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# 2SK1517, 2SK1518

Silicon N-Channel MOS FET

# HITACHI

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## Application

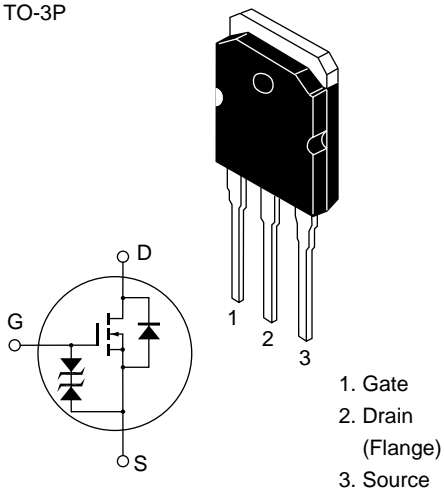
High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- Built-in fast recovery diode ( $t_{rr} = 120$  ns)
- Suitable for motor control, switching regulator, DC-DC converter

## Outline

TO-3P



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## 2SK1517, 2SK1518

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### Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1517	$V_{DSS}$	450	V
	2SK1518		500	
Gate to source voltage		$V_{GSS}$	±30	V
Drain current		$I_D$	20	A
Drain peak current		$I_{D(pulse)}^{*1}$	80	A
Body to drain diode reverse drain current		$I_{DR}$	20	A
Channel dissipation		$Pch^{*2}$	120	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

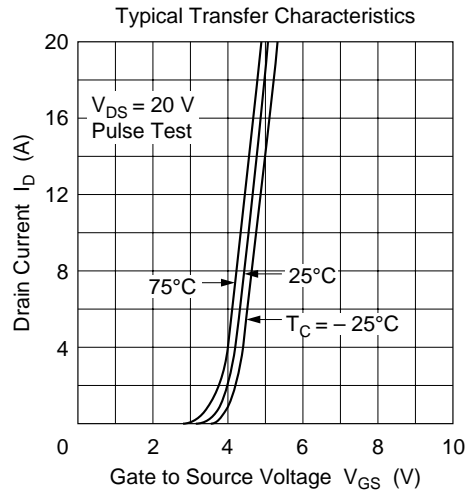
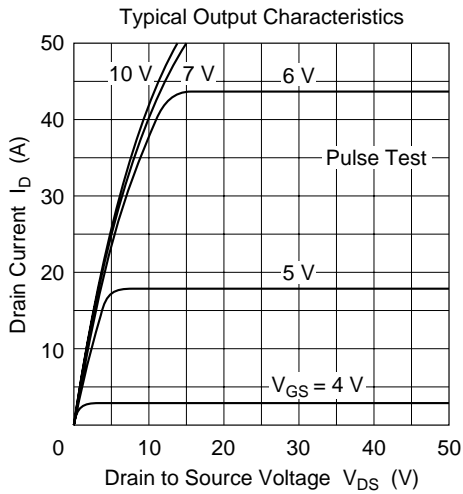
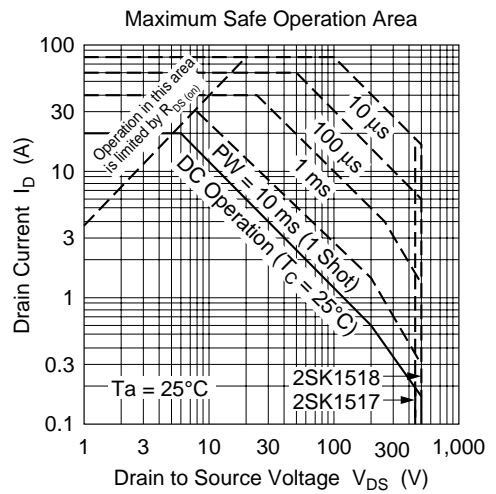
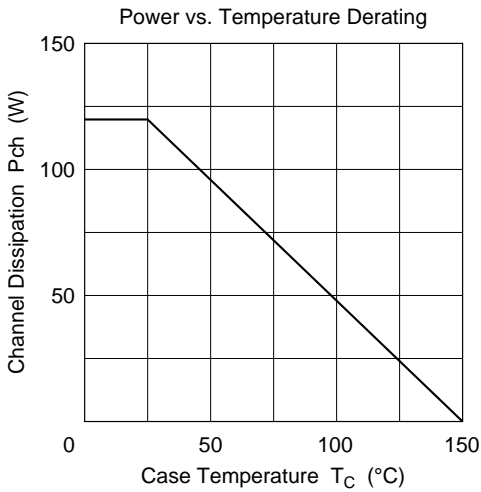
Notes: 1. PW 10 μs, duty cycle 1%

