

# HAT1111C

## Silicon P Channel MOS FET Power Switching

REJ03G0446-0500

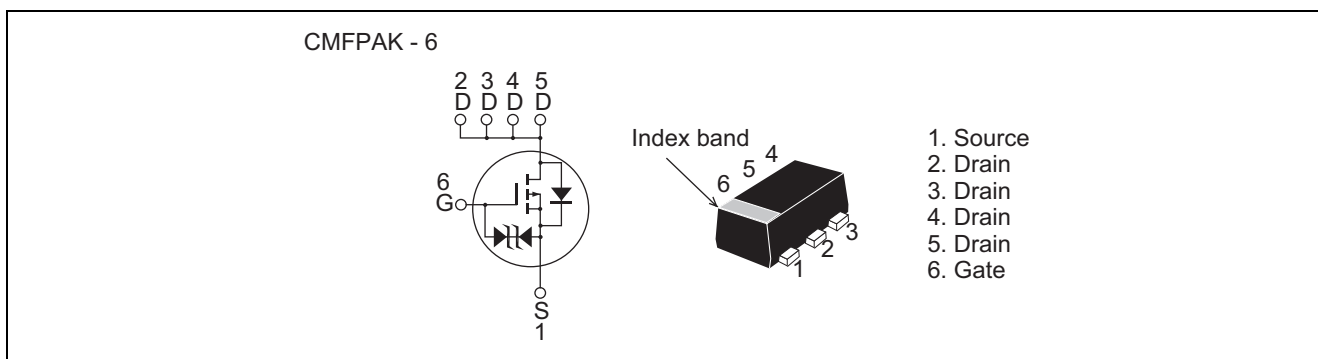
Rev.5.00

Oct.19.2004

### Features

- Low on-resistance  
 $R_{DS(on)} = 245 \text{ m}\Omega$  typ. (at  $V_{GS} = -10\text{V}$ )
- Low drive current.
- 4.5 V gate drive devices.
- High density mounting

### Outline



### Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to Source voltage	$V_{DSS}$	-60	V
Gate to Source voltage	$V_{GSS}$	-20 / +10	V
Drain current	$I_D$	-2	A
Drain peak current	$I_D$ (pulse) <sup>Note 1</sup>	-8	A
Body - Drain diode reverse drain current	$I_{DR}$	-2	A
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	1.25	W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

2. When using the glass epoxy board. (FR4  $40 \times 40 \times 1.6\text{mm}$ ),  $PW \leq 5 \text{ s}$ ,  $T_a = 25^\circ\text{C}$

