

To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

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HAT2143H

Silicon N Channel Power MOS FET
Power Switching

RENESAS

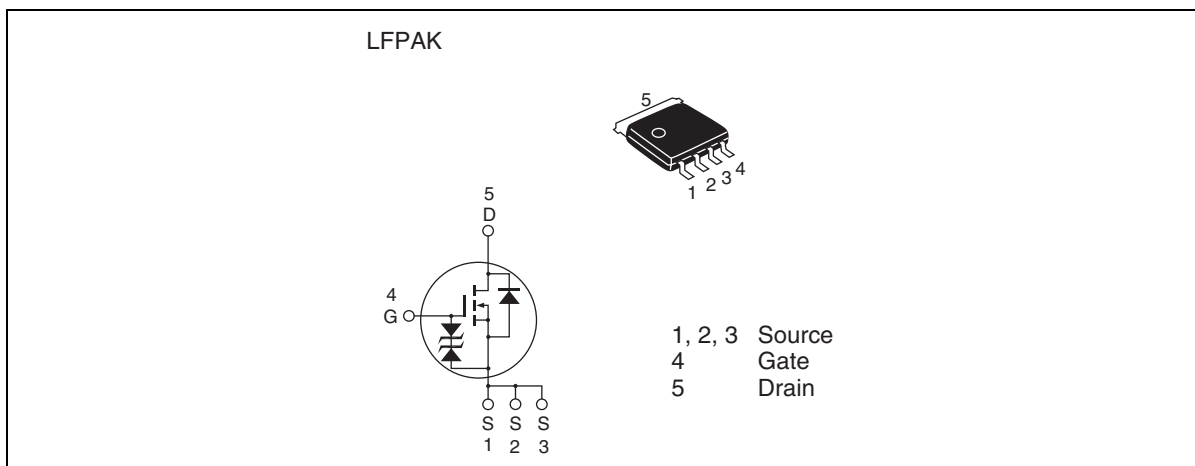
ADE-208-1584A (Z)

Preliminary
2nd. Edition
Aug. 2002

Features

- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 4.9 \text{ m}\Omega$ typ. (at $V_{GS} = 10 \text{ V}$)

Outline



HAT2143H

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V _{DSS}	30	V
Gate to source voltage	V _{GSS}	± 20	V
Drain current	I _D	40	A
Drain peak current	I _{D(pulse)} ^{Note1}	160	A
Body-drain diode reverse drain current	I _{DR}	40	A
Avalanche current	I _{AP} ^{Note 3}	16	A
Avalanche energy	E _{AR} ^{Note 3}	25	mJ
Channel dissipation	P _{ch} ^{Note2}	20	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	– 55 to + 150	°C

- Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Tc=25°C
3. Value at Tch = 25°C, Rg ≥ 50 Ω

Electrical Characteristics

(Ta = 25°C)

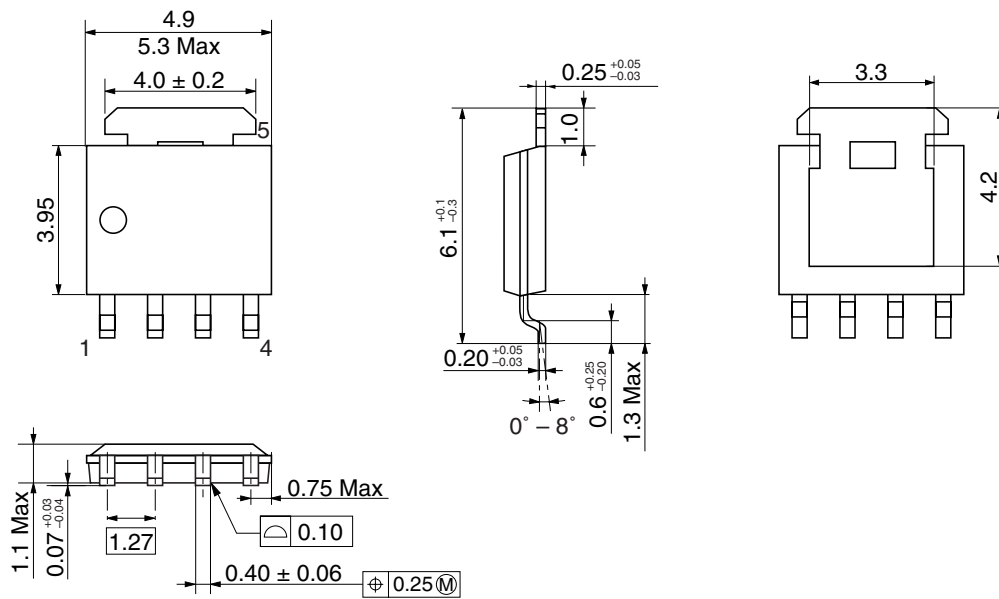
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 30 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	4.9	6.1	m Ω	$I_D = 20 \text{ A}, V_{GS} = 10 \text{ V}$ ^{Note4}
	$R_{DS(on)}$	—	7.9	11.5	m Ω	$I_D = 20 \text{ A}, V_{GS} = 4.5 \text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	30	50	—	S	$I_D = 20 \text{ A}, V_{DS} = 10 \text{ V}$ ^{Note4}
Input capacitance	Ciss	—	2450	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	Coss	—	540	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	280	—	pF	$f = 1 \text{ MHz}$
Total gate charge	Qg	—	40	—	nc	$V_{DD} = 10 \text{ V}$
Gate to source charge	Qgs	—	8	—	nc	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Qgd	—	7	—	nc	$I_D = 40 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$V_{GS} = 10 \text{ V}, I_D = 20 \text{ A}$
Rise time	t_r	—	56	—	ns	$V_{DD} \cong 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	76	—	ns	$R_L = 0.5 \text{ }\Omega$
Fall time	t_f	—	15	—	ns	$R_g = 4.7 \text{ }\Omega$
Body–drain diode forward voltage	V_{DF}	—	0.85	1.11	V	$I_F = 40 \text{ A}, V_{GS} = 0$ ^{Note4}
Body–drain diode reverse recovery time	t_{rr}	—	60	—	ns	$I_F = 40 \text{ A}, V_{GS} = 0$ $diF/dt = 50 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

HAT2143H

Package Dimensions

As of January, 2002
Unit: mm



Hitachi Code	LFPAK
JEDEC	—
JEITA	—
Mass (reference value)	0.080 g

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