

To our customers,

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# RJJ1011DPD

## P Channel Power MOS FET High Speed Switching

REJ03G1623-0300

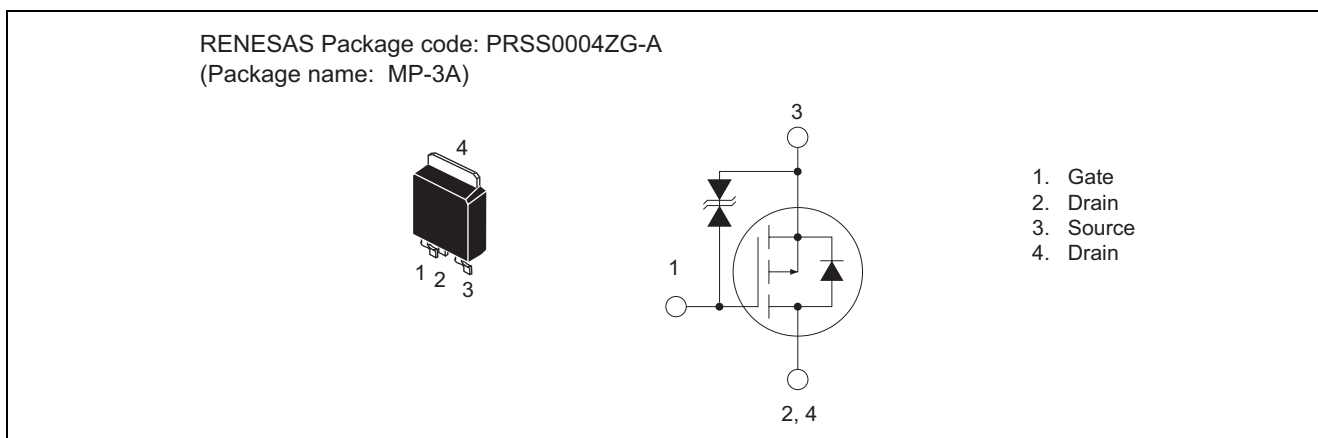
Rev.3.00

Dec 19, 2008

### Features

- $V_{DSS}$  : -100 V
- $R_{DS(on)}$  : 0.30  $\Omega$  (Max)
- $I_D$  : -6 A
- Surface mount package (MP-3A)

### Outline



### Application

- Motor control, Solenoid control, DC-DC converter, etc.

### Absolute Maximum Ratings

( $T_c = 25^\circ\text{C}$ )

Item	Symbol	Ratings	Unit	Conditions
Drain to source voltage	$V_{DSS}$	-100	V	$V_{GS} = 0\text{ V}$
Gate to source voltage	$V_{GSS}$	$\pm 20$	V	$V_{DS} = 0\text{ V}$
Drain current (DC)	$I_D$	-6	A	
Drain current (Pulsed)*1	$I_{D(pulse)}$	-12	A	
Avalanche current	$I_{AP}$	-6	A	$L = 100\ \mu\text{H}$
Channel dissipation	$P_{ch}$	30	W	
Channel to case thermal impedance	$\theta_{ch-c}$	4.17	$^\circ\text{C/W}$	
Channel temperature	$T_{ch}$	-55 to +150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

