
2SK1403, 2SK1403A

Silicon N-Channel MOS FET

HITACHI

Application

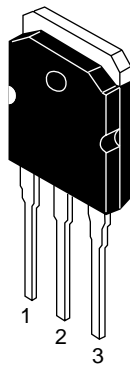
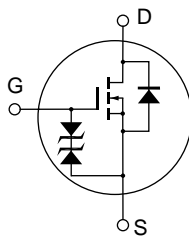
High speed power switching

Features

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

Outline

TO-3P



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	2SK1403	V_{DSS}	600	V
	2SK1403A		650	
Gate to source voltage		V_{GSS}	±30	V
Drain current		I_D	8	A
Drain peak current		$I_{D(pulse)}^{*1}$	32	A
Body to drain diode reverse drain current		I_{DR}	8	A
Channel dissipation		Pch^{*2}	100	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

Notes: 1. PW 10 μs, duty cycle 1%

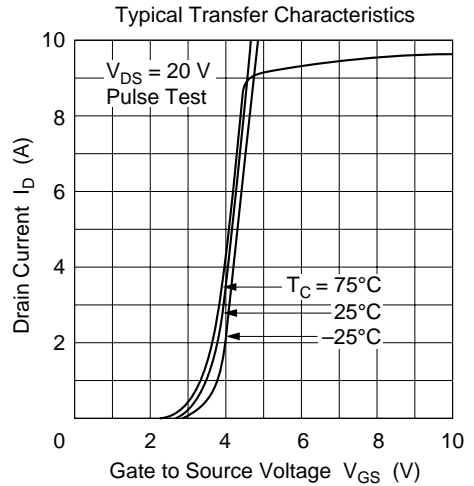
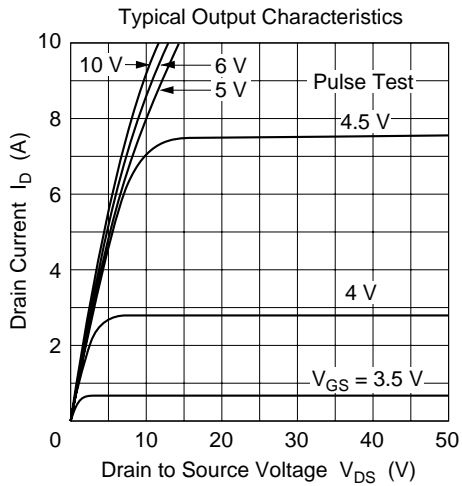
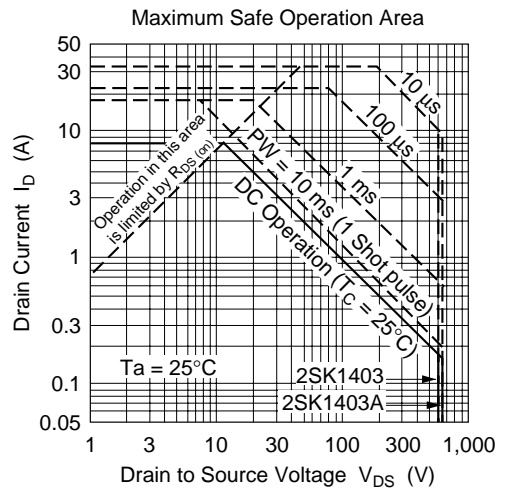
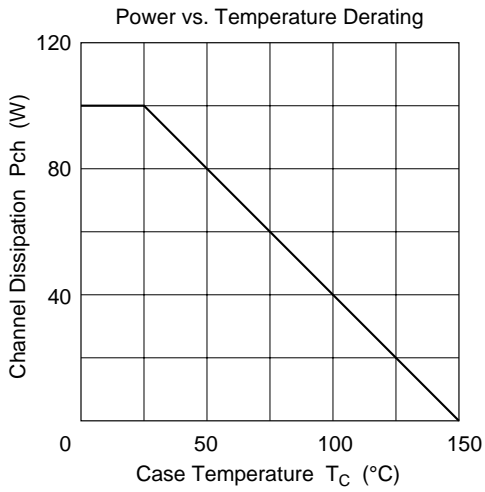
2. Value at T_c = 25°C

