

## HAT2025R

Silicon N Channel Power MOS FET  
High Speed Power Switching

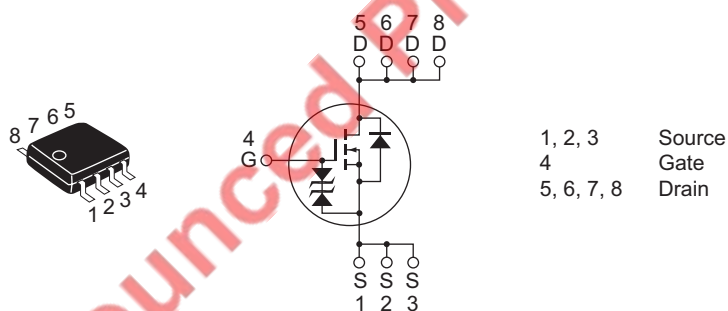
REJ03G1160-0500  
(Previous: ADE-208-518C)  
Rev.5.00  
Sep 07, 2005

### Features

- High speed switching
- Low on-resistance
- Capable of 4 V gate drive
- Low drive current
- High density mounting

### Outline

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



## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DS}$	30	V
Gate to source voltage	$V_{GS}$	±20	V
Drain current	$I_D$	8	A
Drain peak current	$I_{D(pulse)}$ <sup>Note 1</sup>	64	A
Body-drain diode reverse drain current	$I_{DR}$	8	A
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	2.5	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$ 2. When using the glass epoxy board (FR4 40 × 40 × 1.6 mm),  $PW \leq 10 s$ 

