

# 2SK1402, 2SK1402A

Silicon N Channel MOS FET

REJ03G0942-0200  
(Previous: ADE-208-1282)  
Rev.2.00  
Sep 07, 2005

## Application

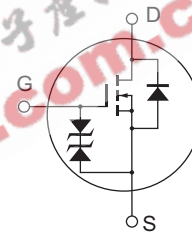
High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter

## 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	2SK1402	600	V
	2SK1402A	650	
Gate to source voltage	V <sub>GSS</sub>	±30	V
Drain current	I <sub>D</sub>	4	A
Drain peak current	I <sub>D(pulse)</sub> *1	16	A
Body to drain diode reverse drain current	I <sub>DR</sub>	4	A
Channel dissipation	P <sub>ch</sub> *2	50	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 T<sub>C</sub> = 25°C

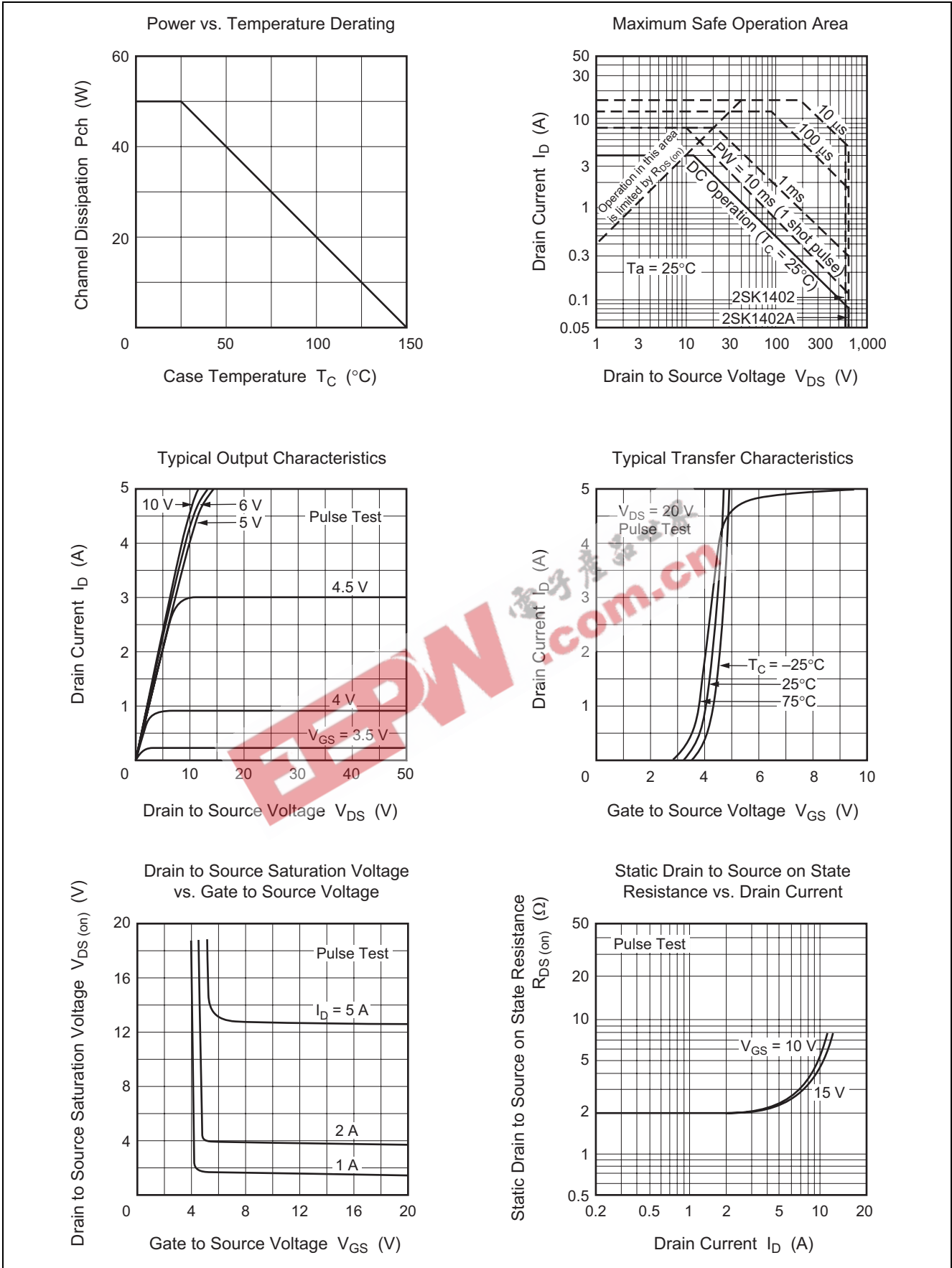
## Electrical Characteristics

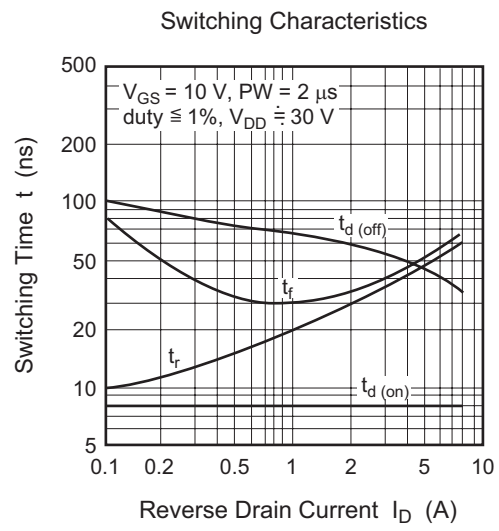
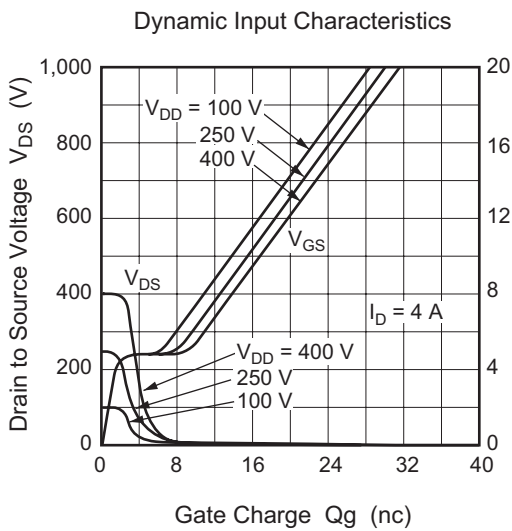
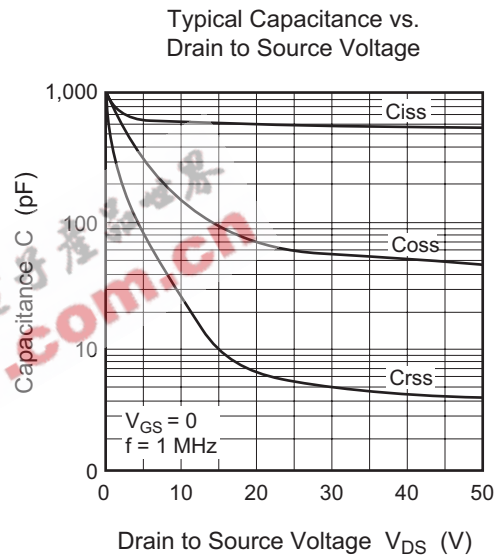
