

H5N5006DL, H5N5006DS

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G0397-0100

Rev.1.00

May 30, 2006

Features

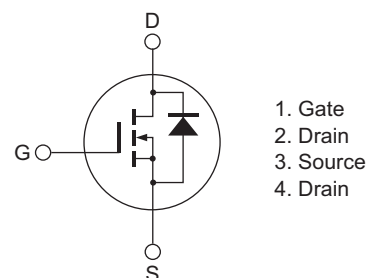
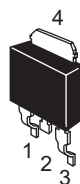
- Low on-resistance: $R_{DS(on)} = 2.5 \Omega$ typ.
- Low leakage current: $I_{DSS} = 1 \mu A$ max. (at $V_{DS} = 500 V$)
- High speed switching: $t_f = 15 ns$ typ. (at $V_{GS} = 10 V$, $V_{DD} \cong 250 V$, $I_D = 1.5 A$)
- Low gate charge: $Q_g = 14 nC$ typ. (at $V_{DD} = 400 V$, $V_{GS} = 10 V$, $I_D = 3 A$)
- Avalanche ratings

Outline

RENESAS Package code: PRSS0004ZD-B
(Package name: DPAK (L)-(2))



RENESAS Package code: PRSS0004ZD-C
(Package name: DPAK (S))



Absolute Maximum Ratings

($T_a = 25^\circ C$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	500	V
Gate to source voltage	V_{GSS}	± 30	V
Drain current	I_D	3	A
Drain peak current	$I_{D (pulse)}$ ^{Note1}	12	A
Body-drain diode reverse drain current	I_{DR}	3	A
Body-drain diode reverse drain peak current	$I_{DR (pulse)}$ ^{Note1}	12	A
Avalanche current	I_{AP} ^{Note3}	3	A
Channel dissipation	P_{ch} ^{Note2}	30	W
Channel to case thermal impedance	θ_{ch-c}	4.17	$^\circ C/W$
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature	T_{stg}	-55 to +150	$^\circ C$

