

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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## HAT2088R

Silicon N Channel MOS FET  
High Speed Power Switching

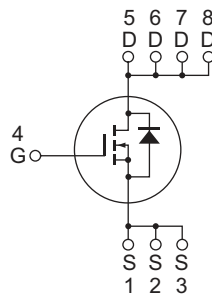
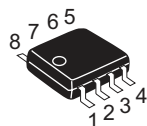
REJ03G1183-0200  
(Previous: ADE-208-1234)  
Rev.2.00  
Sep 07, 2005

### Features

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

### Outline

RENESAS Package code: PRSP0008DD-D  
(Package name: SOP-8 <FP-8DAV> )



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

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V <sub>DSS</sub>	200	V
Gate to source voltage	V <sub>GSS</sub>	±30	V
Drain current	I <sub>D</sub>	2	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note 1</sup>	16	A
Body-drain diode reverse drain current	I <sub>DR</sub>	2	A
Channel dissipation	P <sub>ch</sub> <sup>Note 2</sup>	2.5	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Notes: 1. PW ≤ 10 ∞s, duty cycle ≤ 1%

2. When using the glass epoxy board (FR4 40 · 40 · 1.6 mm), PW ≤ 10 s

## Electrical Characteristics

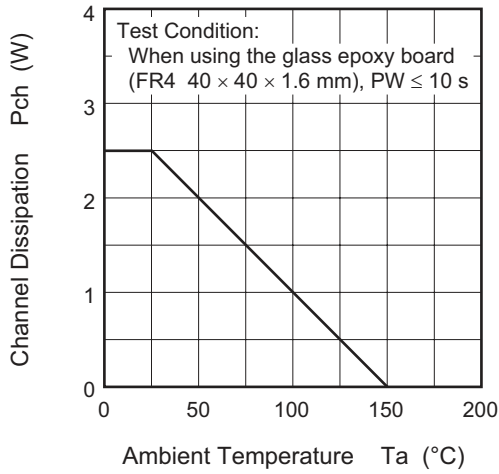
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR) DSS</sub>	200	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±0.1	∞A	V <sub>GS</sub> = ±30 V, V <sub>DS</sub> = 0
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	1	∞A	V <sub>DS</sub> = 200 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS (off)</sub>	3.0	—	4.5	V	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA
Static drain to source on state resistance	R <sub>DS (on)</sub>	—	0.35	0.44	Ω	I <sub>D</sub> = 1 A, V <sub>GS</sub> = 10 V <sup>Note 3</sup>
Forward transfer admittance	y <sub>fs</sub>	1.5	2.5	—	S	I <sub>D</sub> = 1 A, V <sub>DS</sub> = 10 V <sup>Note 3</sup>
Input capacitance	C <sub>iss</sub>	—	450	—	pF	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0
Output capacitance	C <sub>oss</sub>	—	65	—	pF	f = 1 MHz
Reverse transfer capacitance	C <sub>rss</sub>	—	13	—	pF	
Total gate charge	Q <sub>g</sub>	—	13	—	nC	V <sub>DD</sub> = 160 V
Gate to source charge	Q <sub>gs</sub>	—	2	—	nC	V <sub>GS</sub> = 10 V
Gate to drain charge	Q <sub>gd</sub>	—	6	—	nC	I <sub>D</sub> = 2 A
Turn-on delay time	t <sub>d (on)</sub>	—	19	—	ns	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 1 A
Rise time	t <sub>r</sub>	—	8.5	—	ns	V <sub>DD</sub> ≅ 100 V
Turn-off delay time	t <sub>d (off)</sub>	—	48	—	ns	R <sub>L</sub> = 100 Ω
Fall time	t <sub>f</sub>	—	11	—	ns	R <sub>g</sub> = 10 Ω
Body-drain diode forward voltage	V <sub>DF</sub>	—	0.8	1.2	V	I <sub>F</sub> = 2 A, V <sub>GS</sub> = 0 <sup>Note 3</sup>
Body-drain diode reverse recovery time	t <sub>rr</sub>	—	65	—	ns	I <sub>F</sub> = 2 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 100 A/∞s

