

# 2SK1515, 2SK1516

Silicon N-Channel MOS FET

# HITACHI

ADE-208-1286 (Z)  
1st. Edition  
Mar. 2001

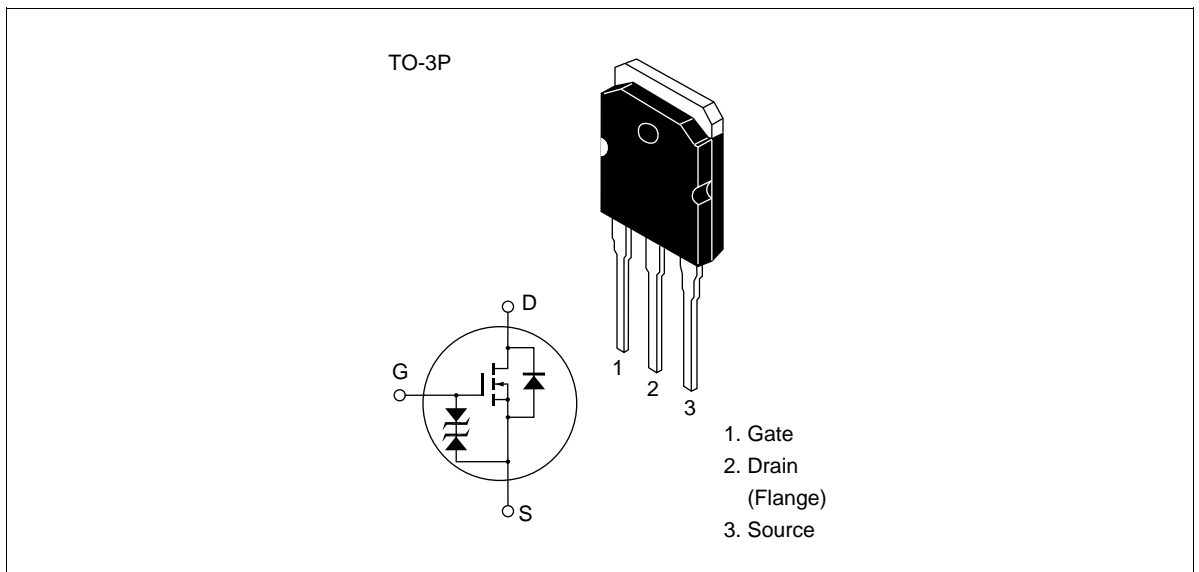
## Application

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



## 2SK1515, 2SK1516

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

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1515	$V_{DSS}$	450	V
	2SK1516		500	
Gate to source voltage		$V_{GSS}$	±30	V
Drain current		$I_D$	10	A
Drain peak current		$I_{D(pulse)}^{*1}$	30	A
Body to drain diode reverse drain current		$I_{DR}$	10	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%