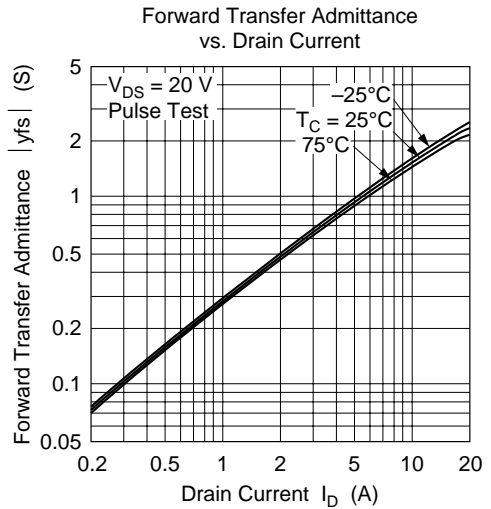
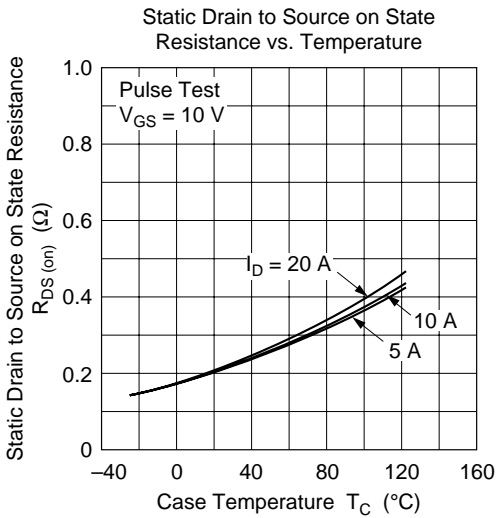
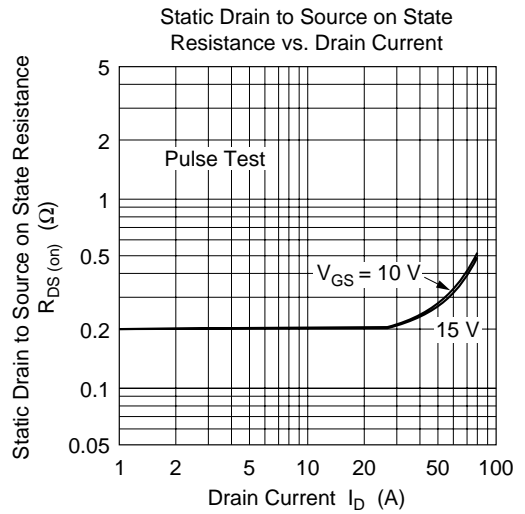
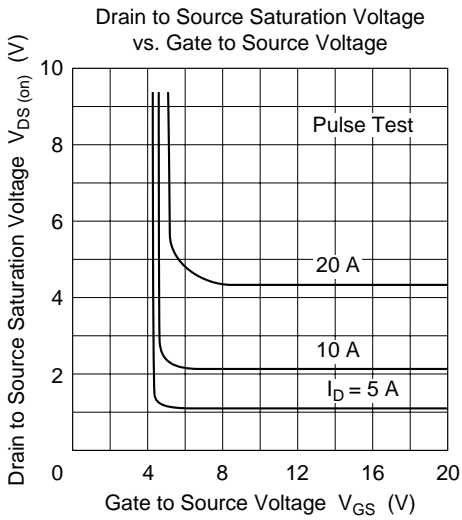
2. Value at T<sub>c</sub> = 25°C

