

# Switching (−30V, −5.0A)

## SP8J1

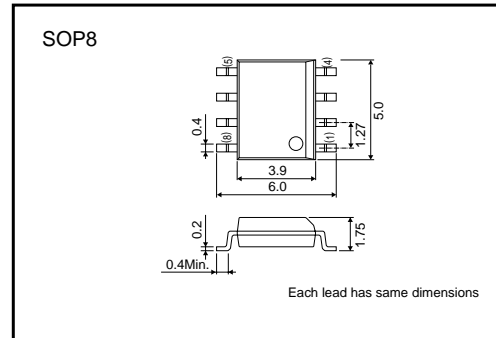
**●Features**

- 1) Low On-resistance. (40mΩ at 4.5V)
- 2) High Power Package.
- 3) High speed switching.
- 4) Low voltage drive. (4.5V)

**●Applications**

Power switching, DC-DC converter

**●External dimensions (Unit : mm)**



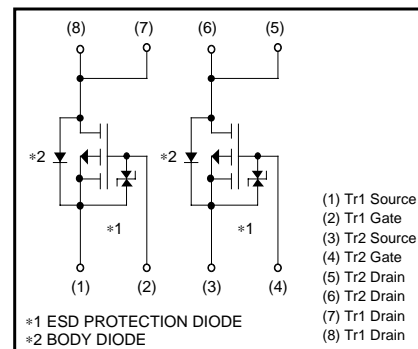
**●Structure**

Silicon P-channel  
MOS FET

**●Packaging specifications**

Type	Package	Taping
		Code
	Basic ordering unit (pieces)	2500
SP8J1		○

**●Equivalent circuit**



## Transistors

## ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V <sub>DSS</sub>	-30	V
Gate-source voltage	V <sub>GSS</sub>	±20	V
Drain current	Continuous	I <sub>D</sub>	±5.0 A
	Pulsed	I <sub>DP</sub>	±20 A
Source current (Body diode)	Continuous	I <sub>S</sub>	-1.6 A
	Pulsed	I <sub>SP</sub>	-20 A
Total power dissipation	P <sub>D</sub>	2.0	W
Channel temperature	T <sub>ch</sub>	150	°C
Range of Storage temperature	T <sub>stg</sub>	-55 to +150	°C

\*1 P<sub>w</sub>≤10μs, Duty cycle≤1%

\*2 Mounted on a ceramic board

## ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I <sub>GSS</sub>	-	-	±10	μA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	-30	-	-	V	I <sub>D</sub> =-1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	-	-	-1	μA	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	-1.0	-	-2.5	V	V <sub>DS</sub> =-10V, I <sub>D</sub> =-1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub>	-	30	42	mΩ	I <sub>D</sub> =-5.0A, V <sub>GS</sub> =-10V
		-	40	56	mΩ	I <sub>D</sub> =-2.5A, V <sub>GS</sub> =-4.5V
		-	45	63	mΩ	I <sub>D</sub> =-2.5A, V <sub>GS</sub> =-4.0V
Forward transfer admittance	Y <sub>fs</sub>	4.5	-	-	S	V <sub>DS</sub> =-10V, I <sub>D</sub> =-2.5A
Input capacitance	C <sub>iss</sub>	-	1400	-	pF	V <sub>DS</sub> =-10V
Output capacitance	C <sub>oss</sub>	-	300	-	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	-	230	-	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub>	-	15	-	ns	I <sub>D</sub> =-2.5A
Rise time	t <sub>r</sub>	-	30	-	ns	V <sub>DD</sub> ≐-15V
Turn-off delay time	t <sub>d(off)</sub>	-	80	-	ns	V <sub>GS</sub> =-10V
Fall time	t <sub>f</sub>	-	40	-	ns	R <sub>L</sub> =6Ω
Total gate charge	Q <sub>g</sub>	-	16	-	nC	R <sub>GS</sub> =10Ω
Gate-source charge	Q <sub>gs</sub>	-	3.5	-	nC	V <sub>DD</sub> ≐-15V
Gate-drain charge	Q <sub>gd</sub>	-	6.5	-	nC	V <sub>GS</sub> =-5V
						I <sub>D</sub> =-5.0A

\*Pulsed

Body diode characteristics (source-drain characteristics)

Forward voltage	V <sub>SD</sub>	-	-	-1.2	V	I <sub>S</sub> =-1.6A, V <sub>GS</sub> =0V
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Transistors

