

2SJ181(L), 2SJ181(S)

Silicon P-Channel MOS FET

HITACHI

Application

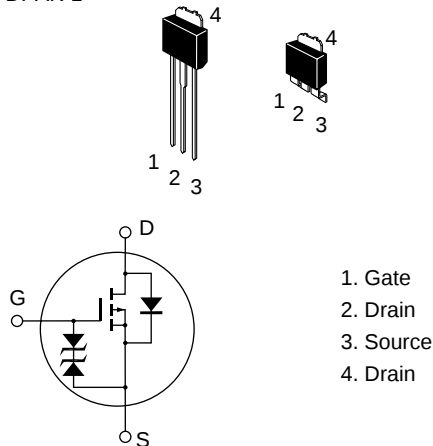
High speed power switching

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	Tch	150	°C
Storage temperature	Tstg	−55 to +150	°C

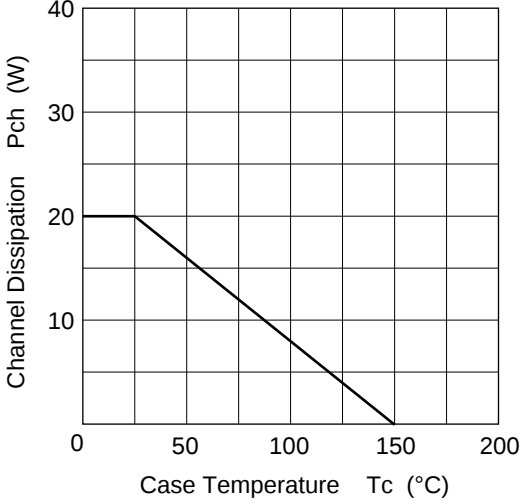
Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$
2. Value at $T_C = 25^\circ C$

Electrical Characteristics (Ta = 25°C)

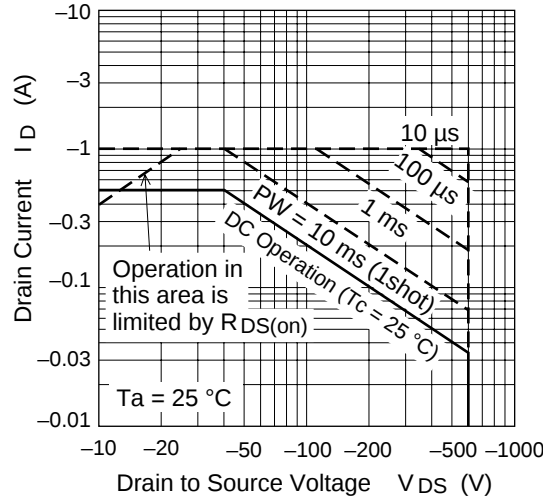
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	−600	—	—	V	$I_D = -10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±15	—	—	V	$I_G = \pm 100 \mu A$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 12 \text{ V}$, $V_{DS} = 0$
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

