

# Switching (−30V, −3.5A)

## SP8J3

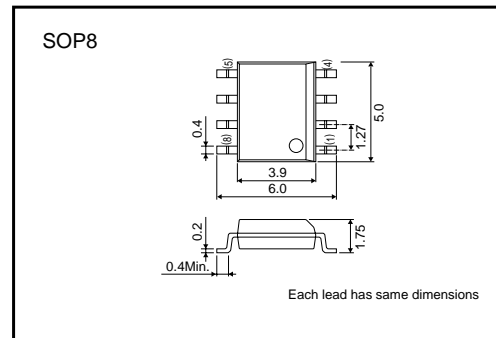
### ●Features

- 1) Low On-resistance. (100mΩ 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)



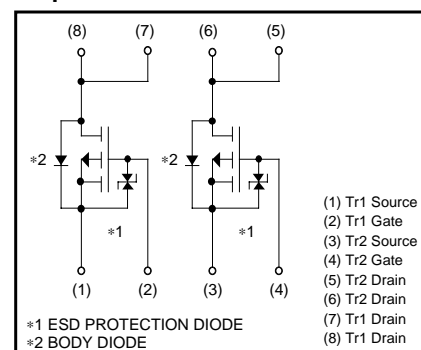
### ●Structure

Silicon P-channel  
MOS FET

### ●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SP8J3		○

### ●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>	±3.5
	Pulsed	I <sub>DP</sub>	±14
Source current (Body diode)	Continuous	I <sub>S</sub>	−1.6
	Pulsed	I <sub>SP</sub>	−14
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 Pw≤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>	−	65	90	mΩ	I <sub>D</sub> = −3.5A, V <sub>GS</sub> = −10V
		−	100	140	mΩ	I <sub>D</sub> = −1.75A, V <sub>GS</sub> = −4.5V
		−	120	165	mΩ	I <sub>D</sub> = −1.75A, V <sub>GS</sub> = −4.0V
Forward transfer admittance	Y <sub>fs</sub>	1.8	−	−	S	V <sub>DS</sub> = −10V, I <sub>D</sub> = −1.75A
Input capacitance	C <sub>iss</sub>	−	490	−	pF	V <sub>DS</sub> = −10V
Output capacitance	C <sub>oss</sub>	−	110	−	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	−	75	−	pF	f=1MHz
Turn-on delay time	t <sub>d (on)</sub>	−	10	−	ns	I <sub>D</sub> = −1.75A
Rise time	t <sub>r</sub>	−	15	−	ns	V <sub>DD</sub> ≒ −15V
Turn-off delay time	t <sub>d (off)</sub>	−	35	−	ns	V <sub>GS</sub> = −10V
Fall time	t <sub>f</sub>	−	10	−	ns	R <sub>L</sub> =8.6Ω
Total gate charge	Q <sub>g</sub>	−	5.5	−	nC	V <sub>DD</sub> ≒ −15V
Gate-source charge	Q <sub>gs</sub>	−	1.5	−	nC	V <sub>GS</sub> = −5V
Gate-drain charge	Q <sub>gd</sub>	−	2.0	−	nC	I <sub>D</sub> = −3.5A

