

## 2SJ221

### Silicon P Channel MOS FET

REJ03G0851-0200  
(Previous: ADE-208-1185)  
Rev.2.00  
Sep 07, 2005

#### Description

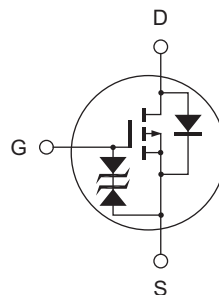
High speed power switching

#### Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device
  - Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

#### Outline

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



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

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V <sub>DSS</sub>	-100	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	-20	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note 1</sup>	-80	A
Body to drain diode reverse drain current	I <sub>DR</sub>	-20	A
Channel dissipation	P <sub>ch</sub> <sup>Note 2</sup>	75	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

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

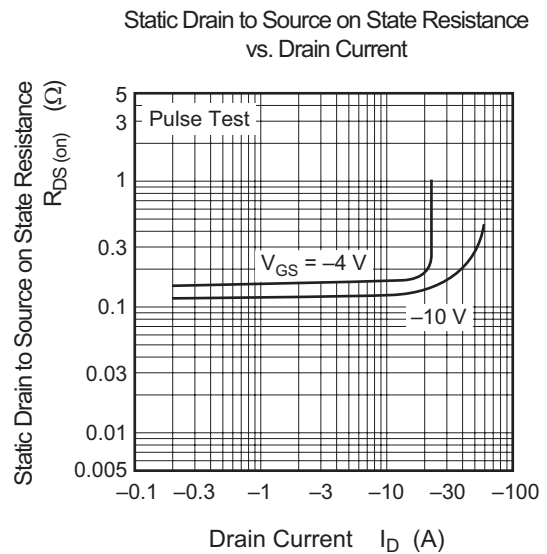
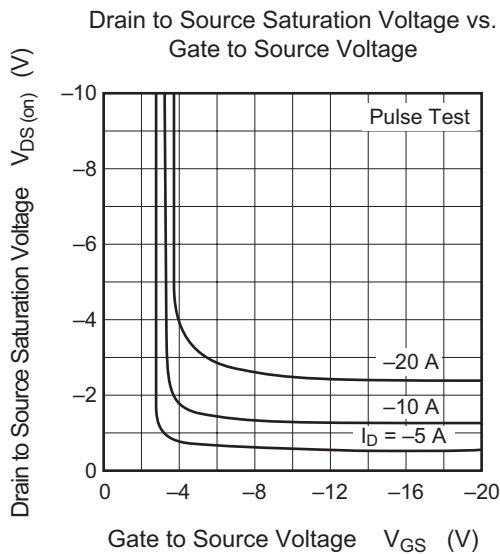
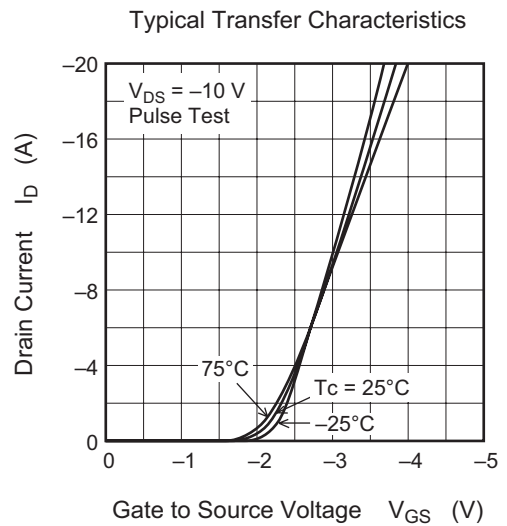
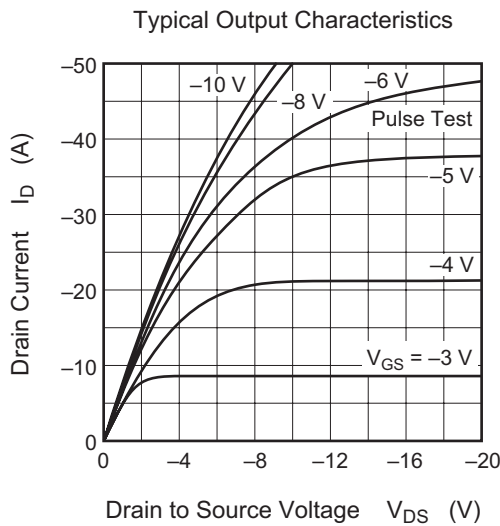
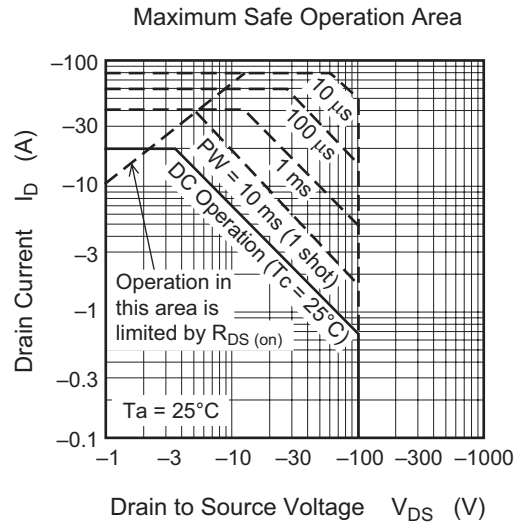
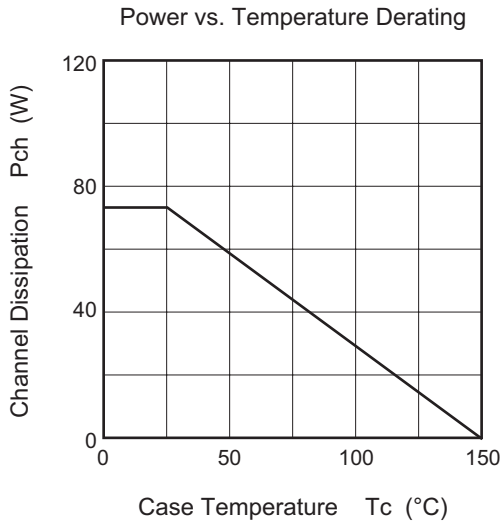
## Electrical Characteristics