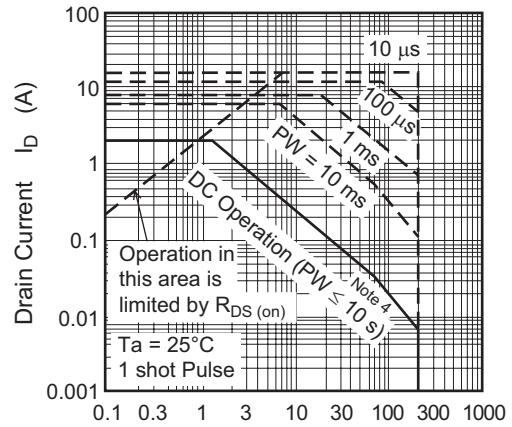
Note: 3. Pulse test

Main Characteristics

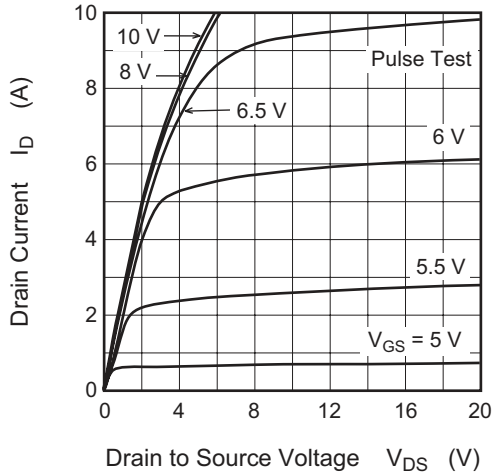
Power vs. Temperature Derating



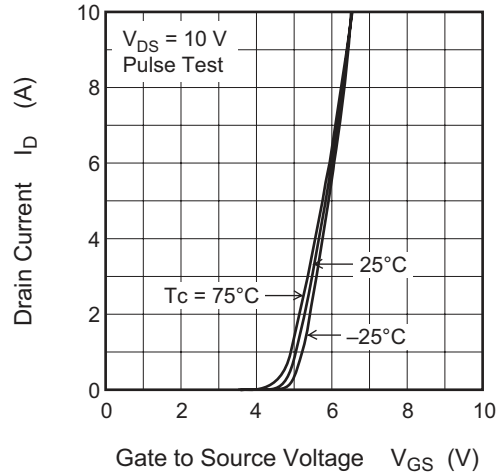
Maximum Safe Operation Area



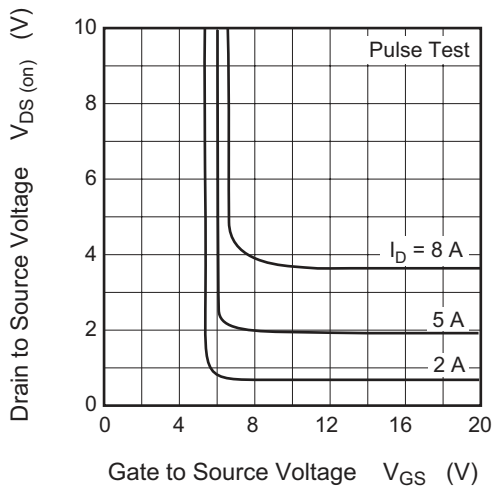
Typical Output Characteristics



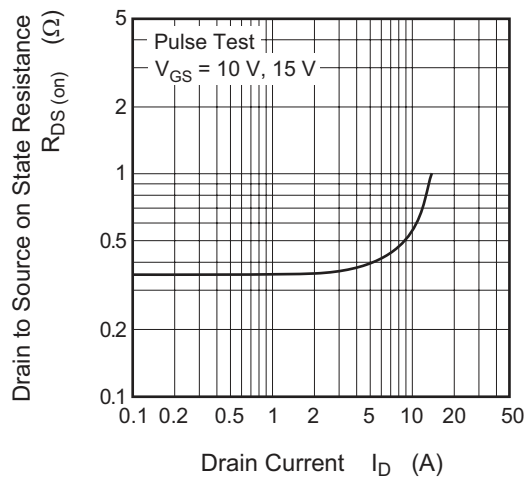
Typical Transfer Characteristics



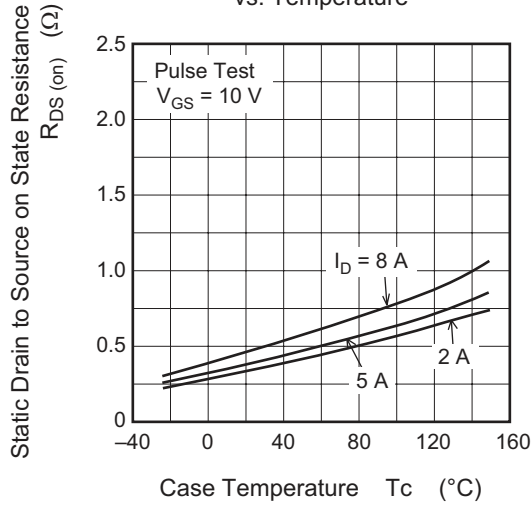
Drain to Source Saturation Voltage vs. Gate to Source Voltage