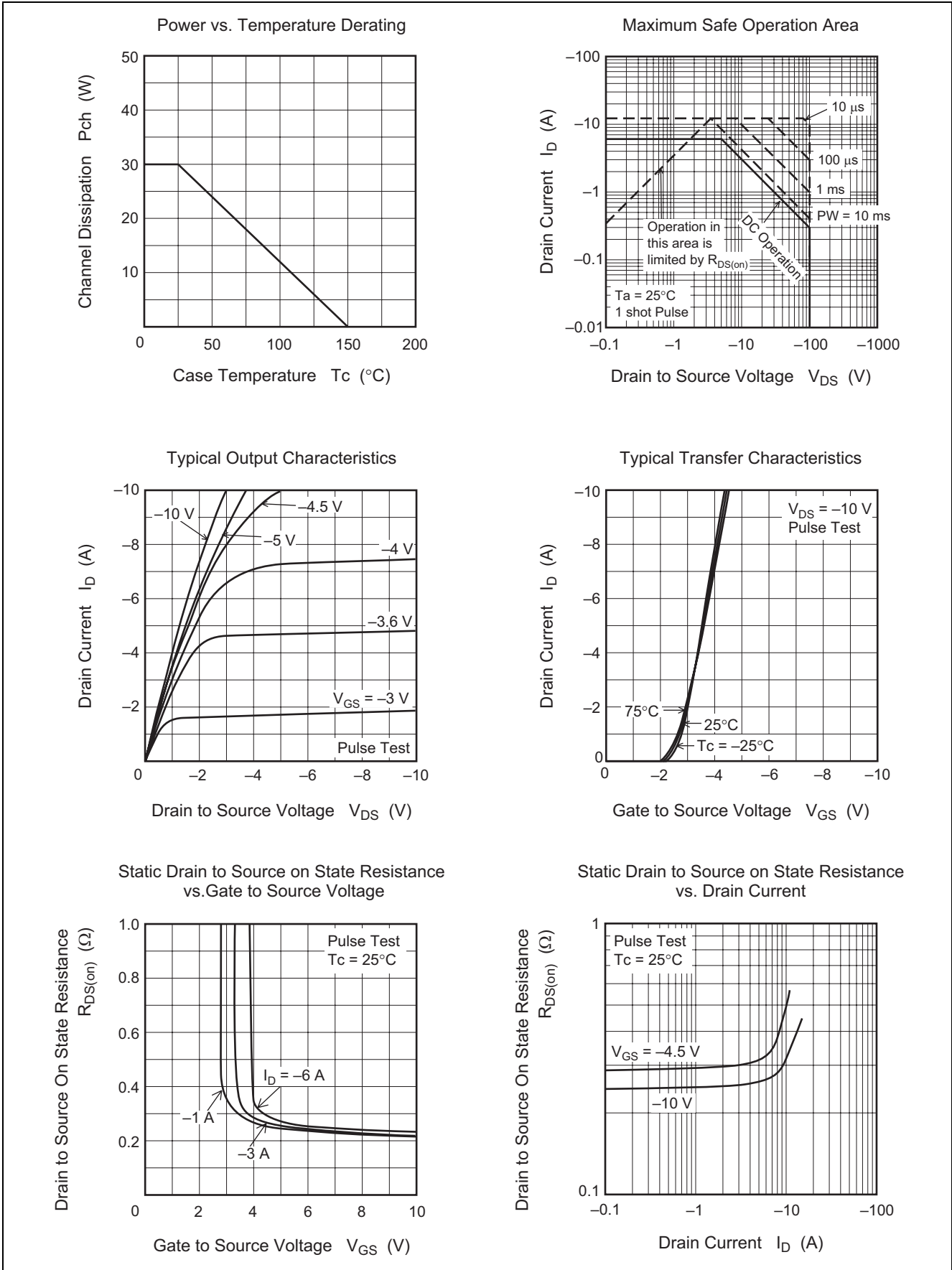
Note: 1. Pulse width limited by safe operating area.

## Electrical Characteristics

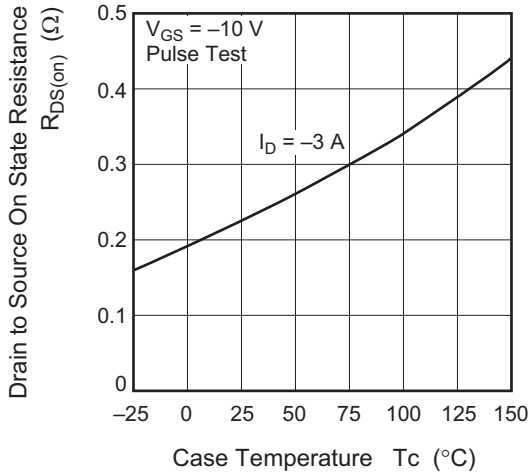
(Tc = 25°C)

