

# 2SK3081

Silicon N Channel MOS FET  
High Speed Power Switching

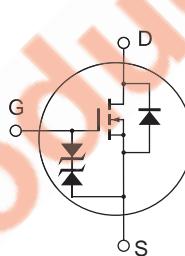
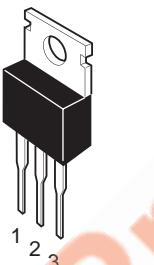
REJ03G1064-0400  
(Previous: ADE-208-636A)  
Rev.4.00  
Sep 07,2005

## Features

- Low on-resistance  
 $R_{DS(on)} = 10 \text{ m}\Omega \text{ typ.}$
- 4 V gate drive devices.
- High speed switching

## 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	Ratings	Unit
Drain to source voltage	V <sub>DSS</sub>	30	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	45	A
Drain peak current	I <sub>D(pulse)</sub> <sup>Note1</sup>	180	A
Body-drain diode reverse drain current	I <sub>DR</sub>	45	A
Channel dissipation	P <sub>ch</sub> <sup>Note2</sup>	75	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>tsg</sub>	-55 to +150	°C

Notes: 1. PW ≤ 10μs, duty cycle ≤ 1 %

2. Value at T<sub>c</sub> = 25°C**Electrical Characteristics**

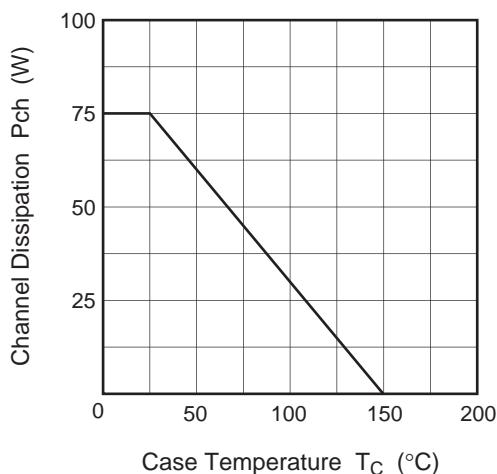
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR)DSS</sub>	30	—	—	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
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	10	μA	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±16 V, V <sub>DS</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>	—	10	14	mΩ	I <sub>D</sub> = 20 A, V <sub>GS</sub> = 10 V <sup>Note3</sup>
	R <sub>DS(on)</sub>	—	15	25	mΩ	I <sub>D</sub> = 20 A, V <sub>GS</sub> = 4 V <sup>Note3</sup>
Forward transfer admittance	y <sub>fs</sub>	20	30	—	S	I <sub>D</sub> = 20 A, V <sub>DS</sub> = 10 V <sup>Note3</sup>
Input capacitance	C <sub>iss</sub>	—	1570	—	pF	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0, f = 1 MHz
Output capacitance	C <sub>oss</sub>	—	1100	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	410	—	pF	
Turn-on delay time	t <sub>d(on)</sub>	—	32	—	ns	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A, R <sub>L</sub> = 0.5 Ω
Rise time	t <sub>r</sub>	—	300	—	ns	
Turn-off delay time	t <sub>d(off)</sub>	—	180	—	ns	
Fall time	t <sub>f</sub>	—	200	—	ns	
Body-drain diode forward voltage	V <sub>DF</sub>	—	1.0	—	V	I <sub>F</sub> = 45 A, V <sub>GS</sub> = 0
Body-drain diode reverse recovery time	t <sub>rr</sub>	—	75	—	ns	I <sub>F</sub> = 45 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 50 A/μs