\*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

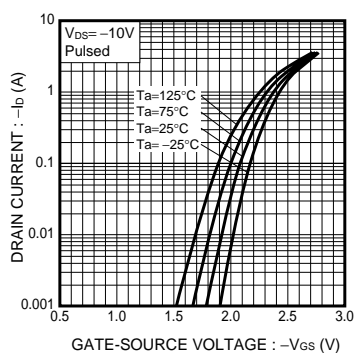


Fig.1 Typical Transfer Characteristics

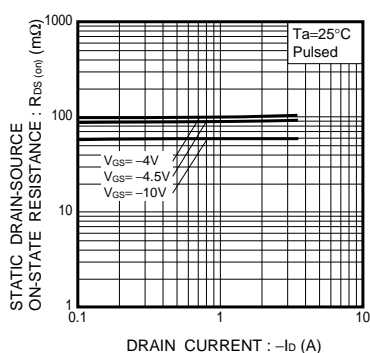


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

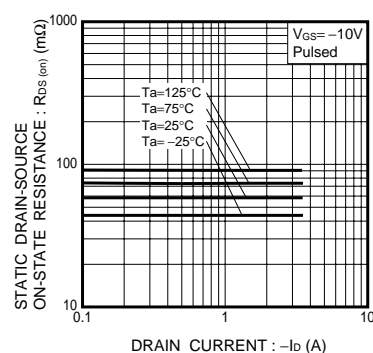


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

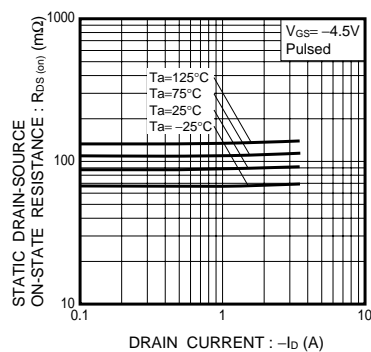


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

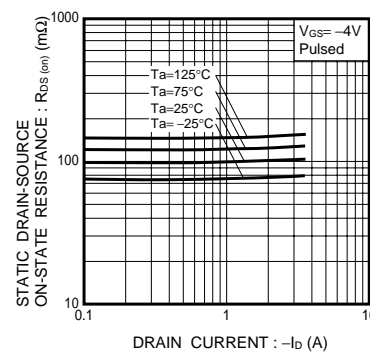


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

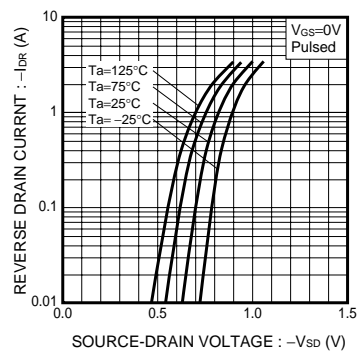


Fig.6 Reverse Drain Current Source-Drain Current

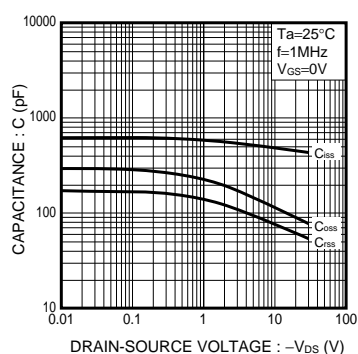


Fig.7 Typical Capacitance vs. Drain-Source Voltage

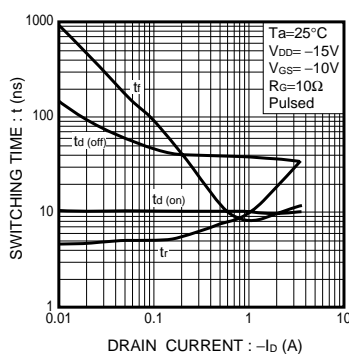


Fig.8 Switching Characteristics

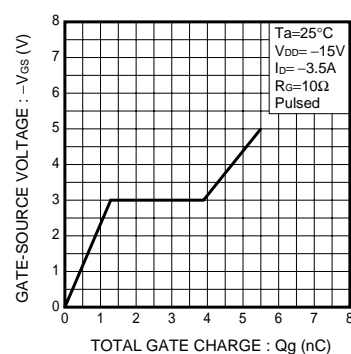


Fig.9 Dynamic Input Characteristics

## Transistors

### ●Measurement circuits

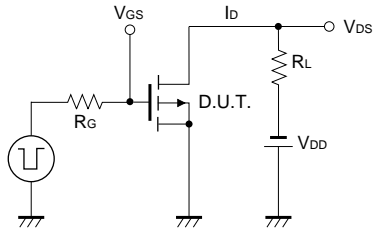


Fig.10 Switching Time Test Circuit

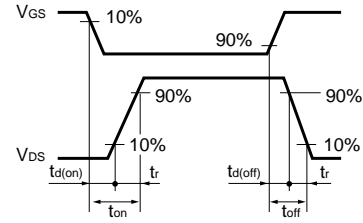


Fig.11 Switching Time Waveforms

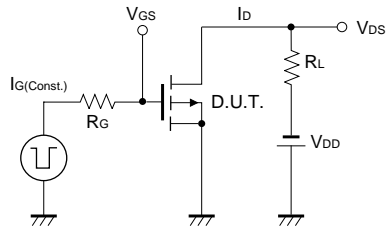


Fig.12 Gate Charge Test Circuit

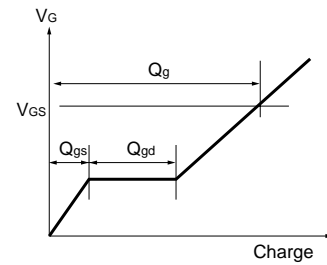


Fig.13 Gate Charge Waveform

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