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# 2SK1521, 2SK1522

Silicon N-Channel MOS FET

# HITACHI

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## Application

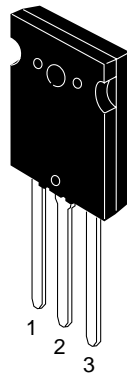
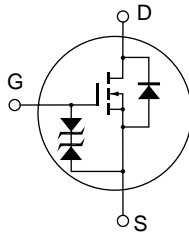
High speed power switching

## 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-3PL



1. Gate
2. Drain
3. Source

## 2SK1521, 2SK1522

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

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1521	$V_{DSS}$	450	V
	2SK1522		500	
Gate to source voltage		$V_{GSS}$	±30	V
Drain current		$I_D$	50	A
Drain peak current		$I_{D(pulse)}^{*1}$	200	A
Body to drain diode reverse drain current		$I_{DR}$	50	A
Channel dissipation		$P_{ch}^{*2}$	250	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

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

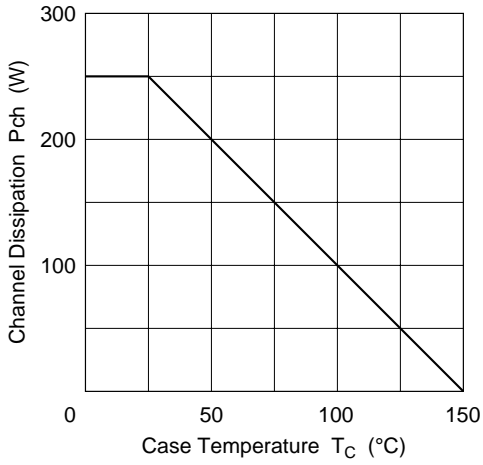
2. Value at  $T_c = 25^\circ C$

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

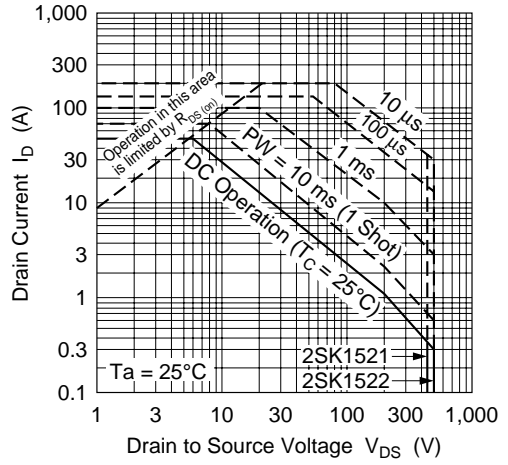
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1521 $V_{(BR)DSS}$ 2SK1522	450 500	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \text{ } \mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	2SK1521 $I_{DSS}$ 2SK1522	—	—	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	2SK1521 $R_{DS(on)}$ 2SK1522	—	0.08 0.085	0.10 0.11	Ω	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	22	35	—	S	$I_D = 25 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	8700	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance	$C_{oss}$	—	2400	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	—	235	—	pF	
Turn-on delay time	$t_{d(on)}$	—	85	—	ns	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time	$t_r$	—	250	—	ns	$R_L = 1.2 \text{ } \Omega$
Turn-off delay time	$t_{d(off)}$	—	600	—	ns	
Fall time	$t_f$	—	250	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.1	—	V	$I_F = 50 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	120	—	ns	$I_F = 50 \text{ A}, V_{GS} = 0,$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