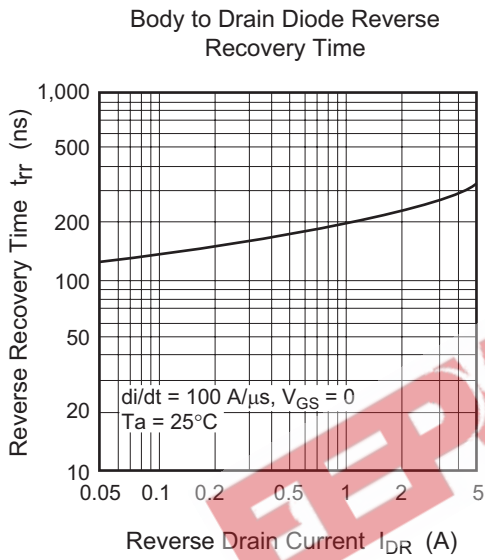
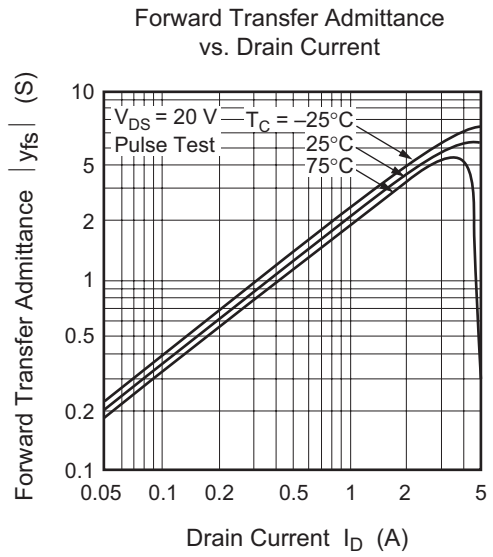
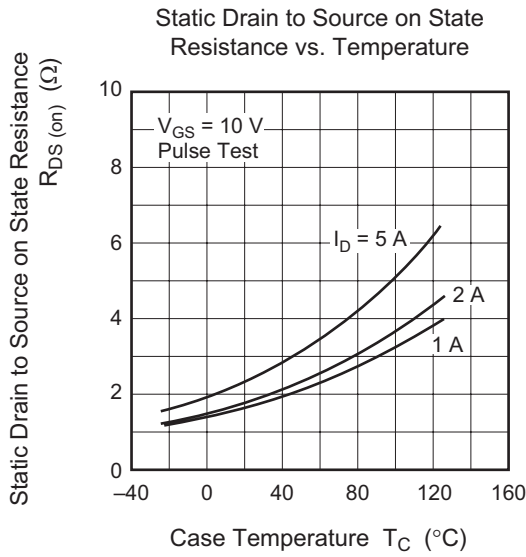
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1402	600	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
	2SK1402A	650	—	—		
Gate to source breakdown voltage	V <sub>(BR)GSS</sub>	±30	—	—	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> = ±25 V, V <sub>DS</sub> = 0
Zero gate voltage drain current	2SK1402	—	—	250	μA	V <sub>DS</sub> = 500 V, V <sub>GS</sub> = 0
	2SK1402A	—	—	—		V <sub>DS</sub> = 550 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS(off)</sub>	2.0	—	3.0	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V
Static drain to source on state resistance	2SK1402	—	1.8	2.4	Ω	I <sub>D</sub> = 2 A, V <sub>GS</sub> = 10 V *3
	2SK1402A	—	2.0	2.6		
Forward transfer admittance	y <sub>fs</sub>	2.2	3.5	—	S	I <sub>D</sub> = 2 A, V <sub>DS</sub> = 10 V *3
Input capacitance	C <sub>iss</sub>	—	600	—	pF	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0, f = 1 MHz
Output capacitance	C <sub>oss</sub>	—	140	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	25	—	pF	
Turn-on delay time	t <sub>d(on)</sub>	—	8	—	ns	I <sub>D</sub> = 2 A, V <sub>GS</sub> = 10 V, R <sub>L</sub> = 15 Ω
Rise time	t <sub>r</sub>	—	30	—	ns	
Turn-off delay time	t <sub>d(off)</sub>	—	60	—	ns	
Fall time	t <sub>f</sub>	—	35	—	ns	
Body to drain diode forward voltage	V <sub>DF</sub>	—	0.9	—	V	I <sub>F</sub> = 4 A, V <sub>GS</sub> = 0
Body to drain diode reverse recovery time	t <sub>rr</sub>	—	300	—	ns	I <sub>F</sub> = 4 A, V <sub>GS</sub> = 0, di <sub>F</sub> /dt = 100 A/μs