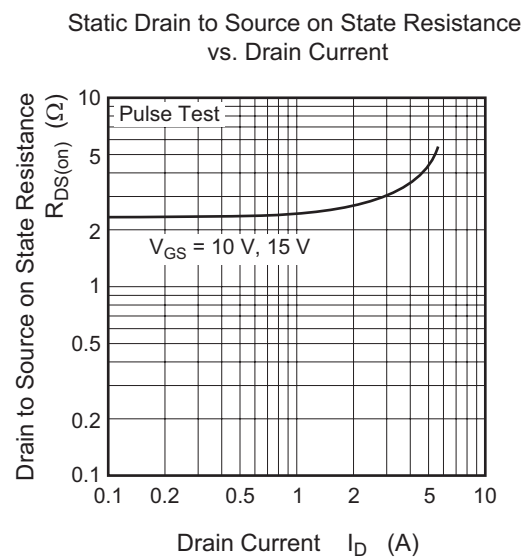
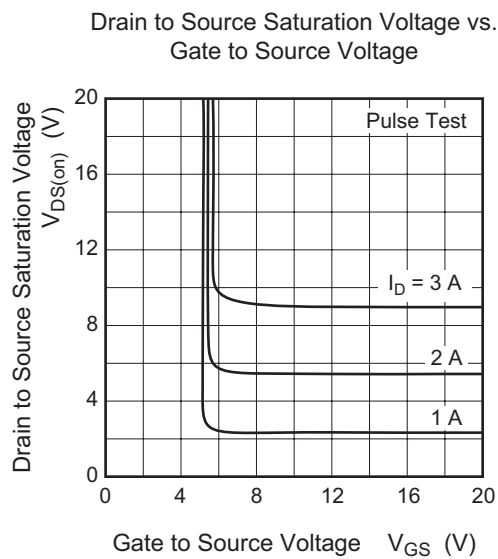
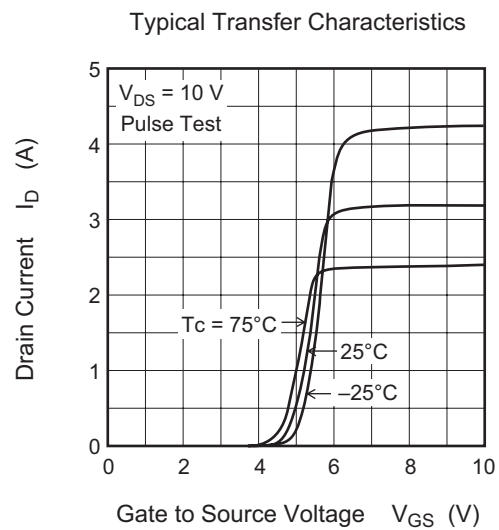
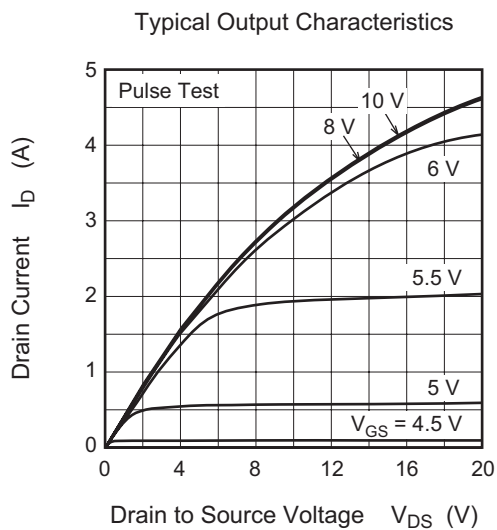
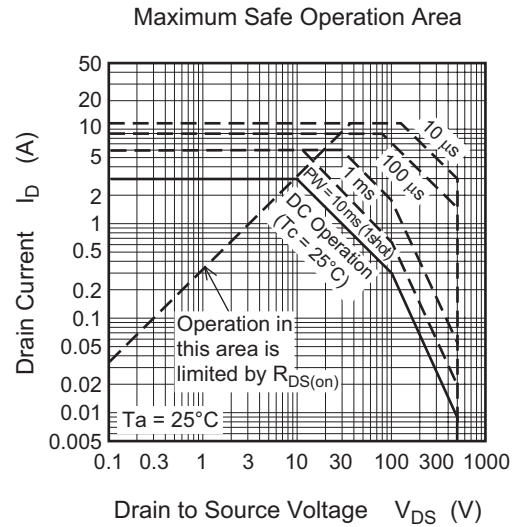
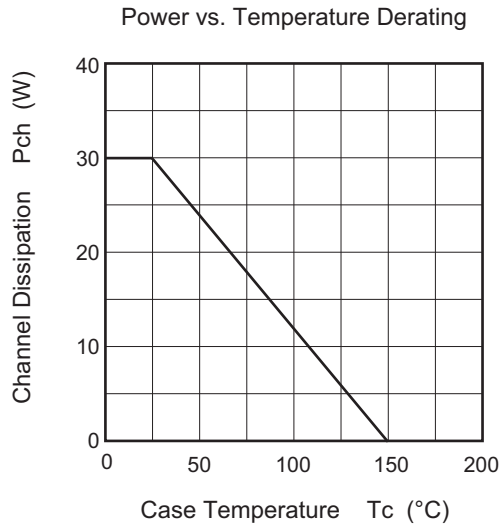
Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$
 2. Value at $T_c = 25^\circ C$
 3. $STch = 25^\circ C$, $T_{ch} \leq 150^\circ C$

