RJK0358DSP

Silicon N Channel Power MOS FET
Power Switching

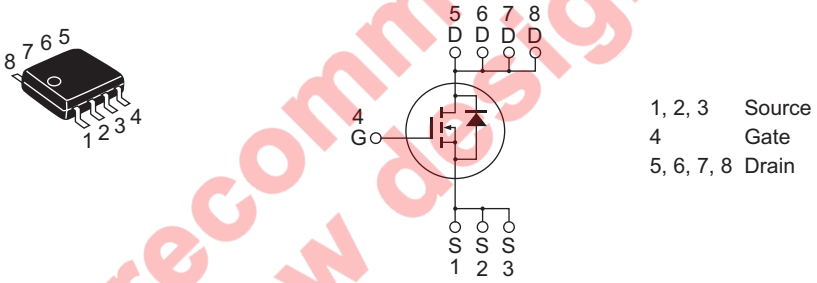
REJ03G1652-0501
Rev.5.01
Apr 24, 2008

Features

- Capable of 5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
  $R_{DS(on)}$ = 3.2 mΩ typ. (at V_{GS} = 10 V)
- Pb-free

Outline

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



Not recommend for new design

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	20	A
Drain peak current	$I_{D(pulse)}$ Note1	160	A
Body-drain diode reverse drain current	I_{DR}	20	A
Avalanche current	I_{AP} Note 2	19	A
Avalanche energy	E_{AR} Note 2	36.1	mJ
Channel dissipation	Pch Note3	2.5	W
Channel to ambient thermal impedance	θch-a Note3	50	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. Value at Tch = 25°C, Rg ≥ 50 Ω
3. When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW ≤ 10s

Electrical Characteristics

(Ta = 25°C)

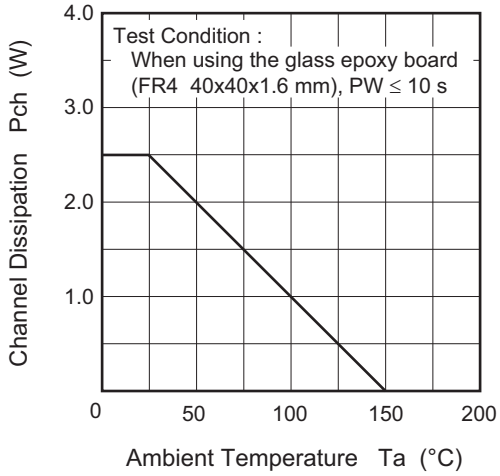
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	± 0.1	µA	V_{GS} = ±20 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 30 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	3.2	4.2	mΩ	I_D = 10 A, V_{GS} = 10 V Note4
	$R_{DS(on)}$	—	4.4	6.2	mΩ	I_D = 10 A, V_{GS} = 5 V Note4
Forward transfer admittance	$\|y_{fs}\|$	—	35	—	S	I_D = 10 A, V_{DS} = 10 V Note4
Input capacitance	Ciss	—	4300	—	pF	V_{DS} = 10 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	500	—	pF	
Reverse transfer capacitance	Crss	—	280	—	pF	
Total gate charge	Qg	—	33	—	nC	V_{DD} = 10 V V_{GS} = 5 V I_D = 20 A
Gate to source charge	Qgs	—	13	—	nC	
Gate to drain charge	Qgd	—	8	—	nC	
Turn-on delay time	$t_{d(on)}$	—	11	—	ns	V_{GS} = 10 V, I_D = 10 A V_{DD} ≅ 10 V R_L = 1.0 Ω Rg = 4.7 Ω
Rise time	t_r	—	5.6	—	ns	
Turn-off delay time	$t_{d(off)}$	—	76	—	ns	
Fall time	t_f	—	10	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.80	1.04	V	I_F = 20 A, V_{GS} = 0 Note4
Body–drain diode reverse recovery time	t_{rr}	—	25	—	ns	I_F = 20 A, V_{GS} = 0 di_F/dt = 100 A/µs

