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

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HAT2044R

Silicon N Channel Power MOS FET Power Switching

RENESAS

ADE-208-722A (Z)
2nd Edition
Feb. 1999

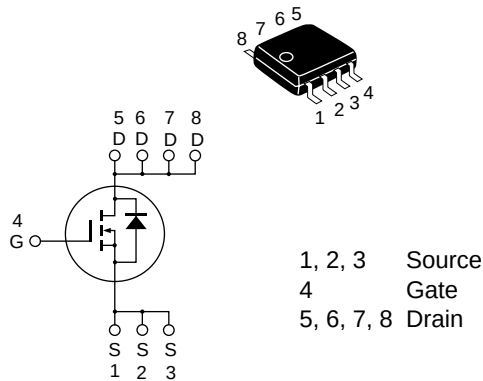
Features

- Capable of 2.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance

$$R_{DS(on)} = 6.5 \text{ m}\Omega \text{ typ} \quad (\text{at } V_{GS} = 4.5\text{V})$$

Outline

SOP-8



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V _{DSS}	30	V
Gate to source voltage	V _{GSS}	± 12	V
Drain current	I _D	15	A
Drain peak current	I _{D(pulse)} ^{Note1}	120	A
Body-drain diode reverse drain current	I _{DR}	15	A
Channel dissipation	Pch ^{Note2}	2.5	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	– 55 to + 150	°C

Note: 1. PW ≤ 10 μs, duty cycle ≤ 1%

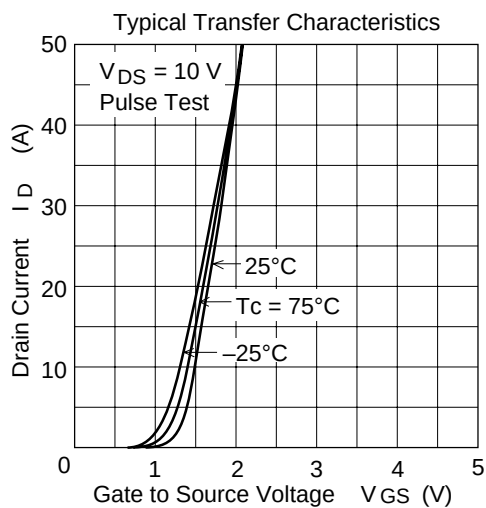
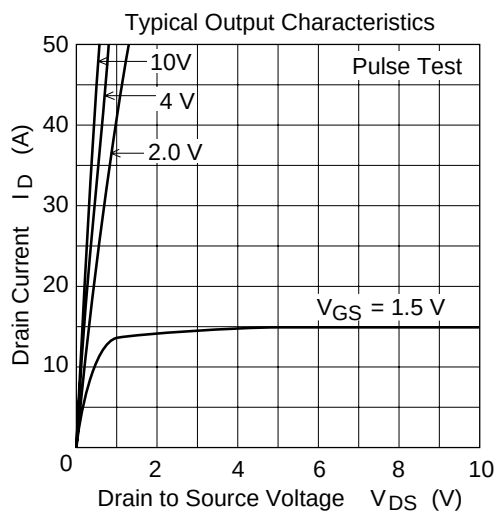
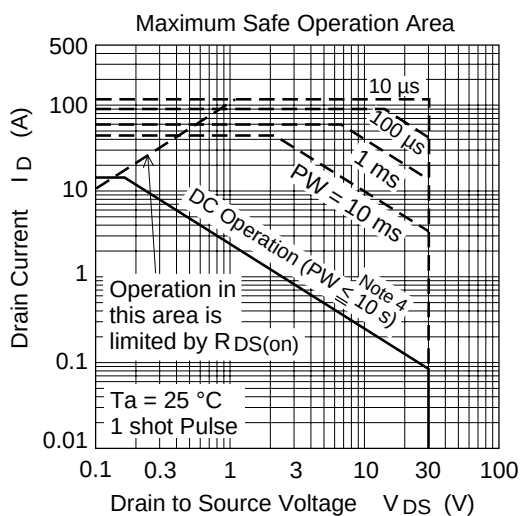
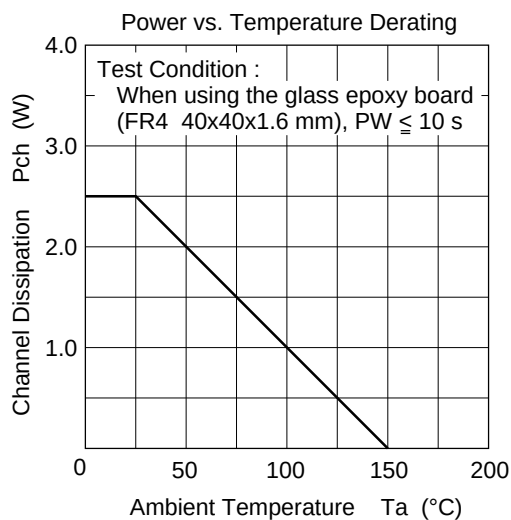
2. When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW ≤ 10s

