

# 2SK1400, 2SK1400A

Silicon N Channel MOS FET

REJ03G0940-0200  
(Previous: ADE-208-1280)  
Rev.2.00  
Sep 07, 2005

## Application

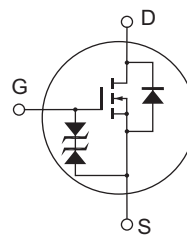
High speed power switching

## 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	$V_{DSS}$	2SK1400	300	V
		2SK1400A	350	
Gate to source voltage	$V_{GSS}$	±30	V	
Drain current	$I_D$	7	A	
Drain peak current	$I_{D(pulse)}^{*1}$	28	A	
Body to drain diode reverse drain current	$I_{DR}$	7	A	
Channel dissipation	$P_{ch}^{*2}$	50	W	
Channel temperature	$T_{ch}$	150	°C	
Storage temperature	$T_{stg}$	-55 to +150	°C	

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$ 2. Value at  $T_C = 25^\circ C$ 

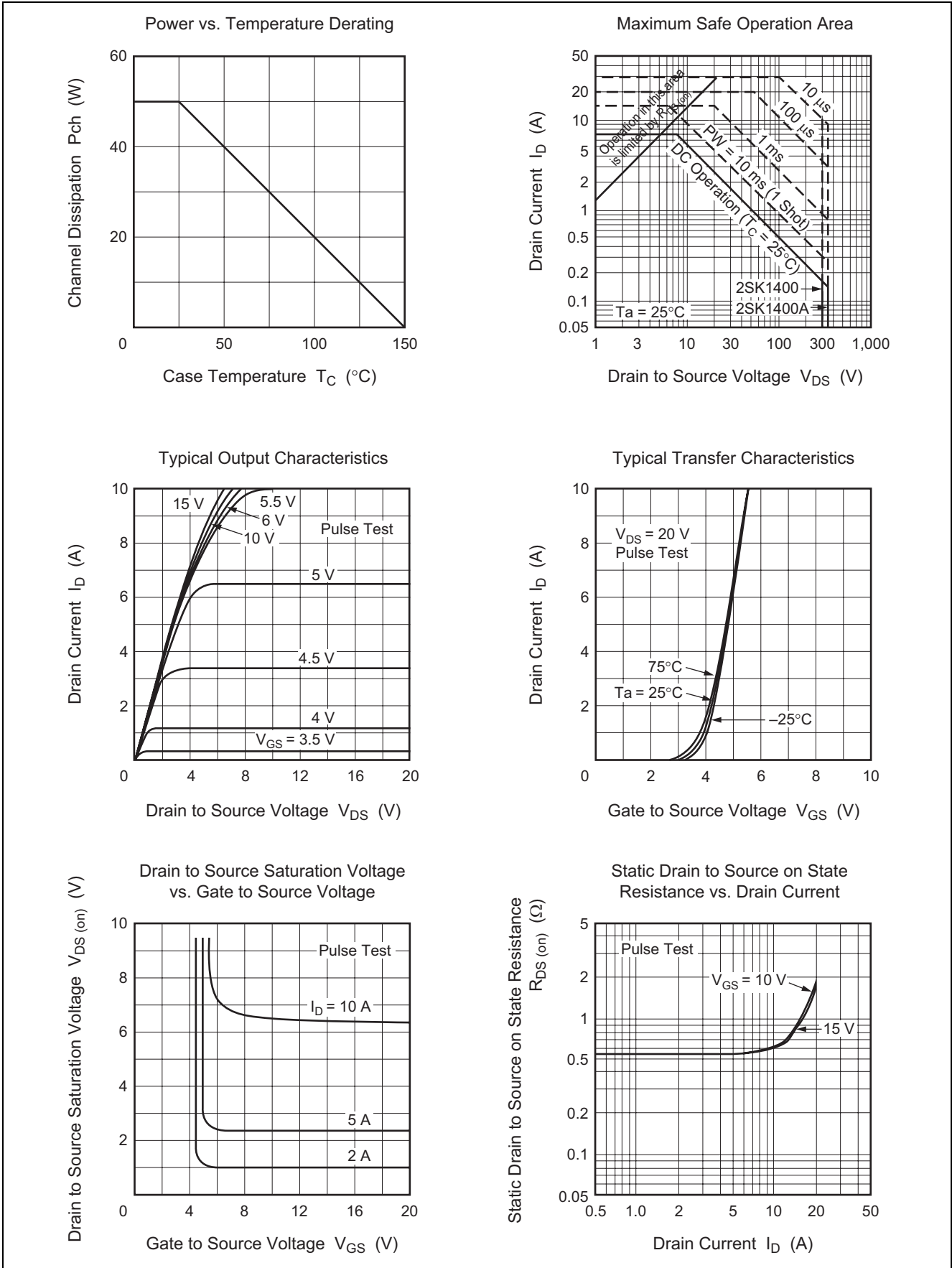
## Electrical Characteristics

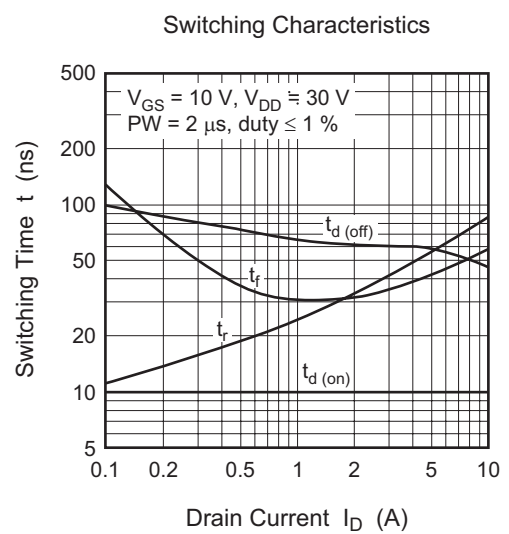
