

# 2SK1933

Silicon N-Channel MOS FET

# HITACHI

## Application

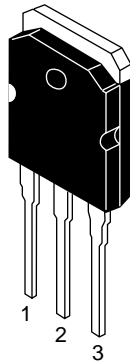
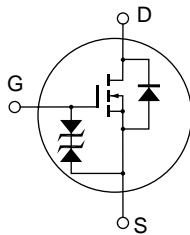
High speed power switching

## Features

- Low on-resistance
- High speed switching
- No secondary breakdown
- Suitable for Switching regulator

## Outline

TO-3P



1. Gate
2. Drain  
(Flange)
3. Source

**Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

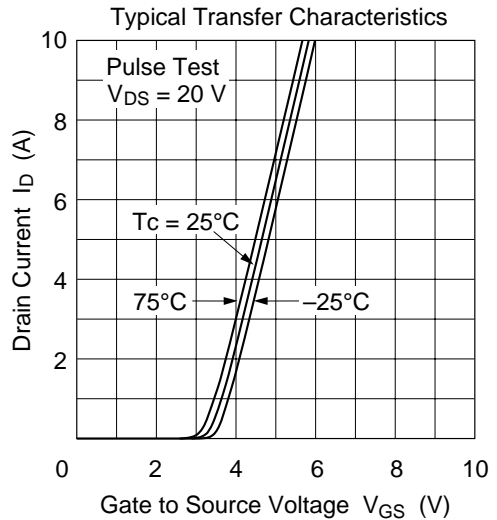
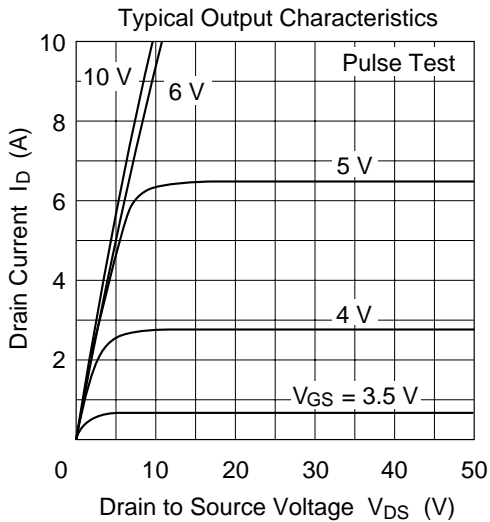
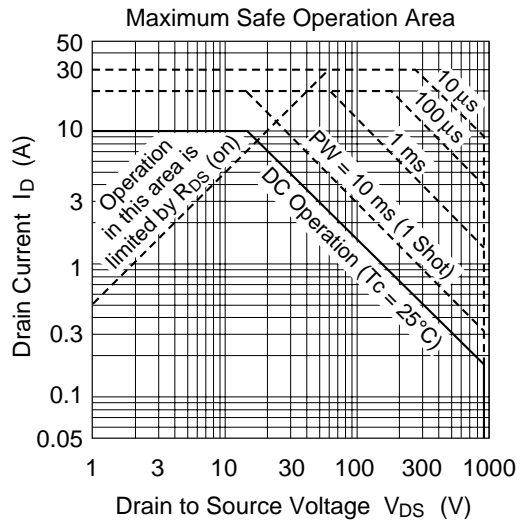
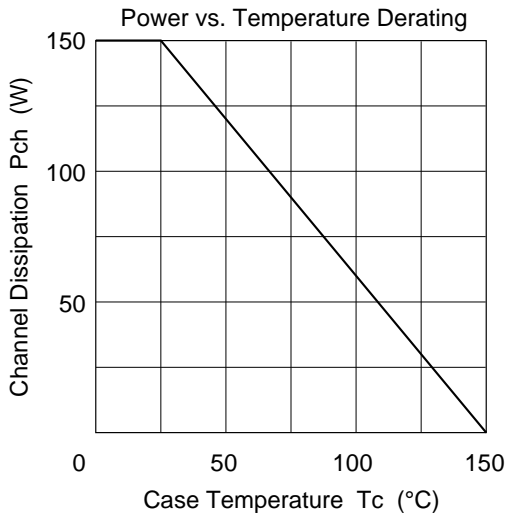
<b>Item</b>	<b>Symbol</b>	<b>Ratings</b>	<b>Unit</b>
Drain to source voltage	$V_{\text{DSS}}$	900	V
Gate to source voltage	$V_{\text{GSS}}$	$\pm 30$	V
Drain current	$I_{\text{D}}$	10	A
Drain peak current	$I_{\text{D(pulse)}}^{*1}$	30	A
Body to drain diode reverse drain current	$I_{\text{DR}}$	10	A
Channel dissipation	$\text{Pch}^{*2}$	150	W
Channel temperature	$T_{\text{ch}}$	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$

