

HAT2085T

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G0163-0500

Rev.5.00

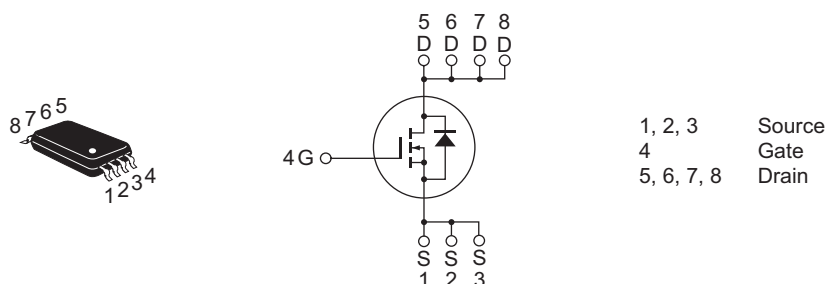
Nov 27, 2007

Features

- Low on-resistance
- Low drive current
- High density mounting

Outline

RENESAS Package code: PTSP0008JB-B
(Package name: TSSOP-8 <TTP-8DV>)



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V_{DS}	200	V
Gate to source voltage	V_{GS}	± 30	V
Drain current	I_D	1.4	A
Drain peak current	$I_{D(pulse)}$ ^{Note 1}	11.2	A
Body to drain diode reverse drain current	I_{DR}	1.4	A
Channel dissipation	P_{ch} ^{Note 2}	1.3	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. When using the glass epoxy board (FR4 40 × 40 × 1.6 mm), $PW \leq 10 s$

Electrical Characteristics

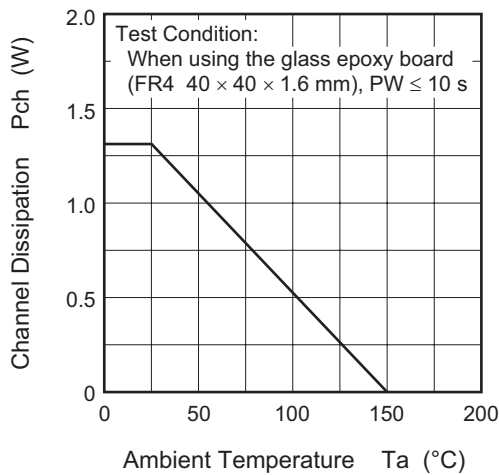
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 200 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.49	0.64	Ω	$I_D = 0.7 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note 3}
Forward transfer admittance	$ y_{fs} $	1.0	1.7	—	S	$I_D = 0.7 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note 3}
Input capacitance	C_{iss}	—	300	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	43	—	pF	
Reverse transfer capacitance	C_{rss}	—	12	—	pF	
Turn-on delay time	$t_{d(on)}$	—	21	—	ns	$V_{DD} \cong 100 \text{ V}$, $I_D = 0.7 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 143 \Omega$ $R_g = 10 \Omega$
Rise time	t_r	—	11	—	ns	
Turn-off delay time	$t_{d(off)}$	—	48	—	ns	
Fall time	t_f	—	18	—	ns	
Total gate charge	Q_g	—	10	—	nC	$V_{DD} = 160 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 1.4 \text{ A}$
Gate to source charge	Q_{gs}	—	1.8	—	nC	
Gate to drain charge	Q_{gd}	—	4.8	—	nC	
Body to drain diode forward voltage	V_{DF}	—	0.8	1.2	V	$I_F = 1.4 \text{ A}$, $V_{GS} = 0$ ^{Note 3}
Body to drain diode reverse recovery time	t_{rr}	—	65	—	ns	$I_F = 1.4 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

