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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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HAT2189WP

Silicon N Channel Power MOS FET Power Switching

REJ03G1251-0200

Rev.2.00

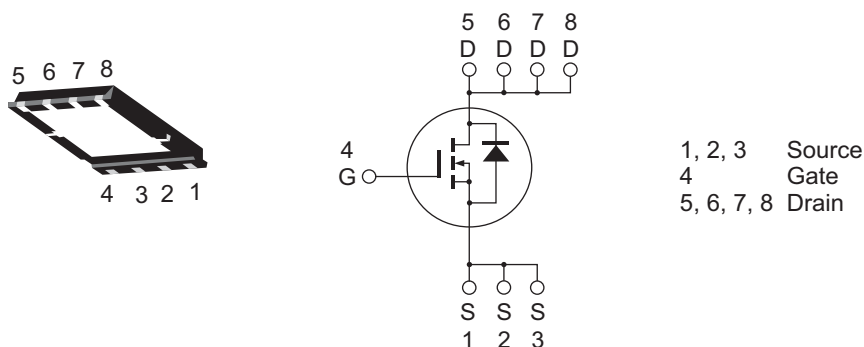
Aug 28, 2009

Features

- Low on-resistance
- Low drive current
- High density mounting

Outline

RENESAS Package code: PWSN0008DA-A
(Package name: WPAK)



Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	200	V
Gate to source voltage	V_{GSS}	± 30	V
Drain current	I_D	8.5	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	17	A
Body-drain diode reverse drain current	I_{DR}	8.5	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ ^{Note1}	17	A
Avalanche current	I_{AP} ^{Note3}	8.5	A
Avalanche energy	E_{AR} ^{Note3}	4.8	mJ
Channel dissipation	P_{ch} ^{Note2}	20	W
Channel to case thermal impedance	θ_{ch-c}	6.25	$^\circ\text{C}/\text{W}$
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 $T_c = 25^\circ\text{C}$

