

HAT3038R

Silicon N/P Channel Power MOSFET Power Switching

R07DS1375EJ0301

Rev.3.01

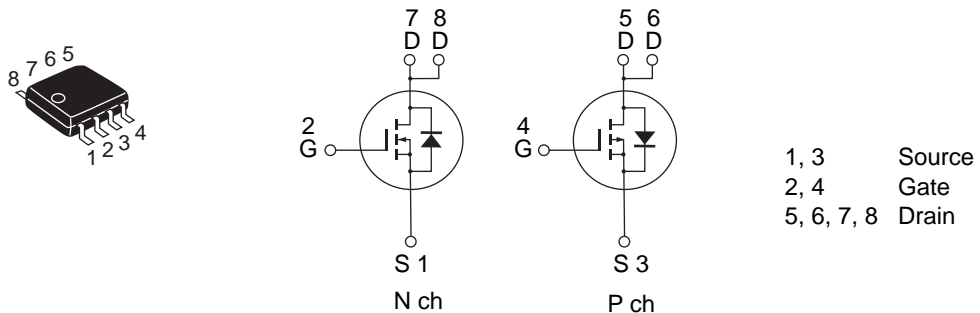
Jan 20, 2017

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>)



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 ≤ 10 μs, duty cycle ≤ 1 %

2. 1 Drive operation; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW ≤ 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	$V_{DD} = 25 \text{ V}$
Gate to source charge	Q_{gs}	—	1.8	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	Q_{gd}	—	2.1	—	nC	$I_D = 5 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	11	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 2.5 \text{ A}$
Rise time	t_r	—	8	—	ns	$V_{DD} \approx 30 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	$R_L = 12 \Omega$
Fall time	t_f	—	4.5	—	ns	$R_g = 4.7 \Omega$
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

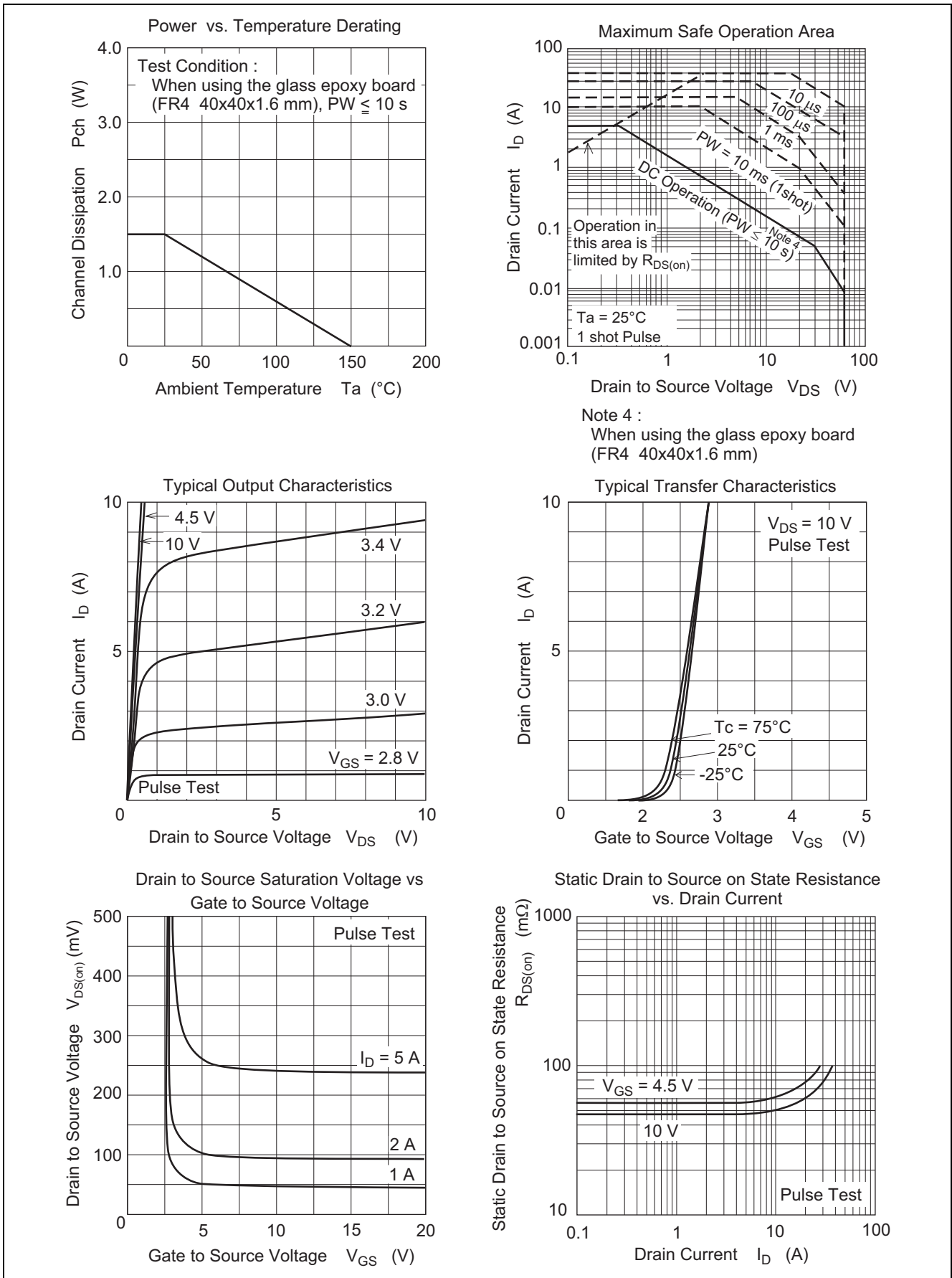
(Ta = 25°C)

