

HAT2169H

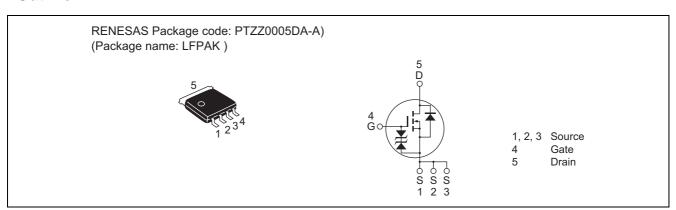
Silicon N Channel Power MOS FET Power Switching

REJ03G0119-0400 Rev.4.00 Sep 20, 2005

Features

- High speed switching
- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance $R_{DS(on)} = 2.8 \ m\Omega \ typ. \ (at \ V_{GS} = 10 \ V)$

Outline



Absolute Maximum Ratings

 $(Ta = 25^{\circ}C)$

Item	Symbol	Ratings	Unit
Drain to source voltage	V _{DSS}	40	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I _D	50	A
Drain peak current	I _{D(pulse)} Note1	200	A
Body-drain diode reverse drain current	I _{DR}	50	A
Avalanche current	I _{AP} Note 2	30	A
Avalanche energy	E _{AR} Note 2	72	mJ
Channel dissipation	Pch Note3	30	W
Channel to Case Thermal Resistance	θch-C	4.17	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