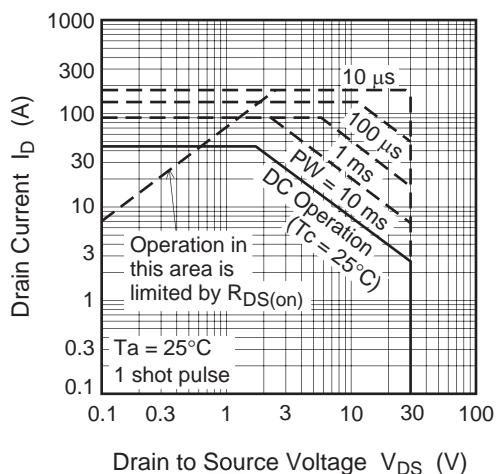
Note: 3. Pulse test

## Main Characteristics

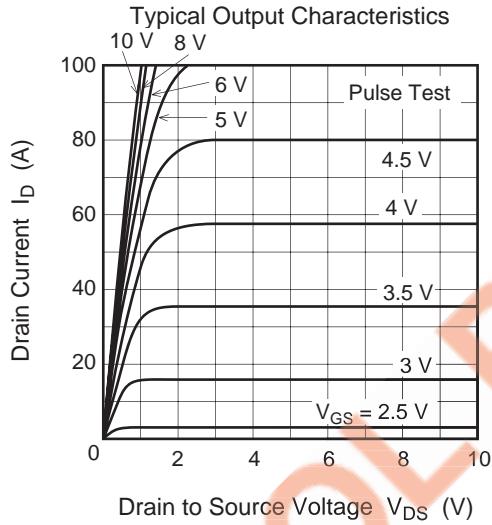
Power vs. Temperature Derating



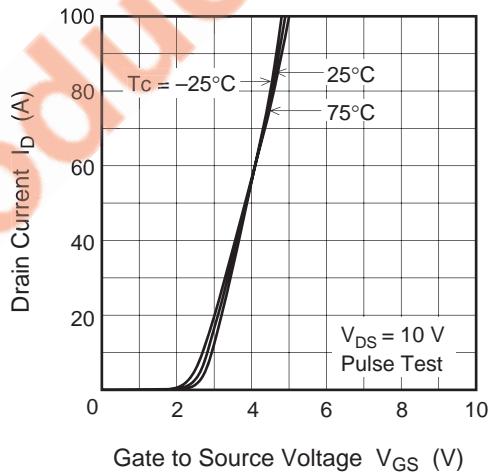
Maximum Safe Operation Area



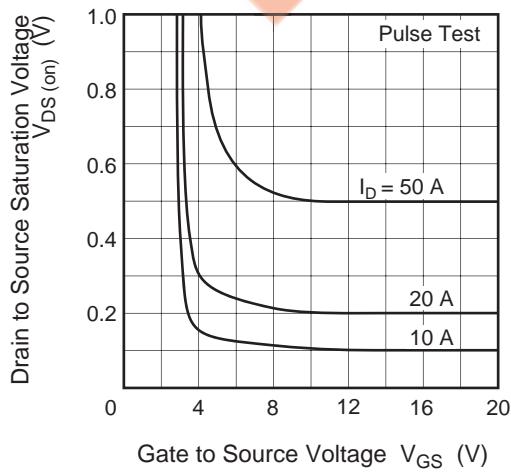
Typical Output Characteristics



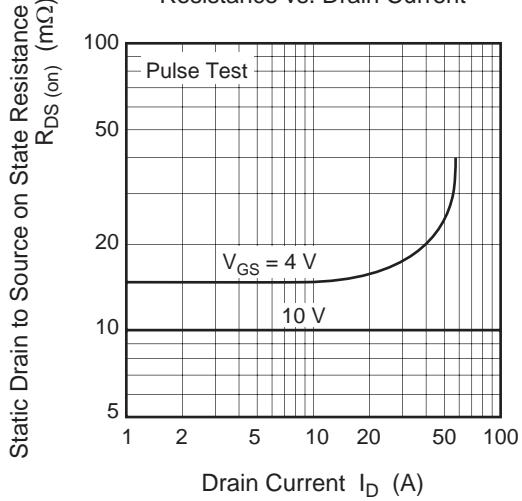
Typical Transfer Characteristics

