

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# HAT2299WP

Silicon N Channel Power MOS FET  
Power Switching

REJ03G1528-0100

Rev.1.00

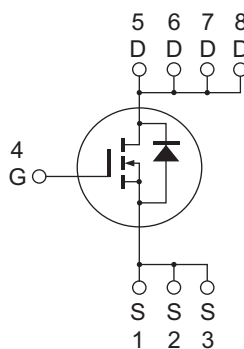
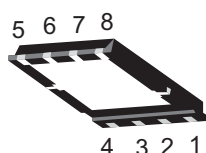
Mar 20, 2007

## Features

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

## Outline

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



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	$V_{DSS}$	150	V
Gate to source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	14	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	28	A
Body-drain diode reverse drain current	$I_{DR}$	14	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	28	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	14	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	14.7	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	25	W
Channel to case thermal impedance	$\theta_{ch-c}$	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.  $STch = 25^\circ\text{C}$ ,  $T_{ch} \leq 150^\circ\text{C}$

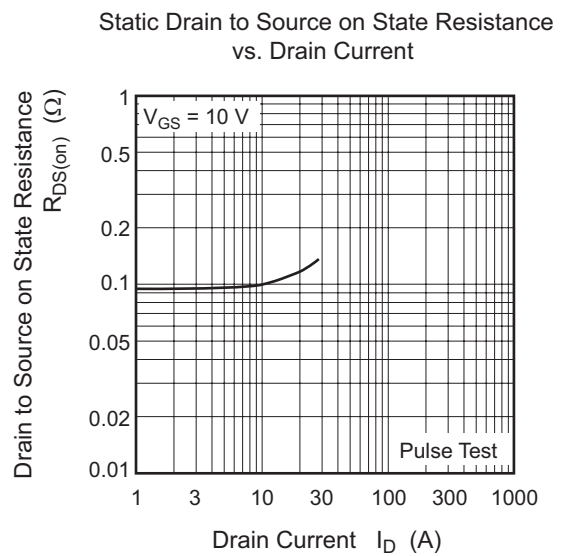
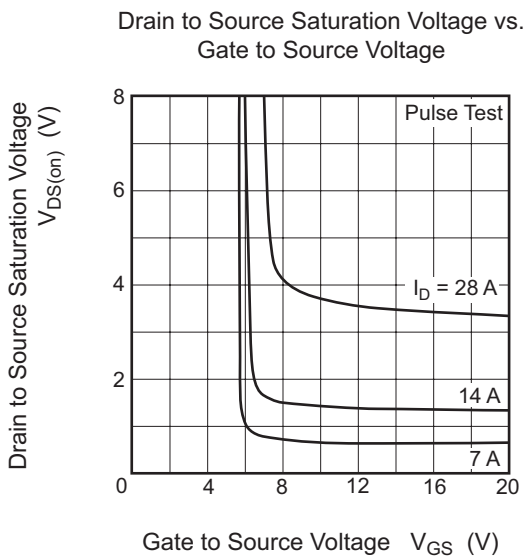
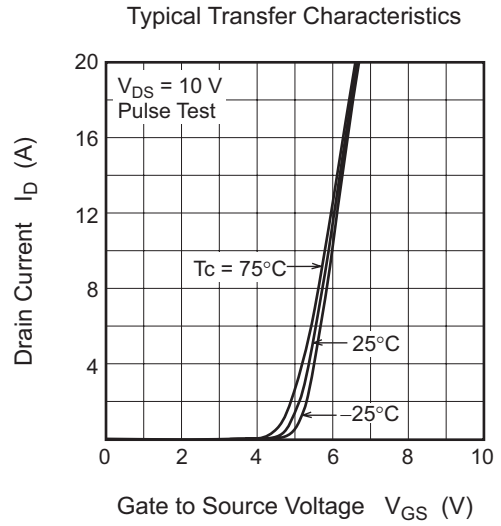
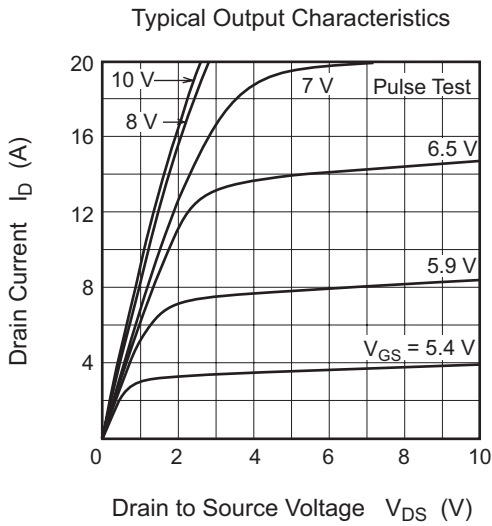
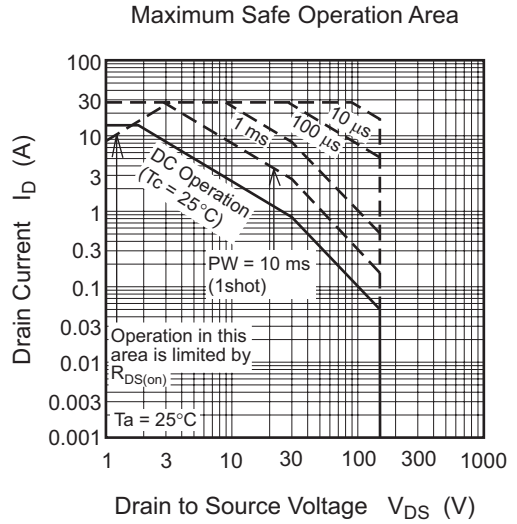
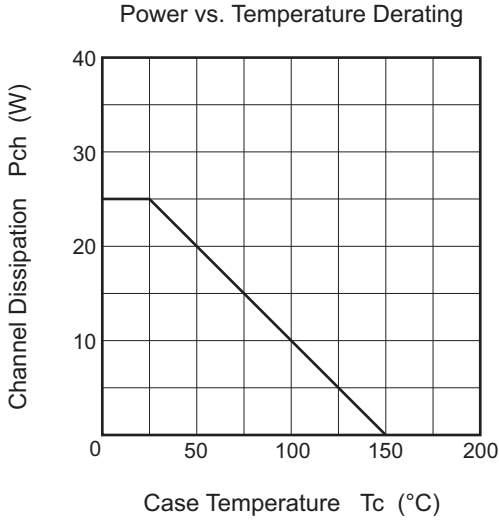
## Electrical Characteristics

