

2SK1400, 2SK1400A

Silicon N Channel MOS FET

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

Application

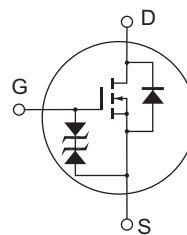
High speed power switching

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	2SK1400	V_{DSS}	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 $T_C = 25^\circ C$

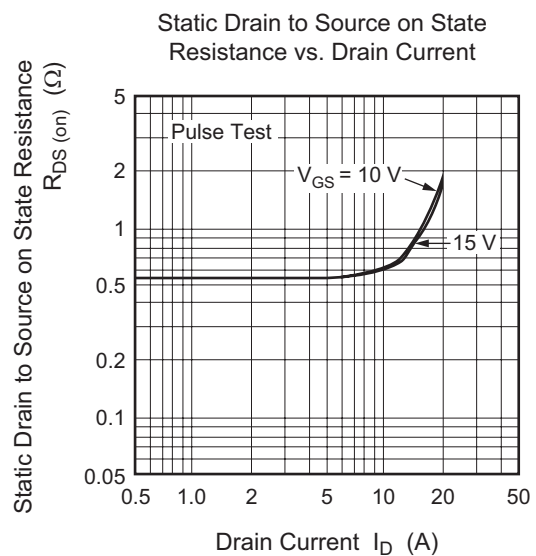
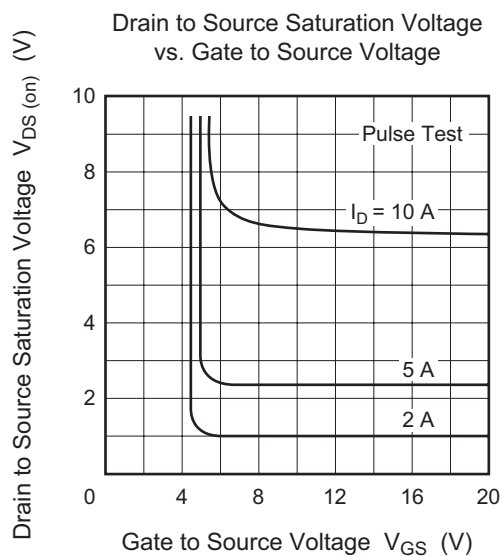
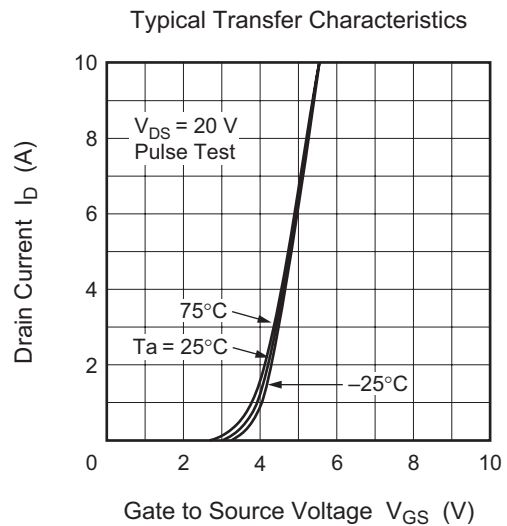
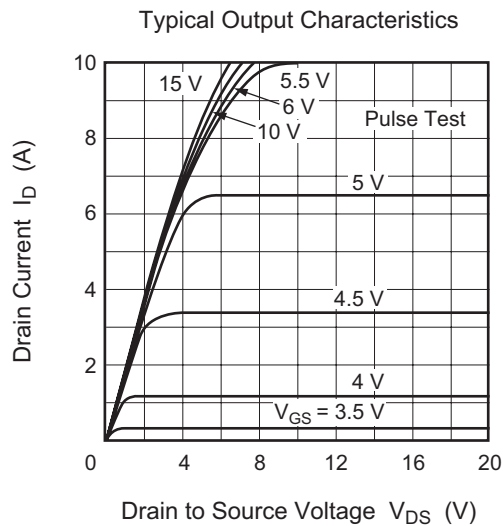
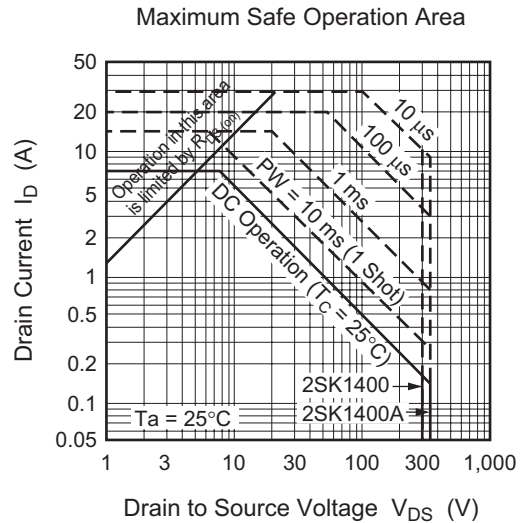
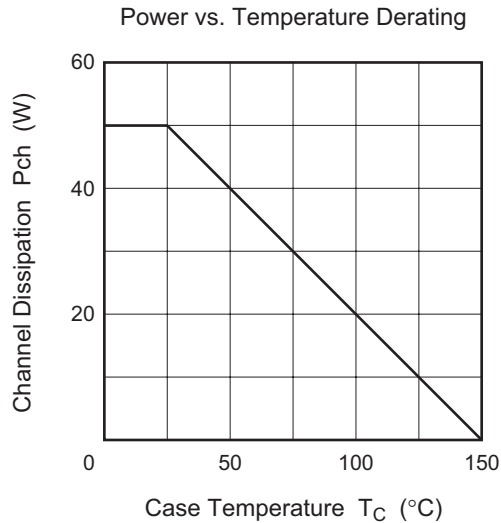
Electrical Characteristics

