

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# HAT2218R

## Silicon N Channel Power MOS FET with Schottky Barrier Diode High Speed Power Switching

REJ03G0396-0300

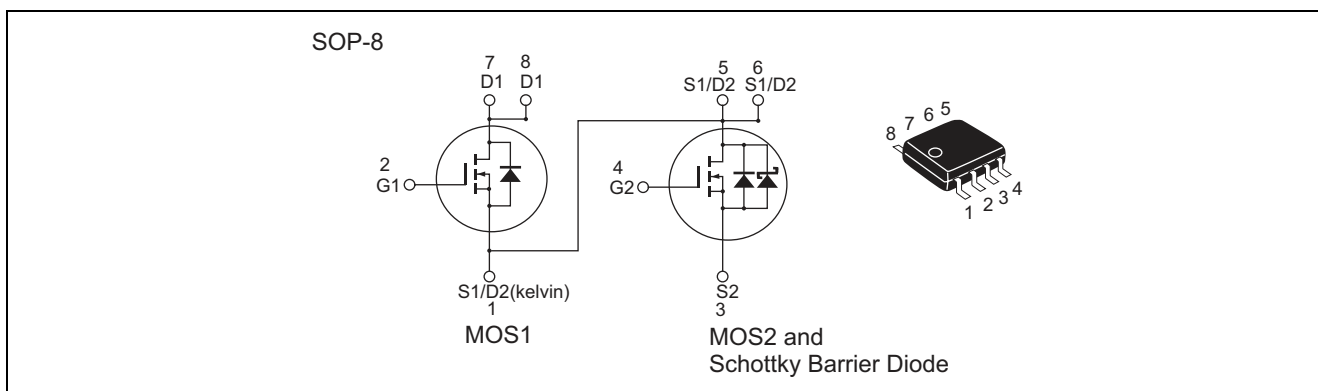
Rev.3.00

Aug.23.2004

### Features

- Low on-resistance
- Capable of 4.5 V gate drive
- High density mounting
- Built-in Schottky Barrier Diode

### Outline



### Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings		Unit
		MOS1	MOS2 & SBD	
Drain to source voltage	$V_{DSS}$	30	30	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	$\pm 12$	V
Drain current	$I_D$	7.5	8.0	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	60	64	A
Reverse drain current	$I_{DR}$	7.5	8.0	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	1.5	1.5	W
Channel temperature	$T_{ch}$	150	150	°C
Storage temperature	$T_{stg}$	-55 to +150	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

2. 1 Drive operation; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm),  $PW \leq 10 s$

## Electrical Characteristics

### • MOS1

(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 leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\infty$ A	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\infty$ A	$V_{DS} = 30 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	19	24	m $\Omega$	$I_D = 3.75 \text{ A}, V_{GS} = 10 \text{ V}$ <sup>Note3</sup>
	$R_{DS(on)}$	—	27	40	m $\Omega$	$I_D = 3.75 \text{ A}, V_{GS} = 4.5 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	9	15	—	S	$I_D = 3.75 \text{ A}, V_{DS} = 10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	630	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	155	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	57	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	4.6	—	nC	$V_{DD} = 10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	2.2	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	1.2	—	nC	$I_D = 7.5 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	7	—	ns	$V_{GS} = 10 \text{ V}, I_D = 3.75 \text{ A}$
Rise time	$t_r$	—	14	—	ns	$V_{DD} \approx 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	36	—	ns	$R_L = 2.66 \Omega$
Fall time	$t_f$	—	3.4	—	ns	$R_g = 4.7 \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	0.85	1.11	V	$I_F = 7.5 \text{ A}, V_{GS} = 0$ <sup>Note3</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	17	—	ns	$I_F = 7.5 \text{ A}, V_{GS} = 0$ $diF/dt = 100 \text{ A}/\infty\text{s}$