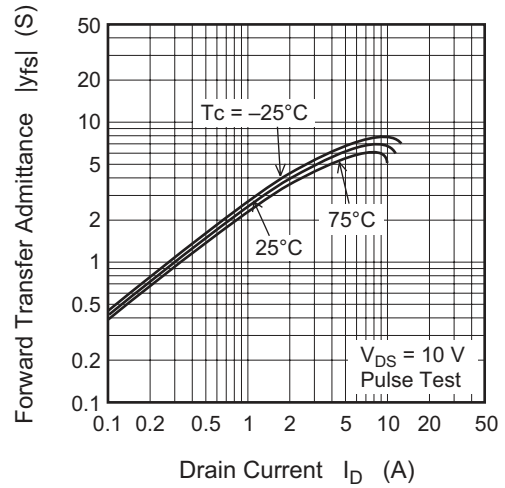
Static Drain to Source on State Resistance vs. Drain Current



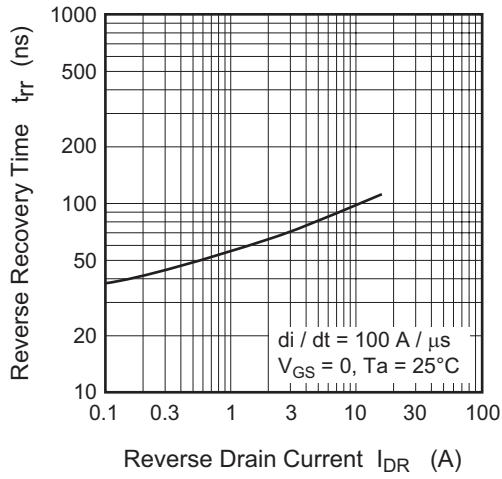
Static Drain to Source on State Resistance vs. Temperature



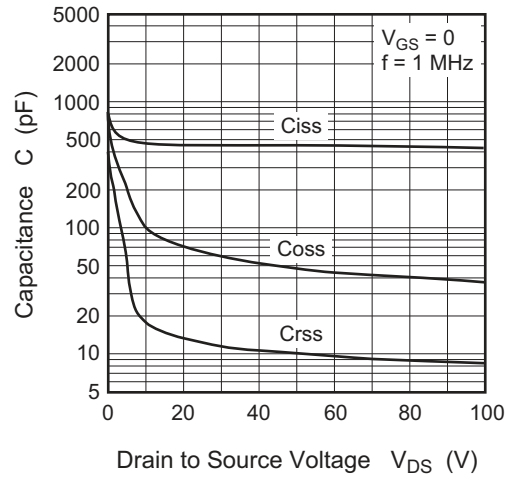
Forward Transfer Admittance vs. Drain Current



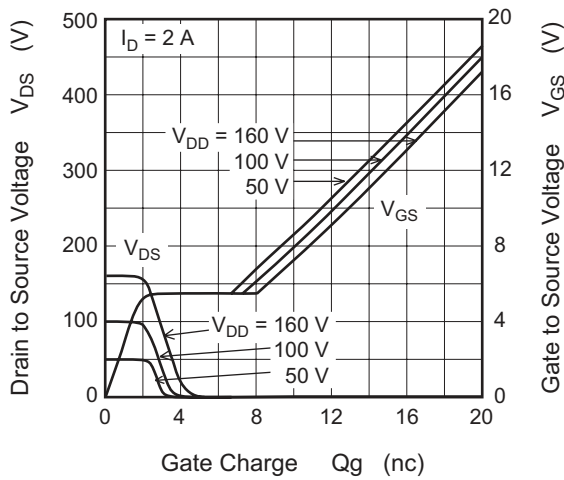
Body-Drain Diode Reverse Recovery Time



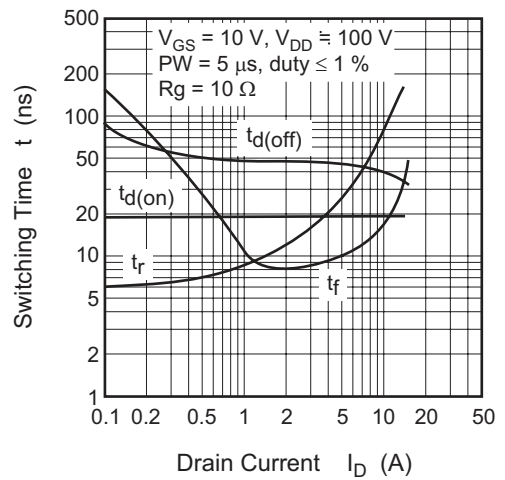
Typical Capacitance vs. Drain to Source Voltage



