

# RJK1536DPN

N-Channel Power MOSFET  
High-Speed Switching Use

REJ03G1594-0300

Rev.3.00

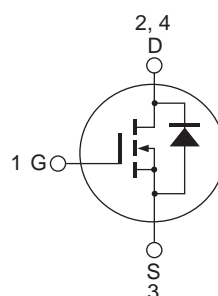
Jun 30, 2010

## Features

- $V_{DS}$  : 150 V
- $R_{DS(on)}$  : 30 m $\Omega$  (Max)
- $I_D$  : 50 A

## Outline

RENESAS Package code: PRSS0004AC-A  
(Package name: TO-220AB)



1. Gate
2. Drain
3. Source
4. Drain

## Application

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

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DS}$	150	V
Gate to source voltage	$V_{GS}$	$\pm 20$	V
Drain current	$I_D$	50	A
Drain peak current	$I_{D(pulse)}$	100	A
Body-drain diode reverse drain current	$I_{DR}$	50	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$	100	A
Avalanche current	$I_{AP}$ <sup>Note2</sup>	25	A
Channel dissipation	$P_{ch}$ <sup>Note1</sup>	125	W
Channel to case thermal impedance	$\theta_{ch-c}$	1.0	°C/W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Notes: 1. Value at  $T_c = 25^\circ\text{C}$

2.  $ST_{ch} = 25^\circ\text{C}$ ,  $T_{ch} \leq 150^\circ\text{C}$ ,  $L = 100 \mu\text{H}$

## Electrical Characteristics

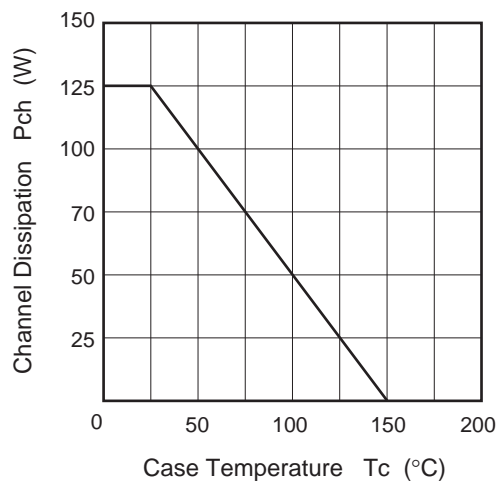
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	$I_D = 1 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	100	$\mu\text{A}$	$V_{DS} = 150 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	3.0	4.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$ <sup>Note3</sup>
Static drain to source on state voltage	$V_{DS(on)}$	—	0.60	0.75	V	$I_D = 25 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note3</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	24	30	$\text{m}\Omega$	$I_D = 25 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	5000	—	pF	$V_{DS} = 10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	560	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	165	—	pF	
Turn-on delay time	$t_{d(on)}$	—	50	—	ns	$V_{DD} = 80 \text{ V}$ $I_D = 25 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_G = 25 \Omega$
Rise time	$t_r$	—	75	—	ns	
Turn-off delay time	$t_{d(off)}$	—	250	—	ns	
Fall time	$t_f$	—	100	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.5	V	$I_F = 25 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	130	—	ns	$I_F = 50 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