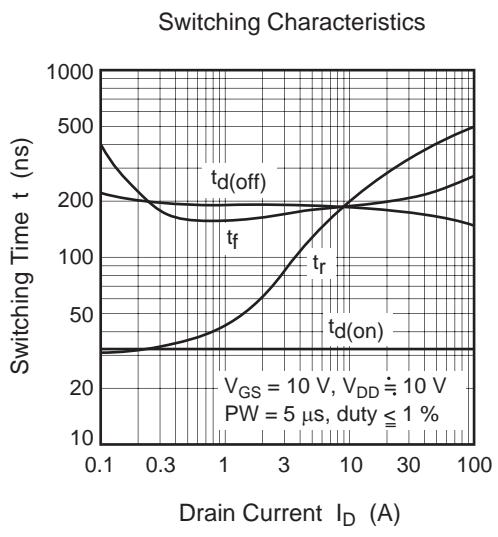
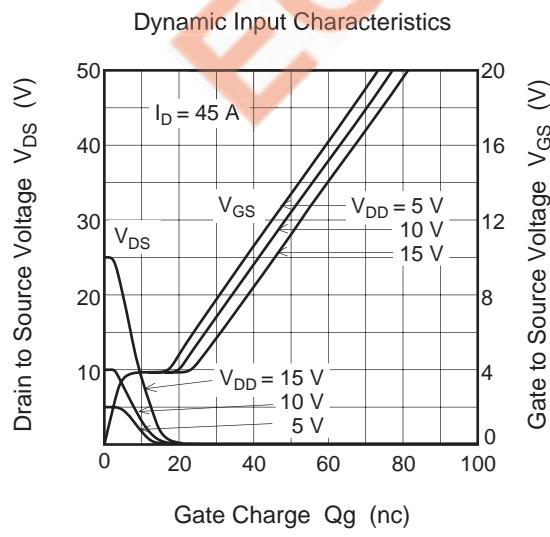
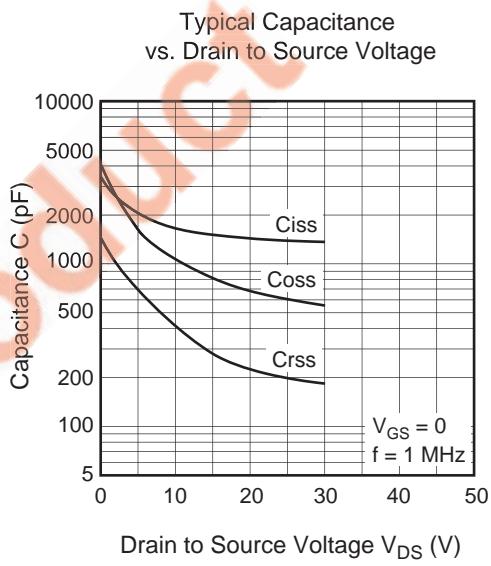
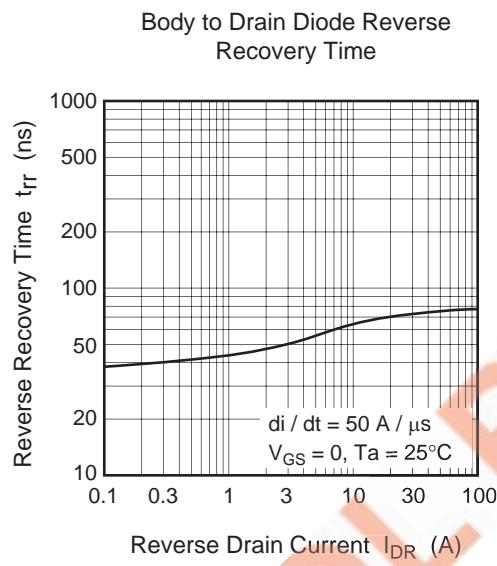
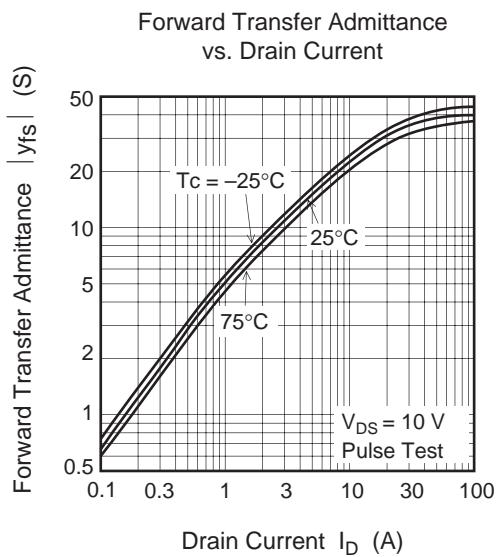
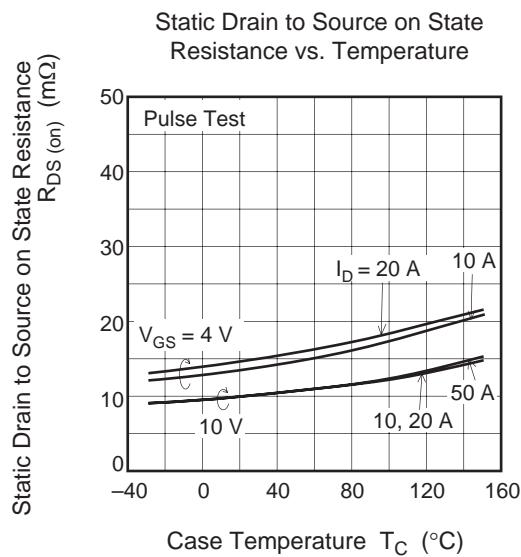


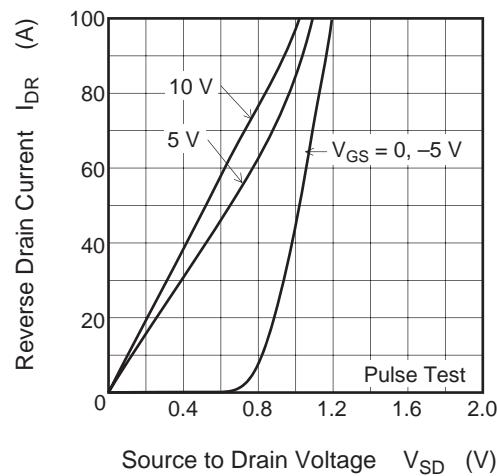
Drain to Source Saturation Voltage vs. Gate to Source Voltage



