

RJK1211DNS

Silicon N Channel Power MOS FET Power Switching

R07DS0090EJ0300

Rev.3.00

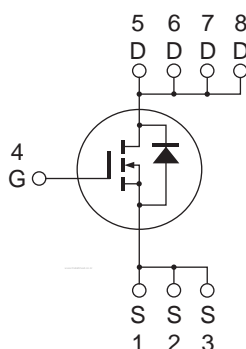
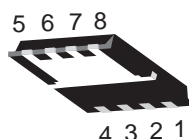
Feb 01, 2012

Features

- High speed switching
- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 100 \text{ m}\Omega$ typ. (at $V_{GS} = 10 \text{ V}$)
- Pb-free
- Halogen-free

Outline

RENESAS Package code: PWSN0008JB-A
(Package name: HWSN-8)



1, 2, 3 Source
4 Gate
5, 6, 7, 8 Drain

Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	120	V
Gate to source voltage	V_{GSS}	+12, -5	V
Drain current	I_D	5	A
Drain peak current	$I_{D(pulse)}$ ^{Note 1}	15	A
Body-drain diode reverse drain current	I_{DR}	5	A
Avalanche current	I_{AP} ^{Note 2}	3	A
Avalanche energy	E_{AR} ^{Note 2}	0.77	mJ
Channel dissipation	P_{ch} ^{Note 3}	10	W
Channel to case thermal impedance	θ_{ch-c} ^{Note 3}	12.5	$^\circ\text{C}/\text{W}$
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$
 2. Value at $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$
 3. $T_c = 25^\circ\text{C}$

Electrical Characteristics

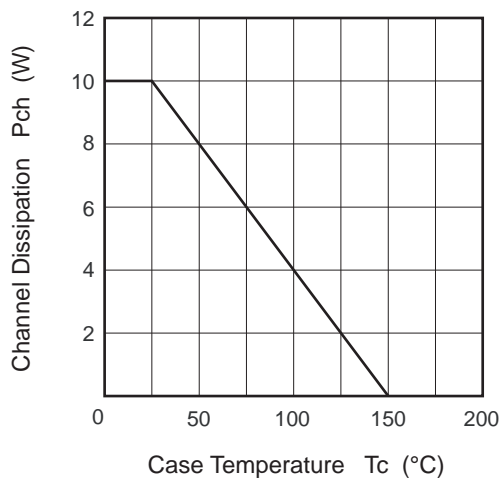
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	120	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = +12, -5 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 120 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.2	—	2.5	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	100	130	$\text{m}\Omega$	$I_D = 2.5 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
	$R_{DS(on)}$	—	110	150	$\text{m}\Omega$	$I_D = 2.5 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	—	9.0	—	S	$I_D = 2.5 \text{ A}$, $V_{DS} = 5 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	1070	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	80	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	35	—	pF	$f = 1 \text{ MHz}$
Gate Resistance	R_g	—	1.7	—	Ω	
Total gate charge	Q_g	—	8.0	—	nC	$V_{DD} = 50 \text{ V}$
Gate to source charge	Q_{gs}	—	3.0	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	Q_{gd}	—	2.0	—	nC	$I_D = 5 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	7.8	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 2.5 \text{ A}$
Rise time	t_r	—	2.8	—	ns	$V_{DD} \cong 30 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	38	—	ns	$R_L = 12 \Omega$
Fall time	t_f	—	2.7	—	ns	$R_g = 4.7 \Omega$
Body-drain diode forward voltage	V_{DF}	—	0.83	1.1	V	$I_F = 5 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 5 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