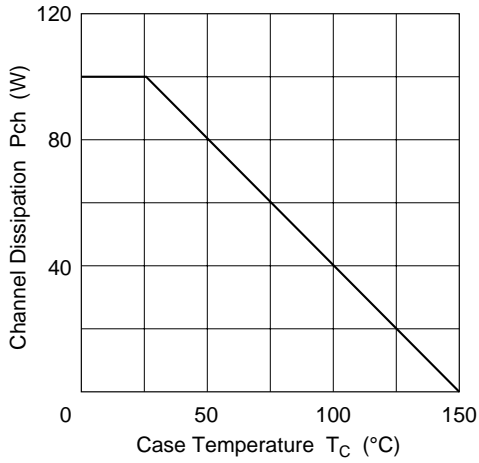
2. Value at T<sub>c</sub> = 25°C

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

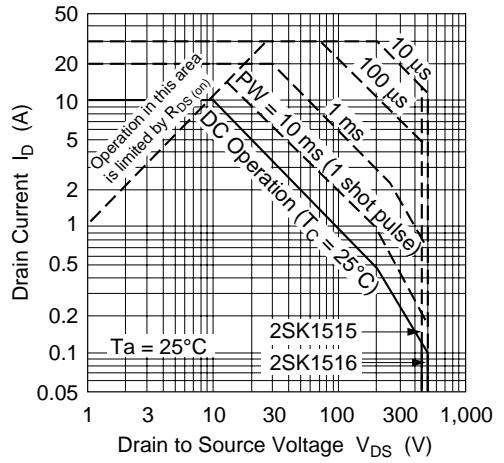
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1515 $V_{(BR)DSS}$ 2SK1516	450 500	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \text{ } \mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	2SK1515 $I_{DSS}$ 2SK1516	—	—	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	2SK1515 $R_{DS(on)}$ 2SK1516	—	0.6 0.7	0.8 0.9		$I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	yfs	4.0	7.0	—	S	$I_D = 5 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	Ciss	—	1100	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,
Output capacitance	Coss	—	310	—	pF	f = 1 MHz
Reverse transfer capacitance	Crss	—	50	—	pF	
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,
Rise time	$t_r$	—	65	—	ns	$R_L = 6$
Turn-off delay time	$t_{d(off)}$	—	95	—	ns	
Fall time	$t_f$	—	55	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.0	—	V	$I_F = 10 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	120	—	ns	$I_F = 10 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