Notes: 4. Pulse test

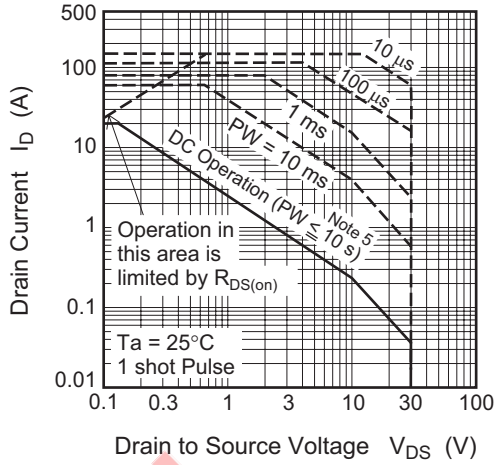
Not recommend for new design

Main Characteristics

Power vs. Temperature Derating

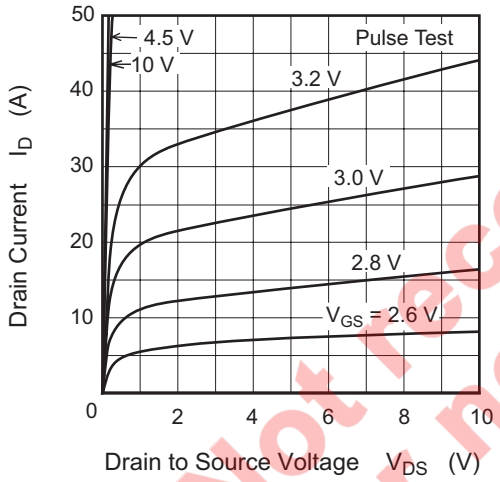


Maximum Safe Operation Area

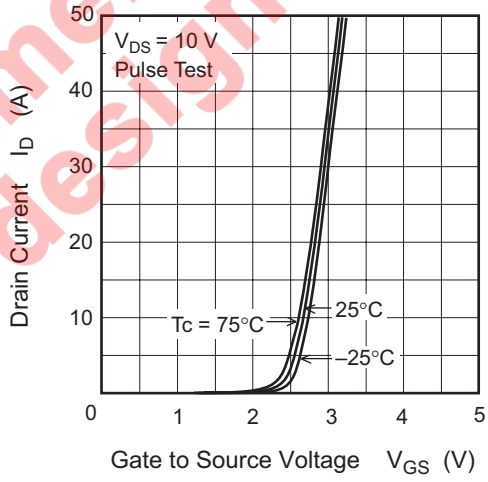


Note 5 : When using the glass epoxy board (FR4 40x40x1.6 mm)