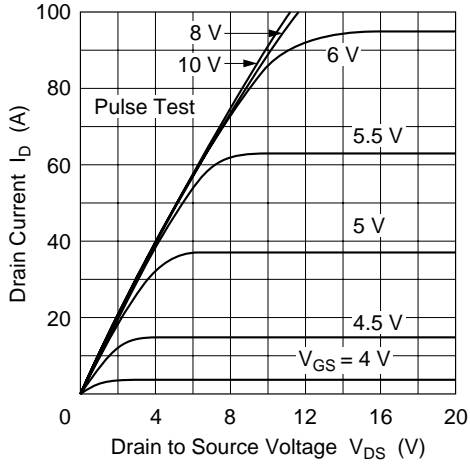
Power vs. Temperature Derating



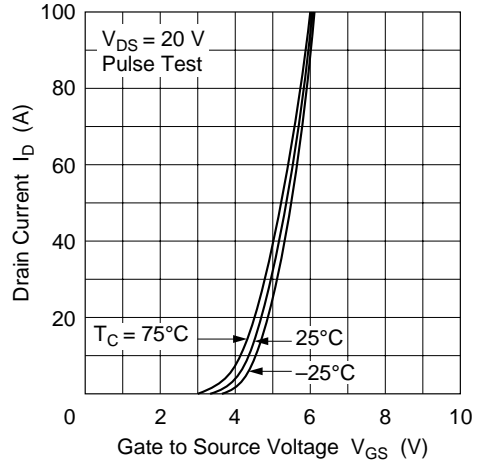
Maximum Safe Operation Area

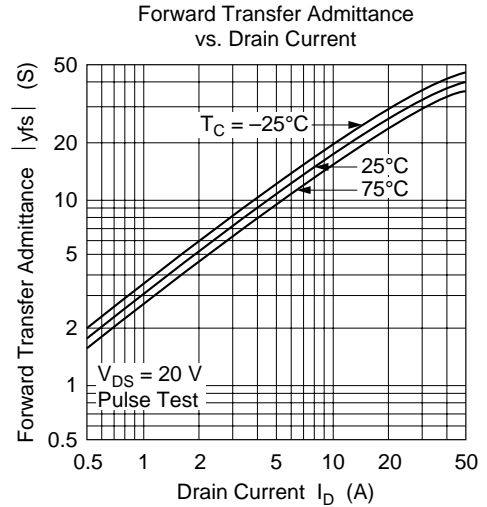
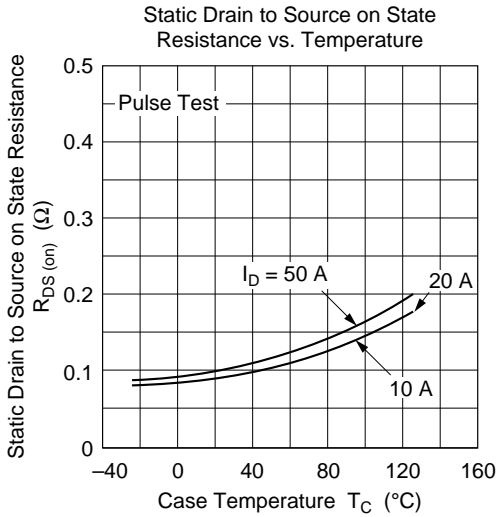
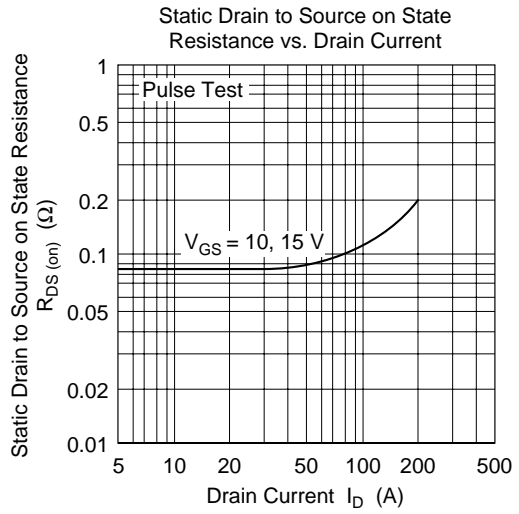
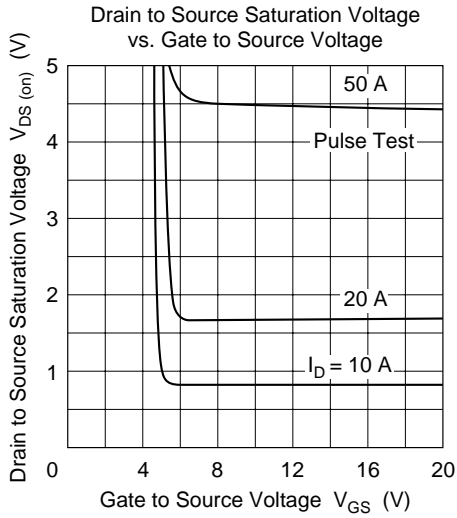


