

# HAT2140H

Silicon N Channel Power MOS FET  
Power Switching

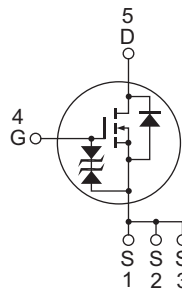
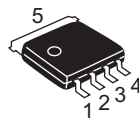
REJ03G1192-0400  
(Previous: ADE-208-1581B)  
Rev.4.00  
Sep 07, 2005

## Features

- Capable of 7 V gate drive
  - Low drive current
  - High density mounting
  - Low on-resistance
- $R_{DS(on)} = 12.5 \text{ m}\Omega$  typ. (at  $V_{GS} = 10 \text{ V}$ )

## Outline

RENESAS Package code: PTZZ0005DA-A  
(Package name: LPAK)



1, 2, 3 Source  
4 Gate  
5 Drain

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DS}$	100	V
Gate to source voltage	$V_{GS}$	±20	V
Drain current	$I_D$	25	A
Drain peak current	$I_{D(pulse)}$ <sup>Note 1</sup>	100	A
Body-drain diode reverse drain current	$I_{DR}$	25	A
Avalanche current	$I_{AP}$ <sup>Note 3</sup>	25	A
Avalanche energy	$E_{AR}$ <sup>Note 3</sup>	62.5	mJ
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	30	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.  $T_c = 25^\circ C$ 3. Value at  $T_{ch} = 25^\circ C$ ,  $R_g \geq 50 \Omega$ 

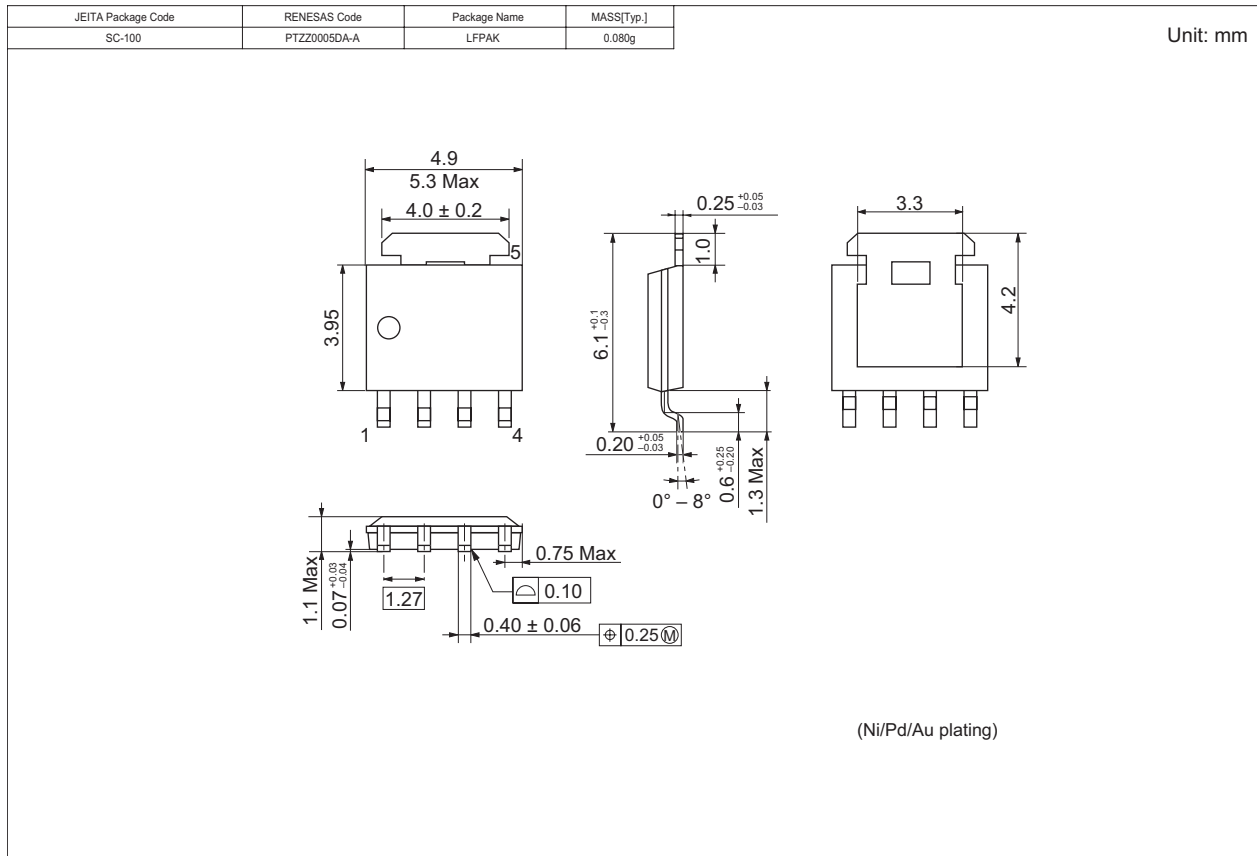
## Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	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	$I_{DSS}$	—	—	1	μA	$V_{DS} = 100 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	12.5	16.0	mΩ	$I_D = 12.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 4</sup>
	$R_{DS(on)}$	—	13.5	18.0	mΩ	$I_D = 12.5 \text{ A}$ , $V_{GS} = 7 \text{ V}$ <sup>Note 4</sup>
Forward transfer admittance	$ y_{fs} $	27	45	—	S	$I_D = 12.5 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 4</sup>
Input capacitance	$C_{iss}$	—	6500	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	480	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	210	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	105	—	nC	$V_{DD} = 50 \text{ V}$
Gate to source charge	$Q_{gs}$	—	20	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	22	—	nC	$I_D = 25 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$V_{GS} = 10 \text{ V}$ , $I_D = 12.5 \text{ A}$
Rise time	$t_r$	—	24	—	ns	$V_{DD} \cong 30 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	100	—	ns	$R_L = 2.4 \Omega$
Fall time	$t_f$	—	12	—	ns	$R_g = 4.7 \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	0.83	1.08	V	$I_F = 25 \text{ A}$ , $V_{GS} = 0$ <sup>Note 4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	55	—	ns	$I_F = 25 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu s$

Note: 4. Pulse test

## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
HAT2140H-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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