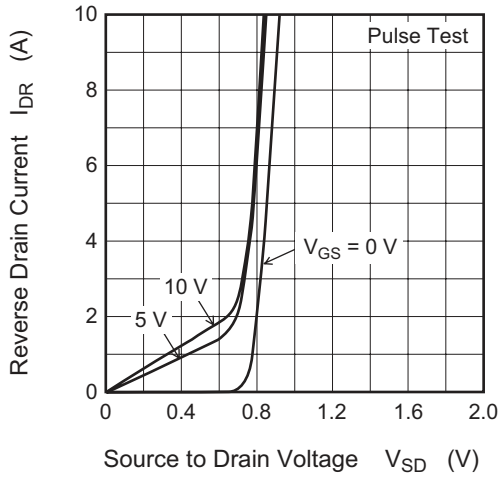
Dynamic Input Characteristics



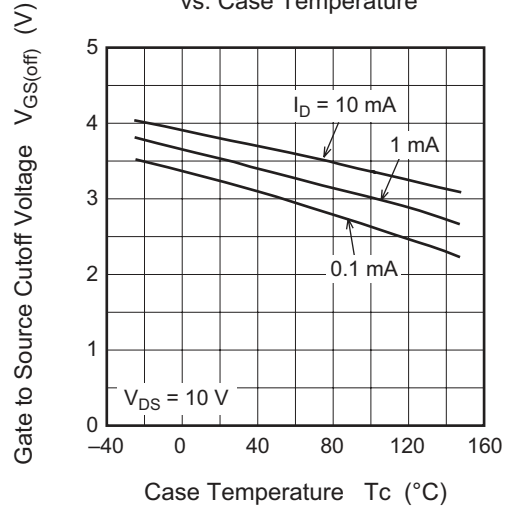
Switching Characteristics



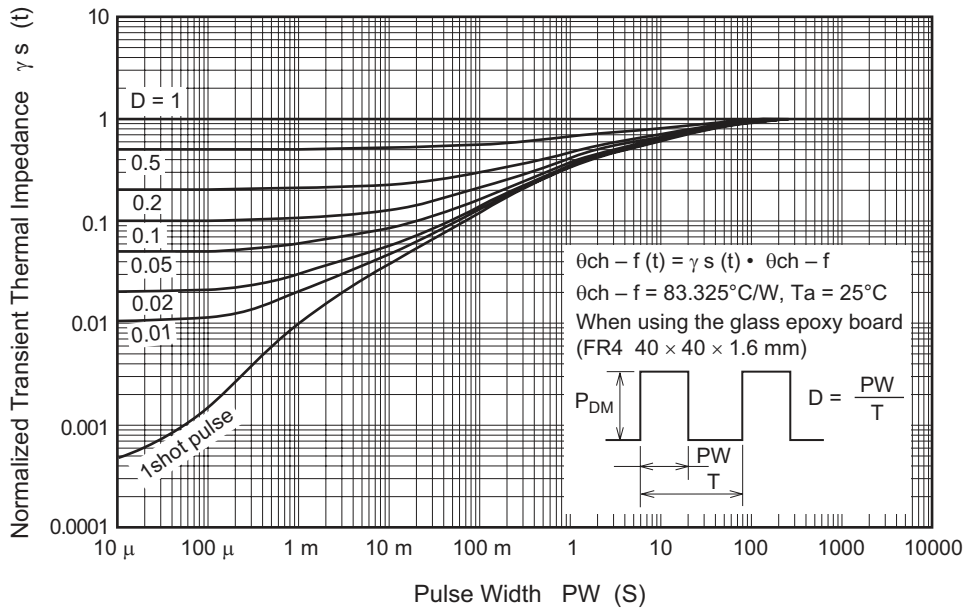
Reverse Drain Current vs. Source to Drain Voltage



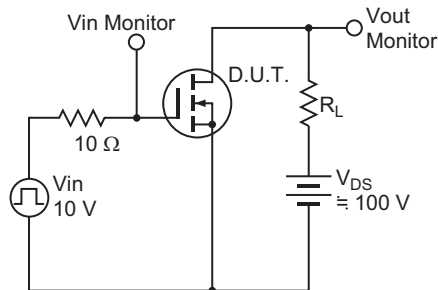
Gate to Source Cutoff Voltage vs. Case Temperature



