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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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HAT2184WP

Silicon N Channel Power MOS FET Power Switching

REJ03G0536-0500

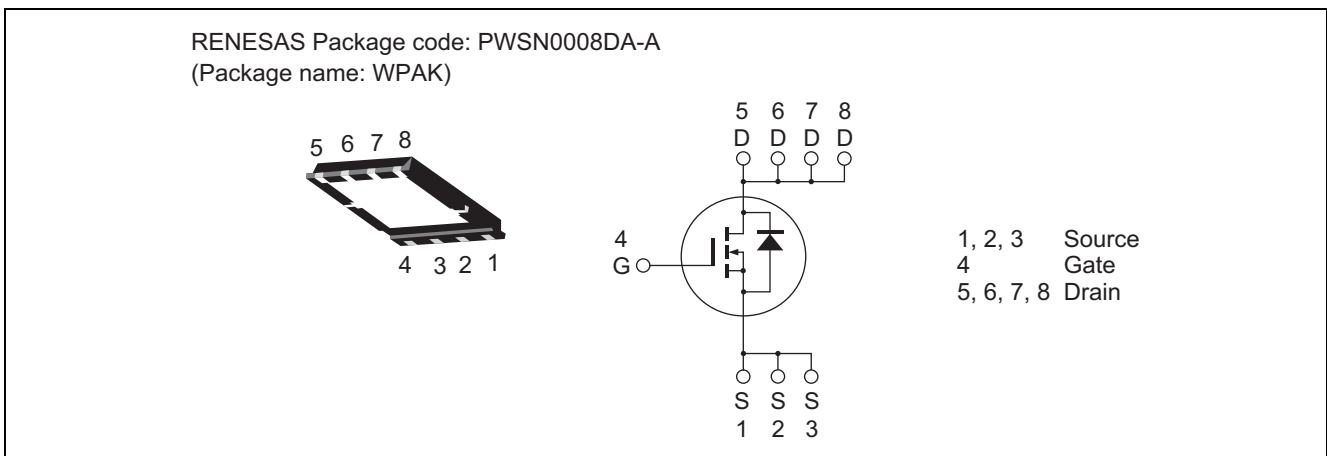
Rev.5.00

Nov 27, 2006

Features

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

Outline



Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	150	V
Gate to source voltage	V_{GSS}	± 30	V
Drain current	I_D	14	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	28	A
Body-drain diode reverse drain current	I_{DR}	14	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ ^{Note1}	28	A
Avalanche current	I_{AP} ^{Note3}	14	A
Avalanche energy	E_{AR} ^{Note3}	14.7	mJ
Channel dissipation	P_{ch} ^{Note2}	25	W
Channel to case thermal impedance	θ_{ch-c}	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 $T_c = 25^\circ\text{C}$

