

RJK03F8DNS

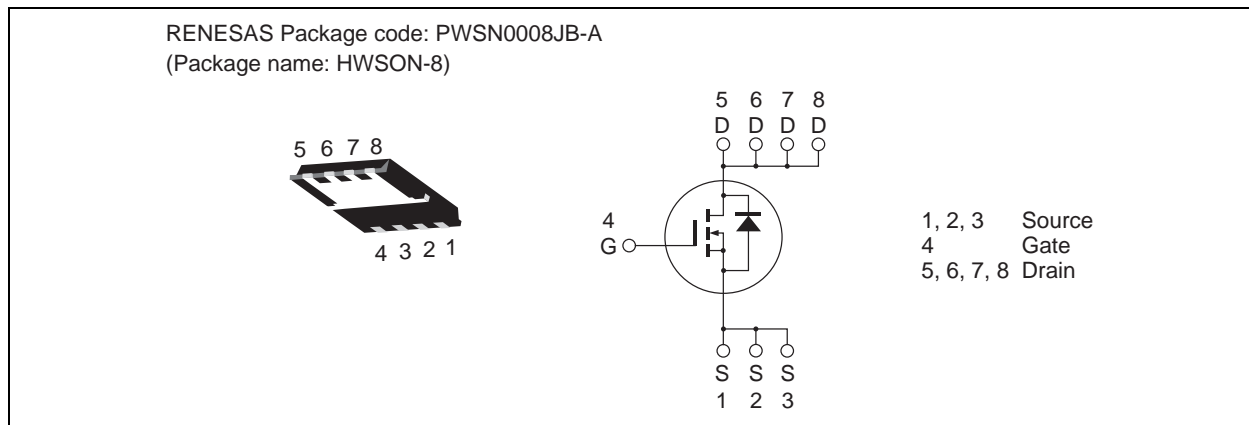
Silicon N Channel Power MOS FET
Power Switching

REJ03G1918-0100
Rev.1.00
Apr 21, 2010

Features

- High speed switching
- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 7 \text{ m}\Omega$ typ. (at $V_{GS} = 8 \text{ V}$)
- Pb-free
- Halogen-free

Outline



Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	± 12	V
Drain current	I_D	16	A
Drain peak current	$I_{D(pulse)}$ ^{Note 1}	64	A
Body-drain diode reverse drain current	I_{DR}	16	A
Avalanche current	I_{AP} ^{Note 2}	10	A
Avalanche energy	E_{AR} ^{Note 2}	10	mJ
Channel dissipation	P_{ch} ^{Note 3}	12.5	W
Channel to case thermal impedance	θ_{ch-c} ^{Note 3}	10.0	$^\circ\text{C}/\text{W}$
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. Value at $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$
 3. $T_c = 25^\circ\text{C}$