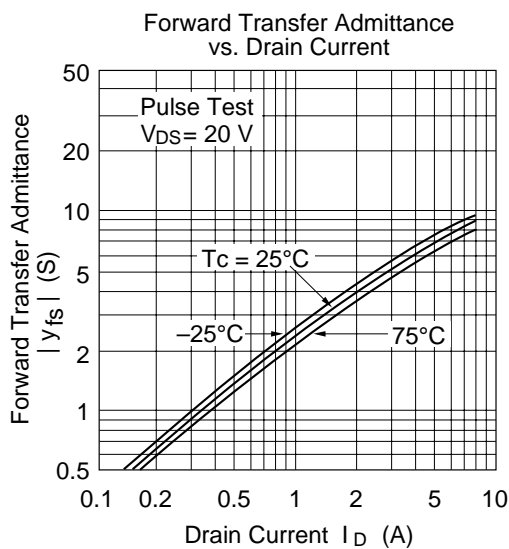
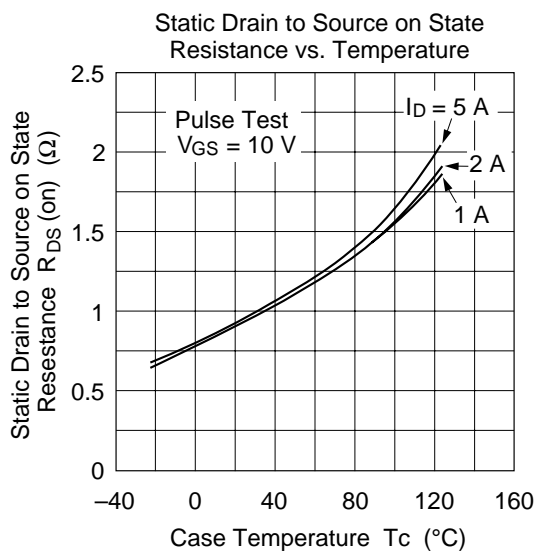
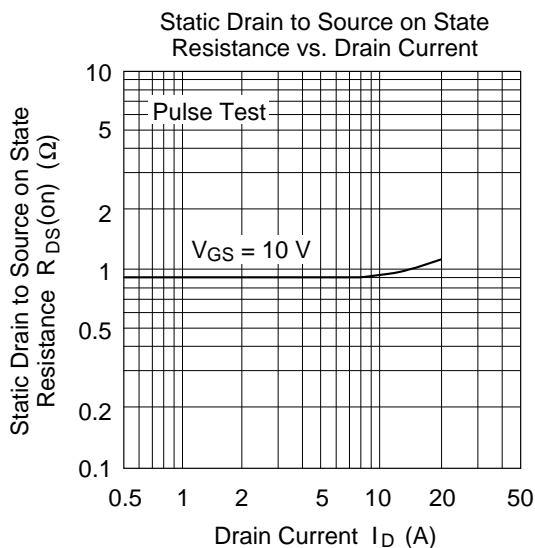
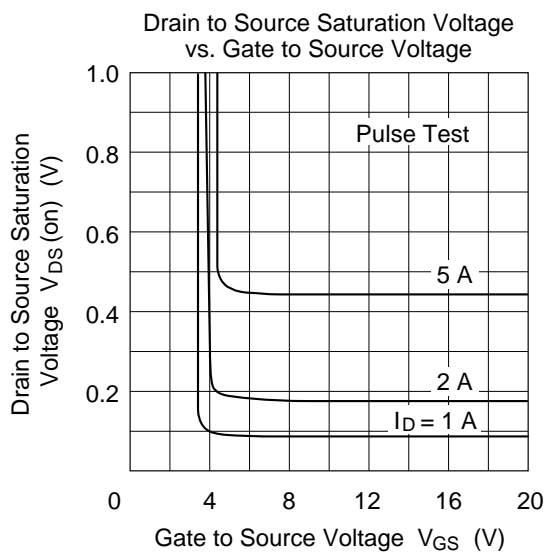
Notes 1.  $\text{PW} \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ\text{C}$

