

# 4V Drive Pch+Pch MOS FET

## SP8J5

### ●Structure

Silicon P-channel MOS FET

### ●Features

- 1) Low On-resistance. ( $25\text{m}\Omega$  at  $4.5\text{V}$ )
- 2) High Power Package. ( $P_D=2.0\text{W}$ )
- 3) High speed switching.
- 4) Low voltage drive. ( $4\text{V}$ )

### ●Applications

Power switching, DC-DC converter

### ●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SP8J5		○

### ●Absolute maximum ratings ( $T_a=25^\circ\text{C}$ )

<It is the same ratings for Tr1 and Tr2.>

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DS}$	-30	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Drain current	Continuous	$I_D$	A
	Pulsed	$I_{DP}$ *1	A
Source current (Body diode)	Continuous	$I_S$	A
	Pulsed	$I_{SP}$ *1	A
Total power dissipation	$P_D$ *2	2.0	W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Range of Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*1  $P_w \leq 10\mu\text{s}$ , Duty cycle  $\leq 1\%$

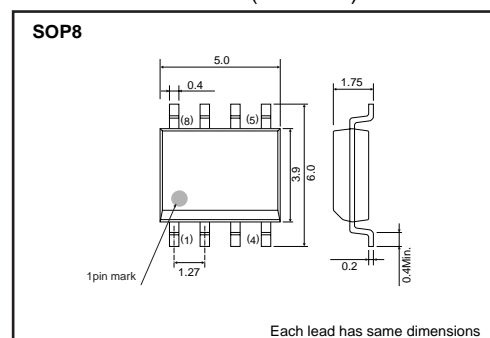
\*2 Mounted on a ceramic board

### ●Thermal resistance

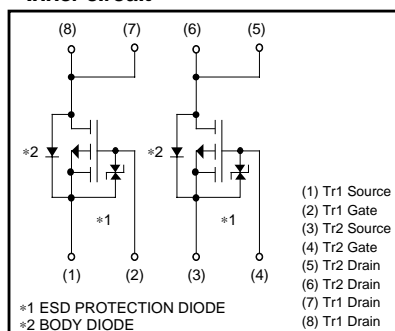
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	62.5	$^\circ\text{C} / \text{W}$

\* Mounted on a ceramic board.

### ●External dimensions (Unit : mm)



### ●Inner circuit



## Transistors

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

&lt;It is the same characteristics for Tr1 and Tr2.&gt;

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> *	—	20	28	mΩ	I <sub>D</sub> = −7A, V <sub>GS</sub> = −10V
		—	25	35	mΩ	I <sub>D</sub> = −3.5A, V <sub>GS</sub> = −4.5V
		—	30	42	mΩ	I <sub>D</sub> = −3.5A, V <sub>GS</sub> = −4.0V
Forward transfer admittance	Y <sub>fs</sub>   *	6.0	—	—	S	V <sub>DS</sub> = −10V, I <sub>D</sub> = −3.5A
Input capacitance	C <sub>iss</sub>	—	2600	—	pF	V <sub>DS</sub> = −10V
Output capacitance	C <sub>oss</sub>	—	450	—	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	—	350	—	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> *	—	20	—	ns	I <sub>D</sub> = −3.5A
Rise time	t <sub>r</sub> *	—	50	—	ns	V <sub>DD</sub> = −15V
Turn-off delay time	t <sub>d(off)</sub> *	—	110	—	ns	V <sub>GS</sub> = −10V
Fall time	t <sub>f</sub> *	—	70	—	ns	R <sub>L</sub> =4.3Ω
Total gate charge	Q <sub>g</sub> *	—	25	—	nC	R <sub>G</sub> =10Ω
Gate-source charge	Q <sub>gs</sub> *	—	5.5	—	nC	V <sub>DD</sub> = −15V
Gate-drain charge	Q <sub>gd</sub> *	—	10	—	nC	V <sub>GS</sub> = −5V
						I <sub>D</sub> = −7A

