

HAT2068R

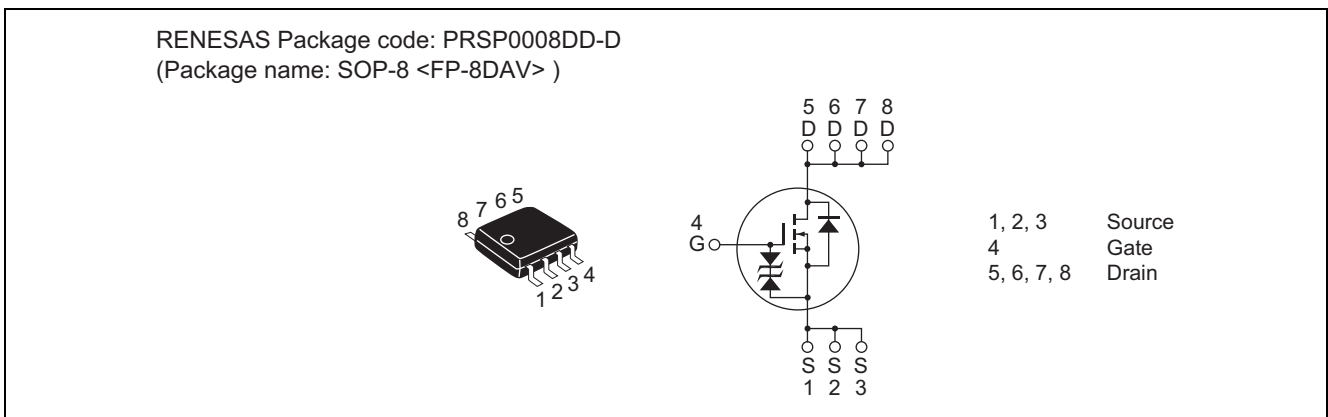
Silicon N Channel Power MOS FET Power Switching

R07DS0871EJ0600
(Previous: REJ03G1176-0500)
Rev.6.00
Aug 23, 2012

Features

- 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 $V_{GS} = 10\text{ V}$)

Outline



Absolute Maximum Ratings

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

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	± 20	V
Drain current	I_D	14	A
Drain peak current	$I_{D(pulse)}$ ^{Note 1}	112	A
Body-drain diode reverse drain current	I_{DR}	14	A
Channel dissipation	P_{ch} ^{Note 2}	2.5	W
Channel to ambient thermal impedance	θ_{ch-a} ^{Note 2}	50	$^\circ\text{C}/\text{W}$
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. When using the glass epoxy board (FR4 $40 \times 40 \times 1.6\text{ mm}$), $PW \leq 10\text{ s}$