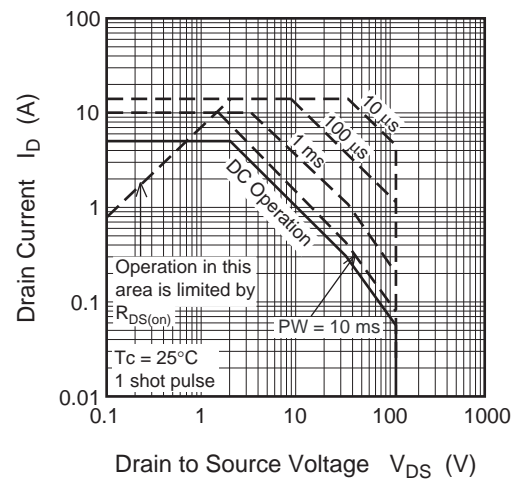
Notes: 4. Pulse test

Main Characteristics

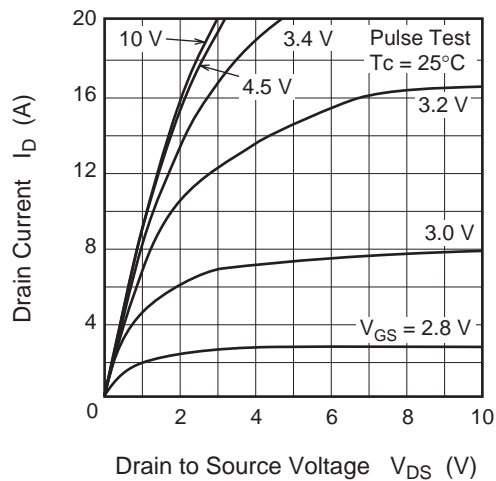
Power vs. Temperature Derating



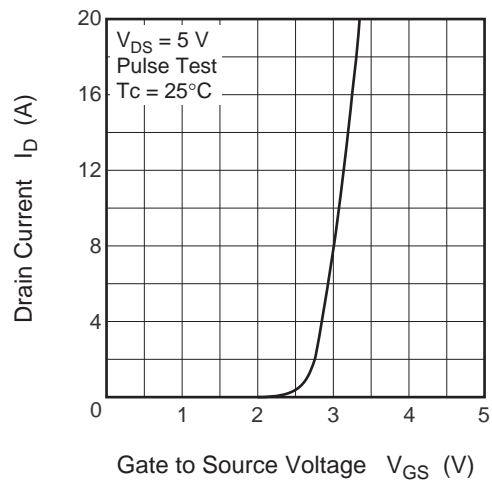
Maximum Safe Operation Area



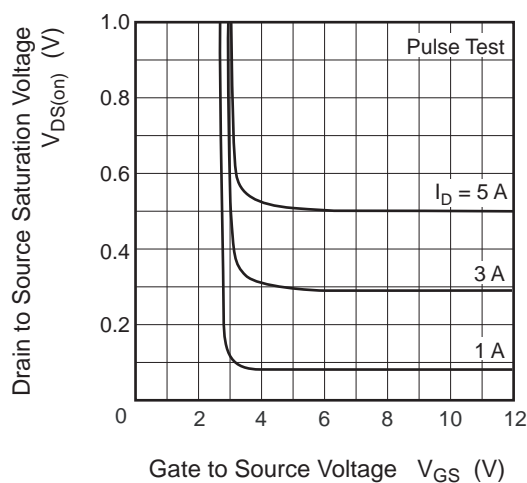
Typical Output Characteristics