Notes: 3. Pulse test

### • MOS2 & Schottky Barrier Diode

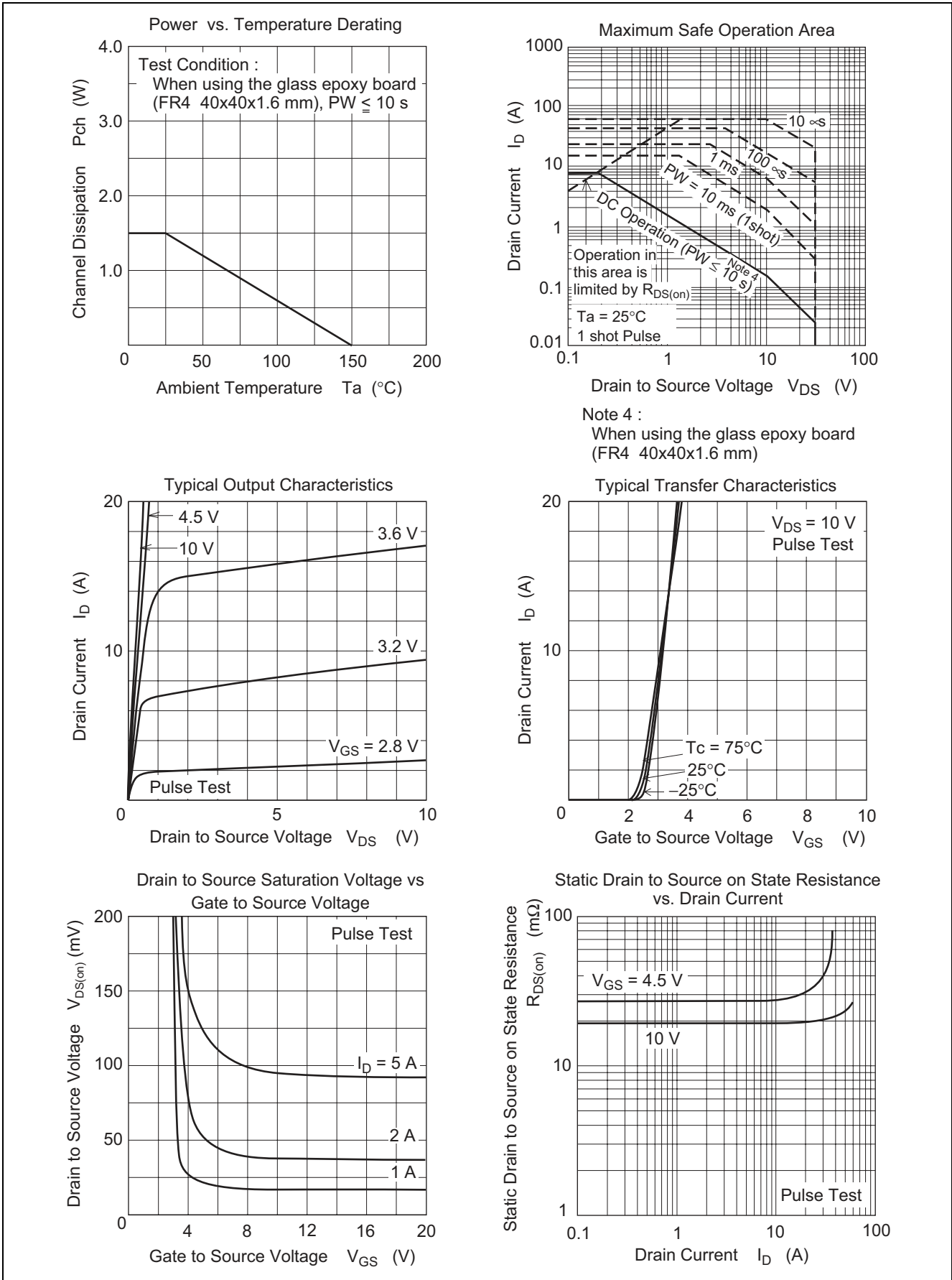
(Ta = 25°C)