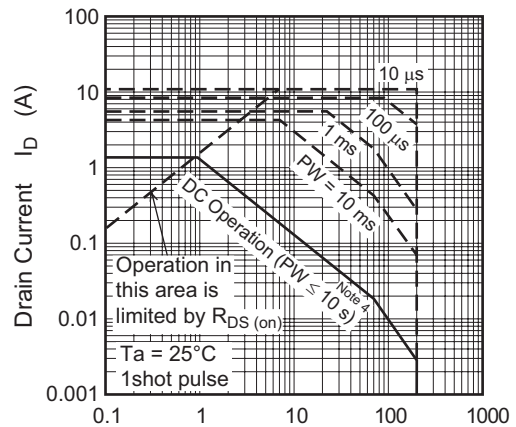
Note: 3. Pulse test

Main Characteristics

Power vs. Temperature Derating



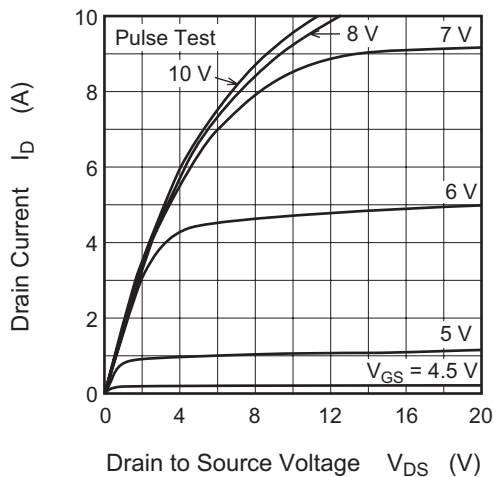
Maximum Safe Operation Area

Drain to Source Voltage V_{DS} (V)

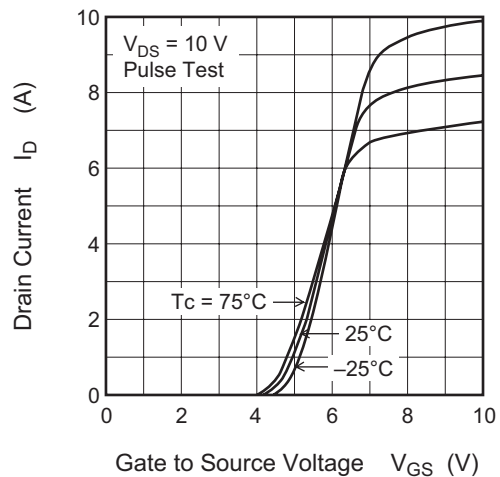
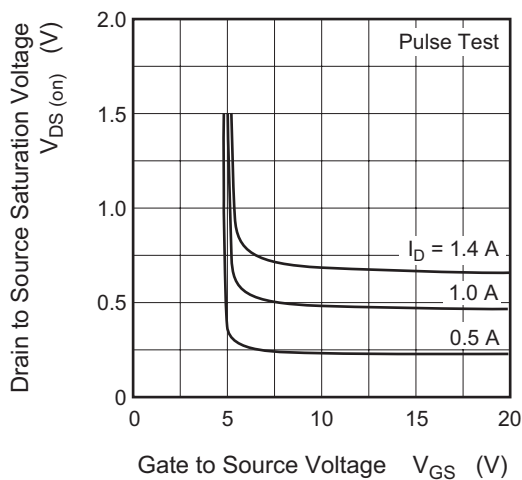
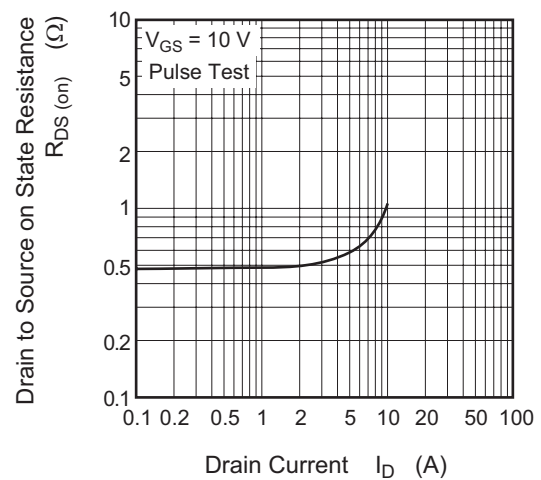
Note 4:

When using the glass epoxy board
(FR4 40 × 40 × 1.6 mm)