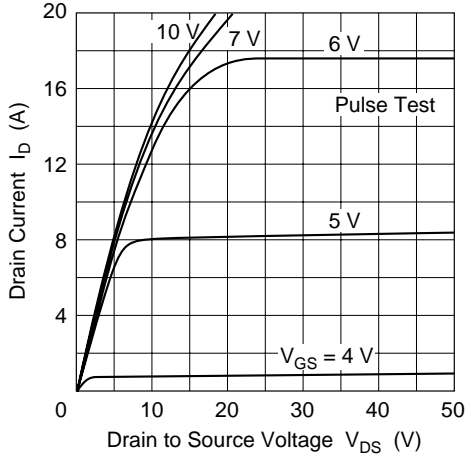
Power vs. Temperature Derating



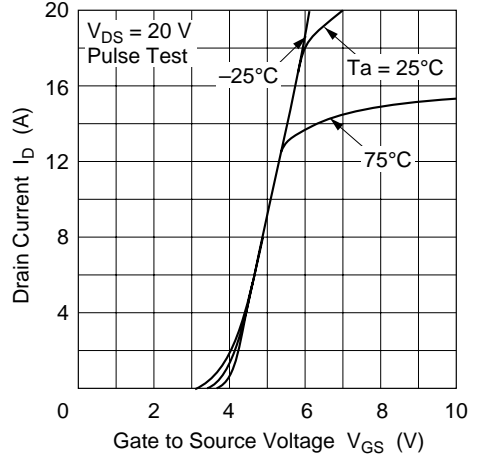
Maximum Safe Operation Area

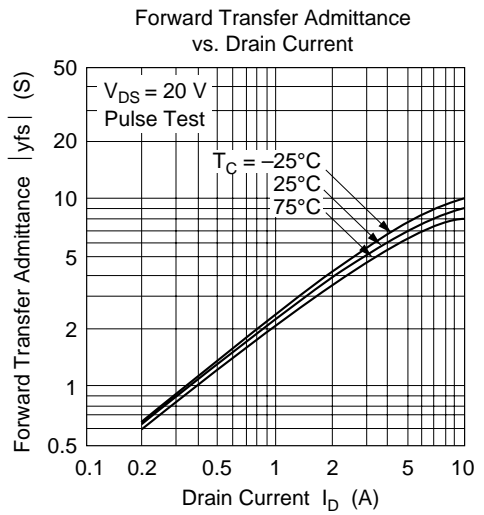
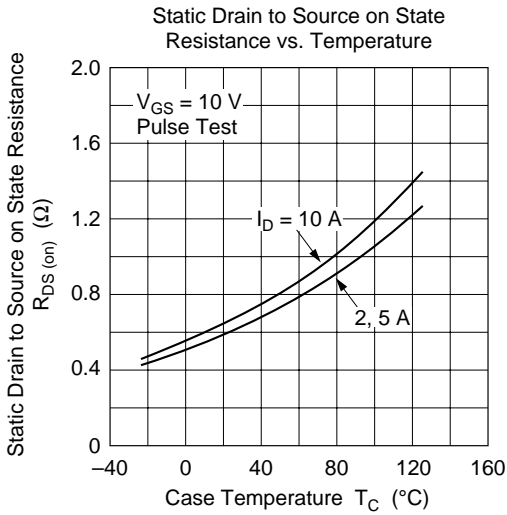
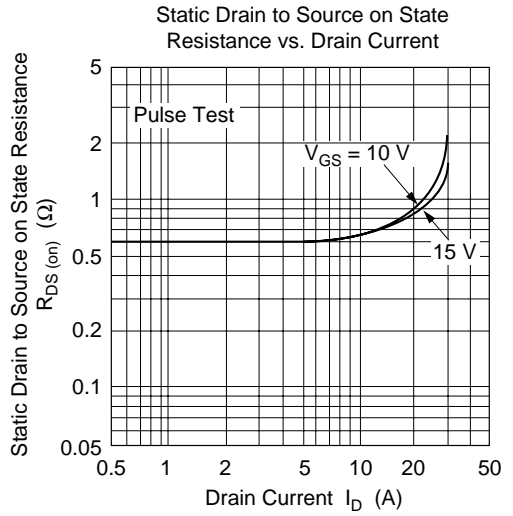
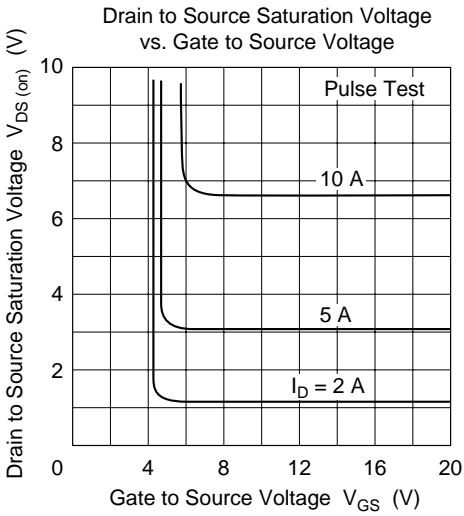