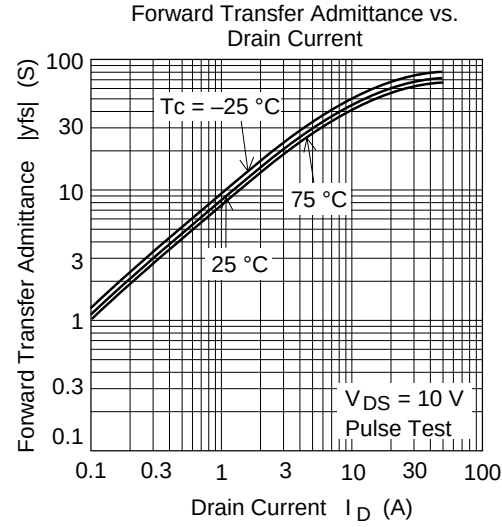
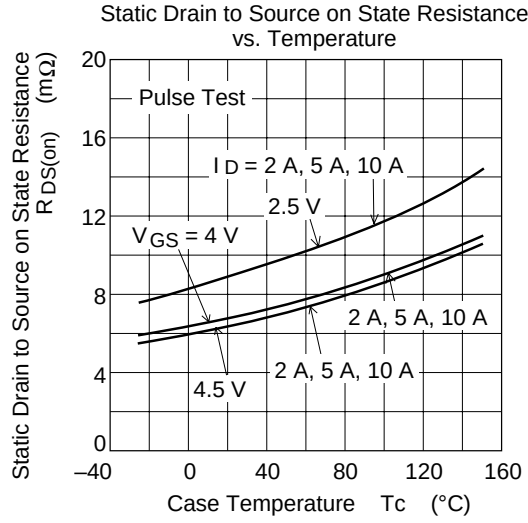
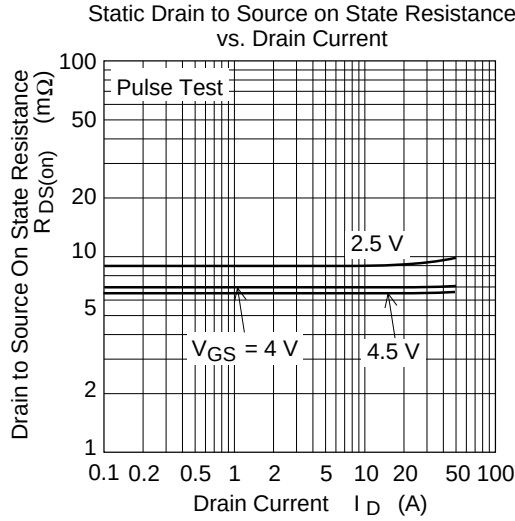
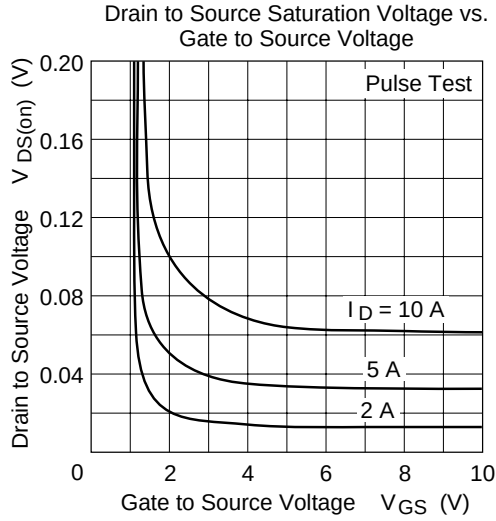
Electrical Characteristics (Ta = 25°C)