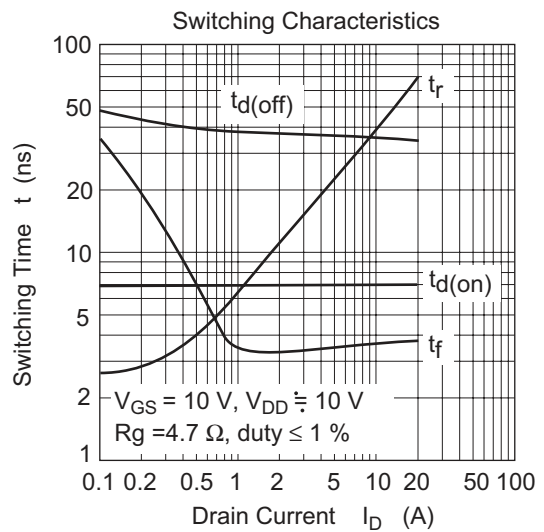
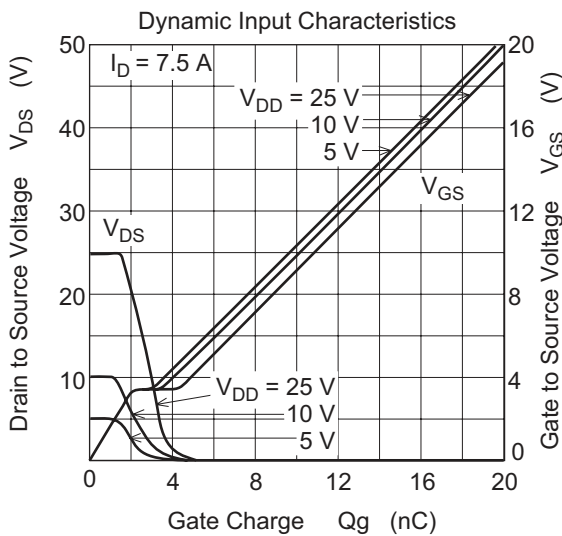
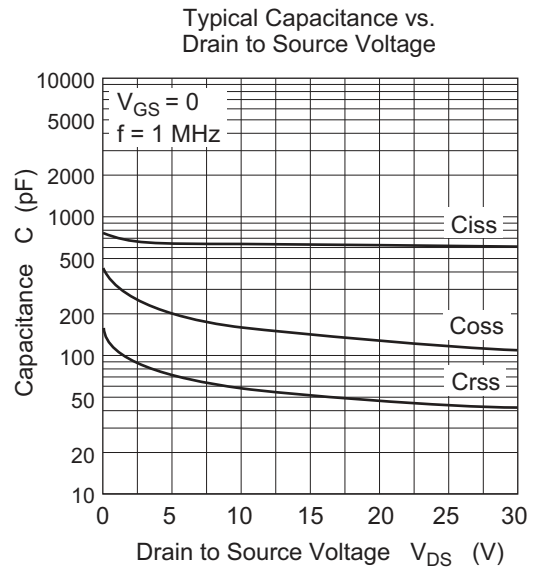
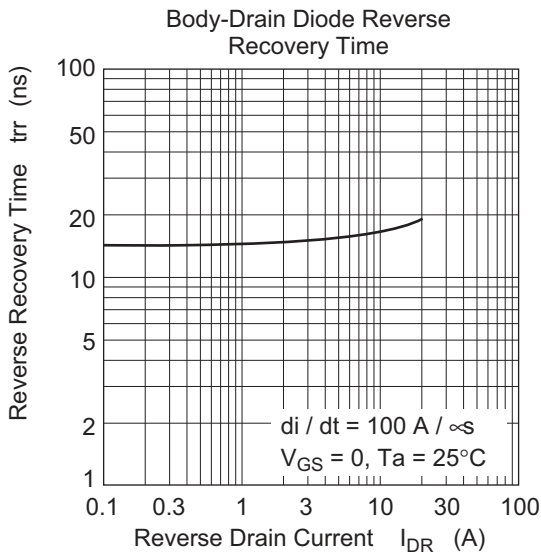
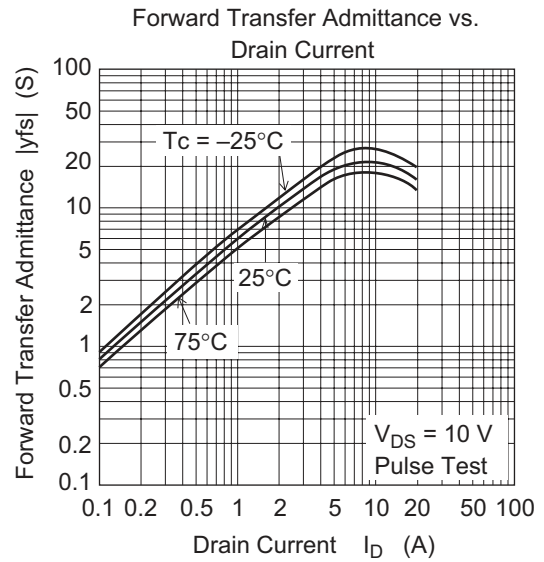
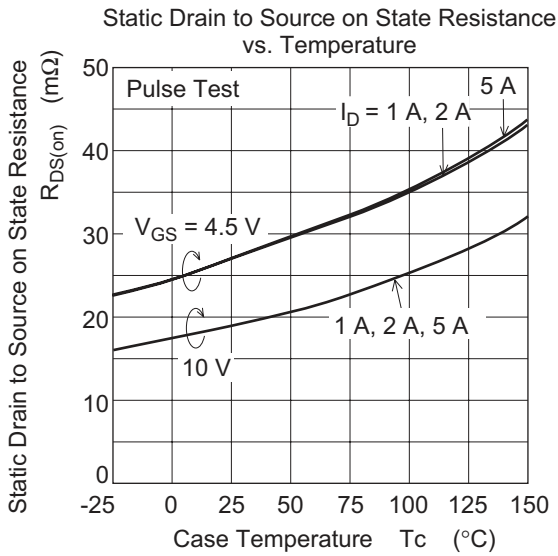
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\infty$ A	$V_{GS} = \pm 12 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	m A	$V_{DS} = 30 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.4	—	2.5	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	17	22	m $\Omega$	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V}$ <sup>Note3</sup>
	$R_{DS(on)}$	—	21	29	m $\Omega$	$I_D = 4 \text{ A}, V_{GS} = 4.5 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	15	25	—	S	$I_D = 4 \text{ A}, V_{DS} = 10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	1330	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	230	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	92	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	11	—	nC	$V_{DD} = 10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	3.8	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	3.2	—	nC	$I_D = 8 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$V_{GS} = 10 \text{ V}, I_D = 4 \text{ A}$
Rise time	$t_r$	—	16	—	ns	$V_{DD} \approx 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	43	—	ns	$R_L = 2.5 \Omega$
Fall time	$t_f$	—	3.9	—	ns	$R_g = 4.7 \Omega$
Schottky Barrier diode forward voltage	$V_F$	—	0.5	—	V	$I_F = 3.5 \text{ A}, V_{GS} = 0$ <sup>Note3</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	15	—	ns	$I_F = 8 \text{ A}, V_{GS} = 0$ $diF/dt = 100 \text{ A}/\infty\text{s}$