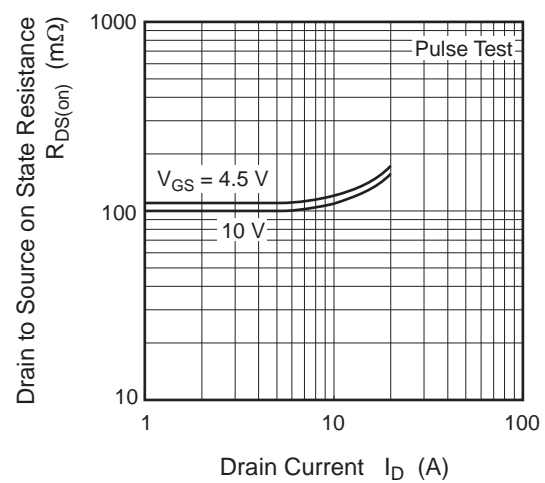
Typical Transfer Characteristics

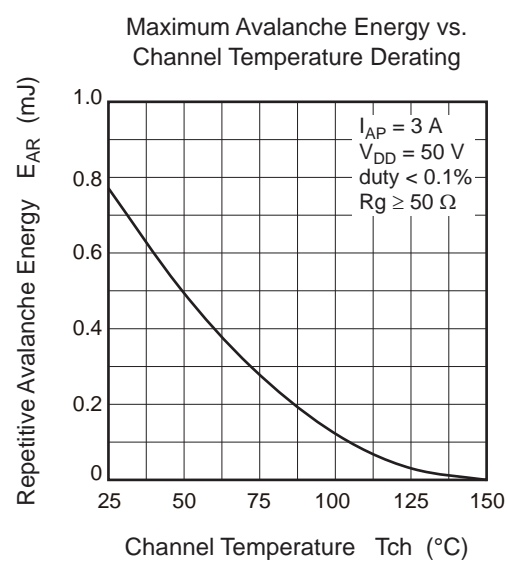
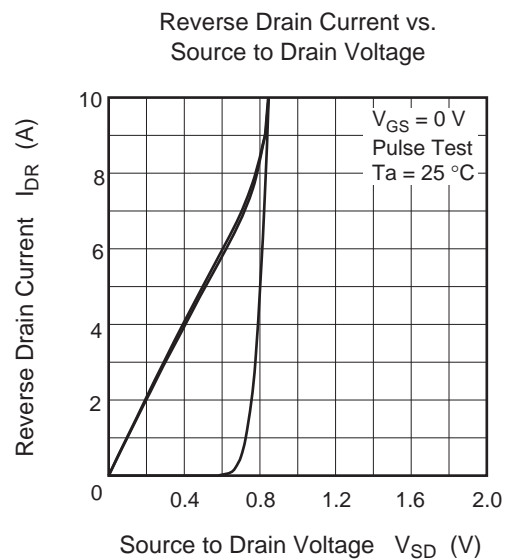
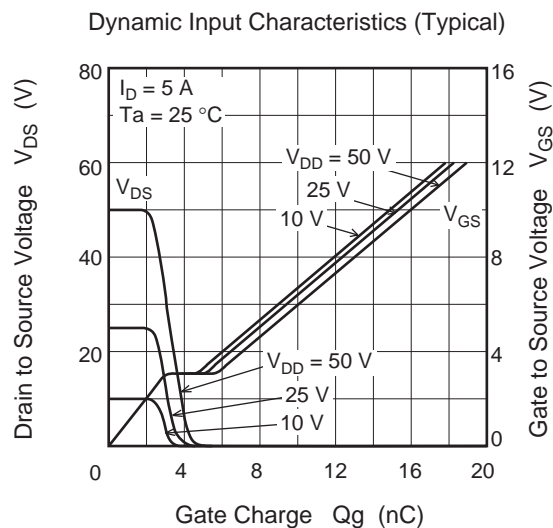
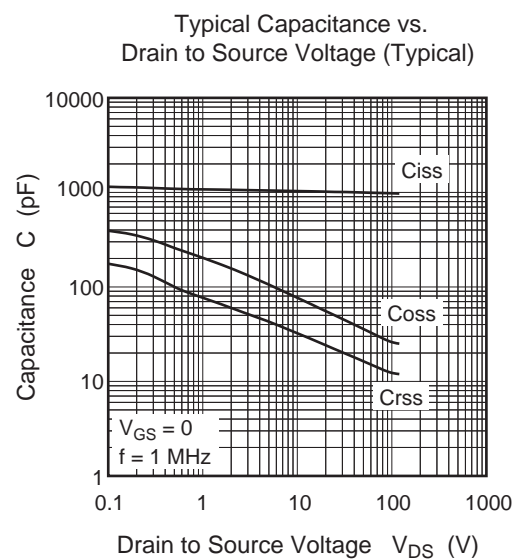
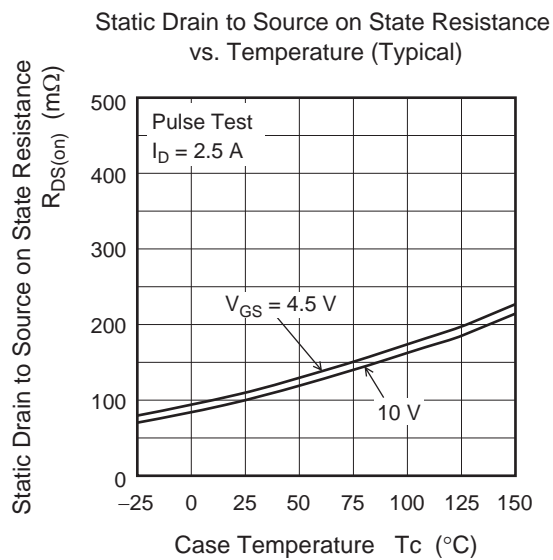