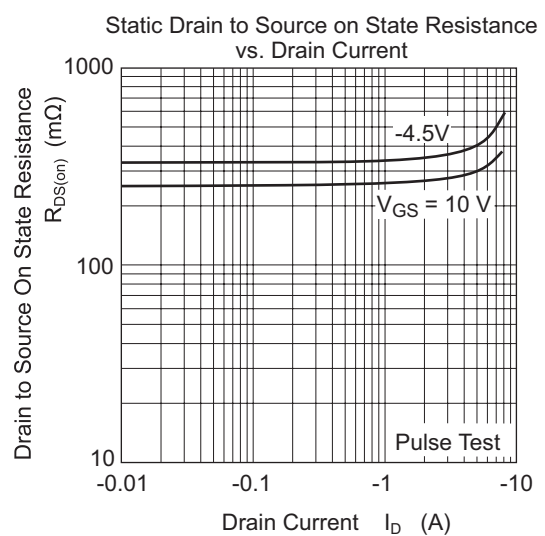
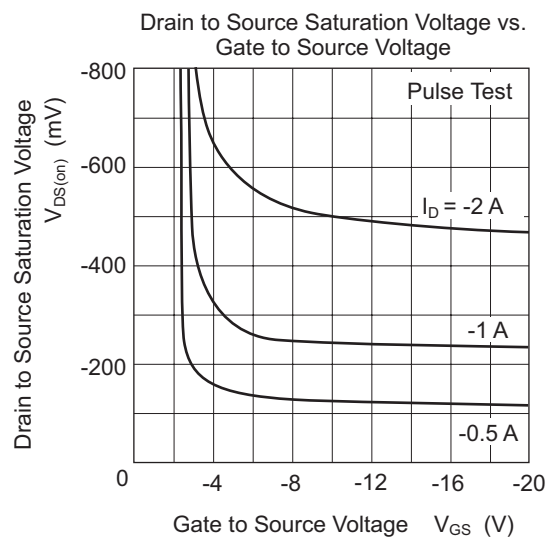
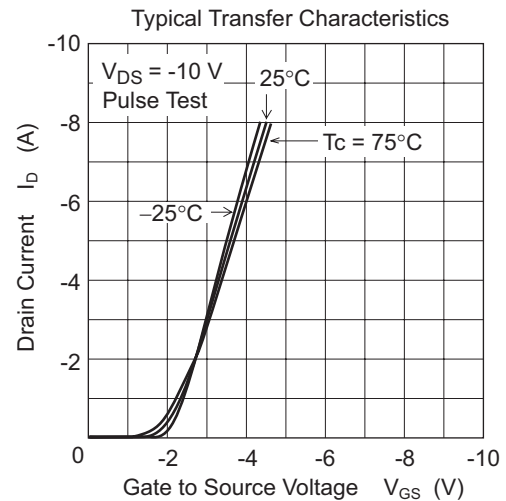
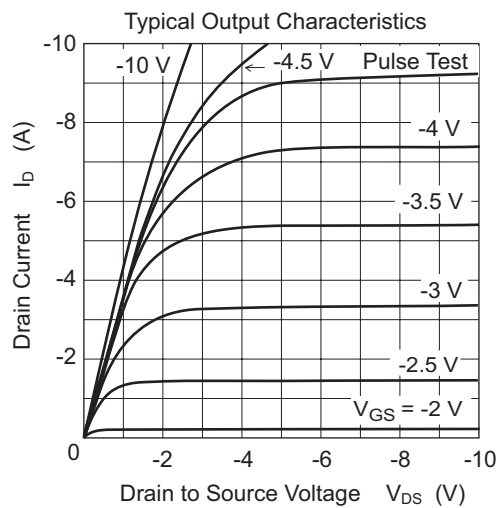
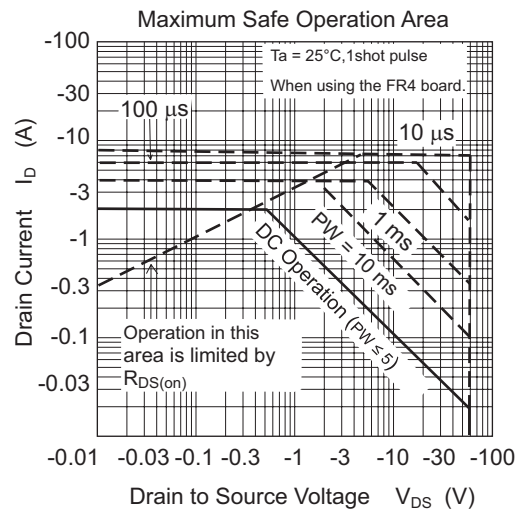
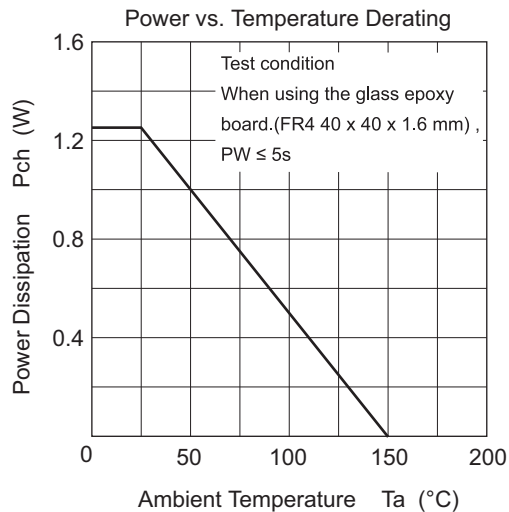
## Electrical Characteristics