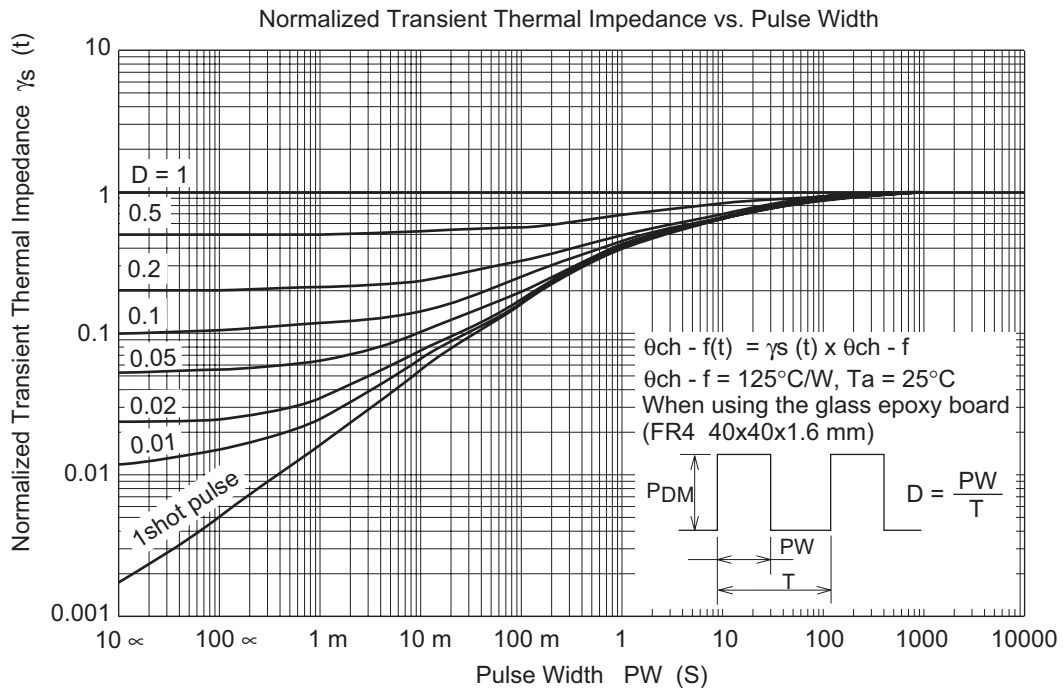
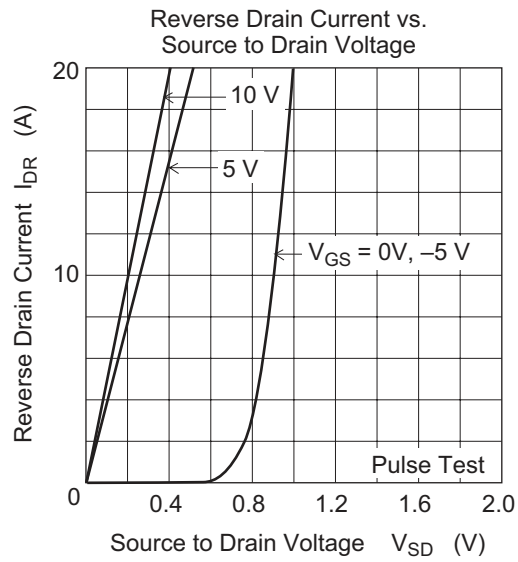
Notes: 3. Pulse test