3. $STch = 25^\circ\text{C}$, $T_{ch} \leq 150^\circ\text{C}$

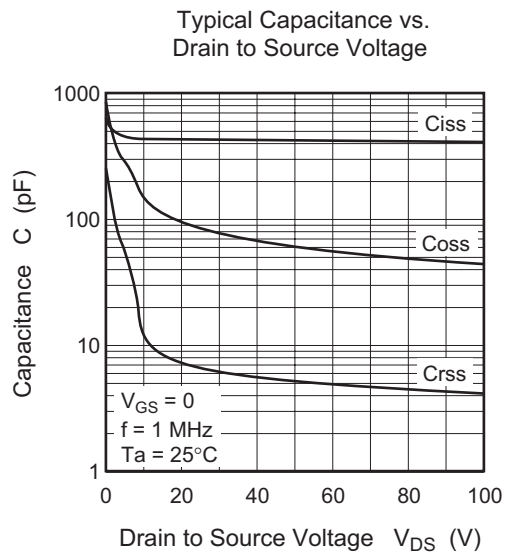
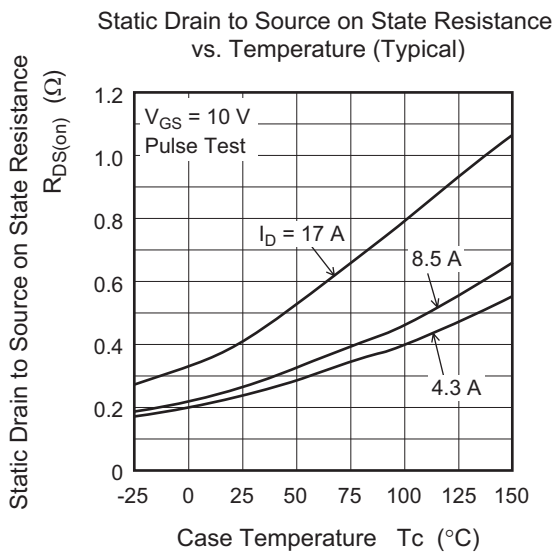
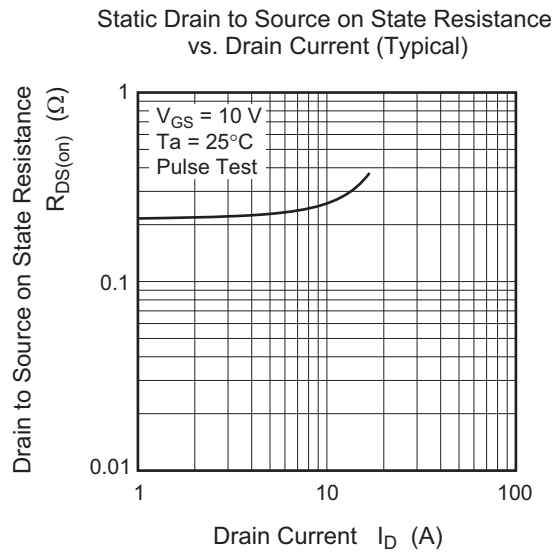
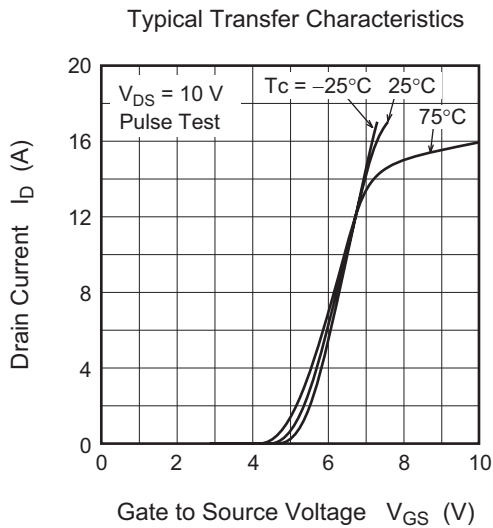
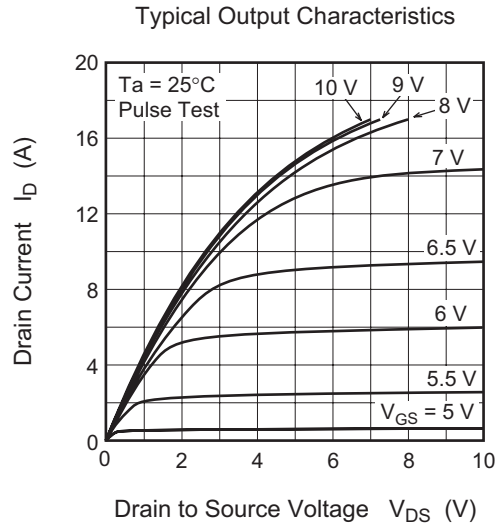
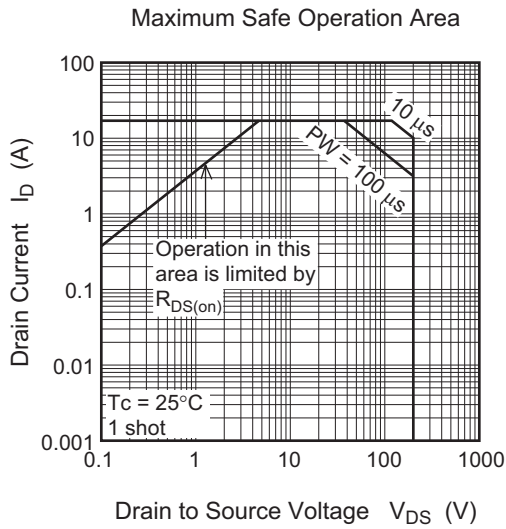
Electrical Characteristics