## Electrical Characteristics (Ta = 25°C)

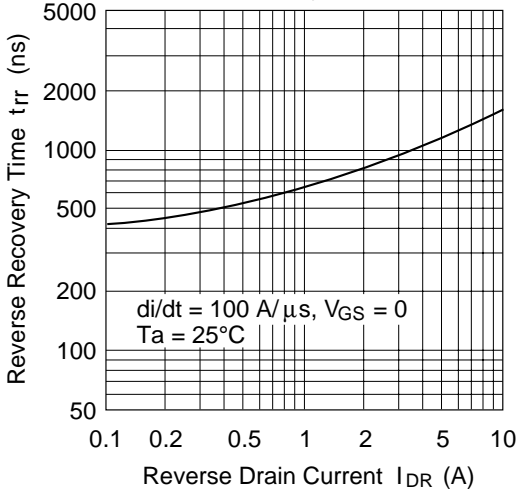
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	900	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 30$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	250	$\mu\text{A}$	$V_{DS} = 720 \text{ V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	0.9	1.2	$\Omega$	$I_D = 5 \text{ A}$ $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	4.5	7	—	S	$I_D = 5 \text{ A}$ $V_{DS} = 20 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	2620	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	830	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	320	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$I_D = 5 \text{ A}$
Rise time	$t_r$	—	140	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	285	—	ns	$R_L = 6 \text{ }\Omega$
Fall time	$t_f$	—	170	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	0.9	—	V	$I_F = 10 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	1600	—	ns	$I_F = 10 \text{ A}$ , $V_{GS} = 0$ , $di_F / dt = 100 \text{ A} / \mu\text{s}$