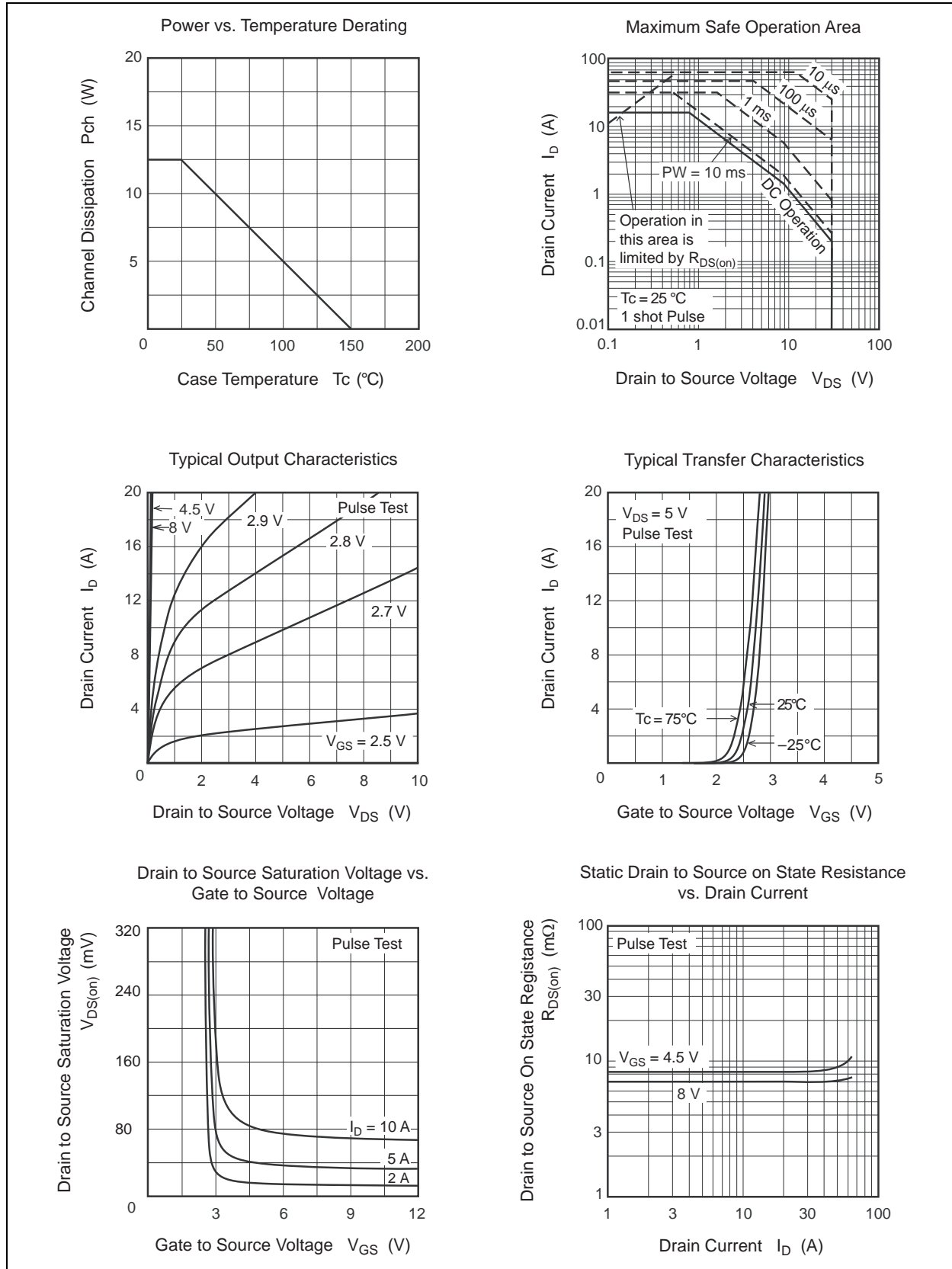
Electrical Characteristics

(T_a = 25°C)