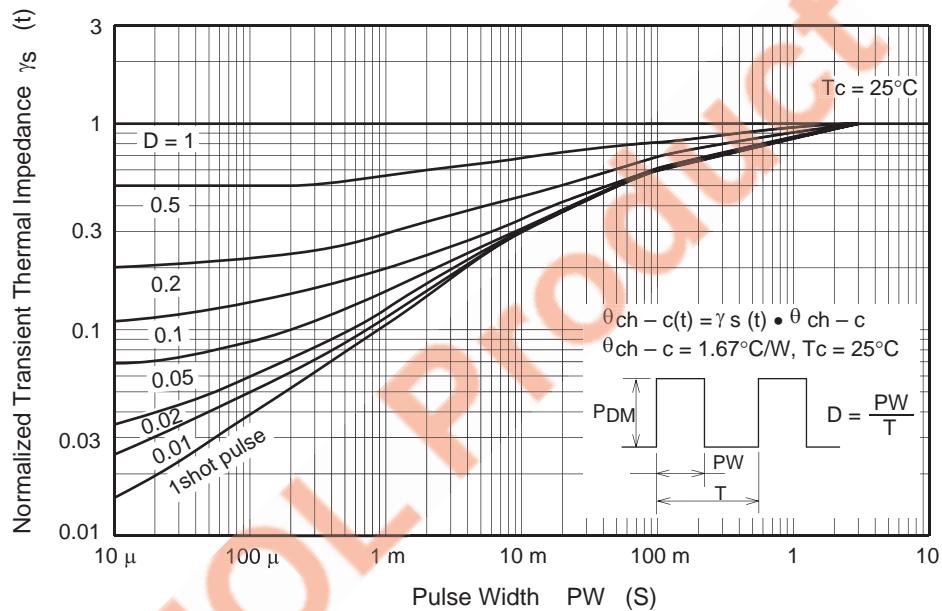
Static Drain to Source on State Resistance vs. Drain Current



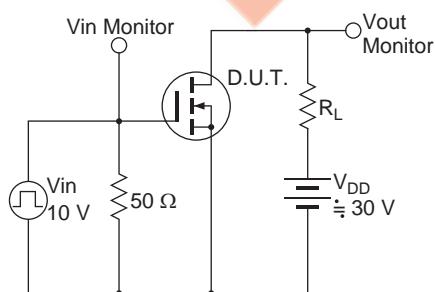


Reverse Drain Current vs.  
Source to Drain Voltage

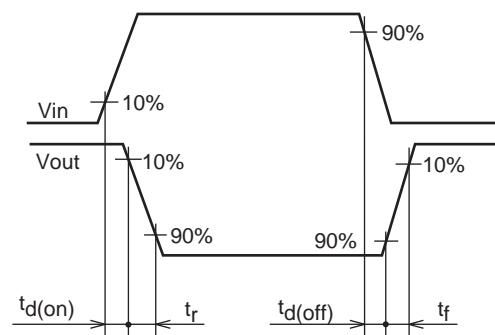
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

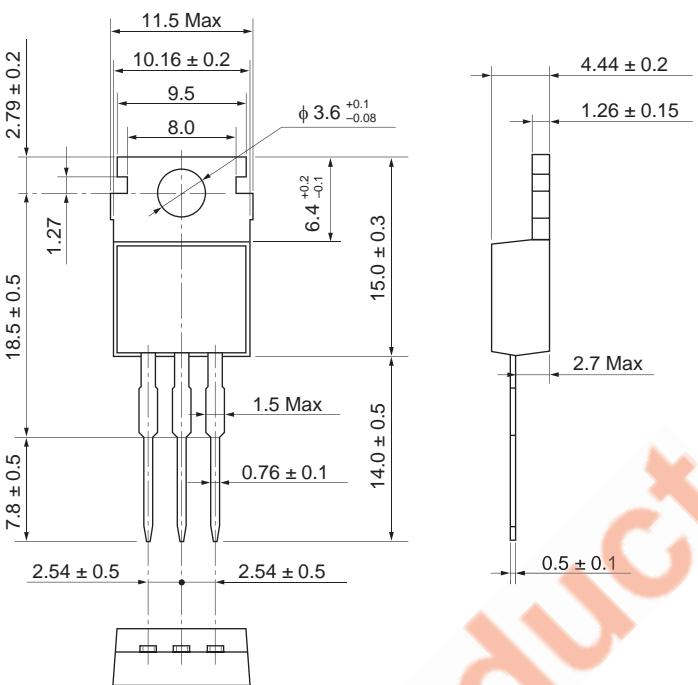


Waveform



## Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS(Typ.)	Unit: mm
SC-46	PRSS0004AC-A	TO-220AB / TO-220ABV	1.8g	



## Ordering Information

Part Name	Quantity	Shipping Container
2SK3081-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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