

# HAT3037R

## Silicon N/P Channel Power MOSFET Power Switching

R07DS1374EJ0501

Rev.5.01

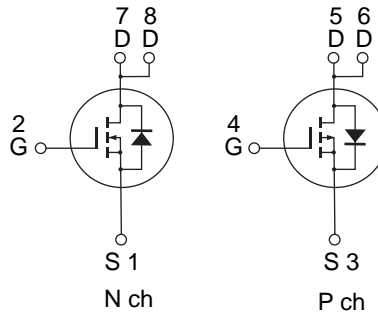
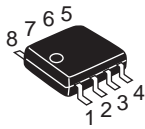
Jan 20, 2017

### Features

- Capable of 4.5 V gate drive
- Low drive current
- High density mounting

### Outline

RENESAS Package code: PRSP0008DD-D  
(Package name: SOP-8<FP-8DAV>)



1, 3 Source  
2, 4 Gate  
5, 6, 7, 8 Drain

### Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings		Unit
		Nch	Pch	
Drain to source voltage	$V_{DSS}$	45	-45	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	-20,+10	V
Drain current	$I_D$	5	-4	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	40	-32	A
Body-drain diode reverse drain current	$I_{DR}$	5	-4	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	1.5		W
Channel dissipation	$P_{ch}$ <sup>Note3</sup>	2.3		W
Channel temperature	$T_{ch}$	150		°C
Storage temperature	$T_{stg}$	-55 to +150		°C

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

2. 1 Drive operation; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm),  $PW \leq 10s$

3. 2 Drive operation; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm),  $PW \leq 10s$

## Electrical Characteristics

## • N Channel

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	45	—	—	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	$\mu\text{A}$	$V_{DS} = 45 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	48	60	$\text{m}\Omega$	$I_D = 2.5 \text{ A}, V_{GS} = 10 \text{ V}$ Note4
	$R_{DS(on)}$	—	55	80	$\text{m}\Omega$	$I_D = 2.5 \text{ A}, V_{GS} = 4.5 \text{ V}$ Note4
Forward transfer admittance	$ y_{fs} $	5.4	9	—	S	$I_D = 2.5 \text{ A}, V_{DS} = 10 \text{ V}$ Note4
Input capacitance	$C_{iss}$	—	440	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	80	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	30	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	3.5	—	nC	$V_{DD} = 10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	1.3	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	0.6	—	nC	$I_D = 5 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$V_{GS} = 10 \text{ V}, I_D = 2.5 \text{ A}$
Rise time	$t_r$	—	12	—	ns	$V_{DD} \approx 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	$R_L = 4 \Omega$
Fall time	$t_f$	—	28	—	ns	$R_g = 4.7 \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	0.85	1.11	V	$I_F = 5 \text{ A}, V_{GS} = 0$ Note4
Body-drain diode reverse recovery time	$t_{rr}$	—	30	—	ns	$I_F = 5 \text{ A}, V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

