2SK1400, 2SK1400A

Silicon N-Channel MOS FET

HITACHI

Application

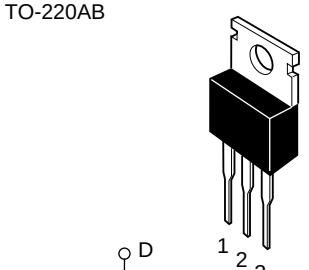
High speed power switching

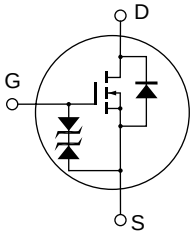
Features

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

Outline

TO-220AB





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

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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 ≤ 10 µs, duty cycle ≤ 1%
2. Value at T_C = 25°C

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Electrical Characteristics (Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	K1400	$V_{(BR)DSS}$	300	—	—	V	I_D = 10 mA, V_{GS} = 0
	K1400A		350	—	—		
Gate to source breakdown voltage		$V_{(BR)GSS}$	±30	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current		I_{GSS}	—	—	±10	µA	V_{GS} = ±25 V, V_{DS} = 0
Zero gate voltage drain current	K1400	I_{DSS}	—	—	250	µA	V_{DS} = 240 V, V_{GS} = 0
	K1400A						V_{DS} = 280 V, V_{GS} = 0
Gate to source cutoff voltage		$V_{GS(off)}$	2.0	—	3.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	K1400	$R_{DS(on)}$	—	0.50	0.70	Ω	I_D = 4 A, V_{GS} = 10 V *[1]
	K1400A		—	0.60	0.80		
Forward transfer admittance		|yfs|	3.0	5.0	—	S	I_D = 4 A, V_{DS} = 10 V *[1]
Input capacitance		Ciss	—	635	—	pF	V_{DS} = 10 V, V_{GS} = 0,
Output capacitance		Coss	—	230	—	pF	f = 1 MHz
Reverse transfer capacitance		Crss	—	40	—	pF	
Turn-on delay time		$t_{d(on)}$	—	10	—	ns	I_D = 4 A, V_{GS} = 10 V,
Rise time		t_r	—	50	—	ns	R_L = 7.5 Ω
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 A, V_{GS} = 0
Body to drain diode reverse recovery time		t_{rr}	—	240	—	ns	I_F = 7 A, V_{GS} = 0, di_F/dt = 100 A/µs

Note: 1. Pulse test

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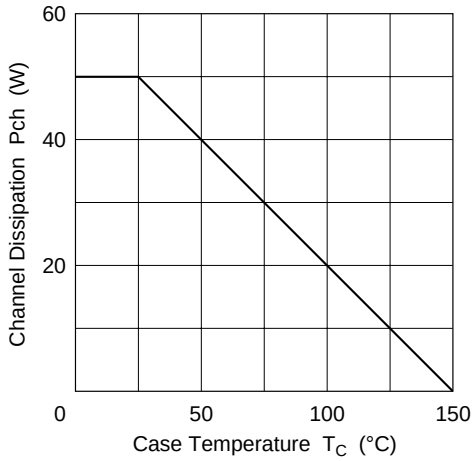
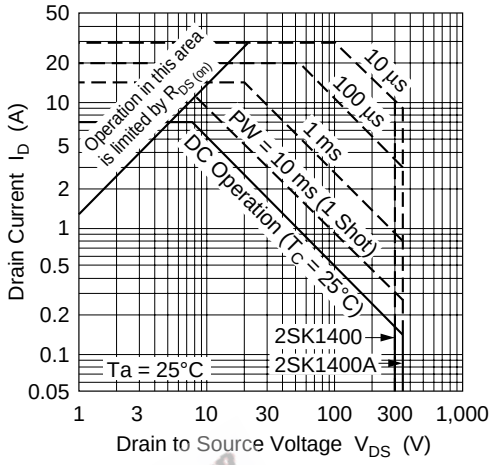
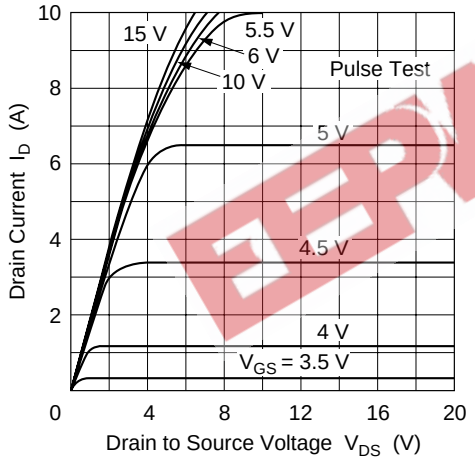
Power vs. Temperature Derating