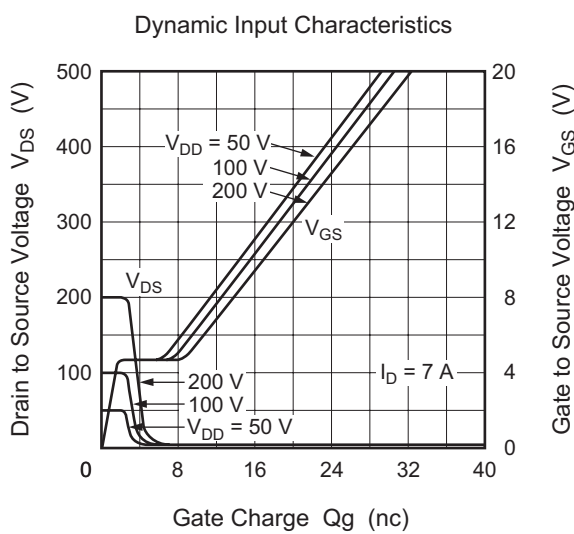
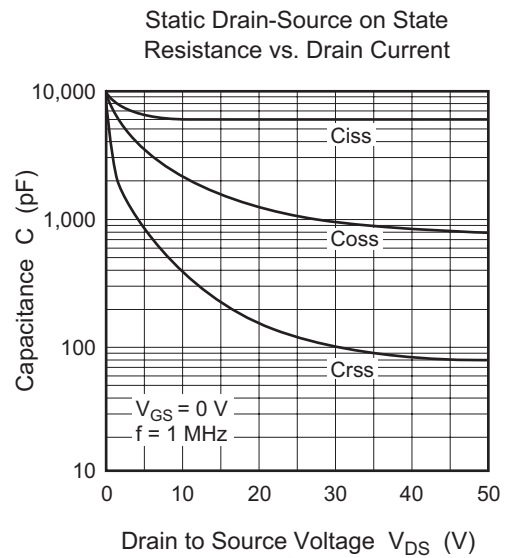
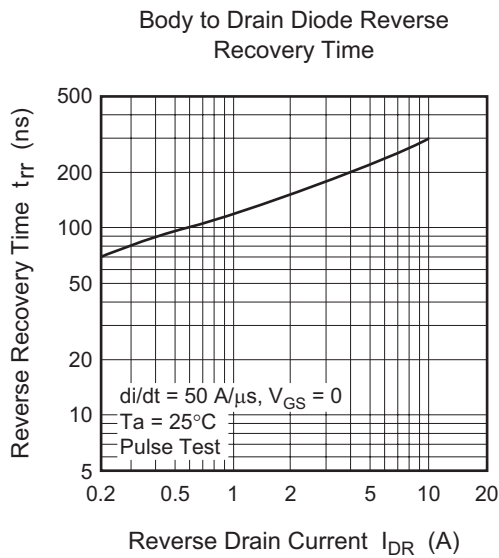
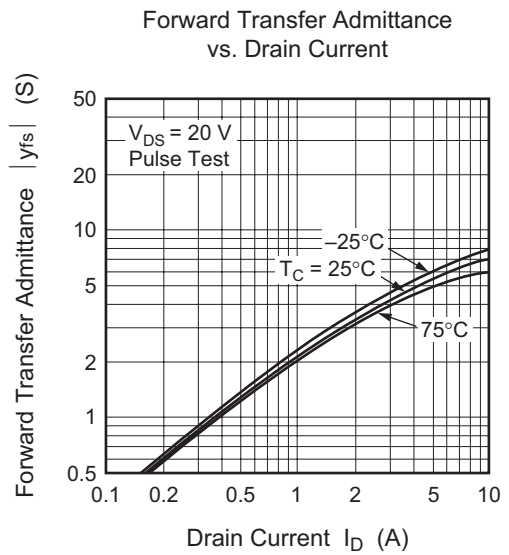
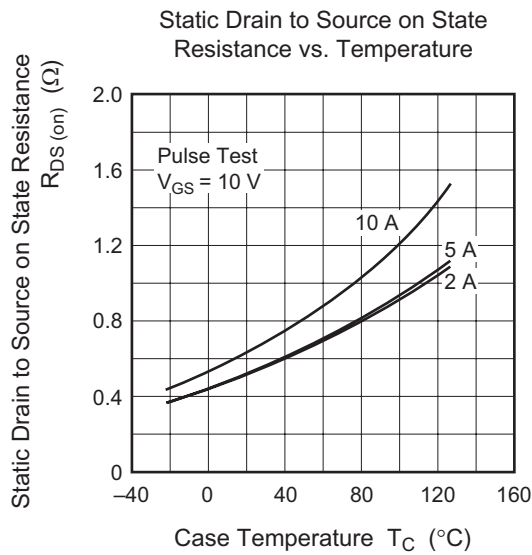
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions	
Drain to source breakdown voltage	$V_{(BR)DSS}$	2SK1400	300	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
		2SK1400A	350	—	—		
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$	
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$	
Zero gate voltage drain current	$I_{DSS}$	2SK1400	—	—	250	μA	$V_{DS} = 240 \text{ V}$ , $V_{GS} = 0$
		2SK1400A	—	—	—		$V_{DS} = 280 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$	
Static drain to source on state resistance	$R_{DS(on)}$	2SK1400	—	0.50	0.70	Ω	$I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*3}$
		2SK1400A	—	0.60	0.80		
Forward transfer admittance	$ y_{fs} $	3.0	5.0	—	S	$I_D = 4 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*3}$	
Input capacitance	$C_{iss}$	—	635	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$	
Output capacitance	$C_{oss}$	—	230	—	pF		
Reverse transfer capacitance	$C_{rss}$	—	40	—	pF		
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_L = 7.5 \Omega$	
Rise time	$t_r$	—	50	—	ns		
Turn-off delay time	$t_{d(off)}$	—	60	—	ns		
Fall time	$t_f$	—	40	—	ns		
Body to drain diode forward voltage	$V_{DF}$	—	1.0	—	V	$I_F = 7 \text{ A}$ , $V_{GS} = 0$	
Body to drain diode reverse recovery time	$t_{rr}$	—	240	—	ns	$I_F = 7 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 100 \text{ A}/\mu s$	