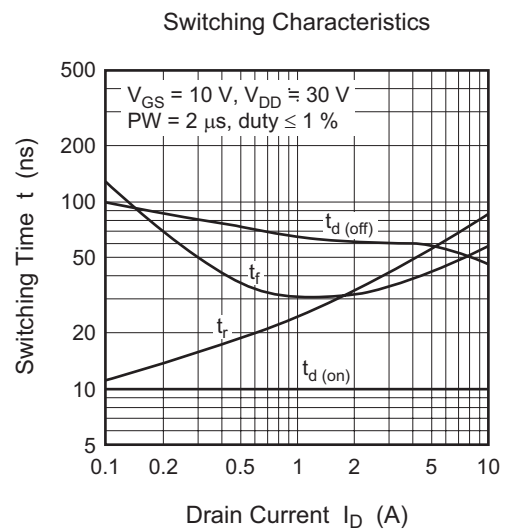
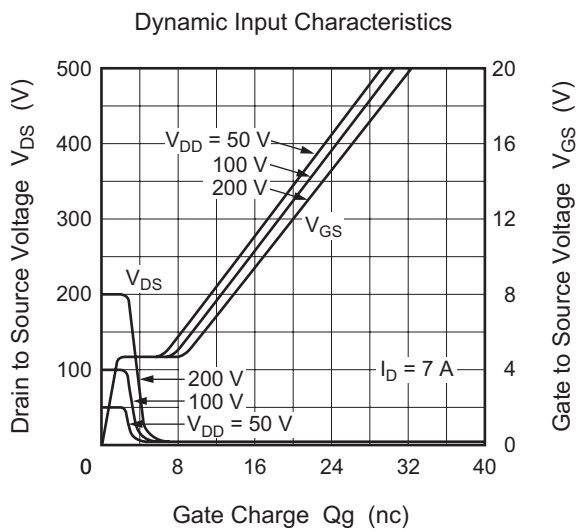
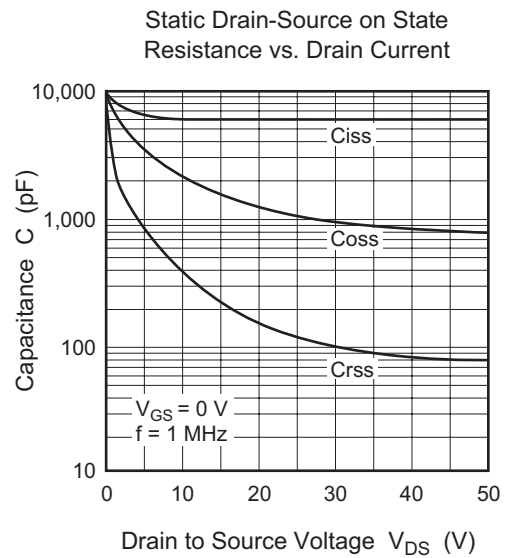
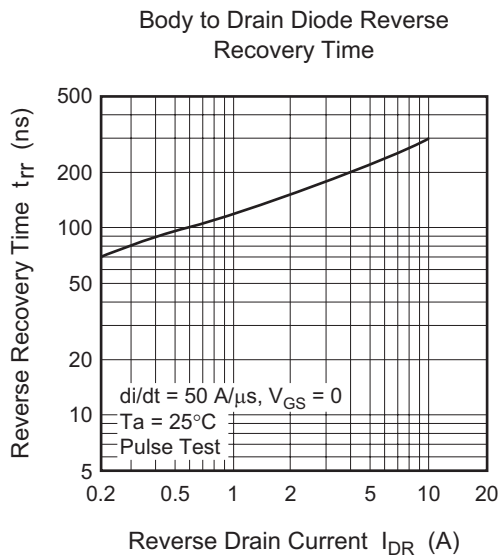
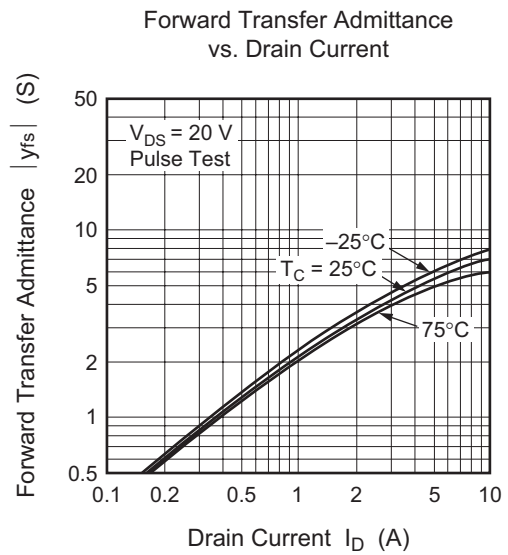
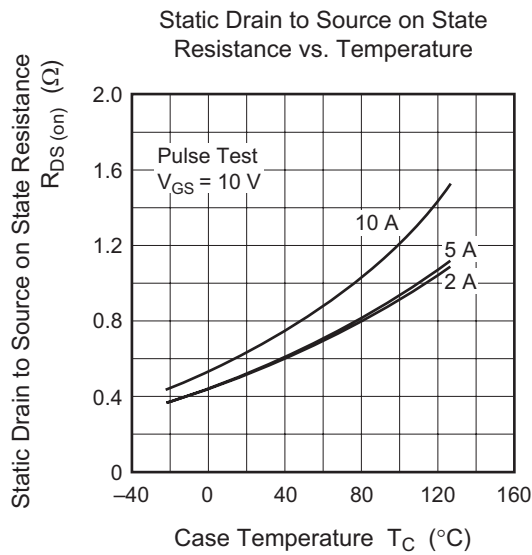
(Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1400	$V_{(BR)DSS}$	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	2SK1400	I_{DSS}	—	—	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	2SK1400	$R_{DS(on)}$	—	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	$I_F = 7 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu s$

