

# 2SJ181(L), 2SJ181(S)

Silicon P-Channel MOS FET

# HITACHI

## Application

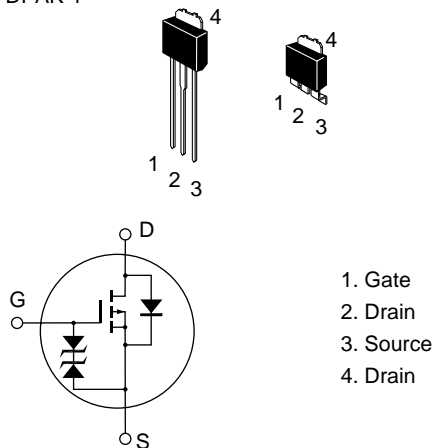
High speed power switching

## Features

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

## Outline

DPAK-1



## 2SJ181(L), 2SJ181(S)

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	-600	V
Gate to source voltage	$V_{GSS}$	±15	V
Drain current	$I_D$	-0.5	A
Drain peak current	$I_{D(pulse)}^{*1}$	-1.0	A
Body to drain diode reverse drain current	$I_{DR}$	-0.5	A
Channel dissipation	$Pch^{*2}$	20	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

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

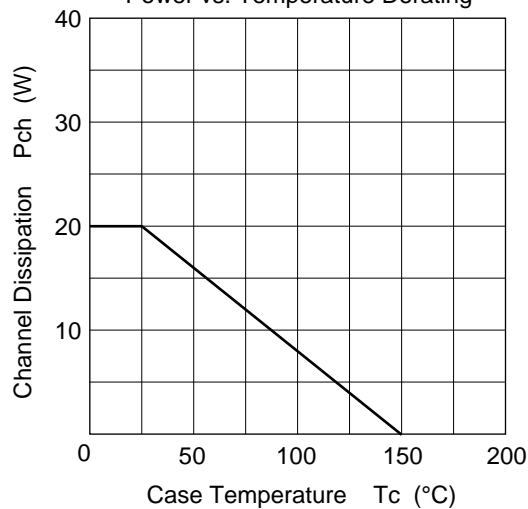
2. Value at  $T_C = 25^\circ C$

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

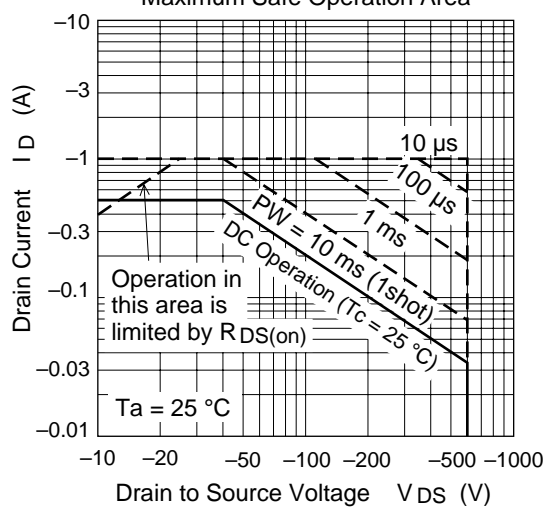
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-600	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±15	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 12 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-100	μA	$V_{DS} = -500 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-2.0	—	-4.0	V	$I_D = -1 \text{ mA}$ , $V_{DS} = -10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	15	25	Ω	$I_D = -0.3 \text{ A}$ , $V_{GS} = -10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	0.3	0.45	—	S	$I_D = -0.3 \text{ A}$ , $V_{DS} = -20 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	220	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	55	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	13	—	pF	
Turn-on delay time	$t_{d(on)}$	—	7	—	ns	$I_D = -0.3 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_L = 100 \Omega$
Rise time	$t_r$	—	20	—	ns	
Turn-off delay time	$t_{d(off)}$	—	35	—	ns	
Fall time	$t_f$	—	35	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	-0.85	—	V	$I_F = -0.5 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	230	—	ns	$I_F = -0.5 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 50 \text{ A}/\mu s$