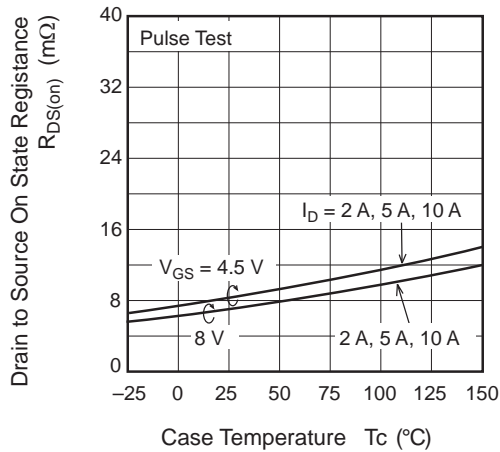
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR)DSS}	30	—	—	V	I _D = 10 mA, V _{GS} = 0
Gate to source leak current	I _{GSS}	—	—	±0.1	μA	V _{GS} = ±12 V, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	1	μA	V _{DS} = 30 V, V _{GS} = 0
Gate to source cutoff voltage	V _{GS(off)}	1.2	—	2.5	V	V _{DS} = 10 V, I _D = 1 mA
Static drain to source on state resistance	R _{DS(on)}	—	7	8.4	mΩ	I _D = 8 A, V _{GS} = 8 V ^{Note4}
	R _{DS(on)}	—	8.3	10.4	mΩ	I _D = 8 A, V _{GS} = 4.5 V ^{Note4}
Forward transfer admittance	y _{fs}	—	40	—	S	I _D = 8 A, V _{DS} = 5 V ^{Note4}
Input capacitance	C _{iss}	—	1500	2100	pF	V _{DS} = 10 V
Output capacitance	C _{oss}	—	162	—	pF	V _{GS} = 0
Reverse transfer capacitance	C _{rss}	—	104	—	pF	f = 1 MHz
Gate Resistance	R _g	—	0.7	1.9	Ω	
Total gate charge	Q _g	—	11.3	—	nC	V _{DD} = 10 V
Gate to source charge	Q _{gs}	—	3.5	—	nC	V _{GS} = 4.5 V
Gate to drain charge	Q _{gd}	—	4.6	—	nC	I _D = 16 A
Turn-on delay time	t _{d(on)}	—	12.8	—	ns	V _{GS} = 8 V, I _D = 8 A
Rise time	t _r	—	8.0	—	ns	V _{DD} ≅ 10 V
Turn-off delay time	t _{d(off)}	—	38.1	—	ns	R _L = 1.25 Ω
Fall time	t _f	—	6.8	—	ns	R _g = 4.7 Ω
Body-drain diode forward voltage	V _{DF}	—	0.85	1.11	V	I _F = 16 A, V _{GS} = 0 ^{Note4}
Body-drain diode reverse recovery time	t _{rr}	—	21	—	ns	I _F = 16 A, V _{GS} = 0 di _F / dt = 100 A/ μs

Notes: 4. Pulse test

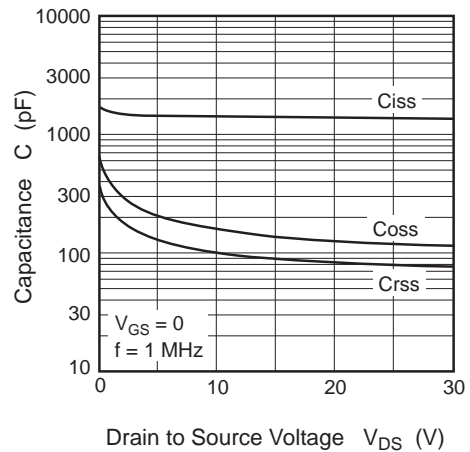
Main Characteristics



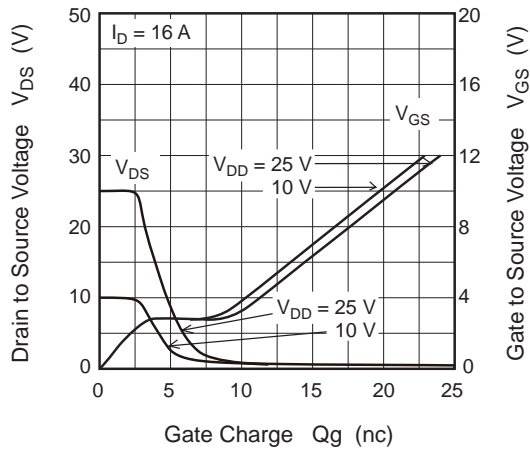
Static Drain to Source on State Resistance vs. Temperature



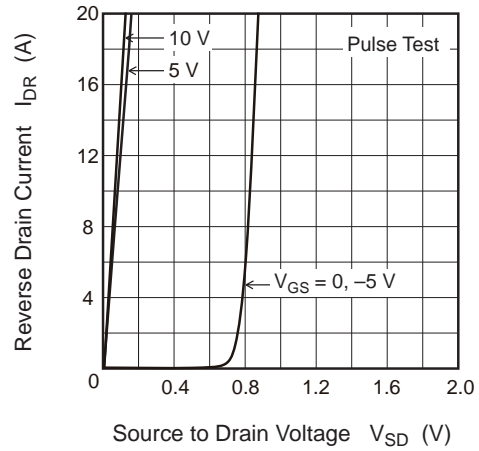
Typical Capacitance vs. Drain to Source Voltage



