

2SK1519, 2SK1520

Silicon N-Channel MOS FET

HITACHI

November 1996

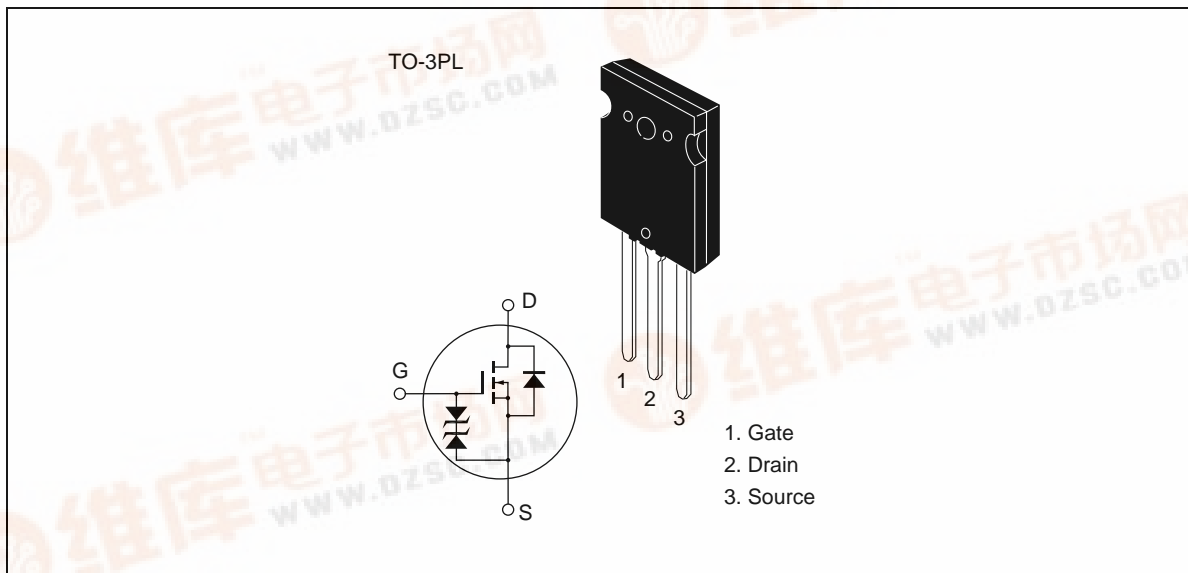
Application

High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- Built-in fast recovery diode ($t_r = 90 \text{ ns}$)
- Suitable for motor control, switching regulator, DC-DC converter

Outline



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Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1519	V_{DSS}	450	V
	2SK1520		500	
Gate to source voltage		V_{GSS}	±30	V
Drain current		I_D	30	A
Drain peak current		$I_{D(pulse)}^{*1}$	120	A
Body to drain diode reverse drain current		I_{DR}	30	A
Channel dissipation		Pch^{*2}	200	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