## • P Channel

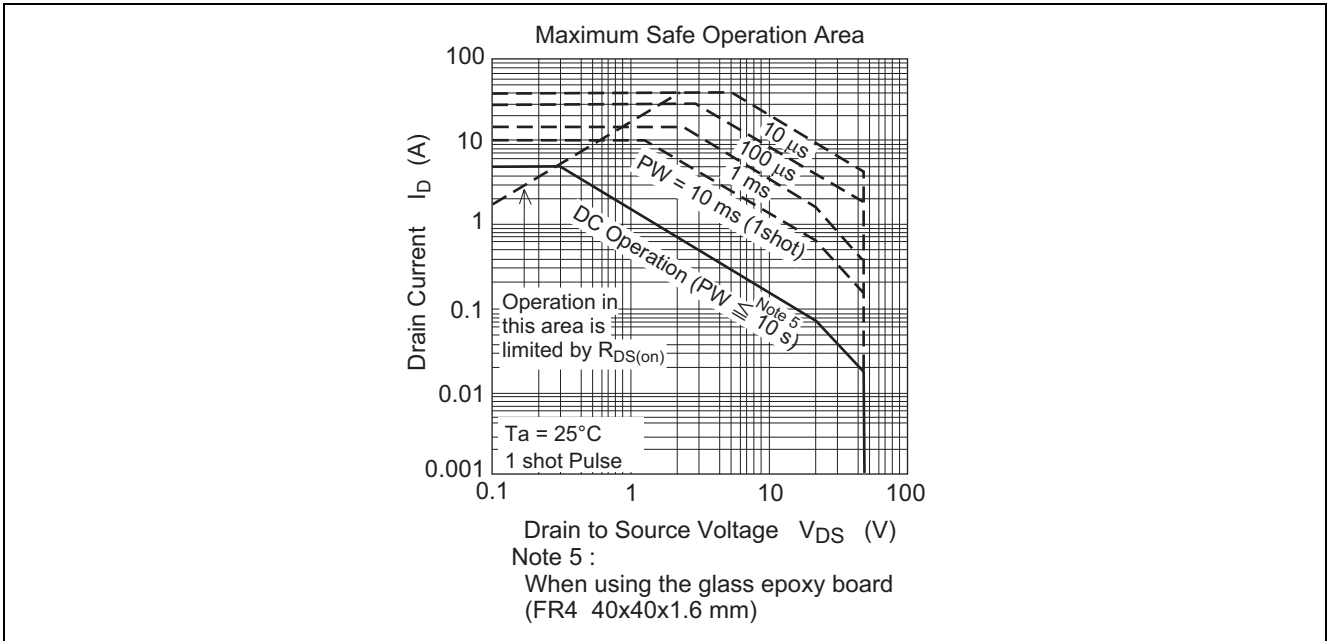
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-45	—	—	V	$I_D = -10 \text{ mA}, V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = -20, +10 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -45 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	70	88	$\text{m}\Omega$	$I_D = -2 \text{ A}, V_{GS} = -10 \text{ V}$ Note4
	$R_{DS(on)}$	—	87	125	$\text{m}\Omega$	$I_D = -2 \text{ A}, V_{GS} = -4.5 \text{ V}$ Note4
Forward transfer admittance	$ y_{fs} $	3.3	5.5	—	S	$I_D = -2 \text{ A}, V_{DS} = -10 \text{ V}$ Note4
Input capacitance	$C_{iss}$	—	650	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	$C_{oss}$	—	85	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	55	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	5.2	—	nC	$V_{DD} = -10 \text{ V}$
Gate to source charge	$Q_{gs}$	—	1.9	—	nC	$V_{GS} = -4.5 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	0.8	—	nC	$I_D = -4 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	16	—	ns	$V_{GS} = -10 \text{ V}, I_D = -2 \text{ A}$
Rise time	$t_r$	—	17	—	ns	$V_{DD} \approx -10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	32	—	ns	$R_L = 5 \Omega$
Fall time	$t_f$	—	4	—	ns	$R_g = 4.7 \Omega$
Body-drain diode forward voltage	$V_{DF}$	—	-0.86	-1.12	V	$I_F = -4 \text{ A}, V_{GS} = 0$ Note4
Body-drain diode reverse recovery time	$t_{rr}$	—	35	—	ns	$I_F = -4 \text{ A}, V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$

