

# RJK0383DPA

## Silicon N Channel Power MOS FET with Schottky Barrier Diode High Speed Power Switching

REJ03G1723-0300

Rev.3.00

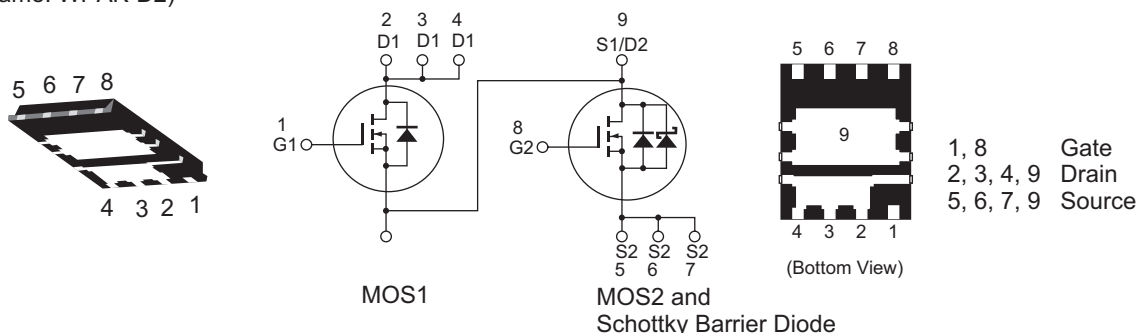
Dec 03, 2008

### Features

- Low on-resistance
- Capable of 4.5 V gate drive
- High density mounting
- Pb-free
- Halogen-free

### Outline

RENESAS Package code: PWSN0008DD-A  
(Package name: WPAK-D2)



### Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings		Unit
		MOS1	MOS2	
Drain to source voltage	$V_{DSS}$	30	30	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	$\pm 20$	V
Drain current	$I_D$	15	45	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	60	180	A
Reverse drain current	$I_{DR}$	15	45	A
Avalanche current	$I_{AP}$ <sup>Note 2</sup>	11	20	A
Avalanche energy	$E_{AR}$ <sup>Note 2</sup>	12.1	40	mJ
Channel dissipation	$P_{ch}$ <sup>Note3</sup>	10	30	W
Channel temperature	$T_{ch}$	150	150	°C
Storage temperature	$T_{stg}$	-55 to +150	-55 to +150	°C

- Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
 2. Value at  $T_{ch} = 25^\circ C$ ,  $R_g \geq 50 \Omega$   
 3.  $T_c = 25^\circ C$

## Electrical Characteristics

## • MOS1

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 30 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.2	—	2.5	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	8.5	11.1	$\text{m}\Omega$	$I_D = 7.5 \text{ A}, V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	12	16.8	$\text{m}\Omega$	$I_D = 7.5 \text{ A}, V_{GS} = 4.5 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	—	31	—	S	$I_D = 7.5 \text{ A}, V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	1010	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	190	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	75	—	pF	$f = 1 \text{ MHz}$
Gate Resistance	$R_g$	—	1.2	—	$\Omega$	
Total gate charge	$Q_g$	—	6.8	—	nC	$V_{DD} = 10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	2.5	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	1.5	—	nC	$I_D = 15 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	5	—	ns	$V_{GS} = 10 \text{ V}, I_D = 7.5 \text{ A}$
Rise time	$t_r$	—	3.6	—	ns	$V_{DD} \cong 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	32	—	ns	$R_L = 1.33 \Omega$
Fall time	$t_f$	—	4.2	—	ns	$R_g = 4.7 \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	0.84	1.10	V	$I_F = 15 \text{ A}, V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	20	—	ns	$I_F = 15 \text{ A}, V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