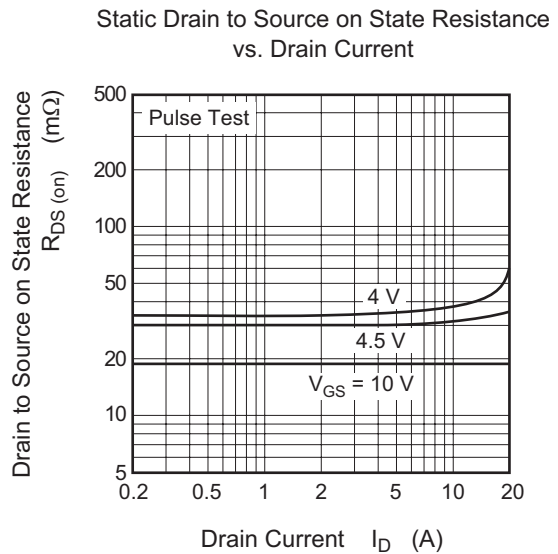
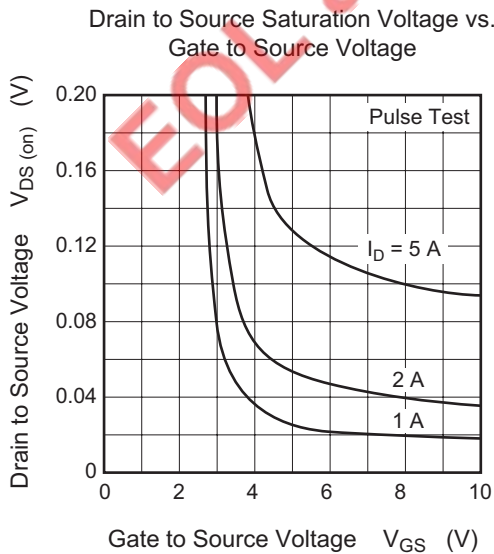
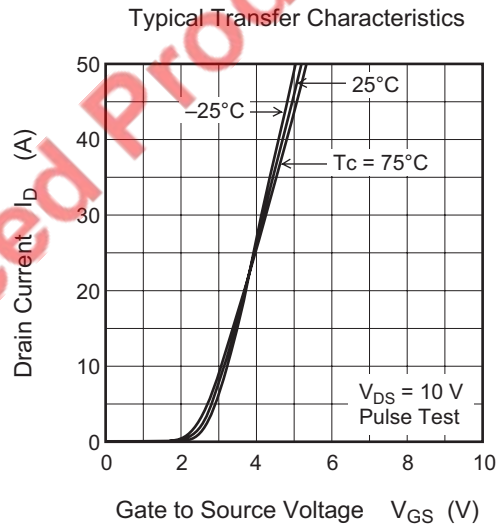
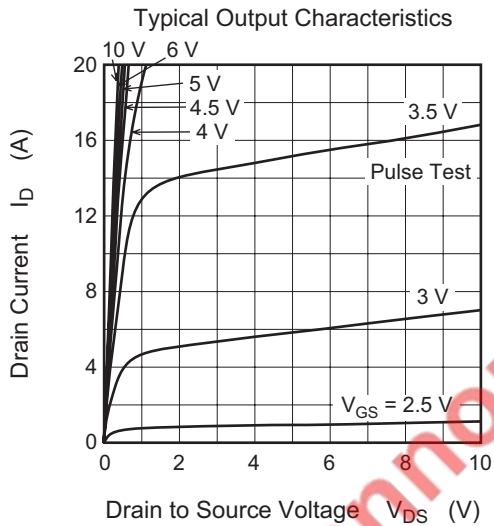
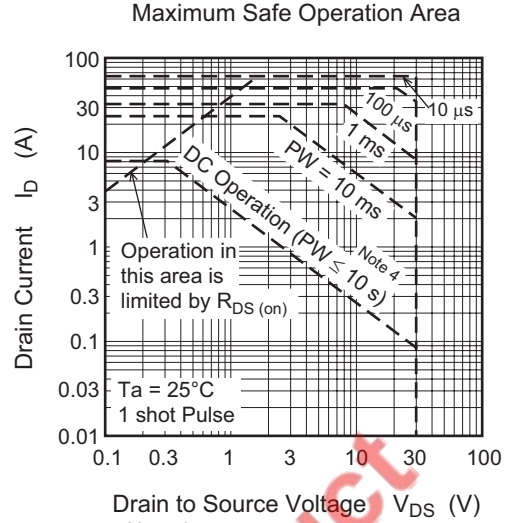
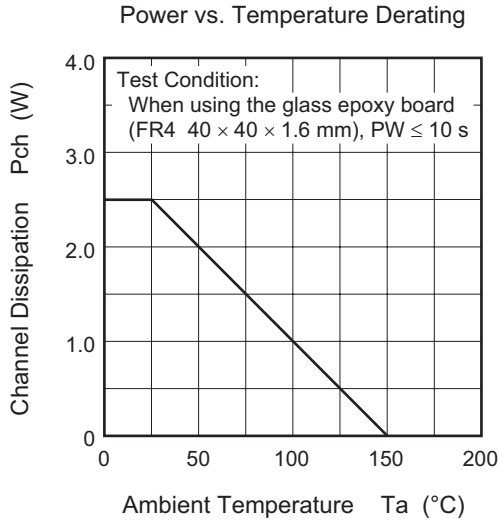
## Electrical Characteristics