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

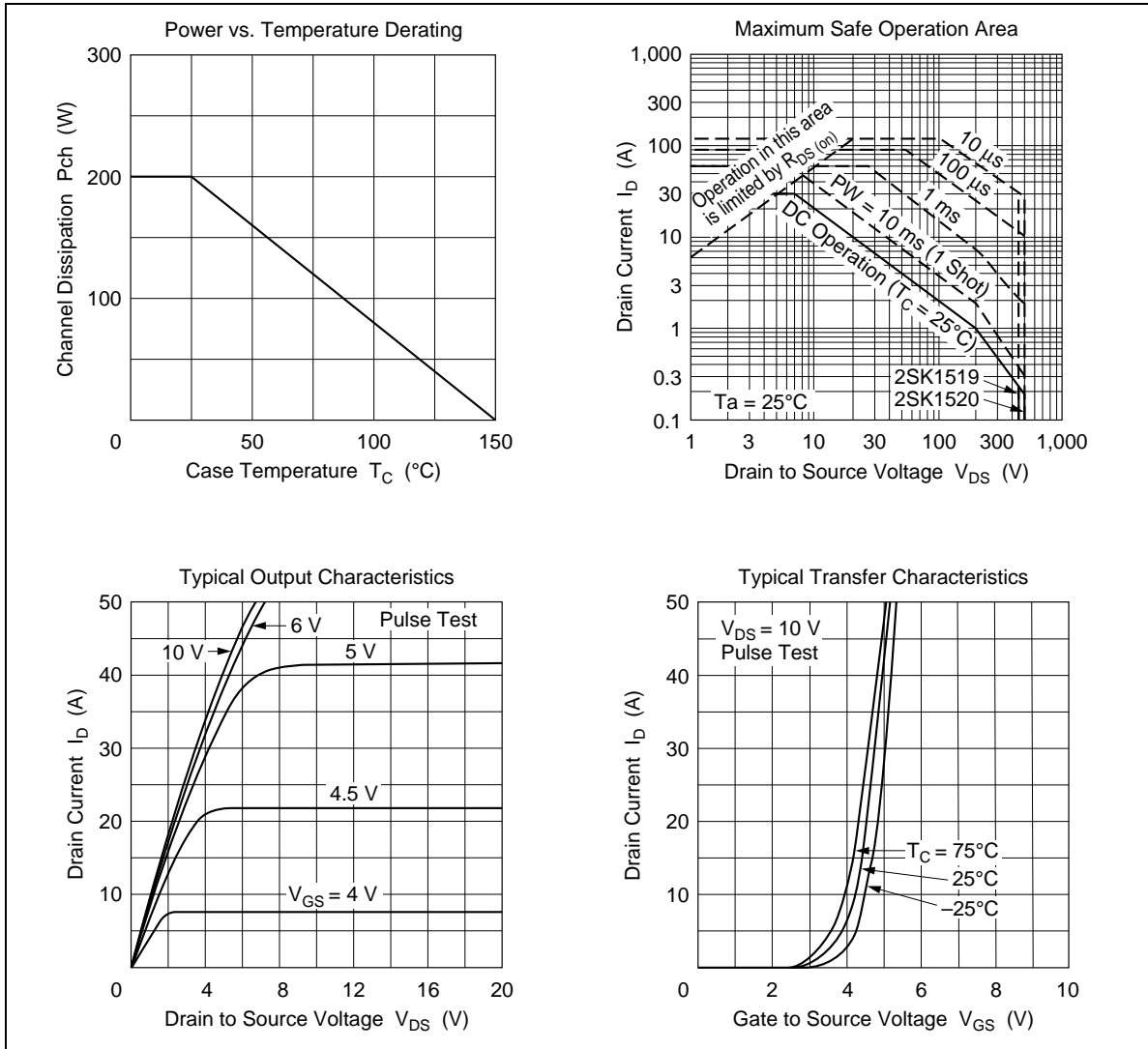
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Electrical Characteristics (Ta = 25°C)

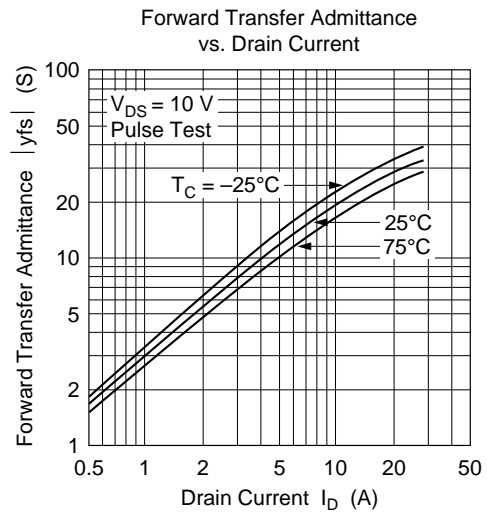
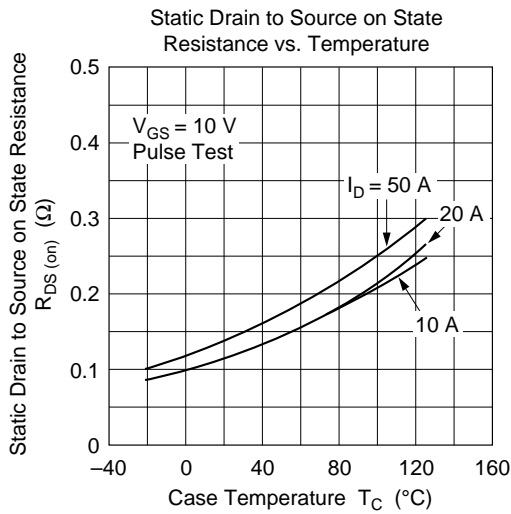
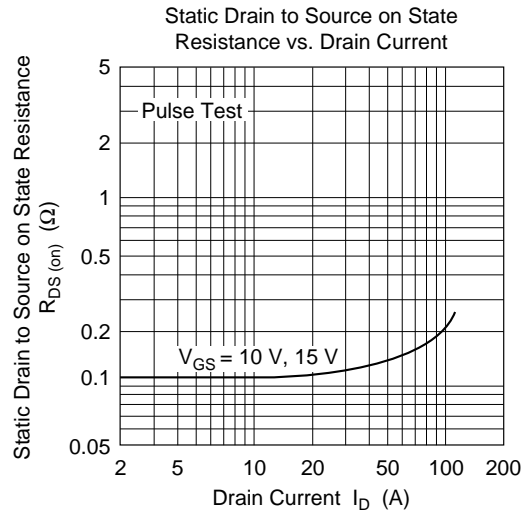
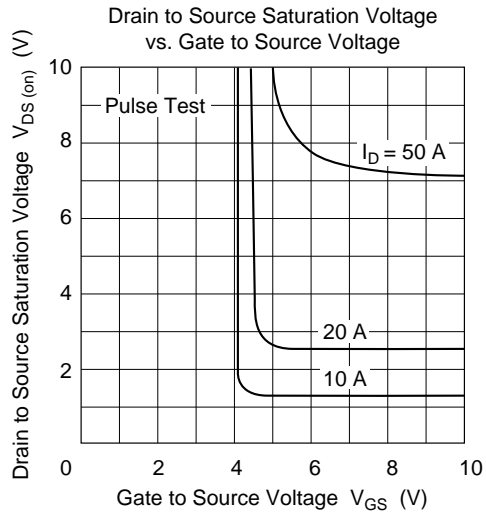
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1519 $V_{(BR)DSS}$ 2SK1520	450 500	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	2SK1519 I_{DSS} 2SK1520	—	—	250	μA	$V_{DS} = 360 \text{ V}$, $V_{GS} = 0$ $V_{DS} = 400 \text{ V}$, $V_{GS} = 0$
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	2SK1519 $R_{DS(on)}$ 2SK1520	—	0.11 0.12	0.15 0.16	Ω	$I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	yfs	15	25	—	S	$I_D = 15 \text{ A}$, $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	Ciss	—	5800	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$,
Output capacitance	Coss	—	1550	—	pF	f = 1 MHz
Reverse transfer capacitance	Crss	—	170	—	pF	
Turn-on delay time	$t_{d(on)}$	—	65	—	ns	$I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$,
Rise time	t_r	—	170	—	ns	$R_L = 2 \Omega$
Turn-off delay time	$t_{d(off)}$	—	415	—	ns	
Fall time	t_f	—	200	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.1	—	V	$I_F = 30 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	120	—	ns	$I_F = 30 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note 1. Pulse test