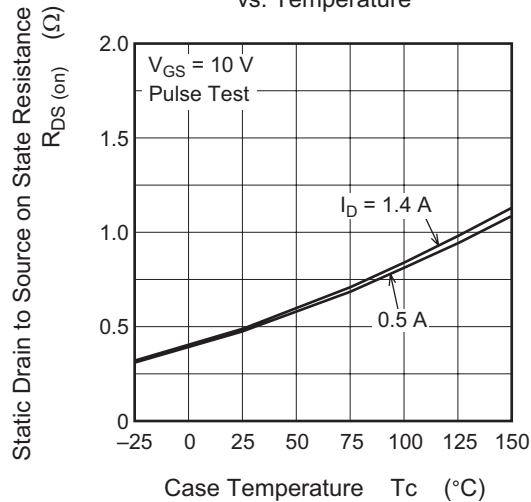
Typical Output Characteristics



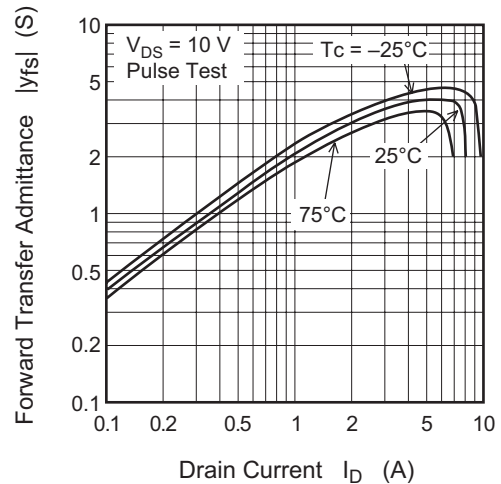
Typical Transfer Characteristics

Drain to Source Saturation Voltage vs.
Gate to Source VoltageStatic Drain to Source on State Resistance
vs. Drain Current

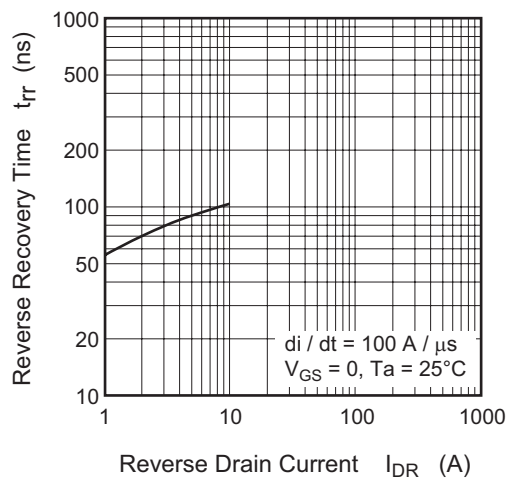
Static Drain to Source on State Resistance vs. Temperature



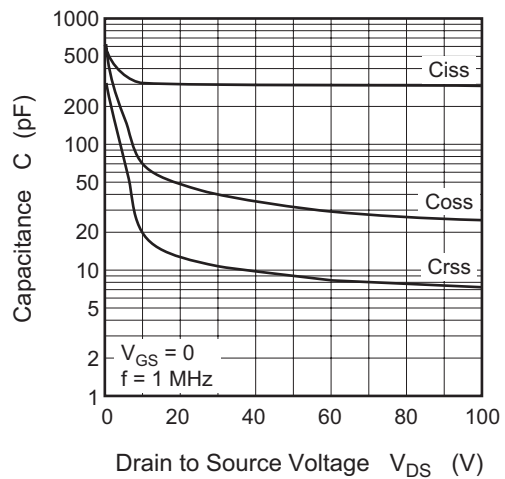
Forward Transfer Admittance vs. Drain Current



