

HAT3038R

Silicon N/P Channel Power MOSFET Power Switching

R07DS1375EJ0301

Rev.3.01

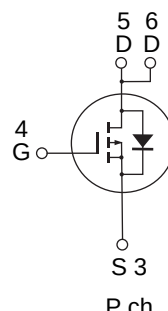
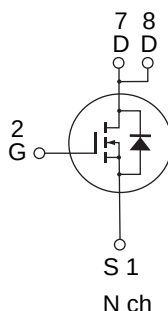
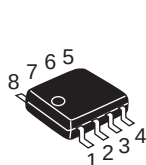
Jan 20, 2017

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}	60	-60	V
Gate to source voltage	V_{GSS}	±20	-20,+10	V
Drain current	I_D	5	-4	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	40	-32	A
Body-drain diode reverse drain current	I_{DR}	5	-4	A
Channel dissipation	P_{ch} ^{Note2}	1.5	1.5	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), $PW \leq 10s$

Electrical Characteristics

• N Channel

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 60 \text{ V}$, $V_{GS} = 0$
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	$\text{m}\Omega$	$I_D = 2.5 \text{ A}$, $V_{GS} = 10 \text{ V}$ Note3
	$R_{DS(on)}$	—	55	80	$\text{m}\Omega$	$I_D = 2.5 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ Note3
Forward transfer admittance	$ y_{fs} $	6.6	11	—	S	$I_D = 2.5 \text{ A}$, $V_{DS} = 10 \text{ V}$ Note3
Input capacitance	C_{iss}	—	675	—	pF	$V_{DS} = 10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	95	—	pF	
Reverse transfer capacitance	C_{rss}	—	35	—	pF	
Total gate charge	Q_g	—	5.2	—	nC	$V_{DD} = 25 \text{ V}$ $V_{GS} = 4.5 \text{ V}$ $I_D = 5 \text{ A}$
Gate to source charge	Q_{gs}	—	1.8	—	nC	
Gate to drain charge	Q_{gd}	—	2.1	—	nC	
Turn-on delay time	$t_{d(on)}$	—	11	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 2.5 \text{ A}$ $V_{DD} \approx 30 \text{ V}$ $R_L = 12 \Omega$ $R_g = 4.7 \Omega$
Rise time	t_r	—	8	—	ns	
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	
Fall time	t_f	—	4.5	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.82	1.07	V	$I_F = 5 \text{ A}$, $V_{GS} = 0$ Note3
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 5 \text{ A}$, $V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$