Typical Output Characteristics

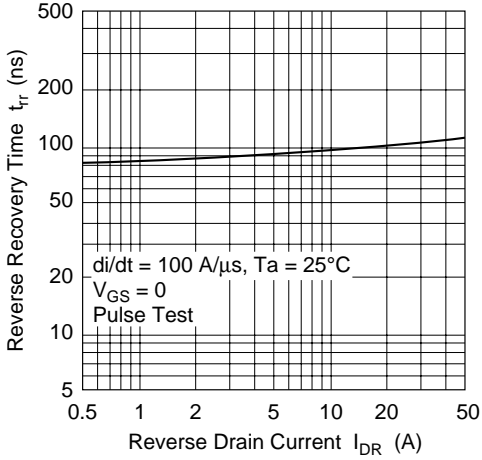


Typical Transfer Characteristics

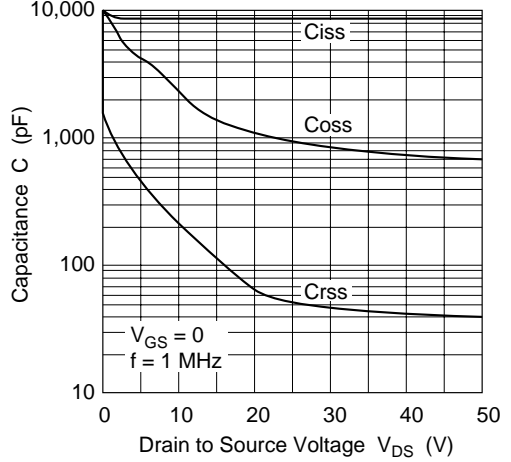




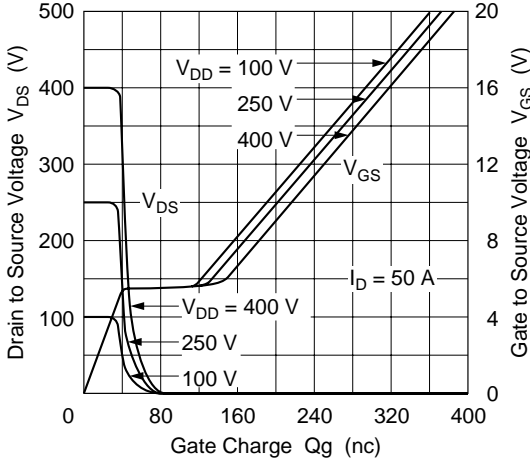
Body to Drain Diode Reverse Recovery Time



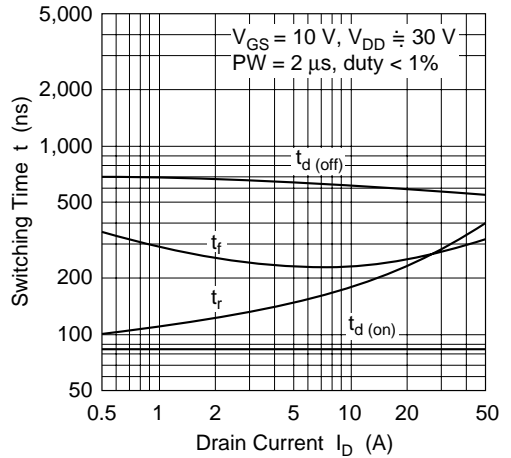
Typical Capacitance vs. Drain to Source Voltage