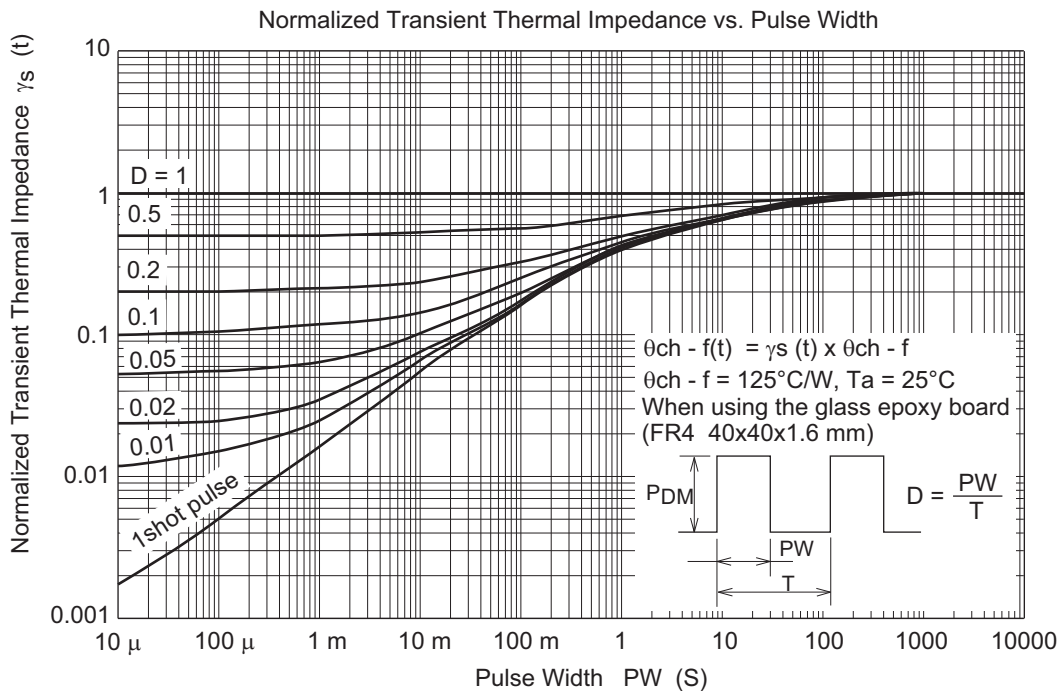
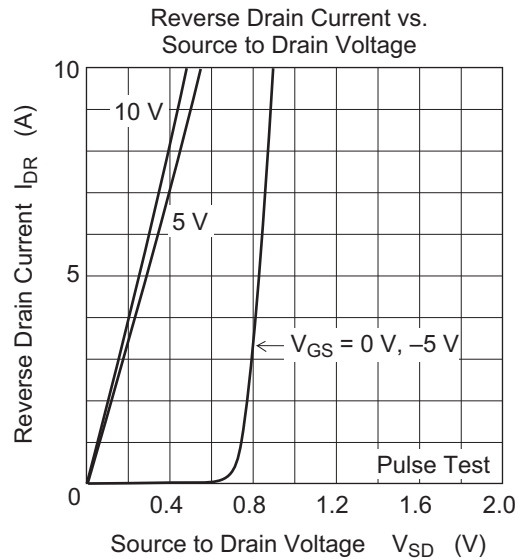
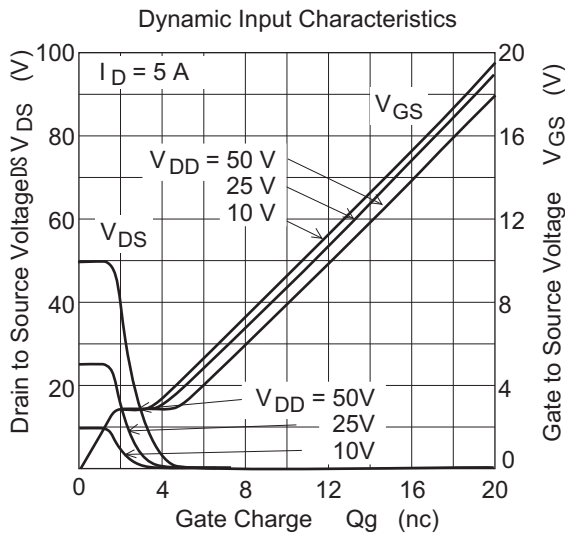
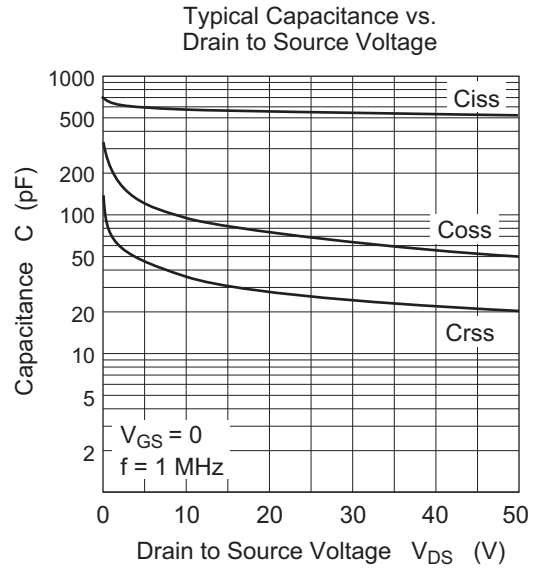
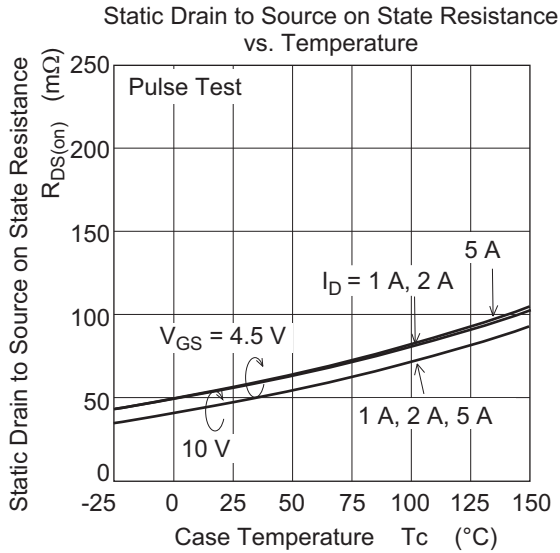
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = -20, +10 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-1	μA	$V_{DS} = -60 \text{ V}$, $V_{GS} = 0$
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	$V_{DD} = -25 \text{ V}$
Gate to source charge	Q_{gs}	—	3.3	—	nC	$V_{GS} = -4.5 \text{ V}$
Gate to drain charge	Q_{gd}	—	4.5	—	nC	$I_D = -4 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	18	—	ns	$V_{GS} = -10 \text{ V}$, $I_D = -2 \text{ A}$
Rise time	t_r	—	12	—	ns	$V_{DD} \approx -30 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	52	—	ns	$R_L = 15 \Omega$
Fall time	t_f	—	5	—	ns	$R_g = 4.7 \Omega$
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	$I_F = -4 \text{ A}$, $V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$

