To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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HAT2093R

Silicon N Channel Power MOS FET
High Speed Power Switching

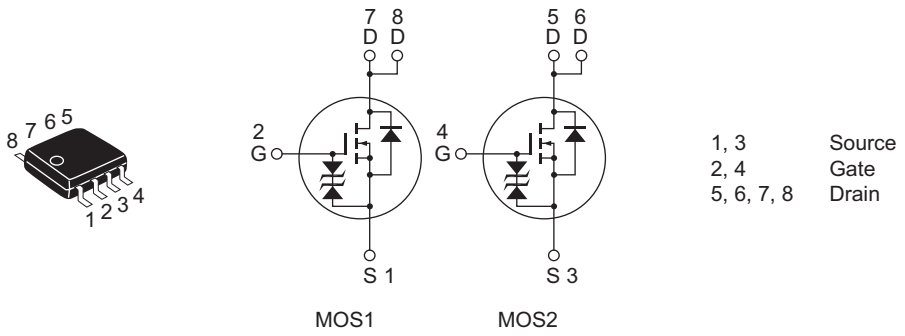
REJ03G1185-0300
(Previous: ADE-208-1237A)
Rev.3.00
Sep 07, 2005

Features

- Low on-resistance
- Capable of 4.5 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_{DSS}	30	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	9	A
Drain peak current	$I_{D\ (pulse)}$ Note 1	72	A
Body-drain diode reverse drain current	I_{DR}	9	A
Channel dissipation	Pch Note 2	2	W
Channel dissipation	Pch Note 3	3	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. 1 Drive operation: When using the glass epoxy board (FR4 40 × 40 × 1.6 mm), PW ≤ 10 s
3. 2 Drive operation: When using the glass epoxy board (FR4 40 × 40 × 1.6 mm), PW ≤ 10 s

Electrical Characteristics

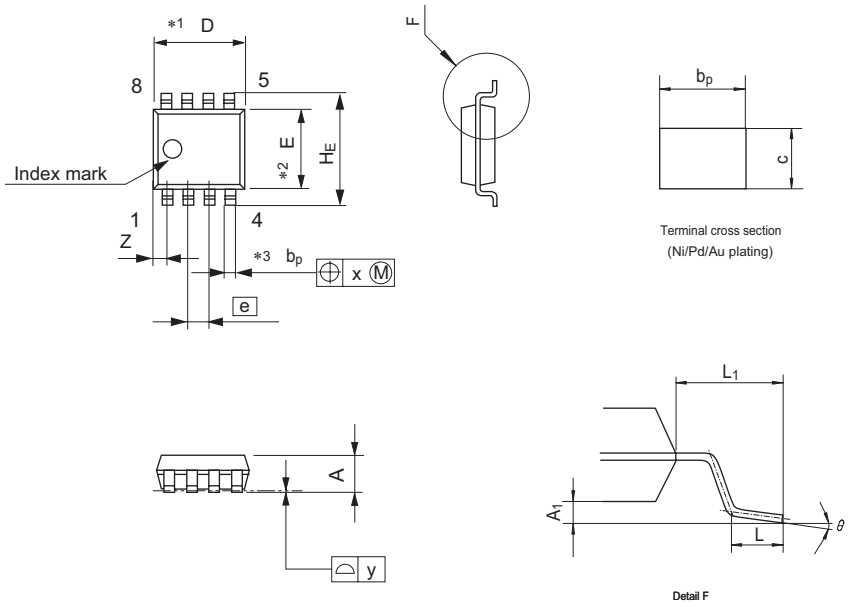
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)\ DSS}$	30	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)\ GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 30 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS\ (off)}$	1.0	—	2.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS\ (on)}$	—	18	23	mΩ	I_D = 4.5 A, V_{GS} = 10 V Note 4
	$R_{DS\ (on)}$	—	27	39	mΩ	I_D = 4.5 A, V_{GS} = 4.5 V Note 4
Forward transfer admittance	$\|y_{fs}\|$	9	15	—	S	I_D = 4.5 A, V_{DS} = 10 V Note 4
Input capacitance	Ciss	—	750	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	200	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	110	—	pF	f = 1 MHz
Total gate charge	Qg	—	12	—	nC	V_{DD} = 10 V
Gate to source charge	Qgs	—	2.3	—	nC	V_{GS} = 10 V
Gate to drain charge	Qgd	—	2.2	—	nC	I_D = 9 A
Turn-on delay time	$t_{d\ (on)}$	—	11	—	ns	V_{GS} = 10 V, I_D = 4.5 A
Rise time	t_r	—	16	—	ns	V_{DD} ≅ 10 V
Turn-off delay time	$t_{d\ (off)}$	—	40	—	ns	R_L = 2.22 Ω
Fall time	t_f	—	7	—	ns	Rg = 4.7 Ω
Body-drain diode forward voltage	V_{DF}	—	0.85	1.10	V	I_F = 9 A, V_{GS} = 0 Note 4
Body-drain diode reverse recovery time	t_{rr}	—	50	—	ns	I_F = 9 A, V_{GS} = 0 di_F/dt = 50 A/µs

Note: 4. Pulse test

Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
P-SOP8-3.95 × 4.9-1.27	PRSP0008DD-D	FP-8DAV	0.085g



Terminal cross section
(Ni/Pd/Au plating)

NOTE)
1. DIMENSIONS "*1(Nom)" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	4.90	5.3
E	—	3.95	—
A_2	—	—	—
A_1	0.10	0.14	0.25
A	—	—	1.75
b_p	0.34	0.40	0.46
b_1	—	—	—
c	0.15	0.20	0.25
c_1	—	—	—
θ	0°	—	8°
H_E	5.80	6.10	6.20
e	—	1.27	—
x	—	—	0.25
y	—	—	0.1
Z	—	—	0.75
L	0.40	0.60	1.27
L_1	—	1.08	—

Ordering Information

Part Name	Quantity	Shipping Container
HAT2093R-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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