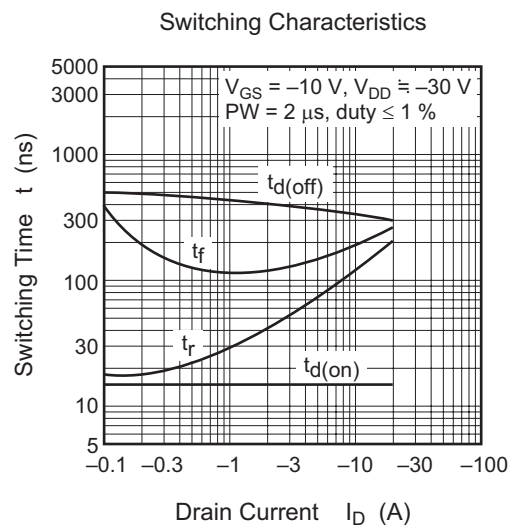
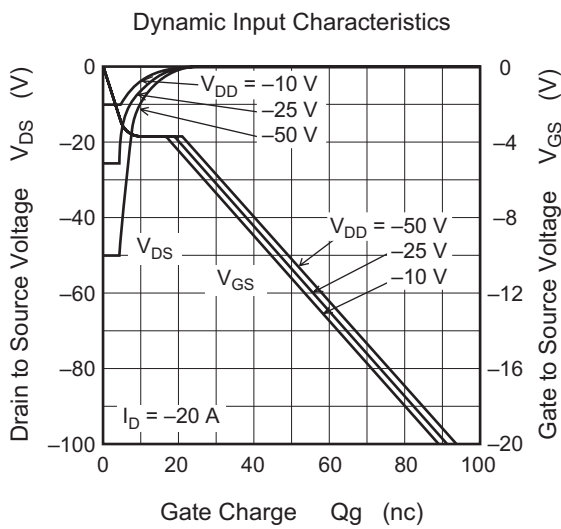
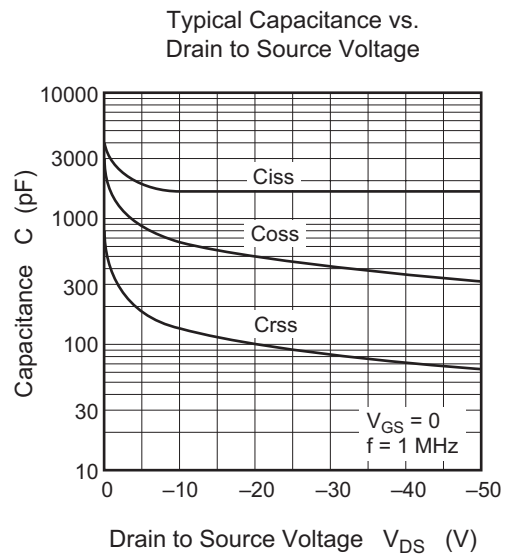
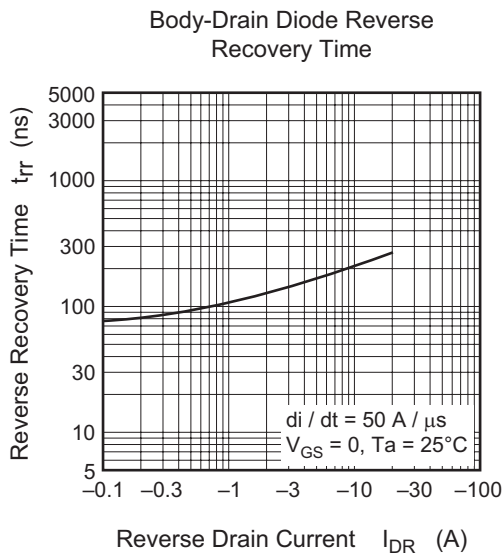
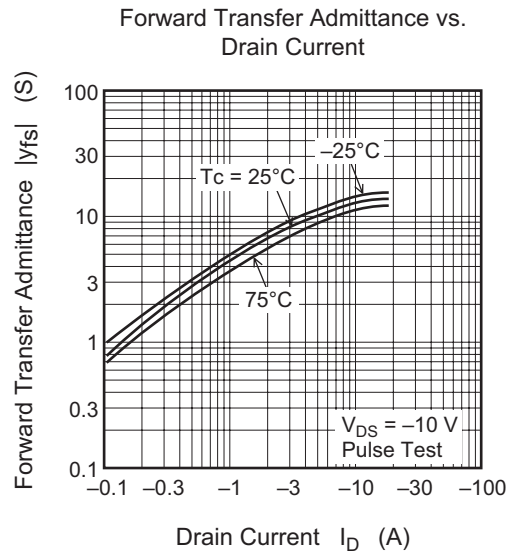
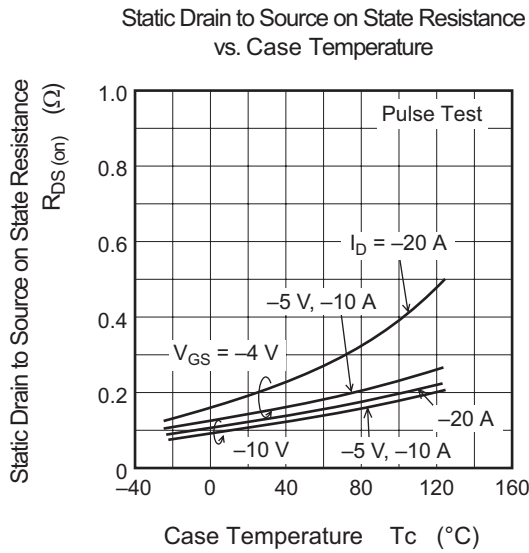
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR) DSS</sub>	-100	—	—	V	I <sub>D</sub> = -10 mA, V <sub>GS</sub> = 0
Gate to source breakdown voltage	V <sub>(BR) GSS</sub>	±20	—	—	V	I <sub>G</sub> = ±100 μA, V <sub>DS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	-250	μA	V <sub>DS</sub> = -80 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS (off)</sub>	-1.0	—	-2.0	V	I <sub>D</sub> = -1 mA, V <sub>DS</sub> = -10 V
Static drain to source on state resistance	R <sub>DS (on)</sub>	—	0.12	0.16	Ω	I <sub>D</sub> = -10 A, V <sub>GS</sub> = -10 V <sup>Note 3</sup>
	R <sub>DS (on)</sub>	—	0.16	0.22	Ω	I <sub>D</sub> = -10 A, V <sub>GS</sub> = -4 V <sup>Note 3</sup>
Forward transfer admittance	y <sub>fs</sub>	7.5	12	—	S	I <sub>D</sub> = -10 A, V <sub>DS</sub> = -10 V <sup>Note 3</sup>
Input capacitance	C <sub>iss</sub>	—	1800	—	pF	V <sub>DS</sub> = -10 V
Output capacitance	C <sub>oss</sub>	—	680	—	pF	V <sub>GS</sub> = 0
Reverse transfer capacitance	C <sub>rss</sub>	—	145	—	pF	f = 1 MHz
Turn-on delay time	t <sub>d (on)</sub>	—	15	—	ns	I <sub>D</sub> = -10 A
Rise time	t <sub>r</sub>	—	115	—	ns	V <sub>GS</sub> = -10 V
Turn-off delay time	t <sub>d (off)</sub>	—	320	—	ns	R <sub>L</sub> = 3 Ω
Fall time	t <sub>f</sub>	—	170	—	ns	
Body to drain diode forward voltage	V <sub>DF</sub>	—	-1.05	—	V	I <sub>F</sub> = -20 A, V <sub>GS</sub> = 0
Body to drain diode reverse recovery time	t <sub>rr</sub>	—	280	—	ns	I <sub>F</sub> = -20 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 50 A/μs

