

HAT2165H

Silicon N Channel Power MOS FET Power Switching

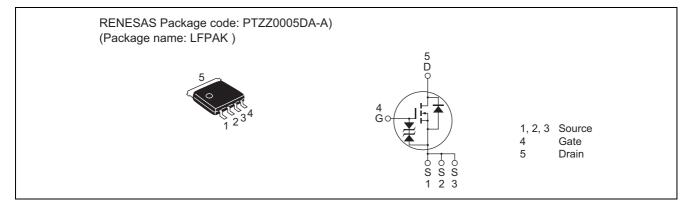
> REJ03G0004-0600 Rev.6.00 Sep 20, 2005

Features

- High speed switching
- Capable of 7 V gate drive
- Low drive current
- High density mounting
- Low on-resistance

 $R_{DS(on)} = 2.5 \text{ m}\Omega \text{ typ.}$ (at $V_{GS} = 10 \text{ V}$)

Outline



Absolute Maximum Ratings

			$(Ta = 25^{\circ}C)$
Item	Symbol	Ratings	Unit
Drain to source voltage	V _{DSS}	30	V
Gate to source voltage	V _{GSS}	±20	V
Drain current	ID	55	A
Drain peak current	Note1 I _{D(pulse)}	220	A
Body-drain diode reverse drain current	I _{DR}	55	A
Avalanche current	I _{AP} Note 2	30	A
Avalanche energy	E _{AR} Note 2	90	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 $\geq 50 \Omega$