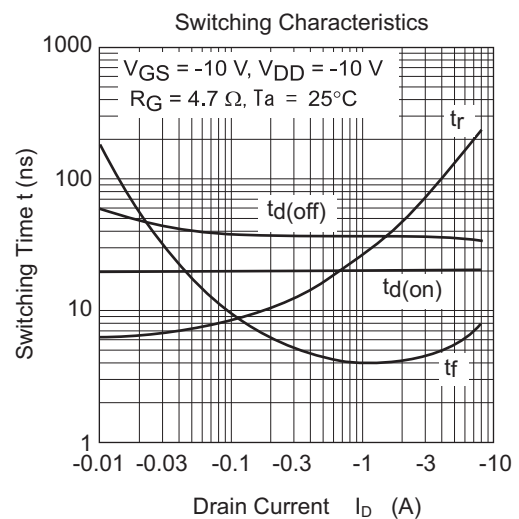
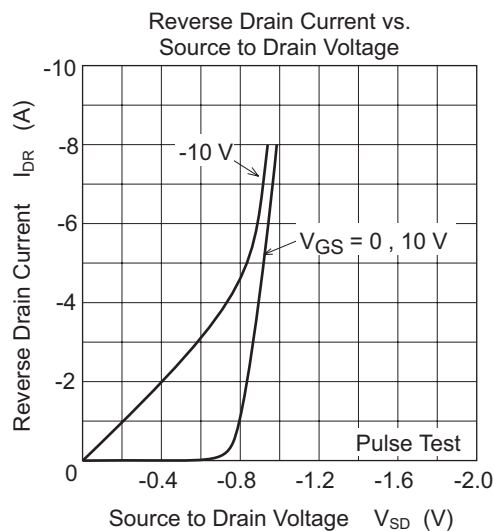
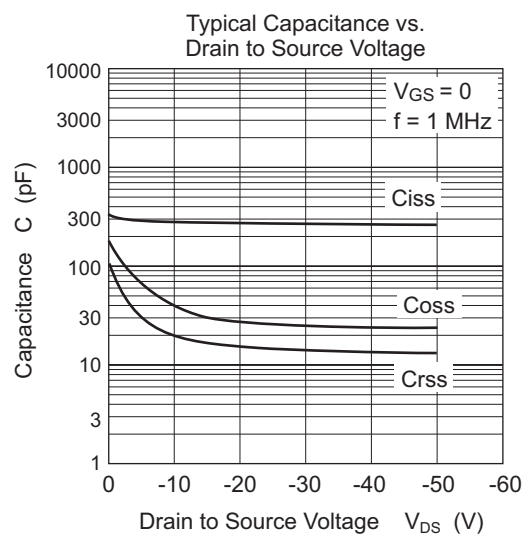
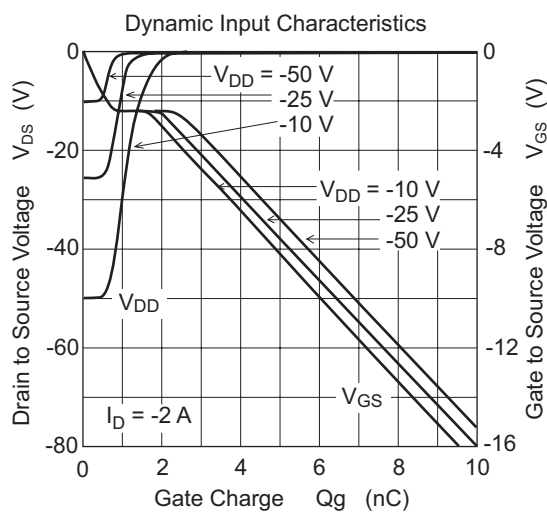
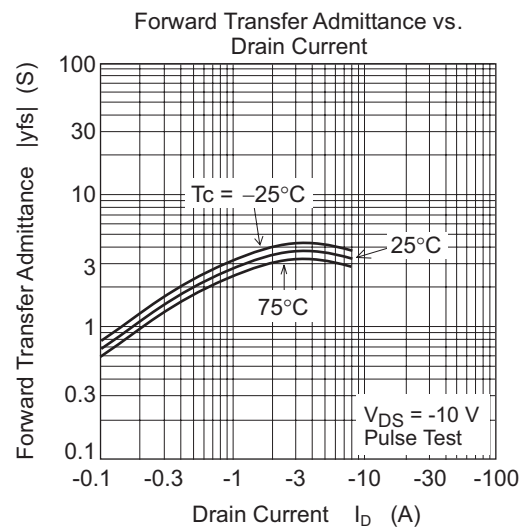
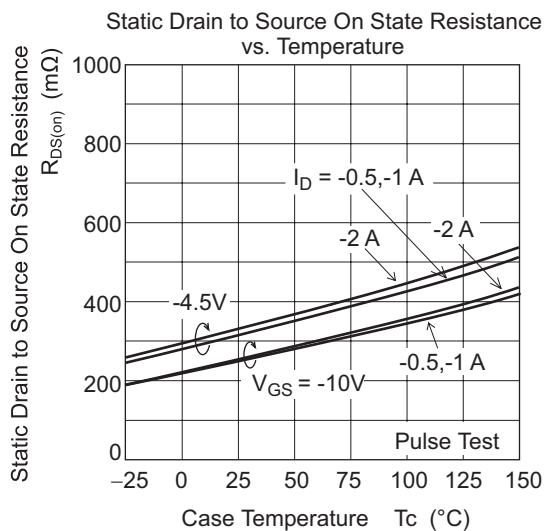
(Ta = 25°C)

