

# HAT2040R

Silicon N Channel Power MOS FET  
Power Switching

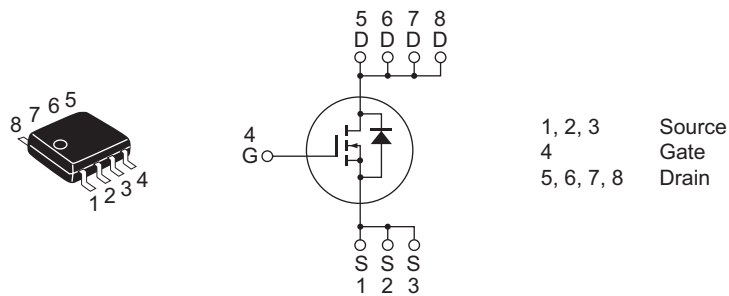
REJ03G1168-0600  
(Previous: ADE-208-565D)  
Rev.6.00  
Sep 07, 2005

## Features

- Low on-resistance  
 $R_{DS(on)} = 6.2 \text{ m}\Omega$  typ
- 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	$V_{GS}$	$\pm 20$	V
Drain current	$I_D$	15	A
Drain peak current	$I_{D(pulse)}$ <sup>Note 1</sup>	120	A
Body-drain diode reverse drain current	$I_{DR}$	15	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),  $PW \leq 10 s$ 

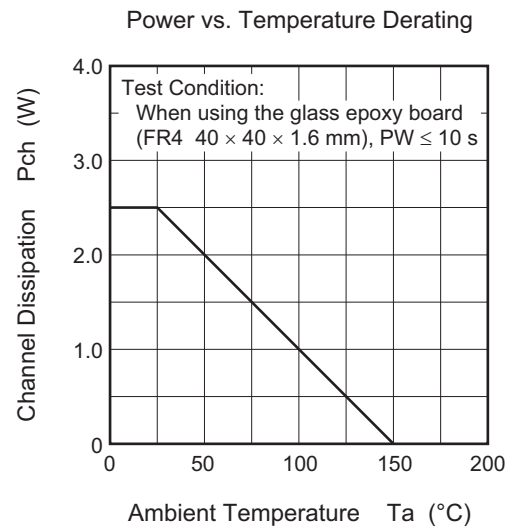
## Electrical Characteristics

(Ta = 25°C)

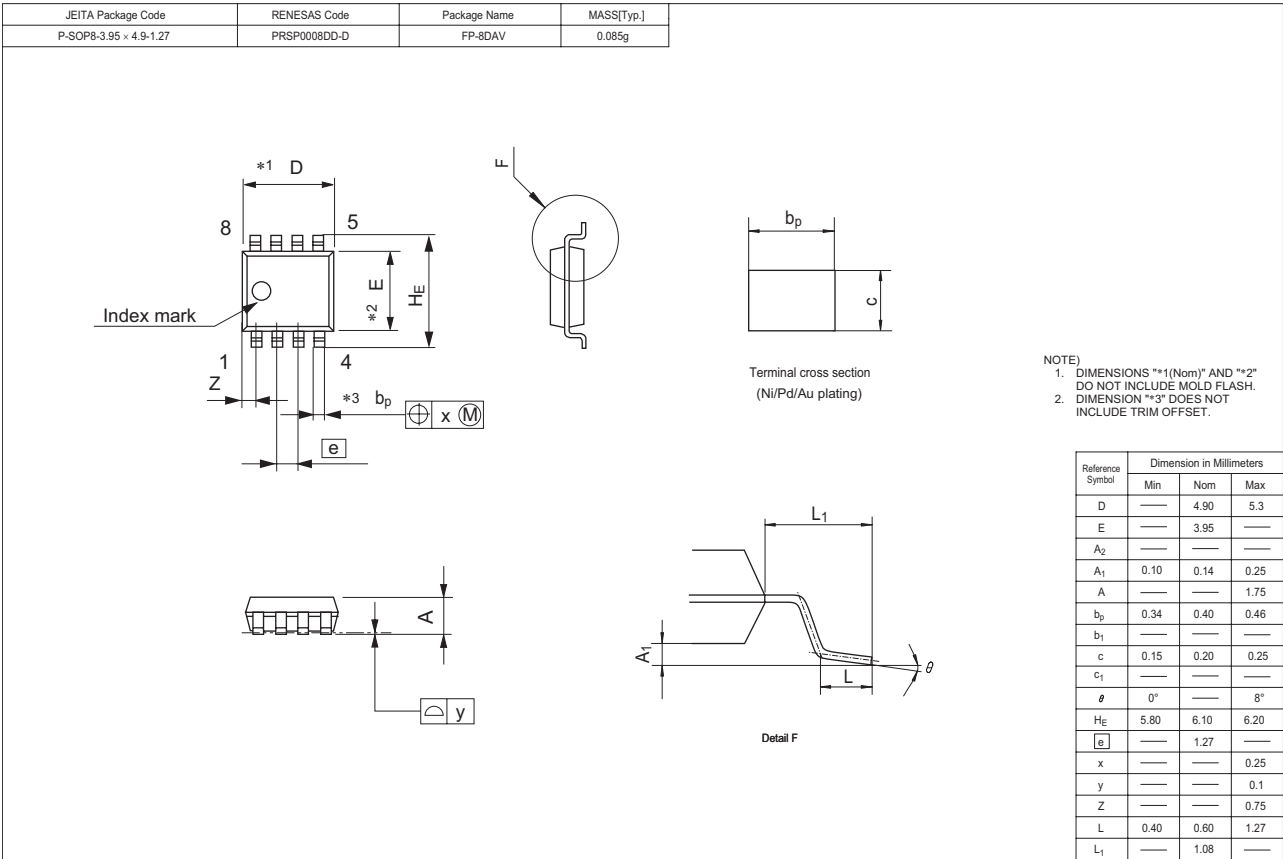
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR) DSS}$	30	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu A$	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu A$	$V_{DS} = 30 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	6.2	8.0	$m\Omega$	$I_D = 8 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 3</sup>
	$R_{DS(on)}$	—	9.0	13.0	$m\Omega$	$I_D = 8 \text{ A}$ , $V_{GS} = 4 \text{ V}$ <sup>Note 3</sup>
Forward transfer admittance	$ y_{fs} $	18	30	—	S	$I_D = 8 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 3</sup>
Input capacitance	$C_{iss}$	—	4400	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	1100	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	500	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	90	—	nC	$V_{DD} = 10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	15	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	18	—	nC	$I_D = 15 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	110	—	ns	$V_{GS} = 4 \text{ V}$ , $I_D = 8 \text{ A}$ , $V_{DD} \cong 10 \text{ V}$
Rise time	$t_r$	—	410	—	ns	
Turn-off delay time	$t_{d(off)}$	—	200	—	ns	
Fall time	$t_f$	—	230	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.9	—	V	$I_F = 15 \text{ A}$ , $V_{GS} = 0$ <sup>Note 3</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	55	—	ns	$I_F = 15 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 20 \text{ A}/\mu s$

Note: 3. Pulse test

## Main Characteristics



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT2040R-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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