HAT2285WP

Silicon N Channel Power MOS FET with Schottky Barrier Diode High Speed Power Switching

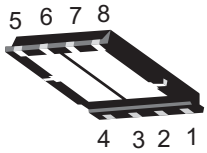
REJ03G1371-0300
Rev.3.00
Apr 05, 2006

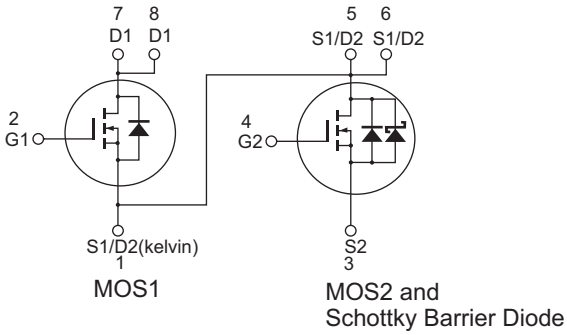
Features

- Low on-resistance
- Capable of 4.5 V gate drive
- High density mounting
- Built-in Schottky Barrier Diode

Outline

RENESAS Package code: PWSN0008DB-A
(Package name: WPAK-D)





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

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings		Unit
		MOS1	MOS2 & SBD	
Drain to source voltage	V_{DSS}	30	30	V
Gate to source voltage	V_{GSS}	±20	±12	V
Drain current	I_D	14	22	A
Drain peak current	$I_{D(pulse)}$ Note1	56	88	A
Reverse drain current	I_{DR}	14	22	A
Channel dissipation	Pch Note2	8	15	W
Channel temperature	Tch	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1 %
2. Tc = 25°C

Electrical Characteristics

• MOS1

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±20 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 30 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	19	24	mΩ	I_D = 7 A, V_{GS} = 10 V [Note3]
	$R_{DS(on)}$	—	27	40	mΩ	I_D = 7 A, V_{GS} = 4.5 V [Note3]
Forward transfer admittance	$\|y_{fs}\|$	10	18	—	S	I_D = 7 A, V_{DS} = 10 V [Note3]
Input capacitance	Ciss	—	630	—	pF	V_{DS} = 10 V, V_{GS} = 0, f = 1MHz
Output capacitance	Coss	—	155	—	pF	
Reverse transfer capacitance	Crss	—	57	—	pF	
Total gate charge	Qg	—	4.6	—	nC	V_{DD} = 10 V, V_{GS} = 4.5 V, I_D = 14 A
Gate to source charge	Qgs	—	2.2	—	nC	
Gate to drain charge	Qgd	—	1.2	—	nC	
Turn-on delay time	$t_{d(on)}$	—	7	—	ns	V_{GS} =10 V, I_D = 7 A, V_{DD} ≅ 10 V, R_L = 1.42 Ω, R_g = 4.7 Ω
Rise time	t_r	—	30	—	ns	
Turn-off delay time	$t_{d(off)}$	—	35	—	ns	
Fall time	t_f	—	3.6	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.91	1.19	V	I_F = 14 A, V_{GS} = 0 [Note3]
Body–drain diode reverse recovery time	t_{rr}	—	18	—	ns	I_F =14 A, V_{GS} = 0 di_F/dt = 100 A/µs

Notes: 3. Pulse test

• MOS2 & Schottky Barrier Diode

(Ta = 25°C)

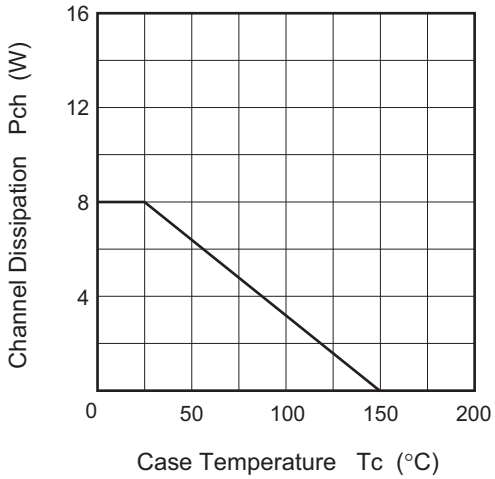
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±12 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	m A	V_{DS} = 30 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.4	—	2.5	V	V_{DS} = 10 V, I_D =1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	14	18	mΩ	I_D =11 A, V_{GS} = 10 V [Note3]
	$R_{DS(on)}$	—	15	23	mΩ	I_D = 11 A, V_{GS} = 4.5 V [Note3]
Forward transfer admittance	$\|y_{fs}\|$	24	40	—	S	I_D = 11 A, V_{DS} = 10 V [Note3]
Input capacitance	Ciss	—	1930	—	pF	V_{DS} = 10 V, V_{GS} = 0, f = 1MHz
Output capacitance	Coss	—	300	—	pF	
Reverse transfer capacitance	Crss	—	130	—	pF	
Total gate charge	Qg	—	18	—	nC	V_{DD} = 10 V, V_{GS} = 4.5 V, I_D = 22 A
Gate to source charge	Qgs	—	5.8	—	nC	
Gate to drain charge	Qgd	—	4.5	—	nC	
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	V_{GS} = 10 V, I_D = 11 A, V_{DD} ≅ 10 V, R_L = 0.91 Ω, R_g = 4.7 Ω
Rise time	t_r	—	20	—	ns	
Turn-off delay time	$t_{d(off)}$	—	45	—	ns	
Fall time	t_f	—	4.0	—	ns	
Schottky Barrier diode forward voltage	V_F	—	0.5	—	V	I_F = 3.5 A, V_{GS} = 0 [Note3]
Body–drain diode reverse recovery time	t_{rr}	—	16	—	ns	I_F = 22 A, V_{GS} = 0 di_F/dt = 100 A/µs