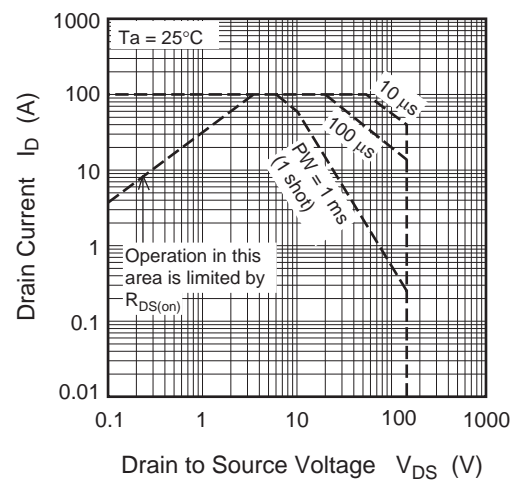
Notes: 3. Pulse test

## Main Characteristics

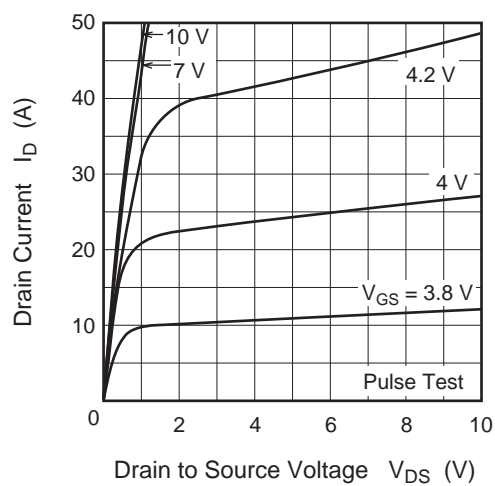
Power vs. Temperature Derating



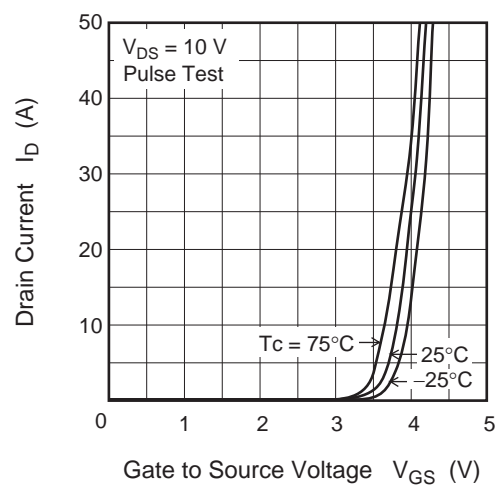
Maximum Safe Operation Area



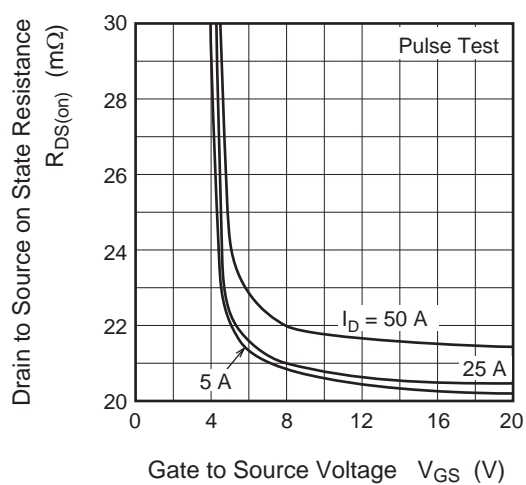
