
2SK1165, 2SK1166

Silicon N-Channel MOS FET

HITACHI

ADE-208-1252 (Z)
1st. Edition
Mar. 2001

Application

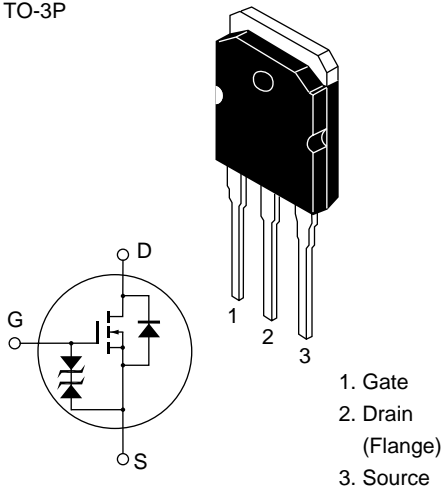
High speed power switching

Features

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

Outline

TO-3P



2SK1165, 2SK1166

Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1165	V_{DSS}	450	V
	2SK1166		500	
Gate to source voltage		V_{GSS}	±30	V
Drain current		I_D	12	A
Drain peak current		$I_{D(pulse)}^{*1}$	48	A
Body to drain diode reverse drain current		I_{DR}	12	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%

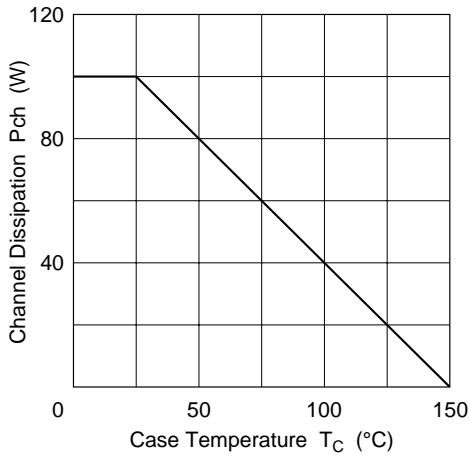
2. Value at T_c = 25°C

Electrical Characteristics (Ta = 25°C)

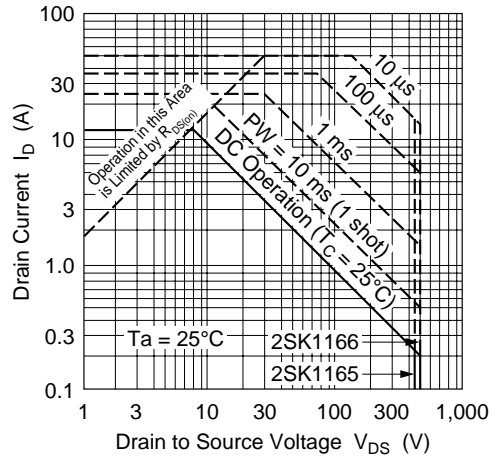
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1165 $V_{(BR)DSS}$ 2SK1166	450 500	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \text{ } \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	2SK1165 I_{DSS} 2SK1166	—	—	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	2SK1165 $R_{DS(on)}$ 2SK1166	—	0.40 0.45	0.55 0.60		$I_D = 6 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	yfs	6.0	10	—	S	$I_D = 6 \text{ A}$, $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	Ciss	—	1450	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$,
Output capacitance	Coss	—	410	—	pF	f = 1 MHz
Reverse transfer capacitance	Crss	—	55	—	pF	
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$I_D = 6 \text{ A}$, $V_{GS} = 10 \text{ V}$,
Rise time	t_r	—	70	—	ns	$R_L = 5$
Turn-off delay time	$t_{d(off)}$	—	120	—	ns	
Fall time	t_f	—	60	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.0	—	V	$I_F = 12 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	450	—	ns	$I_F = 12 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