Note: 1. Pulse test

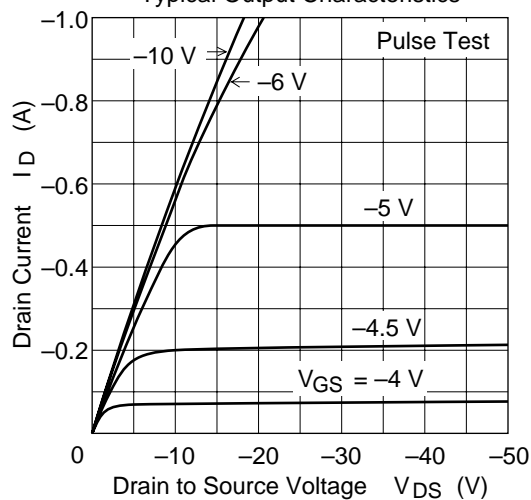
Power vs. Temperature Derating



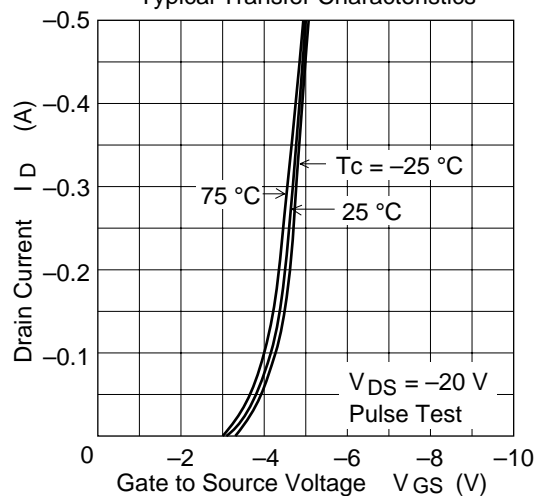
Maximum Safe Operation Area

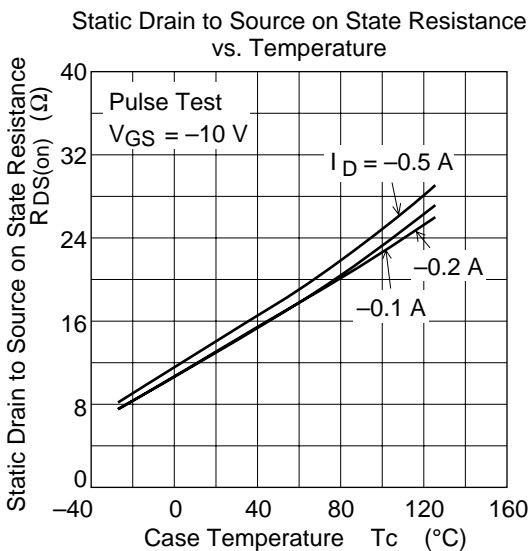
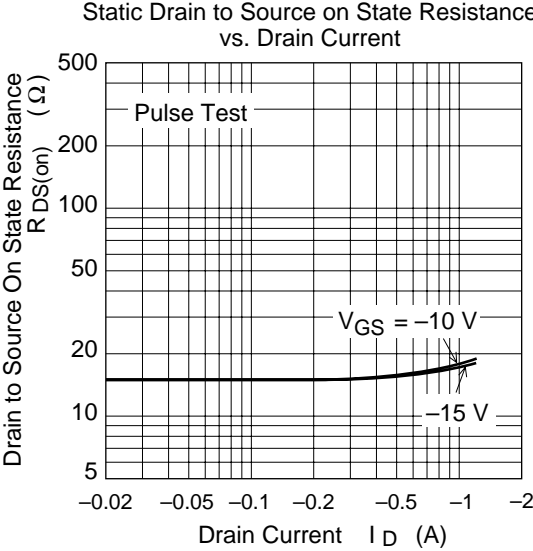
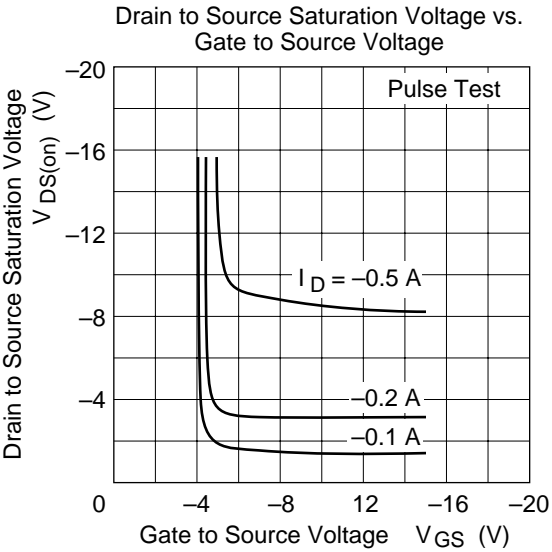