Typical Output Characteristics

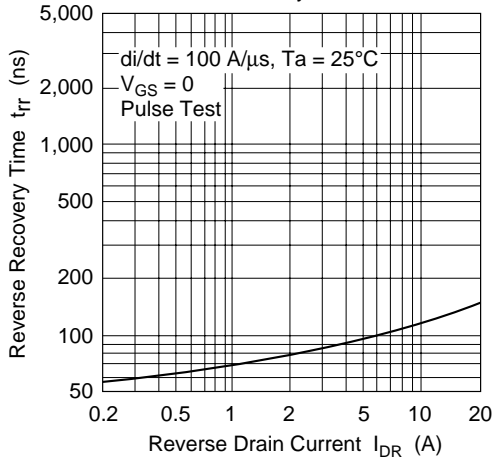


Typical Transfer Characteristics

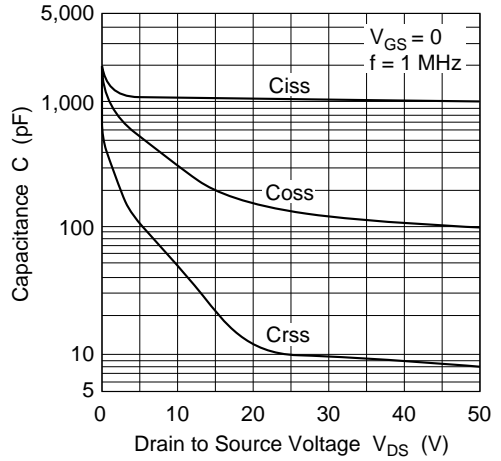




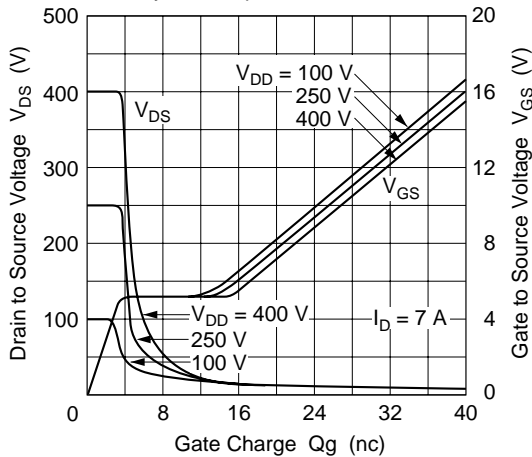
Body to Drain Diode Reverse Recovery Time



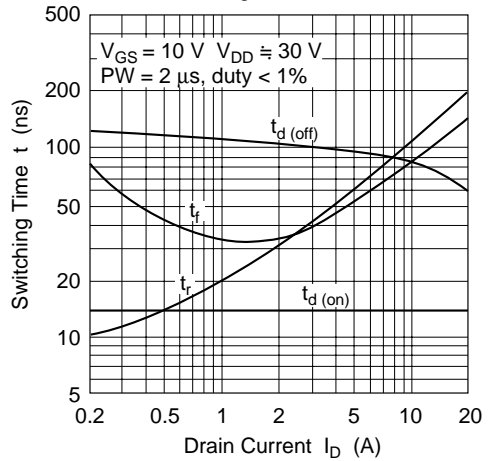
Typical Capacitance vs. Drain to Source Voltage

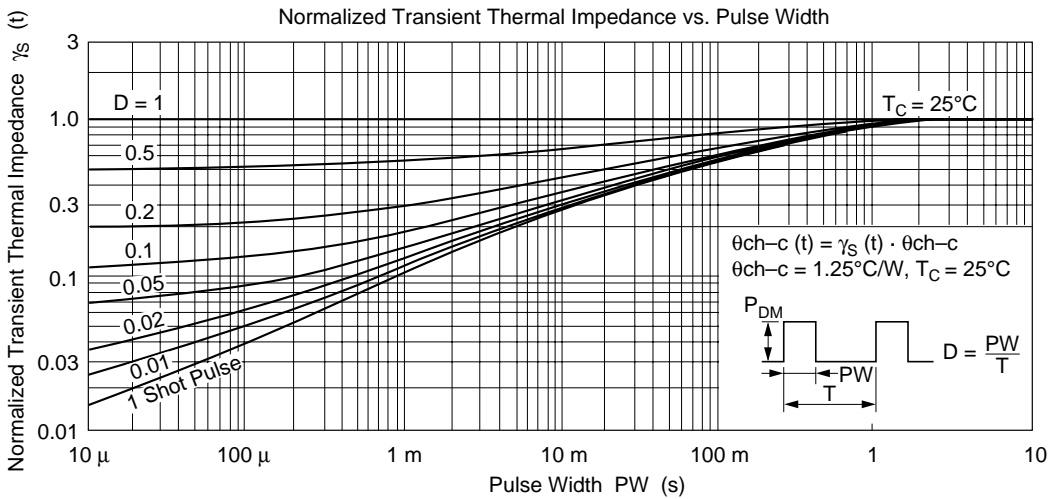
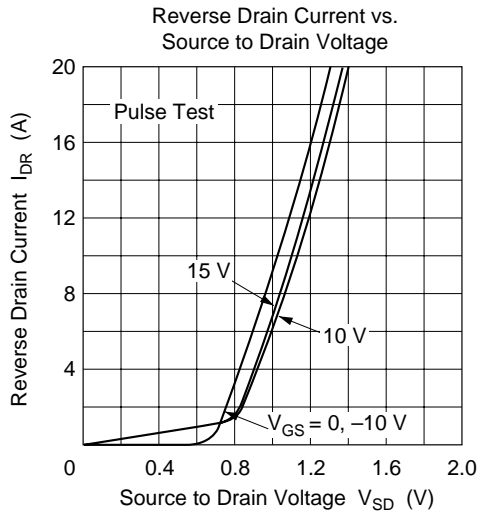