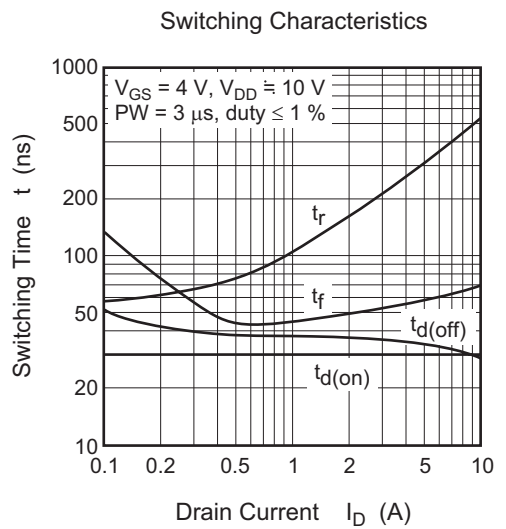
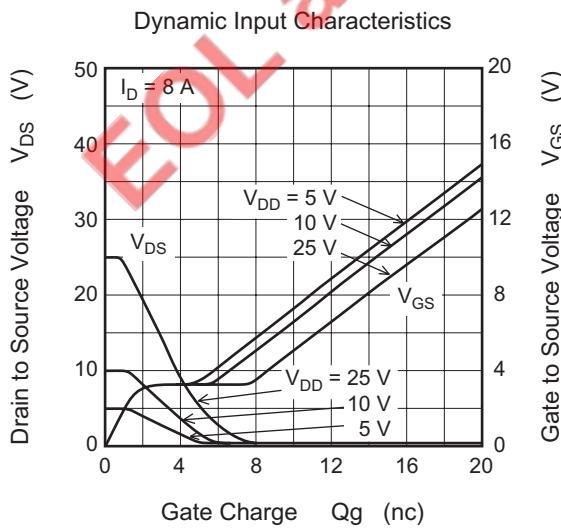
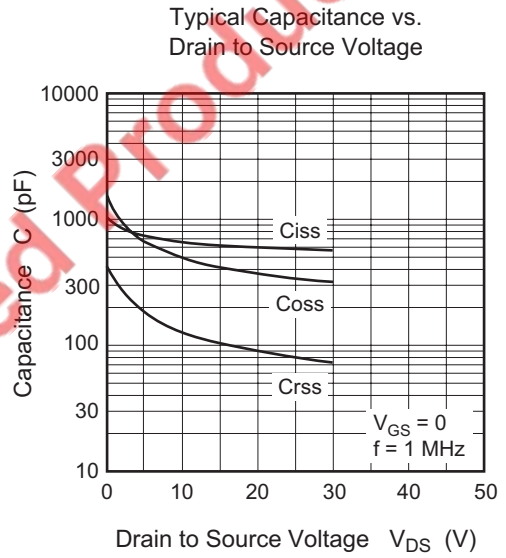
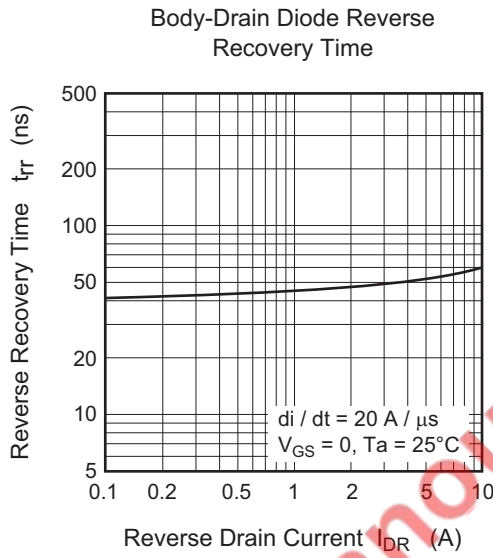
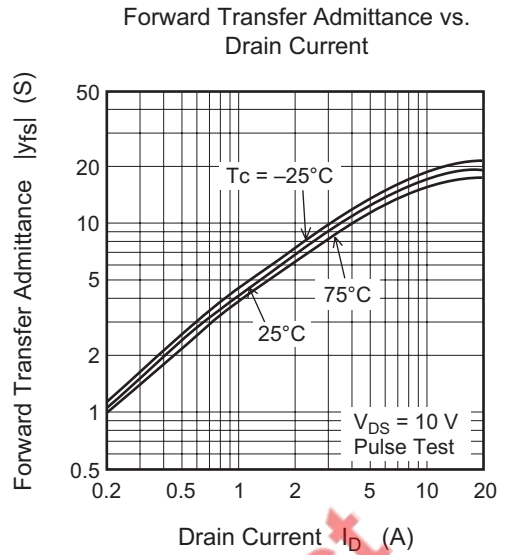
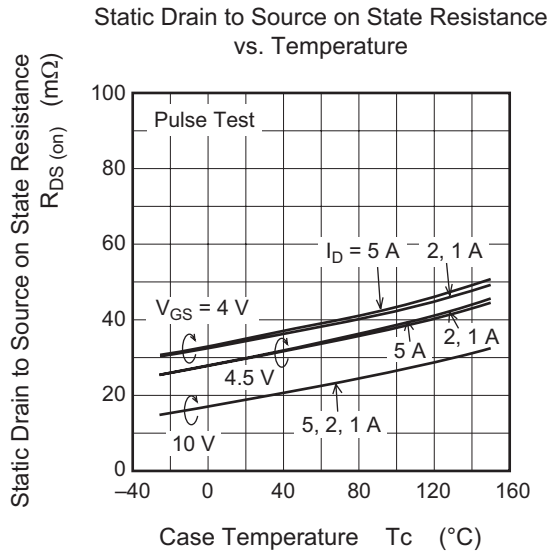
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	μA	$V_{DS} = 30 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.3	—	2.4	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.019	0.026	Ω	$I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 3</sup>
	$R_{DS(on)}$	—	0.030	0.050	Ω	$I_D = 4 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$ <sup>Note 3</sup>
Forward transfer admittance	$ y_{fs} $	7	11	—	S	$I_D = 4 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 3</sup>
Input capacitance	$C_{iss}$	—	660	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	510	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	130	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$V_{GS} = 4 \text{ V}$ , $I_D = 4 \text{ A}$ ,
Rise time	$t_r$	—	265	—	ns	$V_{DD} \cong 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	35	—	ns	
Fall time	$t_f$	—	58	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.8	1.3	V	$I_F = 8 \text{ A}$ , $V_{GS} = 0$ <sup>Note 3</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	55	—	ns	$I_F = 8 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 20 \text{ A}/\mu s$