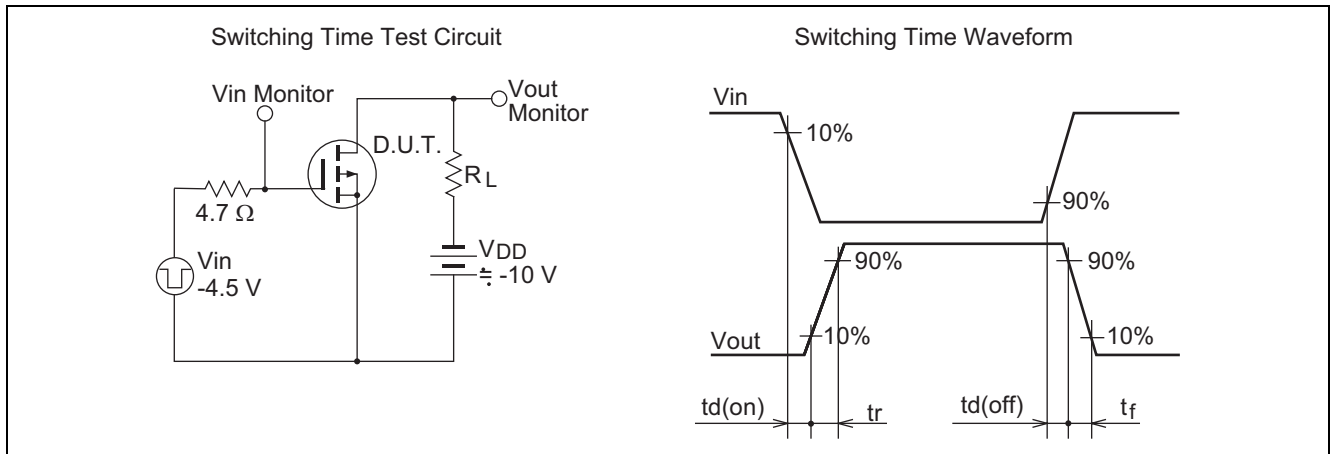
Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to Source breakdown voltage	$V_{(BR)GSS}$	-20 +10	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to Source leakage current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = -16 / +8 \text{ V}$ , $V_{DS} = 0$
Drain to Source leakage current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -60 \text{ V}$ , $V_{GS} = 0$
Gate to Source cutoff voltage	$V_{GS(th)}$	-1	—	-2	V	$I_D = -1 \text{ mA}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>
Drain to Source on state resistance	$R_{DS(on)}$	—	245	307	$\text{m}\Omega$	$I_D = -1 \text{ A}$ , $V_{GS} = -10 \text{ V}$ <sup>Note3</sup>
		—	310	450	$\text{m}\Omega$	$I_D = -1 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	0.65	1	—	S	$I_D = -1 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	290	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	40	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	20	—	pF	
Total gate charge	$Q_g$	—	6	—	nC	$V_{DS} = -10 \text{ V}$ , $V_{GS} = -10 \text{ V}$ $I_D = -2 \text{ A}$
Gate to Source charge	$Q_{gs}$	—	0.7	—	nC	
Gate to Drain charge	$Q_{gd}$	—	1.2	—	nC	
Turn - on delay time	$t_{d(on)}$	—	20	—	ns	$V_{DS} = -10 \text{ V}$ , $V_{GS} = -10 \text{ V}$ $I_D = -1 \text{ A}$ , $R_L = 10 \text{ }\Omega$ , $R_g = 4.7 \text{ }\Omega$
Rise time	$t_r$	—	25	—	ns	
Turn - off delay time	$t_{d(off)}$	—	37	—	ns	
Fall time	$t_f$	—	4	—	ns	
Body - Drain diode forward voltage	$V_{DF}$	—	-0.85	-1.2	V	$I_F = -2 \text{ A}$ , $V_{GS} = 0$

Notes: 3. Pulse test

## Main Characteristics



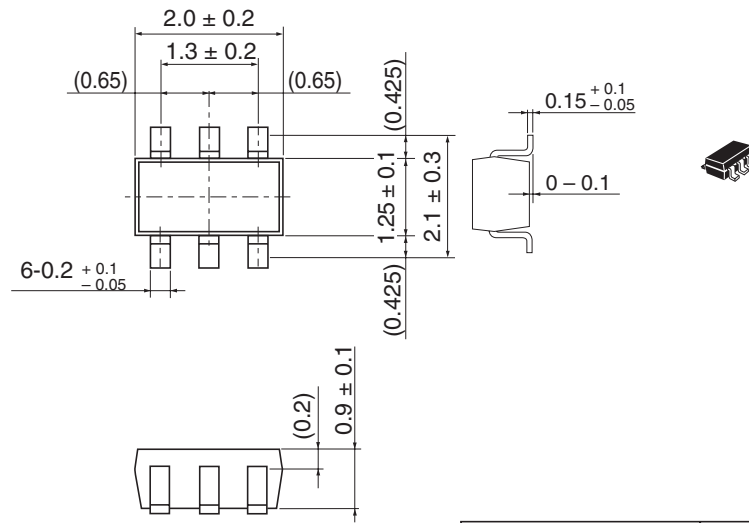




## Package Dimensions

As of January, 2003

Unit: mm



Package Code	CMPAK-6
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.006 g

## Ordering Information

Part Name	Quantity	Shipping Container
HAT1111C-EL-E	3000 pcs	Taping

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