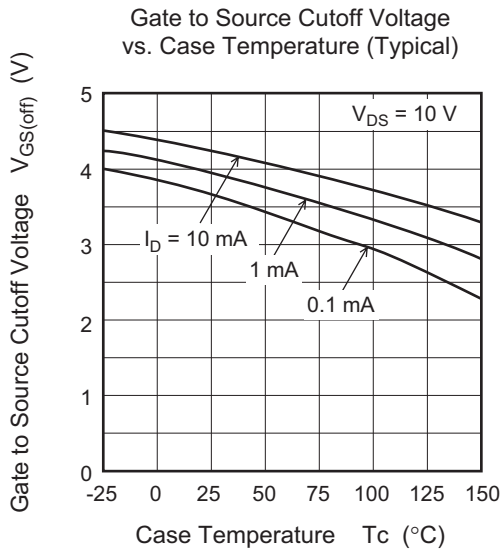
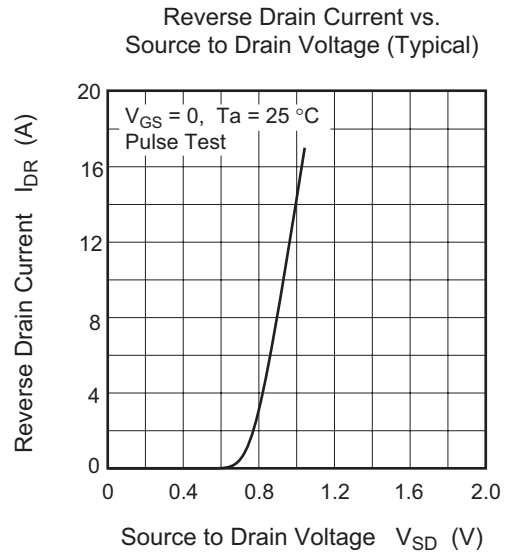
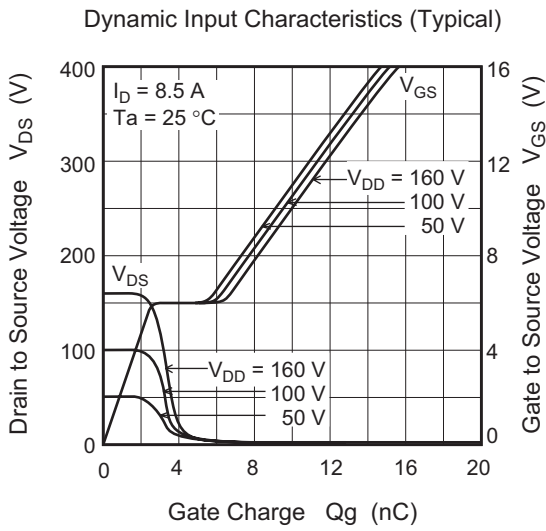
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 200 \text{ V}$, $V_{GS} = 0$
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} $	3.5	6.0	—	S	$I_D = 4.3 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Static drain to source on state resistance	$R_{DS(on)}$	—	0.23	0.27	Ω	$I_D = 4.3 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	430	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	C_{oss}	—	86	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	7	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	24	—	ns	$I_D = 4.3 \text{ A}$
Rise time	t_r	—	24	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	44	—	ns	$R_L = 23.3 \Omega$
Fall time	t_f	—	9	—	ns	$R_g = 10 \Omega$
Total gate charge	Q_g	—	10	—	nC	$V_{DD} = 160 \text{ V}$
Gate to source charge	Q_{gs}	—	2.7	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Q_{gd}	—	3.8	—	nC	$I_D = 8.5 \text{ A}$
Body-drain diode forward voltage	V_{DF}	—	0.9	1.4	V	$I_F = 8.5 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	100	—	ns	$I_F = 8.5 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