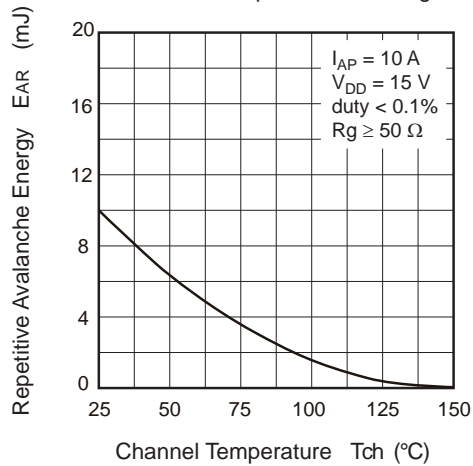
Dynamic Input Characteristics



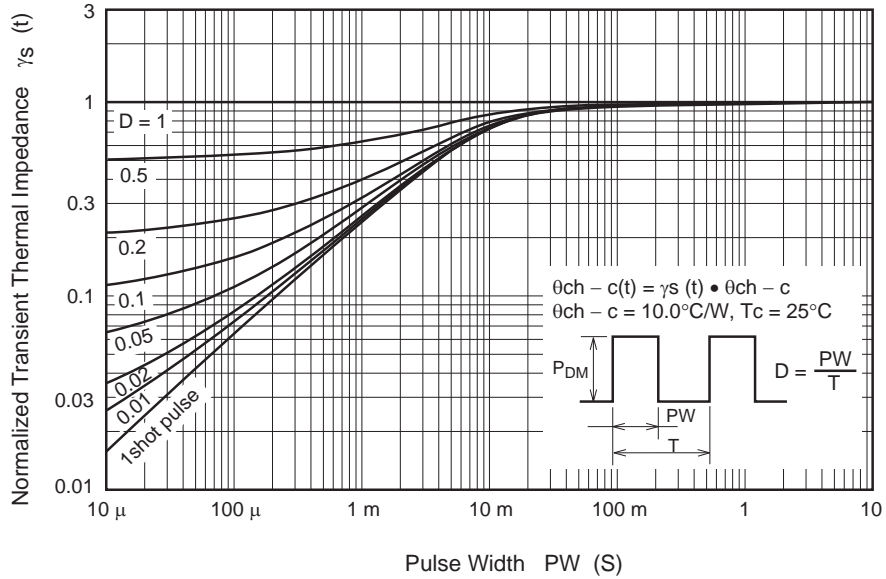
Reverse Drain Current vs. Source to Drain Voltage



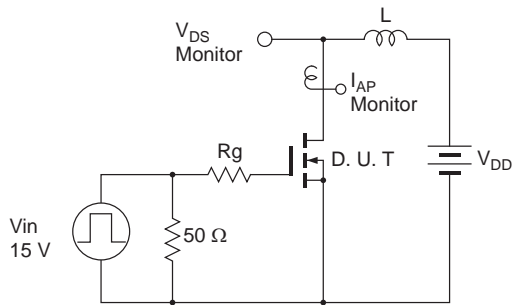
Maximum Avalanche Energy vs. Channel Temperature Derating