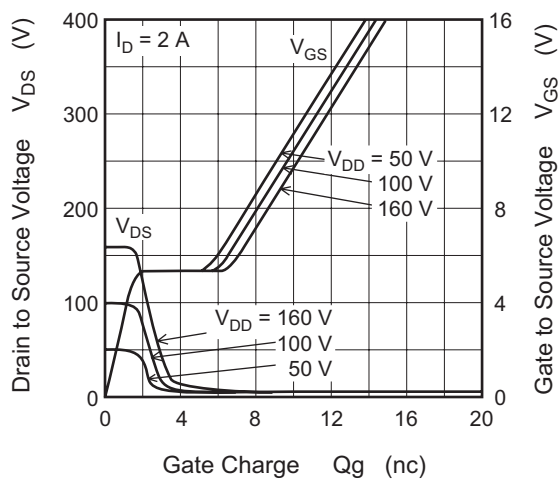
Body to Drain Diode Reverse Recovery Time



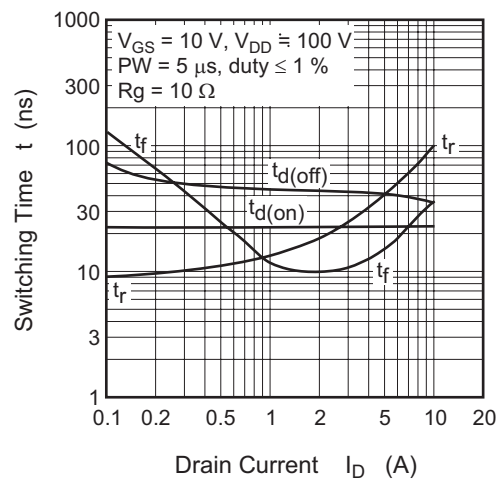
Typical Capacitance vs. Drain to Source Voltage

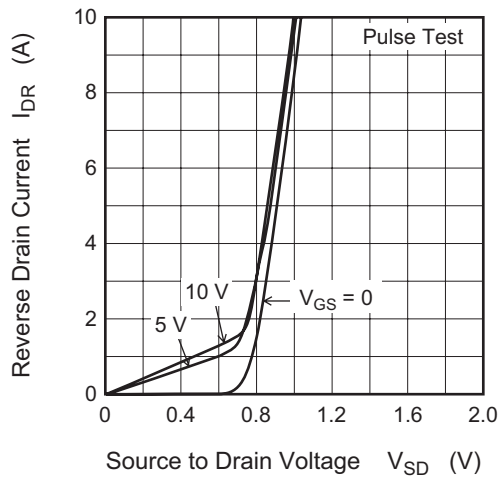
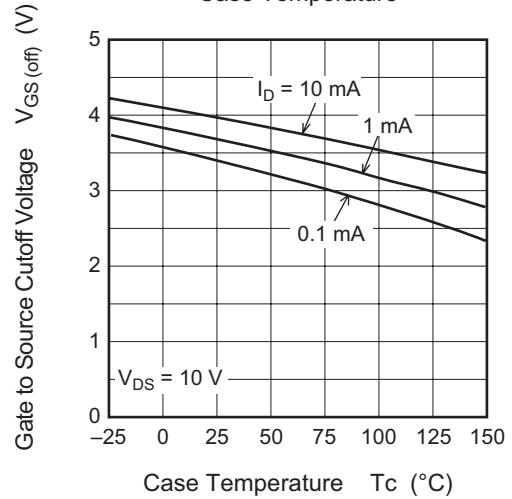