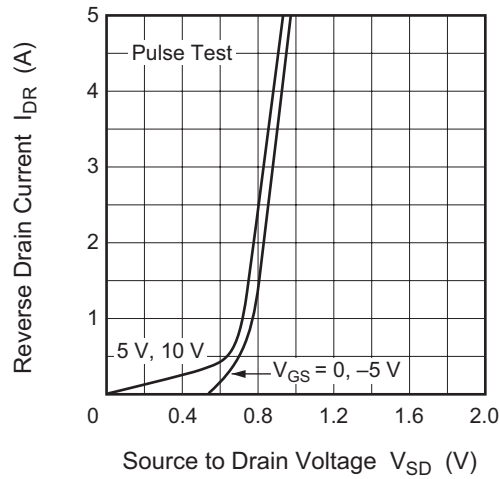
Note: 3. Pulse test

Main Characteristics

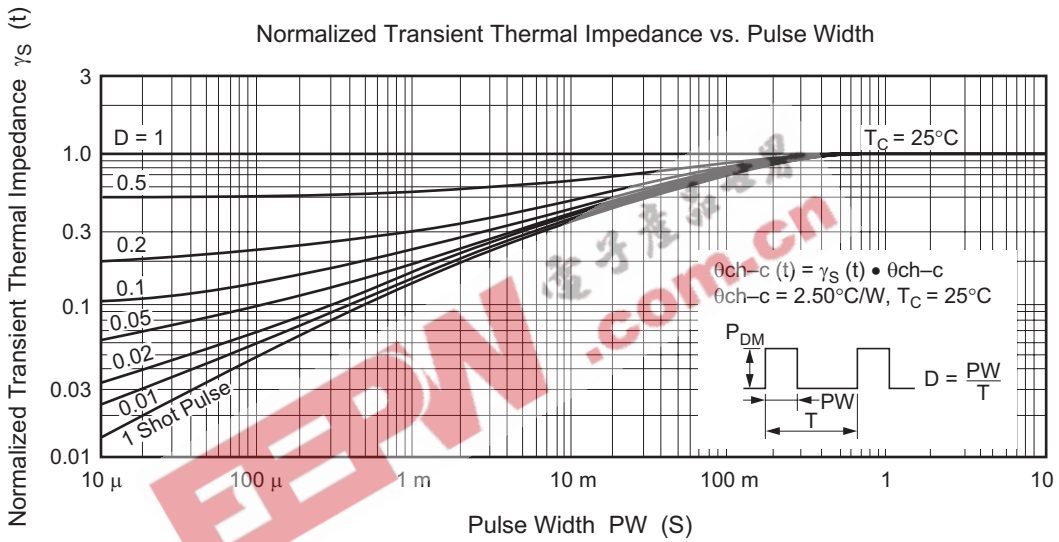




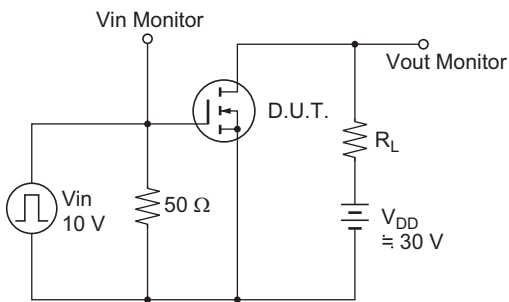
Reverse Drain Current vs. Source to Drain Voltage



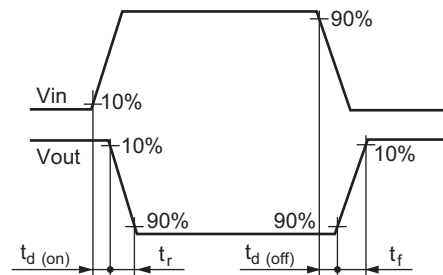
Normalized Transient Thermal Impedance vs. Pulse Width