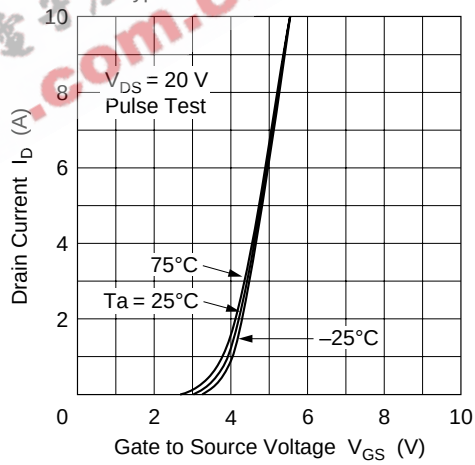
Maximum Safe Operation Area



Typical Output Characteristics



Typical Transfer Characteristics



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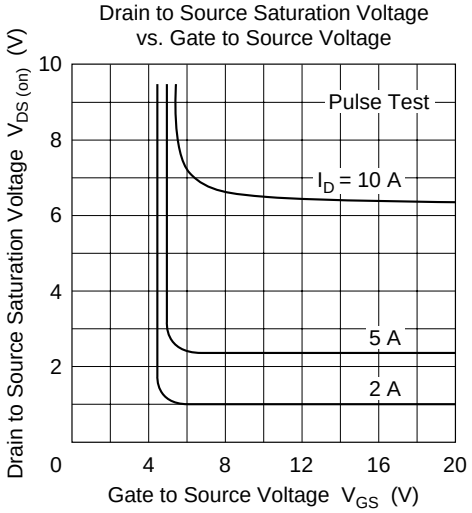
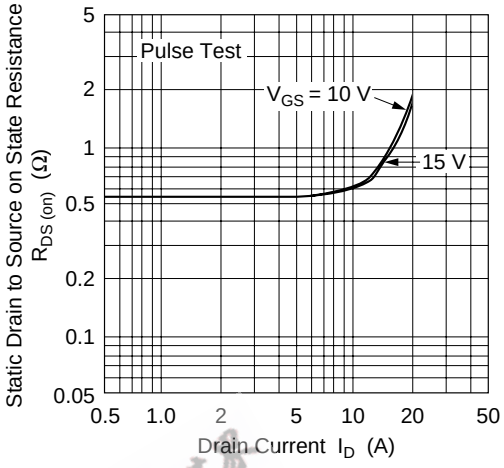
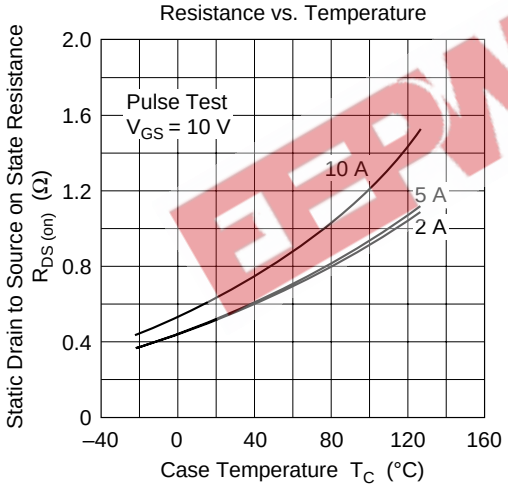
Drain to Source Saturation Voltage vs. Gate to Source Voltage



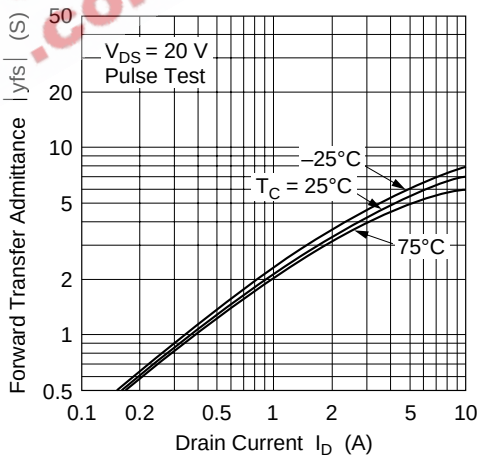
Static Drain to Source on State Resistance vs. Drain Current