Note 1. Pulse Test

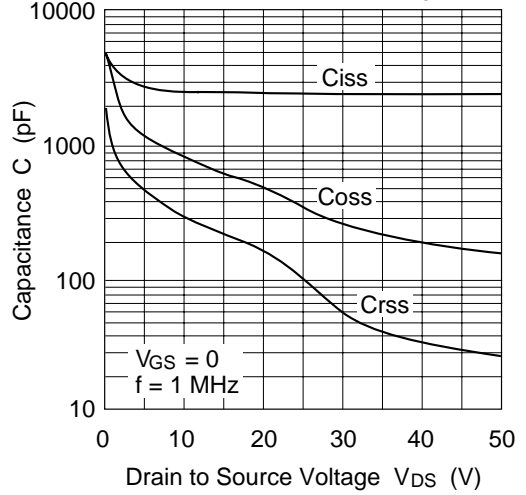




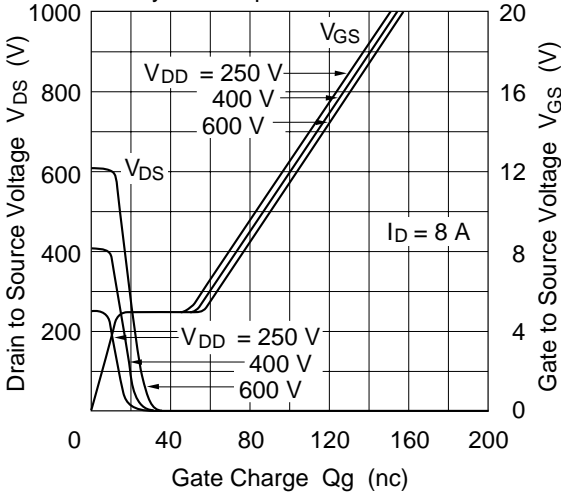
Body to Drain Diode Reverse Recovery Time



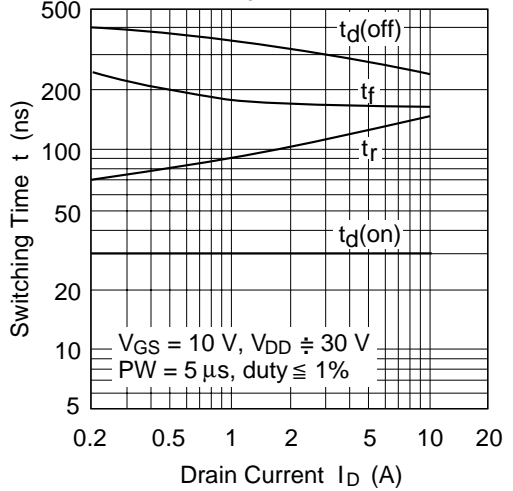
Typical Capacitance vs. Drain to Source Voltage

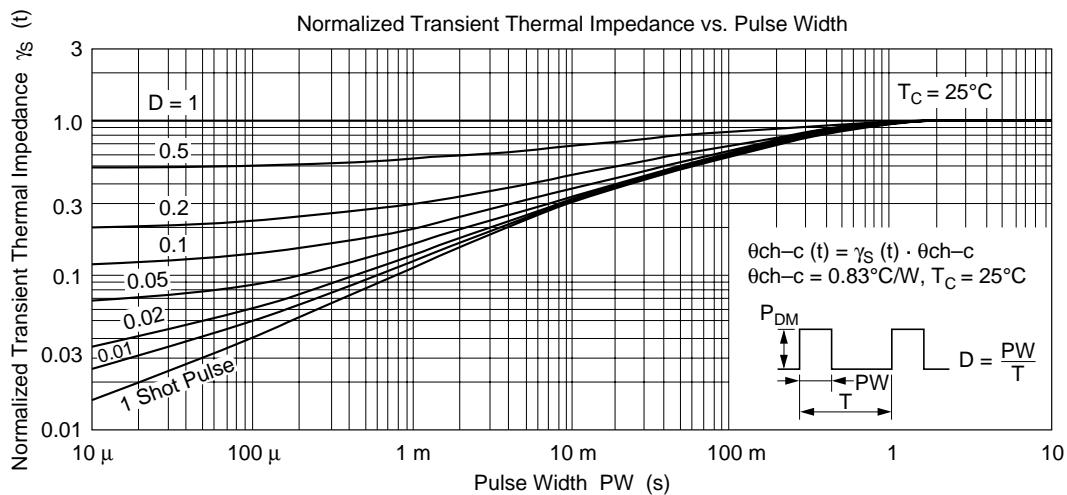
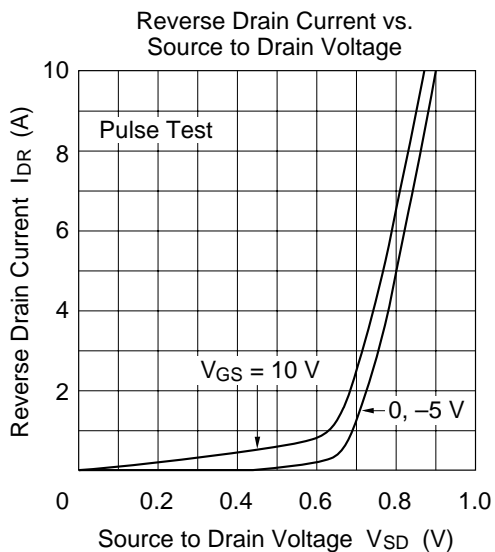


