

# 2SK1401, 2SK1401A

Silicon N Channel MOS FET

REJ03G0941-0200  
(Previous: ADE-208-1281)  
Rev.2.00  
Sep 07, 2005

## Application

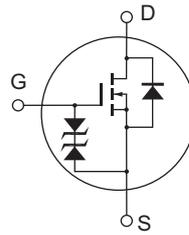
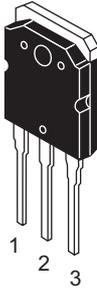
High speed power switching

## 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: PRSS0004ZE-A  
(Package name: TO-3P)



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

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	2SK1401	300	V
	2SK1401A	350	
Gate to source voltage	V <sub>GSS</sub>	±30	V
Drain current	I <sub>D</sub>	15	A
Drain peak current	I <sub>D(pulse)</sub> * <sup>1</sup>	60	A
Body to drain diode reverse drain current	I <sub>DR</sub>	15	A
Channel dissipation	P <sub>ch</sub> * <sup>2</sup>	100	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

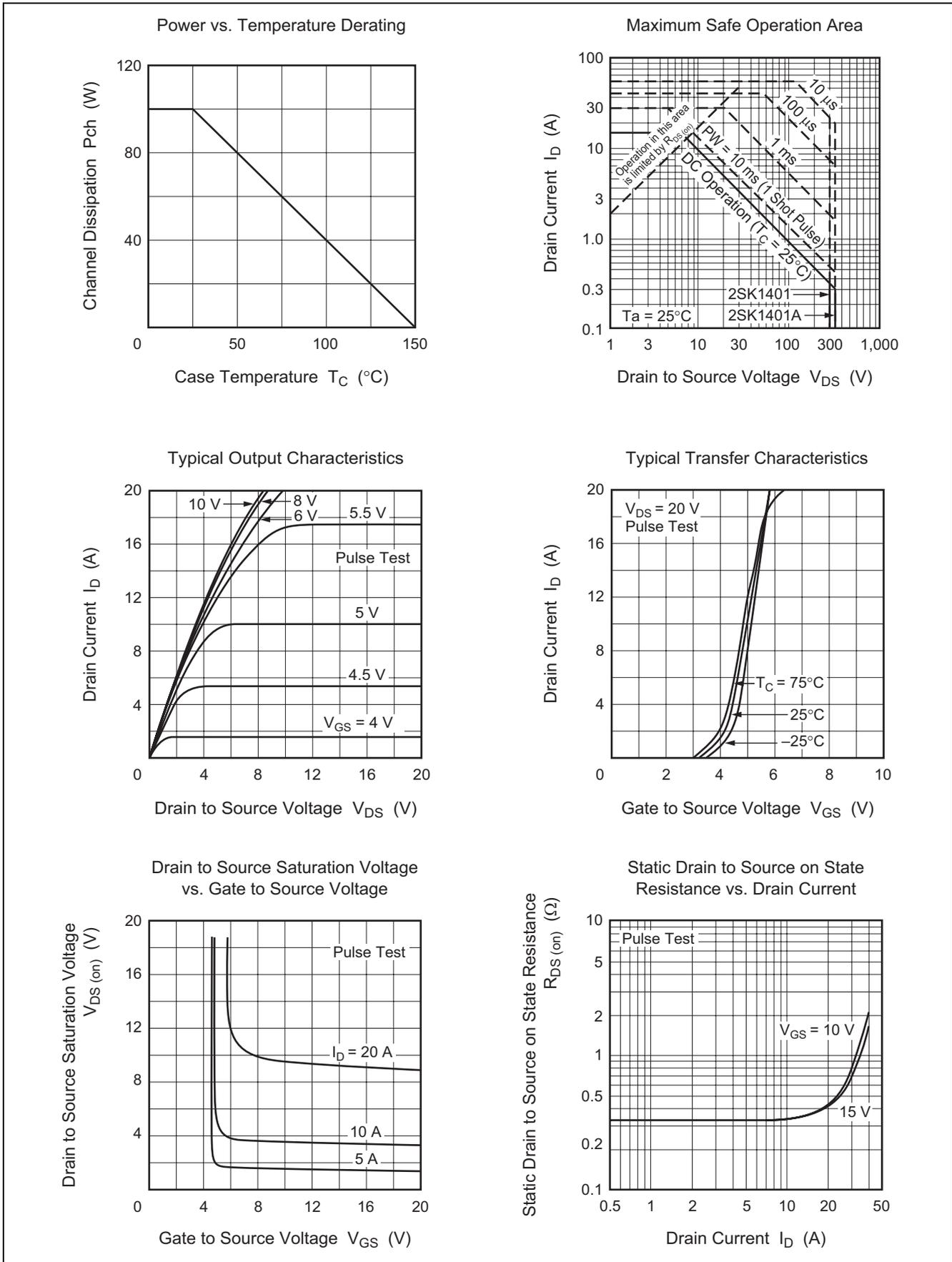
## Electrical Characteristics

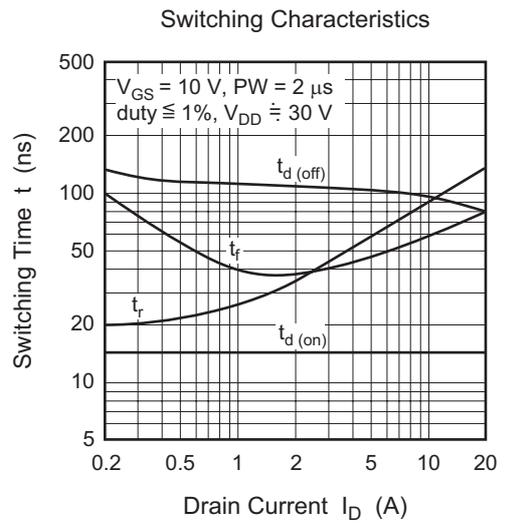
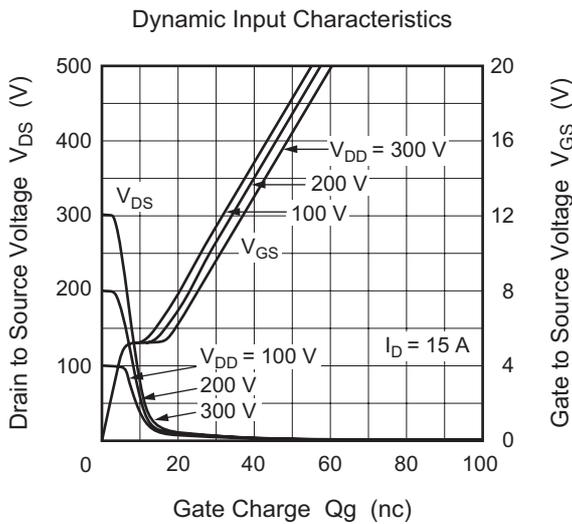
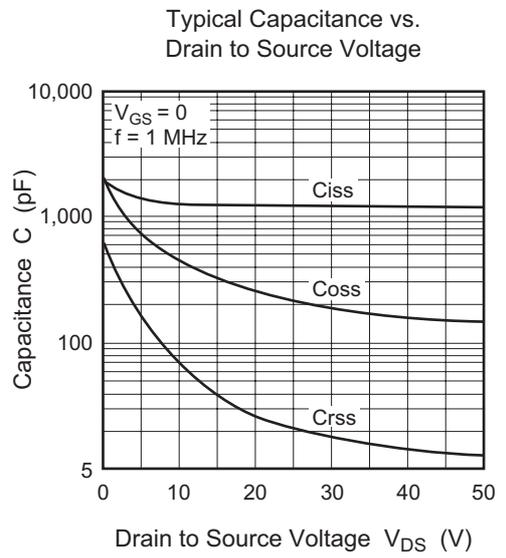
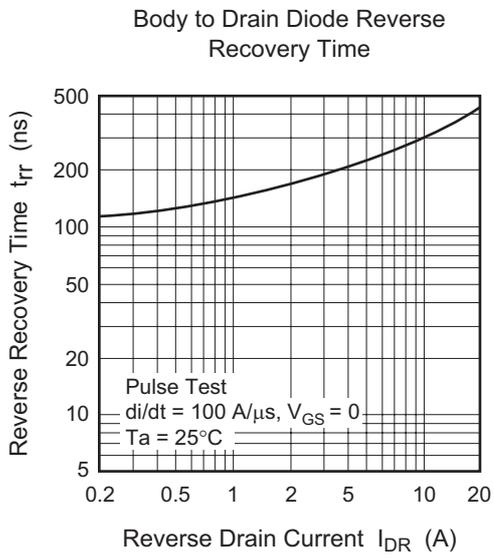
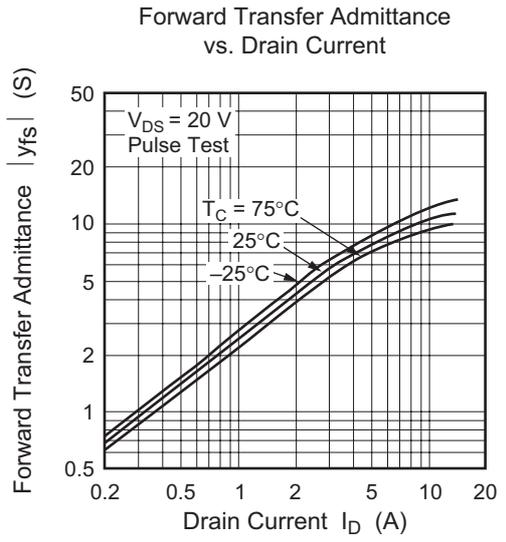
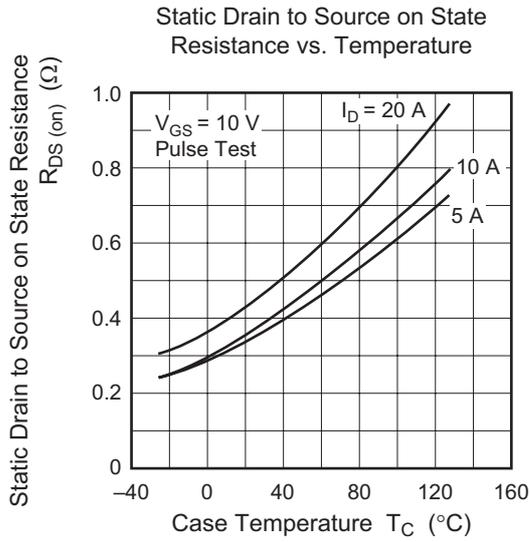
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1401	300	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
	2SK1401A	350	—	—		
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	2SK1401	—	—	250	μA	V <sub>DS</sub> = 240 V, V <sub>GS</sub> = 0
	2SK1401A					V <sub>DS</sub> = 280 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	2SK1401	—	0.25	0.35	Ω	I <sub>D</sub> = 8 A, V <sub>GS</sub> = 10 V * <sup>3</sup>
	2SK1401A		—	0.30		
Forward transfer admittance	y <sub>fs</sub>	6	9.5	—	S	I <sub>D</sub> = 8 A, V <sub>DS</sub> = 10 V * <sup>3</sup>
Input capacitance	C <sub>iss</sub>	—	1250	—	pF	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0, f = 1 MHz
Output capacitance	C <sub>oss</sub>	—	420	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	70	—	pF	
Turn-on delay time	t <sub>d(on)</sub>	—	15	—	ns	I <sub>D</sub> = 8 A, V <sub>GS</sub> = 10 V, R <sub>L</sub> = 3.75 Ω
Rise time	t <sub>r</sub>	—	80	—	ns	
Turn-off delay time	t <sub>d(off)</sub>	—	100	—	ns	
Fall time	t <sub>f</sub>	—	55	—	ns	
Body to drain diode forward voltage	V <sub>DF</sub>	—	1.05	—	V	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0
Body to drain diode reverse recovery time	t <sub>rr</sub>	—	370	—	ns	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0, di <sub>F</sub> /dt = 100 A/μs

