

# RJJ0601JPN

Silicon P Channel MOS FET  
High Speed Power Switching

REJ03G1602-0100

Rev.1.00

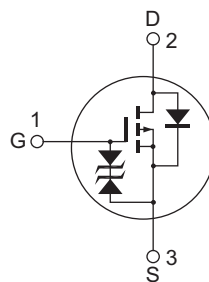
Nov 21, 2007

## Features

- Low on-resistance  
 $R_{DS(on)} = 8.2 \text{ m}\Omega$  typ.
- Capable of 4.5 V gate drive
- High speed switching

## Outline

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



1. Gate
2. Drain (Flange)
3. Source

## Absolute Maximum Ratings

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

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DSS}$	-60	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	-90	A
Drain peak current	$I_D$ (pulse) <sup>Note1</sup>	-360	A
Body-drain diode reverse drain current	$I_{DR}$	-90	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	-40	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	137	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	90	W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Notes: 1.  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$

2. Value at  $T_c = 25^\circ\text{C}$

3. Value at  $T_{ch} = 25^\circ\text{C}$ ,  $R_g \geq 50 \Omega$

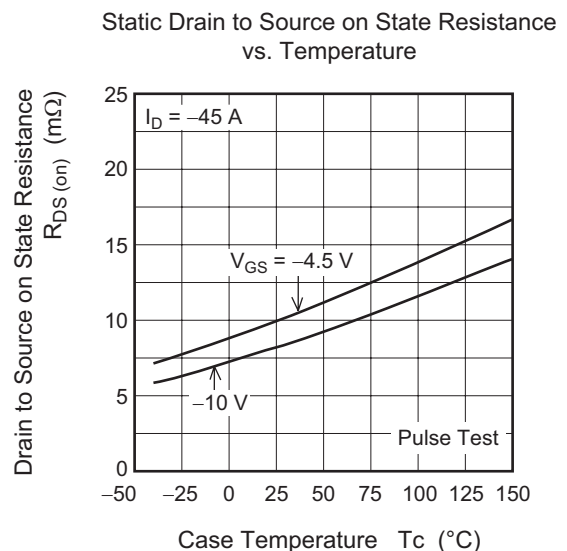
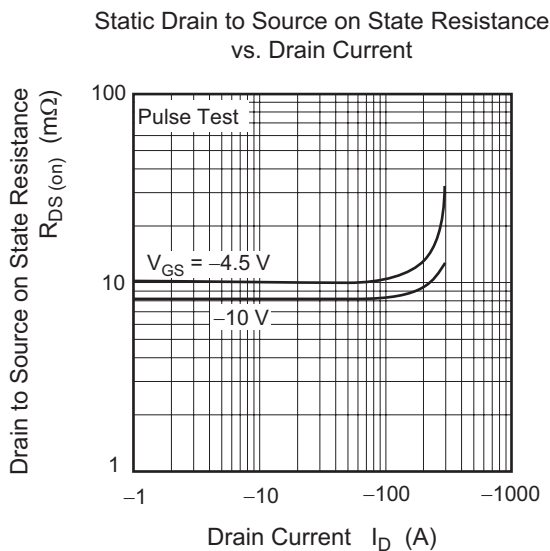
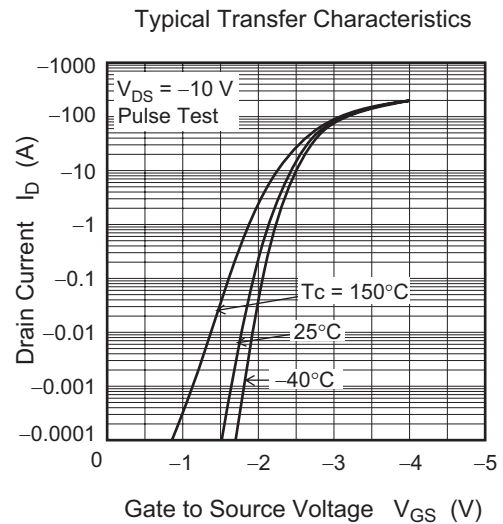
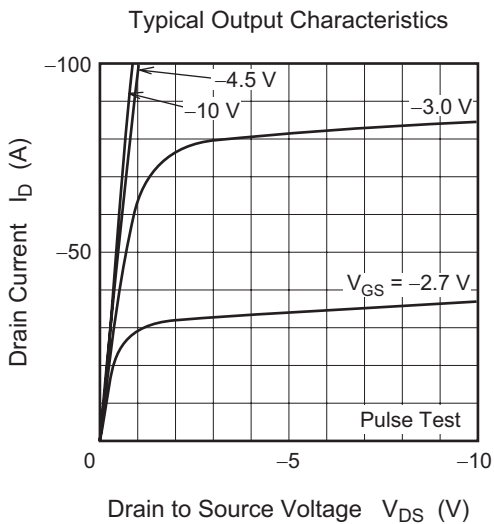
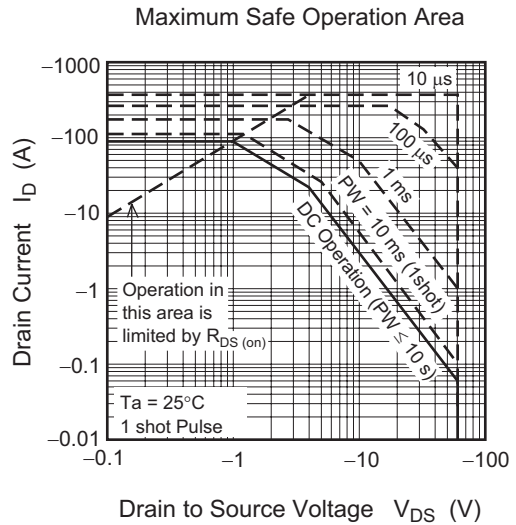
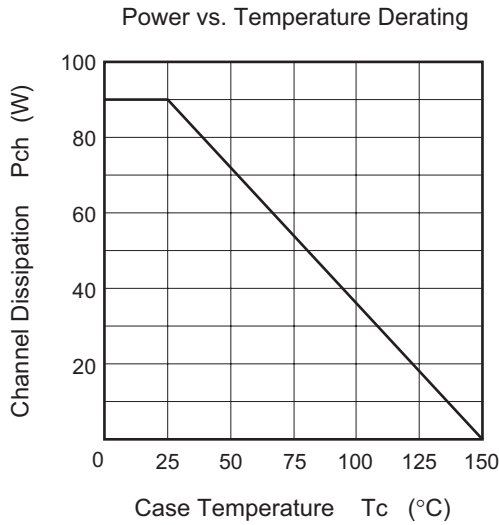