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 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} = 30 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)}	—	6.5	9.0	mΩ	I _D = 8 A, V _{GS} = 4.5 V ^{Note3}
	R _{DS(on)}	—	7.0	9.5	mΩ	I _D = 8 A, V _{GS} = 4.0 V ^{Note3}
	R _{DS(on)}	—	9.0	13.0	mΩ	I _D = 8 A, V _{GS} = 2.5 V ^{Note3}
Forward transfer admittance	y _{fs}	24	40	—	S	I _D = 8 A, V _{DS} = 10 V ^{Note3}
Input capacitance	Ciss	—	3420	—	pF	V _{DS} = 10 V
Output capacitance	Coss	—	950	—	pF	V _{GS} = 0
Reverse transfer capacitance	Crss	—	480	—	pF	f = 1 MHz
Total gate charge	Qg	—	48	—	nc	V _{DD} = 10 V
Gate to source charge	Qgs	—	32	—	nc	V _{GS} = 4 V
Gate to drain charge	Qgd	—	16	—	nc	I _D = 15 A
Turn-on delay time	t _{d(on)}	—	45	—	ns	V _{GS} = 4 V, I _D = 8 A
Rise time	t _r	—	285	—	ns	V _{DD} ≅ 10 V
Turn-off delay time	t _{d(off)}	—	470	—	ns	
Fall time	t _f	—	360	—	ns	
Body–drain diode forward voltage	V _{DF}	—	0.85	1.1	V	IF = 15 A, V _{GS} = 0 ^{Note3}
Body–drain diode reverse recovery time	t _{rr}	—	45	—	ns	IF = 15 A, V _{GS} = 0 diF/ dt = 20 A/ μs