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

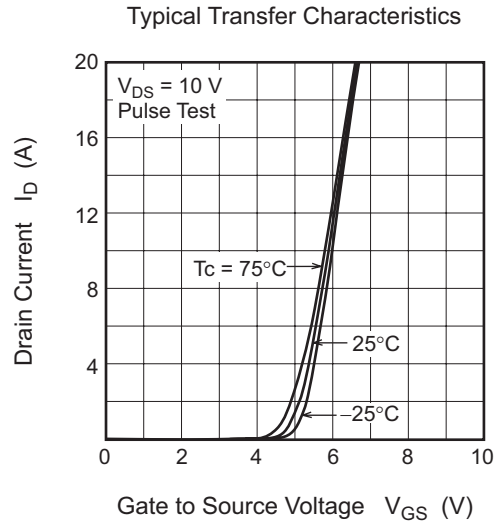
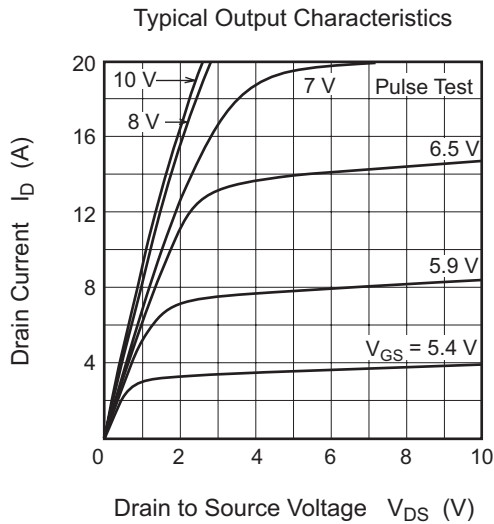
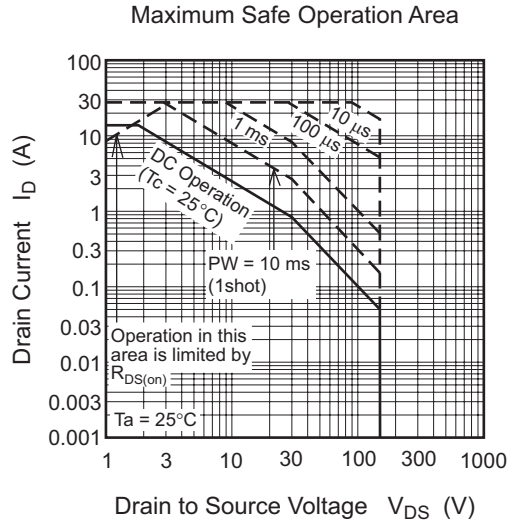
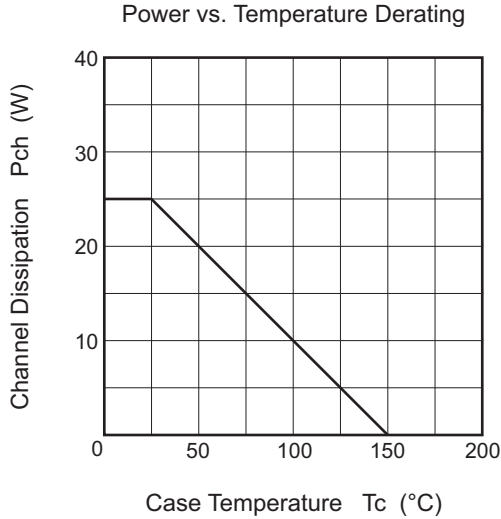
Electrical Characteristics

(Ta = 25°C)

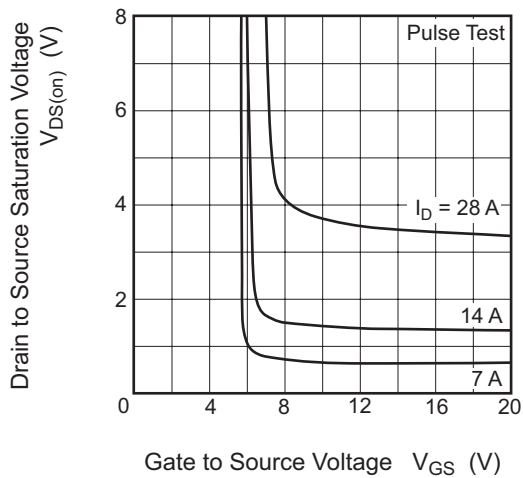
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 150 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$
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} $	6	10	—	S	$I_D = 7 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Static drain to source on state resistance	$R_{DS(on)}$	—	0.097	0.11	Ω	$I_D = 7 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	710	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	C_{oss}	—	160	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	13	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	26	—	ns	$I_D = 7 \text{ A}$
Rise time	t_r	—	31	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	53	—	ns	$R_L = 10.7 \Omega$
Fall time	t_f	—	7	—	ns	$R_g = 10 \Omega$
Total gate charge	Q_g	—	15	—	nC	$V_{DD} = 120 \text{ V}$
Gate to source charge	Q_{gs}	—	4.3	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Q_{gd}	—	5.6	—	nC	$I_D = 14 \text{ A}$
Body-drain diode forward voltage	V_{DF}	—	0.85	1.4	V	$I_F = 14 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	95	—	ns	$I_F = 14 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