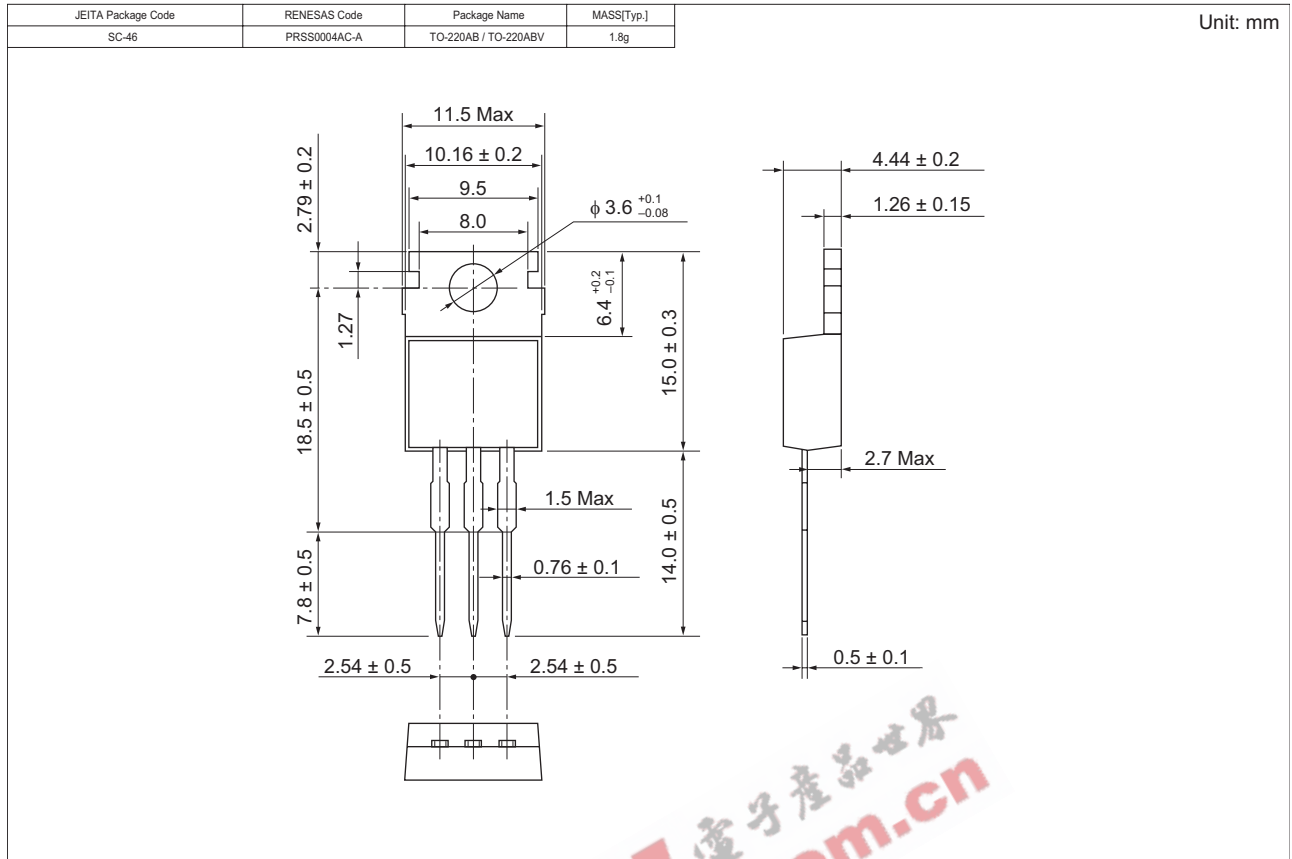
Switching Time Test Circuit



Waveforms



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
2SK1402-E	500 pcs	Box (Sack)
2SK1402A-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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