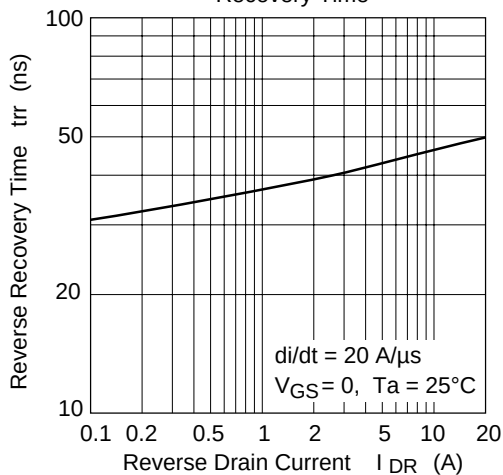
Note: 3. Pulse test

Main Characteristics

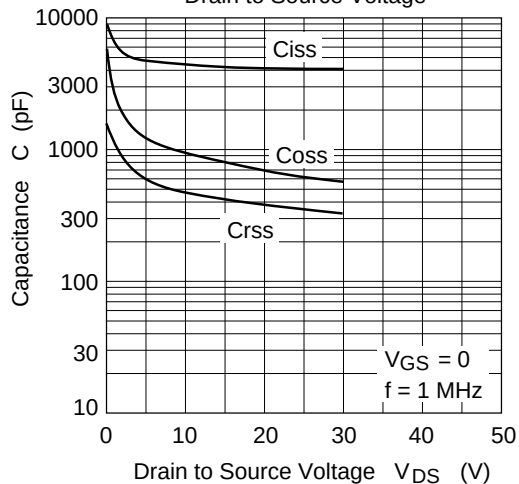




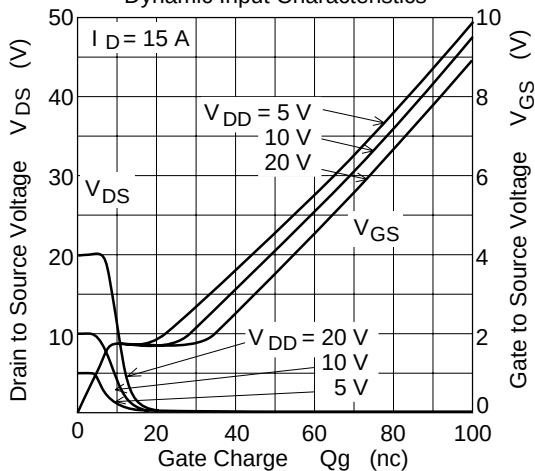
Body-Drain Diode Reverse Recovery Time



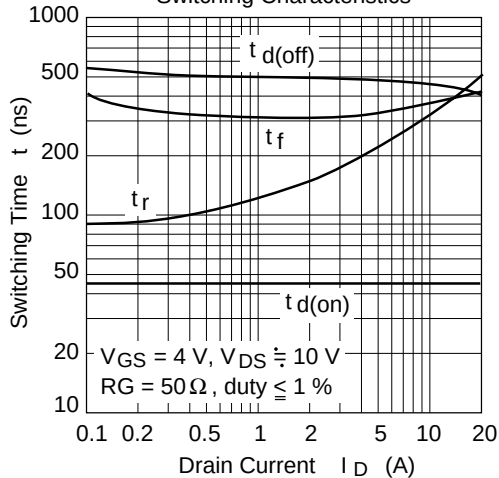
Typical Capacitance vs. Drain to Source Voltage

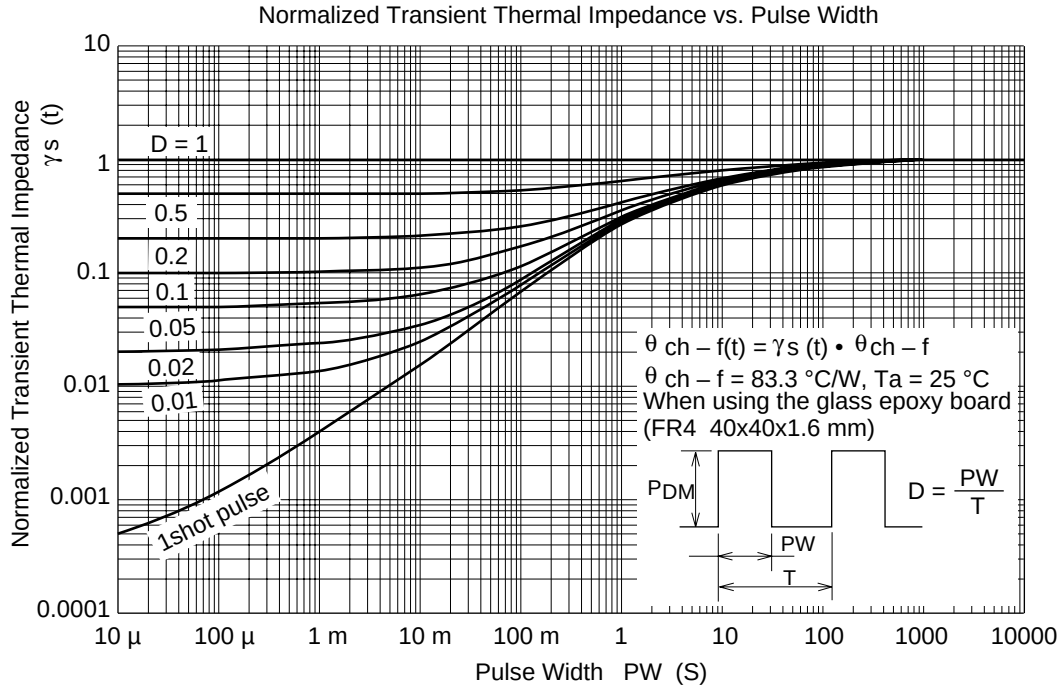
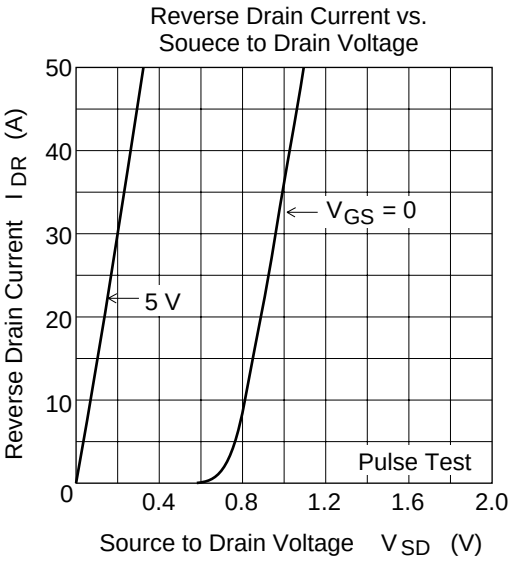


