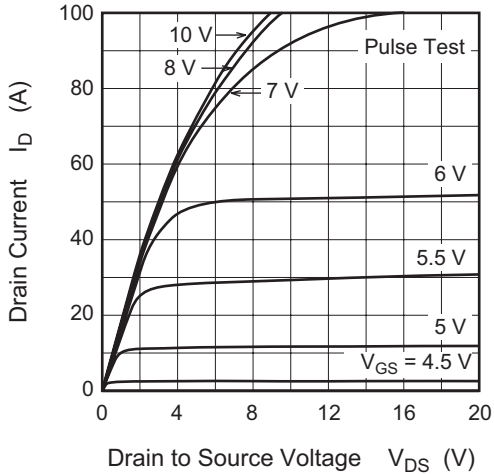
Power vs. Temperature Derating



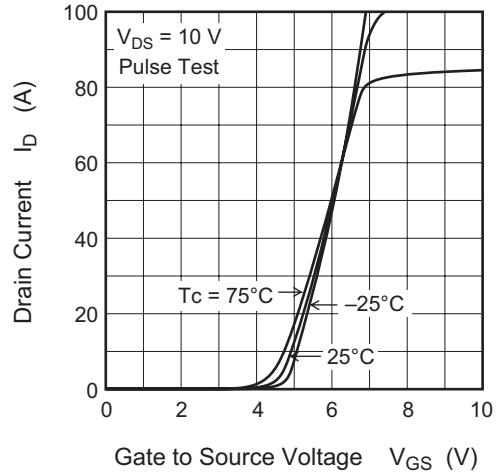
Maximum Safe Operation Area



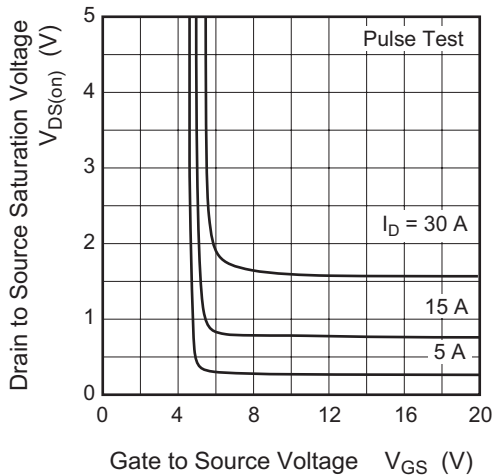
Typical Output Characteristics



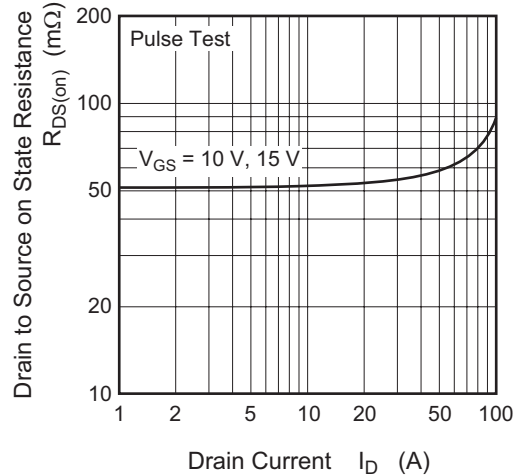