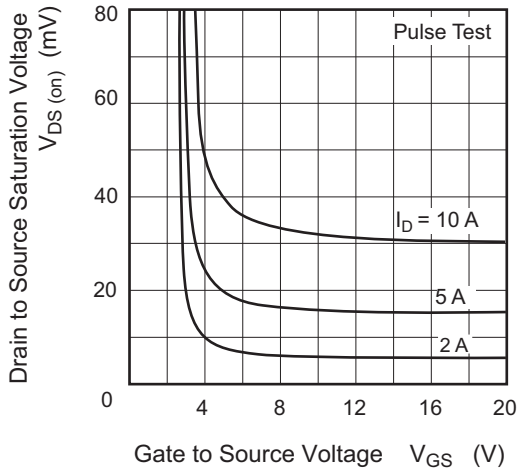
Typical Output Characteristics



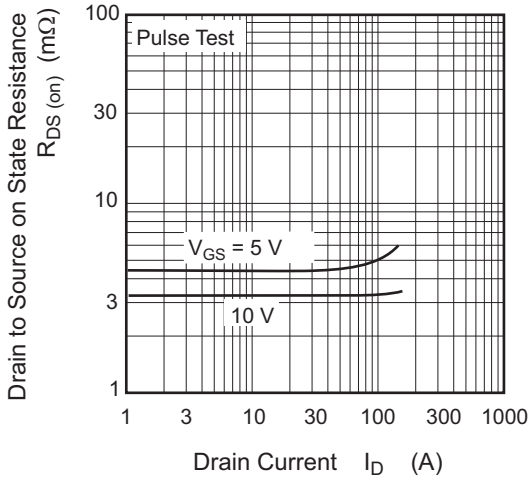
Typical Transfer Characteristics



Drain to Source Saturation Voltage vs. Gate to Source Voltage



Static Drain to Source on State Resistance vs. Drain Current



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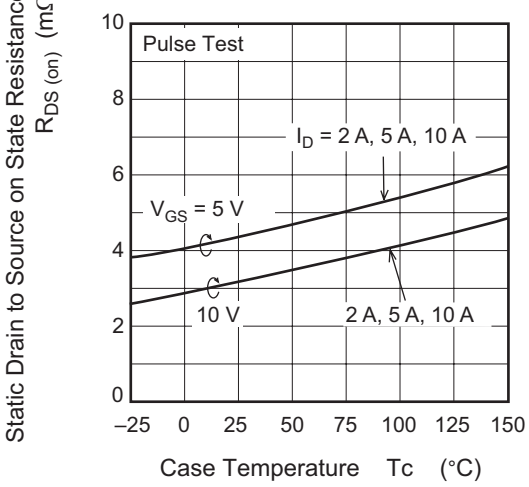
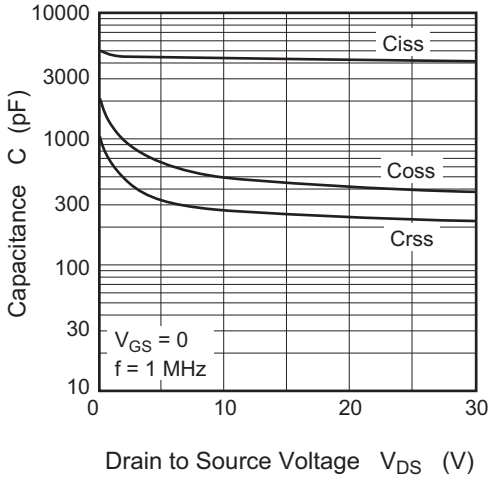
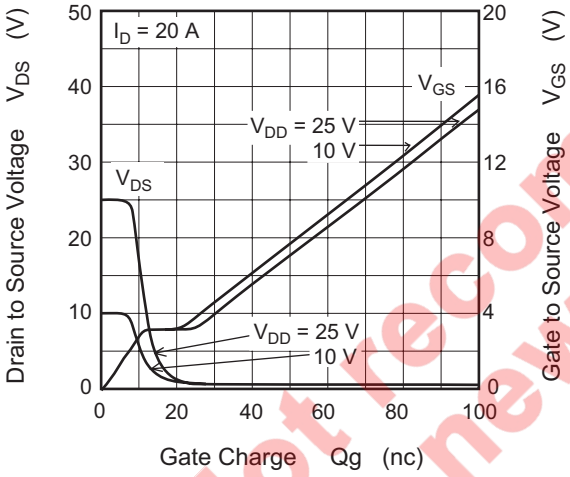
Static Drain to Source on State Resistance vs. Temperature



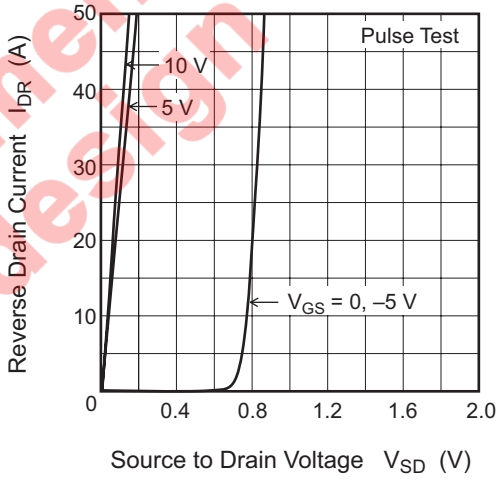
Typical Capacitance vs. Drain to Source Voltage