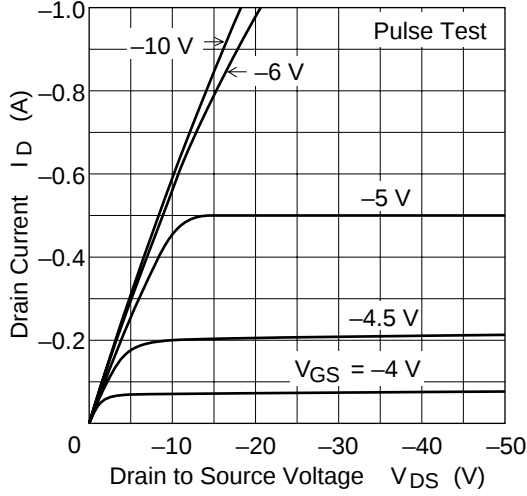
Power vs. Temperature Derating



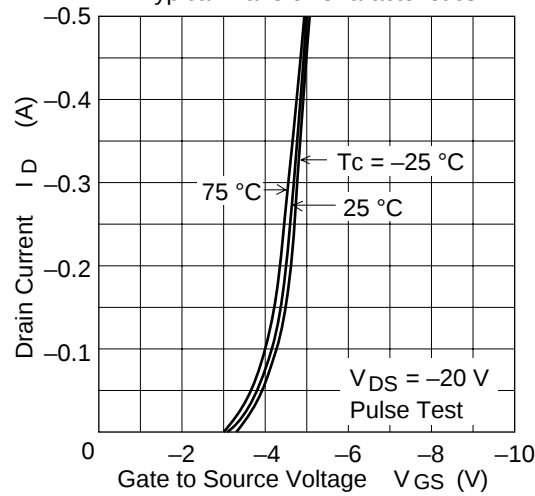
Maximum Safe Operation Area



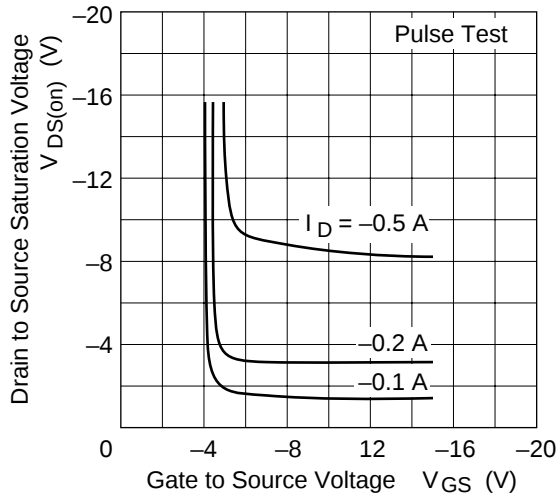
Typical Output Characteristics



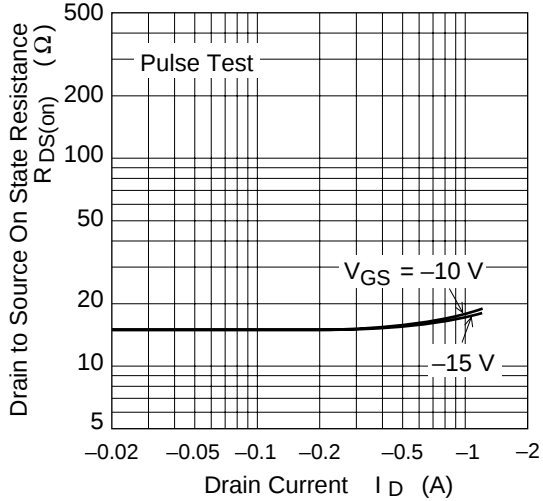
Typical Transfer Characteristics



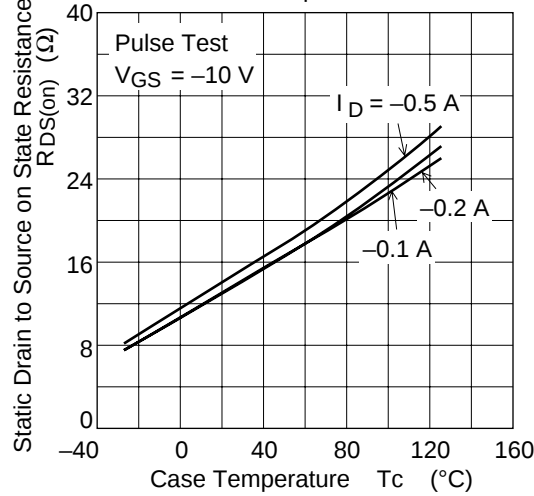
Drain to Source Saturation Voltage vs.
Gate to Source Voltage

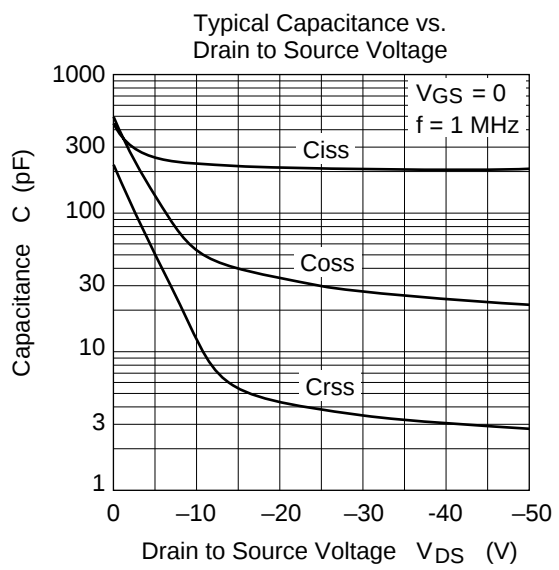
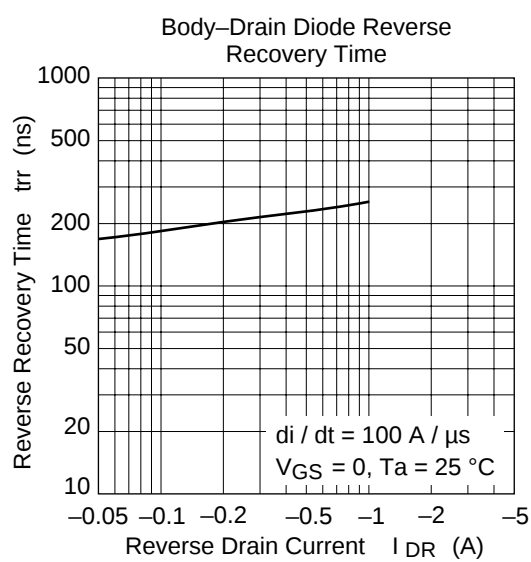
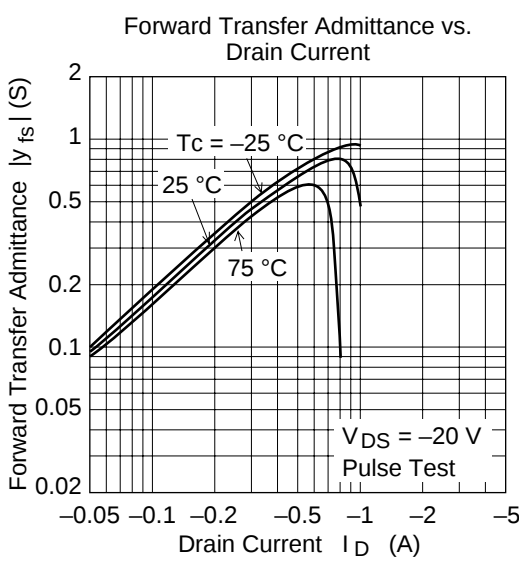