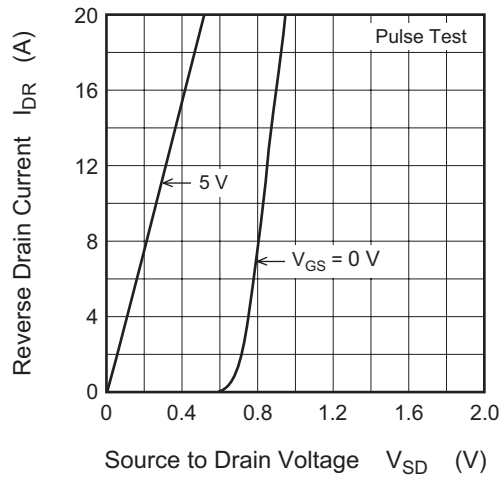
Note: 3. Pulse test

Main Characteristics

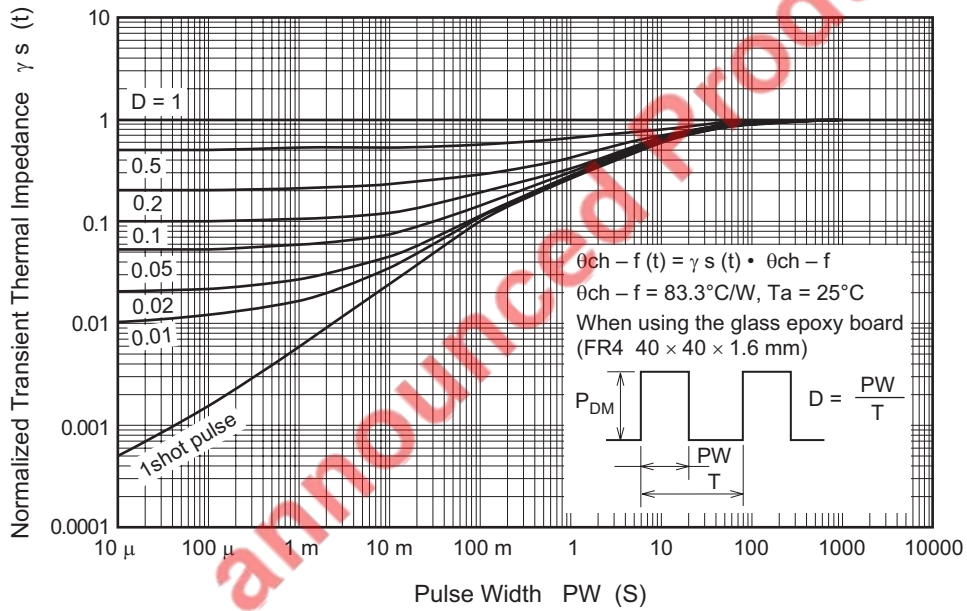




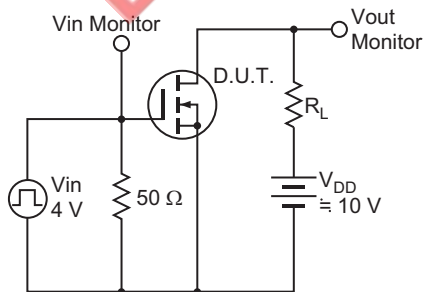
Reverse Drain Current vs. Source to Drain Voltage