(Ta = 25°C)

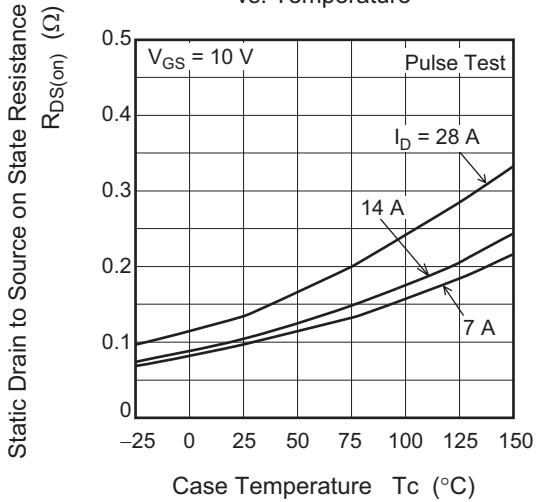
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 150 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.0	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Forward transfer admittance	$ y_{fs} $	6	10	—	S	$I_D = 7 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	0.097	0.11	$\Omega$	$I_D = 7 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
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	$I_F = 14 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
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

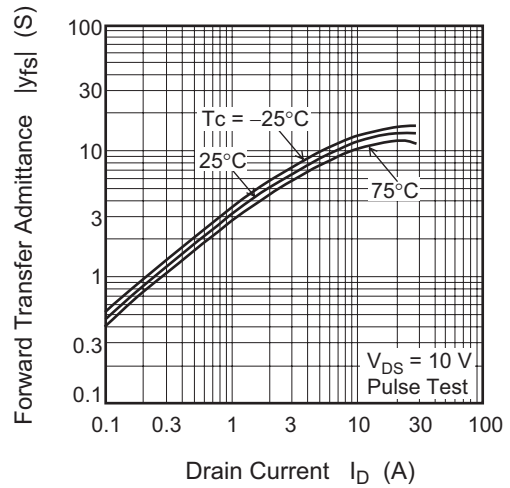
Main Characteristics



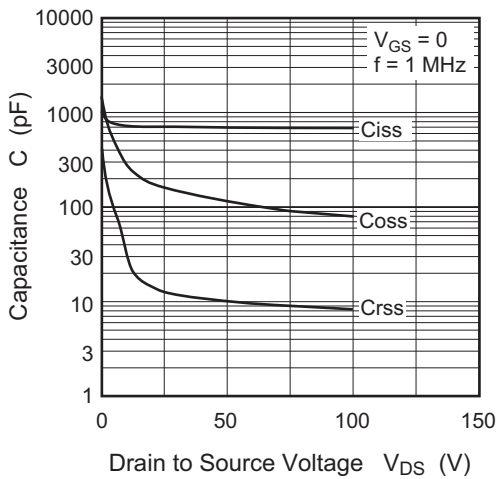
Static Drain to Source on State Resistance vs. Temperature



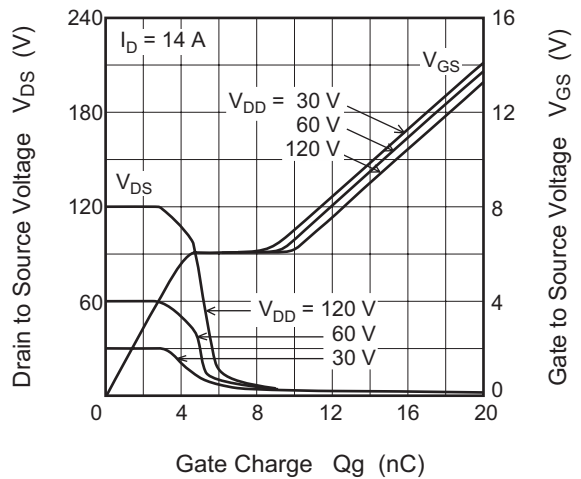
Forward Transfer Admittance vs. Drain Current



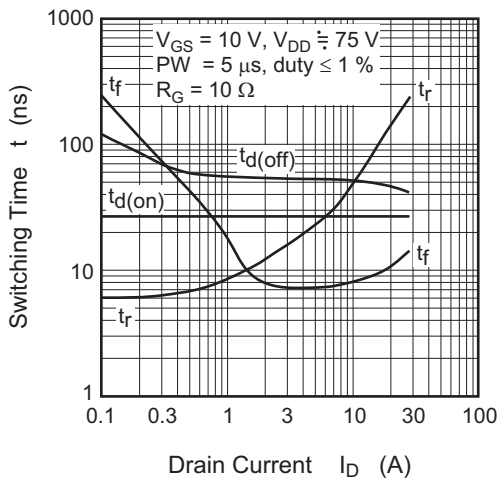
Typical Capacitance vs. Drain to Source Voltage