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-100	—	—	V	$I_D = -1 \text{ mA}$ , $V_{GS} = 0 \text{ V}$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0 \text{ V}$
Drain to source leakage current	$I_{DSS}$	—	—	-1	mA	$V_{DS} = -100 \text{ V}$ , $V_{GS} = 0 \text{ V}$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0 \text{ V}$
Gate-source cutoff voltage	$V_{GS(off)}$	-1.0	-1.9	-2.5	V	$I_D = -1 \text{ mA}$ , $V_{DS} = -10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.26	0.30	$\Omega$	$I_D = -3 \text{ A}$ , $V_{GS} = -10 \text{ V}$
		—	0.30	0.50	$\Omega$	$I_D = -3 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$
Input capacitance	$C_{iss}$	—	930	—	pF	$V_{DS} = -10 \text{ V}$ $V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	80	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	50	—	pF	
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$V_{DD} = -50 \text{ V}$
Rise time	$t_r$	—	15	—	ns	$I_D = -3 \text{ A}$
Turn-off delay time	$t_{d(off)}$	—	65	—	ns	$V_{GS} = -10 \text{ V}$
Fall time	$t_f$	—	35	—	ns	$R_G = 25 \text{ }\Omega$
Source-drain voltage	$V_{SD}$	—	-0.85	-1.2	V	$I_S = -3 \text{ A}$ , $V_{GS} = 0 \text{ V}$

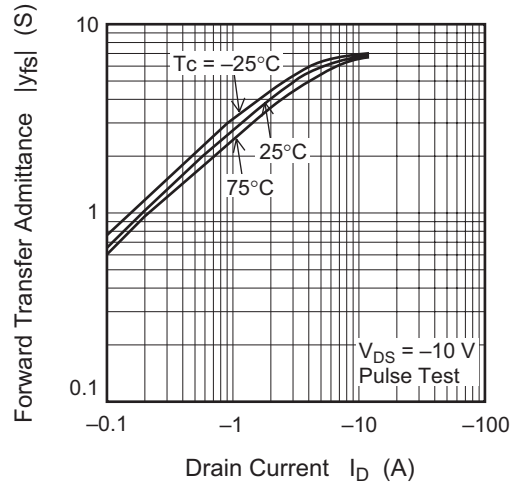
## Main Characteristics



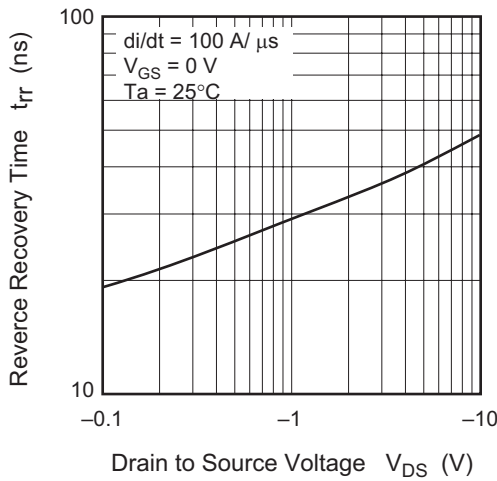
Drain to Source on State Resistance vs. Temperature



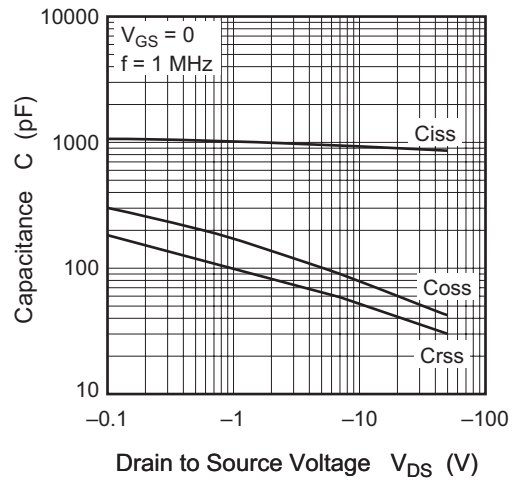
Forward Transfer Admittance vs. Drain Current