Notes: 3. Pulse test

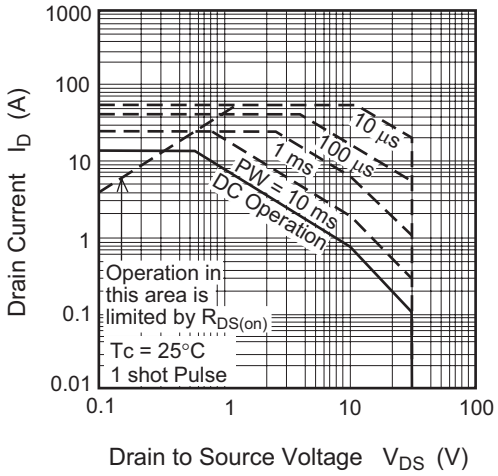
Electrical Characteristics

• **MOS1**

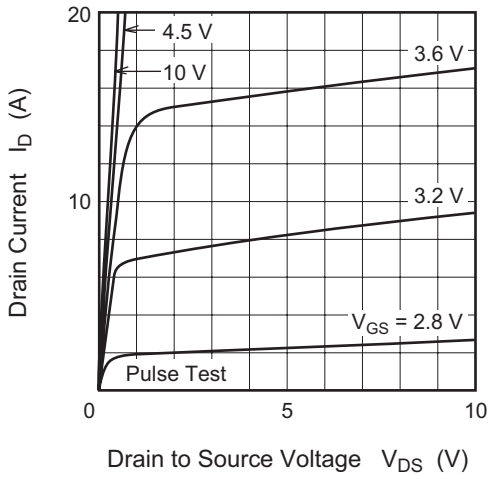
Power vs. Temperature Derating



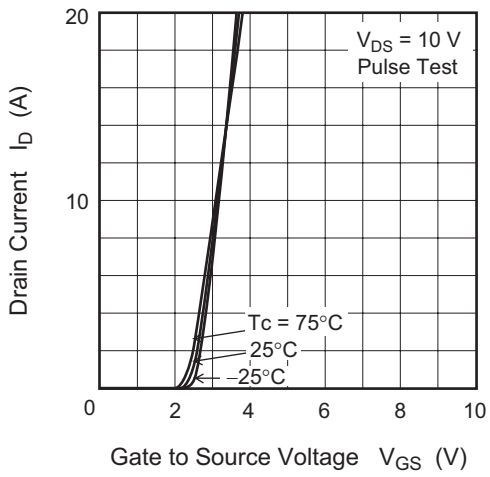
Maximum Safe Operation Area



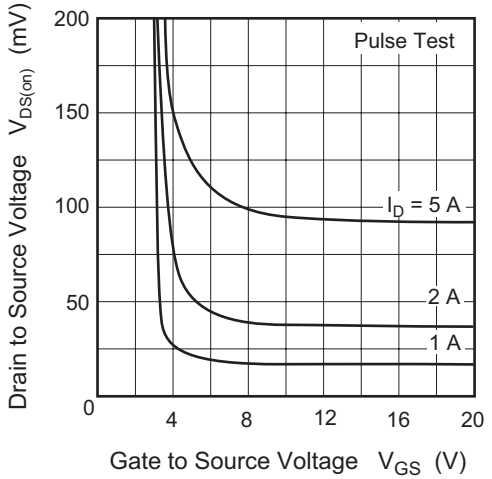
Typical Output Characteristics



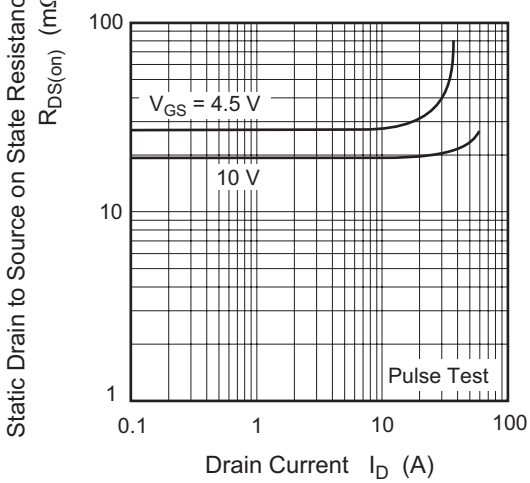
Typical Transfer Characteristics