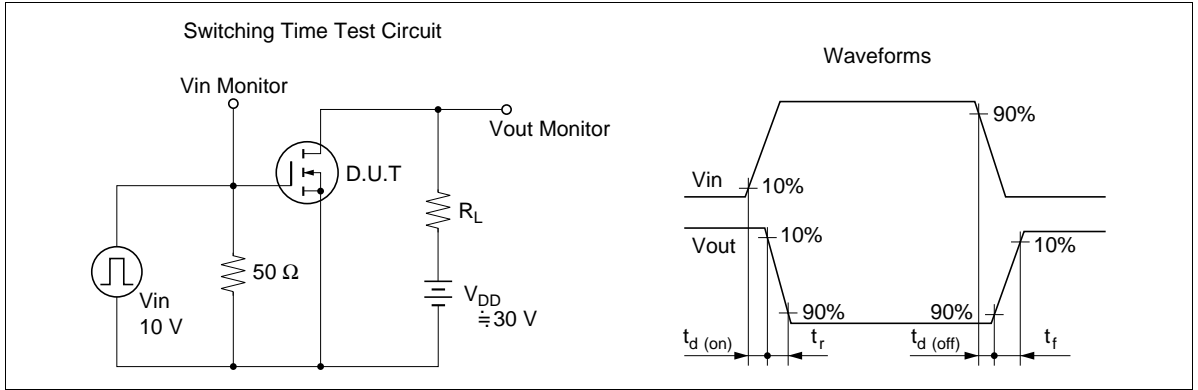
Dynamic Input Characteristics



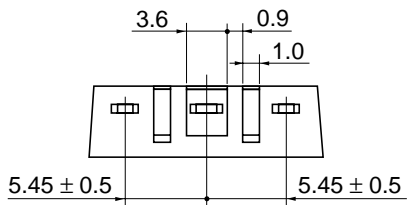
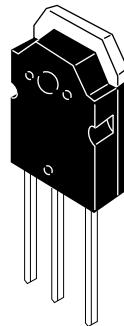
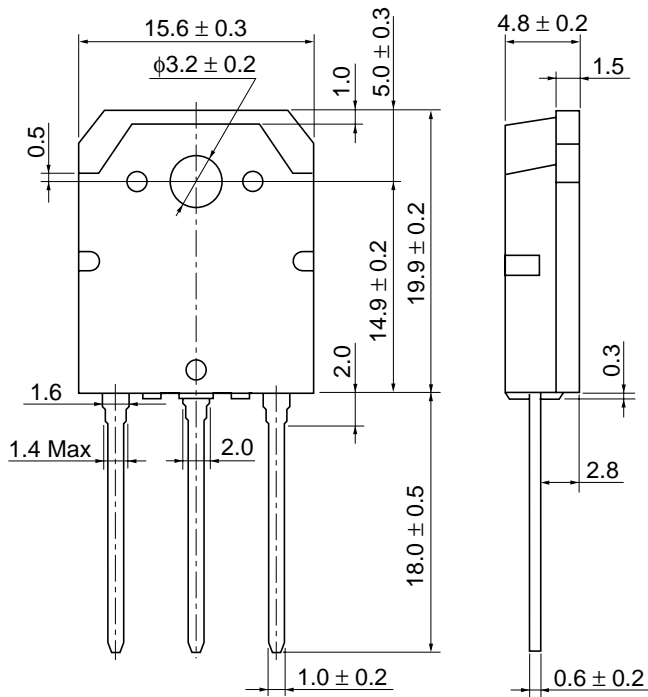
Switching Characteristics











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

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