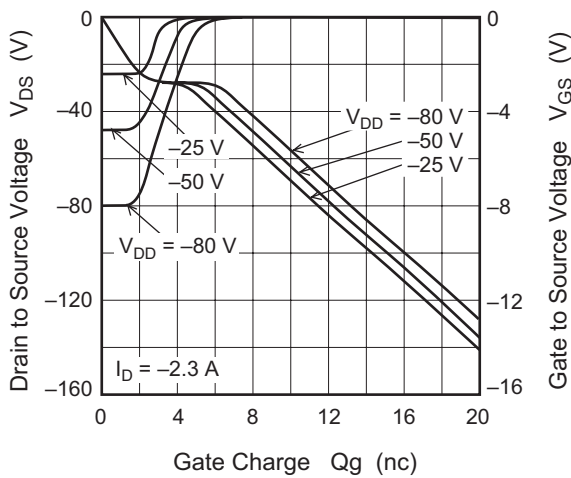
Body-Drain Diode Reverse Recovery Time



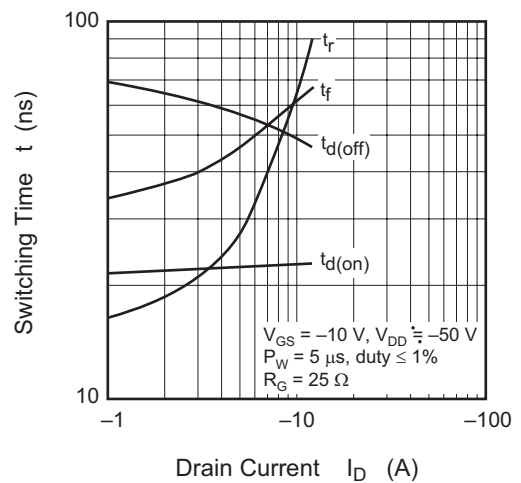
Typical Capacitance vs. Drain to Source Voltage



