

## HAT1128R

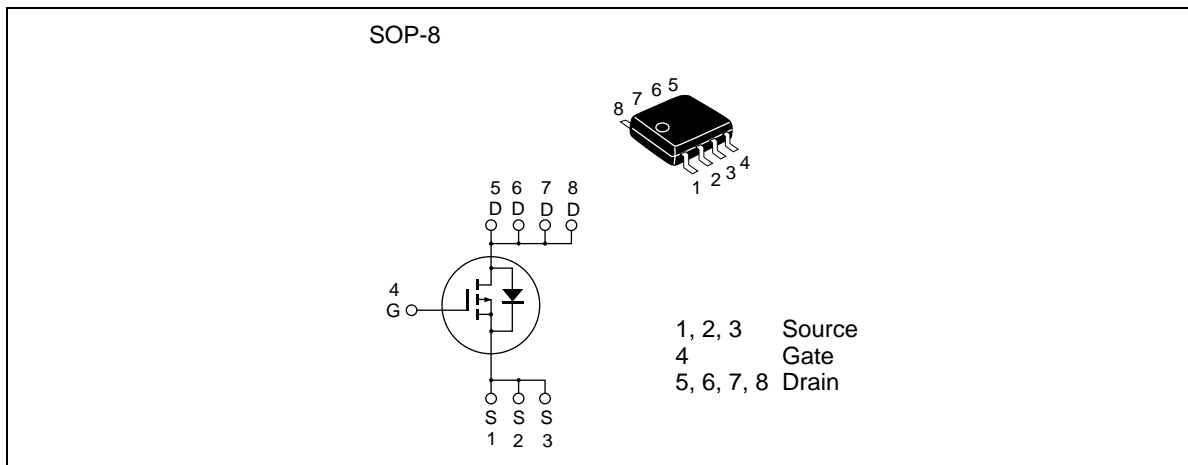
Silicon P Channel Power MOS FET  
High Speed Power Switching

Rev.3.00  
Feb.17.2004

### Features

- Low on-resistance
- Capable of 4.5 V gate drive
- High density mounting

### Outline



**Absolute Maximum Ratings**

(Ta = 25°C)

<b>Item</b>	<b>Symbol</b>	<b>Ratings</b>	<b>Unit</b>
Drain to source voltage	V <sub>DSS</sub>	-30	V
Gate to source voltage	V <sub>GSS</sub>	-20/+10	V
Drain current	I <sub>D</sub>	-16	A
Drain peak current	I <sub>D(pulse)</sub> <sup>Note1</sup>	-128	A
Reverse drain current	I <sub>DR</sub>	-16	A
Channel dissipation	P <sub>ch</sub> <sup>Note2</sup>	2.5	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Notes: 1. PW ≤ 10μs, duty cycle ≤ 1 %