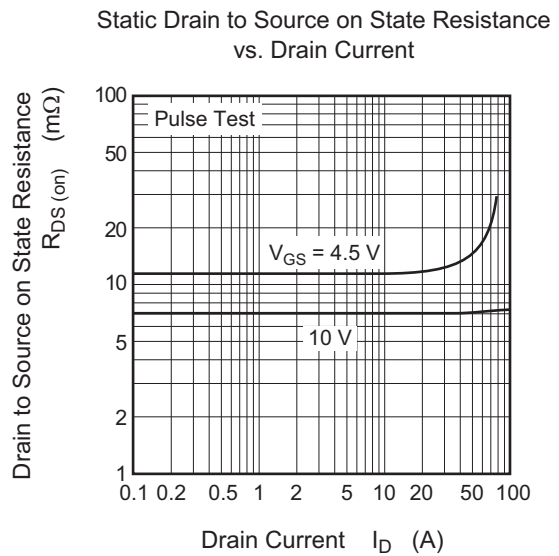
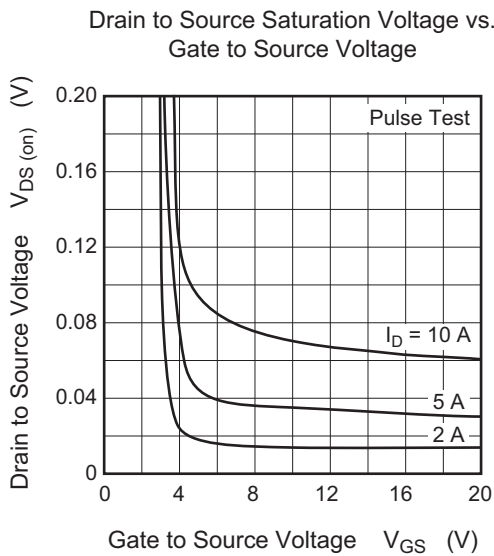
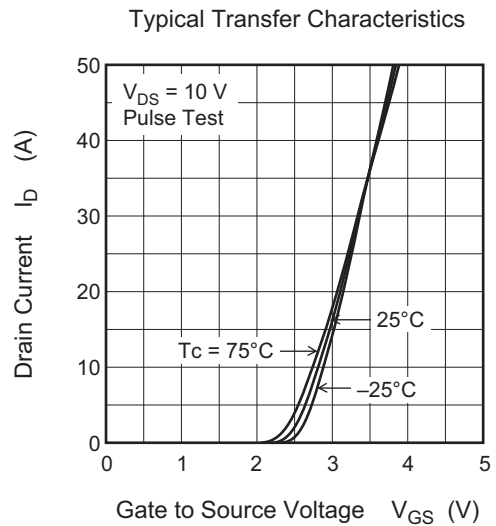
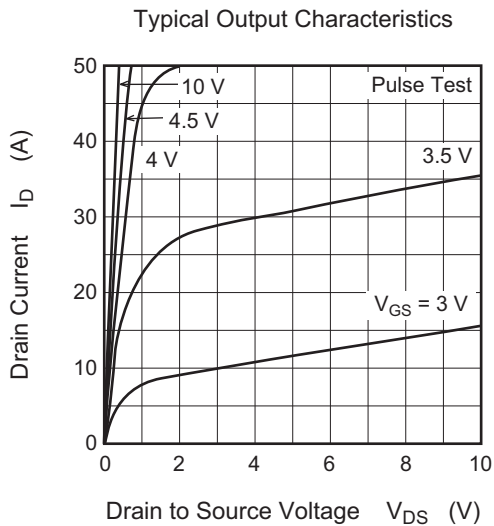
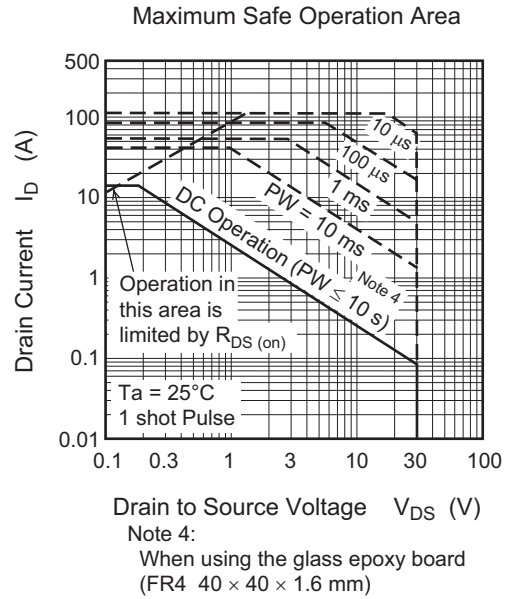
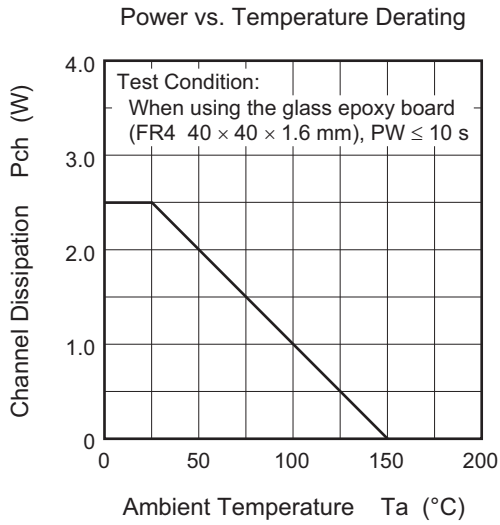
Electrical Characteristics

(Ta = 25°C)