Notes: 3. Pulse test

• P Channel

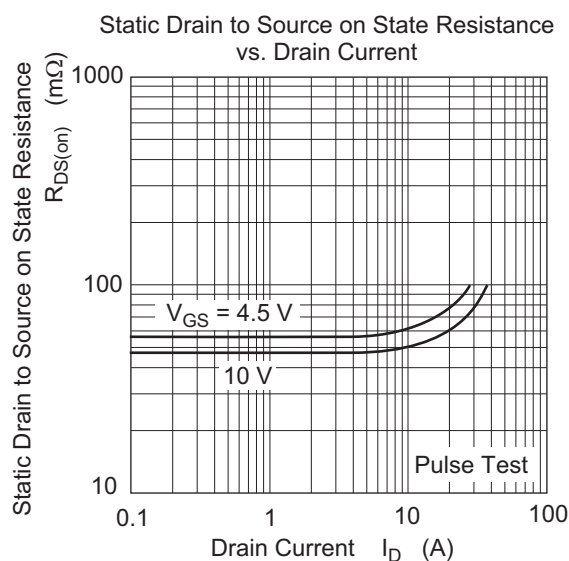
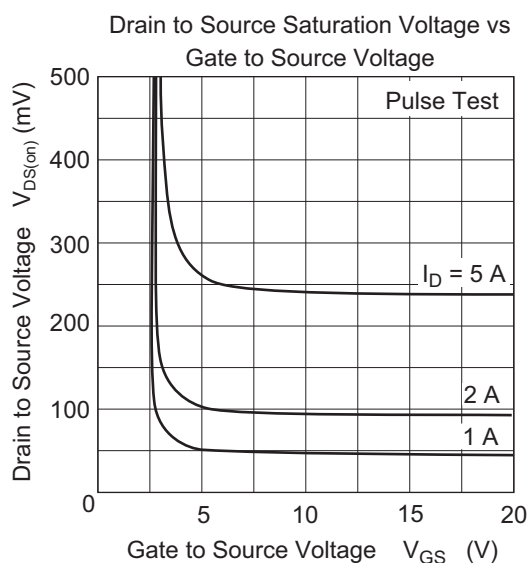
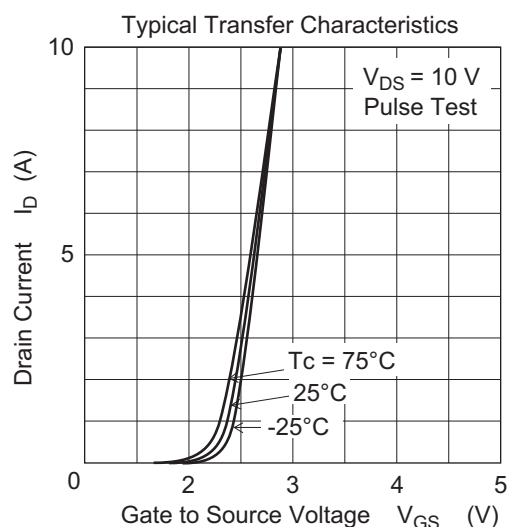
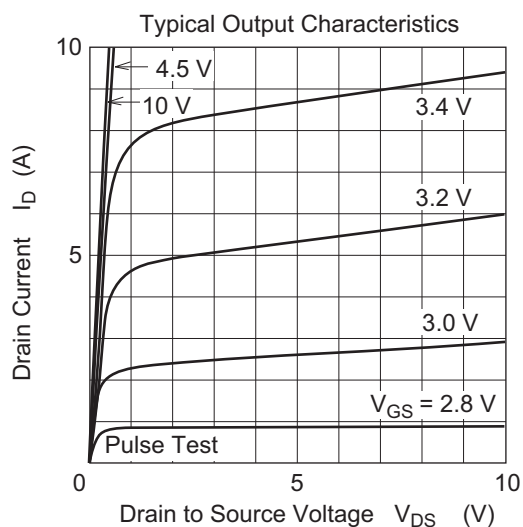
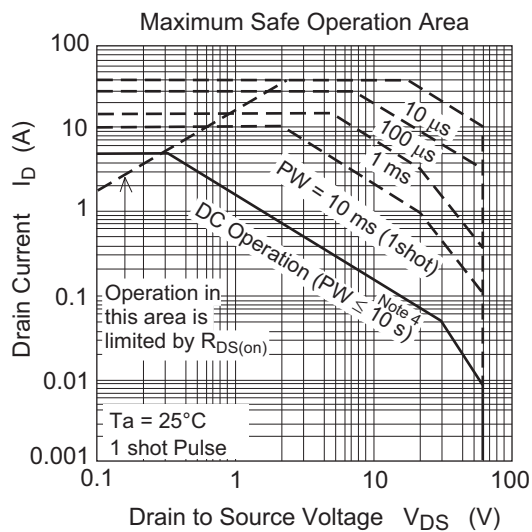
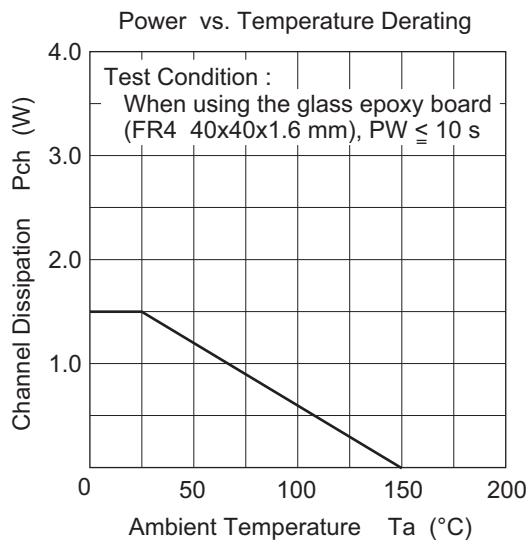
(Ta = 25°C)