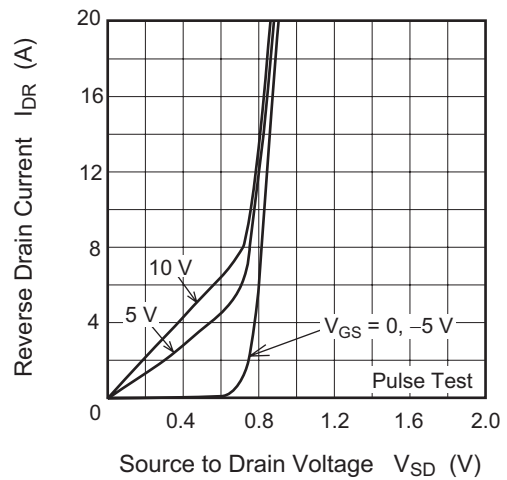
Dynamic Input Characteristics



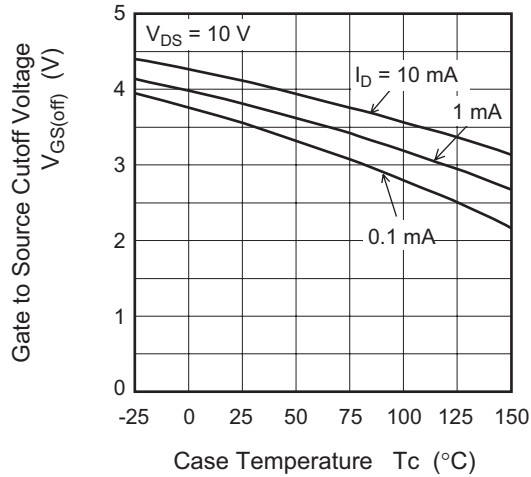
Switching Characteristics



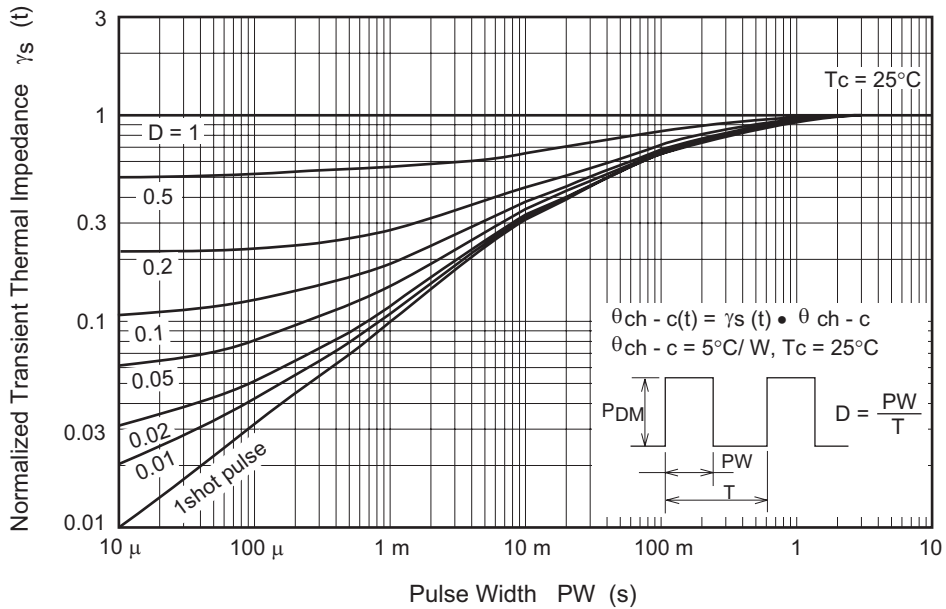
Reverse Drain Current vs. Source to Drain Voltage



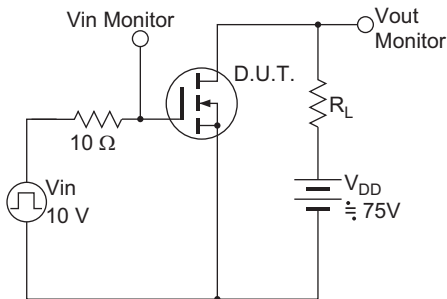
Gate to Source Cutoff Voltage vs. Case Temperature



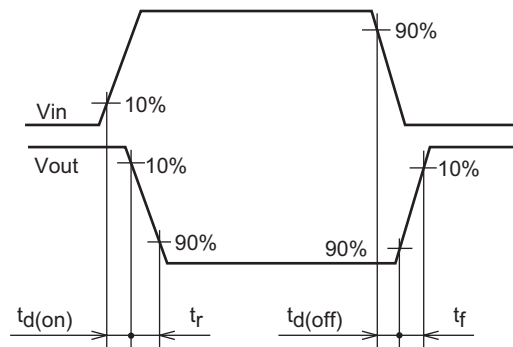
Normalized Transient Thermal Impedance vs. Pulse Width