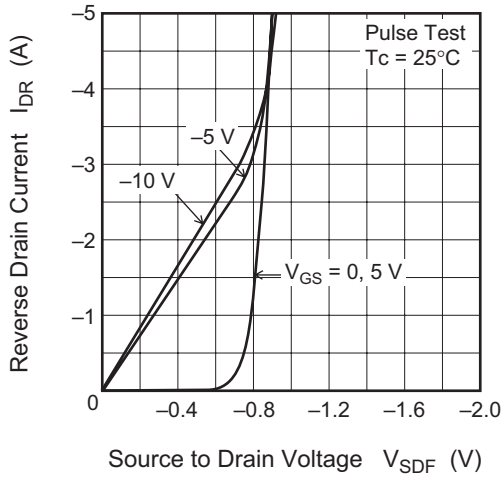
Dynamic Input Characteristics



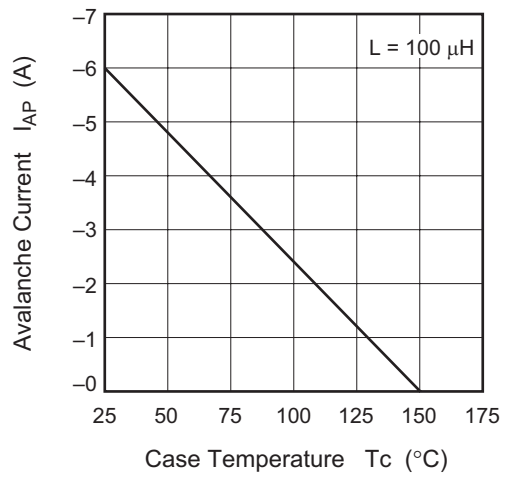
Switching Characteristics



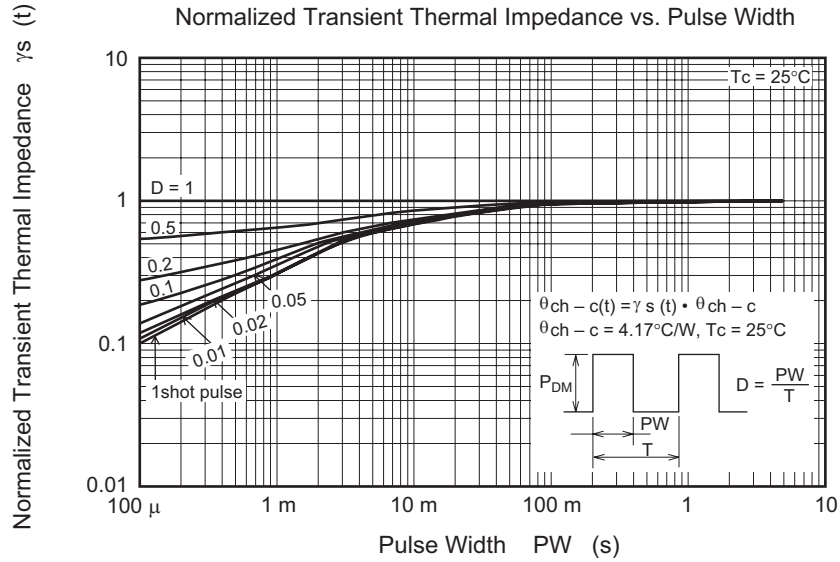
Reverse Drain Current vs. Source to Drain Voltage



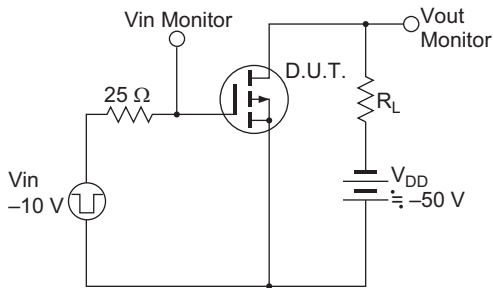
Avalanche Current vs. Case Temperature



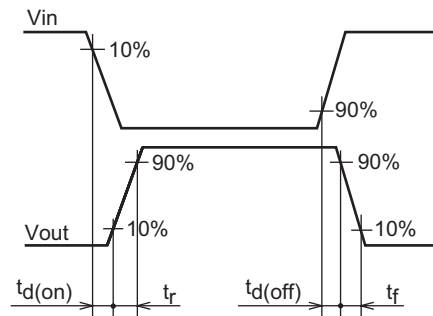
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Switching Time Waveform



## Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
MP-3A	SC-63	PRSS0004ZG-A	—	0.32g	

The technical drawing illustrates the dimensions of the RJJ1011DPD package in millimeters. It includes three views: a top view, a side view, and a bottom view.

- Top View:** Shows a square package with a width of 6.6 mm and a height of 6.1 ± 0.2 mm. The distance between the two leads is 5.3 ± 0.2 mm. The lead width is 0.76 ± 0.2 mm, and the lead pitch is 2.3 ± 0.2 mm. The lead length is 2.5 mm (Min).
- Side View:** Shows the package height of 10.4 mm (Max) and a lead height of 1 ± 0.2 mm. The lead thickness is 0.5 ± 0.2 mm. The distance from the lead tip to the package body is 0.1 ± 0.1 mm. The lead length is 1.4 ± 0.2 mm, and the lead width is 0.5 ± 0.2 mm.
- Bottom View:** Shows the package width of 2.3 mm and a lead width of 1 mm.

## Ordering Information

Part No.	Quantity	Shipping Container
RJJ1011DPD-00-J2	3000 pcs	Taping



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