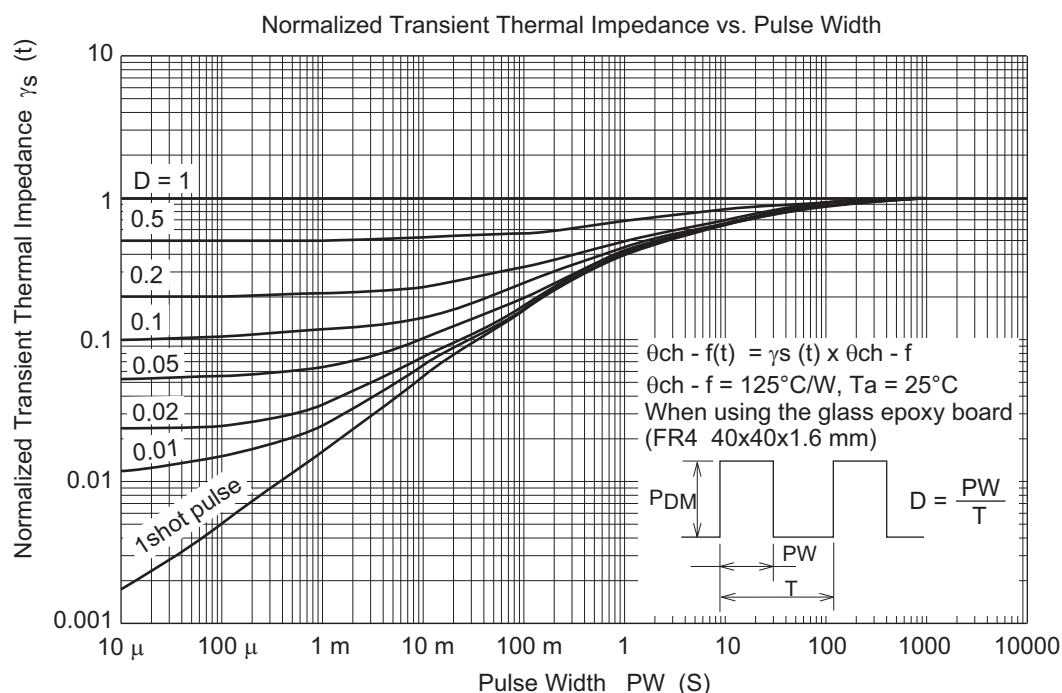
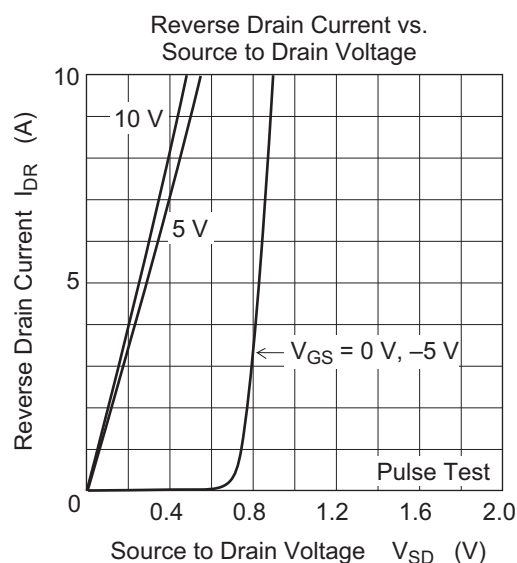
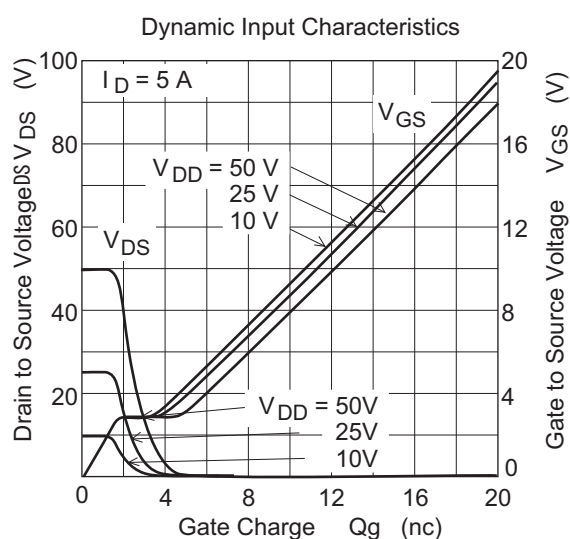
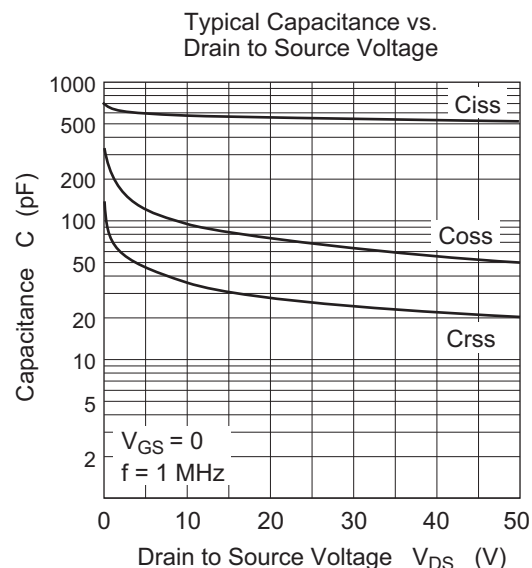
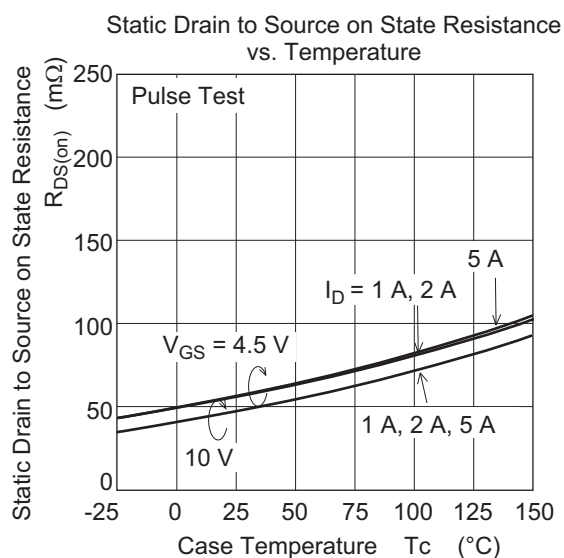
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = -20, +10 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-1	μA	$V_{DS} = -60 \text{ V}$, $V_{GS} = 0$
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	$\text{m}\Omega$	$I_D = -2 \text{ A}$, $V_{GS} = -10 \text{ V}$ Note3
	$R_{DS(on)}$	—	82	110	$\text{m}\Omega$	$I_D = -2 \text{ A}$, $V_{GS} = -4.5 \text{ V}$ Note3
Forward transfer admittance	$ y_{fs} $	4.5	7.5	—	S	$I_D = -2 \text{ A}$, $V_{DS} = -10 \text{ V}$ Note3
Input capacitance	C_{iss}	—	1330	—	pF	$V_{DS} = -10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	115	—	pF	
Reverse transfer capacitance	C_{rss}	—	75	—	pF	
Total gate charge	Q_g	—	10.5	—	nC	$V_{DD} = -25 \text{ V}$ $V_{GS} = -4.5 \text{ V}$ $I_D = -4 \text{ A}$
Gate to source charge	Q_{gs}	—	3.3	—	nC	
Gate to drain charge	Q_{gd}	—	4.5	—	nC	
Turn-on delay time	$t_{d(on)}$	—	18	—	ns	$V_{GS} = -10 \text{ V}$, $I_D = -2 \text{ A}$ $V_{DD} \approx -30 \text{ V}$ $R_L = 15 \Omega$ $R_g = 4.7 \Omega$
Rise time	t_r	—	12	—	ns	
Turn-off delay time	$t_{d(off)}$	—	52	—	ns	
Fall time	t_f	—	5	—	ns	
Body-drain diode forward voltage	V_{DF}	—	-0.83	-1.08	V	$I_F = -4 \text{ A}$, $V_{GS} = 0$ Note3
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = -4 \text{ A}$, $V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$