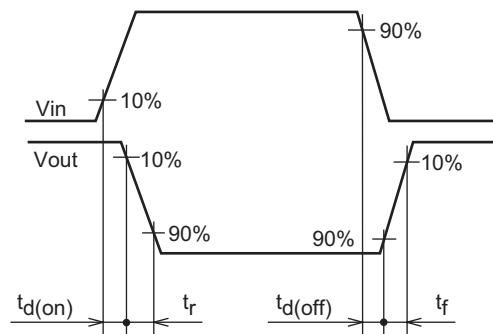
Normalized Transient Thermal Impedance vs. Pulse Width



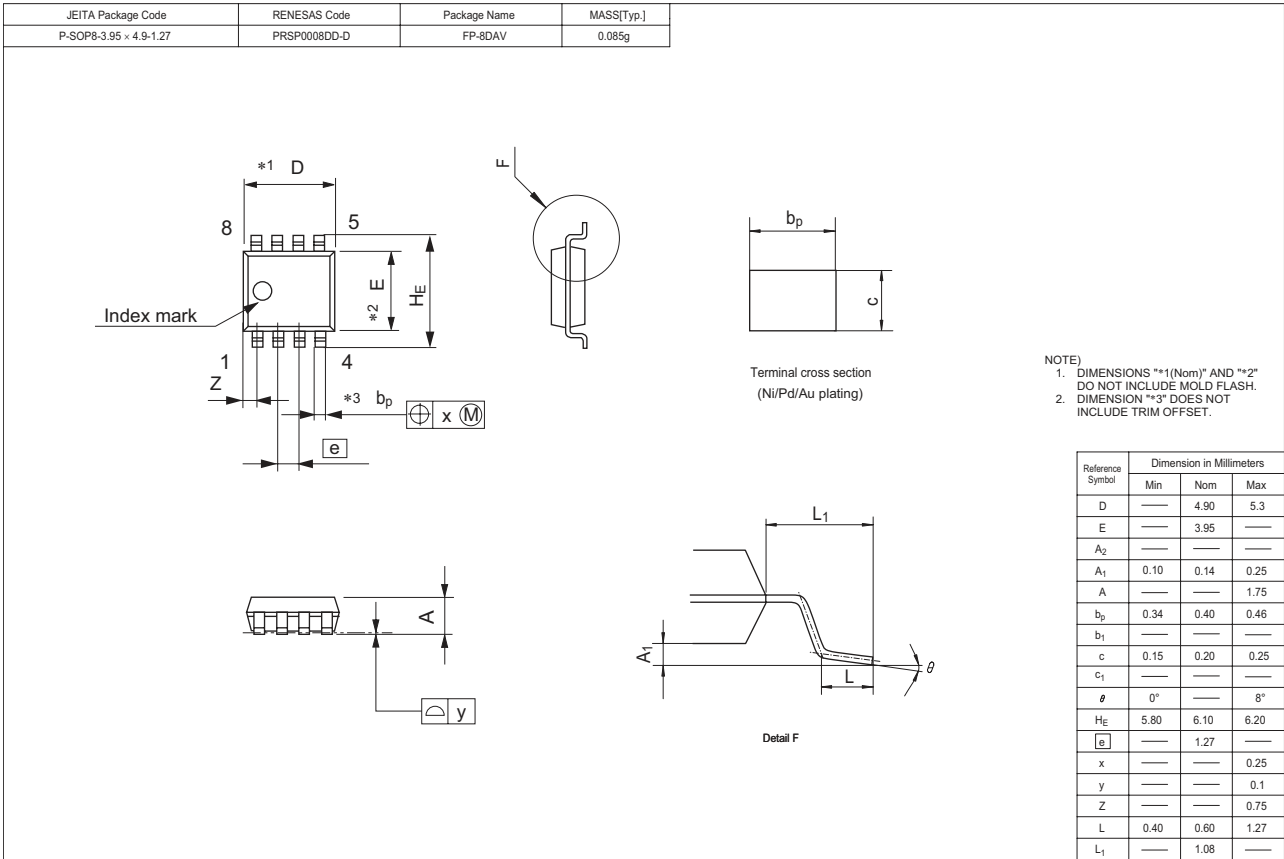
Switching Time Test Circuit



Switching Time Waveform



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
HAT2088R-EL-E	2500 pcs	Taping

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Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China  
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

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Tel: <82> 2-796-3115, Fax: <82> 2-796-2145

#### **Renesas Technology Malaysia Sdn. Bhd.**

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