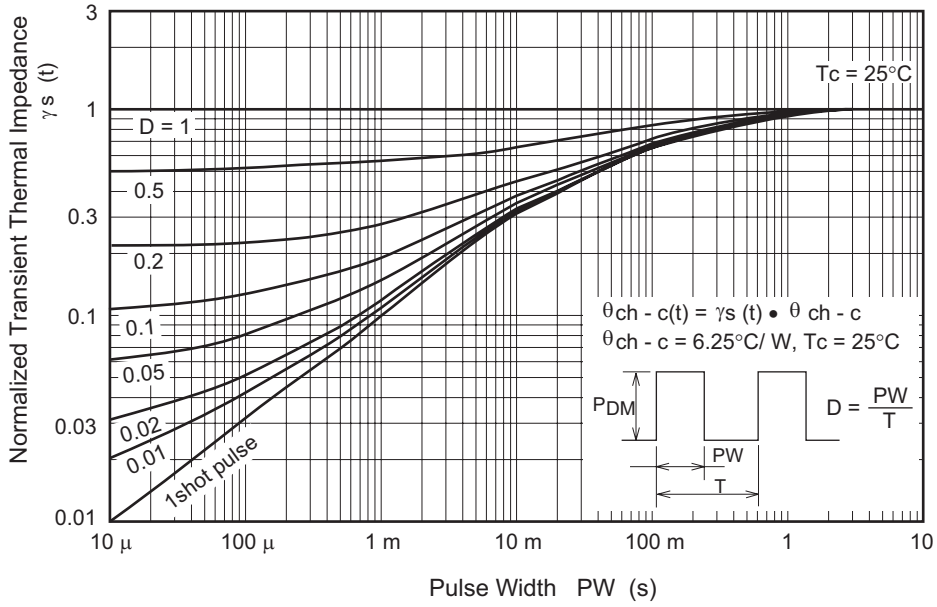
Notes: 4. Pulse test

Main Characteristics

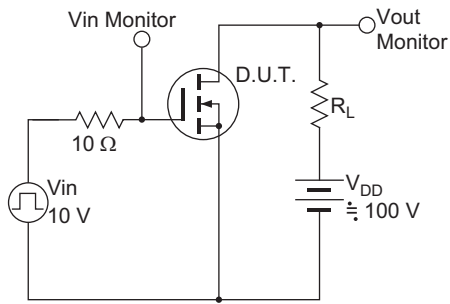




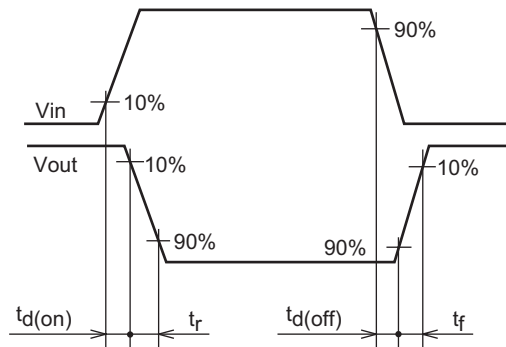
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



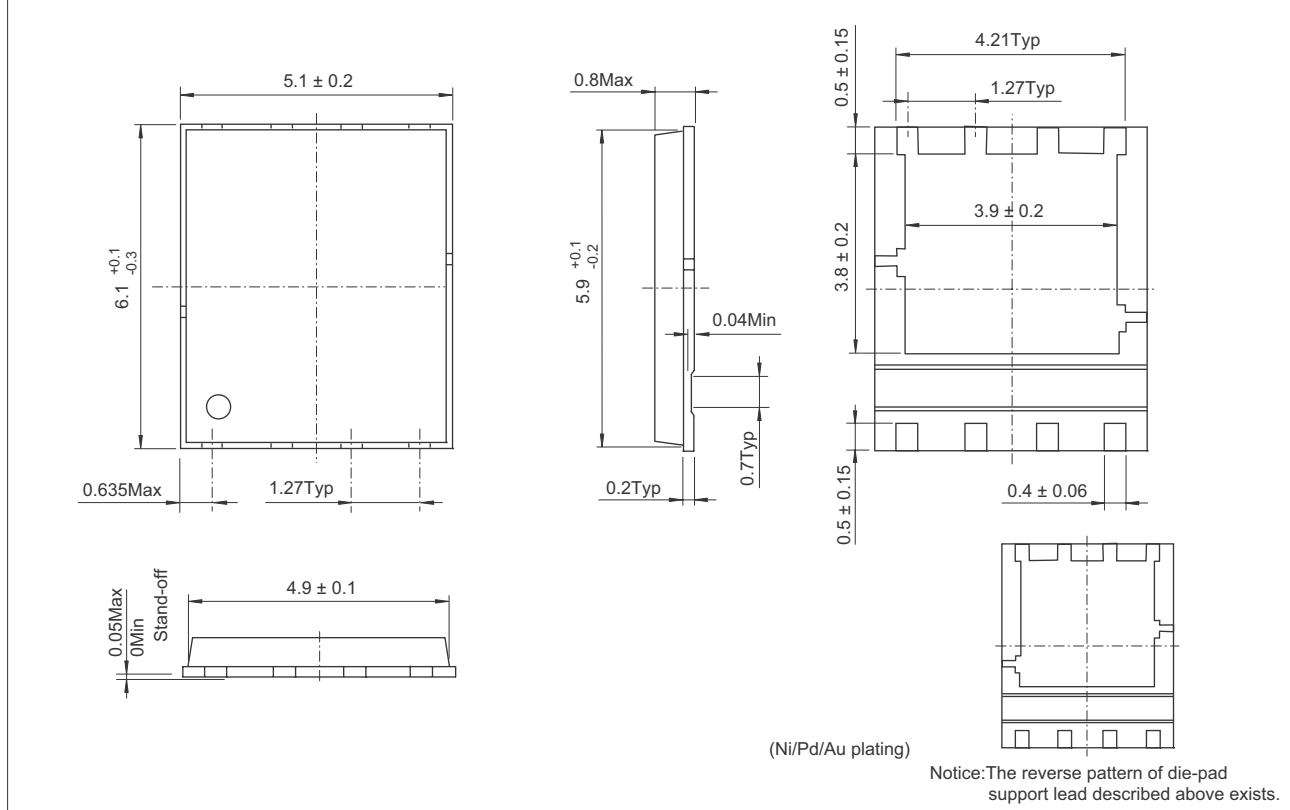
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
WPAK	-	PWSN0008DA-A	WPAKV	0.075g

Unit: mm



Ordering Information

Part No.	Quantity	Shipping Container
HAT2189WP-EL-E	2500 pcs	Taping

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