3. Tc = 25°C



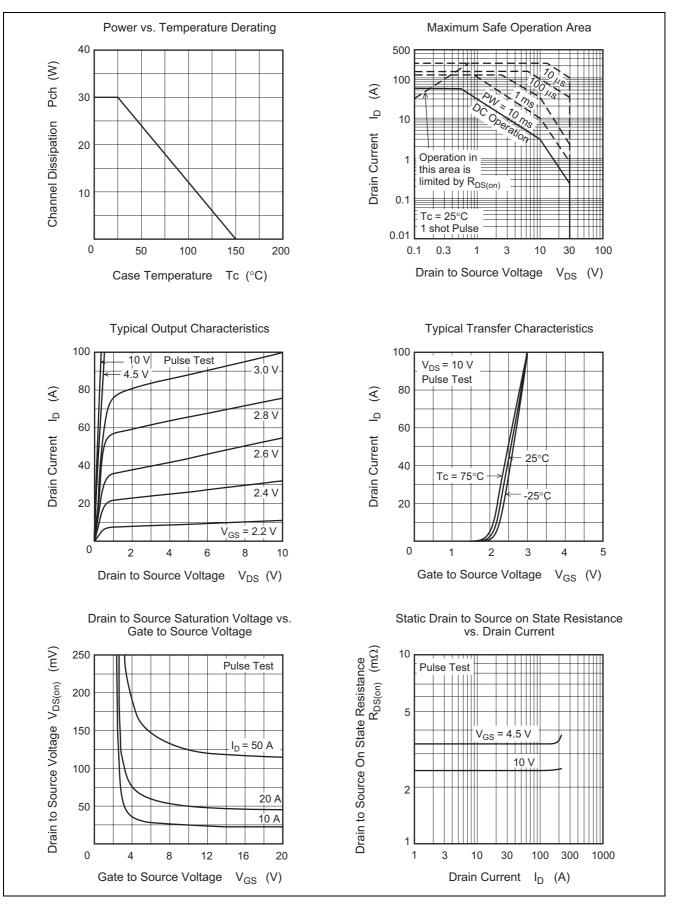
Electrical Characteristics

Symbol					
Symbol	Min	Тур	Max	Unit	Test Conditions
V _{(BR)DSS}	30	—	—	V	$I_{D} = 10 \text{ mA}, V_{GS} = 0$
V _{(BR)GSS}	±20	—	—	V	$I_{G} = \pm 100 \ \mu A, \ V_{DS} = 0$
I _{GSS}	_	—	±10	μA	$V_{GS} = \pm 16 \text{ V}, \text{ V}_{DS} = 0$
I _{DSS}	_	—	1	μA	$V_{DS} = 30 V, V_{GS} = 0$
V _{GS(off)}	1.0	—	2.5	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$
R _{DS(on)}	_	2.5	3.3	mΩ	$I_D = 27.5 \text{ A}, V_{GS} = 10 \text{ V}^{Note4}$
R _{DS(on)}	_	3.4	5.3	mΩ	$I_D = 27.5 \text{ A}, V_{GS} = 4.5 \text{ V}^{Note4}$
y _{fs}	60	100	_	S	$I_D = 27.5 \text{ A}, V_{DS} = 10 \text{ V}^{Note4}$
Ciss	_	5180	_	pF	$V_{DS} = 10 V, V_{GS} = 0,$
Coss	_	1200	_	pF	f = 1 MHz
Crss	_	380		pF	
Rg		0.5		Ω	
Qg		33		nC	$V_{DD} = 10 \text{ V}, V_{GS} = 4.5 \text{ V},$ $I_D = 55 \text{ A}$
Qgs		15		nC	
Qgd		7.1		nC	
t _{d(on)}		13		ns	$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 27.5 \text{ A},$
tr		65		ns	$V_{\text{DD}} \cong 10 \text{ V}, \text{ R}_{\text{L}} = 0.36 \Omega,$ Rg = 4.7 Ω
t _{d(off)}		60		ns	
t _f	_	9.5	—	ns	
V_{DF}	_	0.81	1.06	V	$IF = 55 A, V_{GS} = 0^{Note4}$
t _{rr}	_	40		ns	IF = 55 A, V _{GS} = 0
					di _F / dt = 100 A/ μs
	V(BR)DSS V(BR)GSS IGSS IDSS VGS(off) RDS(on) Iyfs Cisss Coss Crss Rg Qg Qgd td(on) tr td(off) tf VDF	V(BR)DSS 30 V(BR)GSS ±20 IGSS IDSS VGS(off) 1.0 RDS(on) RDS(on) Iyfs 60 Ciss Coss Rg Qg Qgd td(on) tr tf VDF	V _{(BR)DSS} 30 — V _{(BR)GSS} ±20 — I _{GSS} — — I _{DSS} — — I _{DSS} — — V _{GS(off)} 1.0 — V _{GS(off)} 1.0 — R _{DS(on)} — 2.5 R _{DS(on)} — 3.4 yfs 60 100 Ciss — 5180 Coss — 1200 Crss — 380 Rg — 0.5 Qg — 33 Qgs — 15 Qgd — 13 t _r — 65 t _{d(off)} — 60 t _f — 9.5 V _{DF} — 0.81	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

