

# HAT2197R

Silicon N Channel Power MOS FET Power Switching

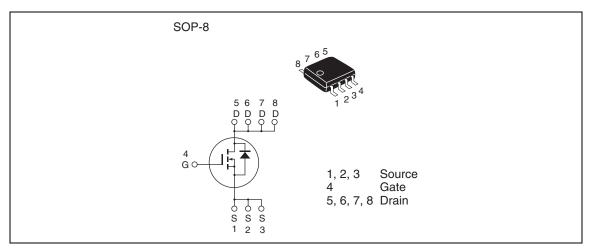
REJ03G0061-0200Z Rev.2.00 Apr.02.2004

# Features

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

 $R_{DS(on)} = 5.3 \text{ m}\Omega \text{ typ.}$  (at  $V_{GS} = 10 \text{ V}$ )

# Outline





# **Absolute Maximum Ratings**

			$(Ta = 25^{\circ}C)$	
Item	Symbol	Ratings	Unit	
Drain to source voltage	V <sub>DSS</sub>	30	V	
Gate to source voltage	V <sub>GSS</sub>	±20	V	
Drain current	ID	16	А	
Drain peak current	Note1 I <sub>D(pulse)</sub>	128	А	
Body-drain diode reverse drain current	I <sub>DR</sub>	16	А	
Avalanche current	I <sub>AP</sub> Note 2	16	А	
Avalanche energy	EAR Note 2	25.6	mJ	
Channel dissipation	Pch Note3	2.5	W	
Channel to ambient thermal impedance	$\theta$ ch-a <sup>Note3</sup>	50	°C/W	
Channel temperature	Tch	150	°C	
Storage temperature	Tstg	-55 to +150	°C	

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

2. Value at Tch = 25°C, Rg  $\geq$  50  $\Omega$ 

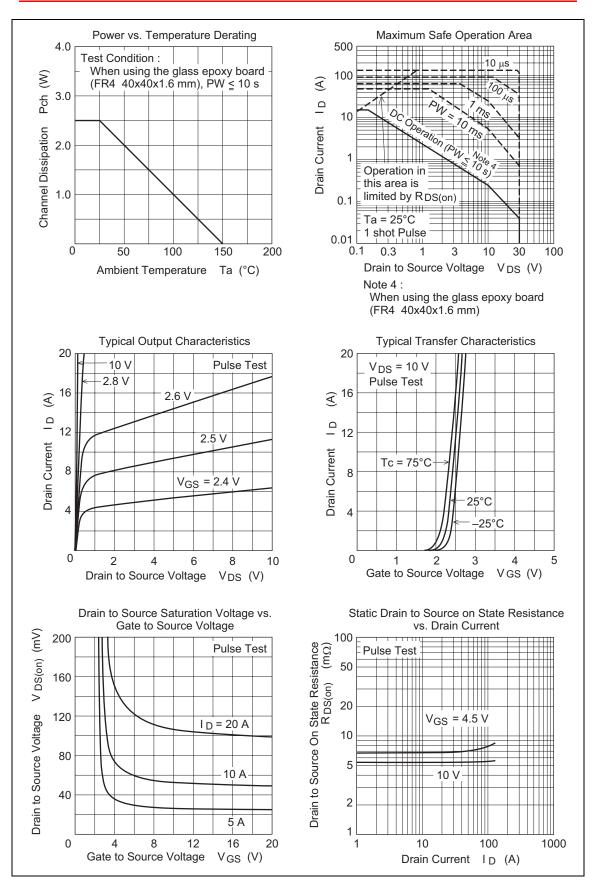
3. When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW  $\leq$  10s