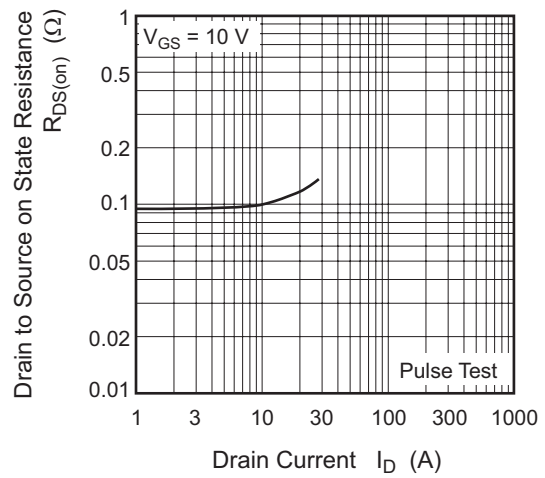
Main Characteristics

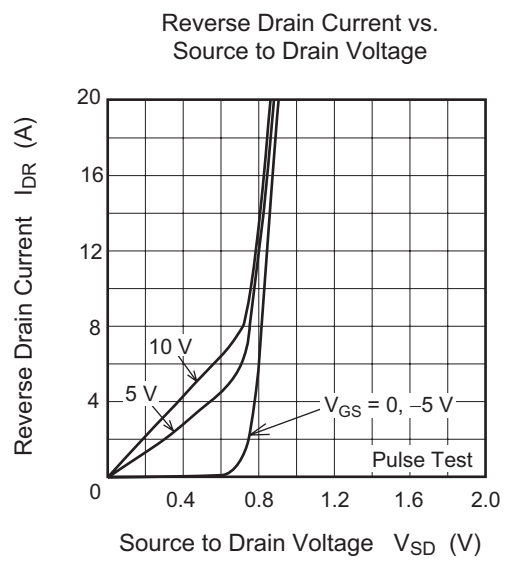
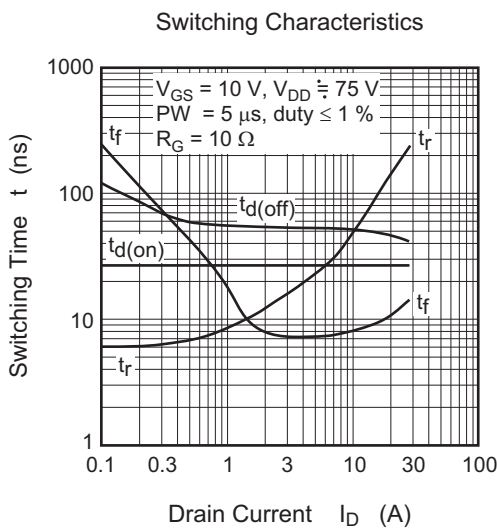
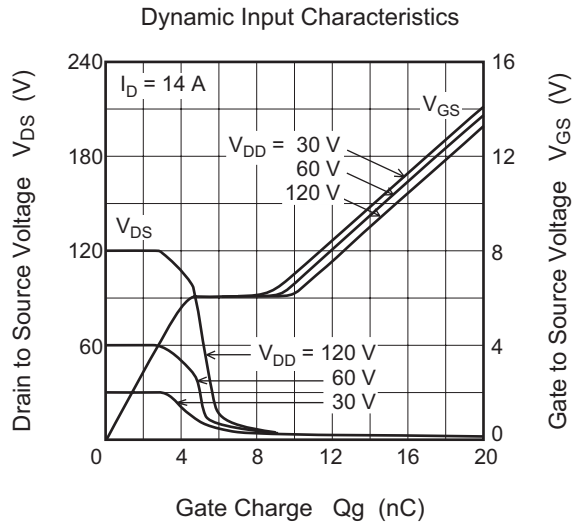
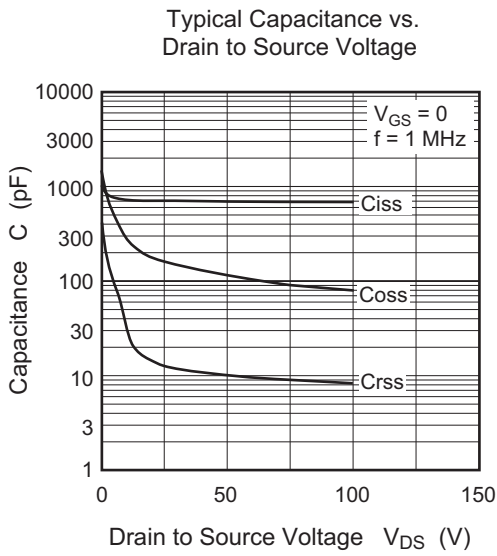
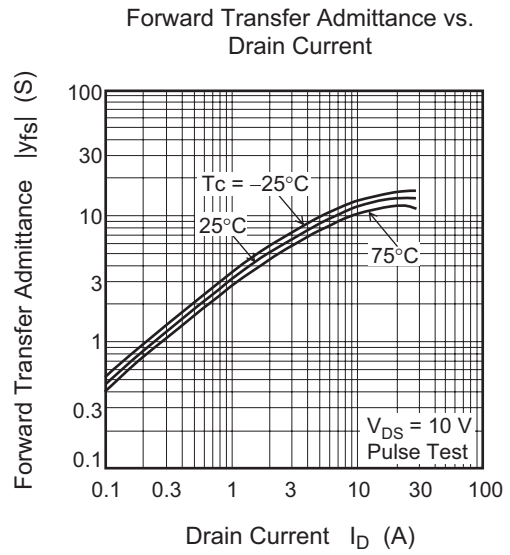
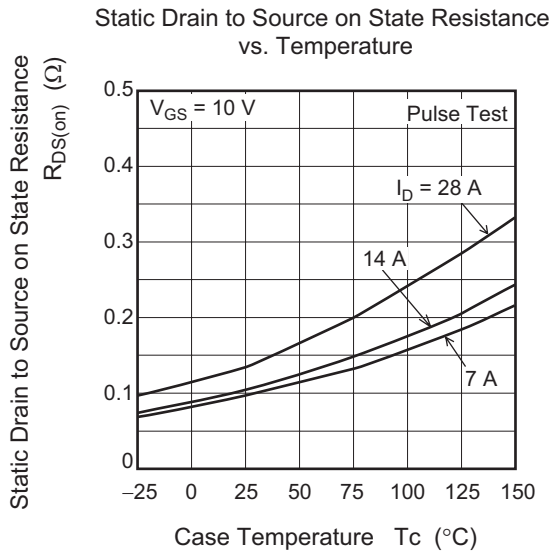