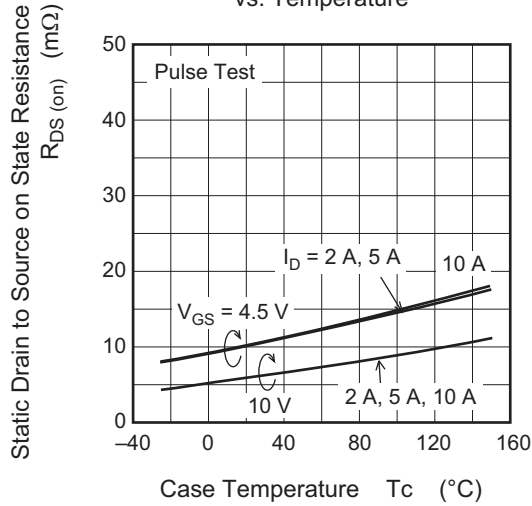
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 30 \text{ V}$, $V_{GS} = 0$
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 resistance	$R_{DS(on)}$	—	7	9	$\text{m}\Omega$	$I_D = 7 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note 3}
	$R_{DS(on)}$	—	11	16	$\text{m}\Omega$	$I_D = 7 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ ^{Note 3}
Forward transfer admittance	$ y_{fs} $	16	28	—	S	$I_D = 7 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note 3}
Input capacitance	C_{iss}	—	1650	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	400	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	220	—	pF	$f = 1 \text{ MHz}$
Total gate charge	Q_g	—	26	—	nC	$V_{DD} = 10 \text{ V}$
Gate to source charge	Q_{gs}	—	5	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Q_{gd}	—	5	—	nC	$I_D = 14 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 7 \text{ A}$
Rise time	t_r	—	30	—	ns	$V_{DD} \approx 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	50	—	ns	$R_L = 1.43 \text{ }\Omega$
Fall time	t_f	—	10	—	ns	$R_g = 4.7 \text{ }\Omega$
Body-drain diode forward voltage	V_{DF}	—	0.80	1.04	V	$I_F = 14 \text{ A}$, $V_{GS} = 0$ ^{Note 3}
Body-drain diode reverse recovery time	t_{rr}	—	50	—	ns	$I_F = 14 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 3. Pulse test

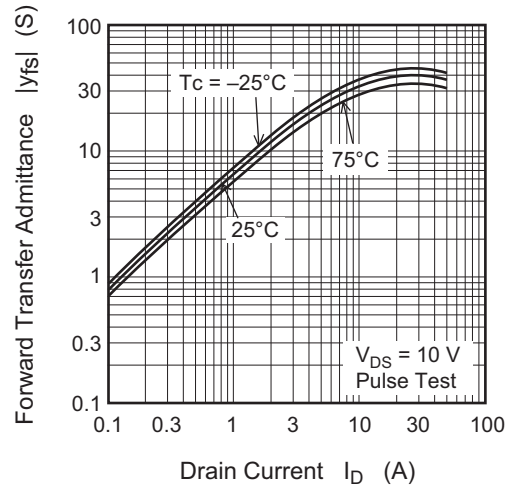
Main Characteristics



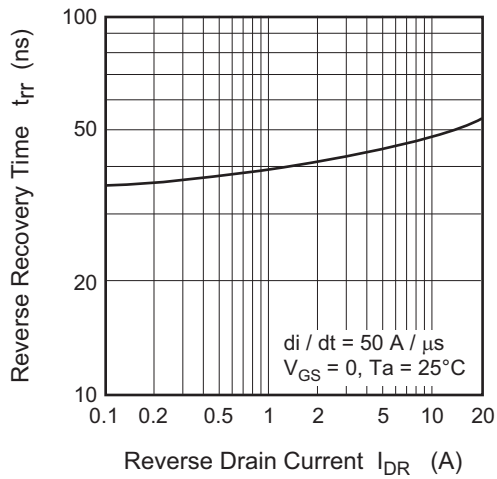
Static Drain to Source on State Resistance vs. Temperature



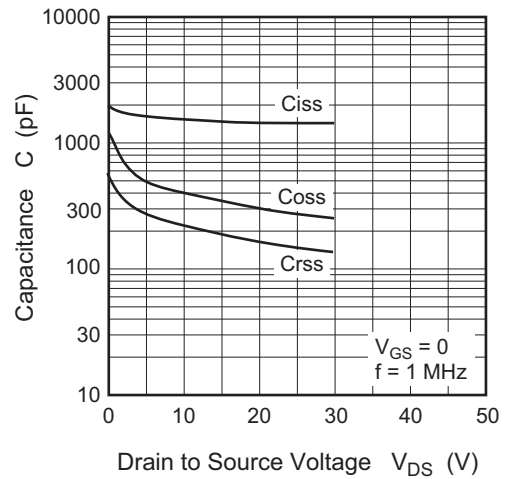
Forward Transfer Admittance vs. Drain Current