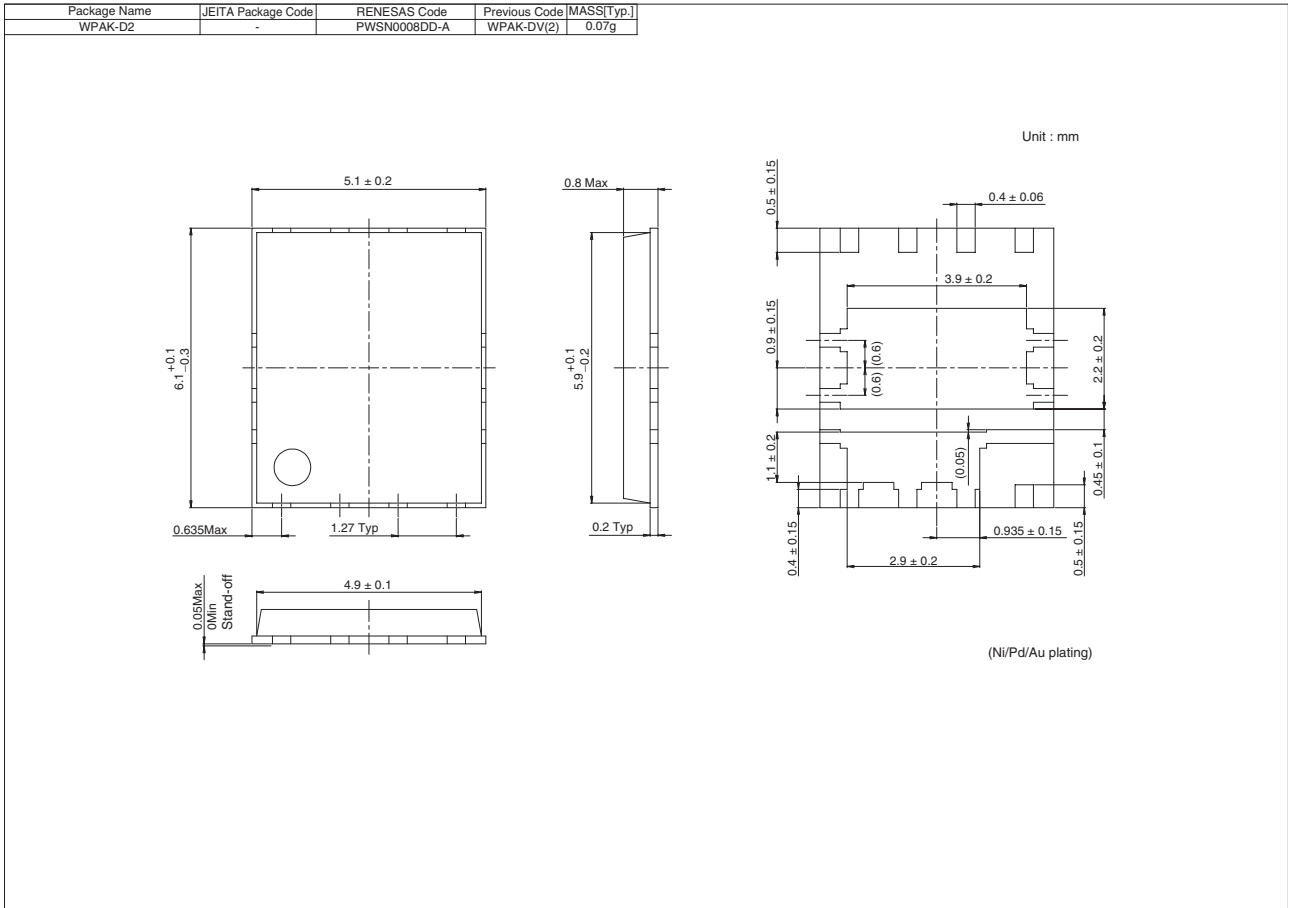
## • MOS2

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	mA	$V_{DS} = 30 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.2	—	2.5	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	2.5	3.3	m $\Omega$	$I_D = 22.5 \text{ A}, V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	3.7	5.2	m $\Omega$	$I_D = 22.5 \text{ A}, V_{GS} = 4.5 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	—	83	—	S	$I_D = 22.5 \text{ A}, V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	3200	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	720	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	300	—	pF	$f = 1 \text{ MHz}$
Gate Resistance	$R_g$	—	1.5	—	$\Omega$	
Total gate charge	$Q_g$	—	20	—	nC	$V_{DD} = 10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	8.6	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	6.5	—	nC	$I_D = 45 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	14	—	ns	$V_{GS} = 10 \text{ V}, I_D = 22.5 \text{ A}$
Rise time	$t_r$	—	7.5	—	ns	$V_{DD} \cong 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	55	—	ns	$R_L = 0.44 \Omega$
Fall time	$t_f$	—	8.0	—	ns	$R_g = 4.7 \Omega$
Schottky Barrier diode forward voltage	$V_F$	—	0.36	—	V	$I_F = 2 \text{ A}, V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	30	—	ns	$I_F = 45 \text{ A}, V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

### Package Dimensions



### Ordering Information

Part No.	Quantity	Shipping Container
RJK0383DPA-00-J53	3000 pcs	Taping

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