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# 2SK1400, 2SK1400A

Silicon N-Channel MOS FET

# HITACHI

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## Application

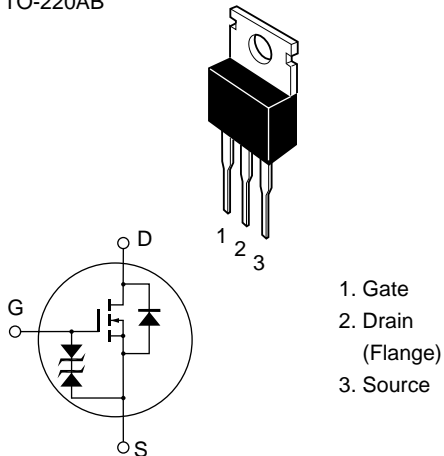
High speed power switching

## Features

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

## Outline

TO-220AB



## 2SK1400, 2SK1400A

### 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		$Pch^{*2}$	50	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

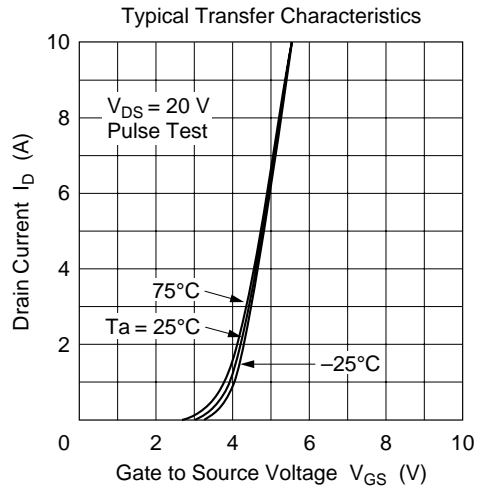
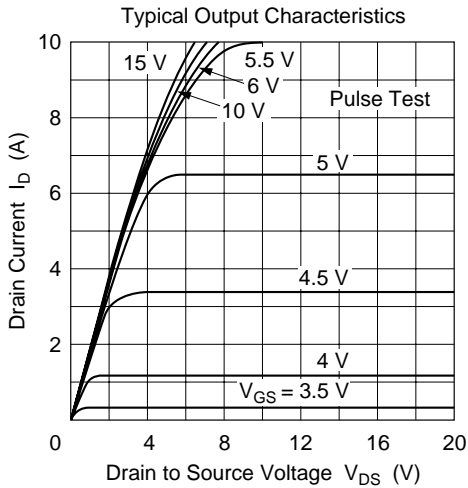
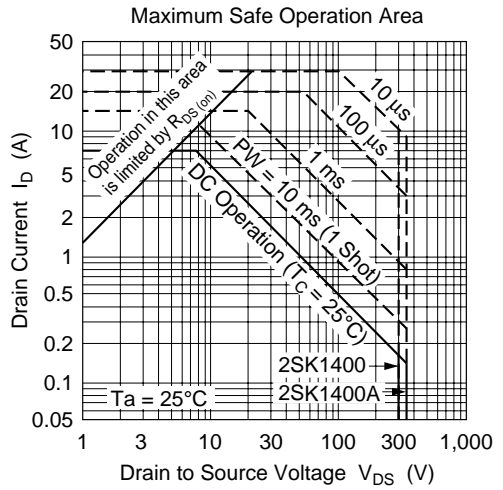
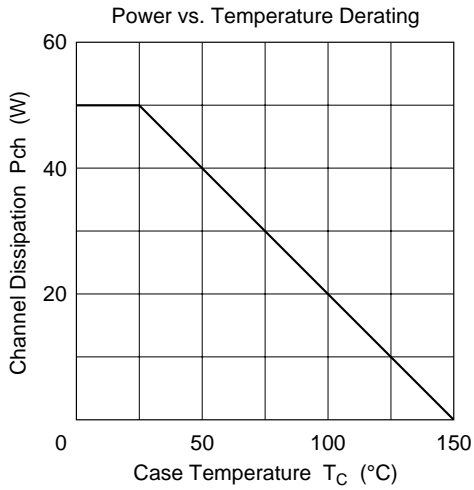
2. Value at  $T_c = 25^\circ C$