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

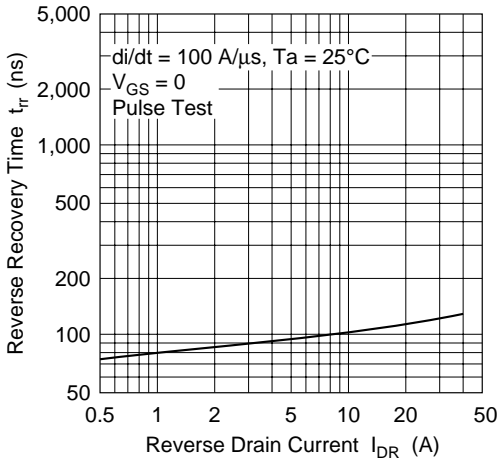
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1517 $V_{(BR)DSS}$ 2SK1518	450 500	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	2SK1517 $I_{DSS}$ 2SK1518	—	—	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	2SK1517 $R_{DS(on)}$ 2SK1518	—	0.20 0.22	0.25 0.27		$I_D = 10 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	yfs	10	16	—	S	$I_D = 10 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	Ciss	—	3050	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance	Coss	—	940	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	Crss	—	140	—	pF	
Turn-on delay time	$t_{d(on)}$	—	35	—	ns	$I_D = 10 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time	$t_r$	—	130	—	ns	$R_L = 3$
Turn-off delay time	$t_{d(off)}$	—	240	—	ns	
Fall time	$t_f$	—	105	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.0	—	V	$I_F = 20 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	120	—	ns	$I_F = 20 \text{ A}, V_{GS} = 0,$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

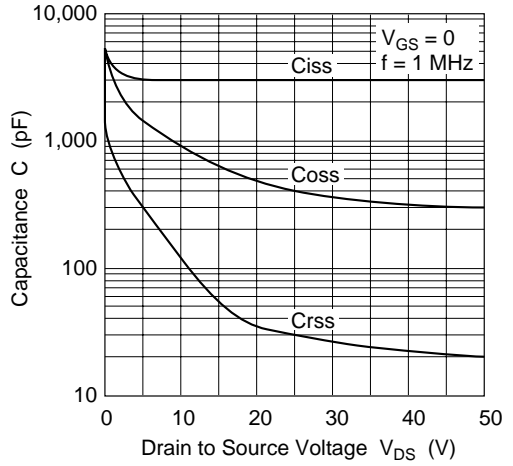




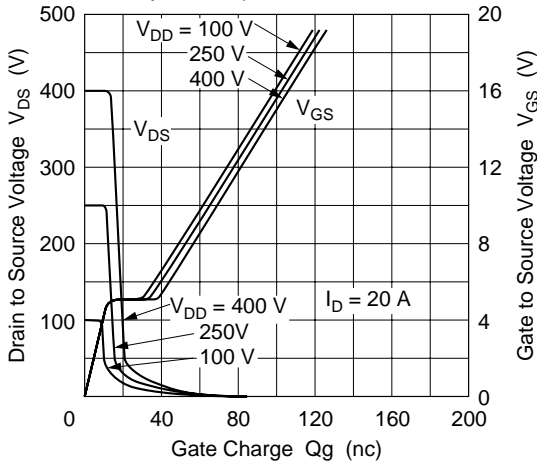
Body to Drain Diode Reverse Recovery Time



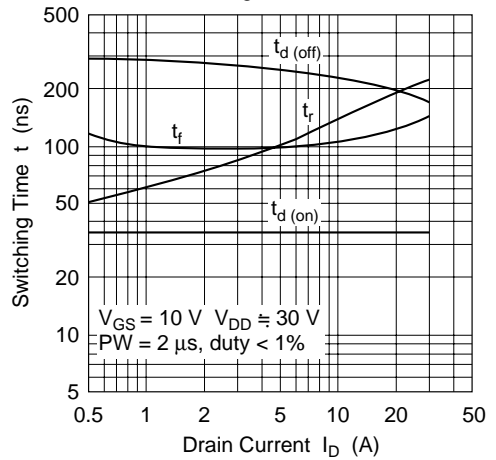
Typical Capacitance vs. Drain to Source Voltage