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

- 2. Value at Tch = 25°C, Rg \geq 50 Ω
- 3. $Tc = 25^{\circ}C$

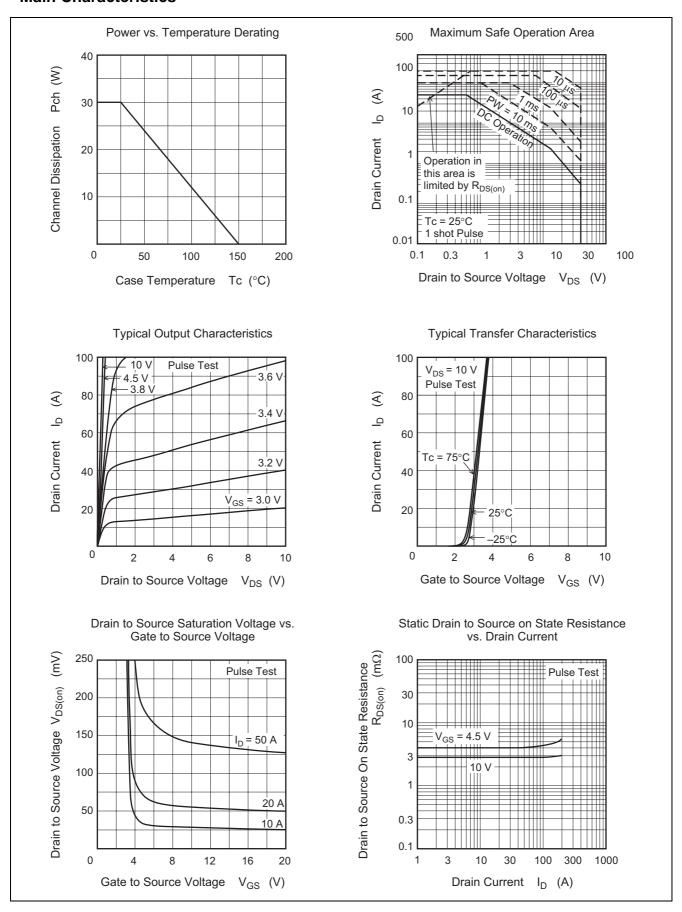
Electrical Characteristics

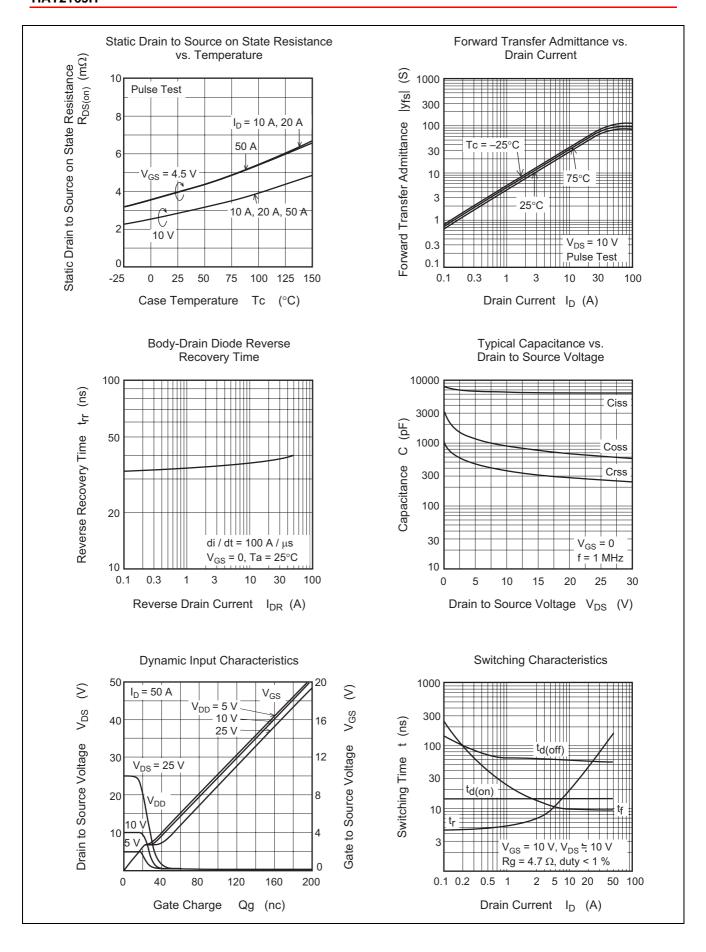
 $(Ta = 25^{\circ}C)$

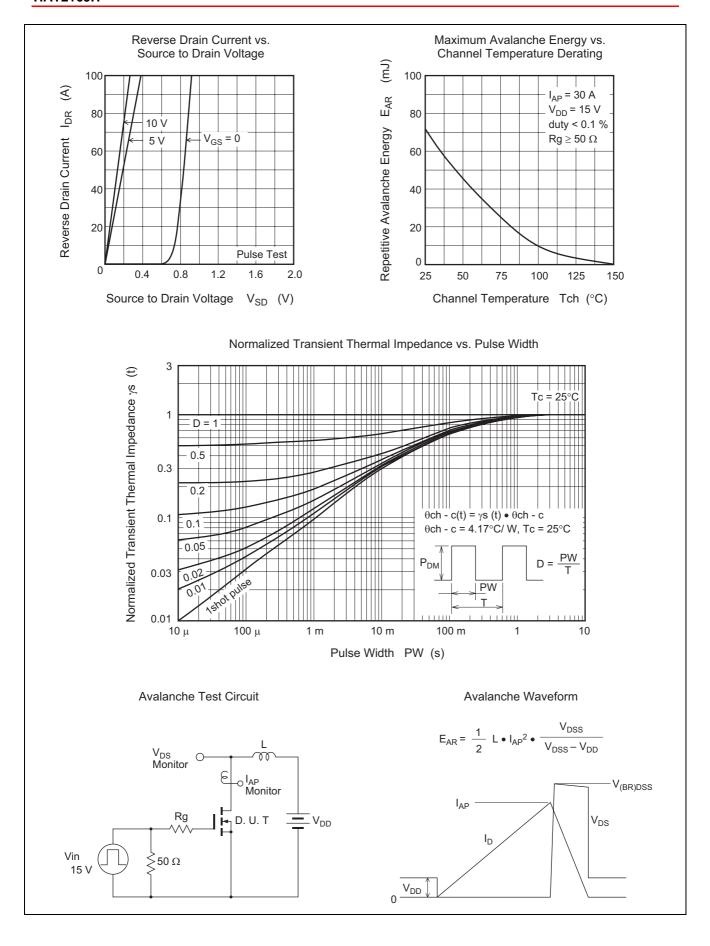
Item	Symbol	Min	Тур	Max	Unit	Test Conditions	
Drain to source breakdown voltage	V _{(BR)DSS}	40	_	_	V	$I_D = 10 \text{ mA}, V_{GS} = 0$	
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	_	_	V	$I_G = \pm 100 \ \mu A, \ V_{DS} = 0$	
Gate to source leak current	I _{GSS}	_	_	±10	μΑ	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$	
Zero gate voltage drain current	I _{DSS}	_	_	1	μΑ	$V_{DS} = 40 \text{ V}, V_{GS} = 0$	
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	R _{DS(on)}	_	2.8	3.5	mΩ	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V}^{\text{Note4}}$	
resistance	R _{DS(on)}	_	4.0	6.0	mΩ	$I_D = 25 \text{ A}, V_{GS} = 4.5 \text{ V}^{\text{Note4}}$	
Forward transfer admittance	y _{fs}	39	65	_	S	$I_D = 25 \text{ A}, V_{DS} = 10 \text{ V}^{\text{Note4}}$	