Drain to Source Saturation Voltage vs. Gate to Source Voltage

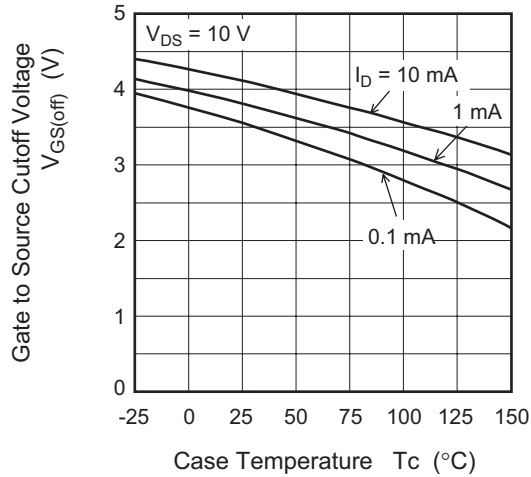


Static Drain to Source on State Resistance vs. Drain Current

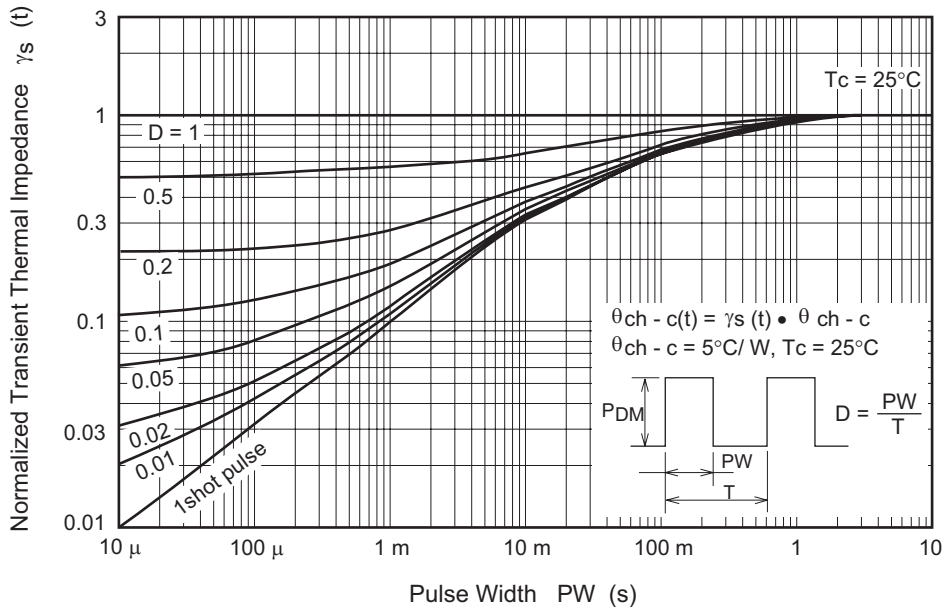




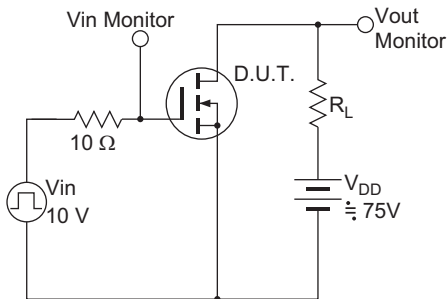
Gate to Source Cutoff Voltage vs. Case Temperature