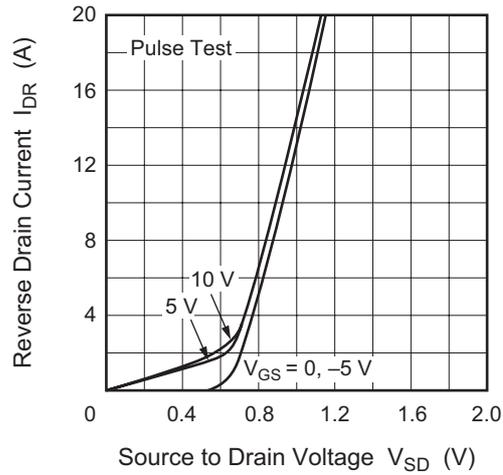
Note: 3. Pulse test

### Main Characteristics

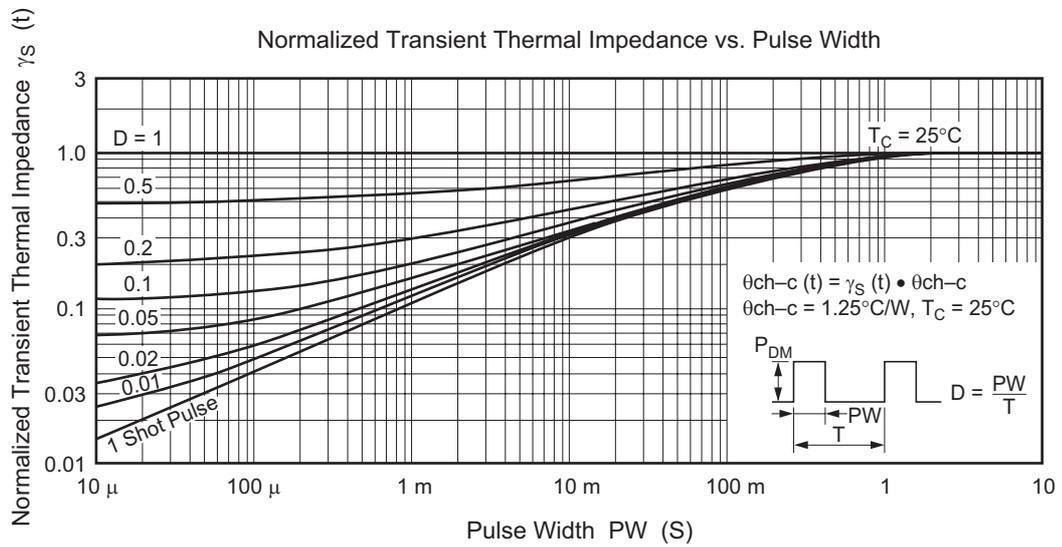




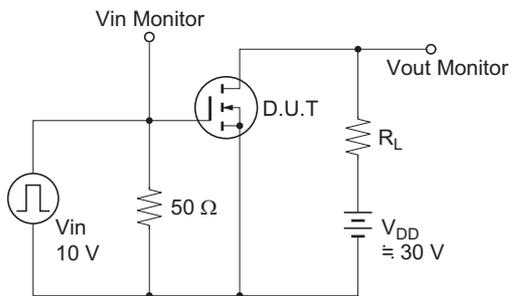
Reverse Drain Current vs. Source to Drain Voltage



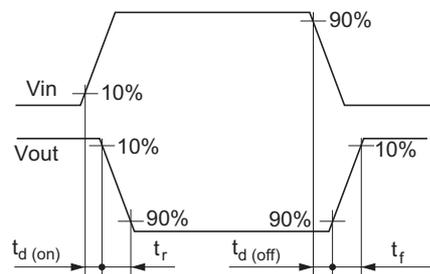
Normalized Transient Thermal Impedance vs. Pulse Width