Dynamic Input Characteristics

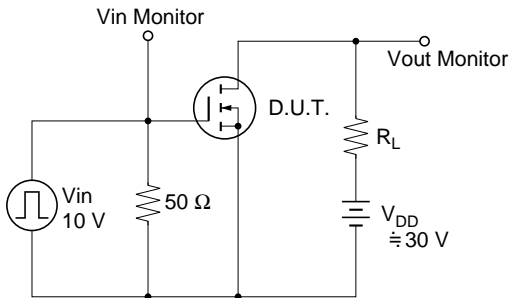


Switching Characteristics

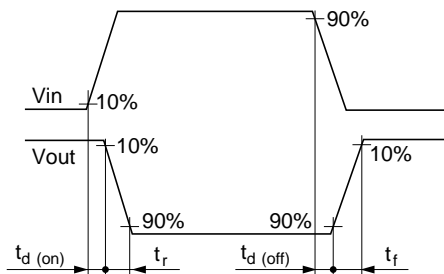




Switching Time Test Circuit

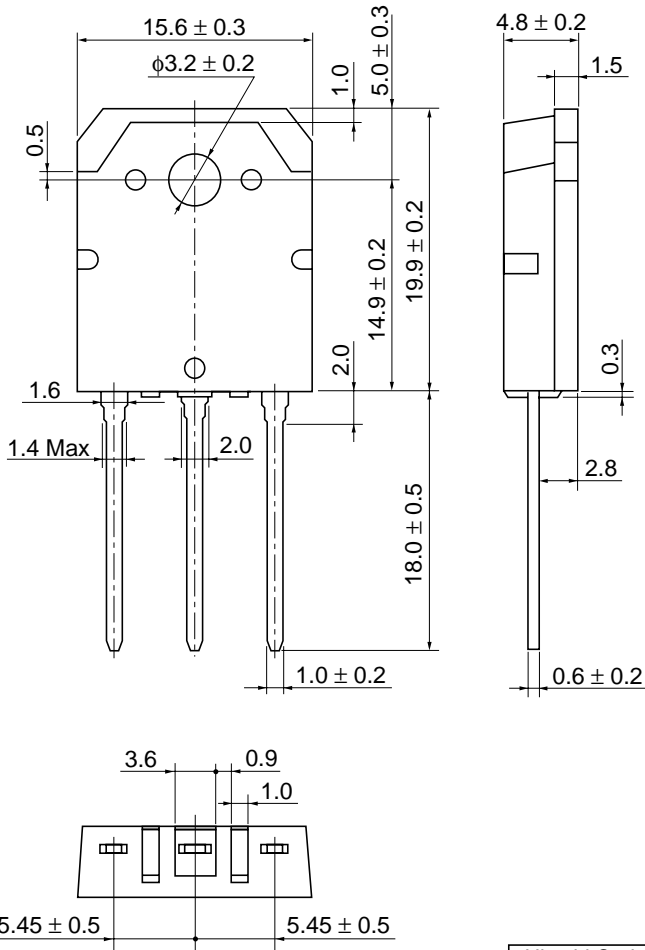


Waveforms



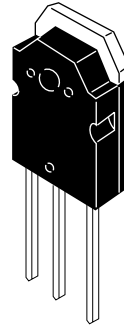
# 2SK1515, 2SK1516

## Package Dimensions



As of January, 2001

Unit: mm



Hitachi Code	TO-3P
JEDEC	—
EIAJ	Conforms
Mass (reference value)	5.0 g

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