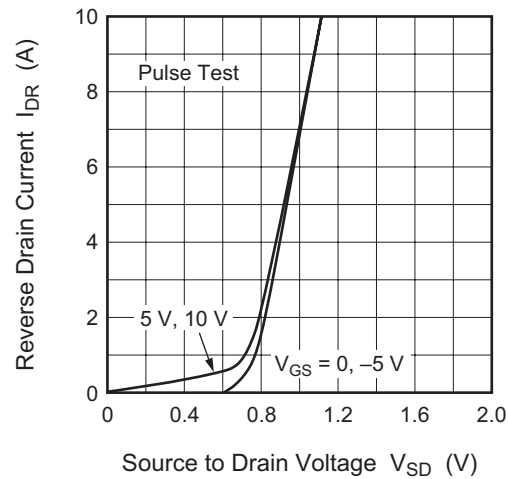
Note: 3. Pulse test

Main Characteristics

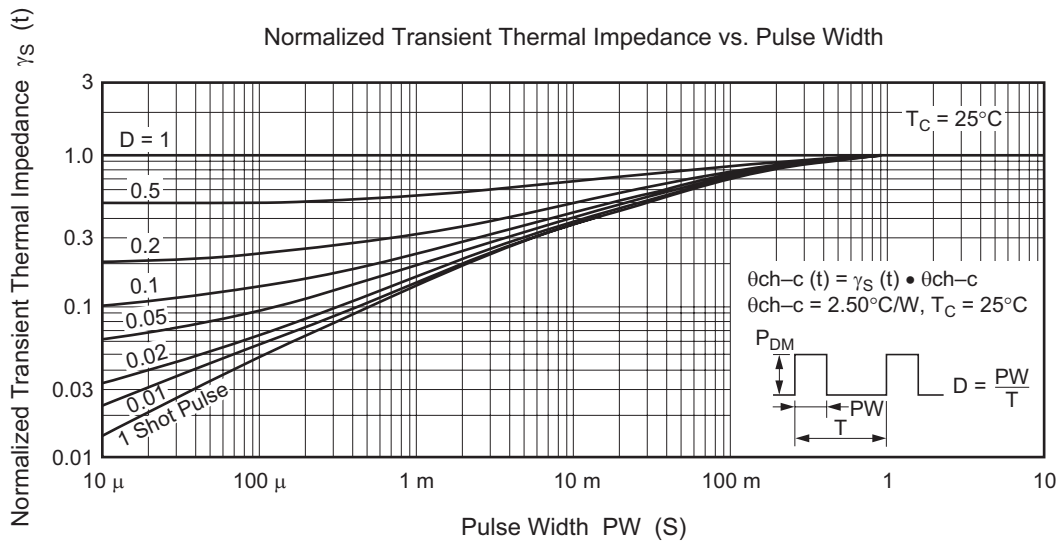




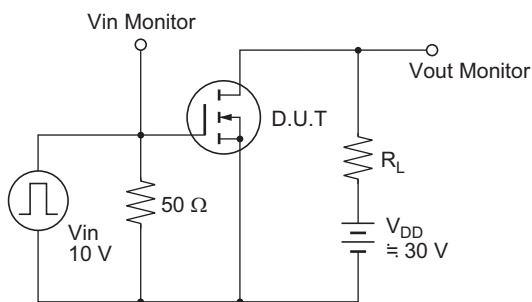
Reverse Drain Current vs.
Source to Drain Voltage



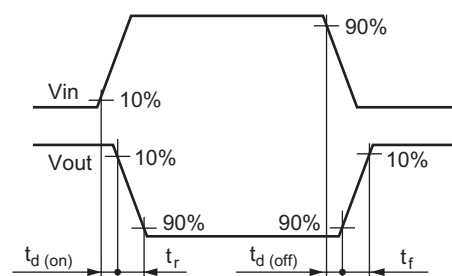
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveforms



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