
2SK1169, 2SK1170

Silicon N-Channel MOS FET

HITACHI

Application

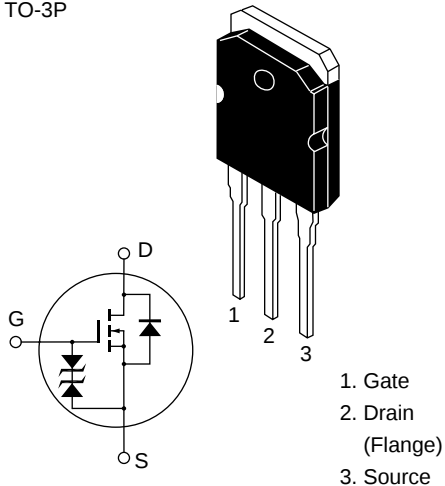
High speed power switching

Features

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

Outline

TO-3P



2SK1169, 2SK1170

Absolute Maximum Ratings (Ta = 25°C)

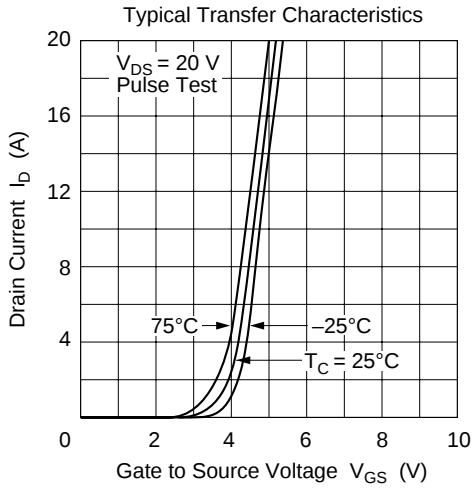
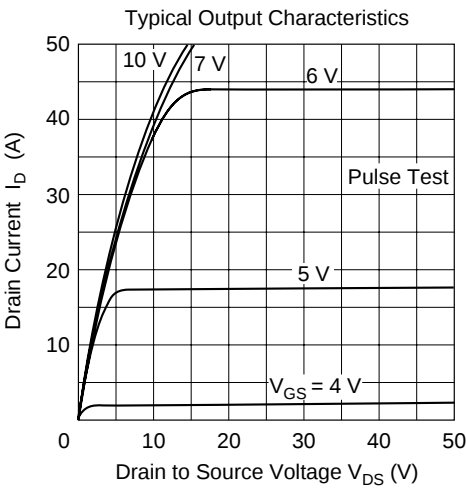
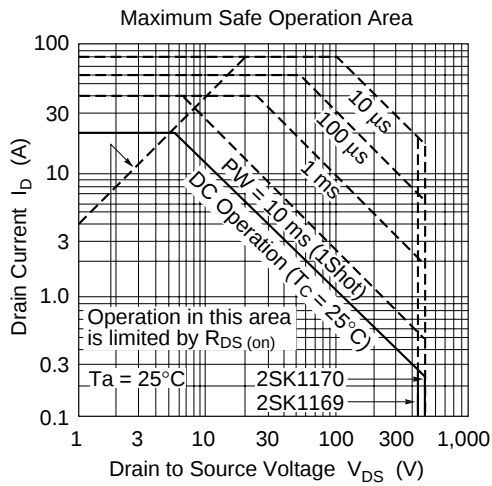
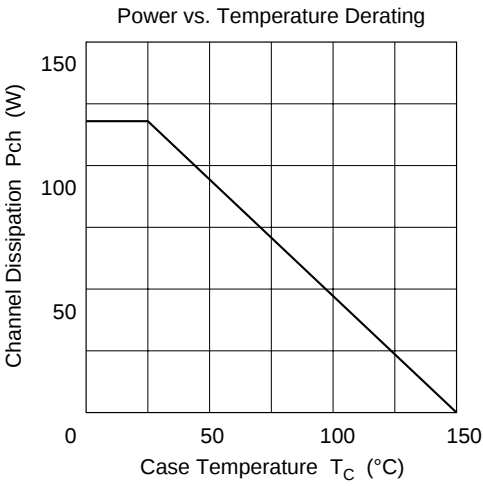
Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1169	V_{DSS}	450	V
	2SK1170		500	
Gate to source voltage		V_{GSS}	±30	V
Drain current		I_D	20	A
Drain peak current		$I_{D(pulse)}^{*1}$	80	A
Body to drain diode reverse drain current		I_{DR}	20	A
Channel dissipation		Pch^{*2}	120	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	−55 to +150	°C