## Main Characteristics

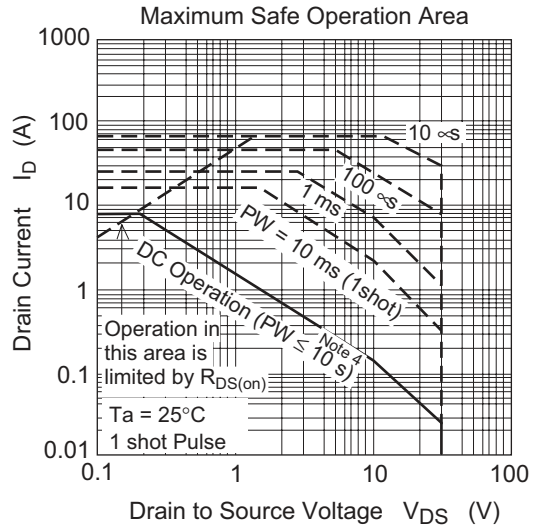
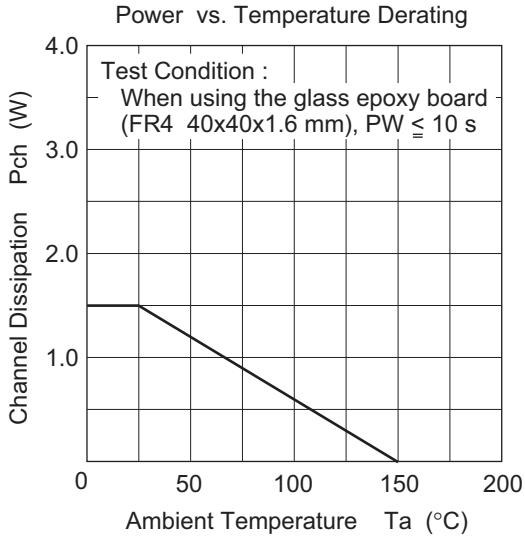
### • MOS1



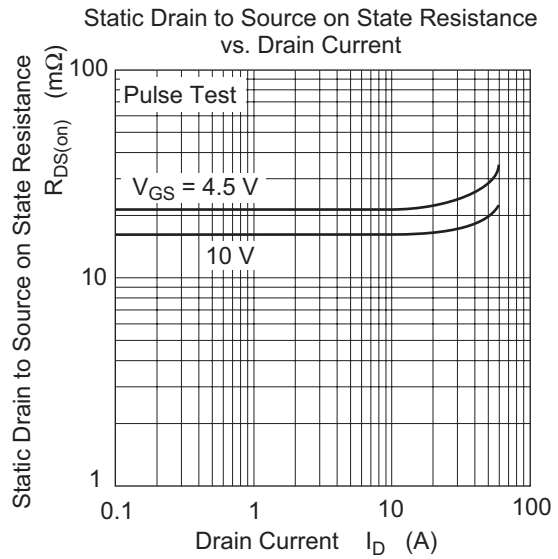
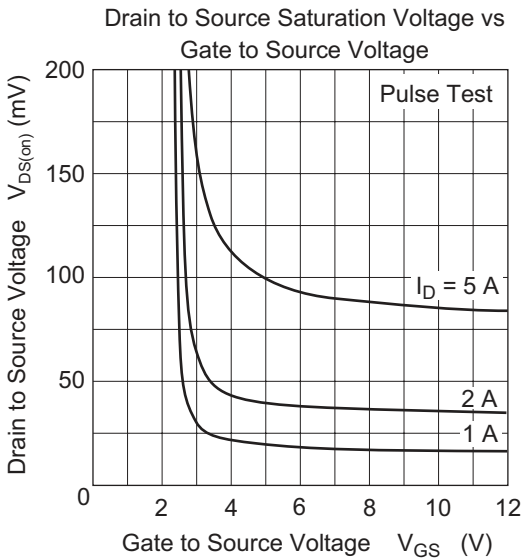
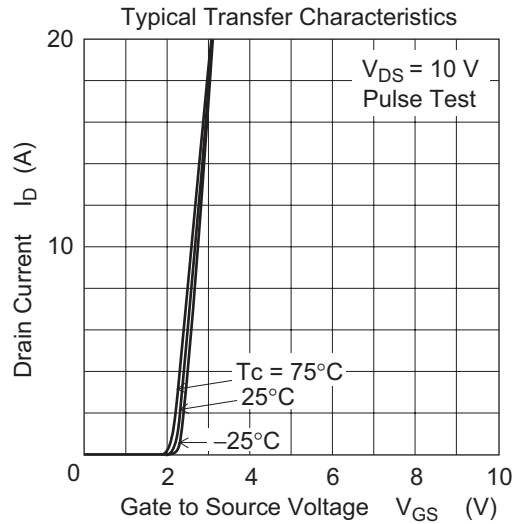
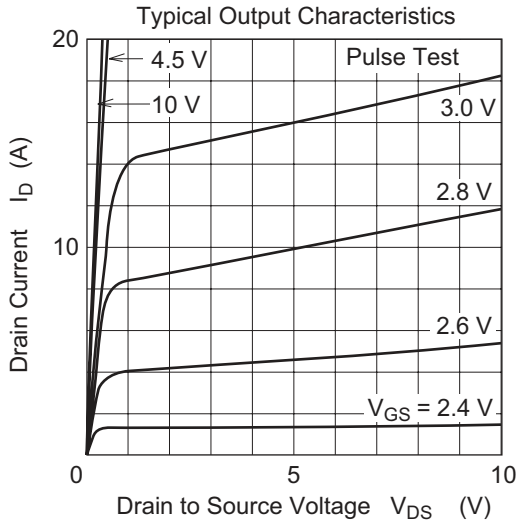