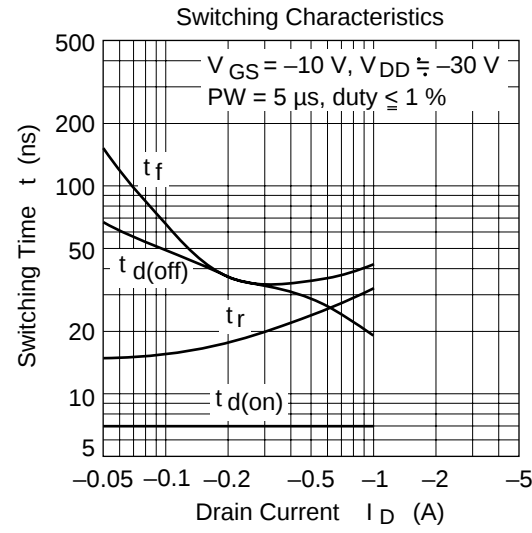
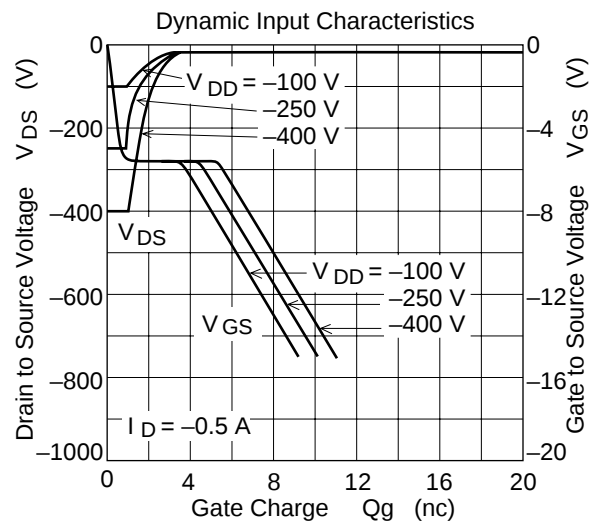
Static Drain to Source on State Resistance
vs. Drain Current