## Electrical Characteristics

(Ta = 25°C)

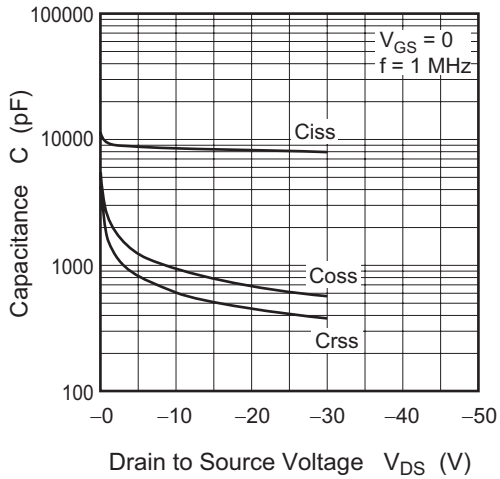
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-10	$\mu\text{A}$	$V_{DS} = -60 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.5	V	$V_{DS} = -10 \text{ V}$ , $I_D = -1 \text{ mA}$ <sup>Note4</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	8.2	10	$\text{m}\Omega$	$I_D = -45 \text{ A}$ , $V_{GS} = -10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	10	15	$\text{m}\Omega$	$I_D = -45 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	8800	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	950	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	600	—	pF	
Total gate charge	$Q_g$	—	150	—	nC	$V_{DD} = -25 \text{ V}$ , $V_{GS} = -10 \text{ V}$ , $I_D = -90 \text{ A}$
Gate to source charge	$Q_{gs}$	—	25	—	nC	
Gate to drain charge	$Q_{gd}$	—	23	—	nC	
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$V_{GS} = -10 \text{ V}$ , $I_D = -45 \text{ A}$ , $V_{DD} = -30 \text{ V}$ , $R_G = 4.7 \text{ }\Omega$
Rise time	$t_r$	—	30	—	ns	
Turn-off delay time	$t_{d(off)}$	—	290	—	ns	
Fall time	$t_f$	—	135	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	-0.96	—	V	$I_F = -90 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	45	—	ns	$I_F = -90 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 4. Pulse test