Typical Transfer Characteristics

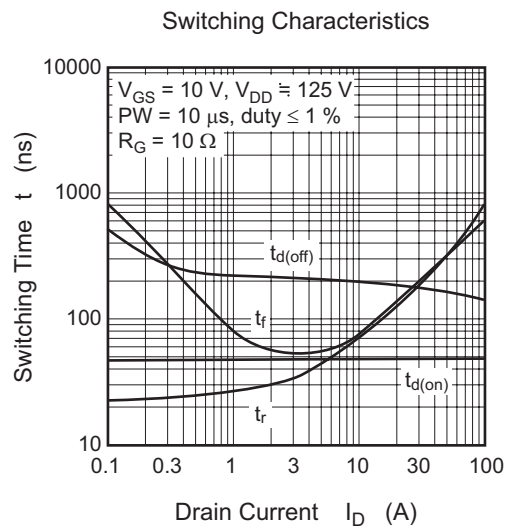
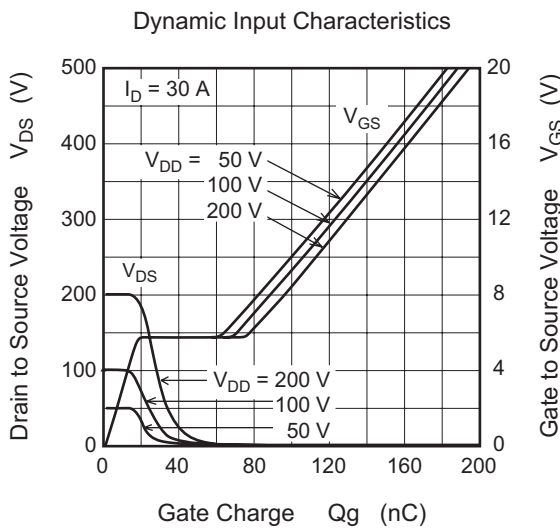
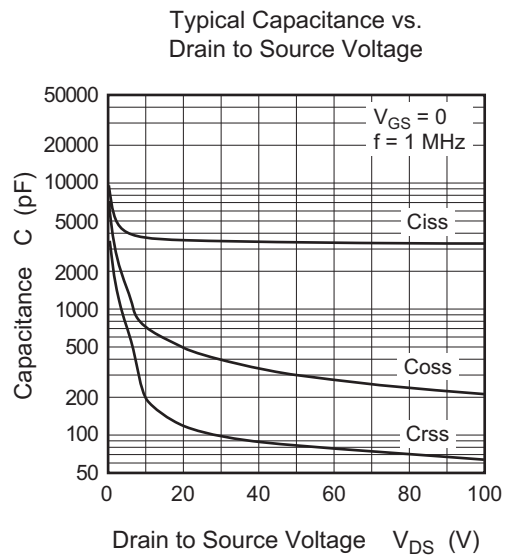
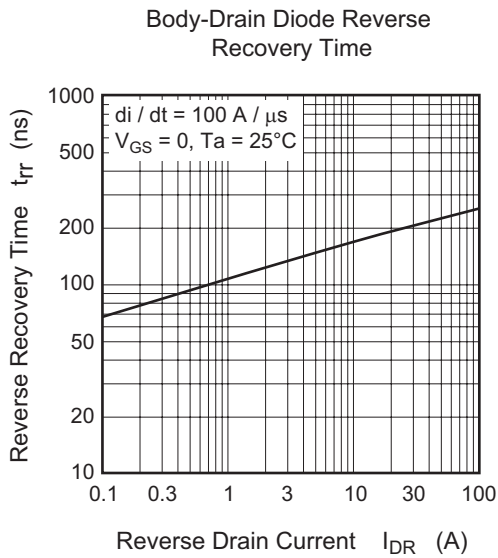
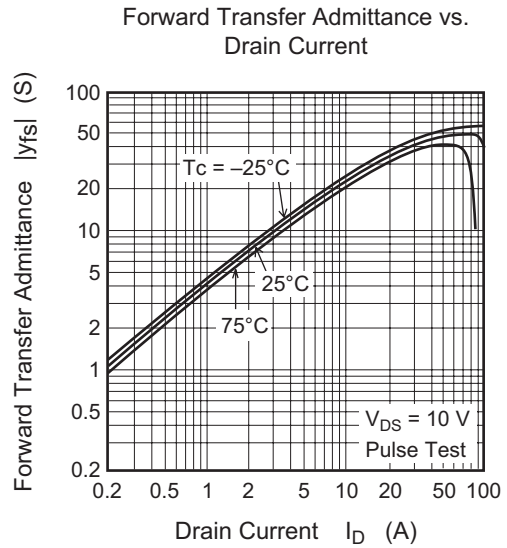
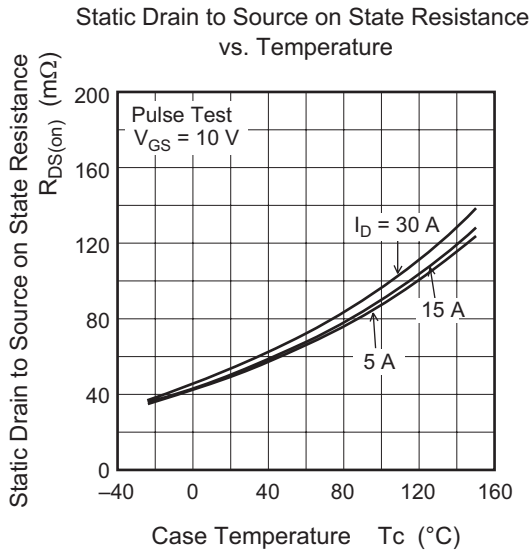