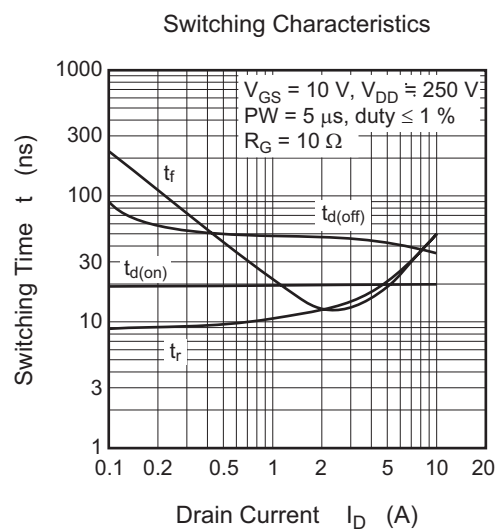
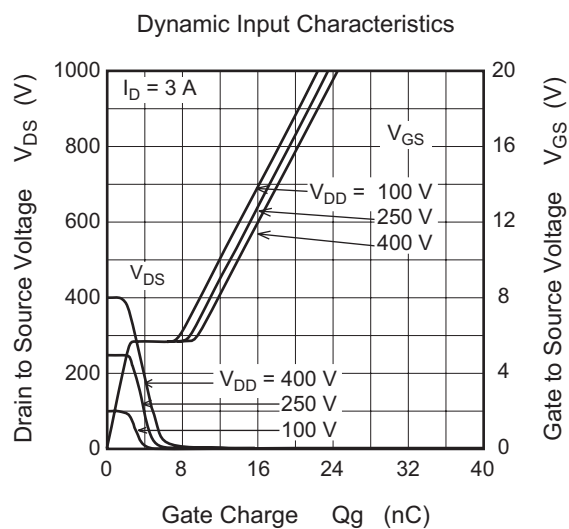
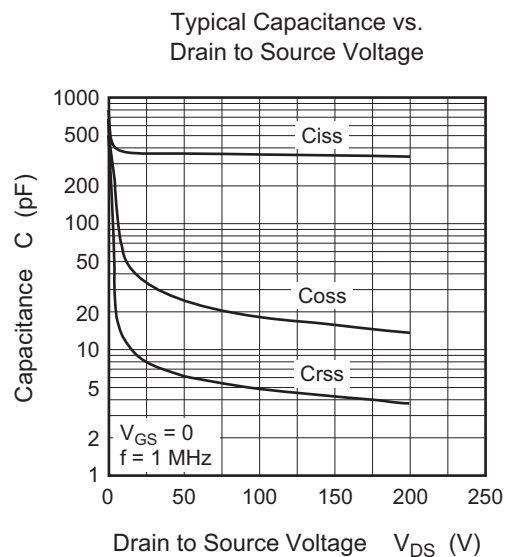
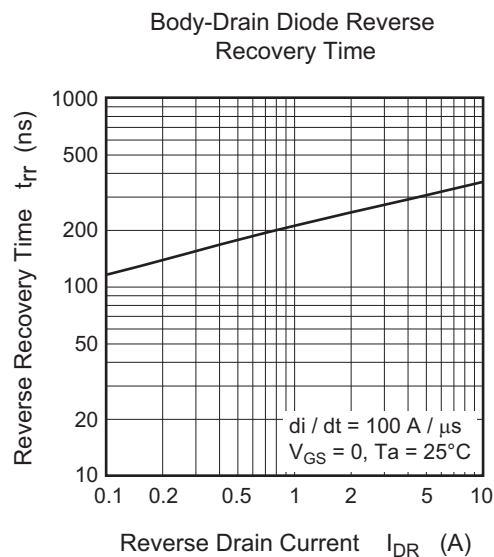
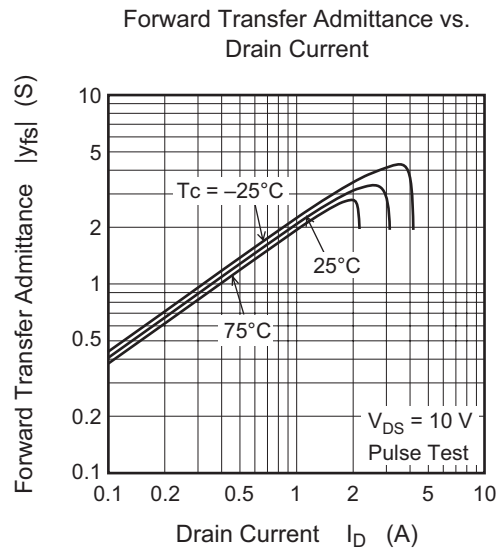
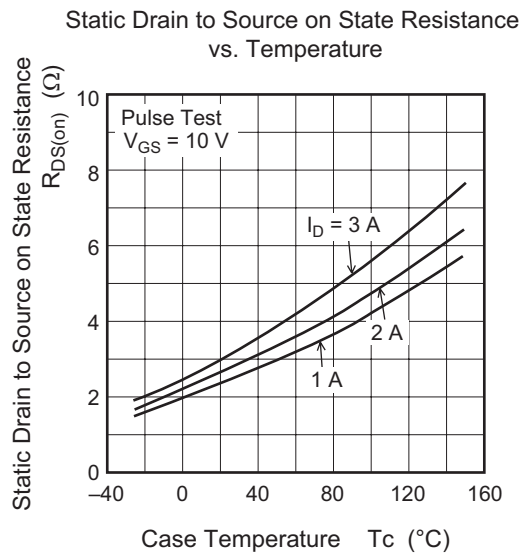
Electrical Characteristics