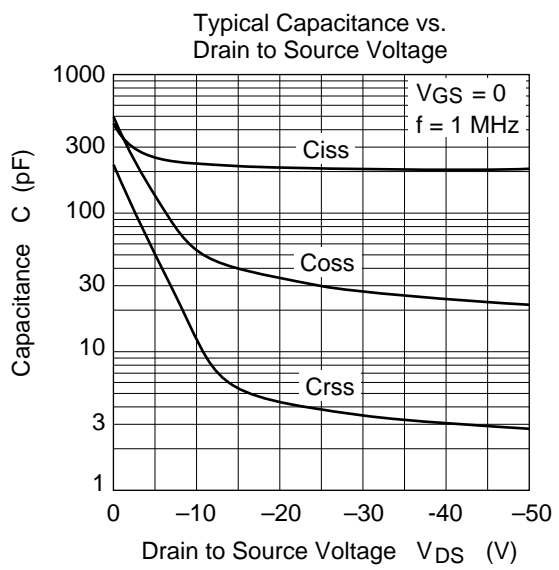
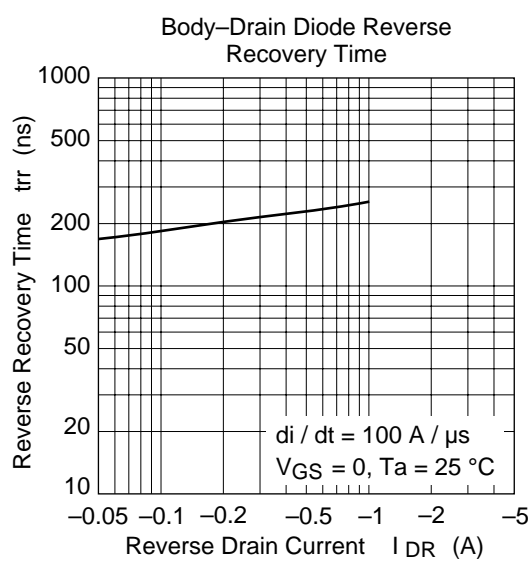
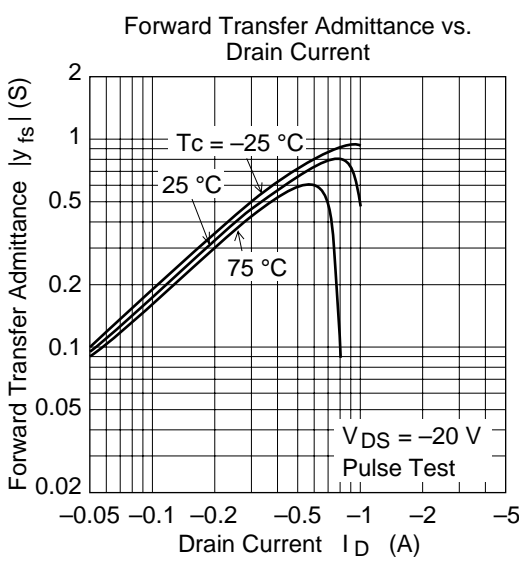
Typical Output Characteristics