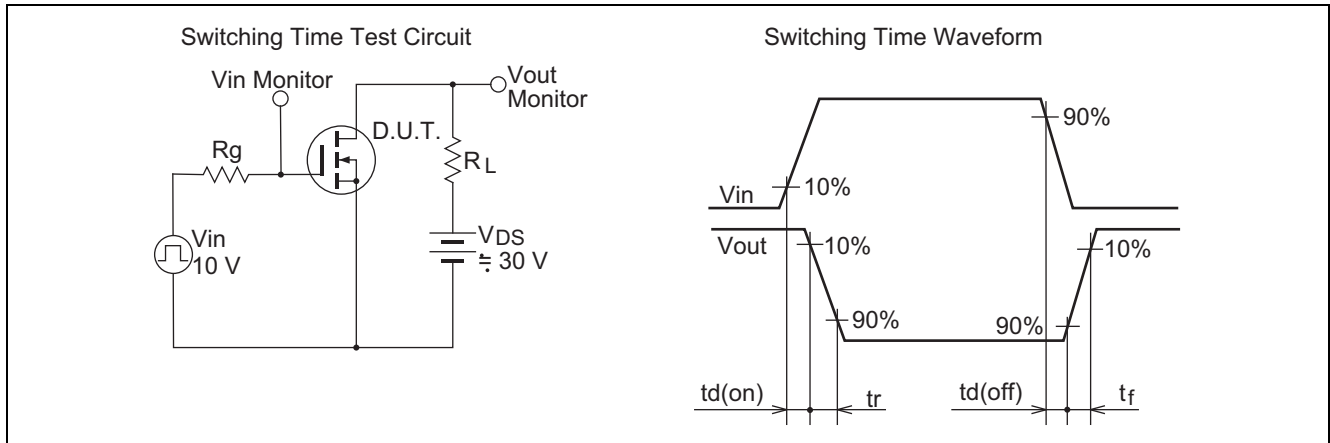
Notes: 3. Pulse test

Main Characteristics

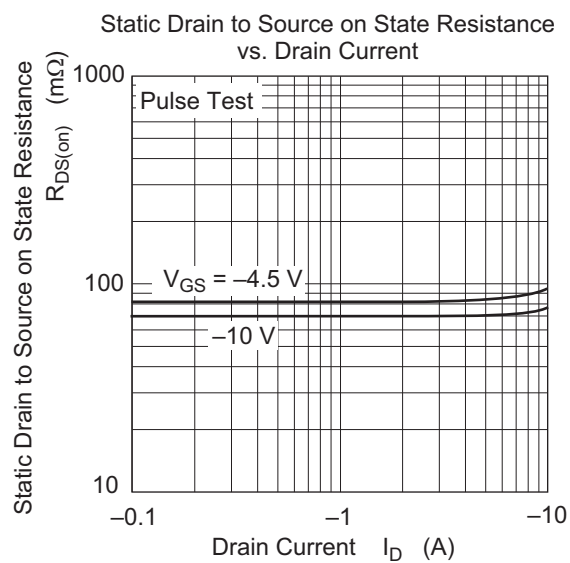
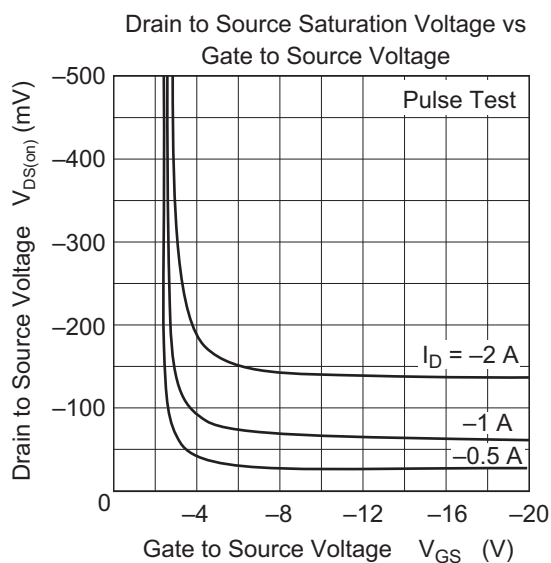