Dynamic Input Characteristics

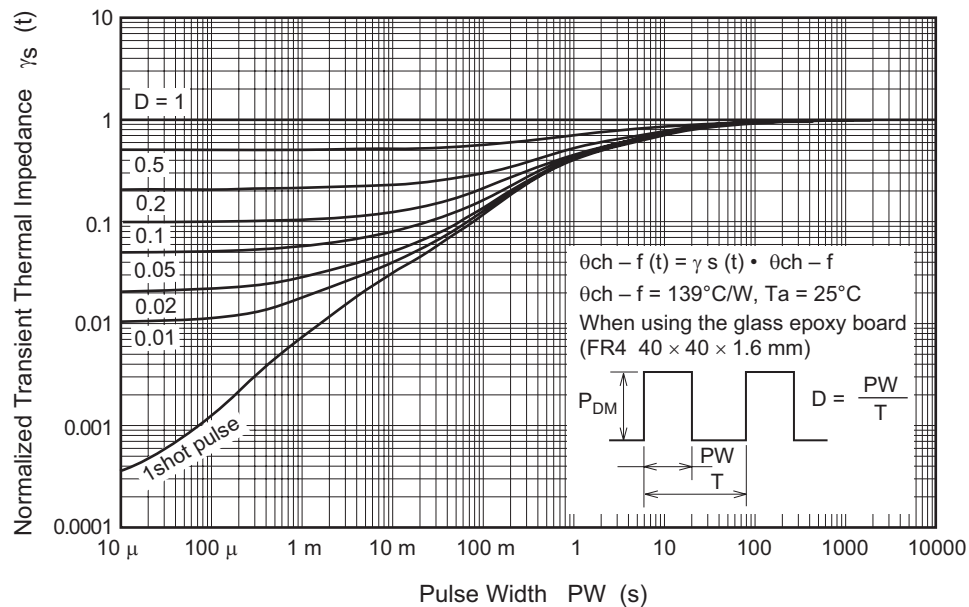


Switching Characteristics

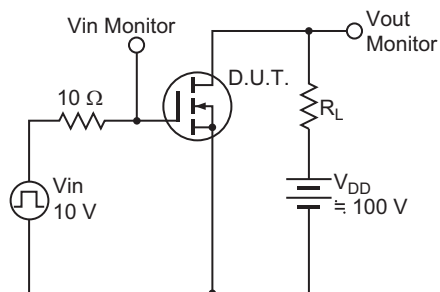


Reverse Drain Current vs.
Source to Drain VoltageGate to Source Cutoff Voltage vs.
Case Temperature

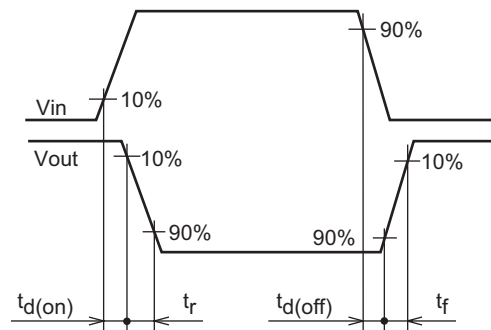
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

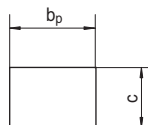
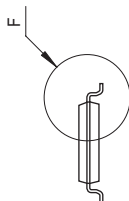
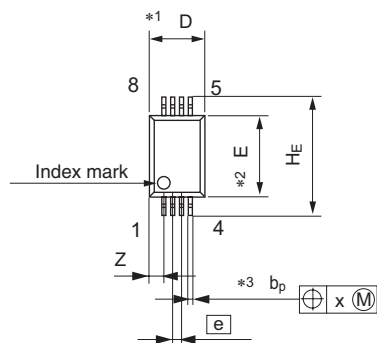


Switching Time Waveform



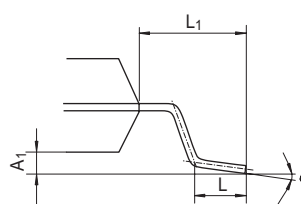
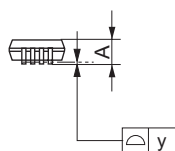
Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TSSOP-8	P-TSSOP8-4.4 × 3-0.65	PTSP0008JB-B	TTP-8DV	0.037g



Terminal cross section
(Ni/Pd/Au plating)

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



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	3.00	3.30
E	—	4.40	—
A ₂	—	—	—
A ₁	0.03	0.07	0.10
A	—	—	1.10
b _p	0.15	0.20	0.25
b ₁	—	—	—
c	0.10	0.15	0.20
c ₁	—	—	—
θ	0°	—	8°
H _E	6.20	6.40	6.60
[e]	—	0.65	—
x	—	—	0.13
y	—	—	0.10
Z	—	—	0.805
L	0.40	0.50	0.60
L ₁	—	1.0	—

Ordering Information

Part No.	Quantity	Shipping Container
HAT2085T-EL-E	3000 pcs	Taping

Notes:

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