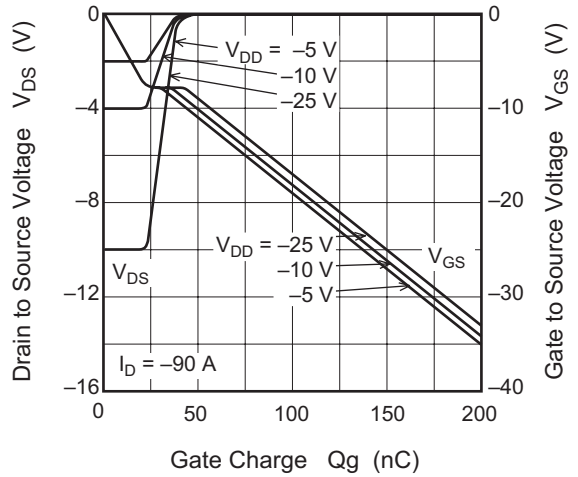
Main Characteristics



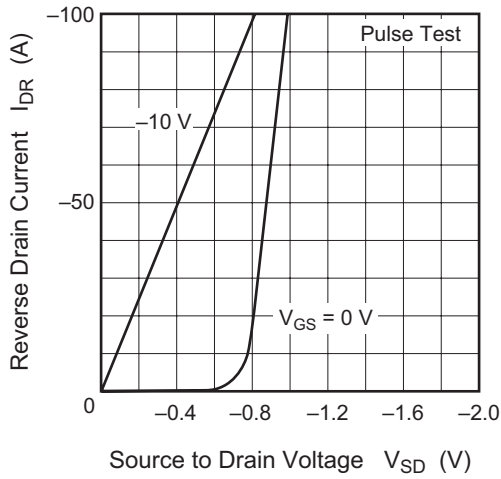
Typical Capacitance vs. Drain to Source Voltage



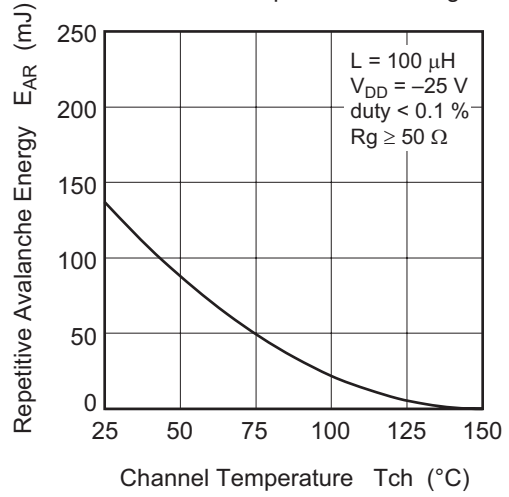
Dynamic Input Characteristics



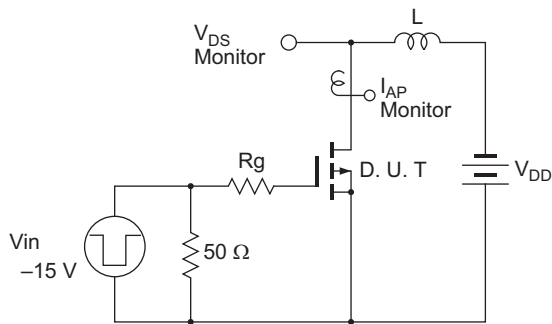
Reverse Drain Current vs. Source to Drain Voltage