Normalized Transient Thermal Impedance vs. Pulse Width

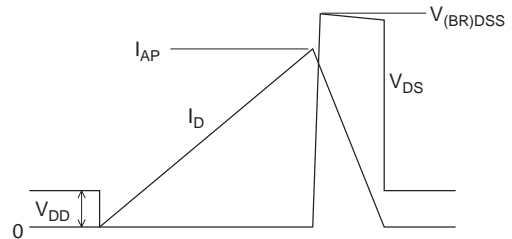


Avalanche Test Circuit

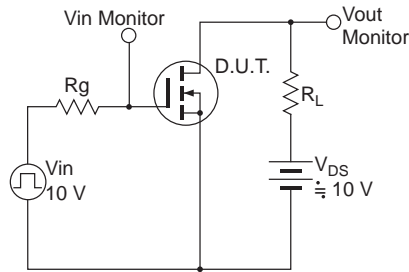


Avalanche Waveform

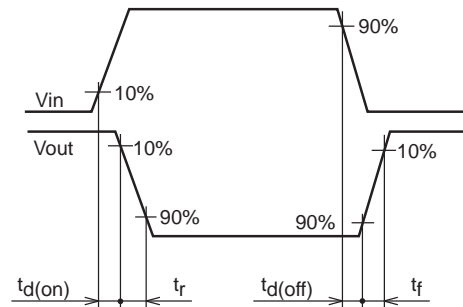
$$E_{AR} = \frac{1}{2} L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



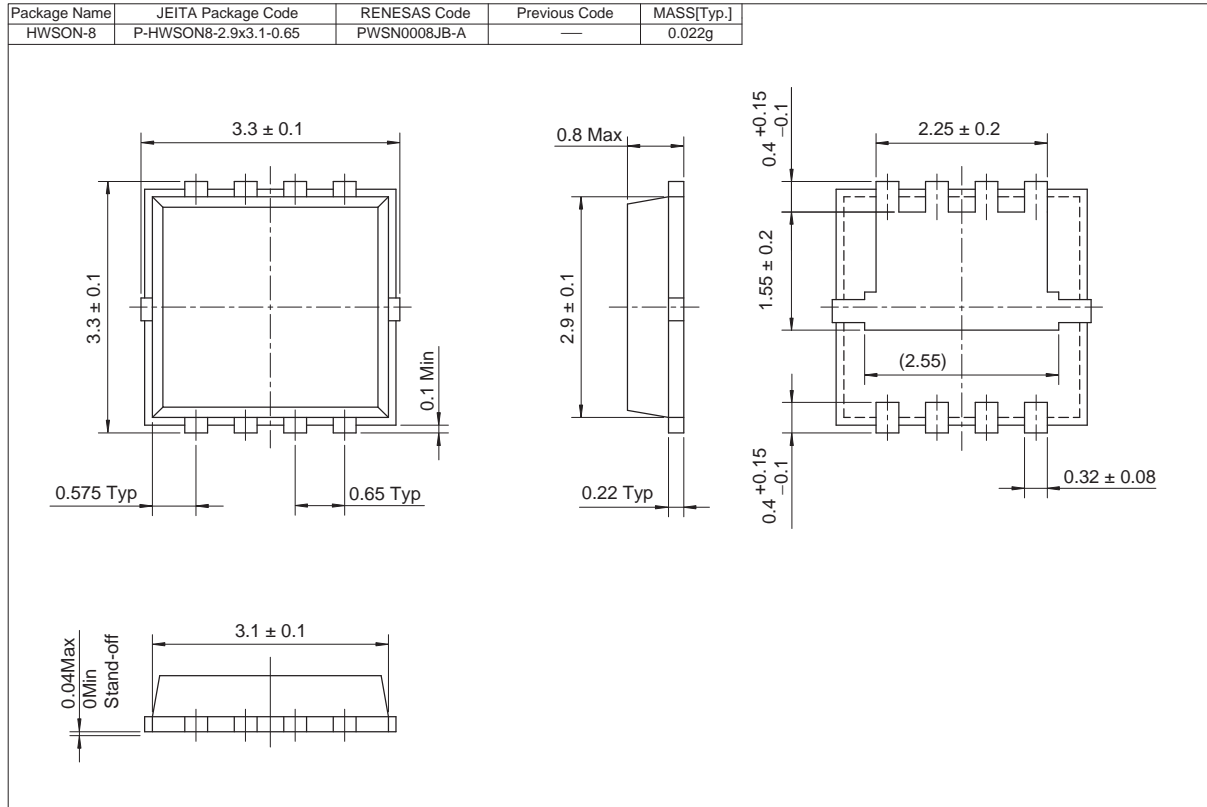
Switching Time Test Circuit



Switching Time Waveform



Package Dimensions



Ordering Information

Part No.	Quantity	Shipping Container
RJK03F8DNS-00-J5	5000 pcs	Taping

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