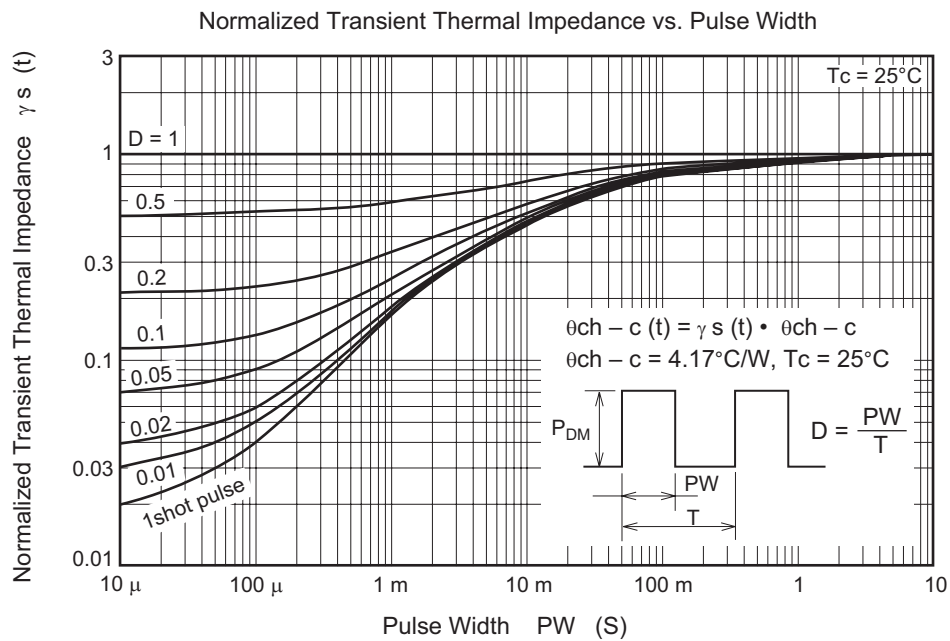
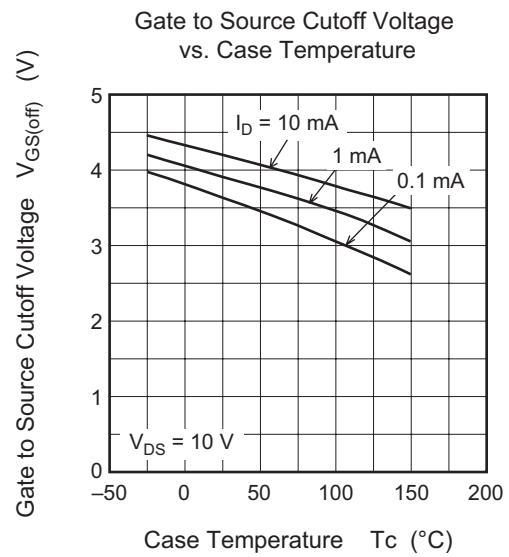
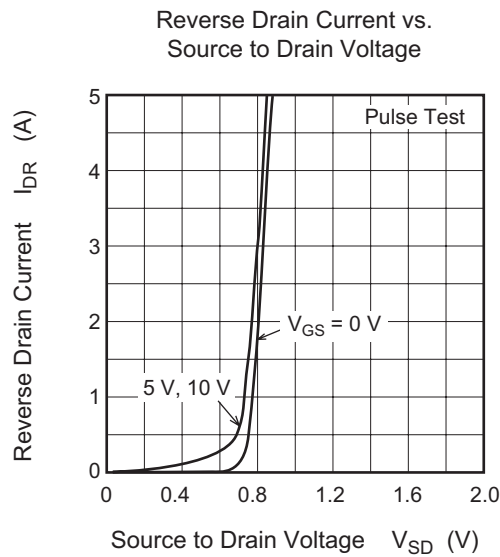
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 500 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Forward transfer admittance	$ y_{fs} $	1.5	2.5	—	S	$I_D = 1.5 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Static drain to source on state resistance	$R_{DS(on)}$	—	2.5	3.0	Ω	$I_D = 1.5 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	365	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	35	—	pF	
Reverse transfer capacitance	C_{rss}	—	8	—	pF	
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$V_{DD} \cong 250 \text{ V}$, $I_D = 1.5 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 167 \Omega$ $R_g = 10 \Omega$
Rise time	t_r	—	12	—	ns	
Turn-off delay time	$t_{d(off)}$	—	48	—	ns	
Fall time	t_f	—	15	—	ns	$V_{DD} = 400 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 3 \text{ A}$
Total gate charge	Q_g	—	14	—	nC	
Gate to source charge	Q_{gs}	—	2	—	nC	
Gate to drain charge	Q_{gd}	—	8	—	nC	$I_F = 3 \text{ A}$, $V_{GS} = 0$ ^{Note4} $I_F = 3 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$
Body-drain diode forward voltage	V_{DF}	—	0.85	1.3	V	
Body-drain diode reverse recovery time	t_{rr}	—	270	—	ns	
Body-drain diode reverse recovery charge	Q_{rr}	—	0.8	—	μC	