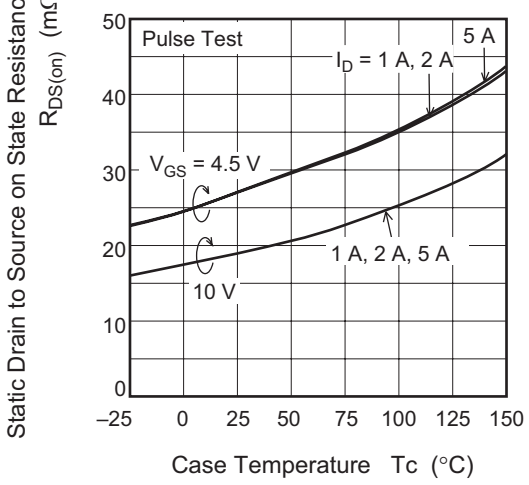
Drain to Source Saturation Voltage vs Gate to Source Voltage



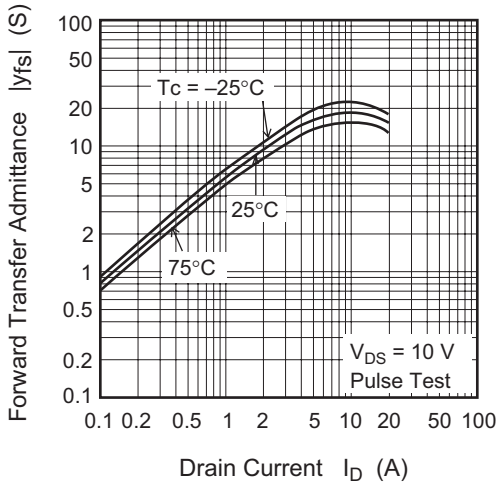
Static Drain to Source on State Resistance vs. Drain Current



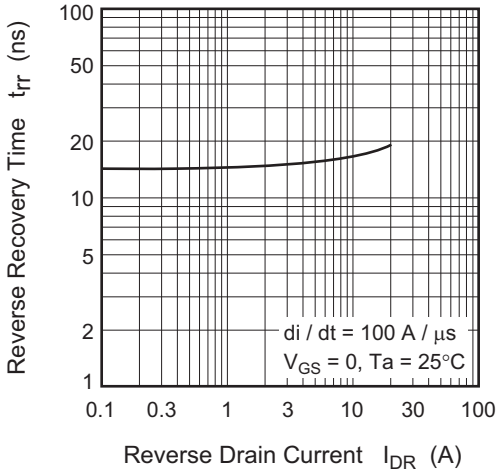
Static Drain to Source on State Resistance vs. Temperature



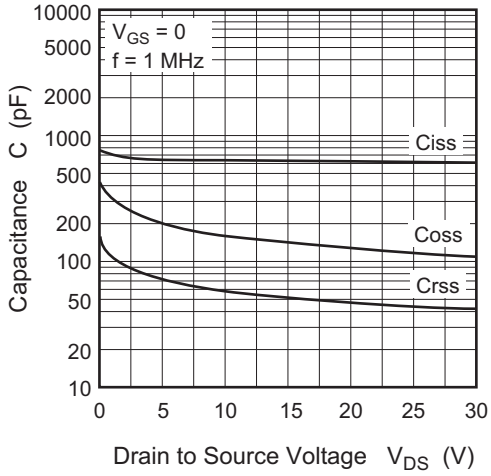
Forward Transfer Admittance vs. Drain Current