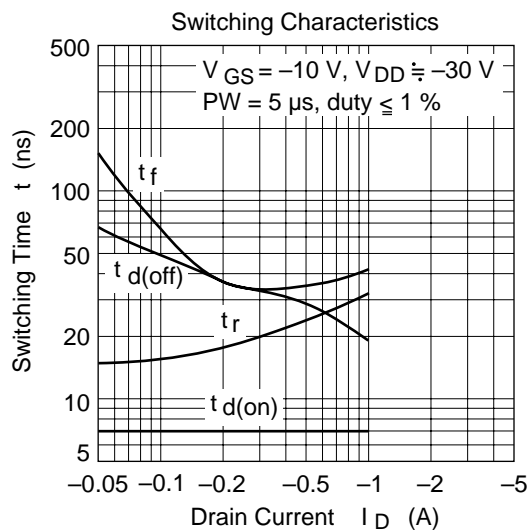
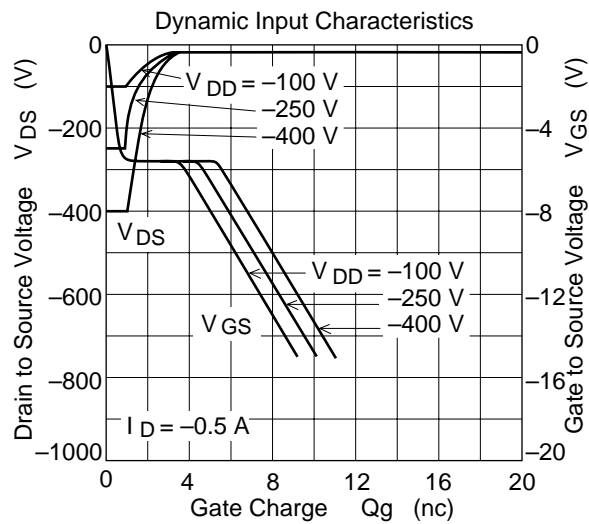


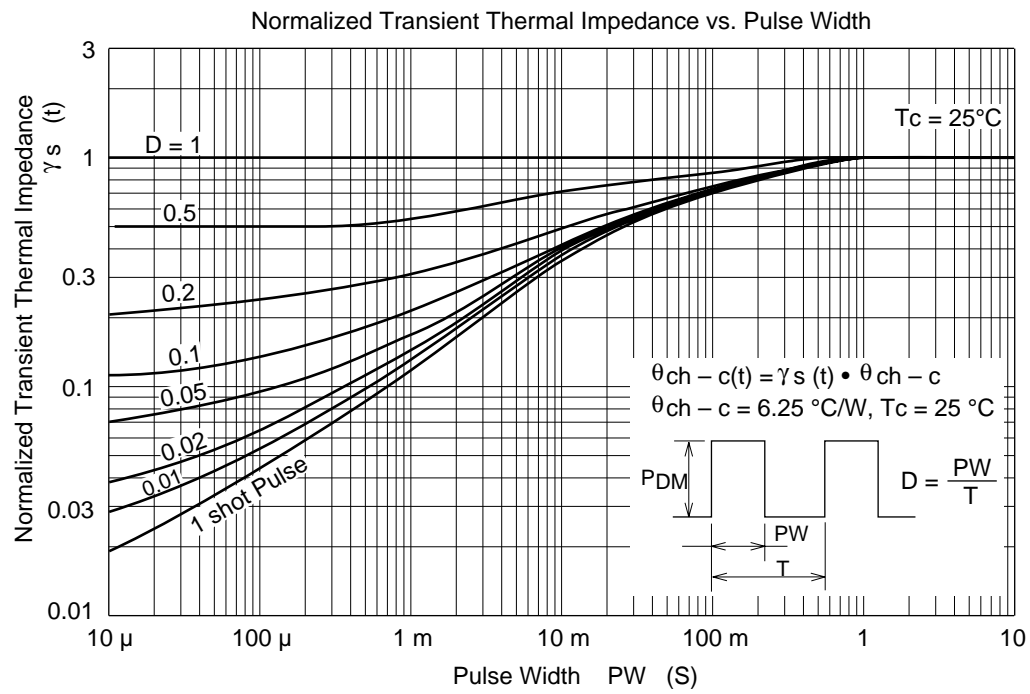
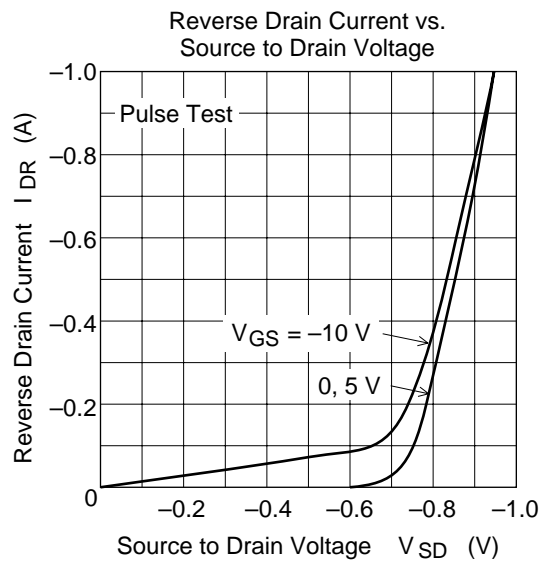
Typical Transfer Characteristics