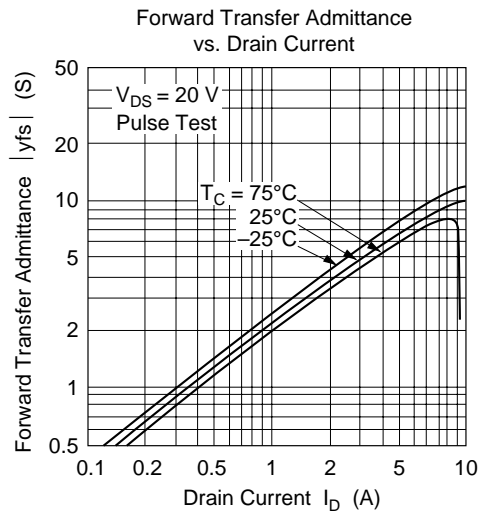
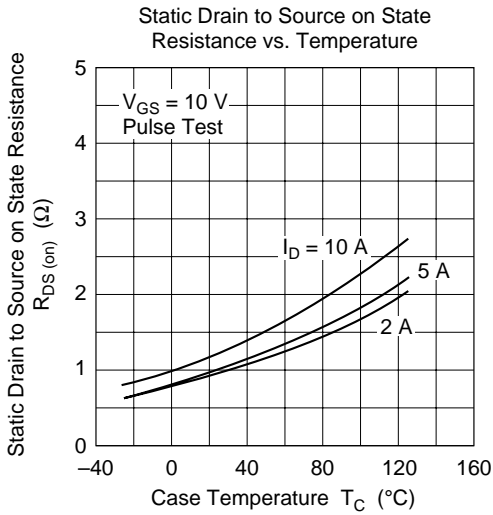
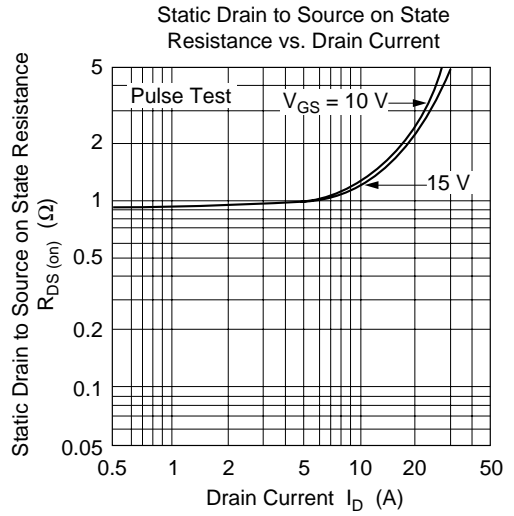
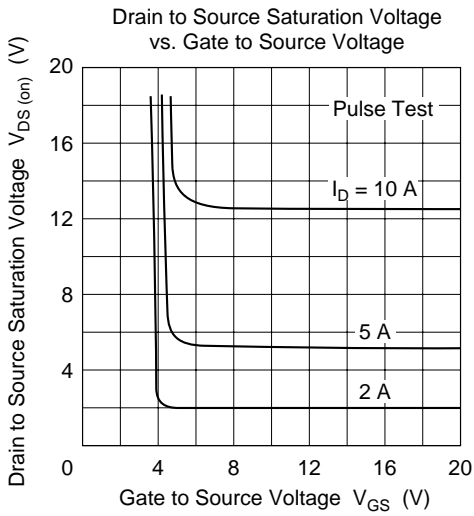
Electrical Characteristics (Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	K1403 K1403A	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage		$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$
Gate to source leak current		I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	K1403 K1403A	I_{DSS}	—	—	250	μA	$V_{DS} = 500 \text{ V}, V_{GS} = 0$ $V_{DS} = 550 \text{ V}, V_{GS} = 0$
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	K1403 K1403A	$R_{DS(on)}$	—	0.9	1.3		$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance		yfs	4.0	6.5	—	S	$I_D = 4 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance		Ciss	—	1180	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance		Coss	—	265	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance		Crss	—	50	—	pF	
Turn-on delay time		$t_{d(on)}$	—	15	—	ns	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time		t_r	—	50	—	ns	$R_L = 7.5$
Turn-off delay time		$t_{d(off)}$	—	105	—	ns	
Fall time		t_f	—	45	—	ns	
Body to drain diode forward voltage		V_{DF}	—	0.95	—	V	$I_F = 8 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time		t_{rr}	—	420	—	ns	$I_F = 8 \text{ A}, V_{GS} = 0,$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