●Electrical characteristic curves

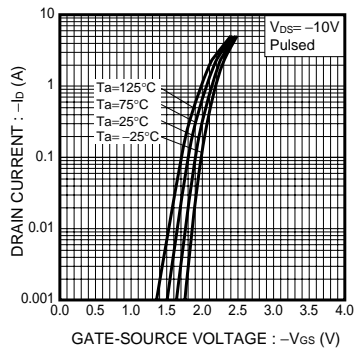


Fig.1 Typical Transfer Characteristics

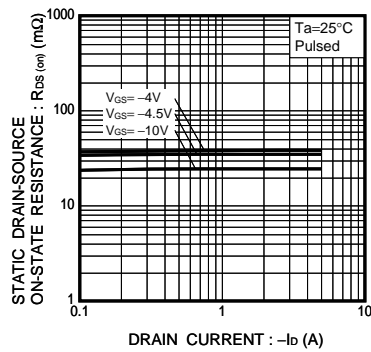


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

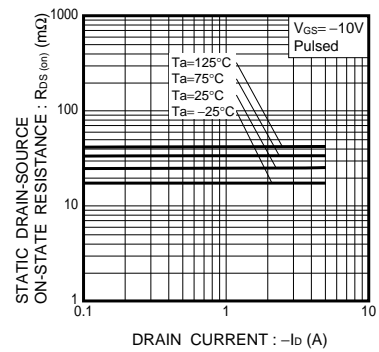


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

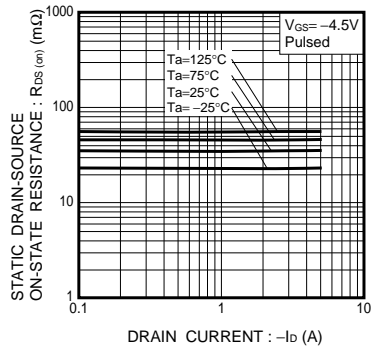


Fig.4 Static Drain-Source On-State vs. Drain Current

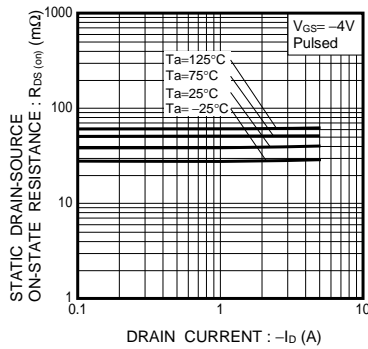


Fig.5 Static Drain-Source On-State vs. Drain Current

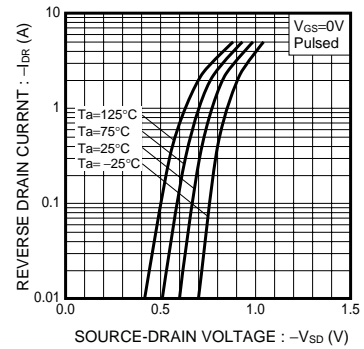


Fig.6 Reverse Drain Current Source-Drain Current

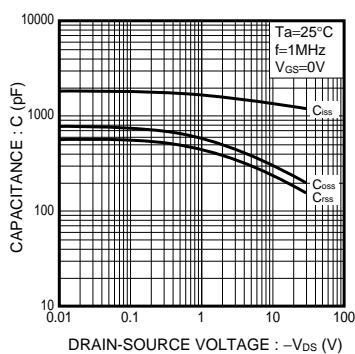


Fig.7 Typical Capacitance vs. Drain-Source Voltage

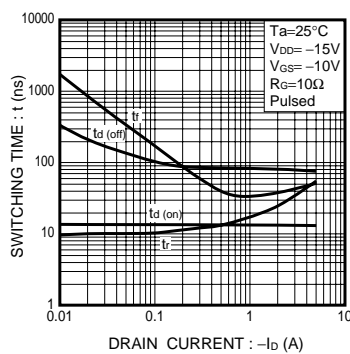


Fig.8 Switching Characteristics

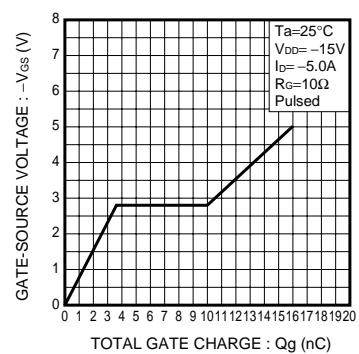


Fig.9 Dynamic Input Characteristics

Transistors

● Measurement circuits

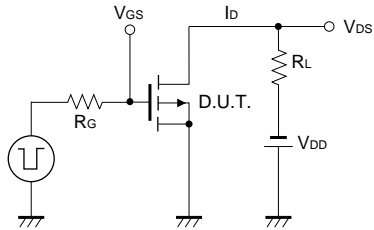


Fig.10 Switching Time Test Circuit

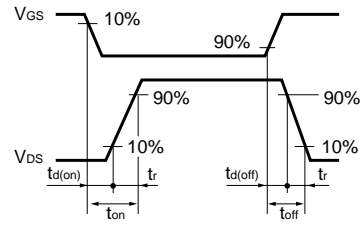


Fig.11 Switching Time Waveforms

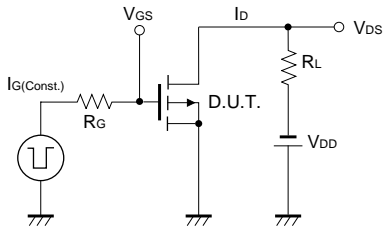


Fig.12 Gate Charge Test Circuit

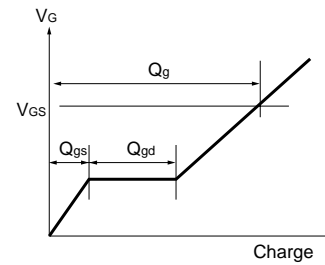


Fig.13 Gate Charge Waveform

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