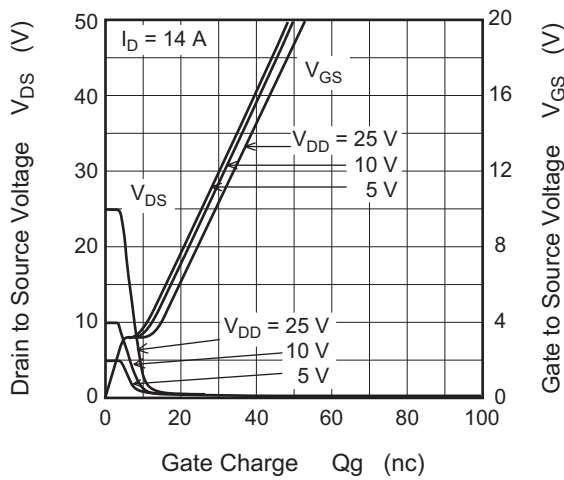
Body-Drain Diode Reverse Recovery Time



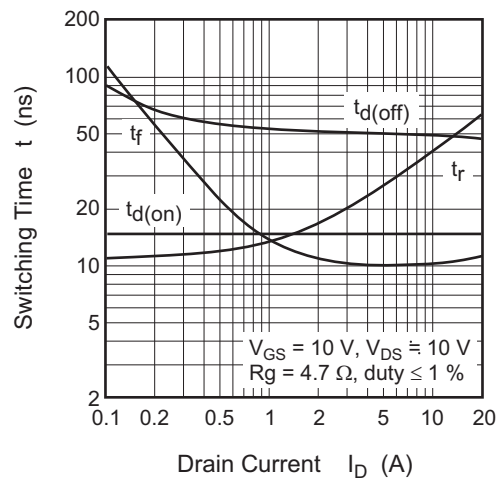
Typical Capacitance vs. Drain to Source Voltage