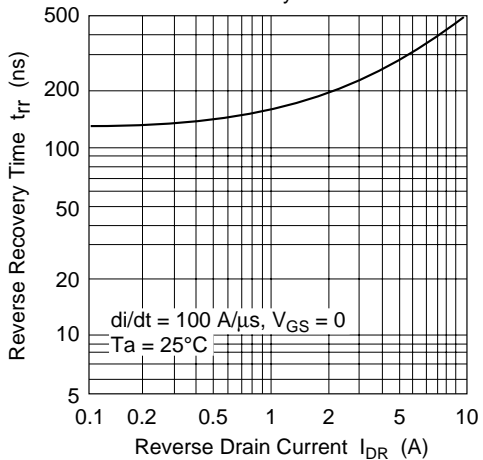
Note: 1. Pulse test

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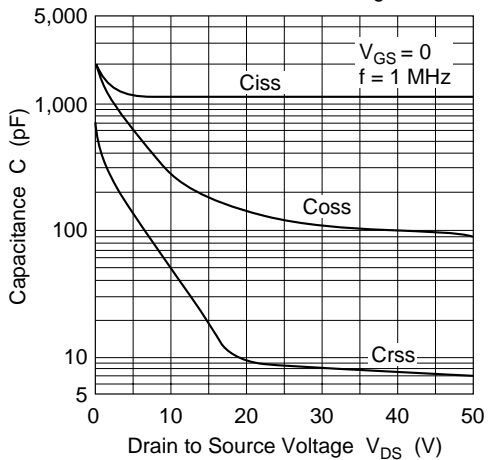




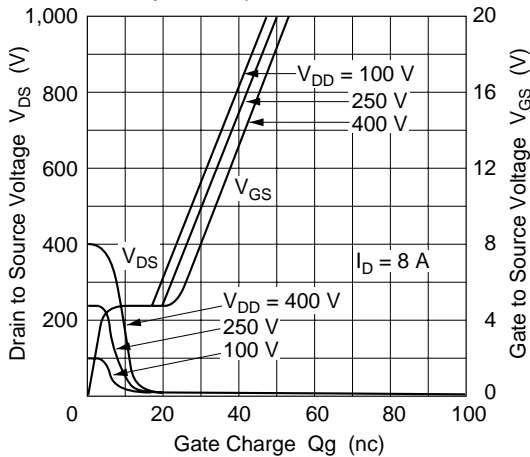
Body to Drain Diode Reverse Recovery Time



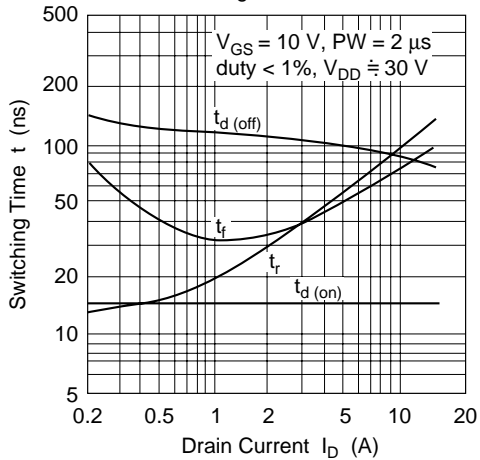
Typical Capacitance vs. Drain to Source Voltage