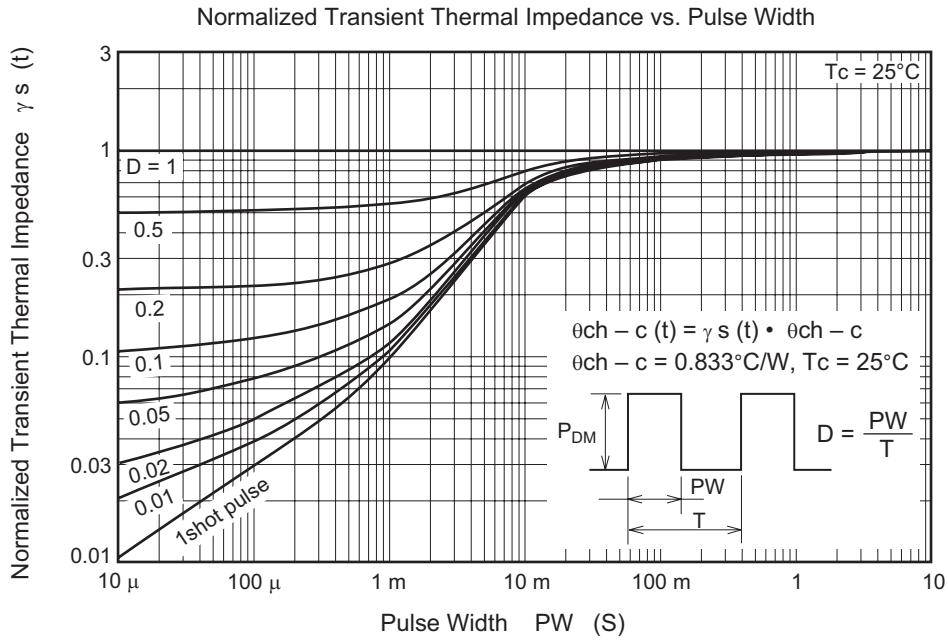
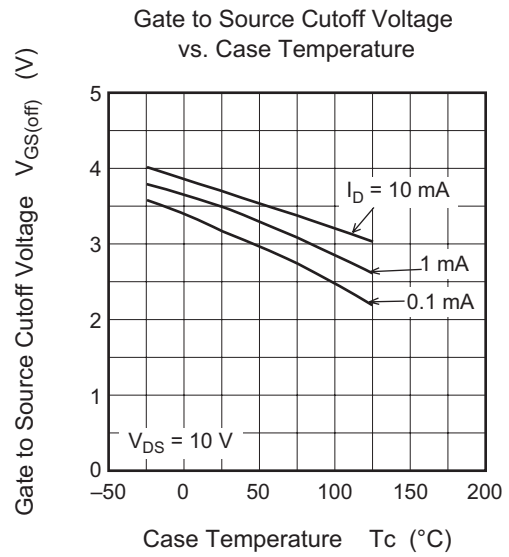
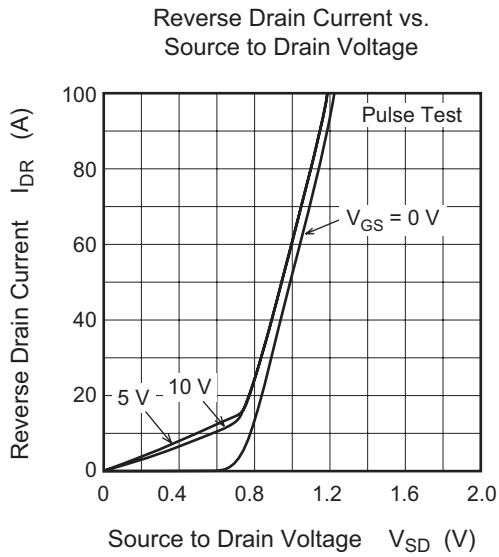
Drain to Source Saturation Voltage vs. Gate to Source Voltage



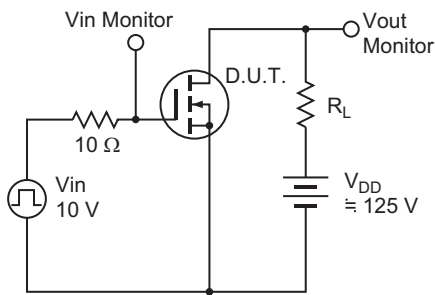
Static Drain to Source on State Resistance vs. Drain Current