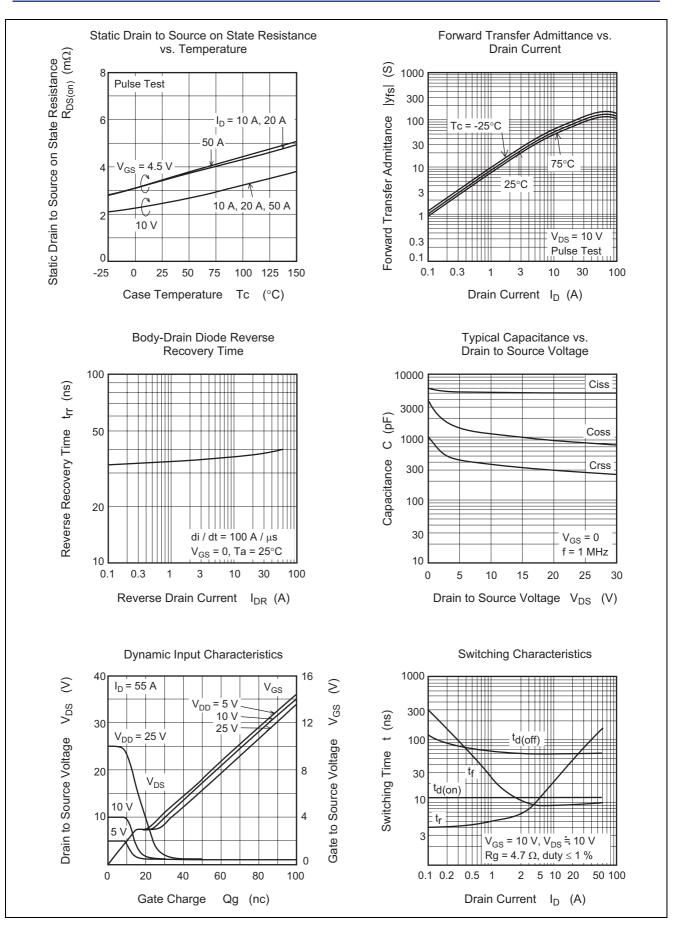
Notes: 4. Pulse test



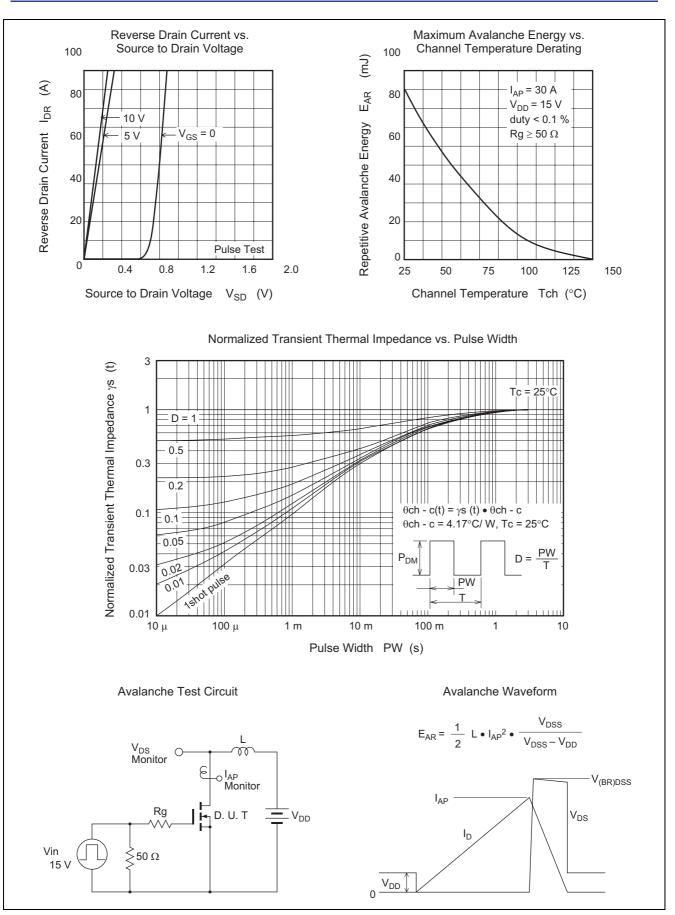
Main Characteristics



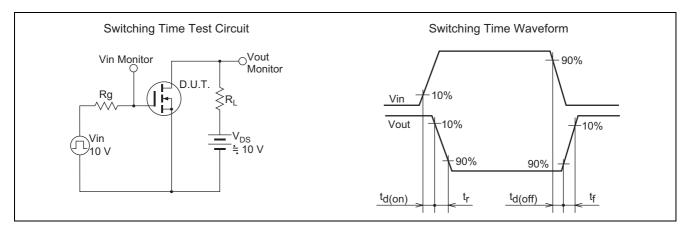






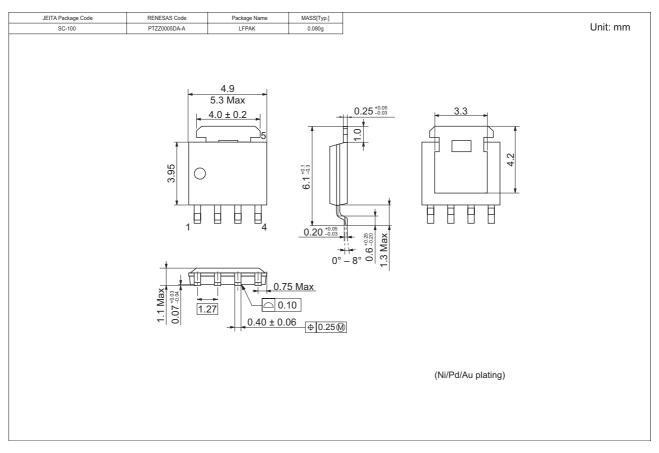








Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT2165H-EL-E	2500 pcs	Taping

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