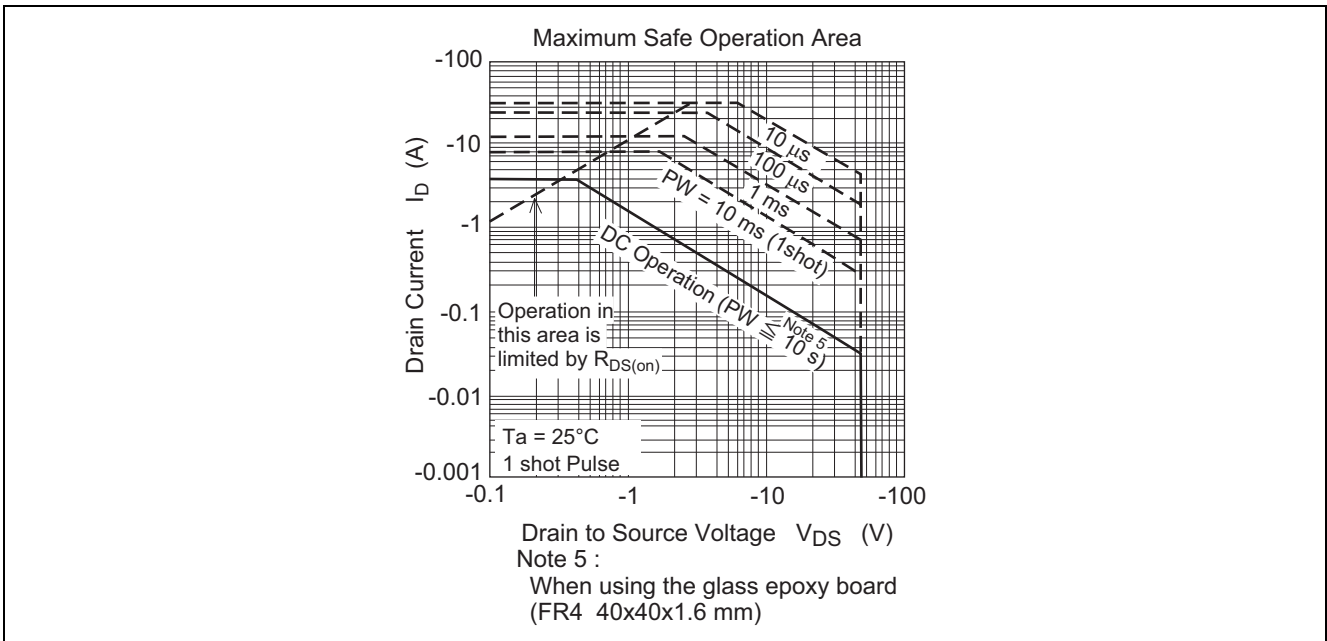
Notes: 4. Pulse test

Main Characteristics

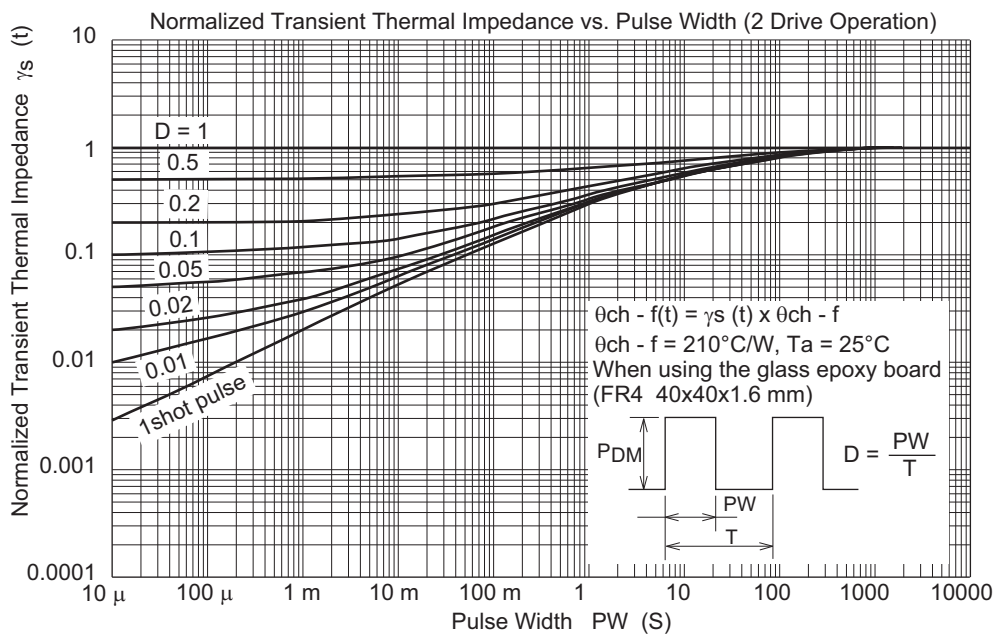
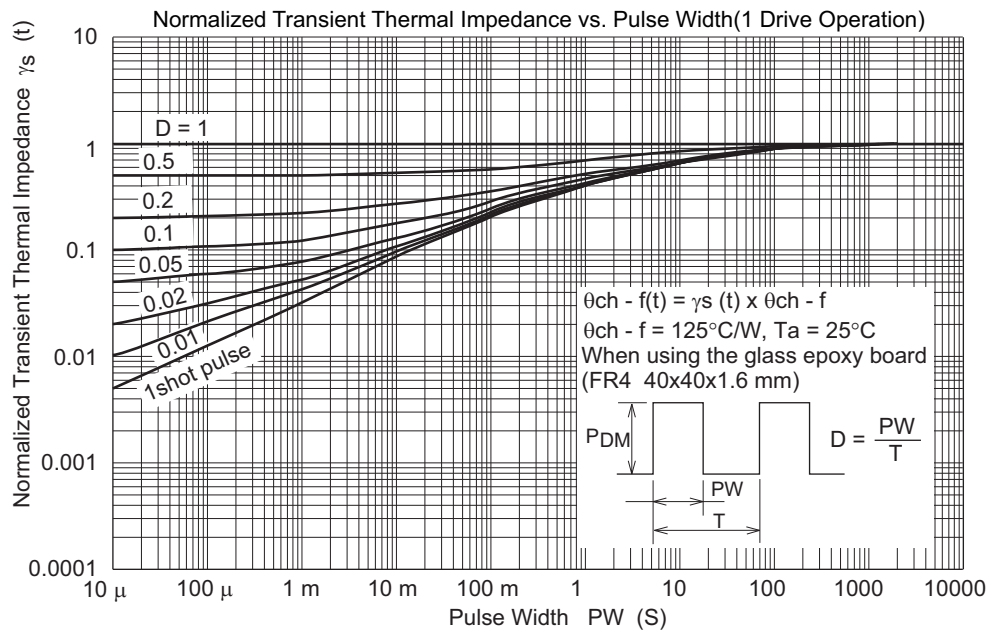
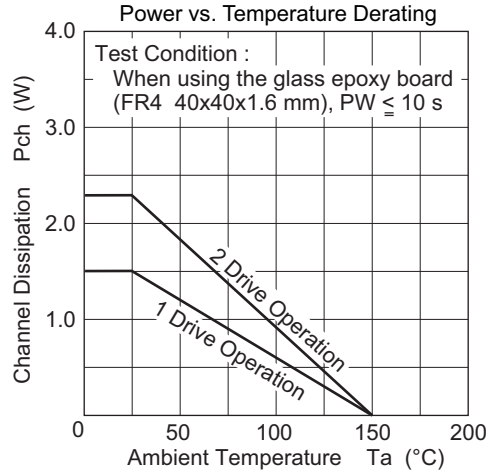
• N Channel