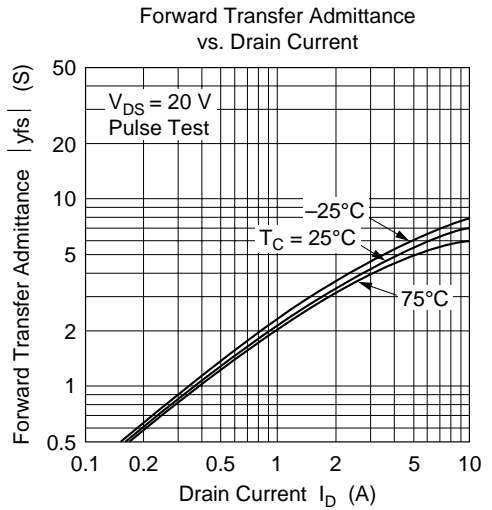
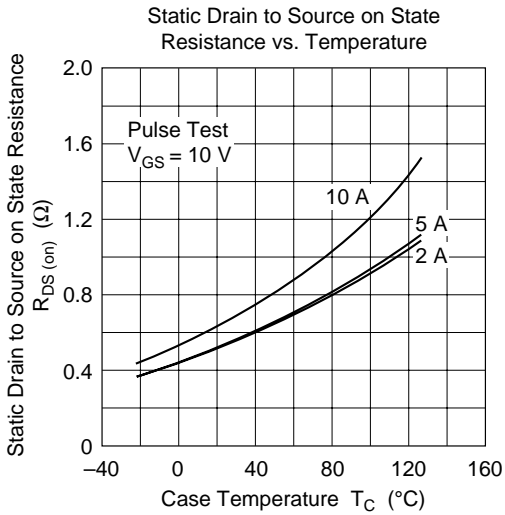
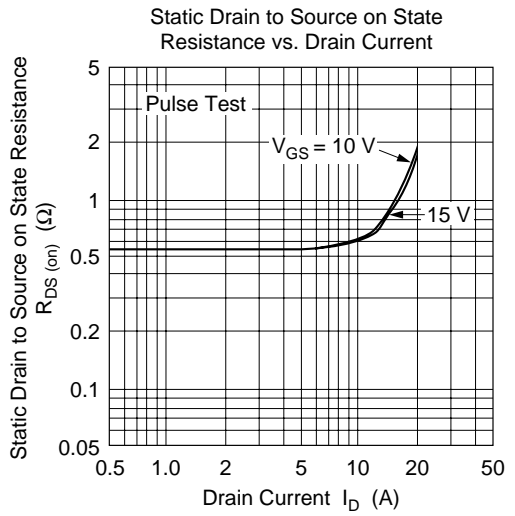
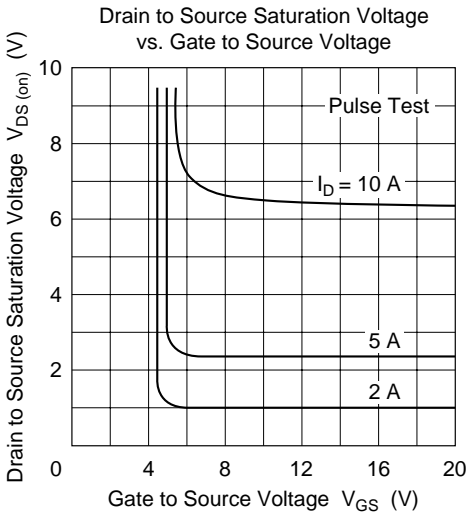
**Electrical Characteristics (Ta = 25°C)**

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	K1400 K1400A	$V_{(BR)DSS}$	300 350	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage		$V_{(BR)GSS}$	$\pm 30$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current		$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	K1400 K1400A	$I_{DSS}$	—	—	250	$\mu\text{A}$	$V_{DS} = 240 \text{ V}, V_{GS} = 0$ $V_{DS} = 280 \text{ V}, V_{GS} = 0$
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	K1400 K1400A	$R_{DS(on)}$	—	0.50 0.60	0.70 0.80	$\Omega$	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance		$ y_{fs} $	3.0	5.0	—	S	$I_D = 4 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance		$C_{iss}$	—	635	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance		$C_{oss}$	—	230	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance		$C_{rss}$	—	40	—	pF	
Turn-on delay time		$t_{d(on)}$	—	10	—	ns	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time		$t_r$	—	50	—	ns	$R_L = 7.5 \text{ }\Omega$
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	$I_F = 7 \text{ A}, V_{GS} = 0,$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