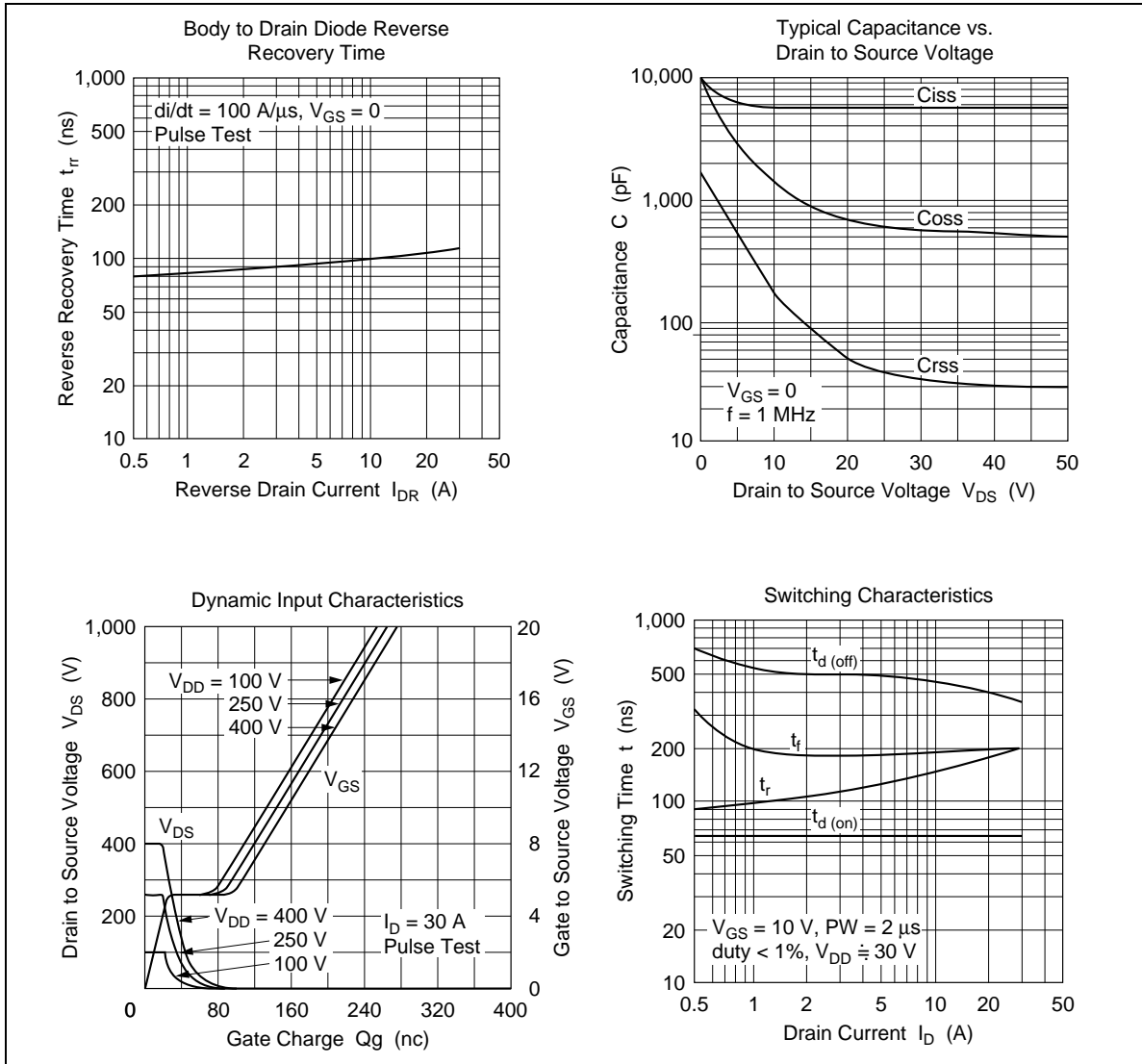
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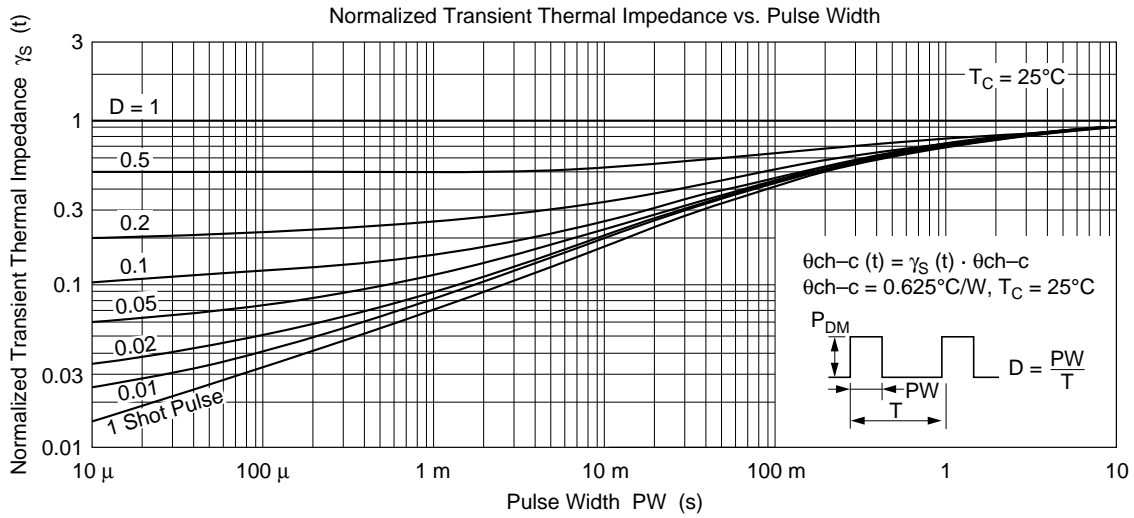
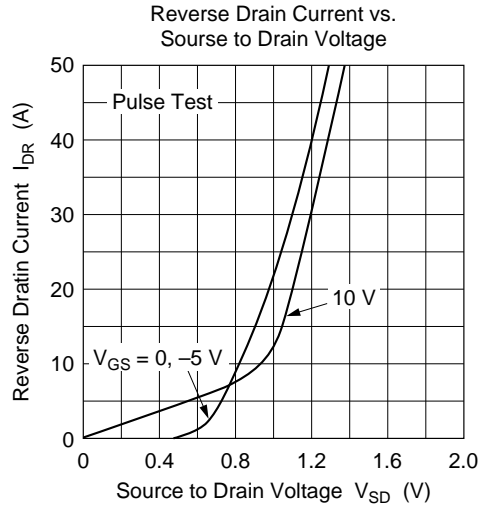


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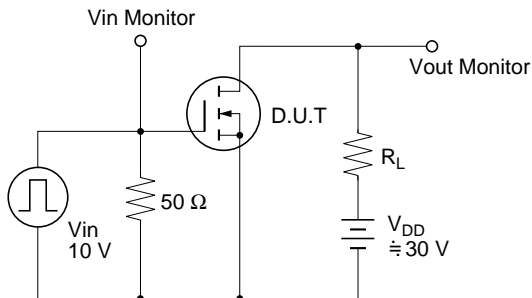


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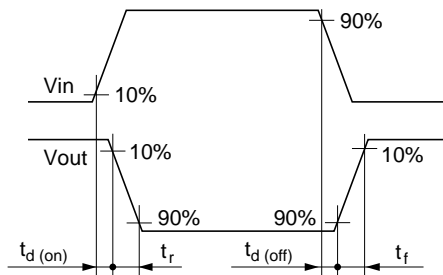




Switching Time Test Circuit



Waveforms



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