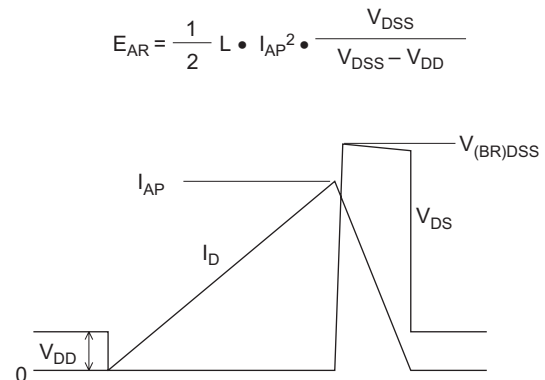
Maximum Avalanche Energy vs. Channel Temperature Derating

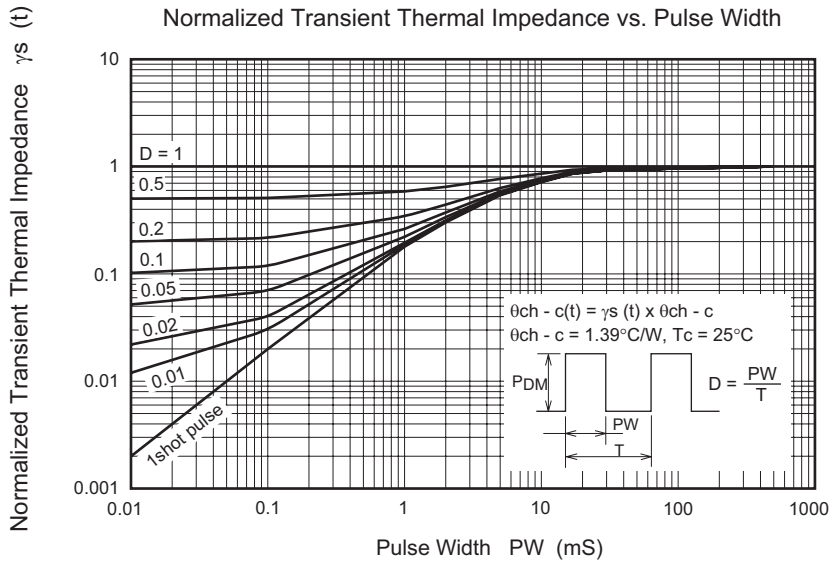


Avalanche Test Circuit

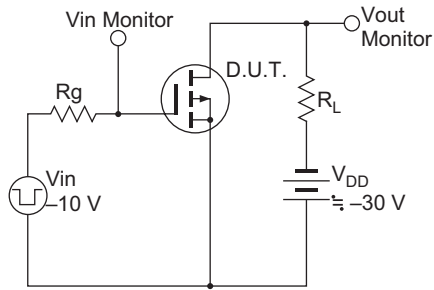


Avalanche Waveform

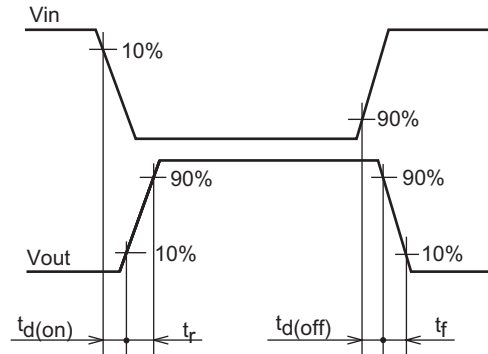