# **Electrical Characteristics**

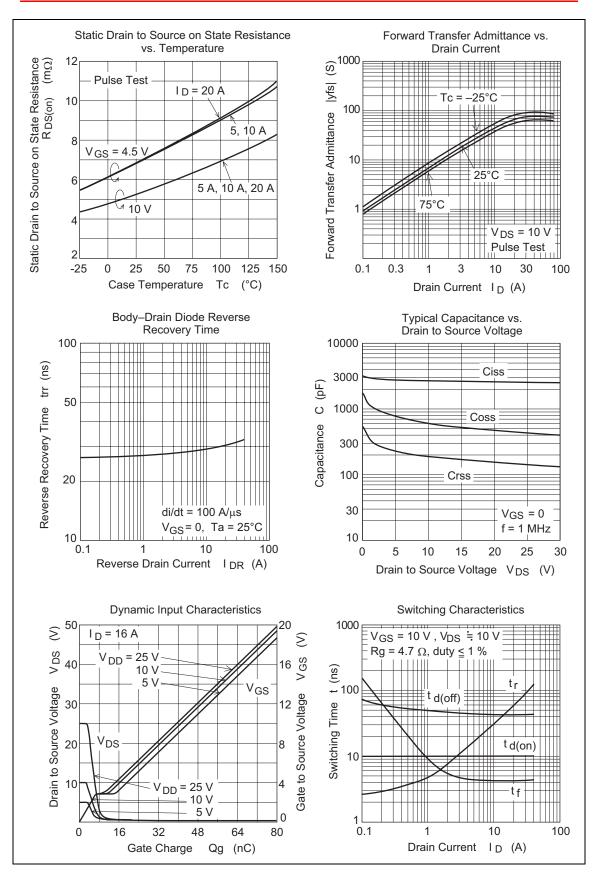
						$(Ta = 25^{\circ}C)$
Item	Symbol	Min	Тур	Max	Unit	Test Conditions
Drain to source breakdown	V <sub>(BR)DSS</sub>	30	_		V	$I_D = 10 \text{ mA}, V_{GS} = 0$
voltage						
Gate to source leak current	I <sub>GSS</sub>	_	_	± 0.1	μA	$V_{GS} = \pm 20 \text{ V},  V_{DS} = 0$
Zero gate voltage drain current	I <sub>DSS</sub>			1	μA	$V_{DS} = 30 V, V_{GS} = 0$
Gate to source cutoff voltage	V <sub>GS(off)</sub>	1.0	—	2.5	V	$V_{DS} = 10 \text{ V}, \text{ I}_{D} = 1 \text{ mA}$
Static drain to source on state	R <sub>DS(on)</sub>	_	5.3	6.7	mΩ	$I_D = 8 \text{ A}, V_{GS} = 10 \text{ V}^{Note4}$
resistance	R <sub>DS(on)</sub>	_	6.8	9.9	mΩ	$I_D = 8 \text{ A}, V_{GS} = 4.5 \text{ V}^{Note4}$
Forward transfer admittance	y <sub>fs</sub>	22	38	_	S	$I_D = 8 \text{ A}, V_{DS} = 10 \text{ V}^{\text{Note4}}$
Input capacitance	Ciss	_	2650	_	рF	V <sub>DS</sub> = 10 V
Output capacitance	Coss	_	610	_	рF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	_	190	_	рF	f = 1 MHz
Gate Resistance	Rg	_	1.2	_	Ω	
Total gate charge	Qg	_	18	_	nC	V <sub>DD</sub> = 10 V
Gate to source charge	Qgs	_	7.5	_	nC	$V_{GS} = 4.5 V$
Gate to drain charge	Qgd	_	4.2	_	nC	I <sub>D</sub> = 16 A
Turn-on delay time	t <sub>d(on)</sub>	_	10	_	ns	$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 8 \text{ A}$
Rise time	tr	_	25	_	ns	$V_{DD} \cong 10 \text{ V}$
Turn-off delay time	t <sub>d(off)</sub>	_	45	_	ns	 R <sub>L</sub> = 1.25 Ω
Fall time	t <sub>f</sub>	_	4.2	_	ns	Rg = 4.7 Ω
Body-drain diode forward voltage	$V_{DF}$	_	0.80	1.04	V	$IF = 16 A, V_{GS} = 0^{Note4}$
Body-drain diode reverse	t <sub>rr</sub>	_	30	_	ns	IF = 16 A, V <sub>GS</sub> = 0
recovery time						diF/ dt = 100 A/ $\mu$ s
Natao 4 Dulas test						