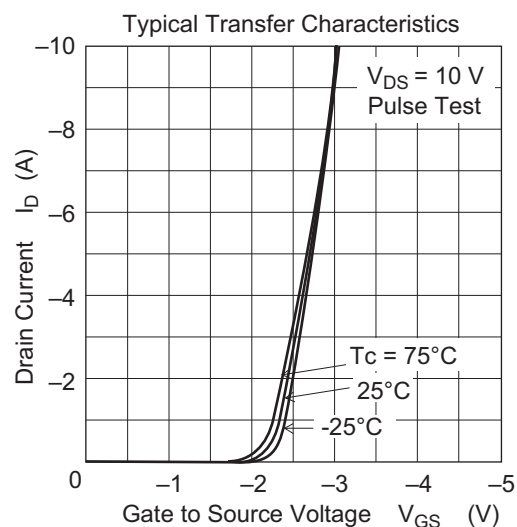
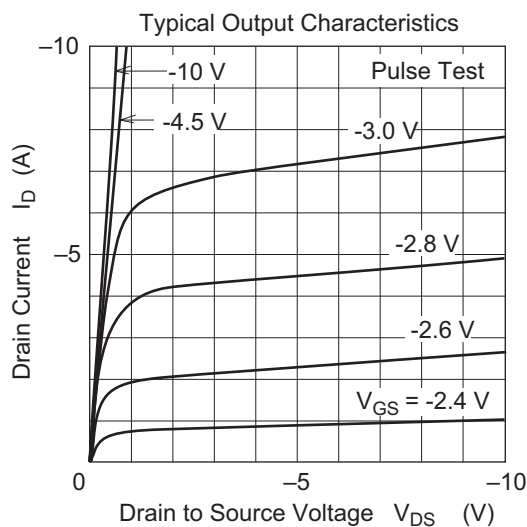
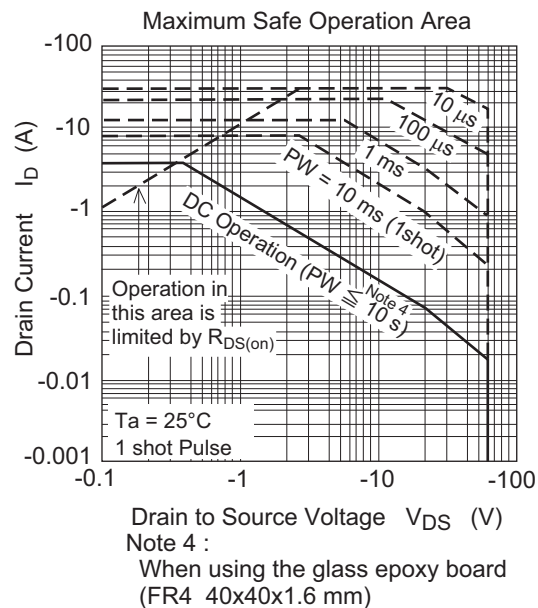
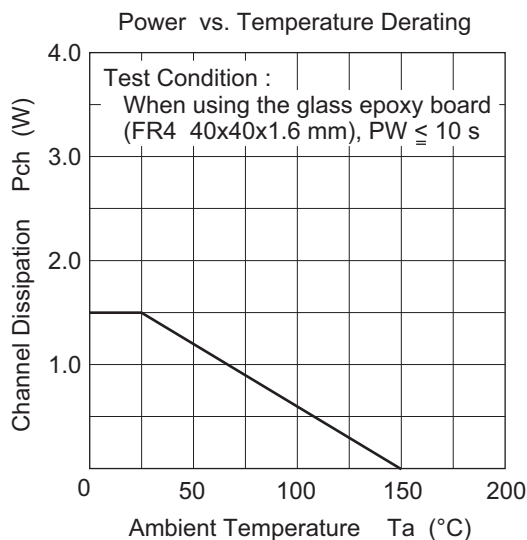
• N Channel