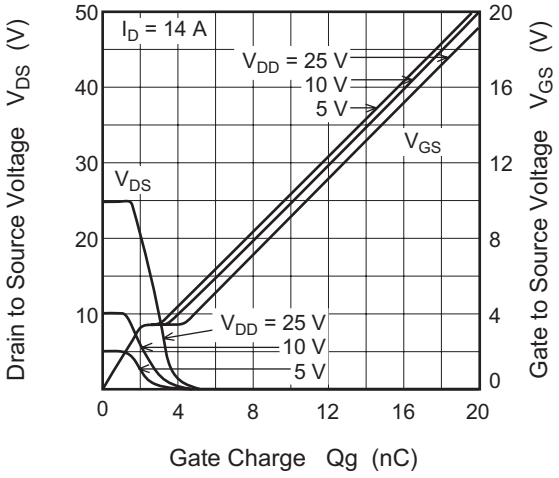
Body-Drain Diode Reverse Recovery Time



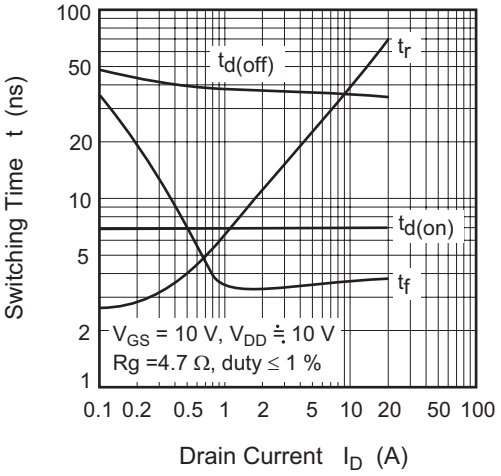
Typical Capacitance vs. Drain to Source Voltage



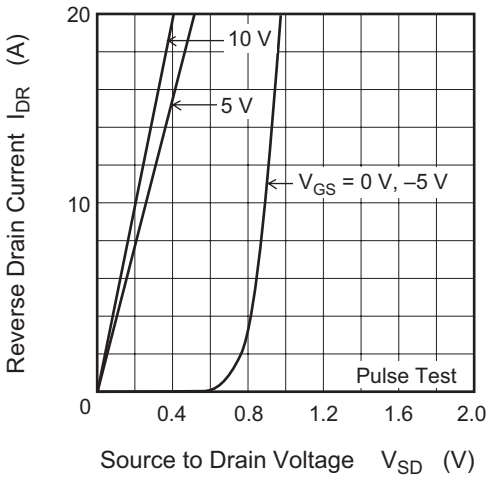
Dynamic Input Characteristics



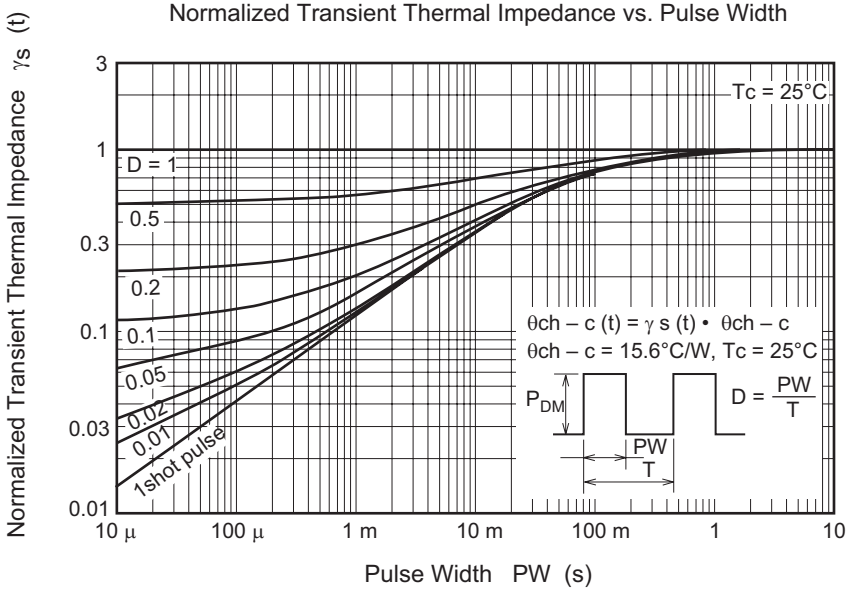
Switching Characteristics



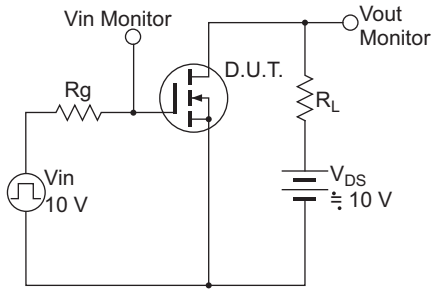
Reverse Drain Current vs.
Source to Drain Voltage