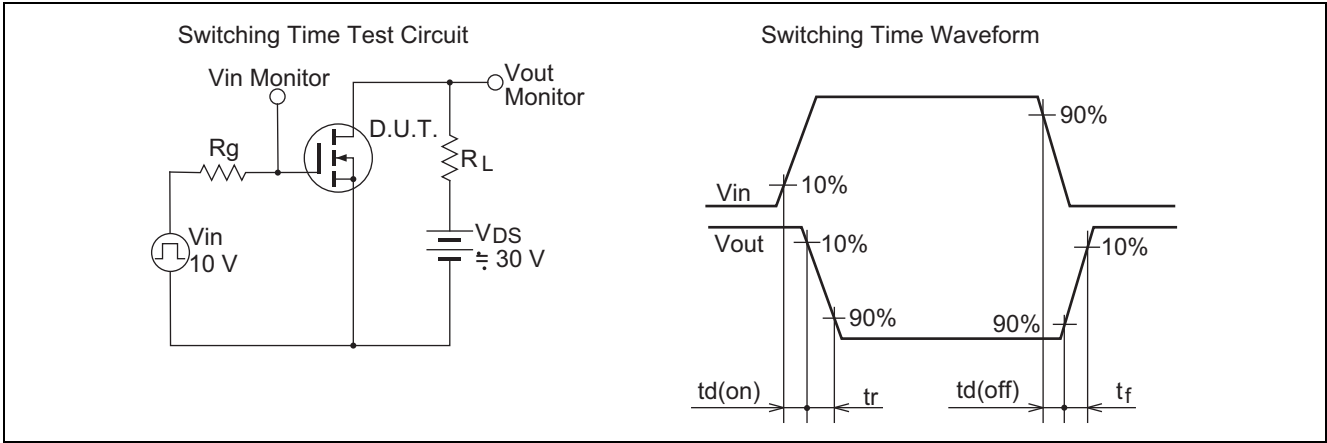
Notes: 3. Pulse test

Main Characteristics

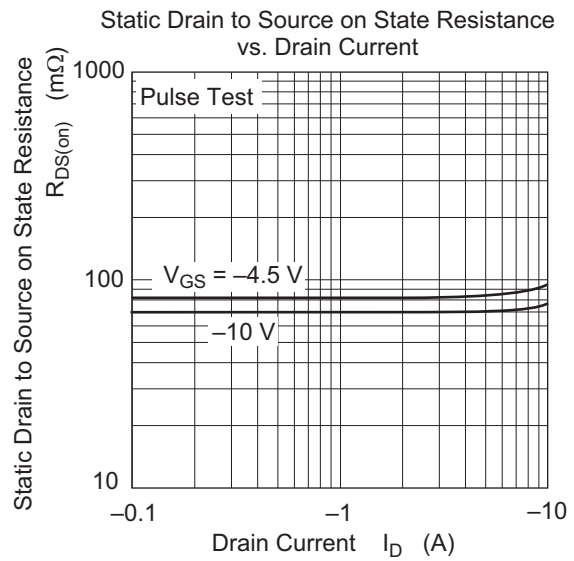
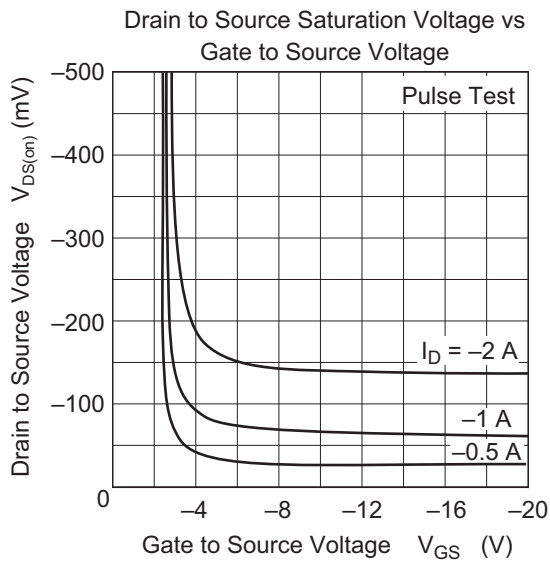