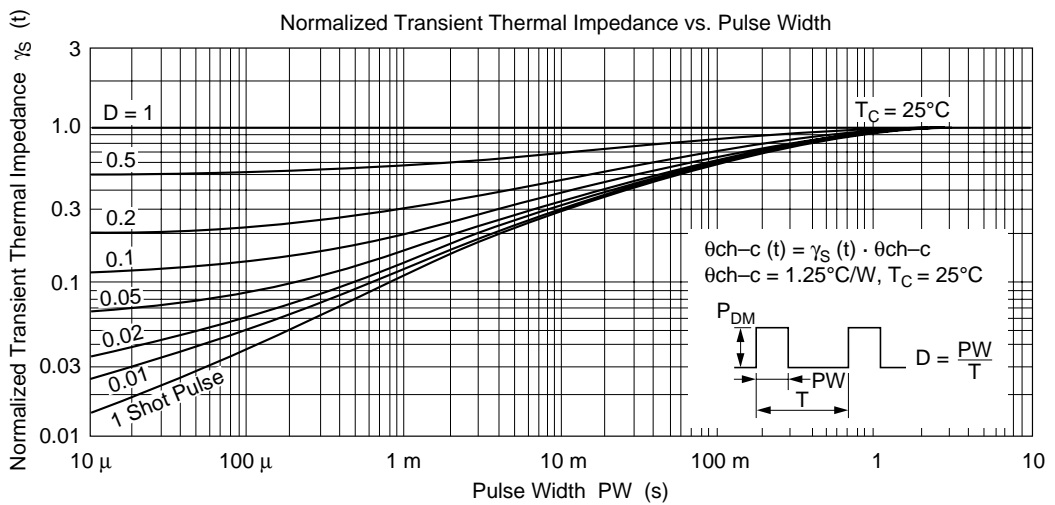
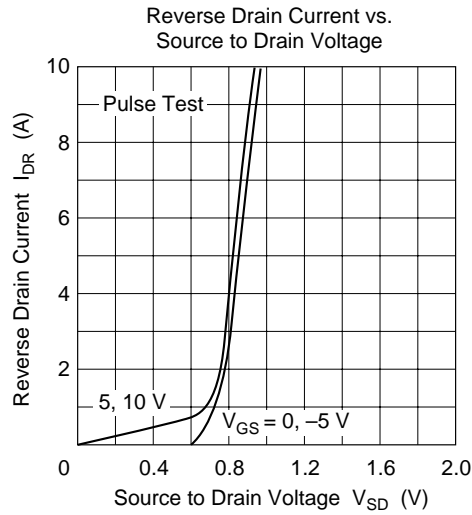


Dynamic Input Characteristics

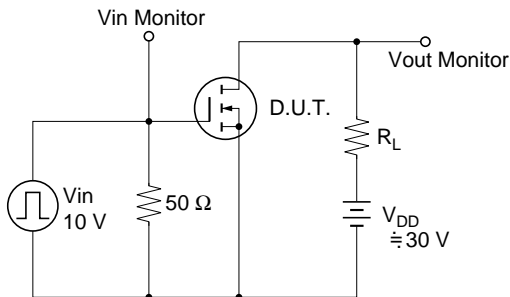


Switching Characteristics

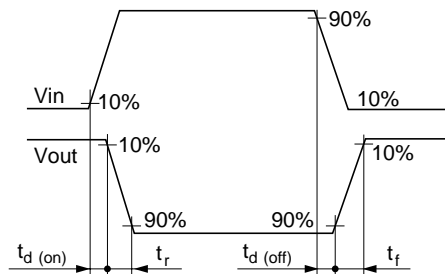




Switching Time Test Circuit



Waveforms



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