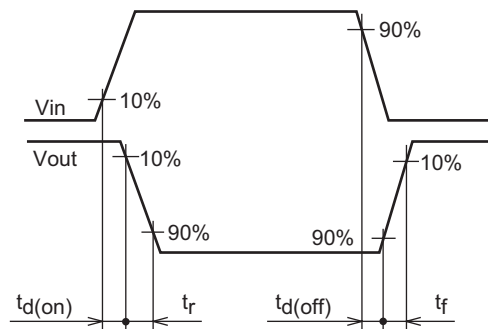
Normalized Transient Thermal Impedance vs. Pulse Width



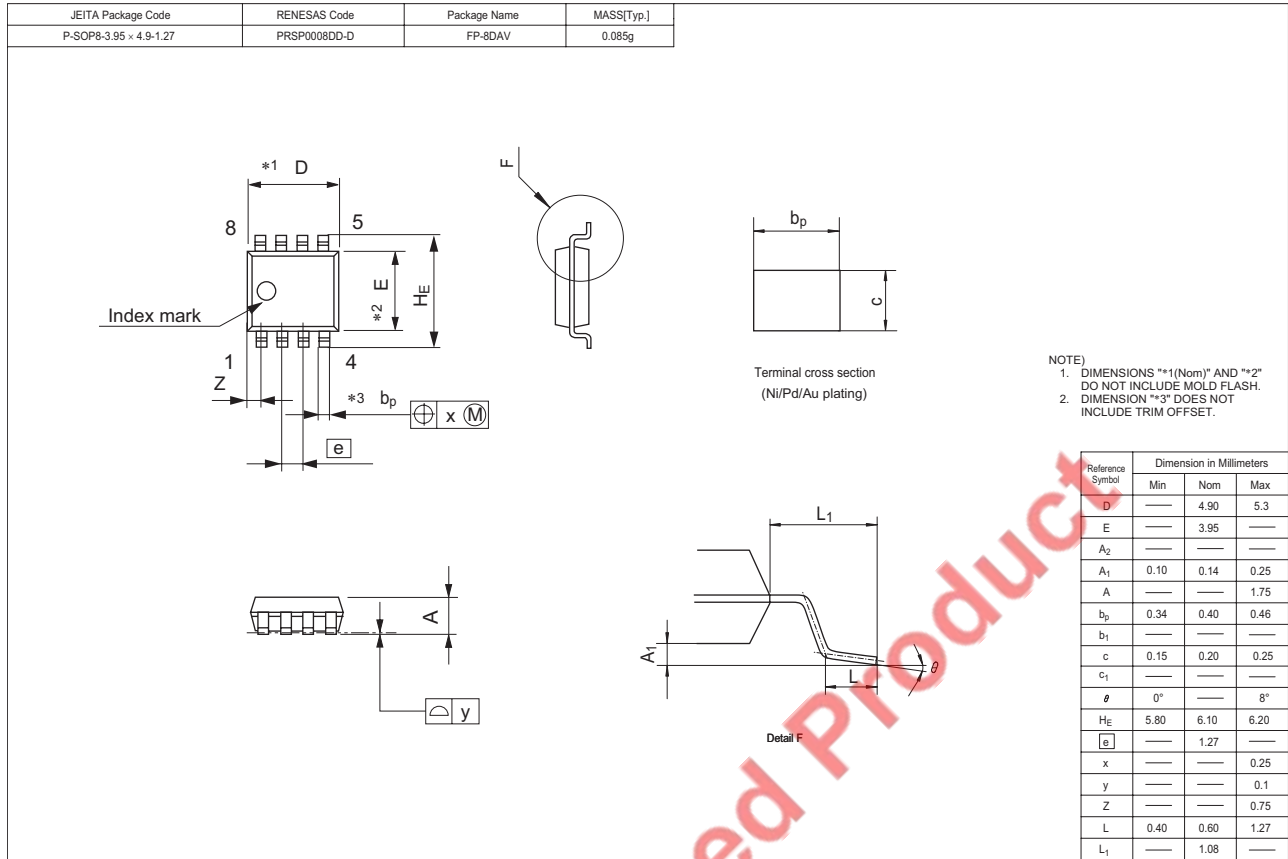
Switching Time Test Circuit



Switching Time Waveform



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
HAT2025R-EL-E	2500 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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