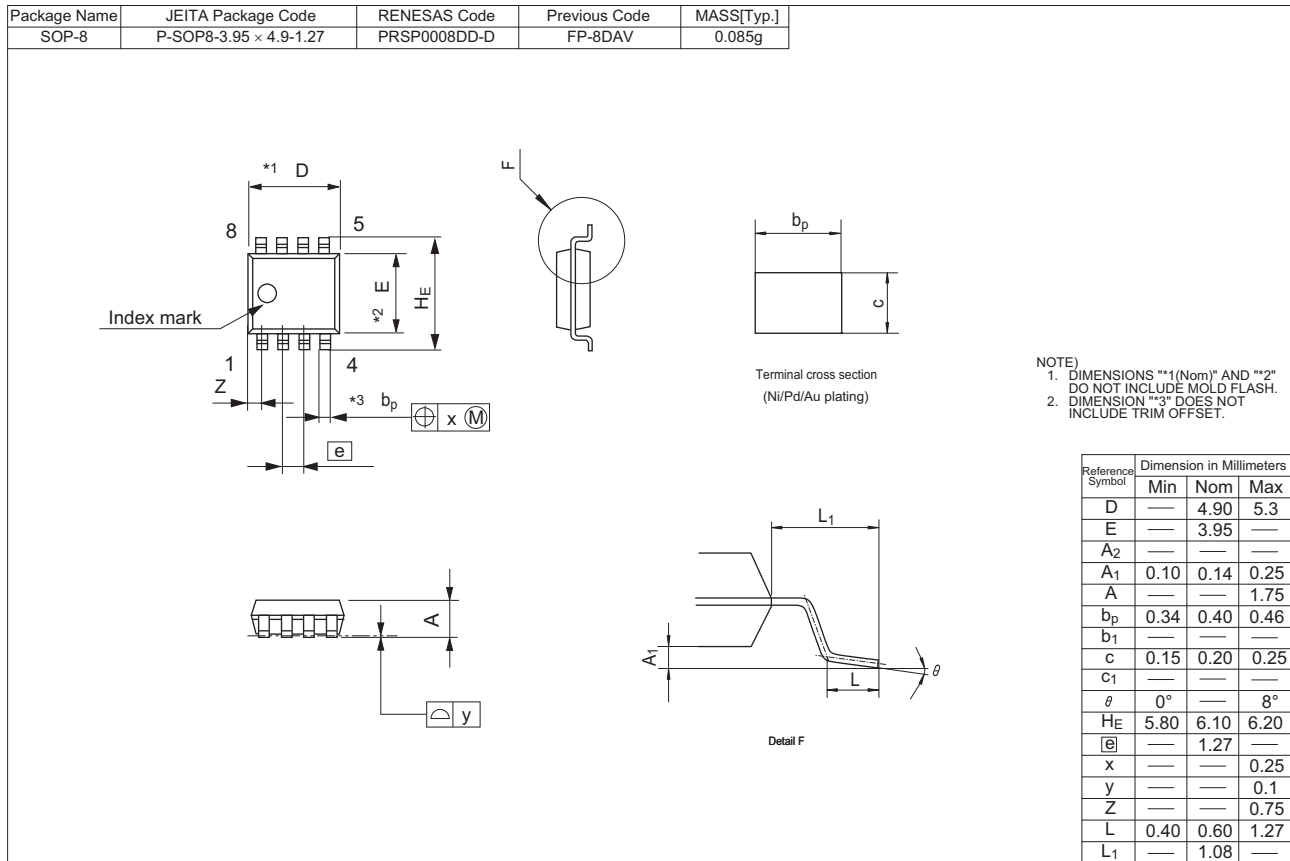
• P Channel



• Common



Package Dimensions



Ordering Information

Orderable Part Number	Quantity	Shipping Container
HAT3037R-EL-E	2500 pcs	Taping

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