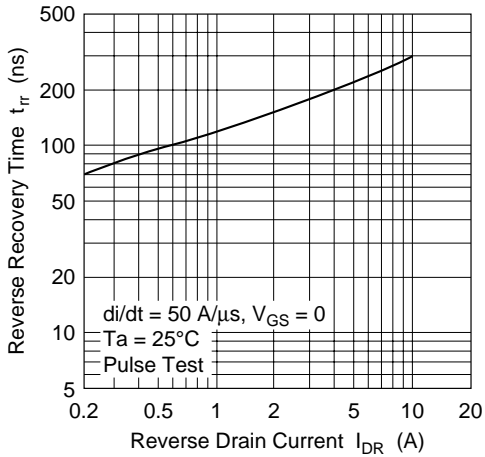
Note: 1. Pulse test

# 2SK1400, 2SK1400A

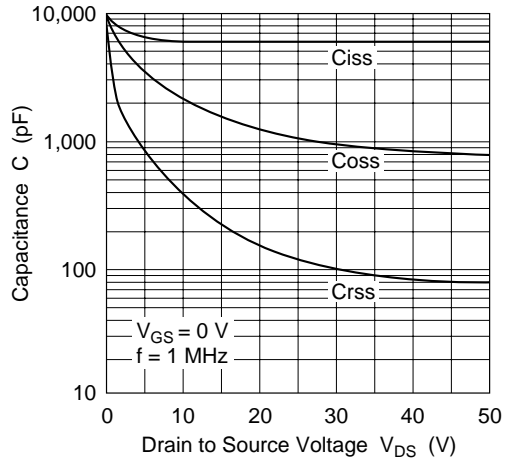




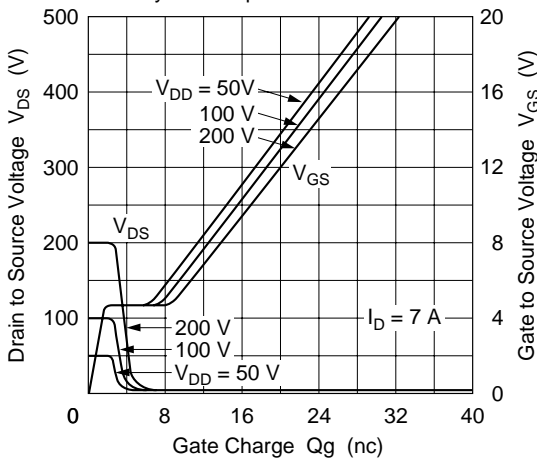
Body to Drain Diode Reverse Recovery Time



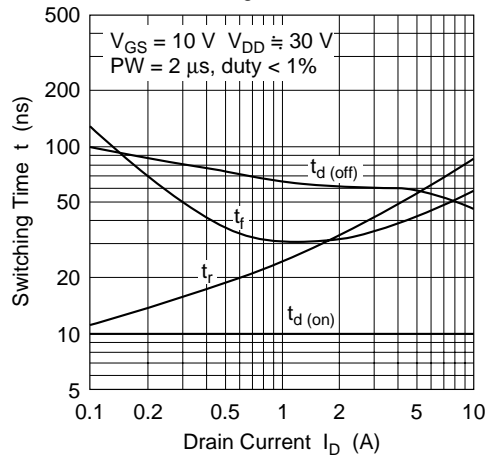
Static Drain-Source on State Resistance vs. Drain Current