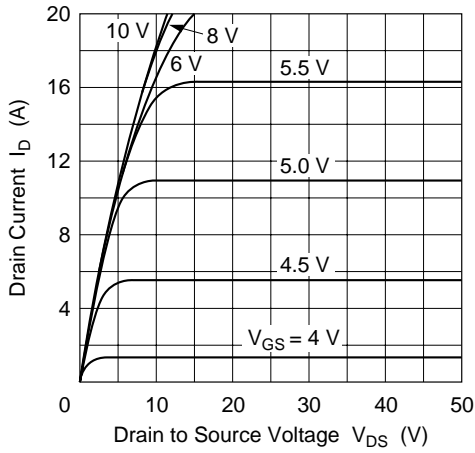
Power vs. Temperature Derating



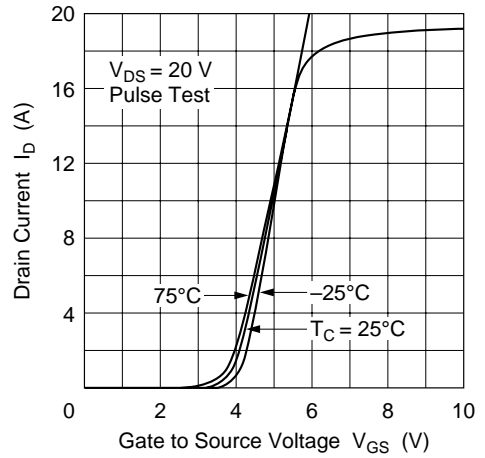
Maximum Safe Operation Area

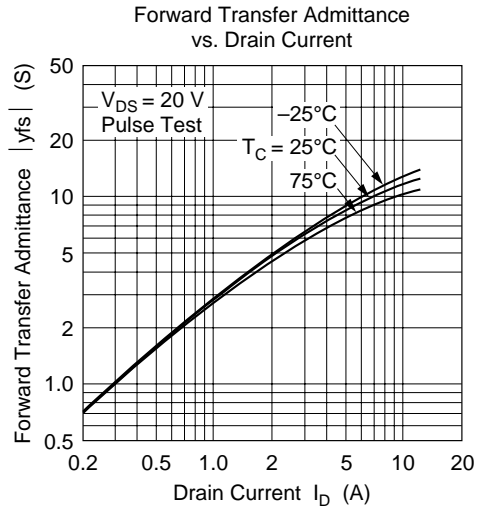
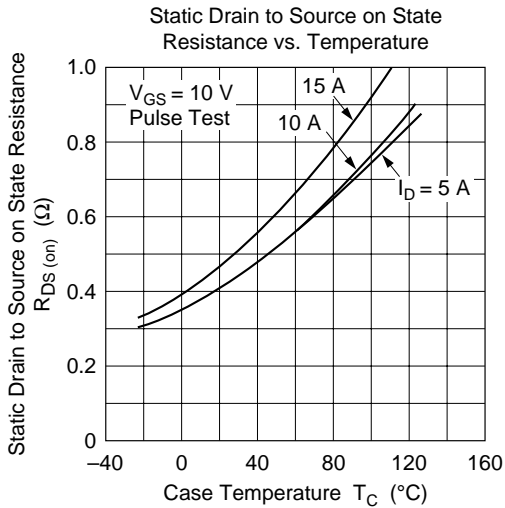
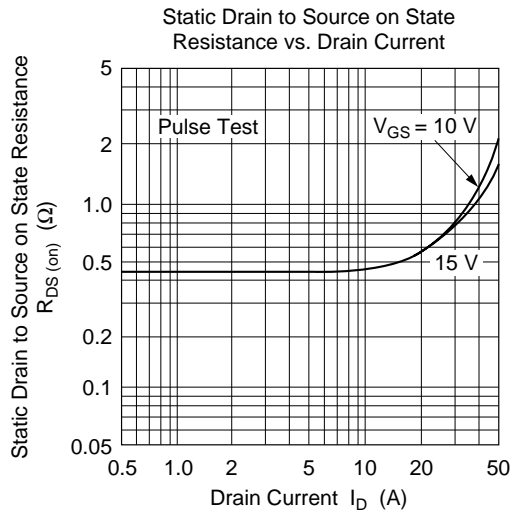
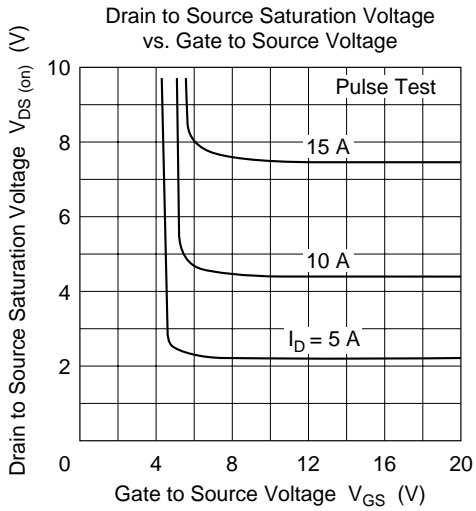