Dynamic Input Characteristics

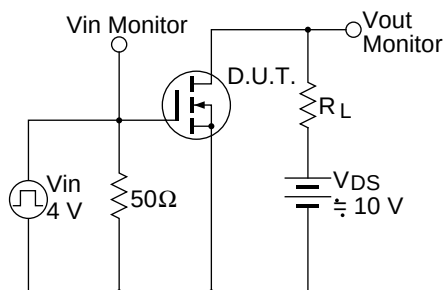


Switching Characteristics

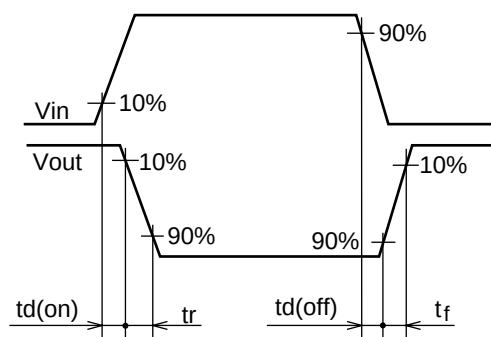




Switching Time Test Circuit

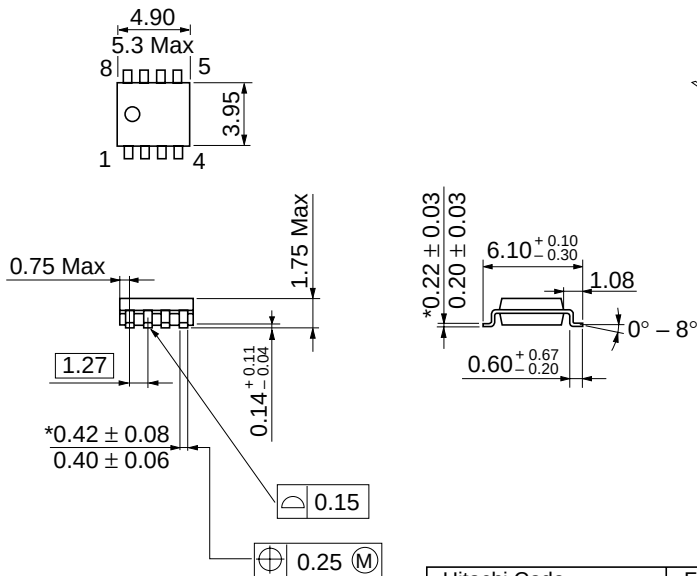


Switching Time Waveform



Package Dimensions

As of January, 2001
Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-8DA
JEDEC	Conforms
EIAJ	—
Mass (reference value)	0.085 g

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