Input capacitance	Ciss	_	6650		pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$	
Output capacitance	Coss	_	890	_	pF	f = 1 MHz	
Reverse transfer capacitance	Crss	_	360	_	pF		
Gate Resistance	Rg	_	0.5	_	Ω		
Total gate charge	Qg	_	45	_	nC	$V_{DD} = 10 \text{ V}, V_{GS} = 4.5 \text{ V},$	
Gate to source charge	Qgs	_	21	_	nC	$I_D = 50 \text{ A}$	
Gate to drain charge	Qgd	_	10	_	nC		
Turn-on delay time	t _{d(on)}	_	15	_	ns	$V_{GS} = 10 \text{ V}, I_D = 25 \text{ A},$	
Rise time	t _r	_	64	_	ns	$V_{DD} \cong 10 \text{ V}, \text{ R}_{L} = 0.4 \Omega,$	
Turn-off delay time	t _{d(off)}	_	55	_	ns	$Rg = 4.7 \Omega$	
Fall time	t _f	_	9.5	_	ns		
Body-drain diode forward voltage	V_{DF}	_	0.83	1.08	V	IF = 50 A, V _{GS} = 0 Note4	
Body-drain diode reverse recovery	t _{rr}	_	40	_	ns	IF = 50 A, V _{GS} = 0	
time						$di_F/dt = 100 \text{ A/} \mu\text{s}$	

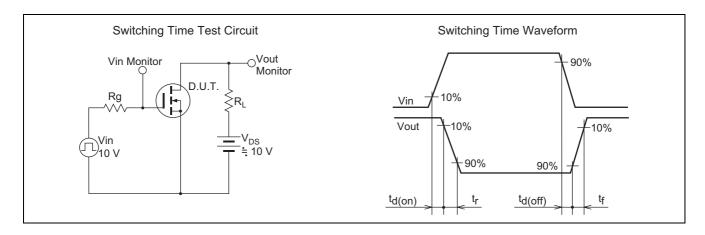
Notes: 4. Pulse test

Main Characteristics

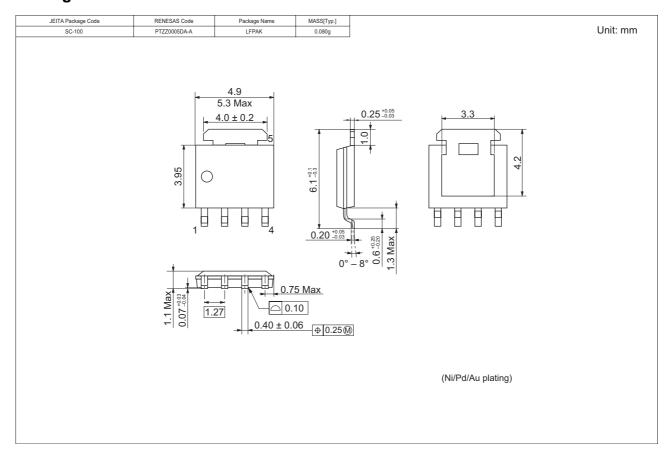








Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT2169H-EL-E	2500 pcs	Taping

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