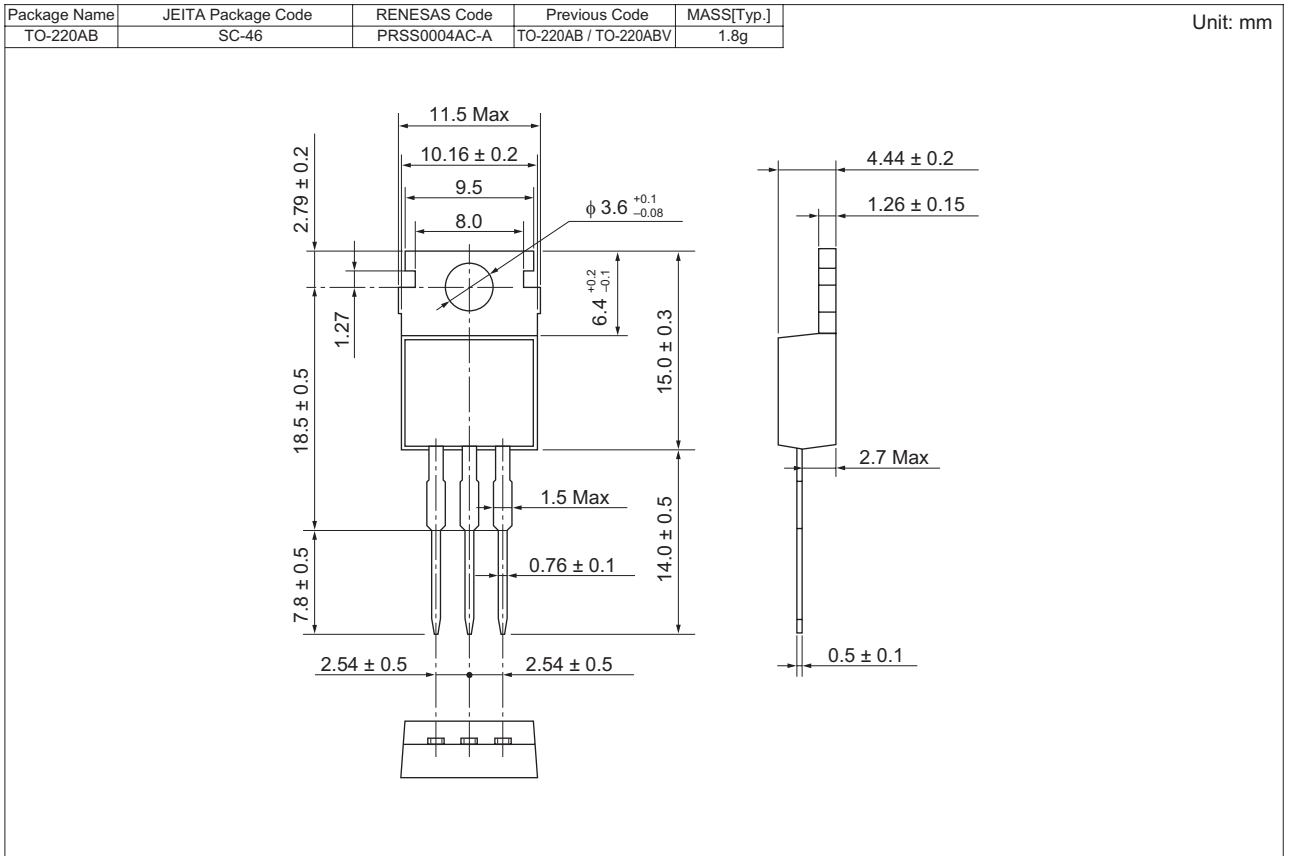
Switching Time Test Circuit



Switching Time Waveform



### Package Dimensions



### Ordering Information

Part No.	Quantity	Shipping Container
RJJ0601JPN-00-02	500 pcs	Box (Sack)

Notes:

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