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

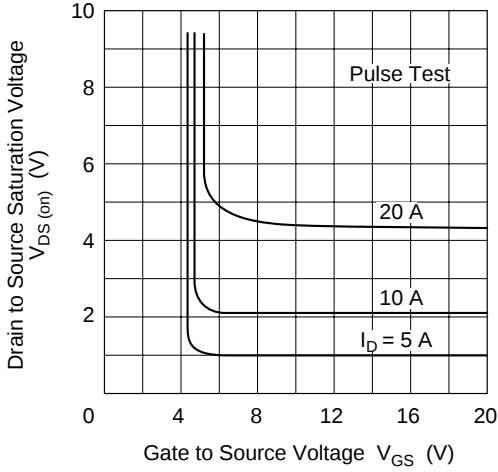
Electrical Characteristics (Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1169 2SK1170	$V_{(BR)DSS}$	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	2SK1169 2SK1170	I_{DSS}	—	—	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	2SK1169 2SK1170	$R_{DS(on)}$	— —	0.20 0.22	0.25 0.27	Ω	$I_D = 10 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance		$ y_{fs} $	10	16	—	S	$I_D = 10 \text{ A}$, $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance		C_{iss}	—	2800	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$,
Output capacitance		C_{oss}	—	780	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance		C_{rss}	—	90	—	pF	
Turn-on delay time		$t_{d(on)}$	—	32	—	ns	$I_D = 10 \text{ A}$, $V_{GS} = 10 \text{ V}$,
Rise time		t_r	—	115	—	ns	$R_L = 3 \text{ }\Omega$
Turn-off delay time		$t_{d(off)}$	—	200	—	ns	
Fall time		t_f	—	90	—	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}	—	500	—	ns	$I_F = 20 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu\text{s}$

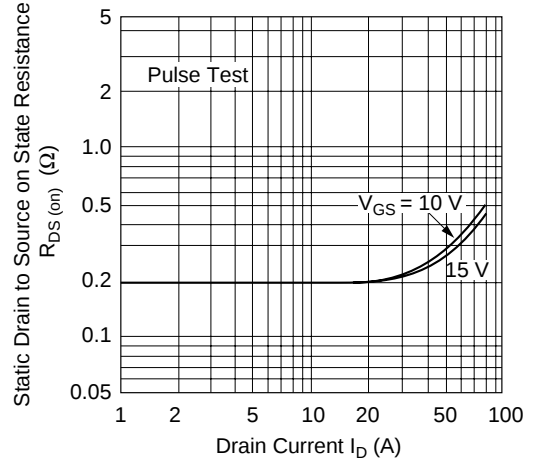
Note: 1. Pulse test



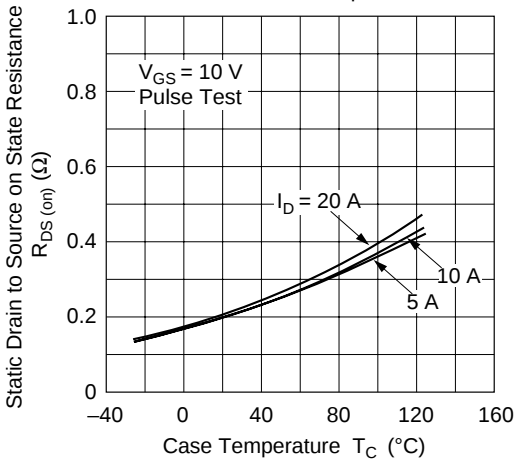
Drain to Source Saturation Voltage
vs. Gate to Source Voltage



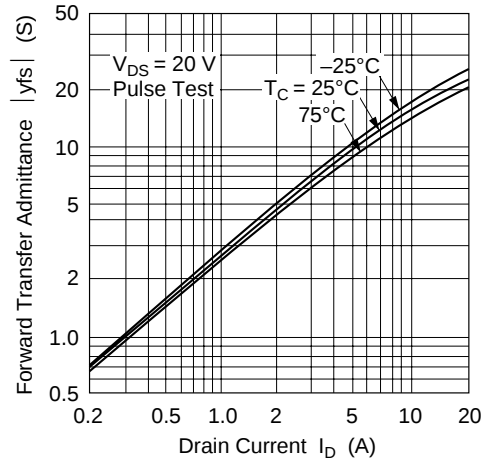
Static Drain to Source on State
Resistance vs. Drain Current