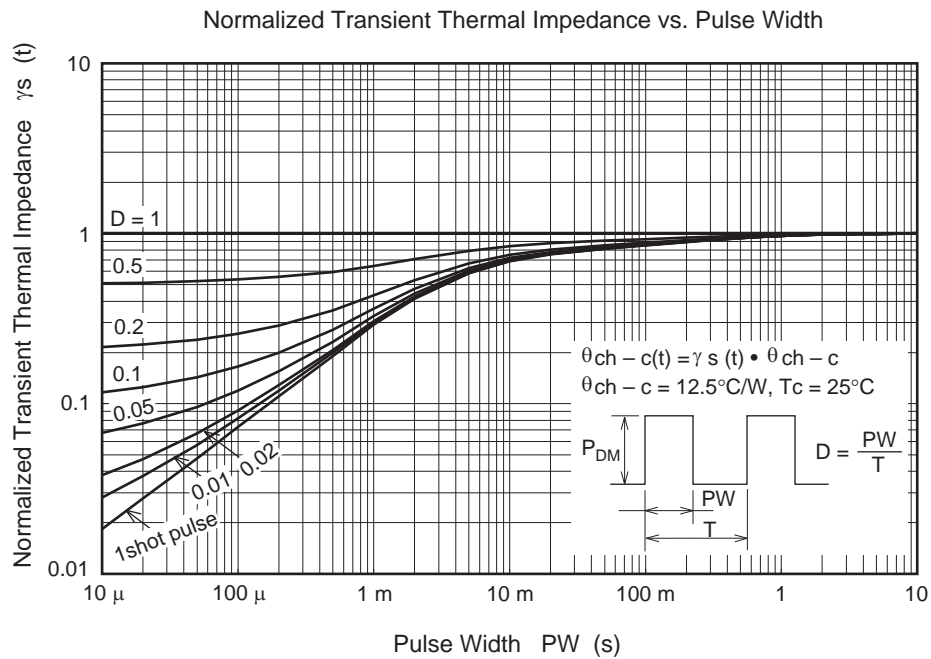
Drain to Source Saturation Voltage vs. Gate to Source Voltage



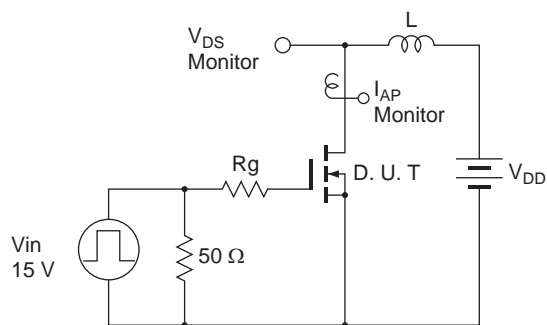
Static Drain to Source on State Resistance vs. Drain Current (Typical)