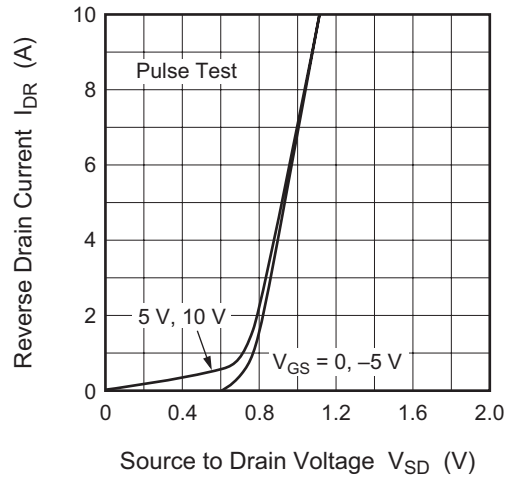
Note: 3. Pulse test

Main Characteristics

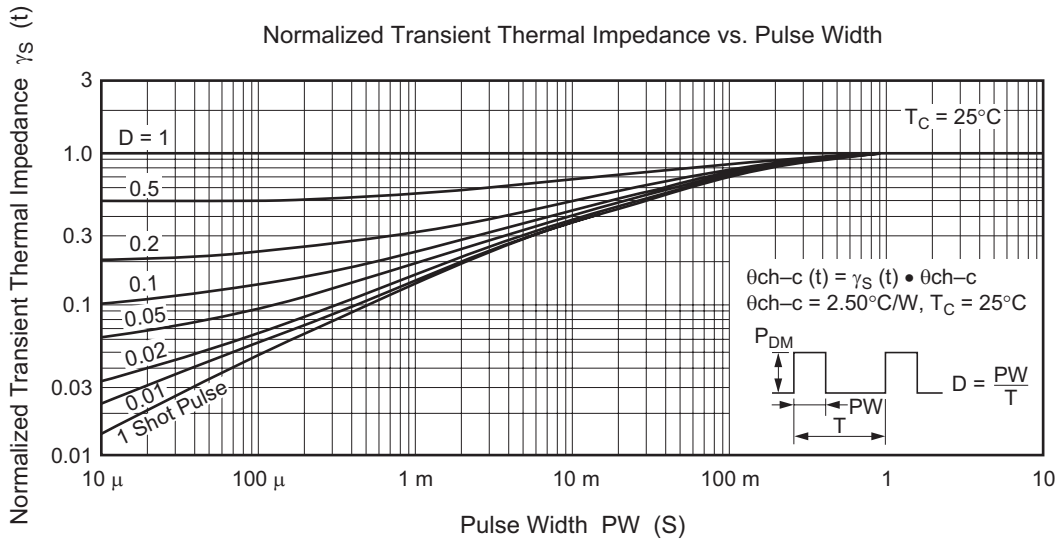




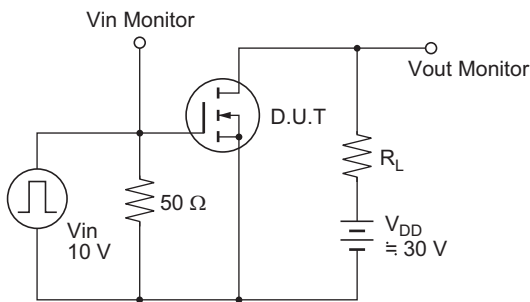
Reverse Drain Current vs. Source to Drain Voltage



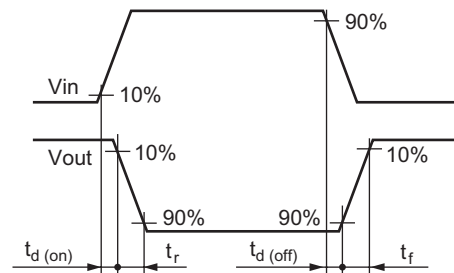
Normalized Transient Thermal Impedance vs. Pulse Width