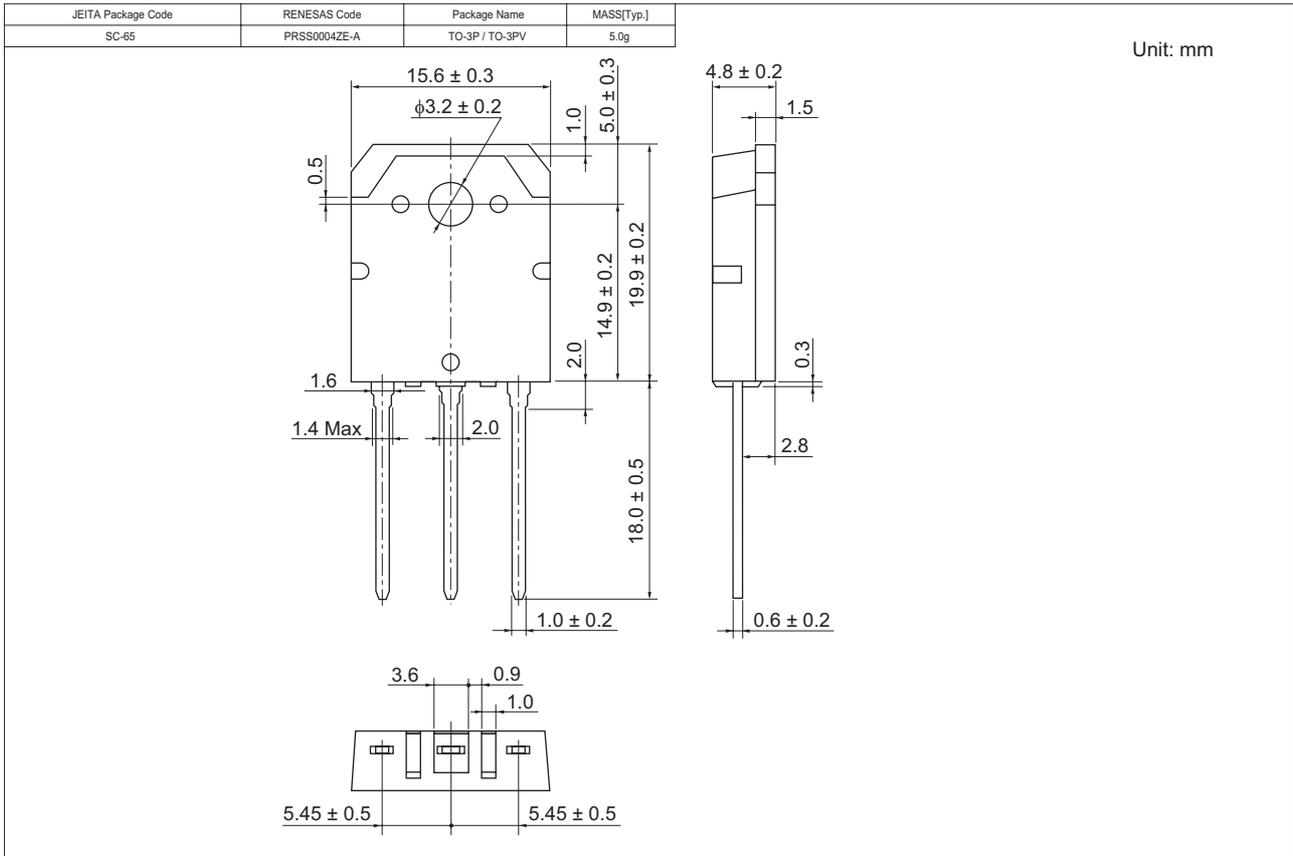
Switching Time Test Circuit



Waveforms



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
2SK1401-E	360 pcs	Box (Tube)
2SK1401A-E	360 pcs	Box (Tube)

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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