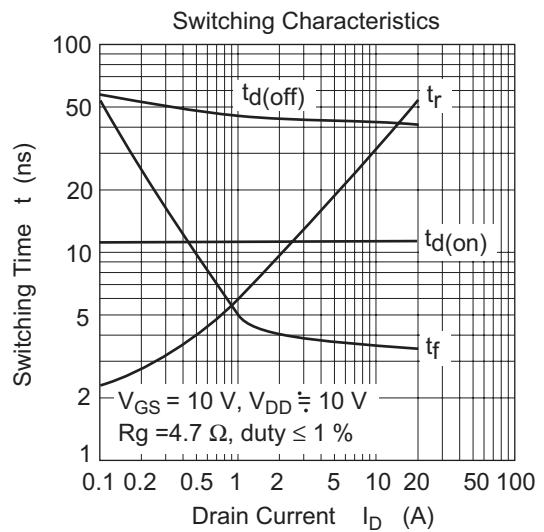
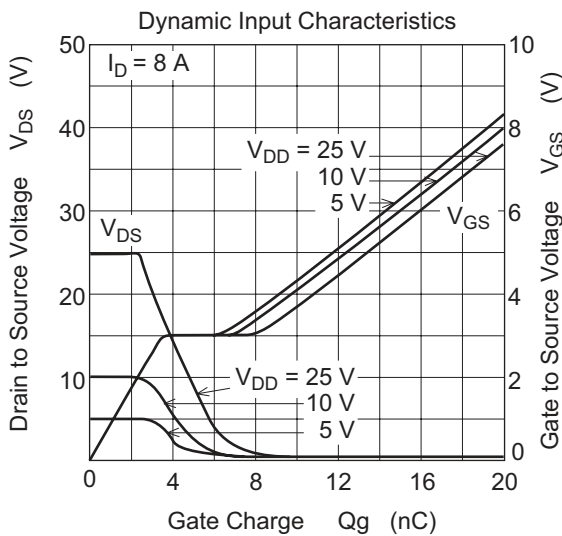
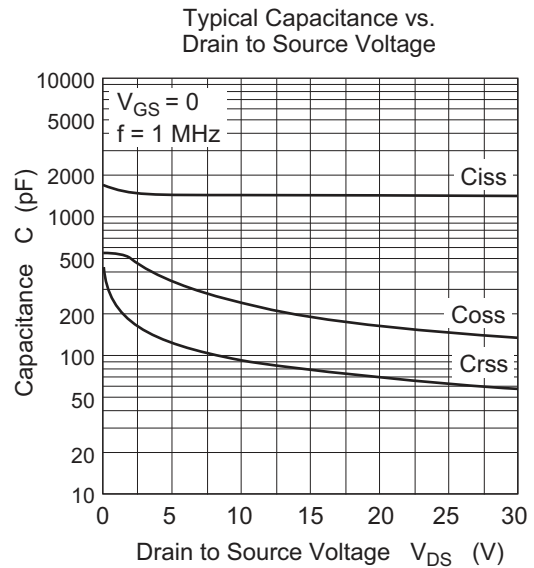
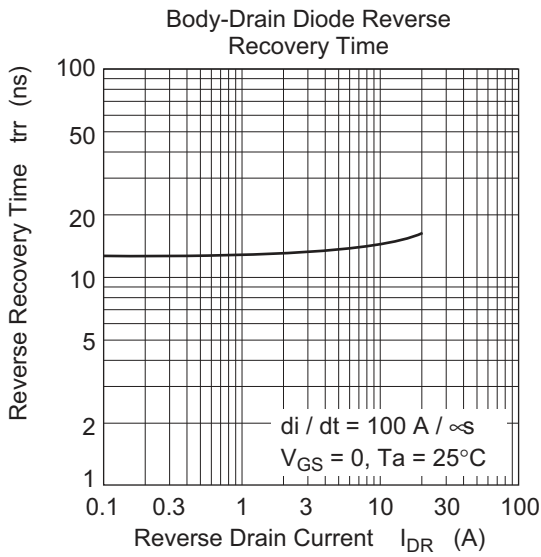
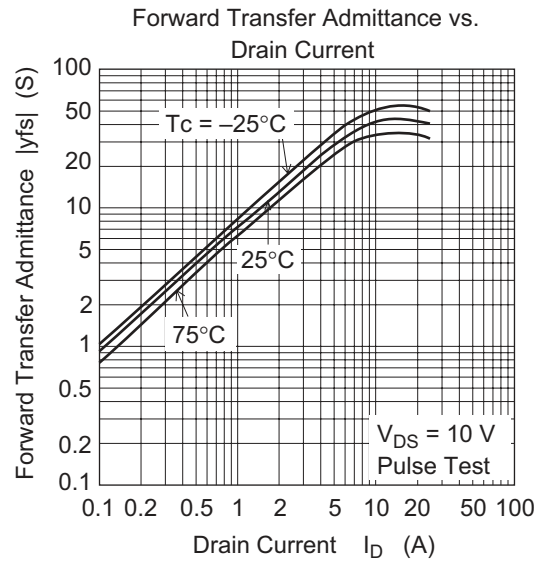
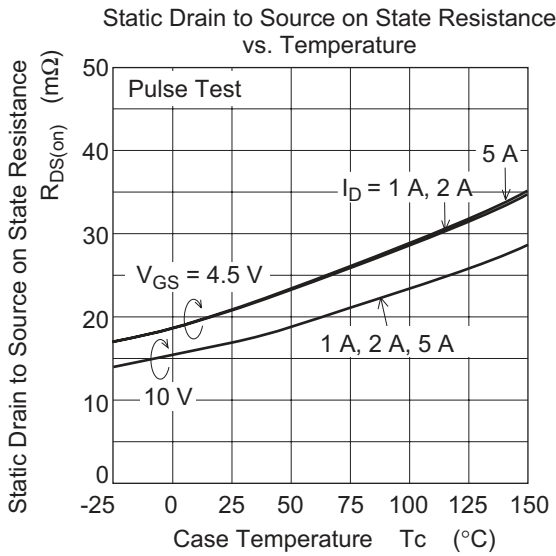
• MOS2 & Schottky Barrier Diode

