HAT2053M

Silicon N Channel Power MOS FET
Power Switching

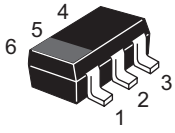
REJ03G1172-0500
(Previous: ADE-208-755C)
Rev.5.00
Sep 07, 2005

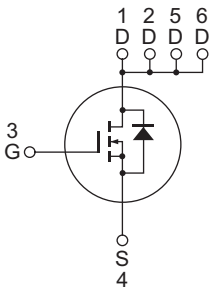
Features

- Low on-resistance
- Low drive current
- High density mounting
- 2.5 V gate drive device can be driven from 3 V source

Outline

RENESAS Package code: PTSP0006FA-A
(Package name: TSOP-6)





4	Source
3	Gate
1, 2, 5, 6	Drain

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	20	V
Gate to source voltage	V_{GSS}	±12	V
Drain current	I_D Note 2	6.1	A
Drain peak current	$I_{D\ (pulse)}$ Note 1	24.4	A
Body to drain diode reverse drain current	I_{DR} Note 2	6.1	A
Channel dissipation	Pch Note 2	2.0	W
	Pch Note 3	1.05	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. When using the alumina ceramic board (50 × 50 × 0.7 mm), PW ≤ 5 s, Ta = 25°C
3. When using the alumina ceramic board (50 × 50 × 0.7 mm), Ta = 25°C

Electrical Characteristics

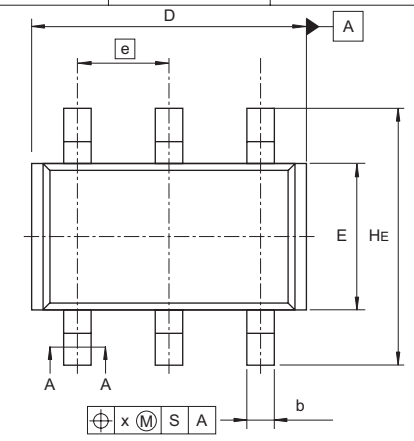
(Ta = 25°C)

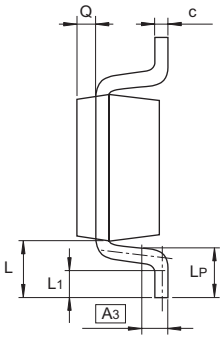
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)\ DSS}$	20	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±12 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 20 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS\ (off)}$	0.4	—	1.4	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS\ (on)}$	—	28	33	mΩ	I_D = 3 A, V_{GS} = 4.5 V Note 4
	$R_{DS\ (on)}$	—	37	48	mΩ	I_D = 3 A, V_{GS} = 2.5 V Note 4
Forward transfer admittance	$\|y_{fs}\|$	6.0	10	—	S	I_D = 3 A, V_{DS} = 10 V Note 4
Input capacitance	Ciss	—	570	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	220	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	160	—	pF	f = 1 MHz
Turn-on delay time	$t_{d\ (on)}$	—	15	—	ns	V_{GS} = 4.5 V, I_D = 3 A,
Rise time	t_r	—	100	—	ns	R_L = 3.3 Ω
Turn-off delay time	$t_{d\ (off)}$	—	90	—	ns	
Fall time	t_f	—	105	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.95	—	V	I_F = 6.1 A, V_{GS} = 0 Note 4
Body to drain diode reverse recovery time	t_{rr}	—	(50)	—	ns	I_F = 6.1 A, V_{GS} = 0 di_F/dt = 20 A/µs

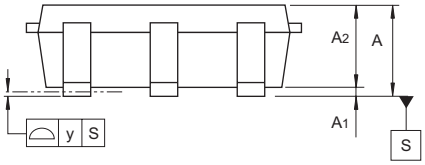
Note: 4. Pulse test

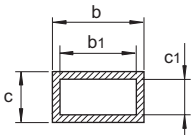
Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-95 Modified	PTSP0006FA-A	TSOP-6 / TSOP-6V	0.012g

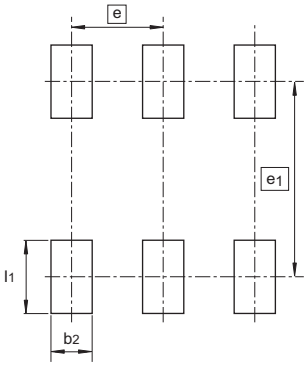








A-A Section



Pattern of terminal position areas

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.8	–	1.1
A_1	0	–	0.1
A_2	0.8	0.9	1.0
$\boxed{A_3}$	–	0.25	–
b	0.25	0.32	0.4
b_1	–	0.3	–
c	0.1	0.13	0.15
c_1	–	0.11	–
D	2.8	2.95	3.1
E	1.45	1.6	1.75
$\boxed{e}$	–	1.0	–
H_E	2.6	2.8	3.0
L	0.3	–	0.7
L_1	0.1	–	0.5
L_P	0.2	–	0.6
x	–	–	0.05
y	–	–	0.05
b_2	–	–	0.45
$\boxed{e_1}$	–	2.2	–
l_1	–	–	0.8
Q	–	0.2	–

Ordering Information

Part Name	Quantity	Shipping Container
HAT2053M-EL-E	3000 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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