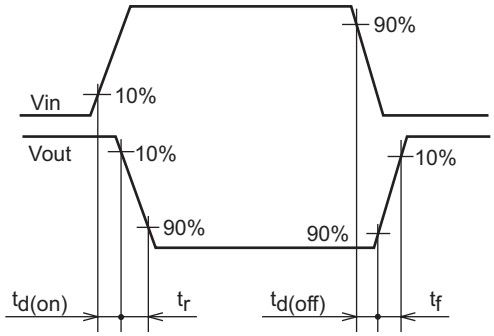
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

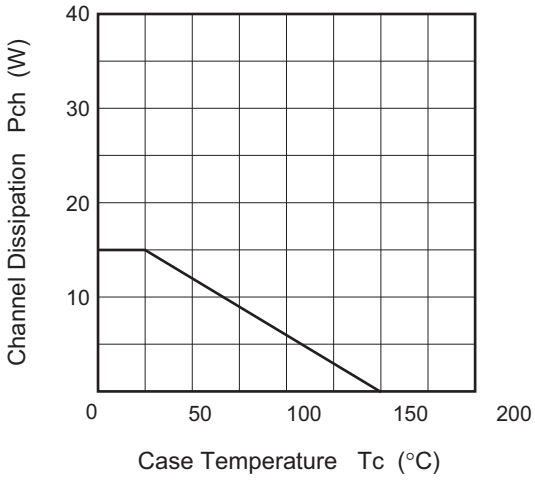


Switching Time Waveform

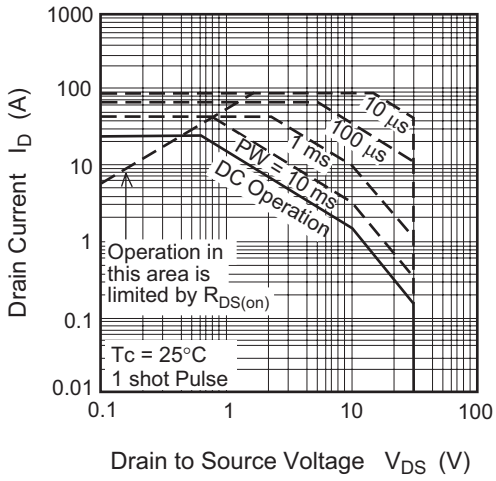


• MOS2 & Schottky Barrier Diode

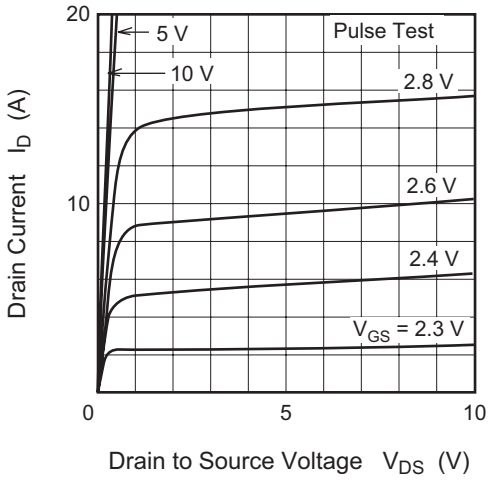
Power vs. Temperature Derating



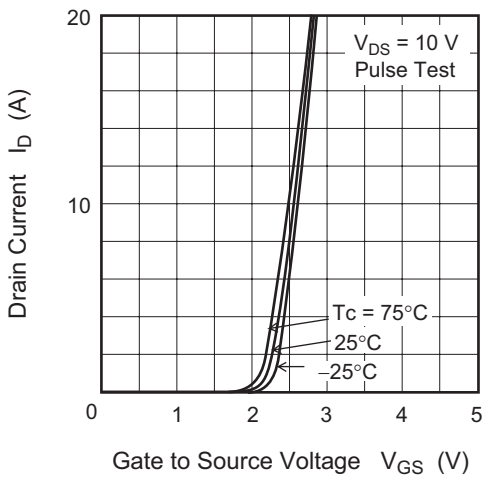
Maximum Safe Operation Area



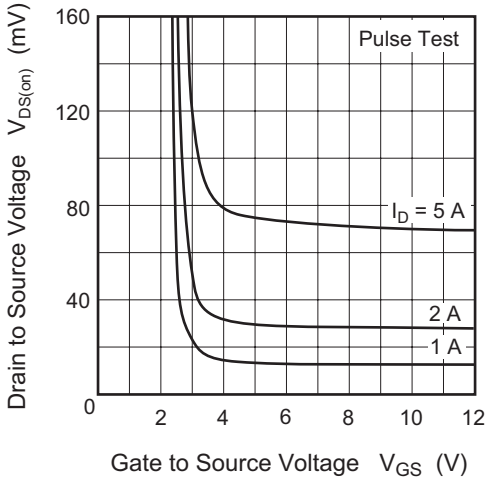
Typical Output Characteristics