Typical Output Characteristics

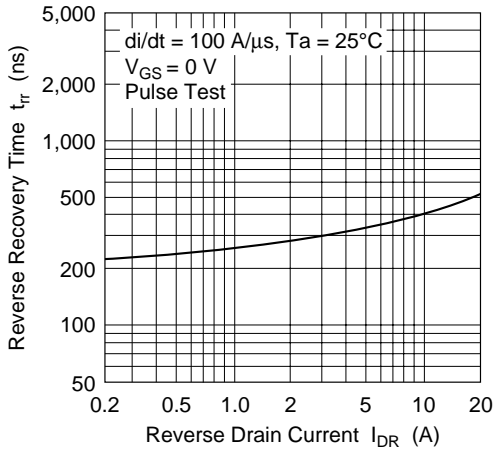


Typical Transfer Characteristics

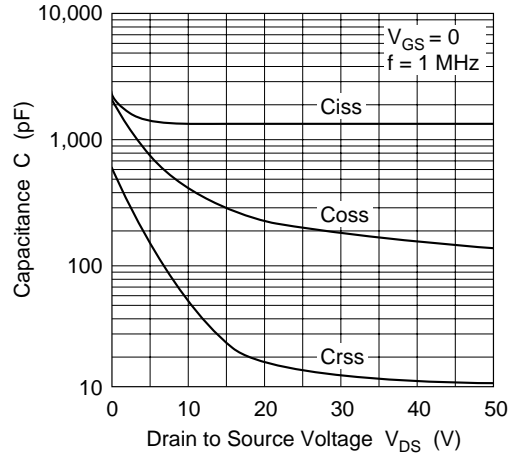




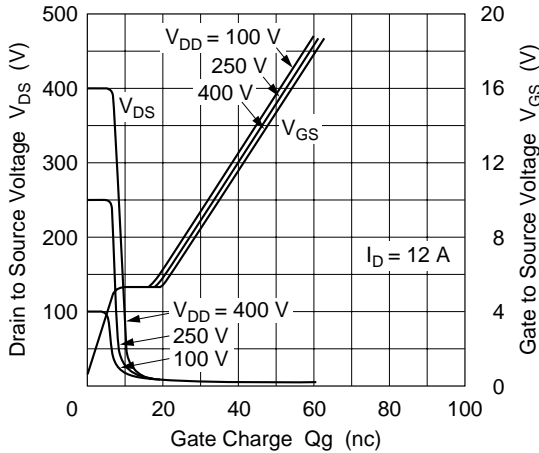
Body to Drain Diode Reverse Recovery Time



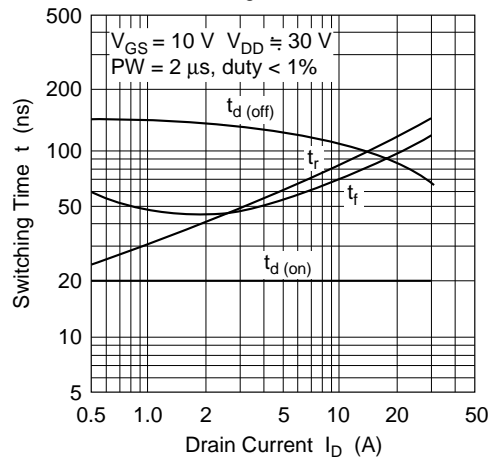
Typical Capacitance vs. Drain to Source Voltage