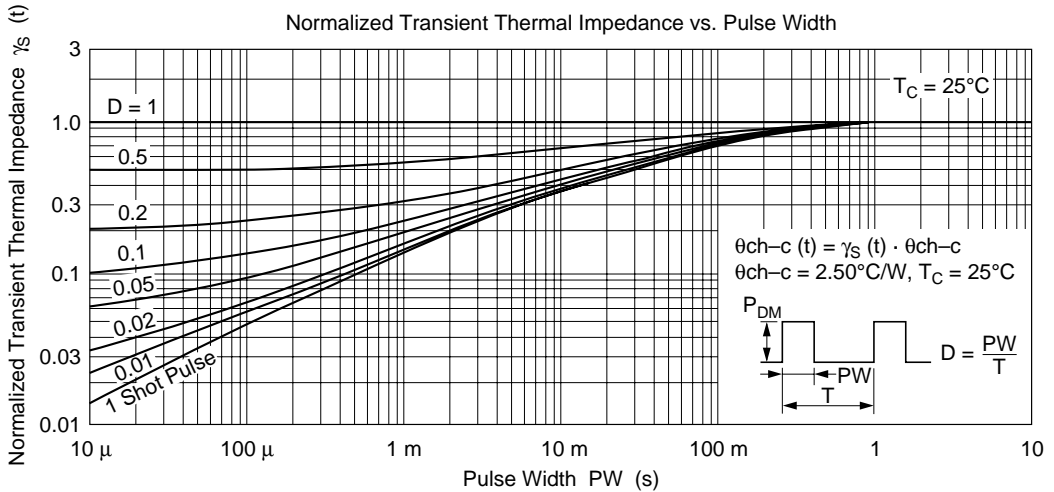
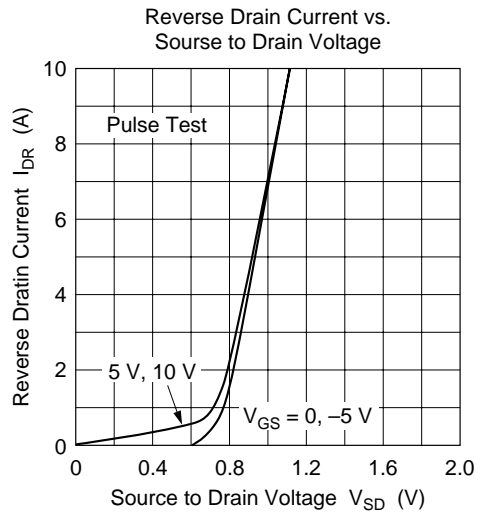


Dynamic Input Characteristics

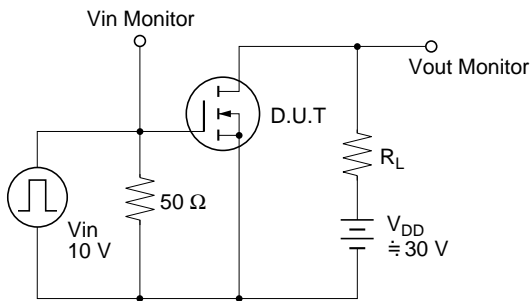


Switching Characteristics

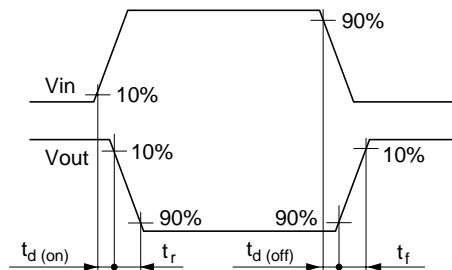


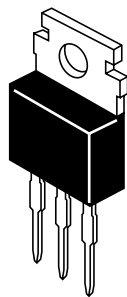
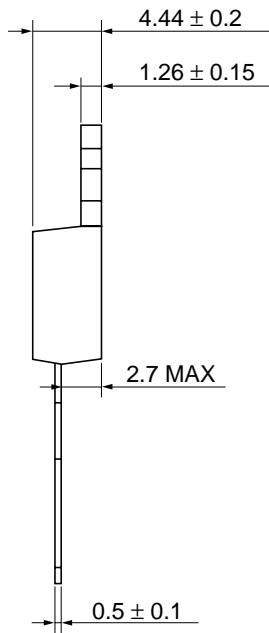
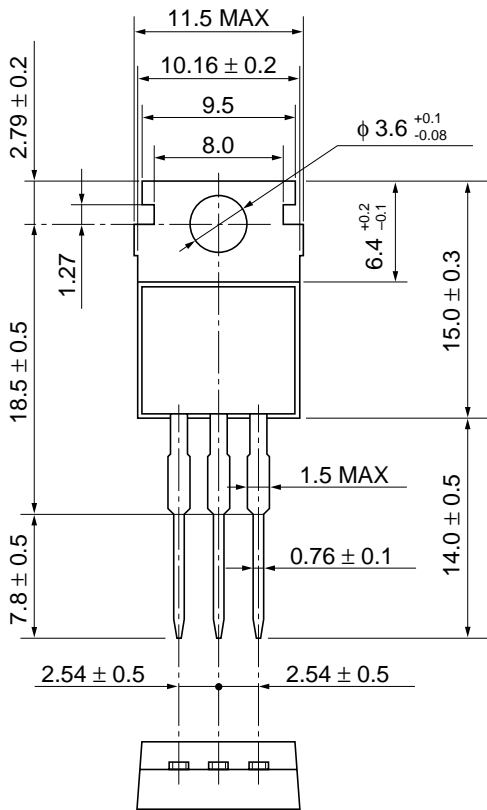


Switching Time Test Circuit



Waveforms





Hitachi Code	TO-220AB
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.8 g



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