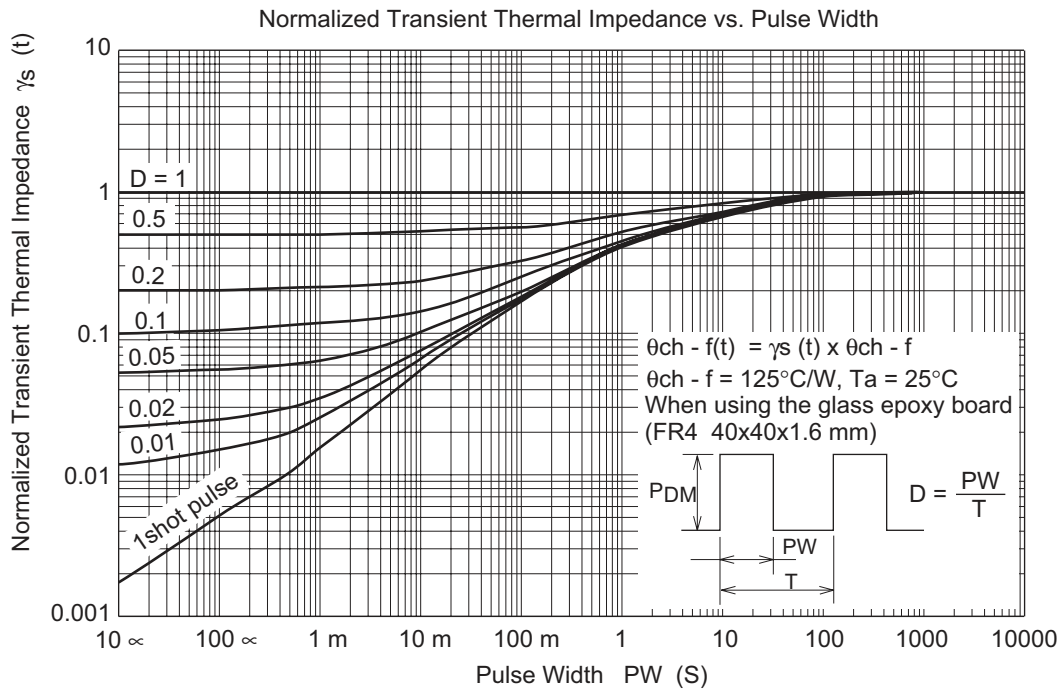
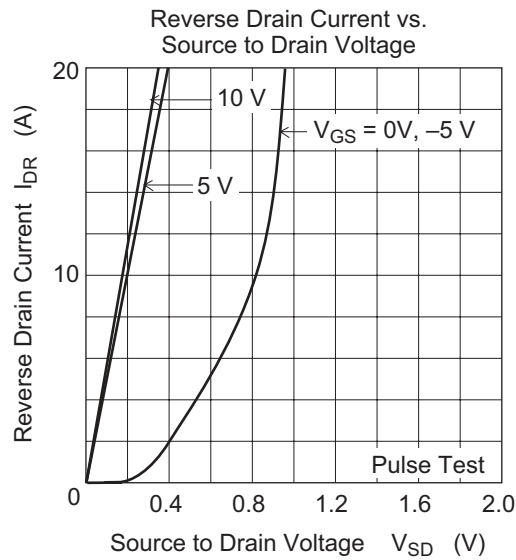