Static Drain to Source on State Resistance vs. Temperature



Forward Transfer Admittance vs. Drain Current



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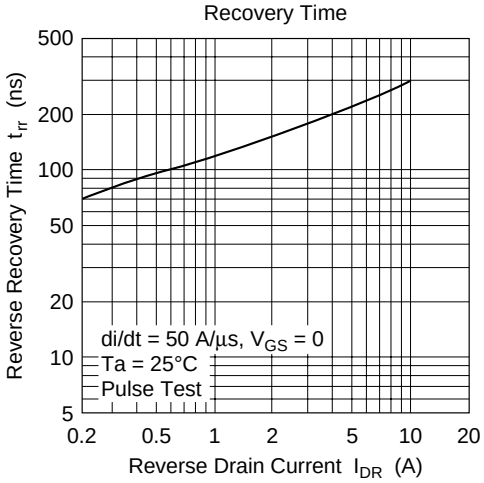
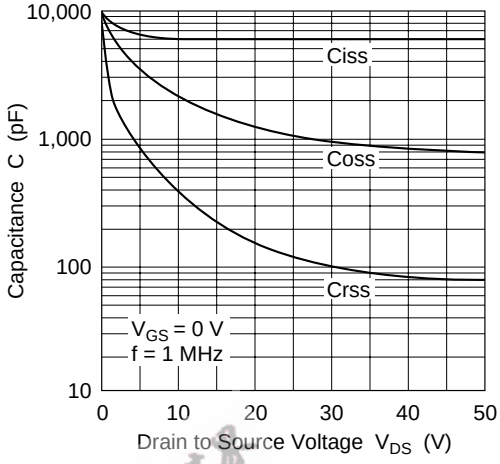
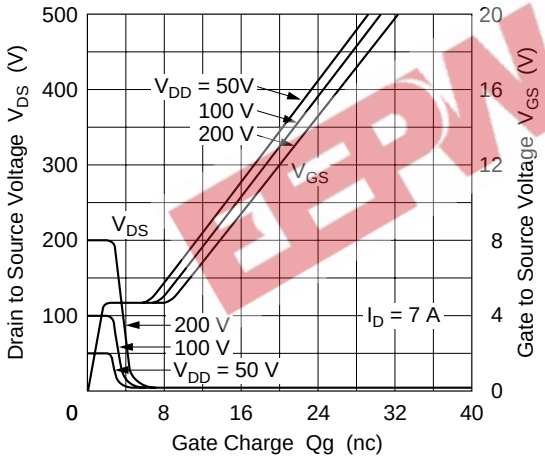
Body to Drain Diode Reverse Recovery Time



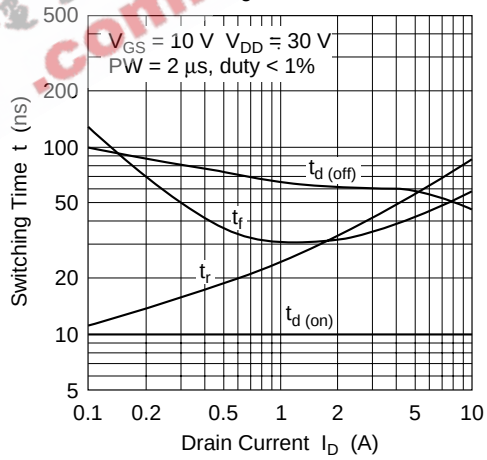
Static Drain-Source on State Resistance vs. Drain Current



Dynamic Input Characteristics



Switching Characteristics



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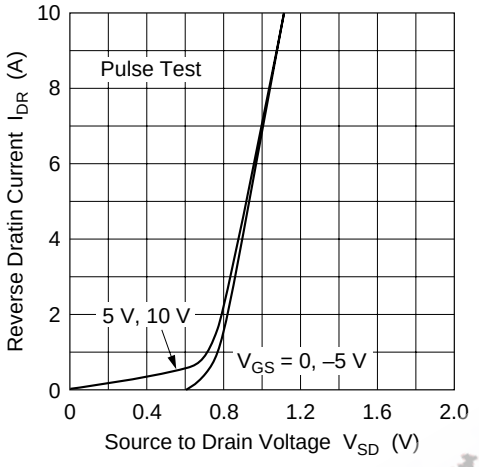
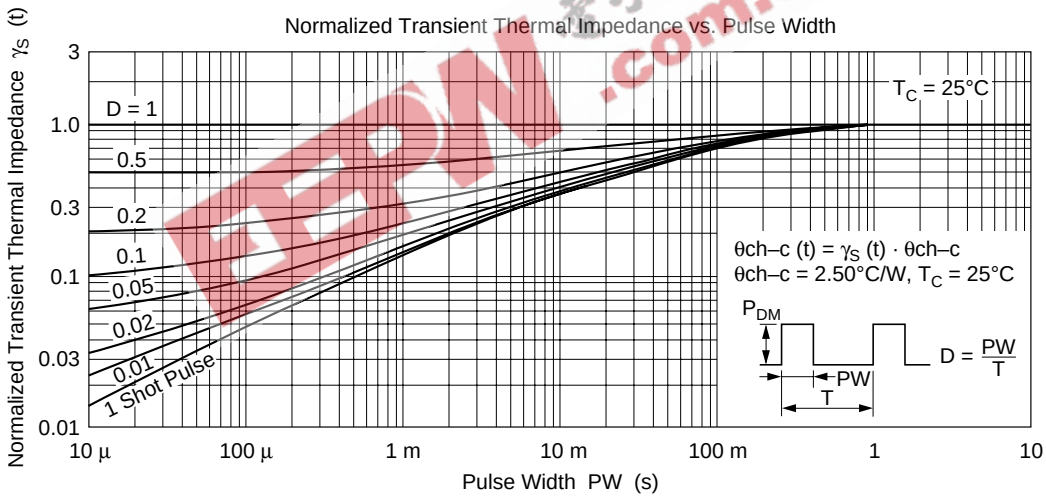
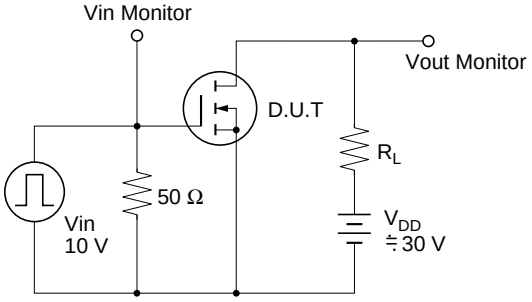
Reverse Drain Current vs.
Sourse to Drain Voltage