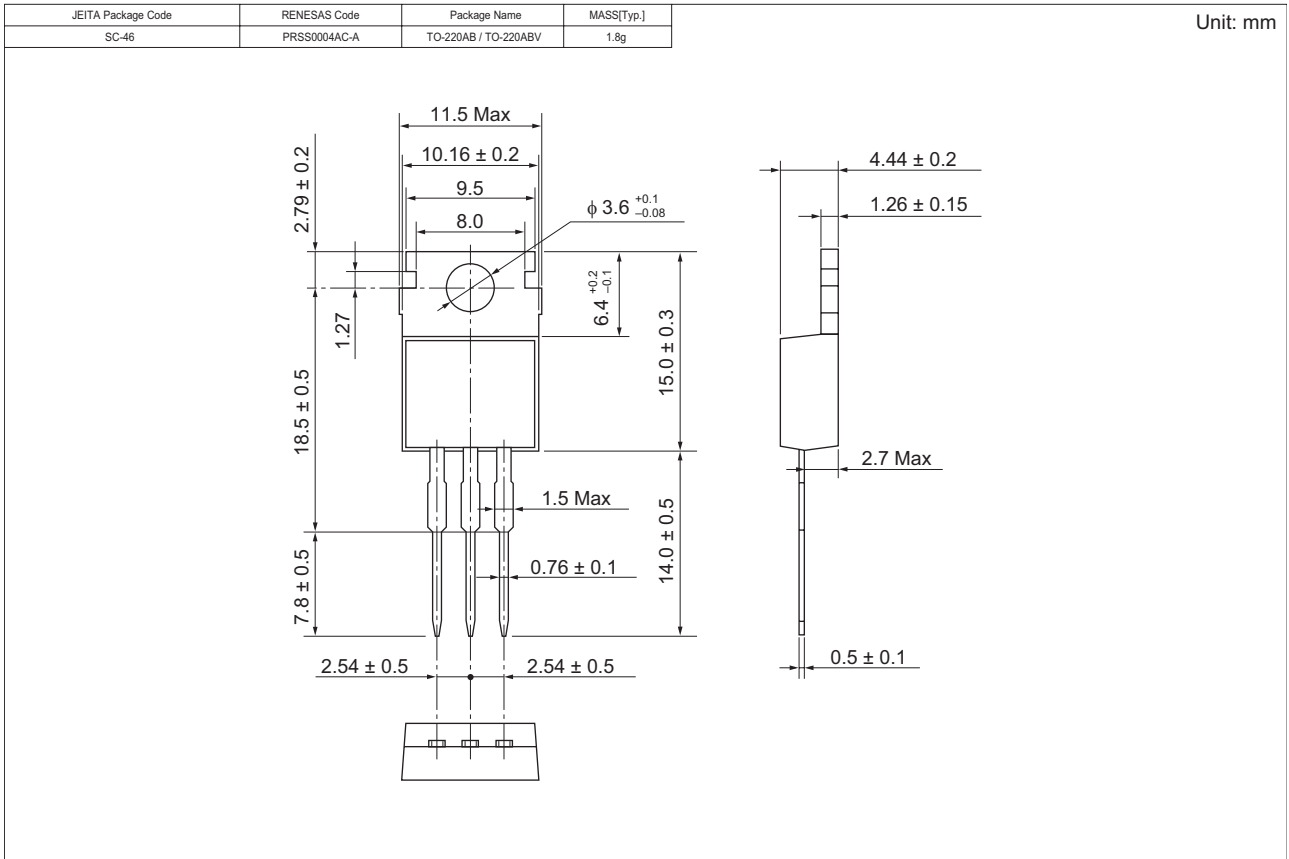
Switching Time Test Circuit



Waveforms



### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
2SK1400-E	500 pcs	Box (Sack)
2SK1400A-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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