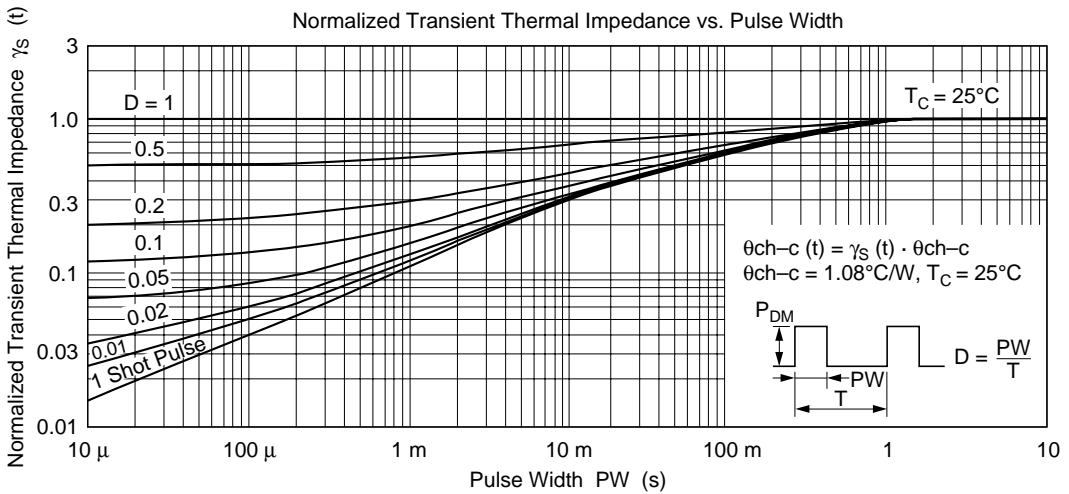
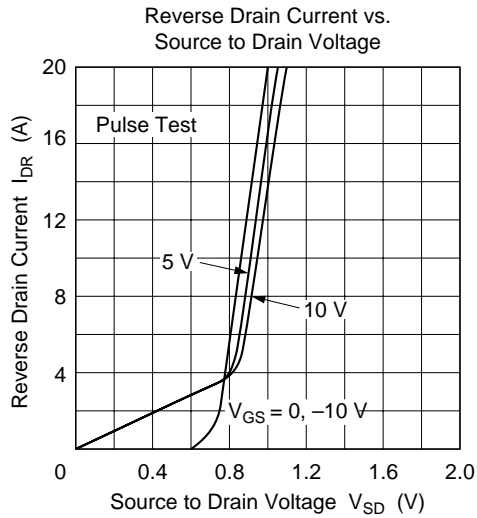


Dynamic Input Characteristics

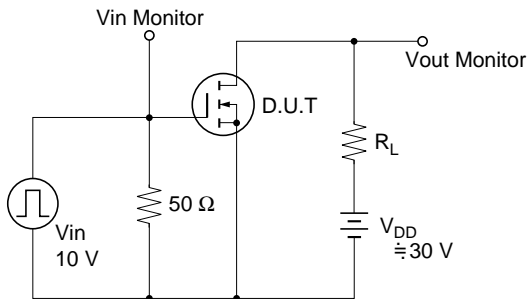


Switching Characteristics

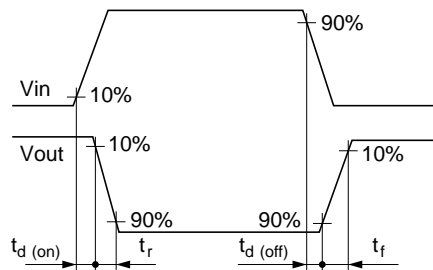




Switching Time Test Circuit



Waveforms



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