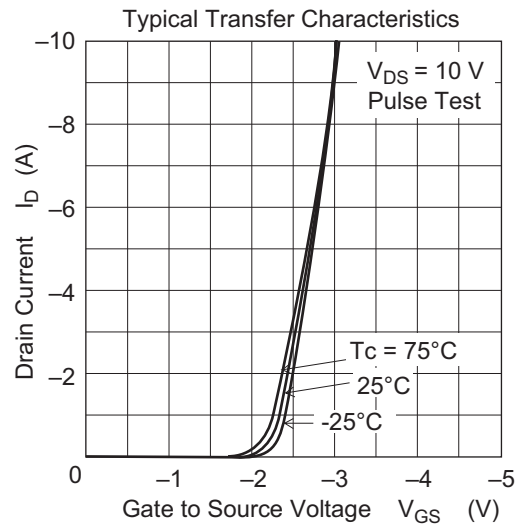
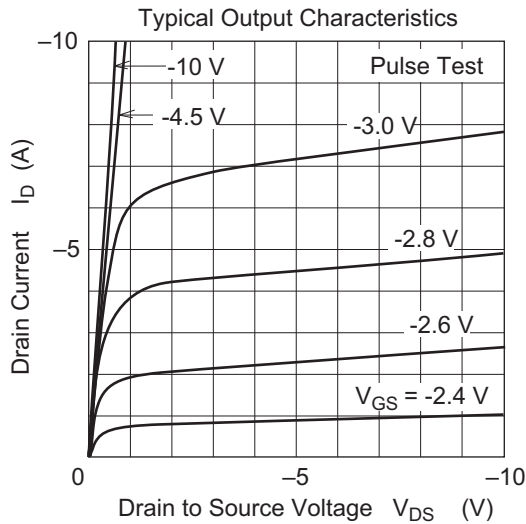
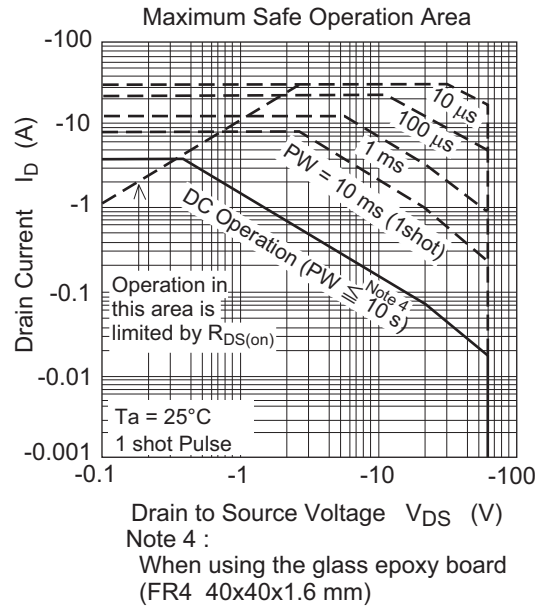