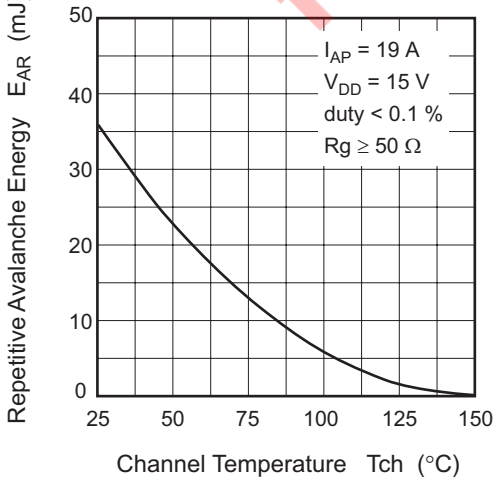
Dynamic Input Characteristics



Reverse Drain Current vs. Source to Drain Voltage



Maximum Avalanche Energy vs. Channel Temperature Derating



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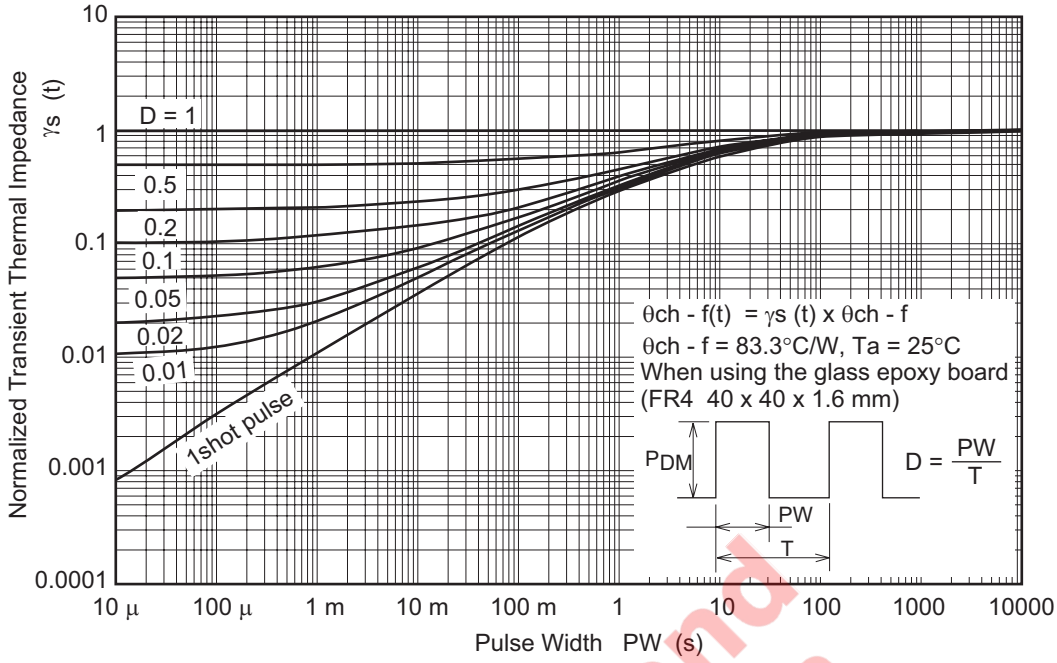
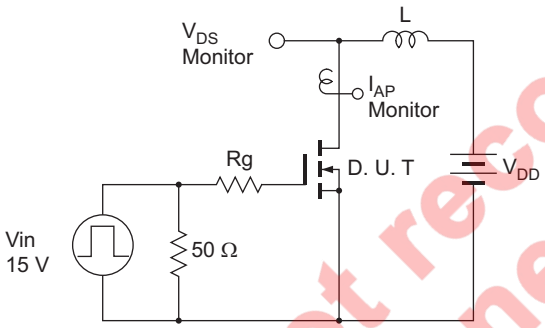
Normalized Transient Thermal Impedance vs. Pulse Width