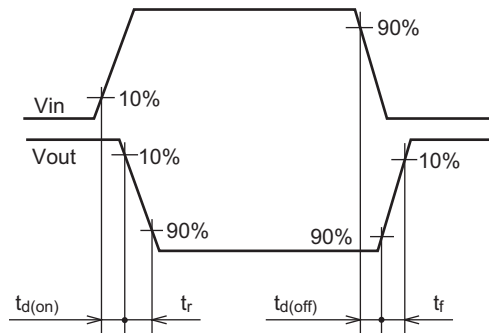




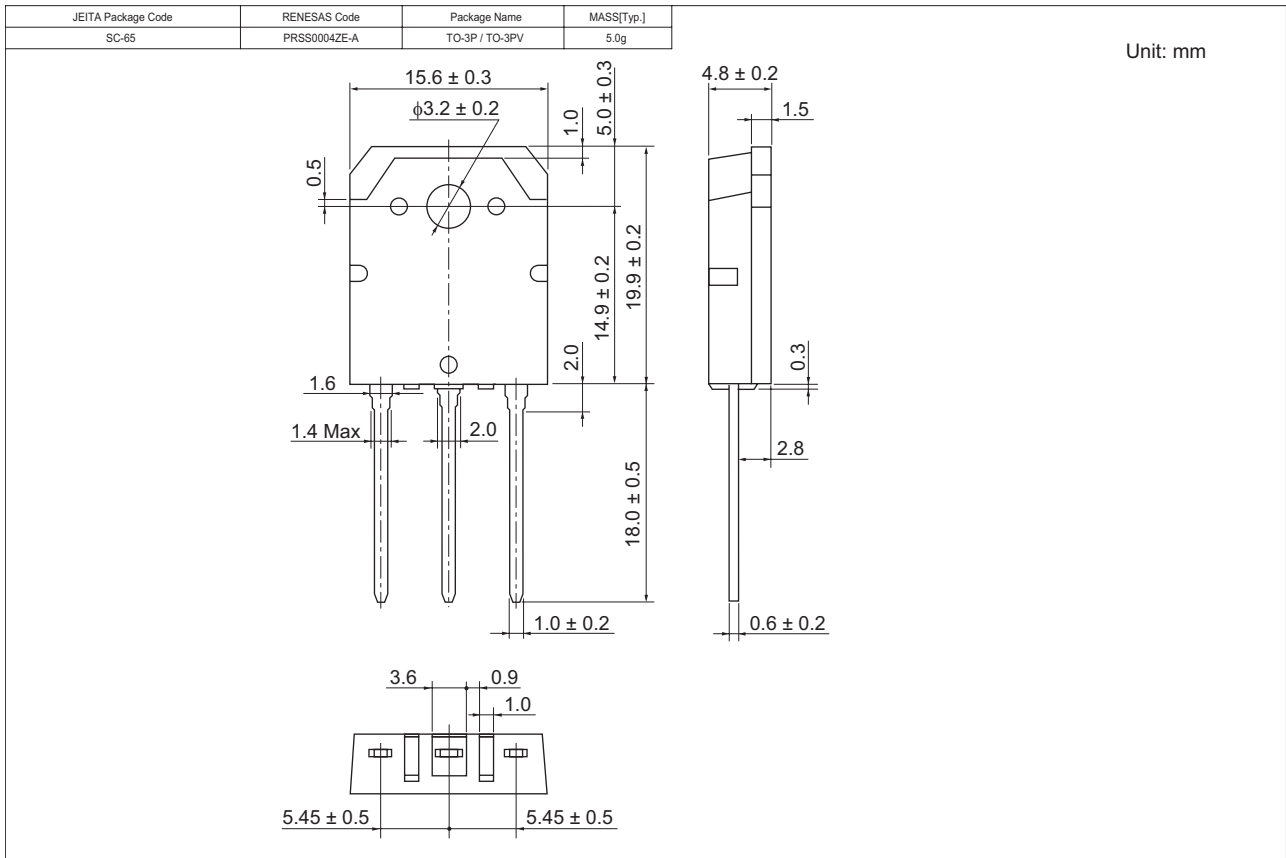
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
H5N2509P-E	360 pcs	Box (Tube)

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