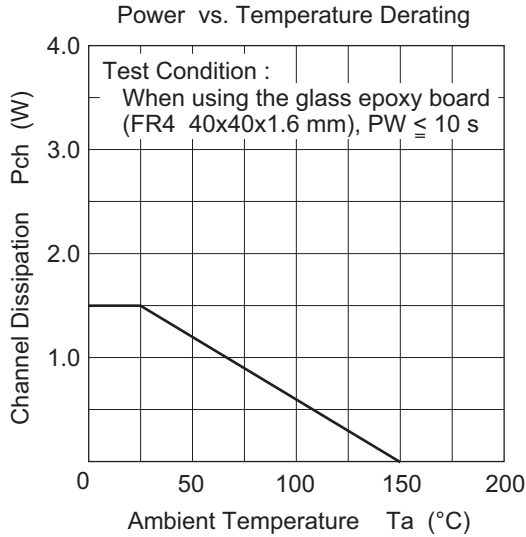
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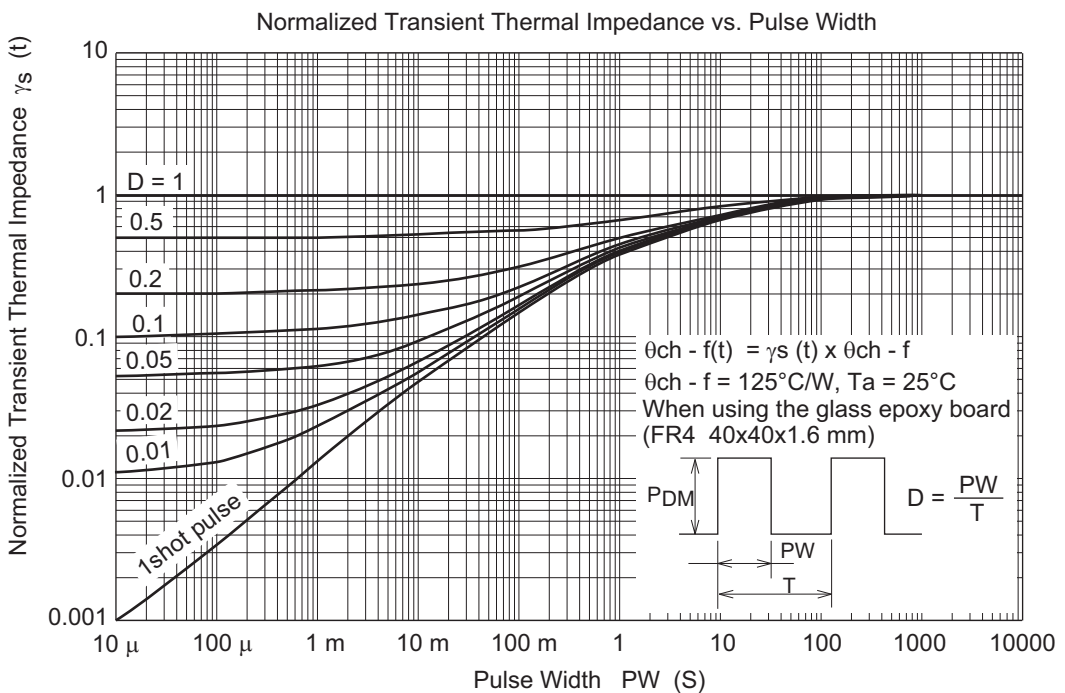