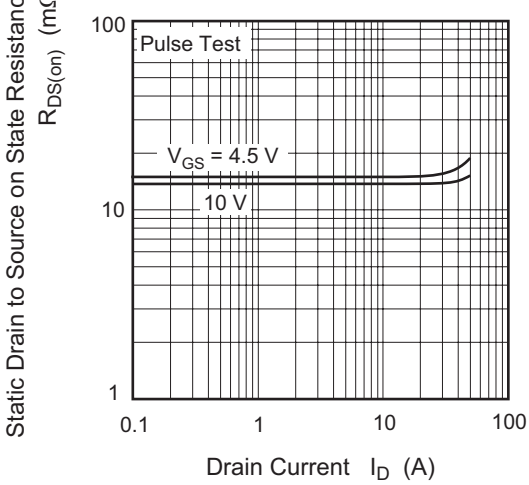
Typical Transfer Characteristics



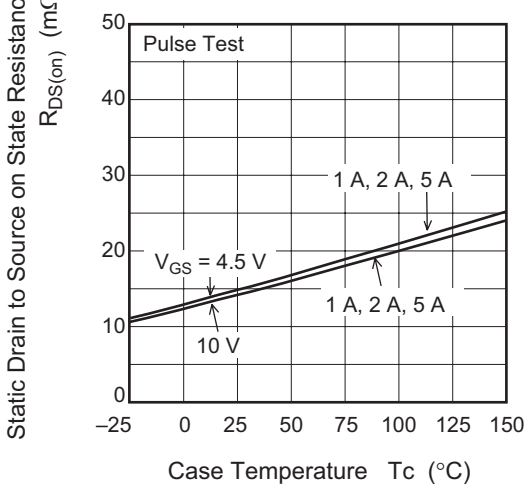
Drain to Source Saturation Voltage vs Gate to Source Voltage



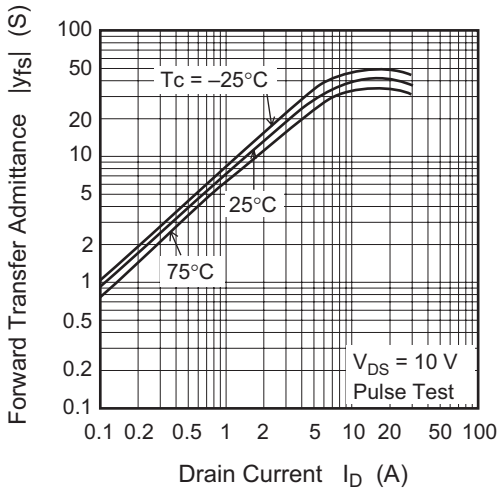
Static Drain to Source on State Resistance vs. Drain Current



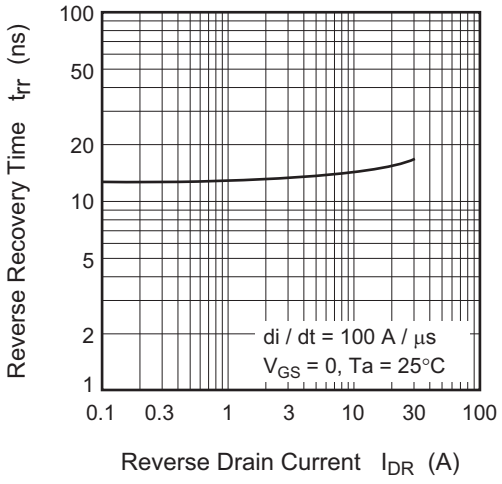
Static Drain to Source on State Resistance vs. Temperature



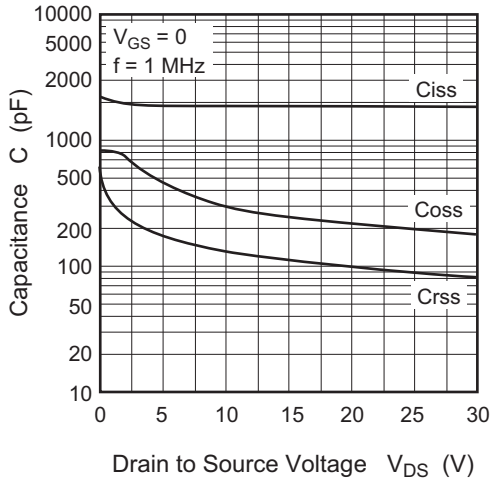
Forward Transfer Admittance vs. Drain Current