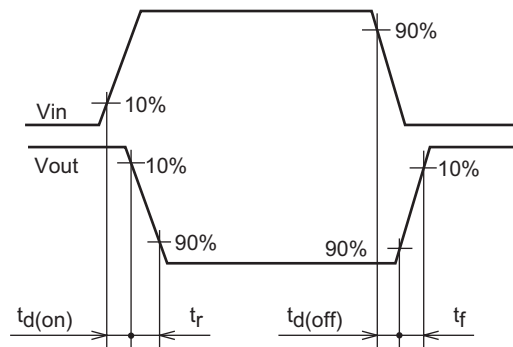
Normalized Transient Thermal Impedance vs. Pulse Width



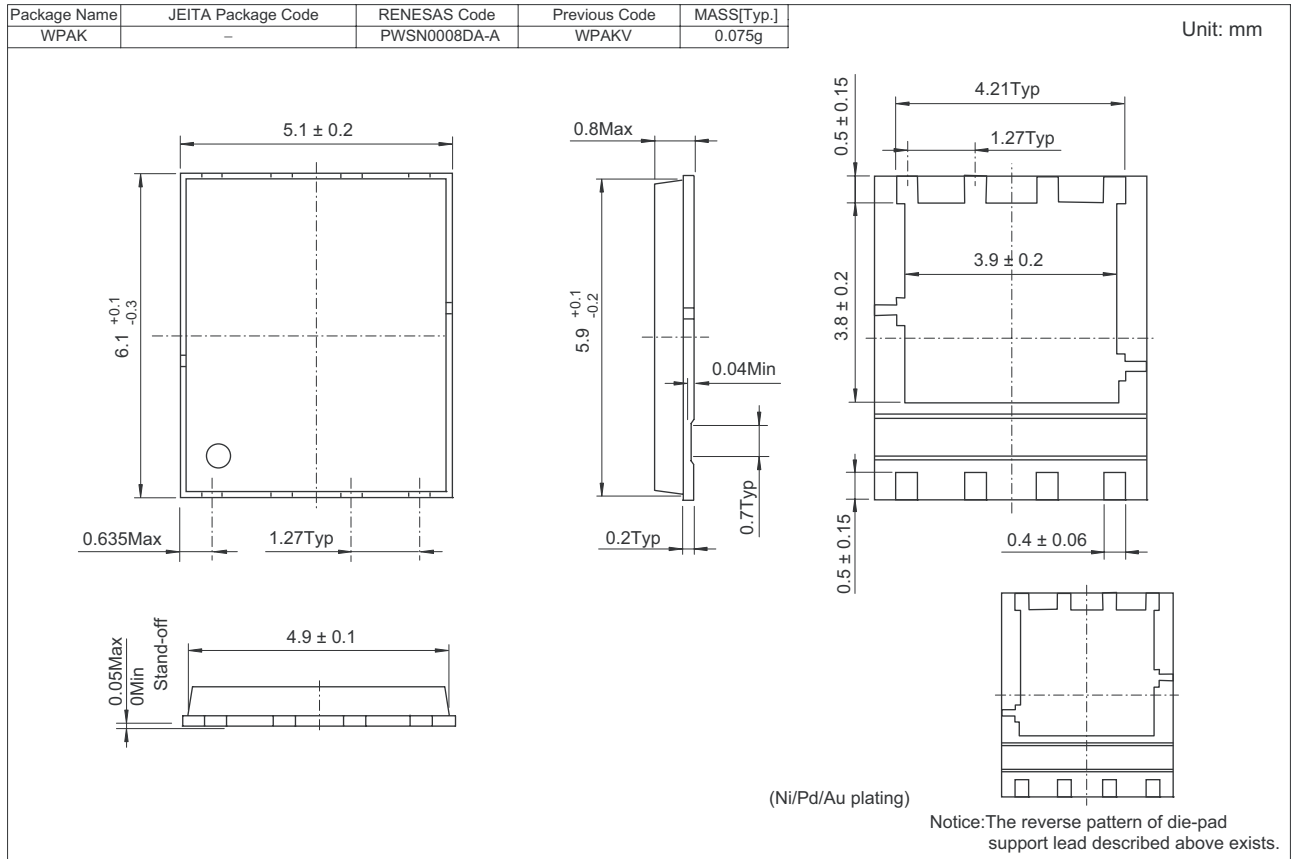
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT2184WP-EL-E	2500 pcs	Taping

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