\*Pulsed

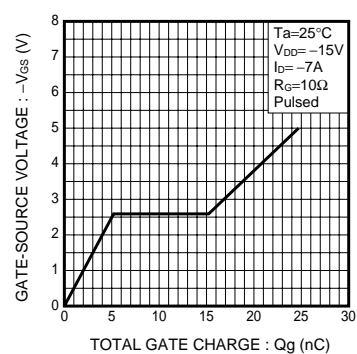
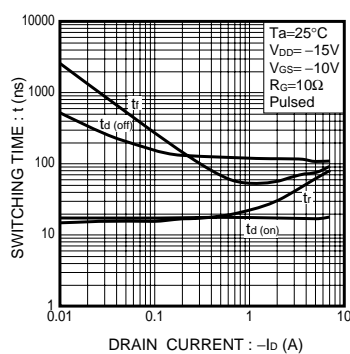
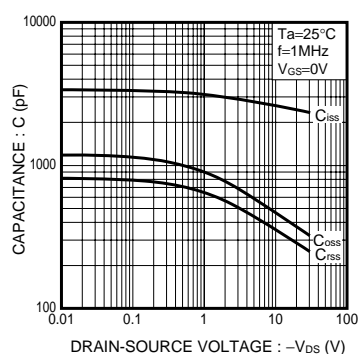
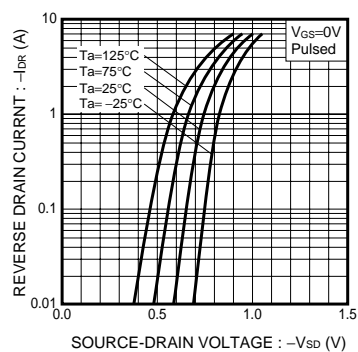
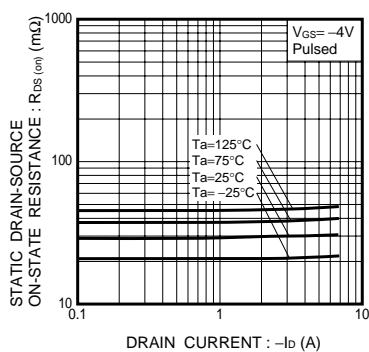
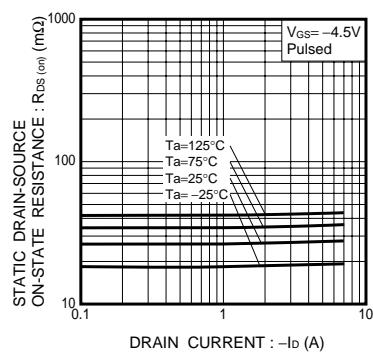
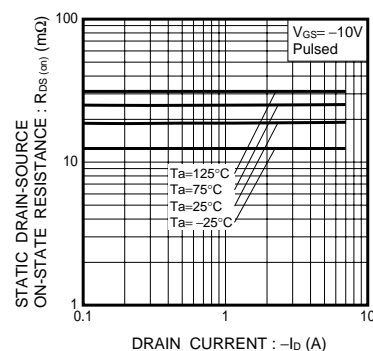
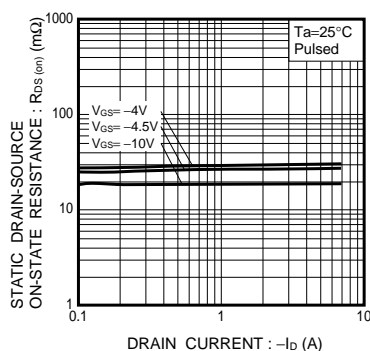
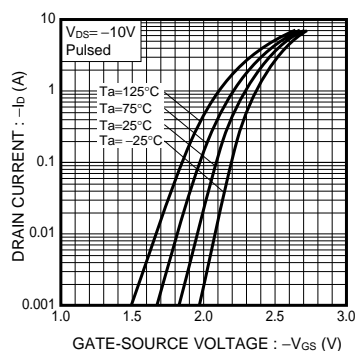
## ●Body diode characteristics (Source-drain) (Ta=25°C)

&lt;It is the same characteristics for Tr1 and Tr2.&gt;

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub>	—	—	−1.2	V	I <sub>S</sub> = −1.6A, V <sub>GS</sub> =0V

## Transistors

## ●Electrical characteristic curves



## Transistors

### ●Measurement circuits

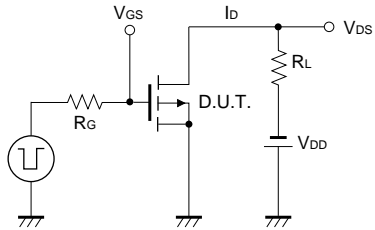


Fig.10 Switching Time Test Circuit

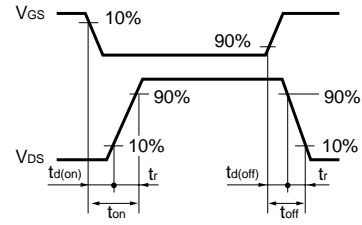


Fig.11 Switching Time Waveforms

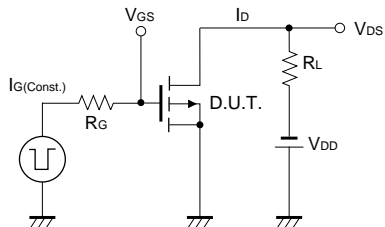


Fig.12 Gate Charge Test Circuit

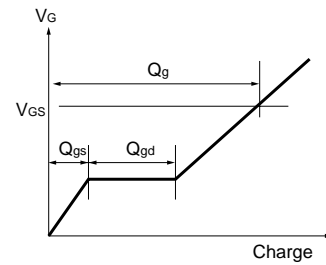


Fig.13 Gate Charge Waveform

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