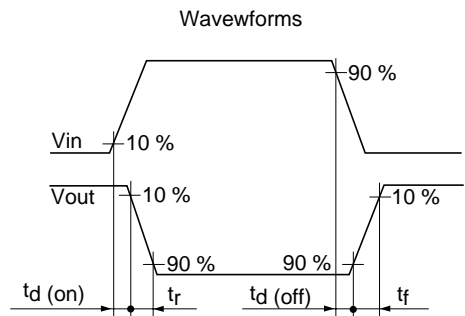
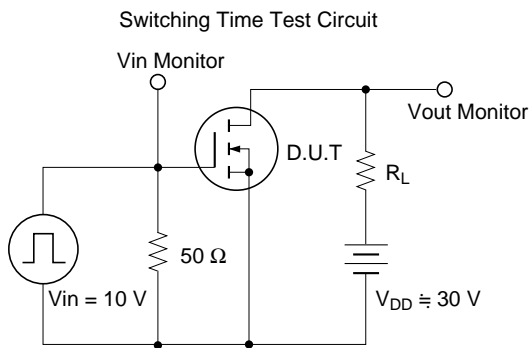
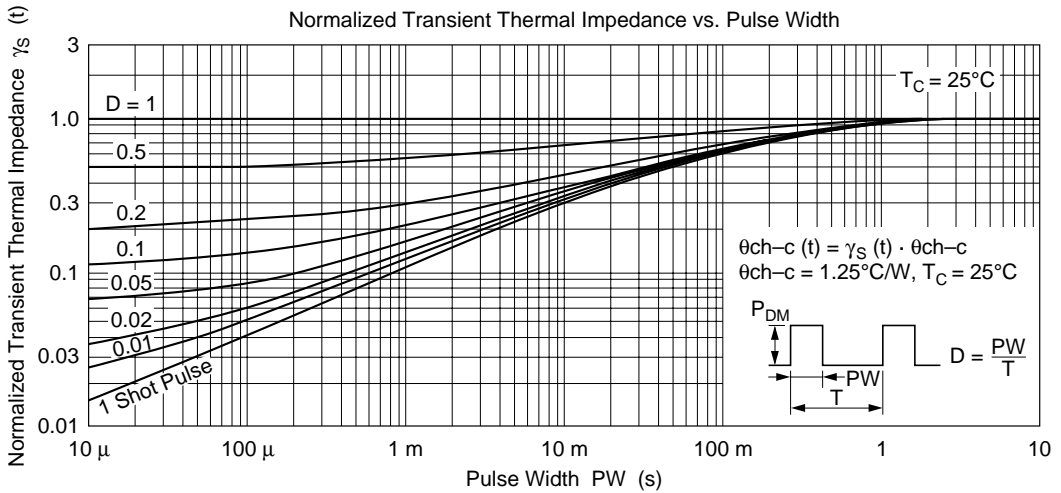
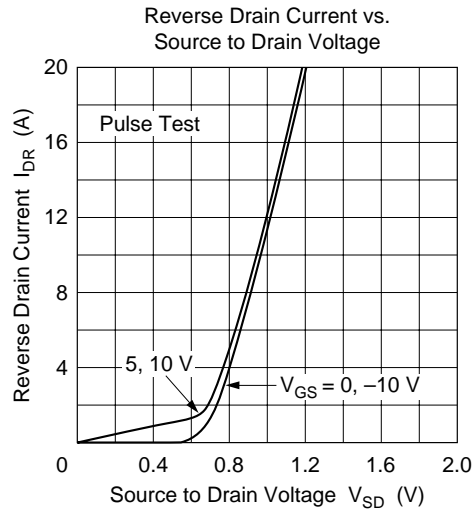


Dynamic Input Characteristics



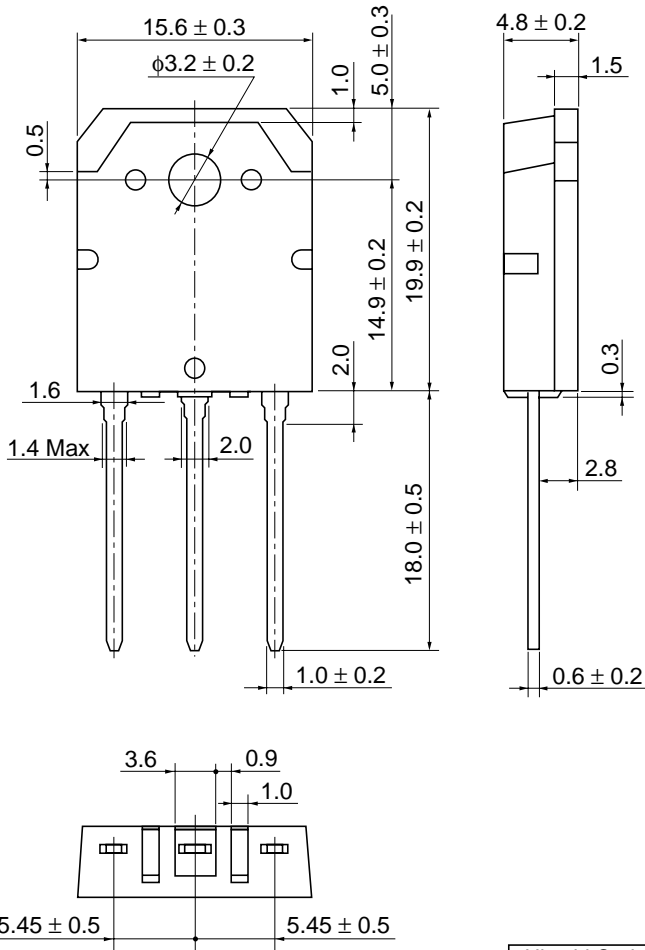
Switching Characteristics





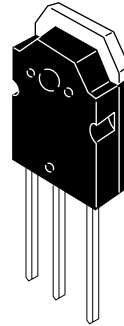
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Package Dimensions



As of January, 2001

Unit: mm



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

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