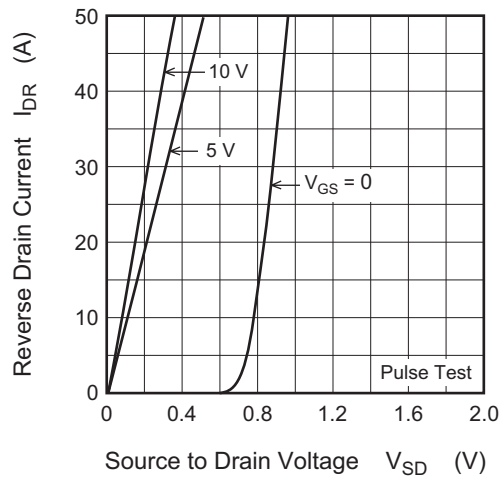
Dynamic Input Characteristics



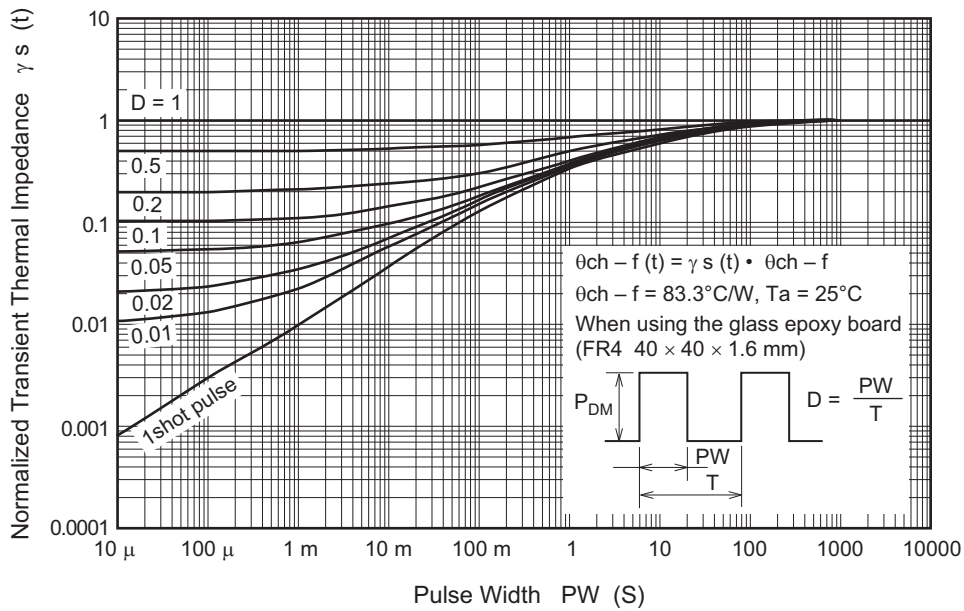
Switching Characteristics



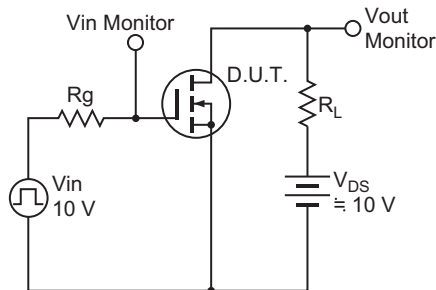
Reverse Drain Current vs. Source to Drain Voltage



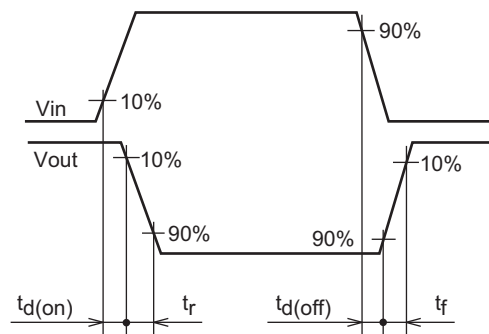
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

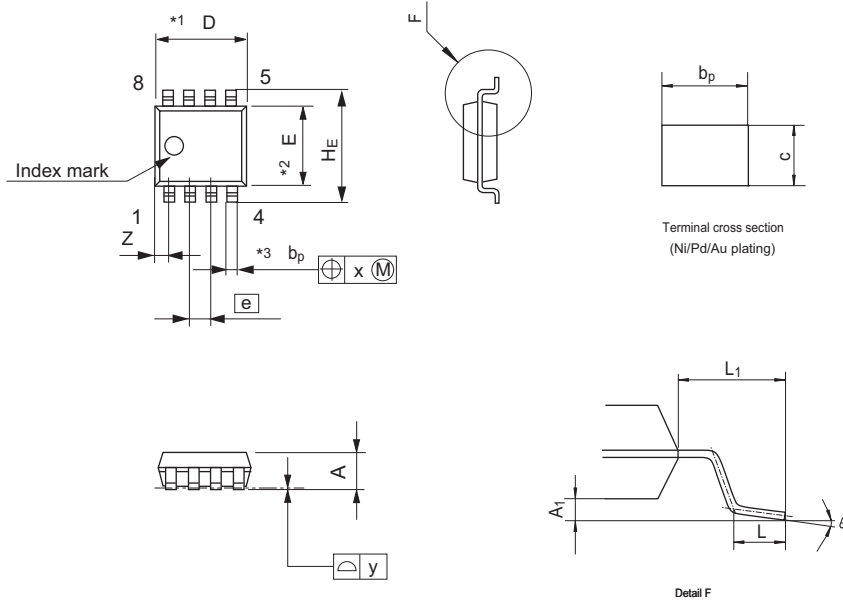


Switching Time Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
SOP-8	P-SOP8-3.95 × 4.9-1.27	PRSP0008DD-D	FP-8DAV	0.085g



NOTE)
 1. DIMENSIONS **1(Nom)" AND **2"
 DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION **3* DOES NOT
 INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	4.90	5.3
E	—	3.95	—
A ₂	—	—	—
A ₁	0.10	0.14	0.25
A	—	—	1.75
b _p	0.34	0.40	0.46
b ₁	—	—	—
c	0.15	0.20	0.25
c ₁	—	—	—
θ	0°	—	8°
H _E	5.80	6.10	6.20
Ⓜ	—	1.27	—
x	—	—	0.25
y	—	—	0.1
Z	—	—	0.75
L	0.40	0.60	1.27
L ₁	—	1.08	—

Ordering Information

Part Name	Quantity	Shipping Container
HAT2068R-EL-E	2500 pcs	Taping

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