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

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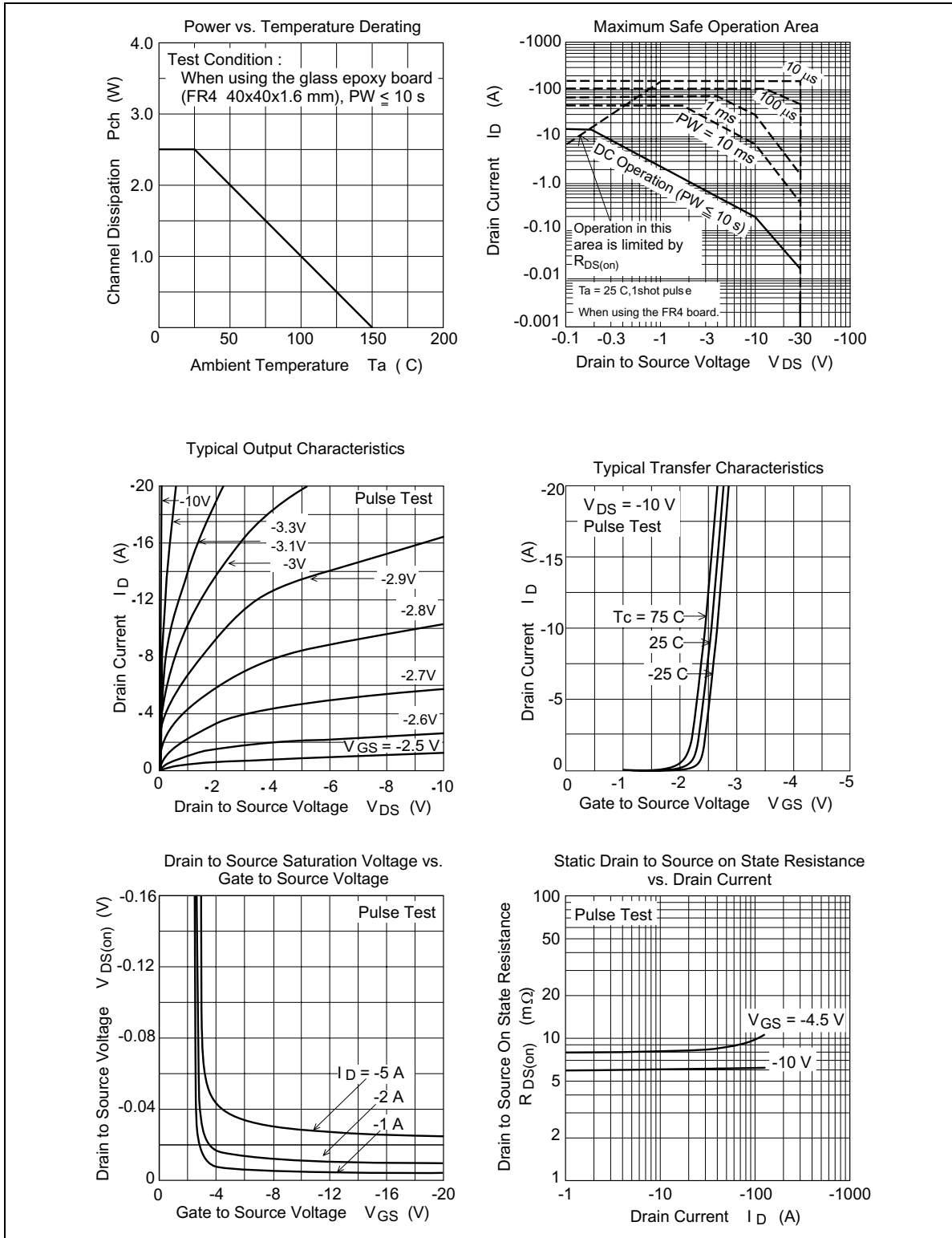
### Electrical Characteristics

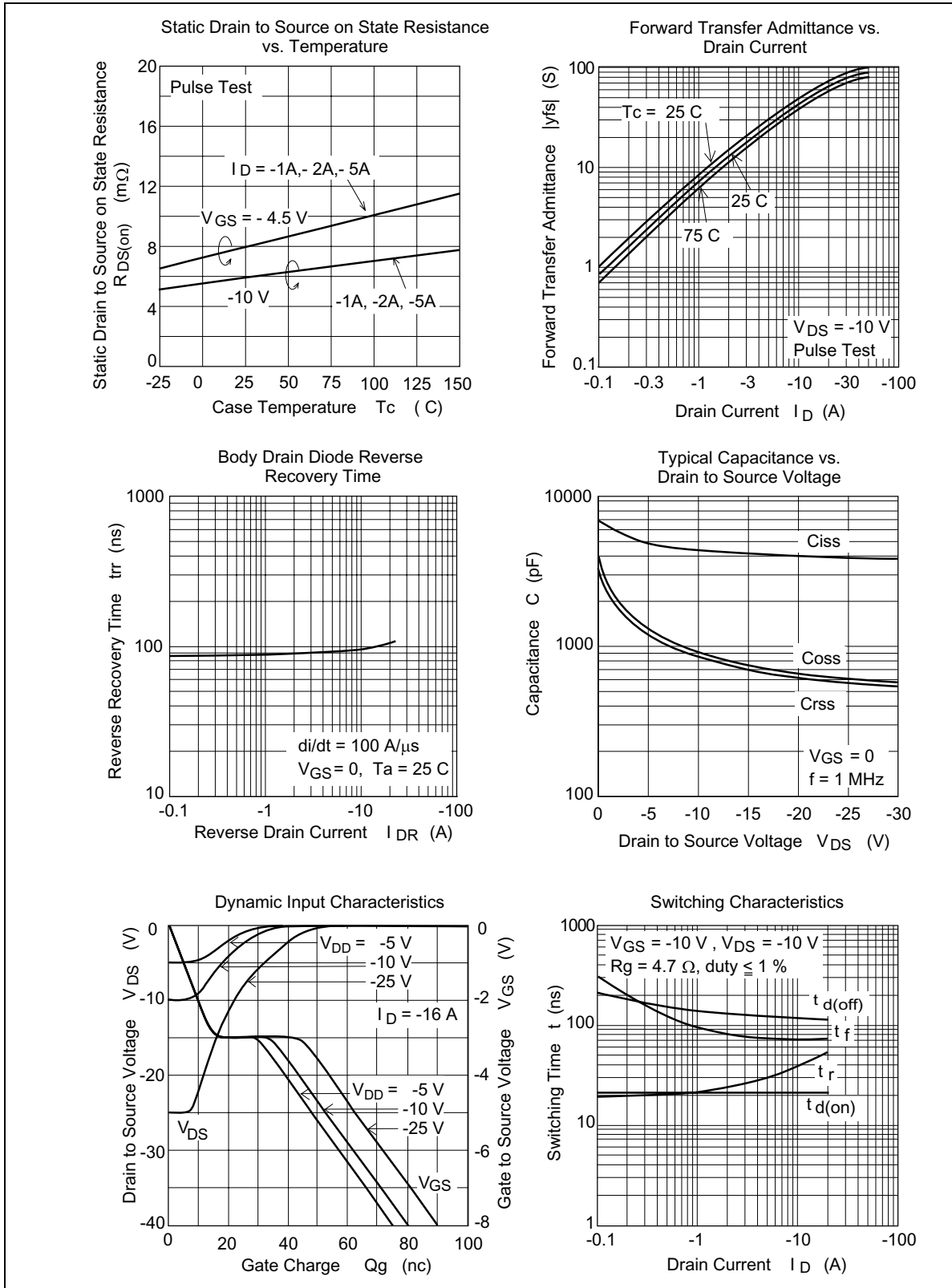
( $T_a = 25^\circ\text{C}$ )