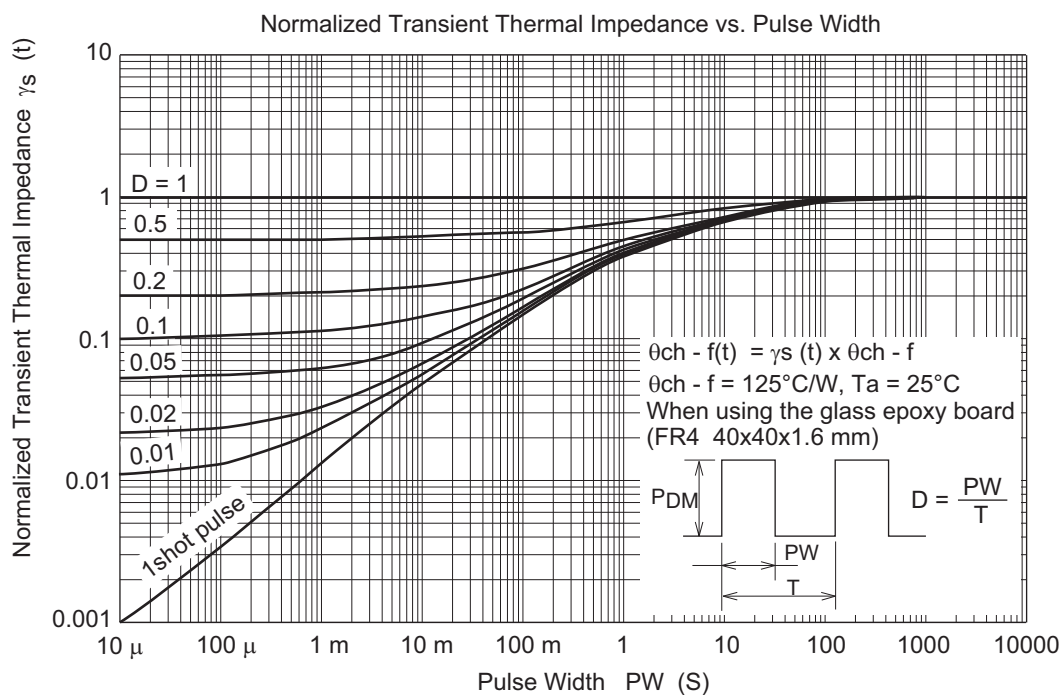
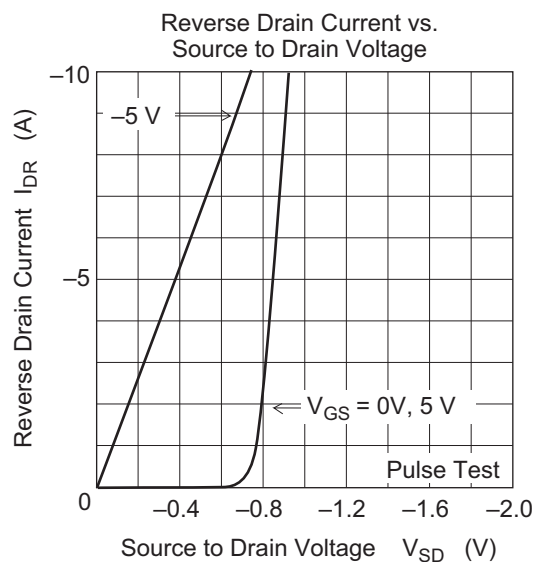
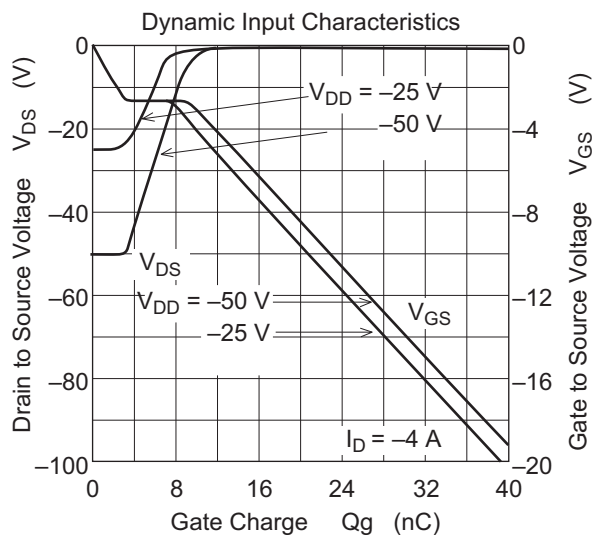
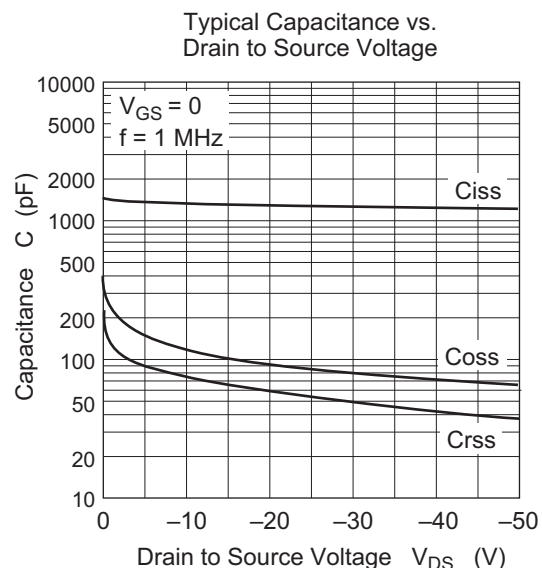
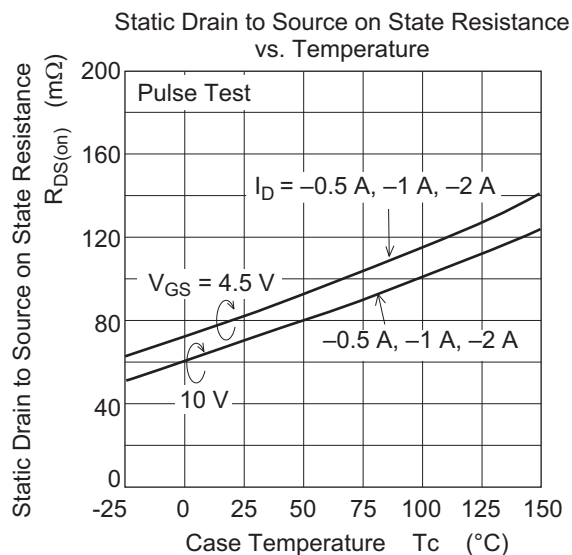