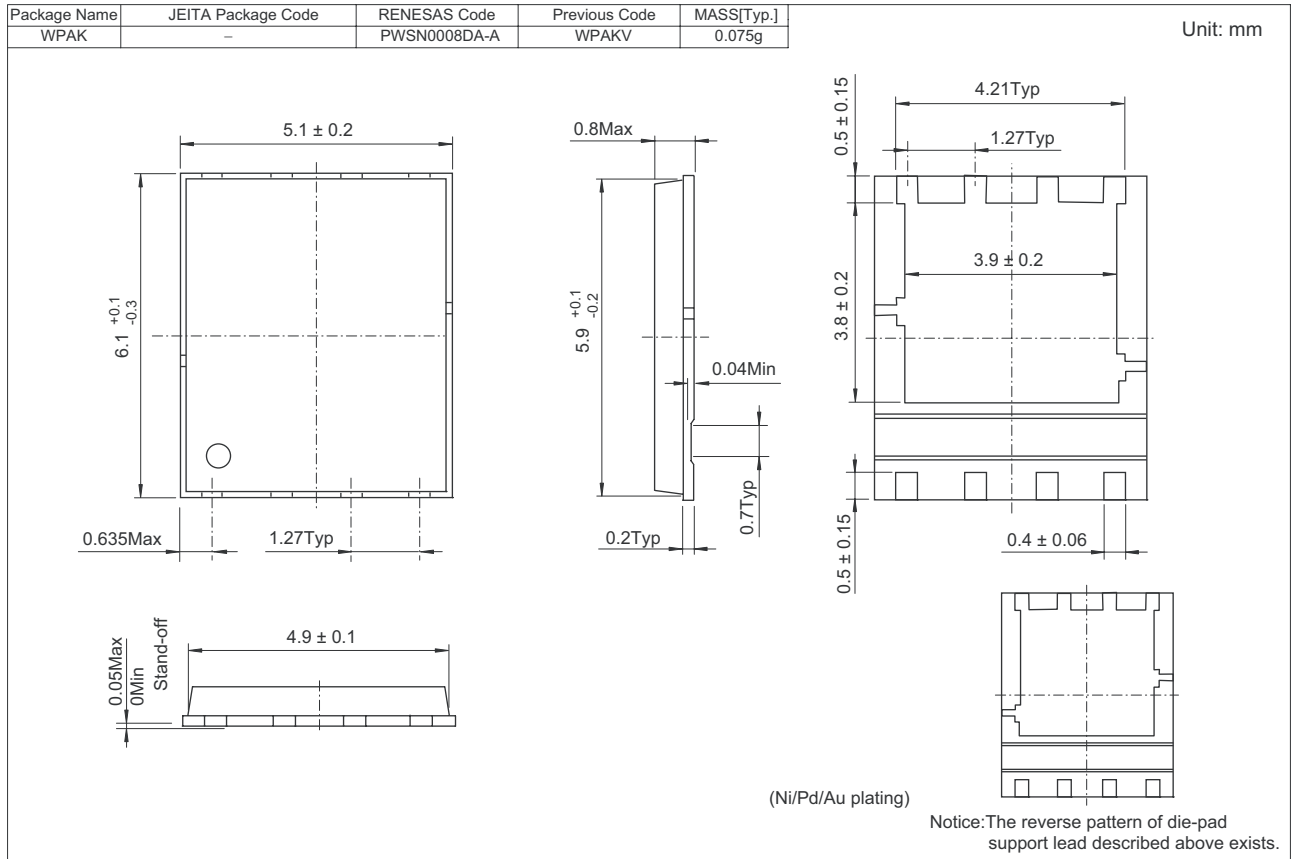
Switching Time Test Circuit



Waveform



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
HAT2299WP-EL-E	2500 pcs	Taping

Notes:

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