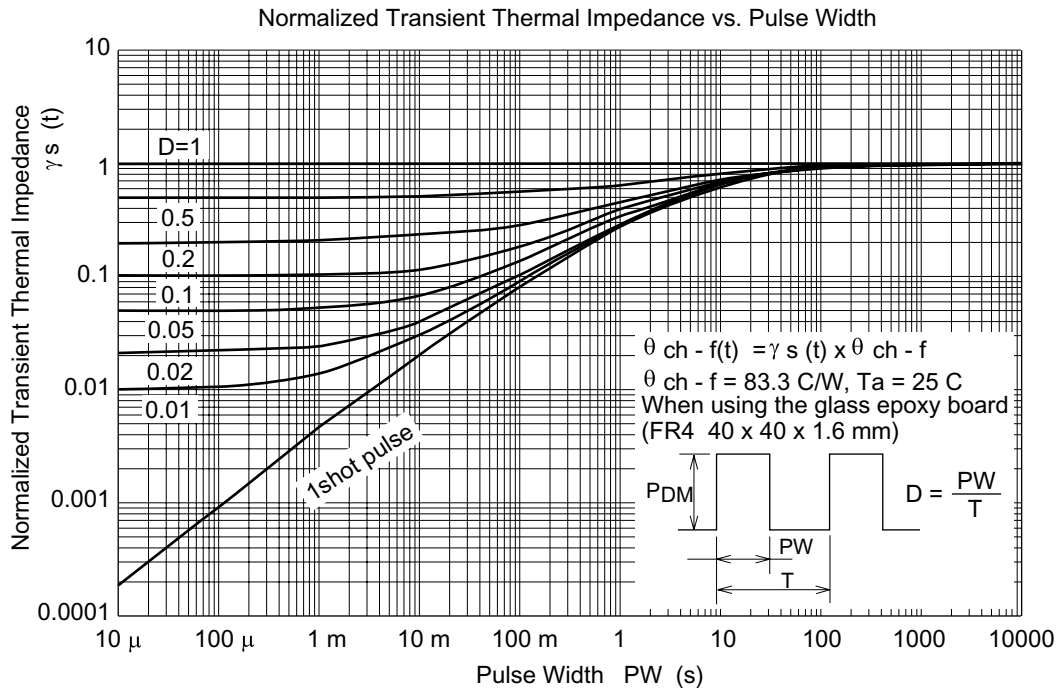
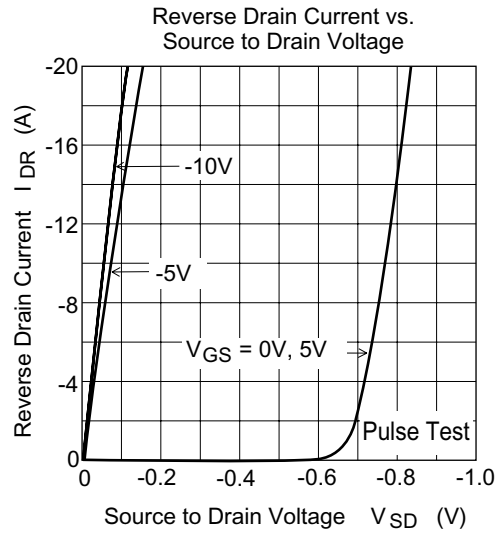
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	V	$I_D = -10\text{mA}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = -20, +10\text{V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -30\text{V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	6.0	7.5	$\text{m}\Omega$	$I_D = -8\text{A}$ , $V_{GS} = -10\text{V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	8.0	11.5	$\text{m}\Omega$	$I_D = -8\text{A}$ , $V_{GS} = -4.5\text{V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	20	35	—	S	$I_D = -8\text{A}$ , $V_{DS} = -10\text{V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	4300	—	pF	$V_{DS} = -10\text{V}$
Output capacitance	$C_{oss}$	—	930	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	880	—	pF	$f = 1\text{MHz}$
Total gate charge	$Q_g$	—	48	—	nc	$V_{DD} = -10\text{V}$
Gate to source charge	$Q_{gs}$	—	14	—	nc	$V_{GS} = -4.5\text{V}$
Gate to drain charge	$Q_{gd}$	—	20	—	nc	$I_D = -16\text{A}$
Turn-on delay time	$t_{d(on)}$	—	21	—	ns	$V_{GS} = -10\text{V}$ , $I_D = -8\text{A}$
Rise time	$t_r$	—	35	—	ns	$V_{DD} \approx -10\text{V}$
Turn-off delay time	$t_{d(off)}$	—	123	—	ns	$R_L = 1.25\ \Omega$
Fall time	$t_f$	—	73	—	ns	$R_g = 4.7\ \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	0.82	1.07	V	$I_F = -16\text{A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	100	—	ns	$I_F = -16\text{A}$ , $V_{GS} = 0$ $di_F/dt = -100\text{A}/\mu\text{s}$