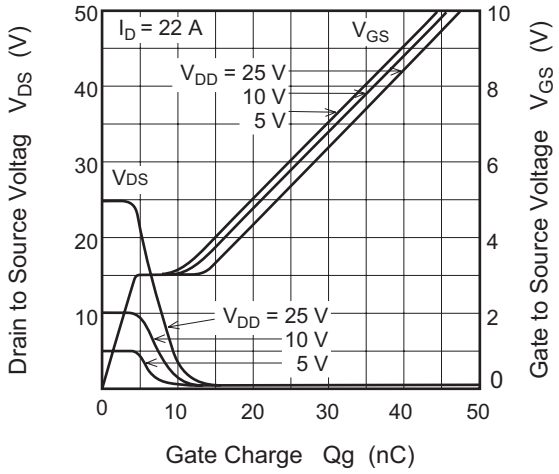
Body-Drain Diode Reverse Recovery Time



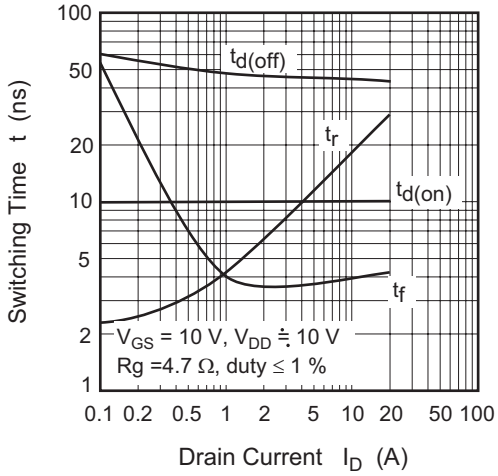
Typical Capacitance vs. Drain to Source Voltage



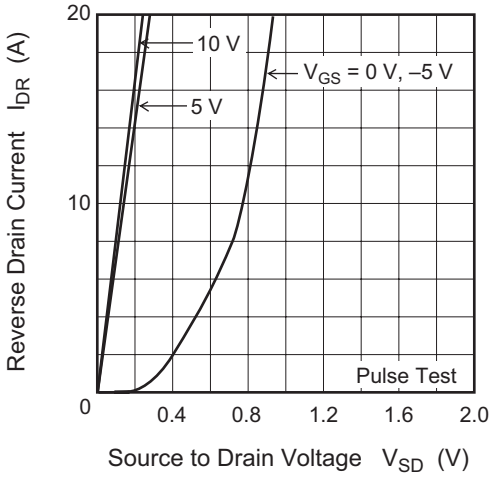
Dynamic Input Characteristics



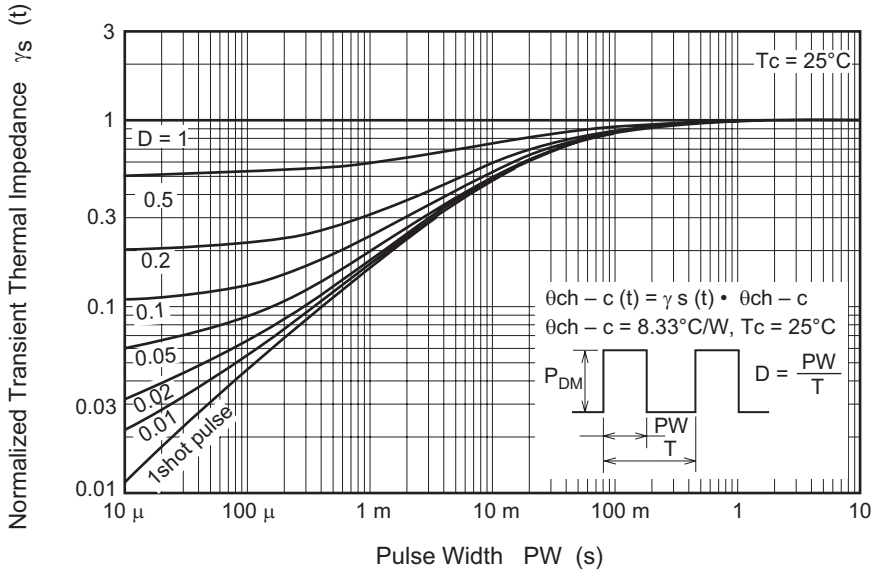
Switching Characteristics



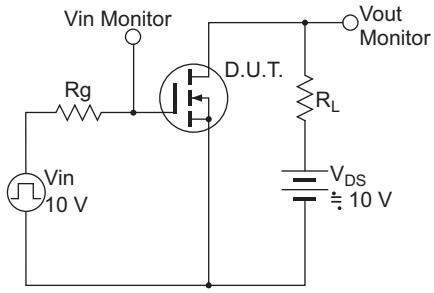
Reverse Drain Current vs.
Source to Drain Voltage