Note 4 :  
When using the glass epoxy board (FR4 40x40x1.6 mm)

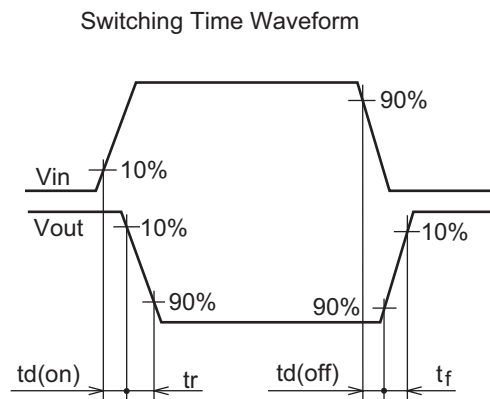
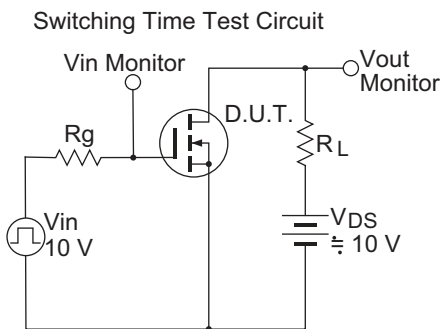






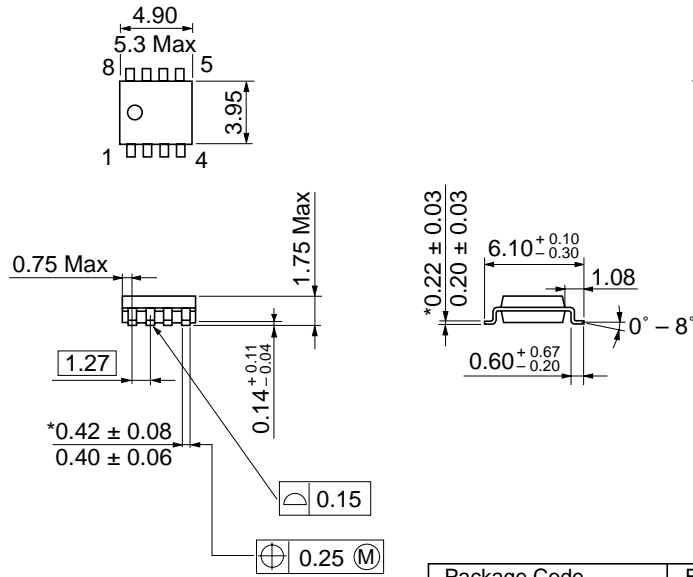


• Common



Package Dimensions

As of January, 2003  
Unit: mm



\*Dimension including the plating thickness  
Base material dimension

Package Code	FP-8DA
JEDEC	Conforms
JEITA	—
Mass (reference value)	0.085 g

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Part Name	Quantity	Shipping Container
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