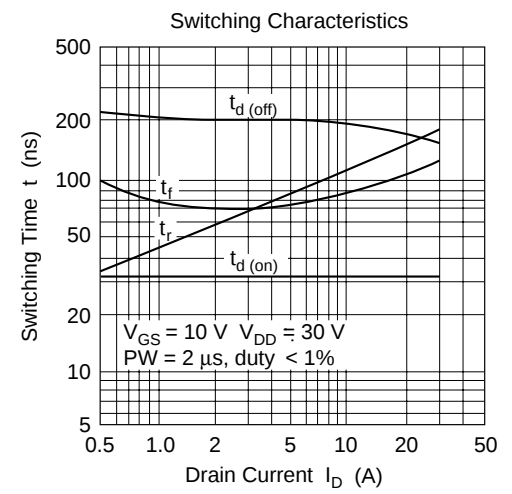
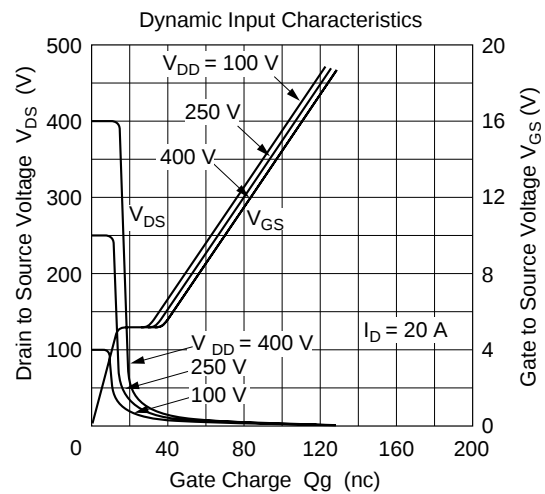
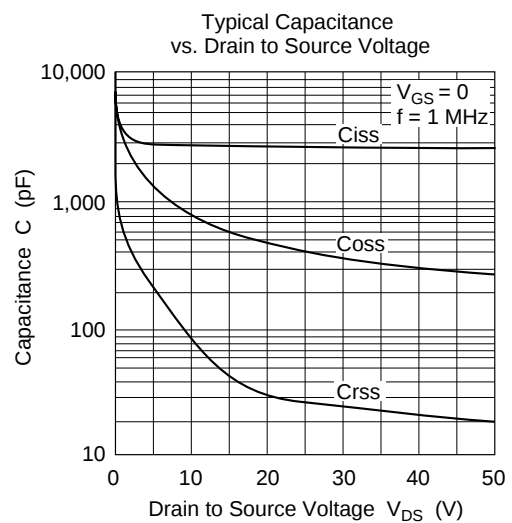
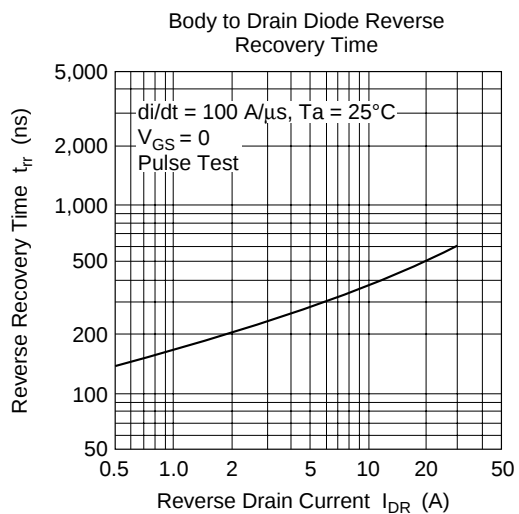