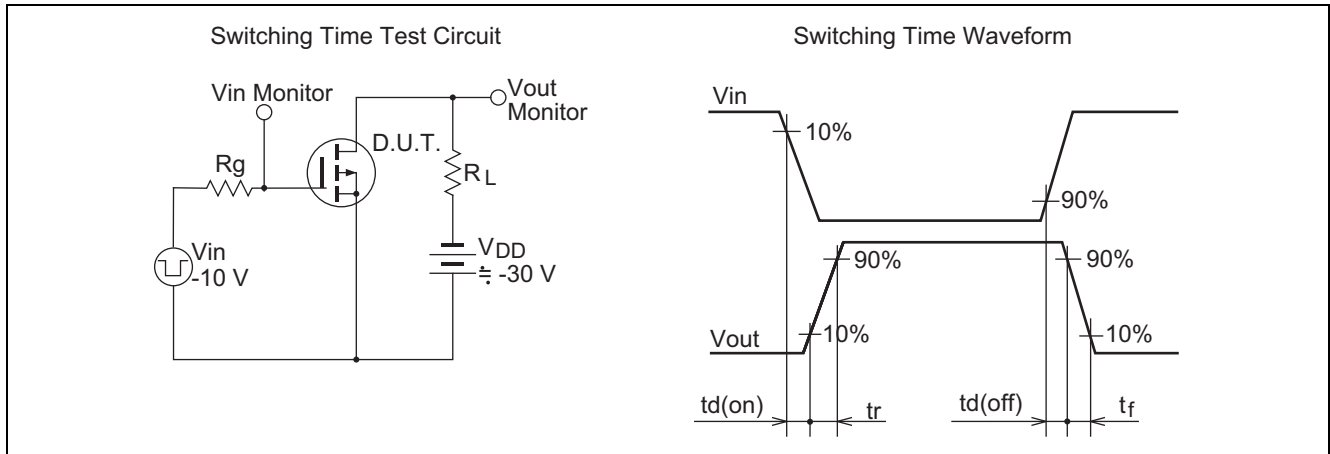




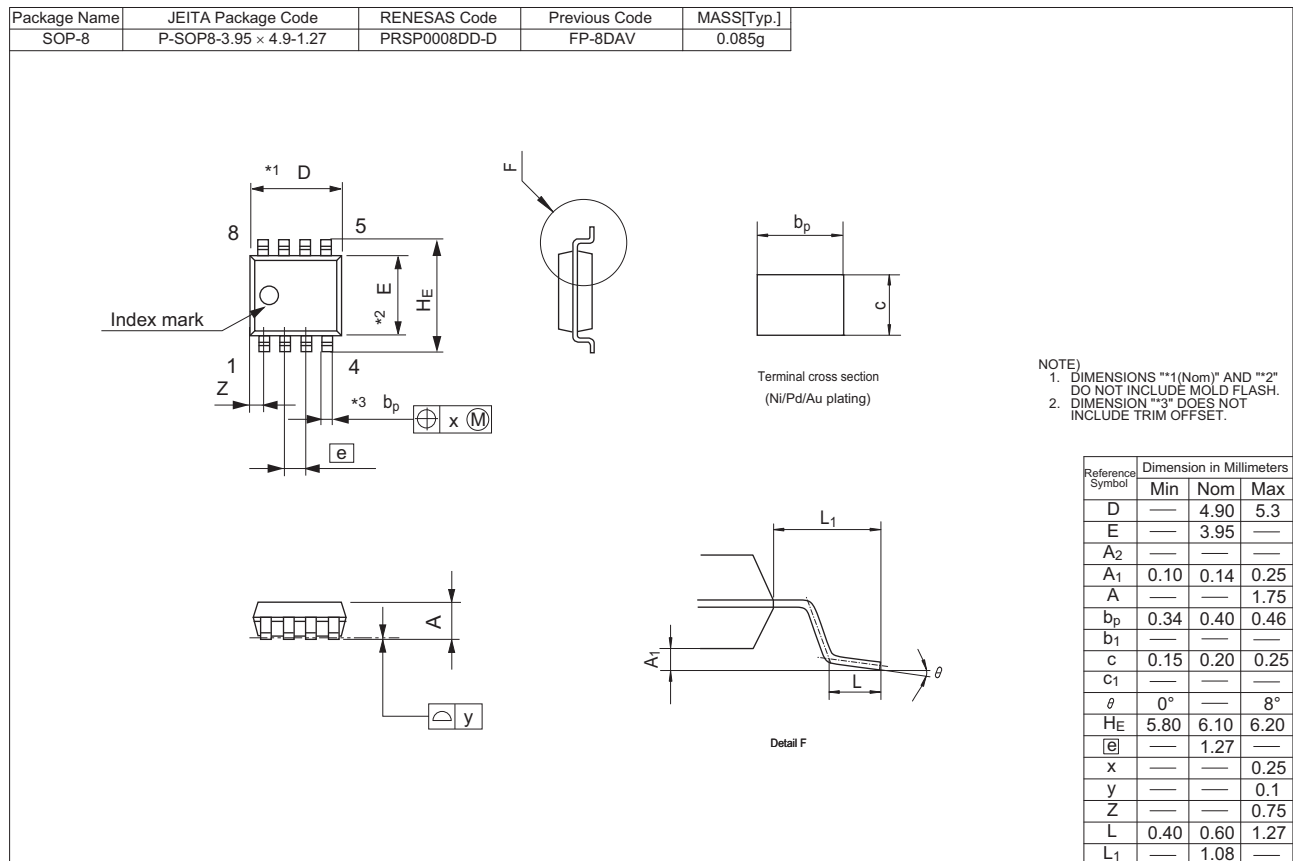
• P Channel







Package Dimensions



Ordering Information

Orderable Part Number	Quantity	Shipping Container
HAT3038R-EL-E	2500 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales Office to check the state of production before ordering the product.

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 10. 向第三方分销或处分产品或者以其他方式将产品置于第三方控制之下的瑞萨电子产品买方或分销商，有责任事先向上述第三方通知本文件规定的内容和条件；对于用户或第三方因非法使用瑞萨电子产品而遭受的任何损失，瑞萨电子不承担任何责任。
 11. 在事先未得到瑞萨电子书面认可的情况下，不得以任何形式部分或全部转载或复制本文件。
 12. 如果对本文件所记载的信息或瑞萨电子产品有任何疑问，或者用户有任何其他疑问，请向瑞萨电子的营业部门咨询。
- (注1) 瑞萨电子：在本文件中指瑞萨电子株式会社及其控股子公司。
(注2) 瑞萨电子产品：指瑞萨电子开发或生产的任何产品。



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