Typical Output Characteristics



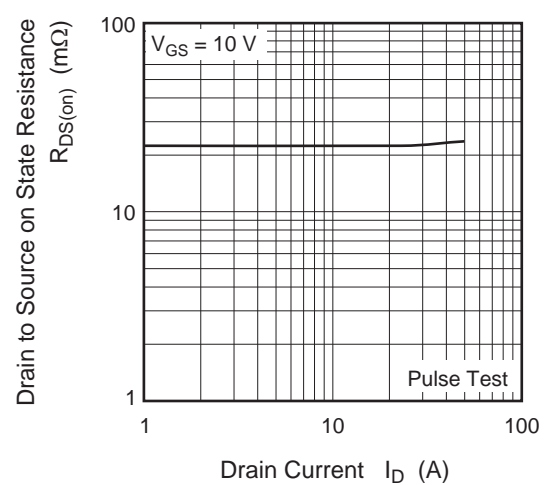
Typical Transfer Characteristics

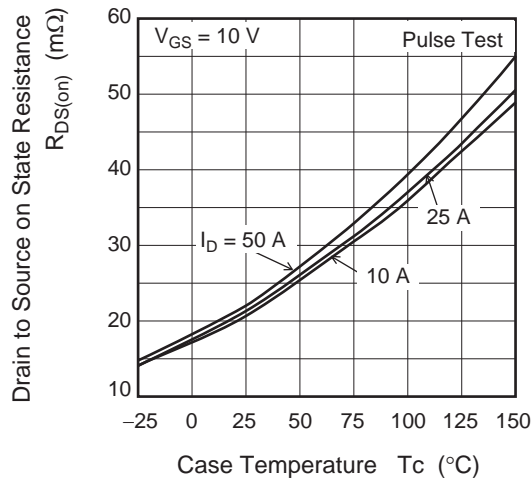
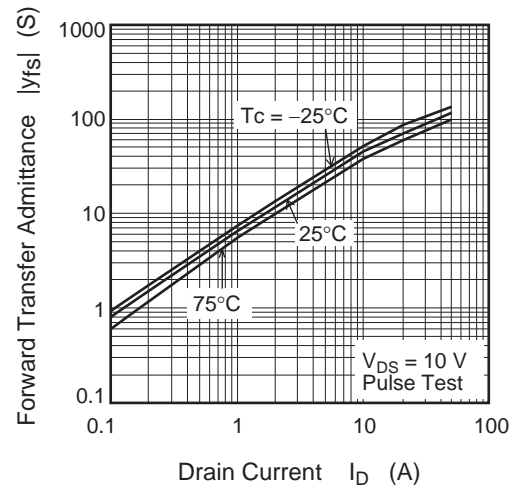
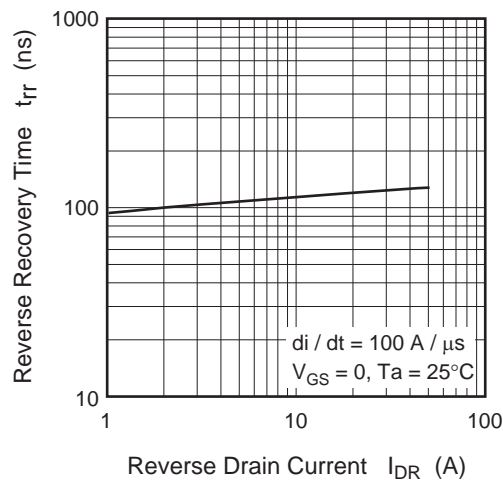
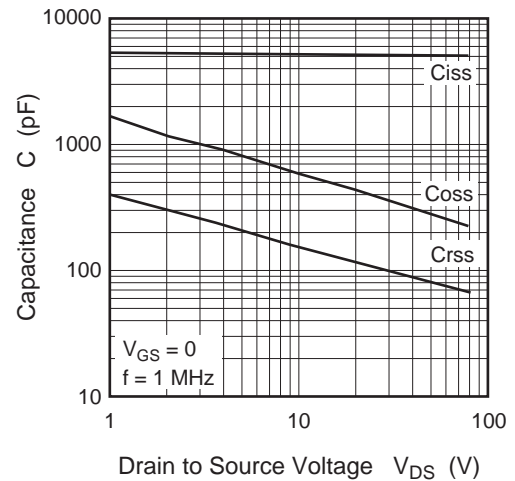