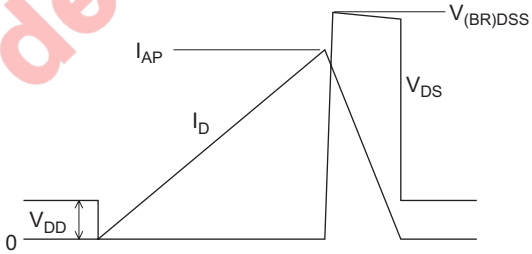


Avalanche Test Circuit

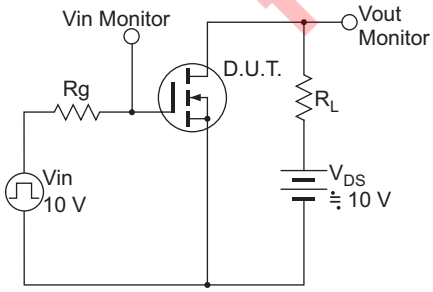


Avalanche Waveform

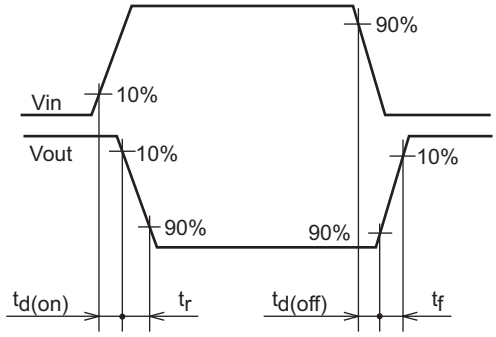
$$E_{AR} = \frac{1}{2} L \bullet I_{AP}^2 \bullet \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



Switching Time Test Circuit



Switching Time Waveform



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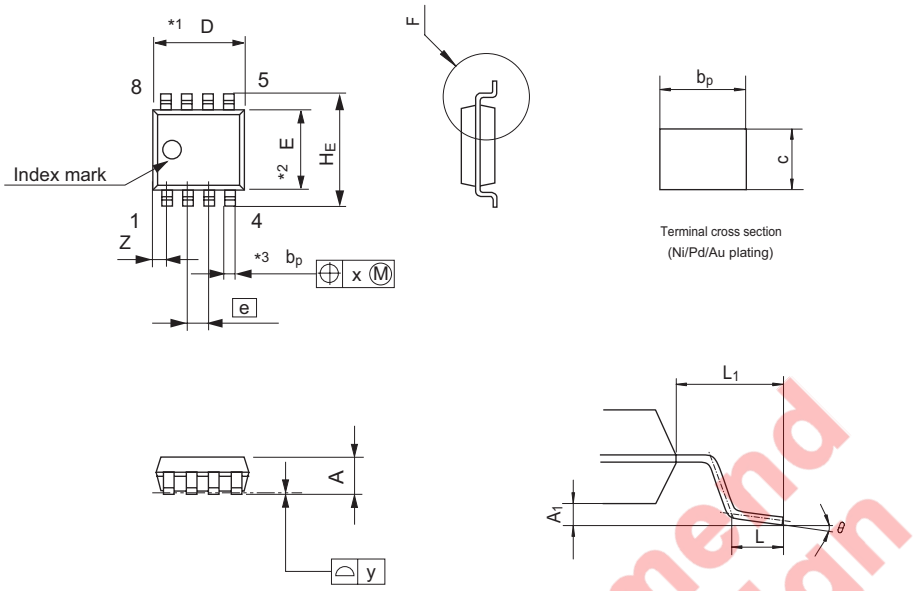
Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
SOP-8	P-SOP8-3.95 × 4.9-1.27	PRSP0008DD-D	FP-8DAV	0.085g



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

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	4.90	5.3
E	—	3.95	—
A_2	—	—	—
A_1	0.10	0.14	0.25
A	—	—	1.75
b_p	0.34	0.40	0.46
b_1	—	—	—
c	0.15	0.20	0.25
c_1	—	—	—
θ	0°	—	8°
H_E	5.80	6.10	6.20
e	—	1.27	—
x	—	—	0.25
y	—	—	0.1
Z	—	—	0.75
L	0.40	0.60	1.27
L_1	—	1.08	—

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Ordering Information

Part No.	Quantity	Shipping Container
RJK0358DSP-00-J0	2500 pcs	Taping

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Renesas Technology Hong Kong Ltd.
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Renesas Technology Malaysia Sdn. Bhd
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
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Colophon .7.2

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

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