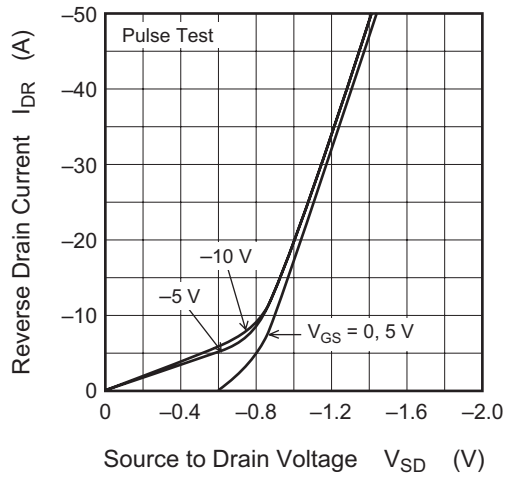
Note: 3. Pulse test

Main Characteristics

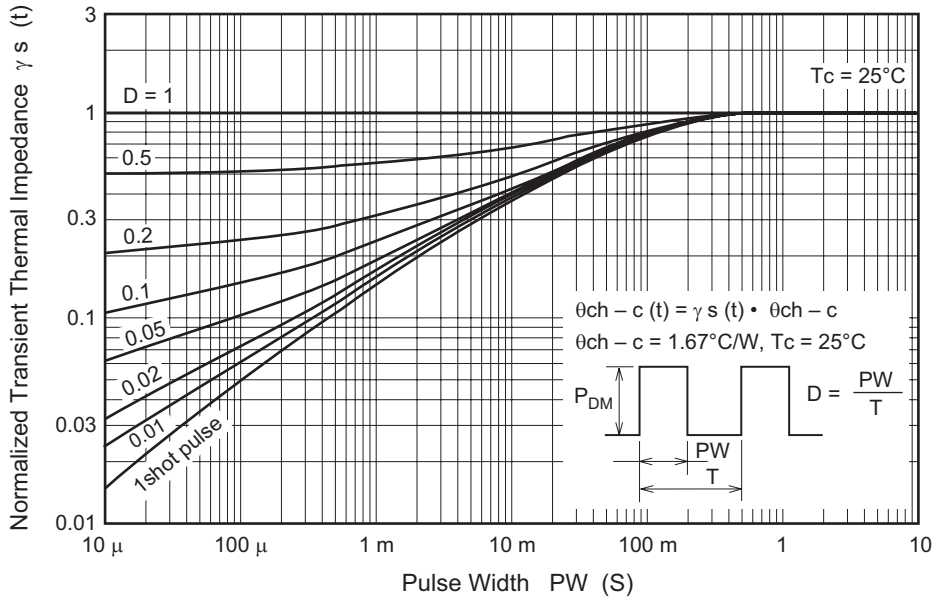




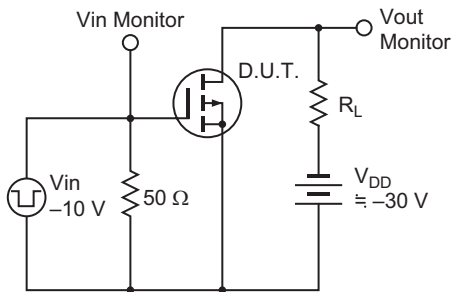
Reverse Drain Current vs. Source to Drain Voltage