Drain to Source on State Resistance vs. Gate to Source Voltage

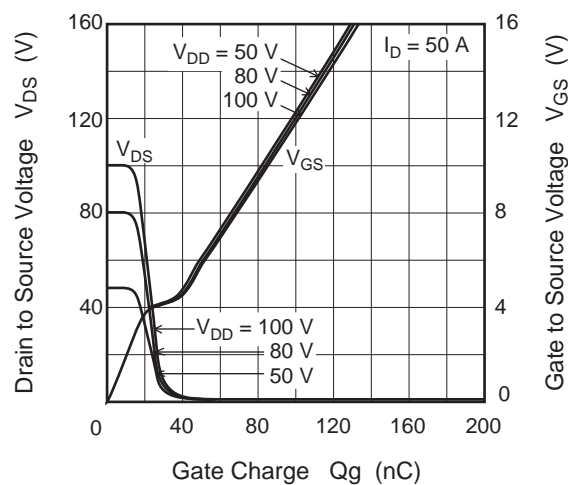


Drain to Source on State Resistance vs. Drain Current

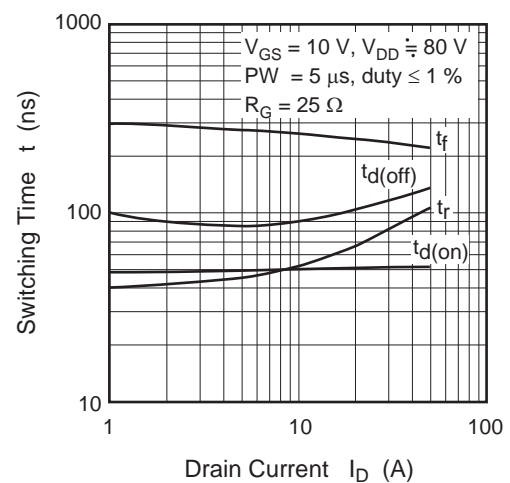


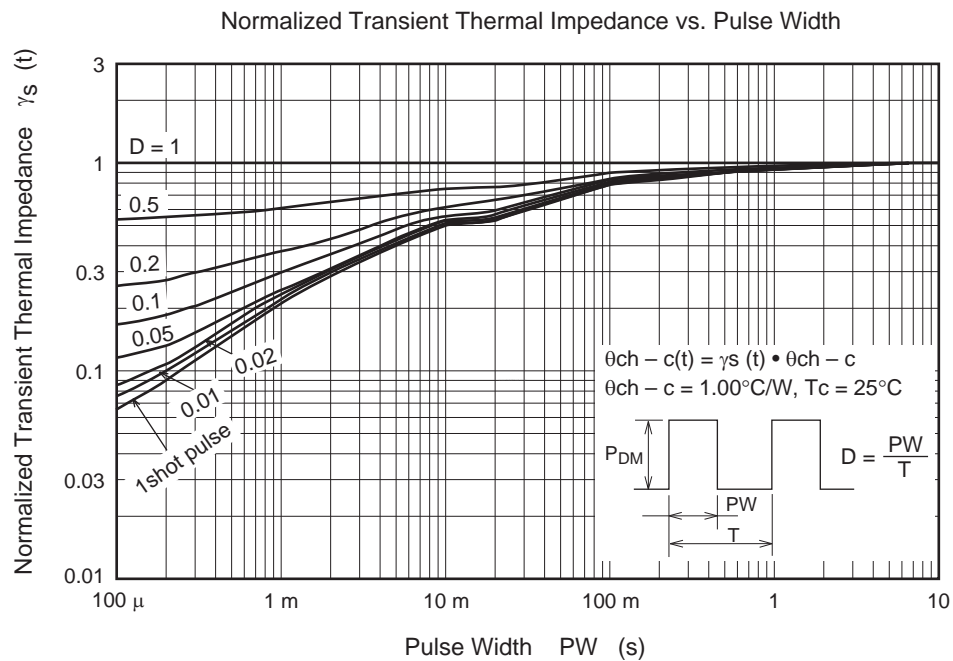
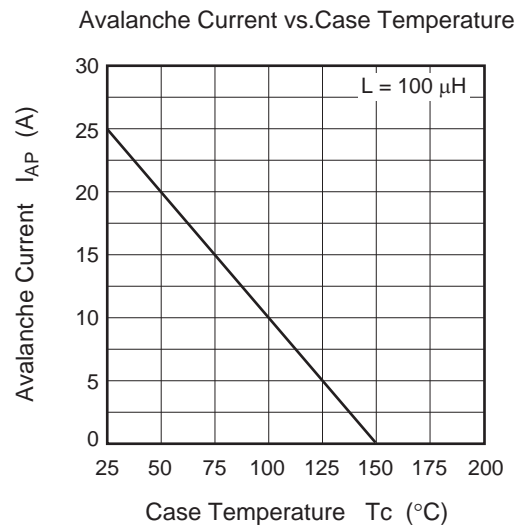
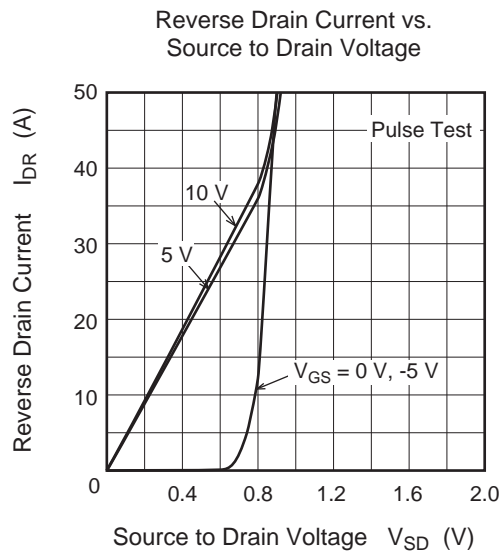
Drain to Source on State Resistance  
vs. TemperatureForward Transfer Admittance vs.  
Drain CurrentBody-Drain Diode Reverse  
Recovery TimeTypical Capacitance vs.  
Drain to Source Voltage