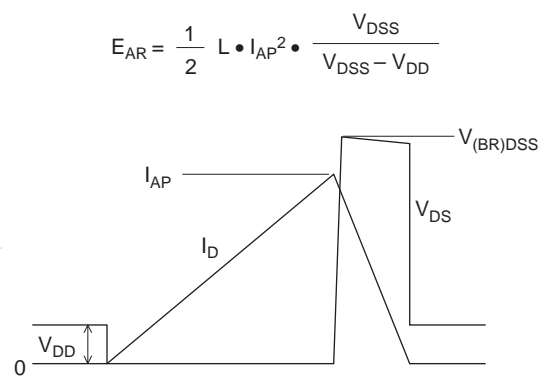




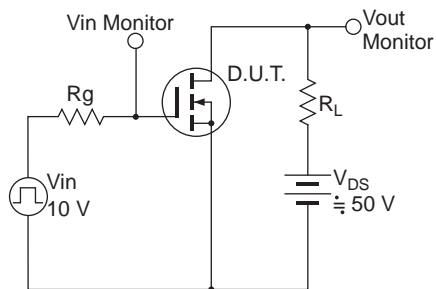
Avalanche Test Circuit



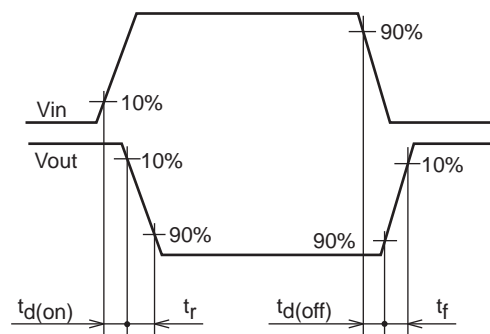
Avalanche Waveform



Switching Time Test Circuit

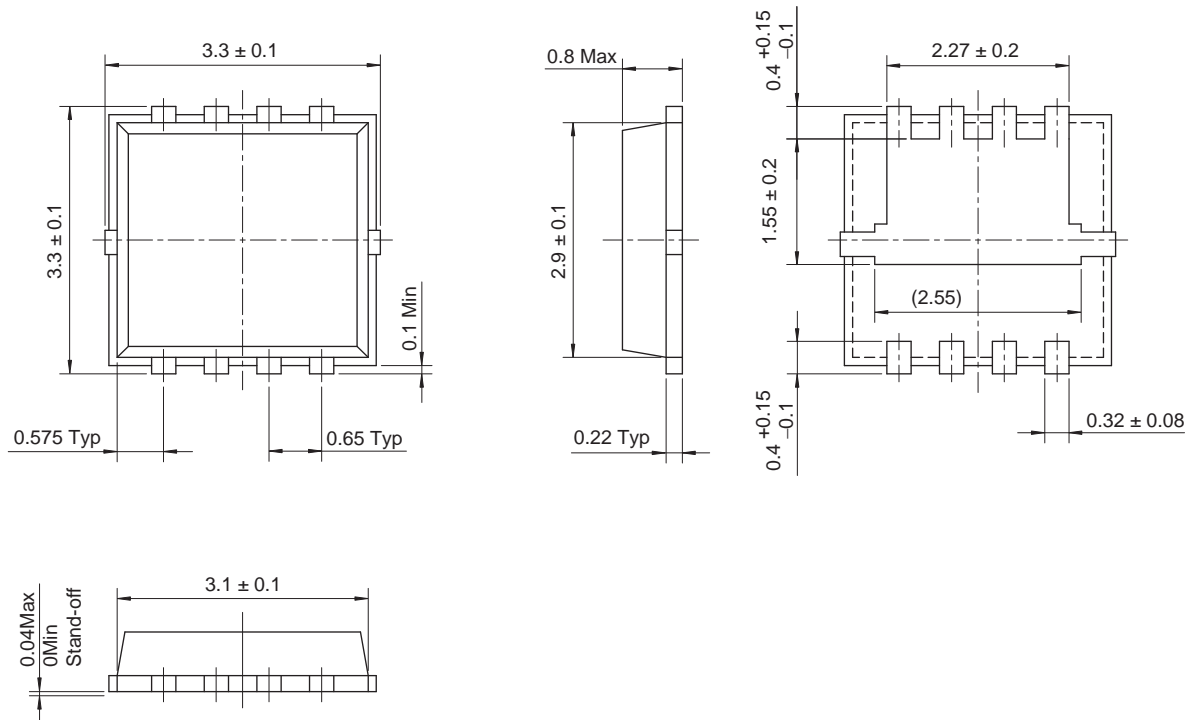


Switching Time Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
HWSN-8	P-HWSN8-2.9x3.1-0.65	PWSN0008JB-A	—	0.022g



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK1211DNS-00-J5	5000 pcs	Taping

Note: The symbol of 2nd "-" is occasionally presented as "#".

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