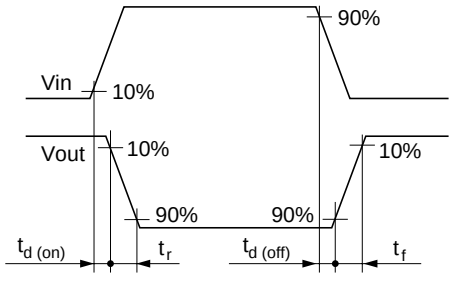
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveforms



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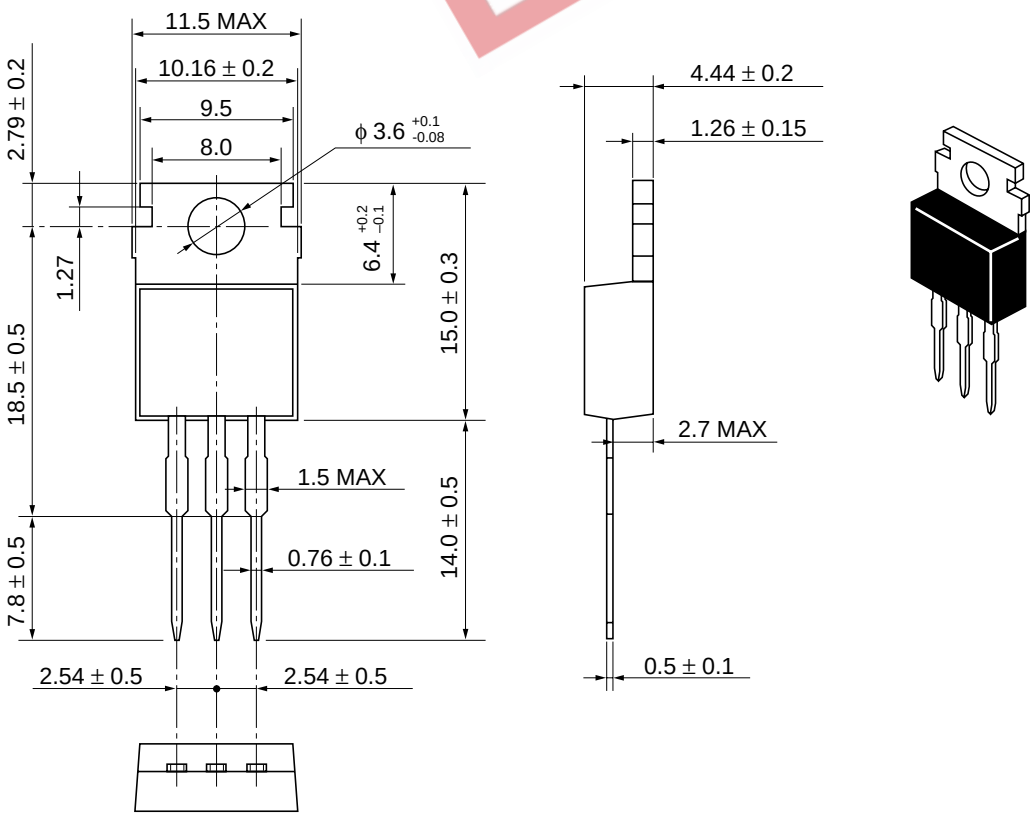
Unit: mm



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

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