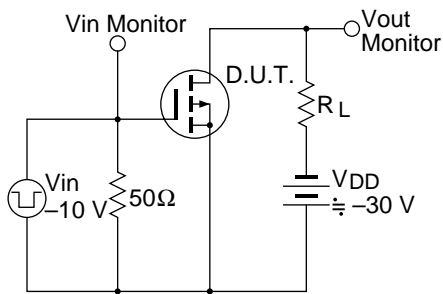




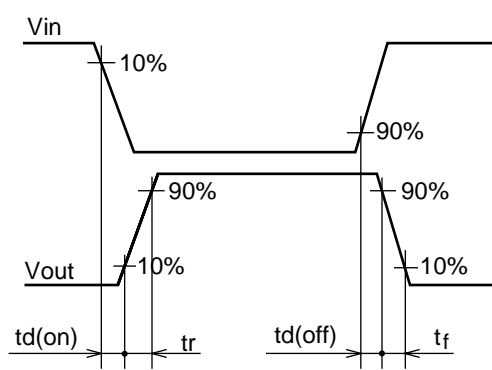


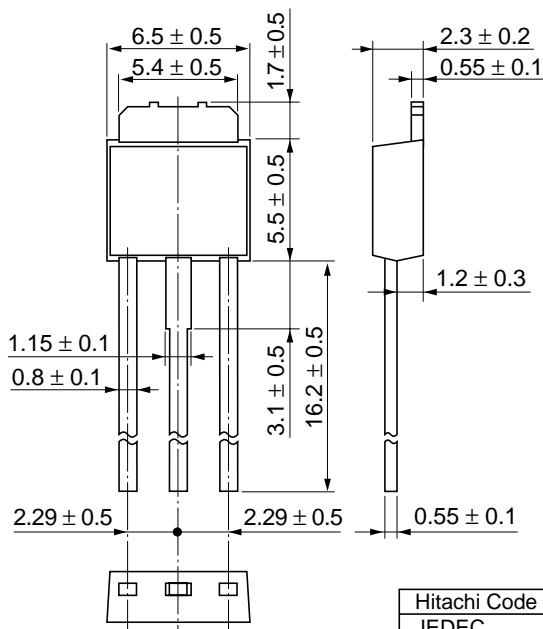


Switching Time Test Circuit



Waveforms





Hitachi Code	DPAK (L)-(1)
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.42 g

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