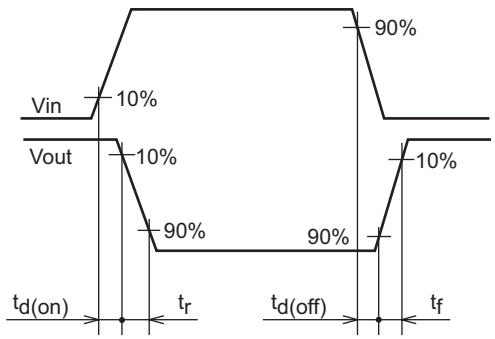
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



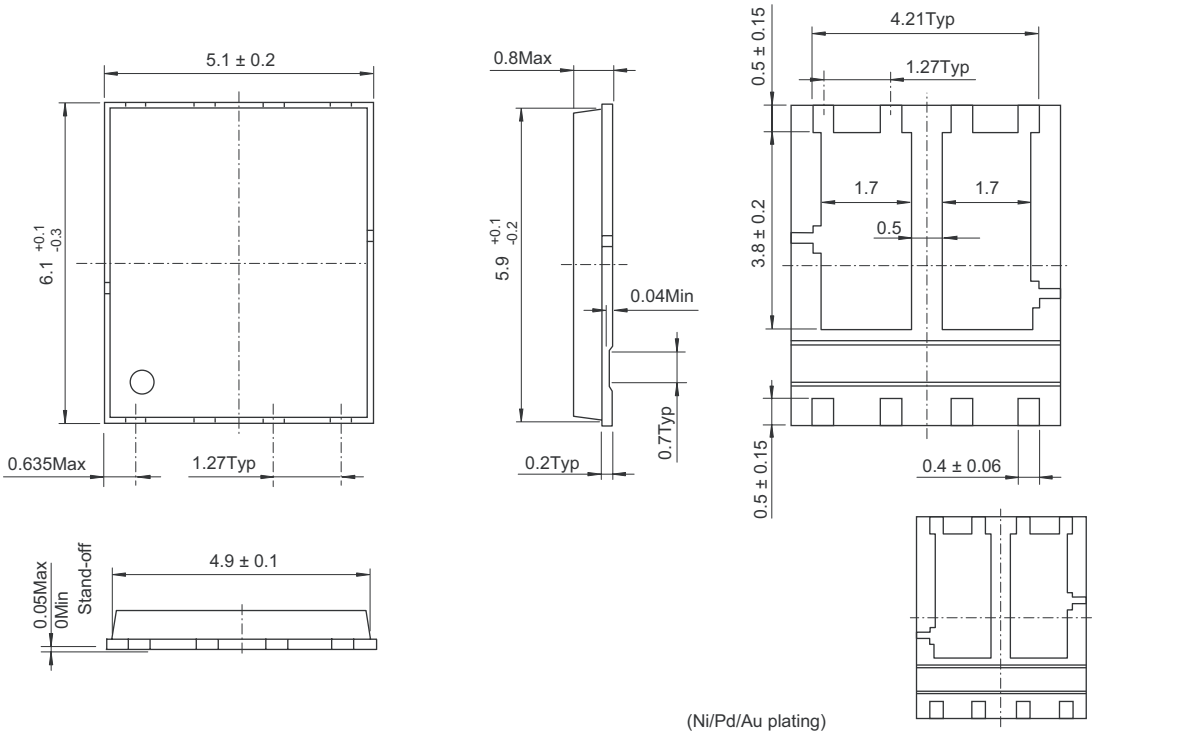
Switching Time Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
WPAK-D	—	PWSN0008DB-A	WPAK-DV	0.07

Unit: mm



Notice: The reverse pattern of die-pad support lead described above exists.

Ordering Information

Part Name	Quantity	Shipping Container
HAT2285WP-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.

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

RENESAS SALES OFFICES

http://www.renesas.com

Refer to "**http://www.renesas.com/en/network**" for the latest and detailed information.

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Tel: <603> 7955-9390, Fax: <603> 7955-9510

Colophon .6.0