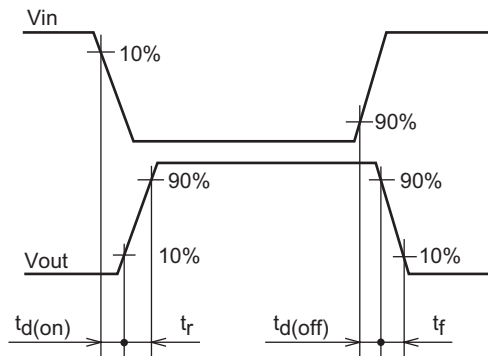
Normalized Transient Thermal Impedance vs. Pulse Width



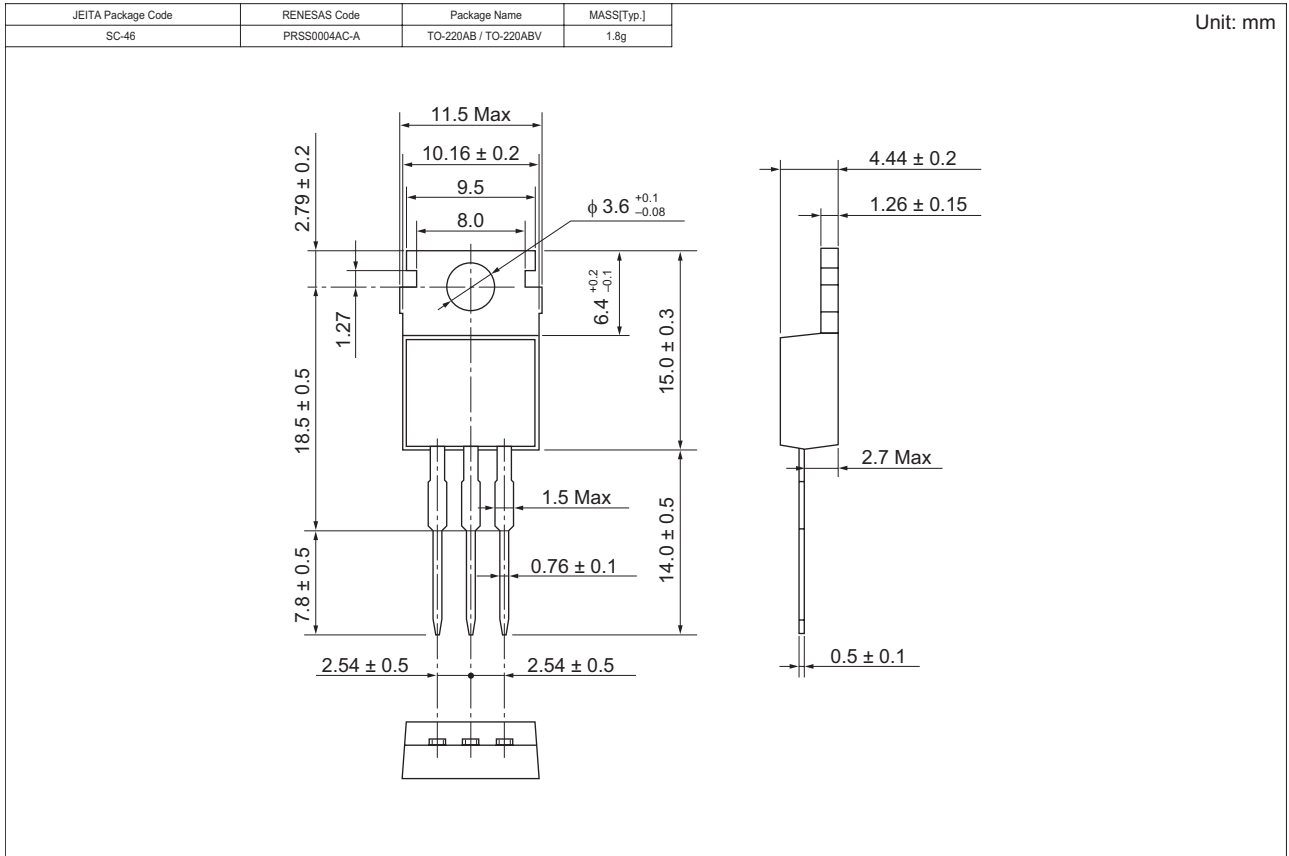
Switching Time Test Circuit



Waveform



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
2SJ221-E	500 pcs	Box (Sack)

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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