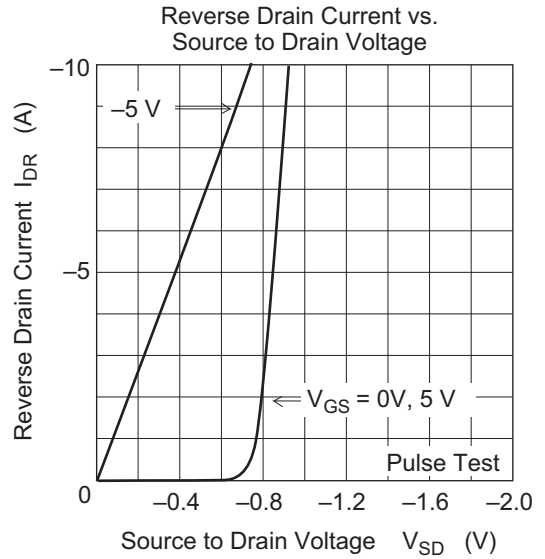
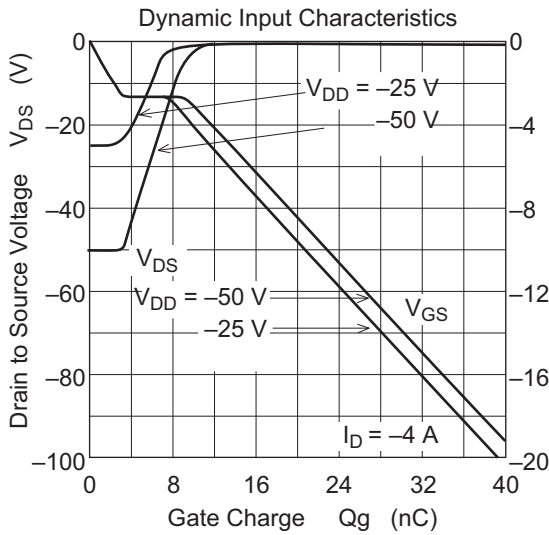
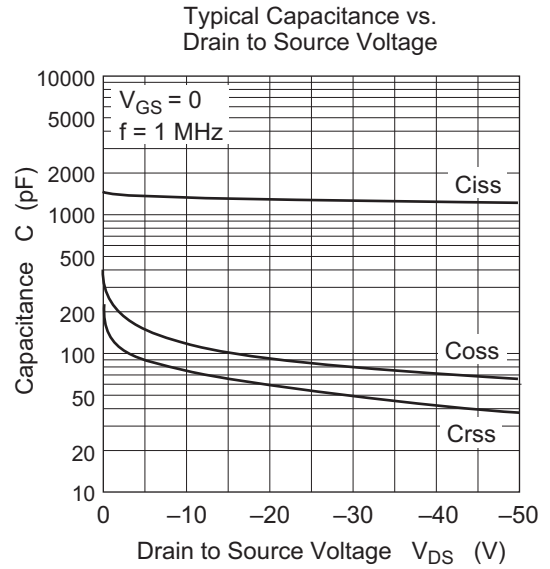
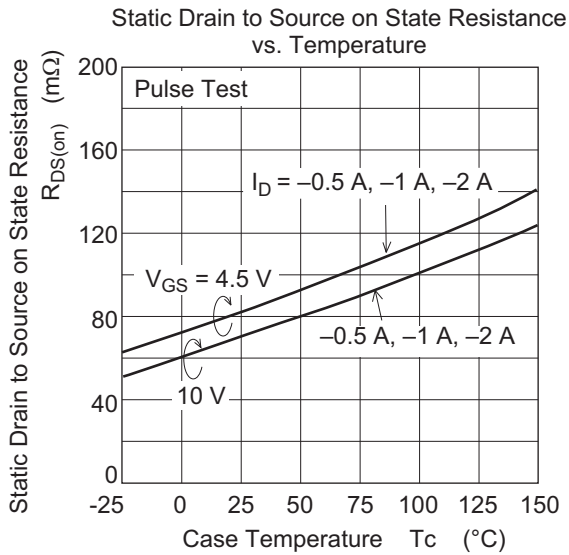