Notes: 4. Pulse test

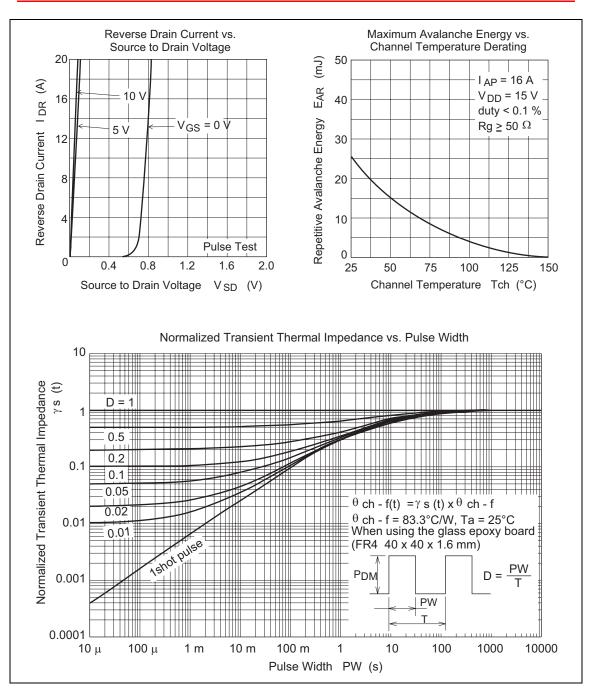




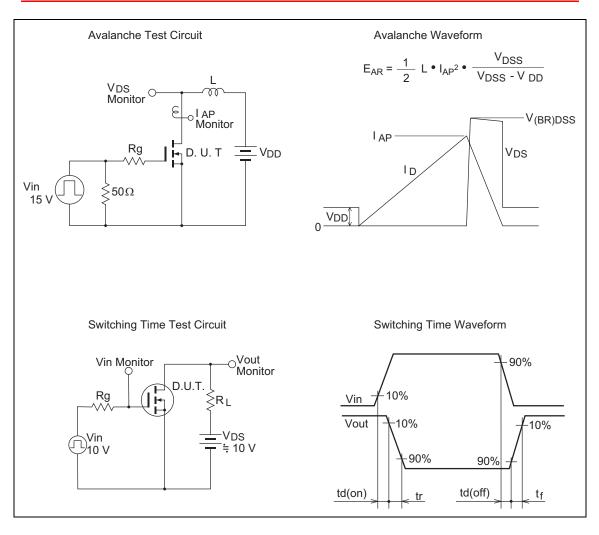
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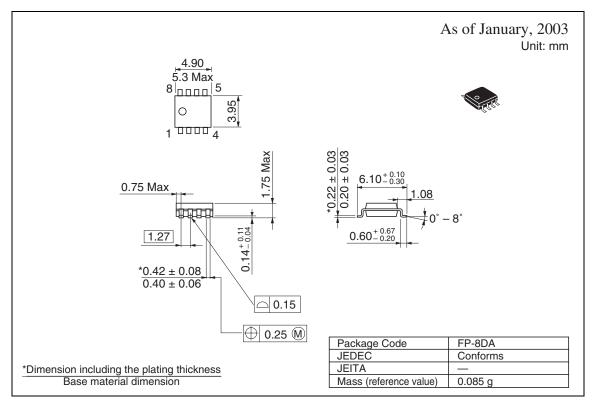


# HAT2197R





# **Package Dimensions**



# **Ordering Information**

Part Name	Quantity	Shipping Container			
HAT2197R-EL-E	2500pcs	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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