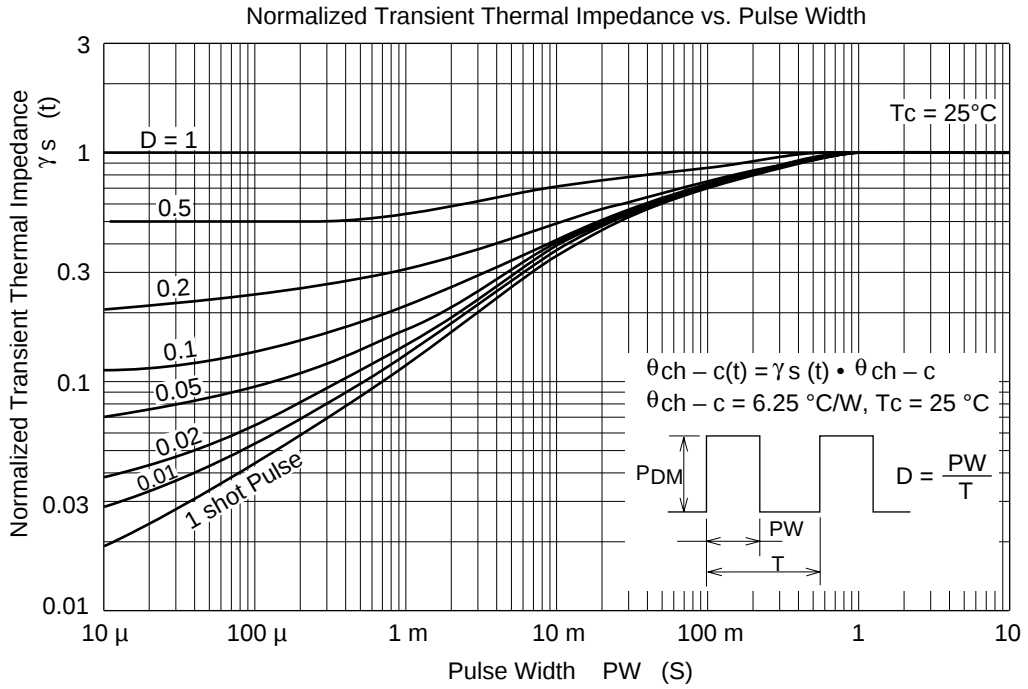
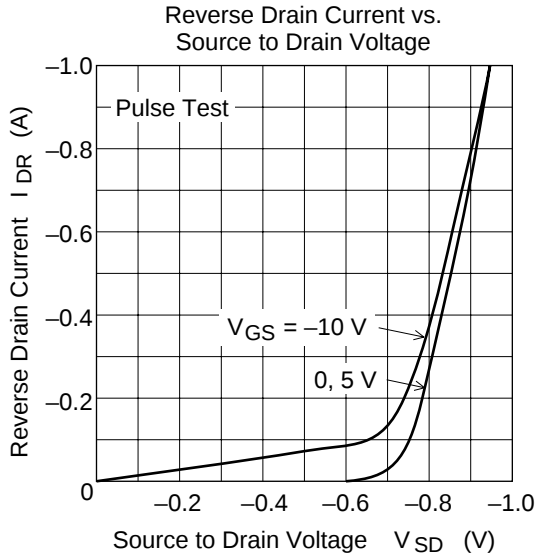


Static Drain to Source on State Resistance
vs. Temperature



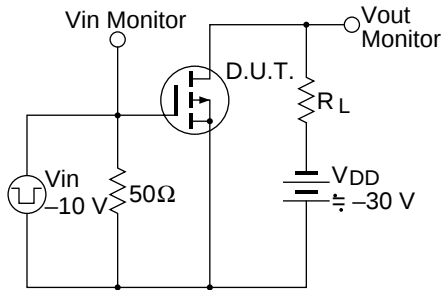




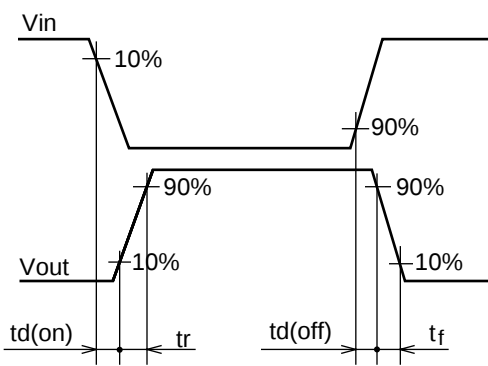


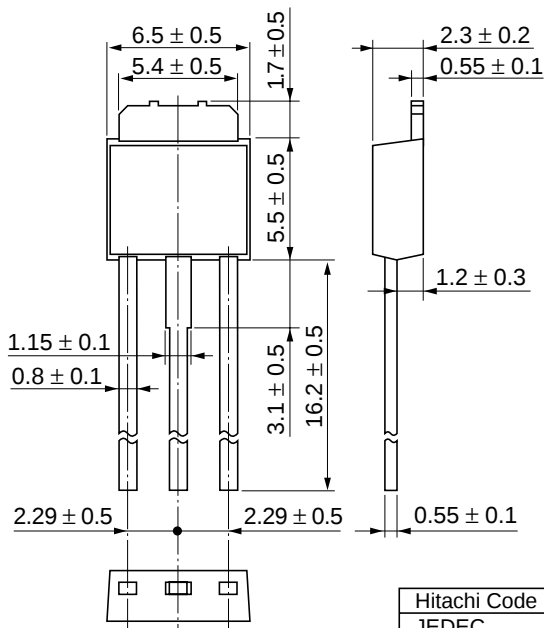
2SJ181(L), 2SJ181(S)

Switching Time Test Circuit



Waveforms





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

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