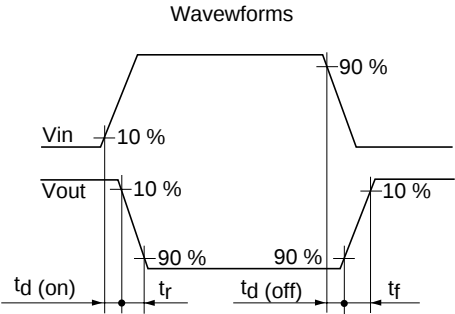
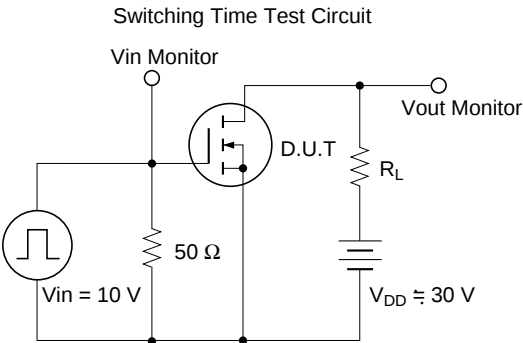
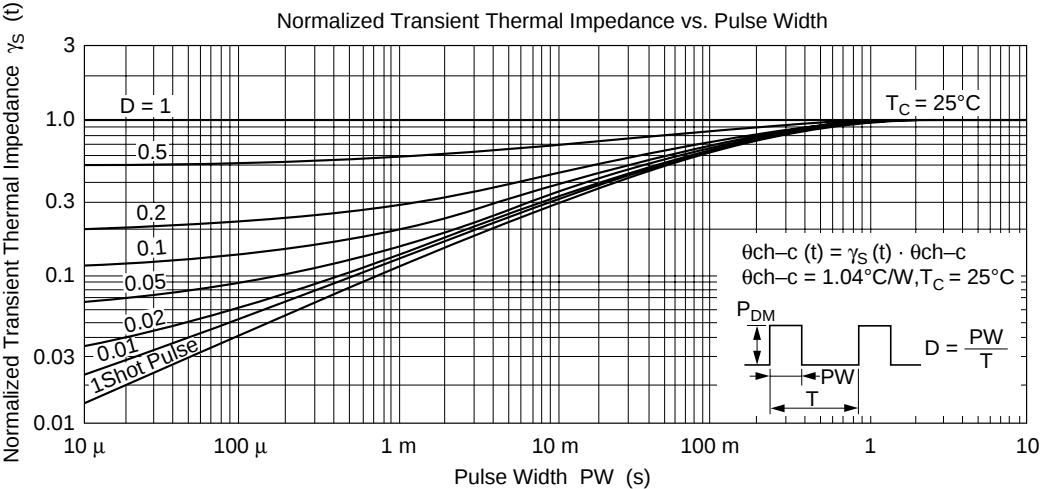
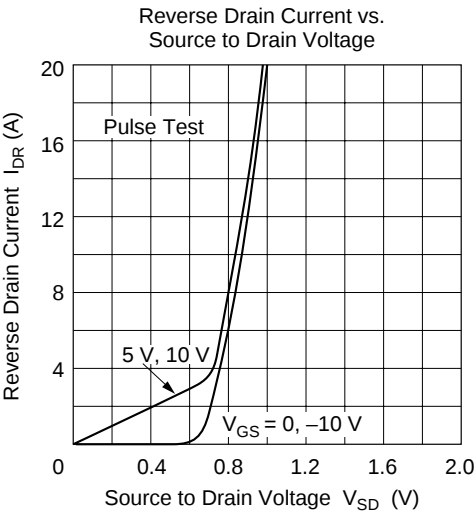
Static Drain to Source on State
Resistance vs. Temperature



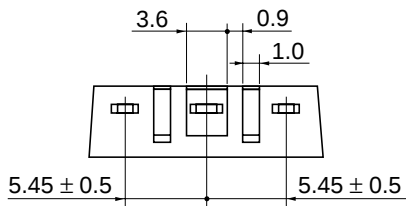
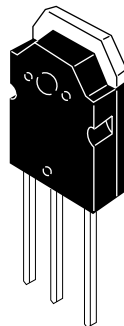
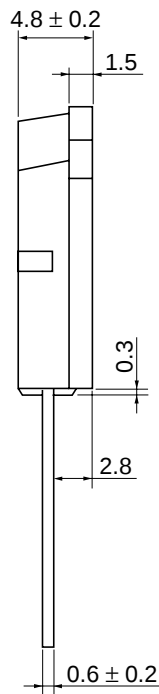
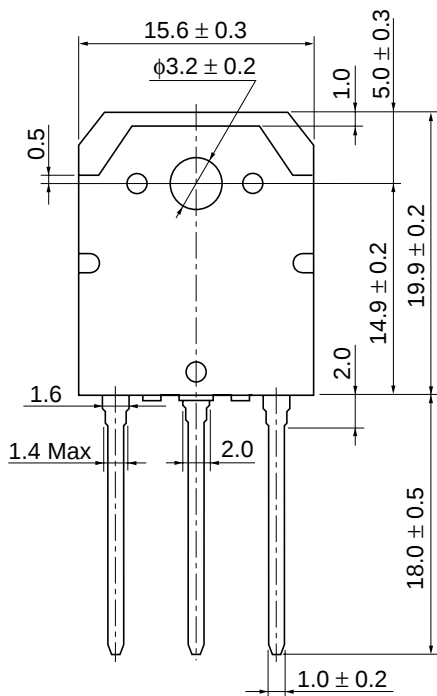
Forward Transfer Admittance
vs. Drain Current







Unit: mm



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

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