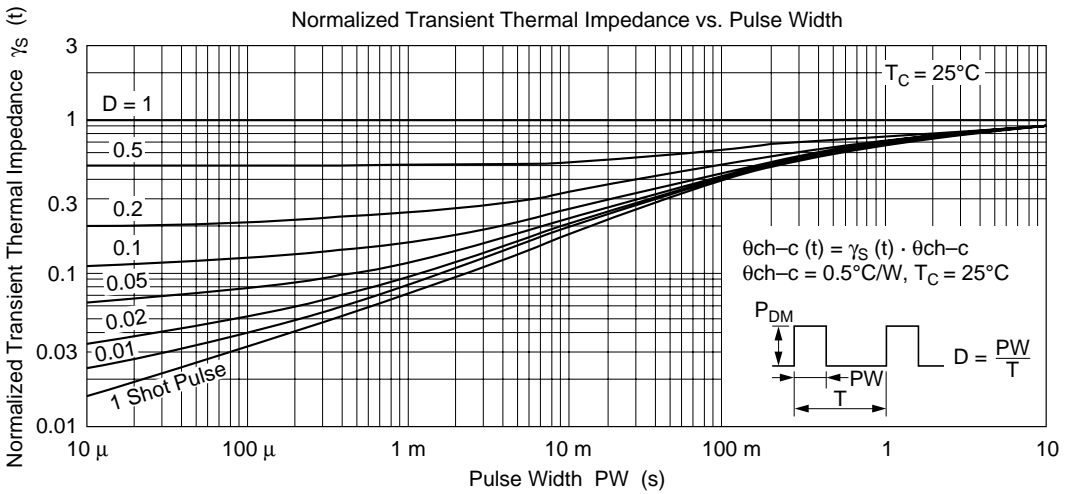
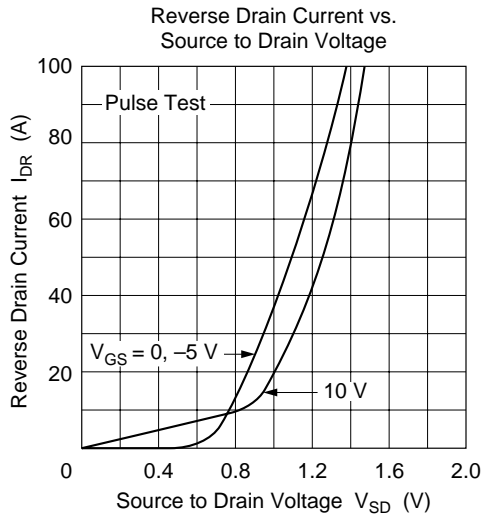


Dynamic Input Characteristics

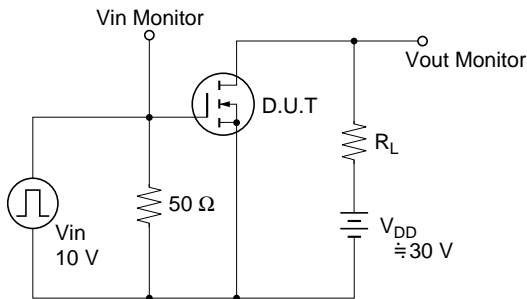


Switching Characteristics

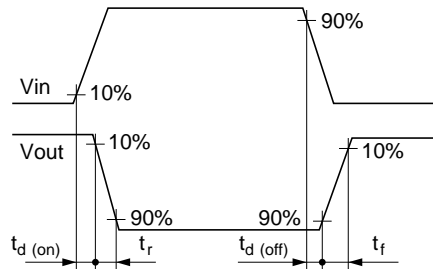


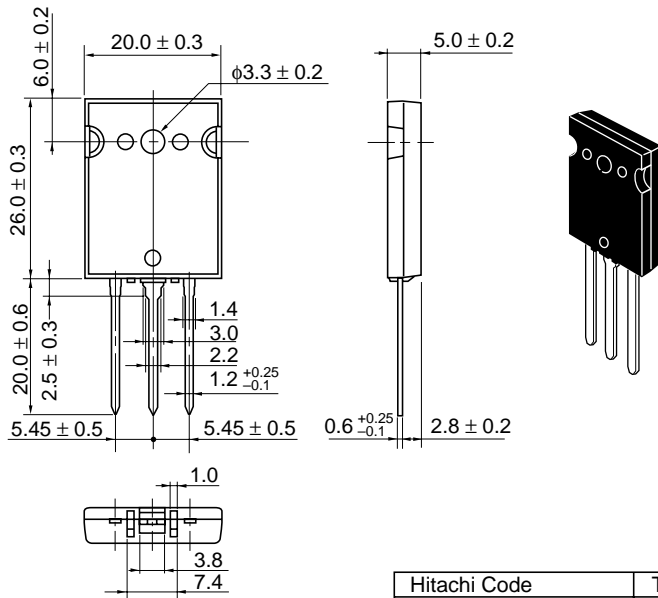


Switching Time Test Circuit



Waveforms





Hitachi Code	TO-3PL
JEDEC	—
EIAJ	—
Weight (reference value)	9.9 g



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