Notes: 4. Pulse test

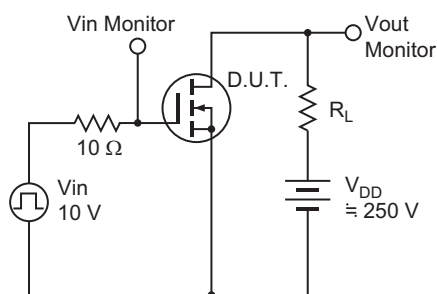
Main Characteristics



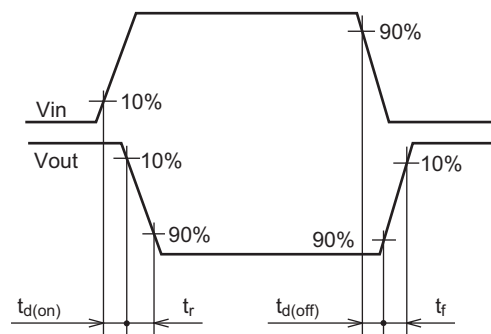




Switching Time Test Circuit



Waveform



Package Dimensions

• H5N5006DL

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
DPAK(L)-(2)	—	PRSS0004ZD-B	DPAK(L)-(2) / DPAK(L)-(2)V	0.42g	

Top view dimensions: 6.5 ± 0.5, 5.4 ± 0.5, 1.7 ± 0.5, 5.5 ± 0.5, 1.15 ± 0.1, 0.8 ± 0.1 (0.7), 3.1 ± 0.5, 4.7 ± 0.5, 16.2 ± 0.5, 0.55 ± 0.1, 2.29 ± 0.5.

Side view dimensions: 2.3 ± 0.2, 0.55 ± 0.1, 1.2 ± 0.3, 0.55 ± 0.1.

Bottom view dimensions: 2.29 ± 0.5.

• H5N5006DS

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
DPAK(S)	SC-63	PRSS0004ZD-C	DPAK(S) / DPAK(S)V	0.28g	

Top view dimensions: 1.5 ± 0.5, 6.5 ± 0.5, 5.4 ± 0.5, (0.1), 5.5 ± 0.5, 1.2 Max, (1.2), 1.0 Max, 0.8 ± 0.1, 2.5 ± 0.5, 2.29 ± 0.5.

Side view dimensions: 2.3 ± 0.2, 0.55 ± 0.1, 0 - 0.25, 0.55 ± 0.1.

Bottom view dimensions: (5.1), (5.1).

Ordering Information

Part Name	Quantity	Shipping Container
H5N5006DL-E	3200 pcs	Box (Sack)
H5N5006DSTL-E	3000 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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