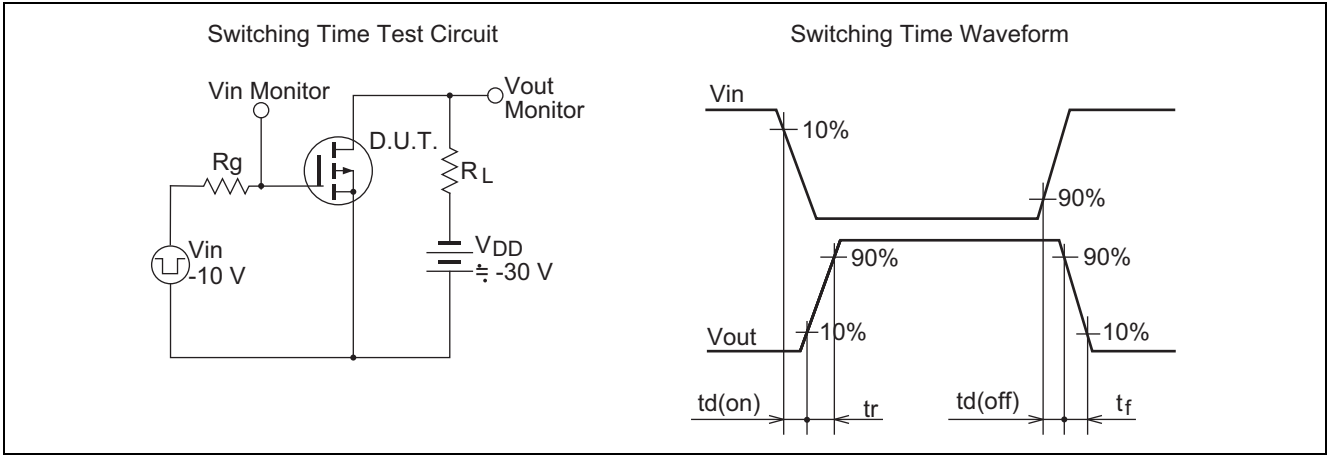




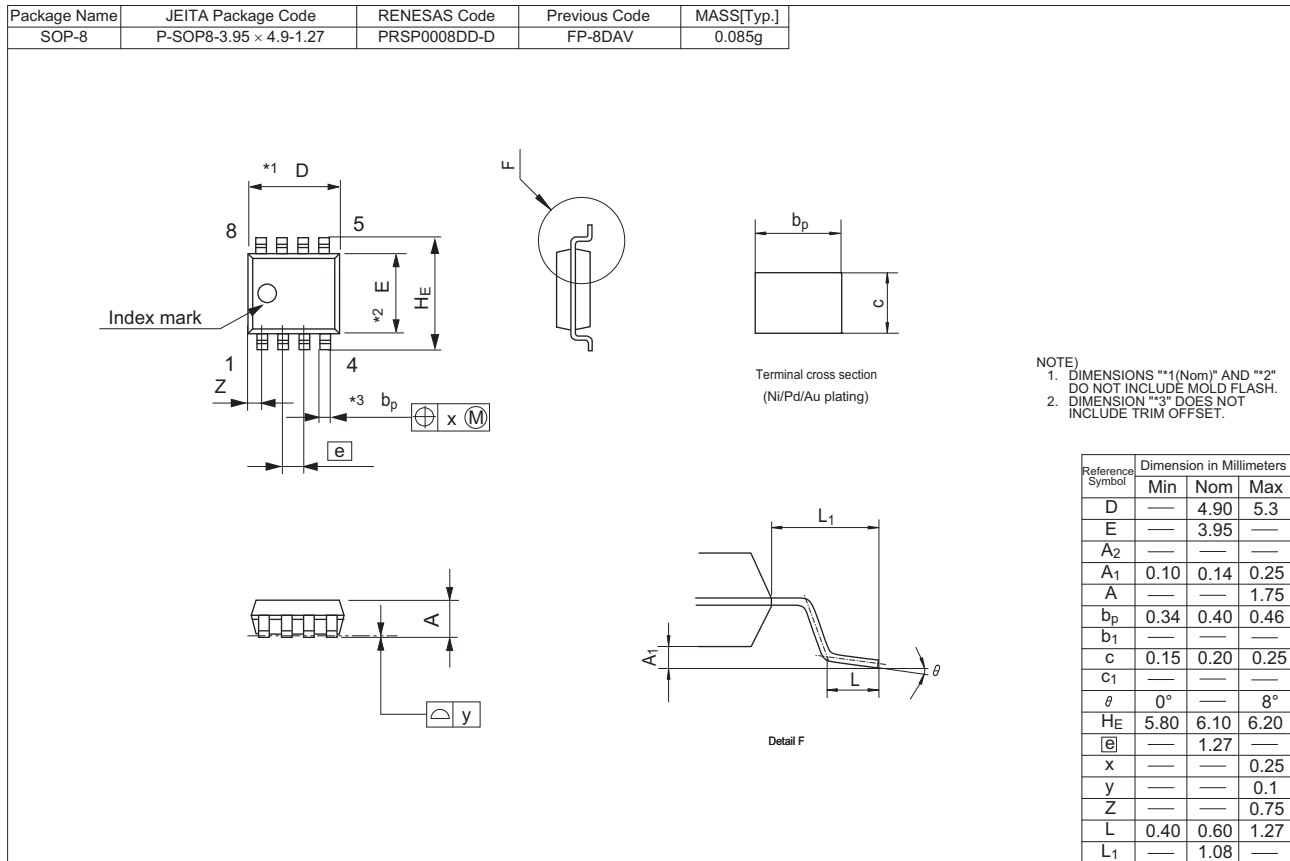
• P Channel







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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