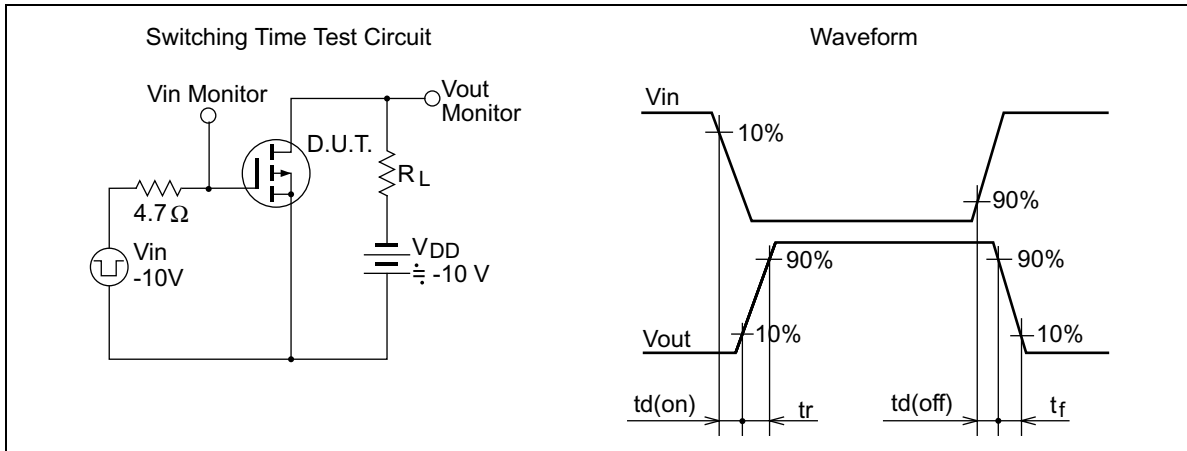
Notes: 4. Pulse test

Main Characteristics



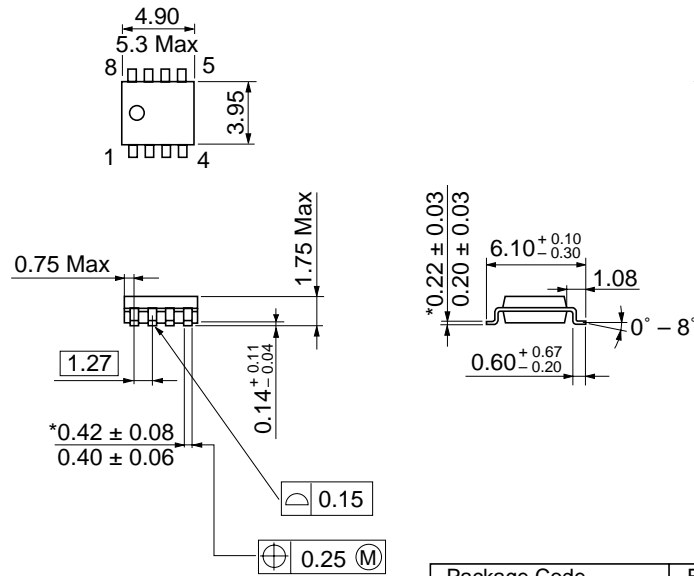






Package Dimensions

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