Dynamic Input Characteristics

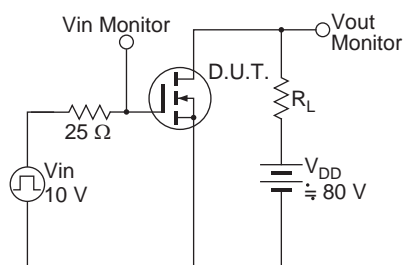


Switching Characteristics

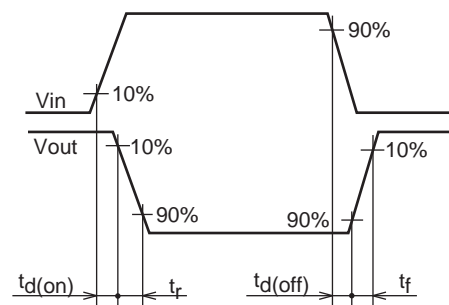




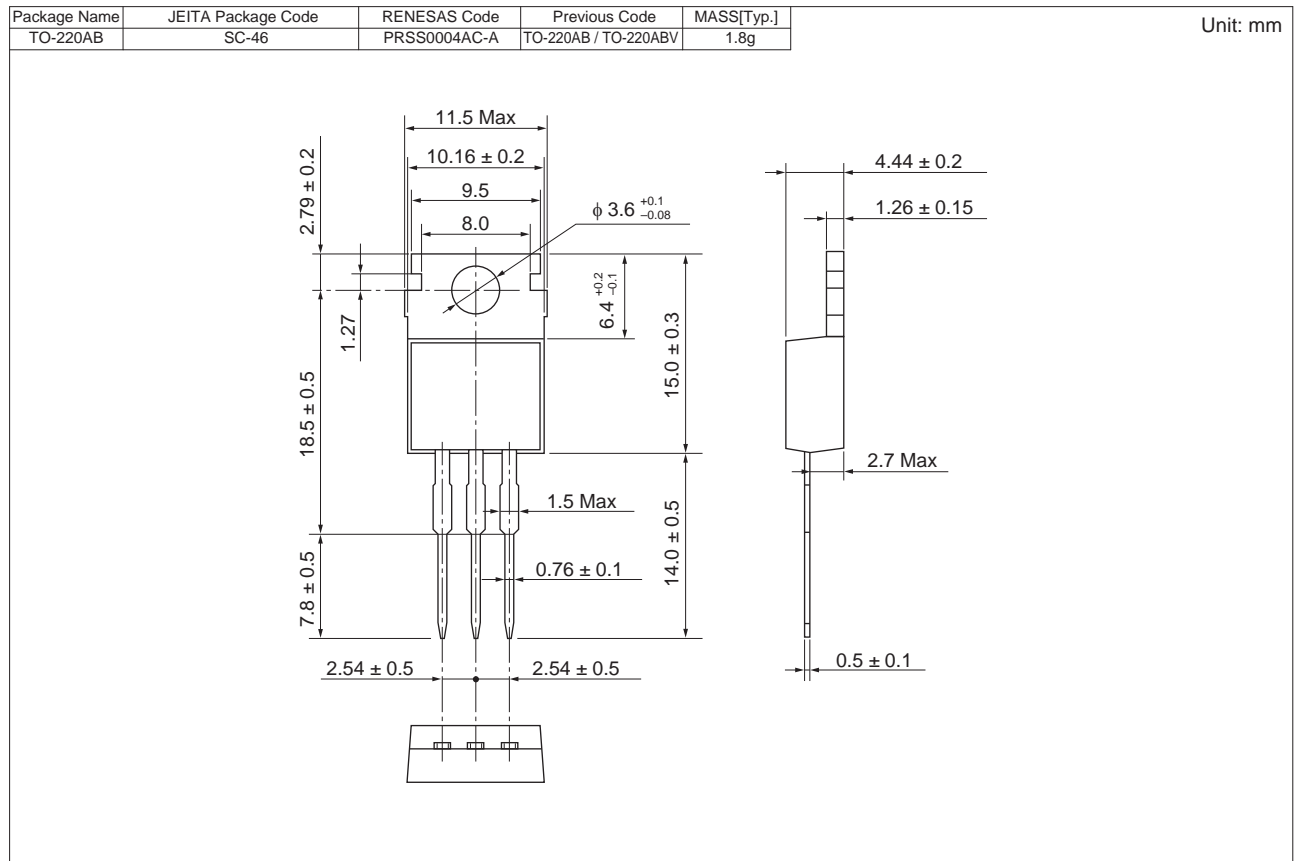
Switching Time Test Circuit



Waveform



## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
RJK1536DPN-00-02	500 pcs	Box (Sack)

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