

4V Drive Pch+Pch MOS FET

SP8J5

●Structure

Silicon P-channel MOS FET

●Features

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

●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_{DSS}	−30	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±7.0	A
	Pulsed	I_{DP} ^{*1}	±28	A
Source current (Body diode)	Continuous	I_S	−1.6	A
	Pulsed	I_{SP} ^{*1}	−28	A
Total power dissipation		P_D ^{*2}	2.0	W
Channel temperature		T_{ch}	150	°C
Range of Storage temperature		T_{stg}	−55 to +150	°C

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

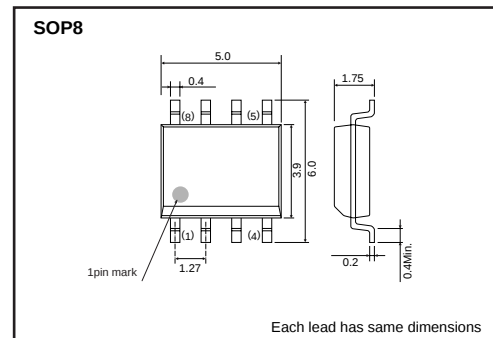
*2 Mounted on a ceramic board

●Thermal resistance

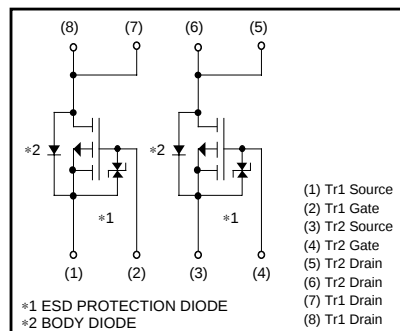
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	62.5	$^\circ\text{C} / \text{W}$

* Mounted on a ceramic board.

●External dimensions (Unit : mm)



●Inner circuit



Transistors

●Electrical characteristics (Ta=25°C)

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	±10	μA	$V_{GS}=±20V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	−30	—	—	V	$I_D=−1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	—	—	−1	μA	$V_{DS}=−30V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	−1.0	—	−2.5	V	$V_{DS}=−10V$, $I_D=−1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	—	20	28	mΩ	$I_D=−7A$, $V_{GS}=−10V$
		—	25	35	mΩ	$I_D=−3.5A$, $V_{GS}=−4.5V$
		—	30	42	mΩ	$I_D=−3.5A$, $V_{GS}=−4.0V$
Forward transfer admittance	$ Y_{fs} $ *	6.0	—	—	S	$V_{DS}=−10V$, $I_D=−3.5A$
Input capacitance	C_{iss}	—	2600	—	pF	$V_{DS}=−10V$
Output capacitance	C_{oss}	—	450	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	350	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	—	20	—	ns	$I_D=−3.5A$
Rise time	t_r *	—	50	—	ns	$V_{DD}=−15V$
Turn-off delay time	$t_{d(off)}$ *	—	110	—	ns	$V_{GS}=−10V$
Fall time	t_f *	—	70	—	ns	$R_L=4.3Ω$
Total gate charge	Q_g *	—	25	—	nC	$V_{DD}=−15V$
Gate-source charge	Q_{gs} *	—	5.5	—	nC	$V_{GS}=−5V$
Gate-drain charge	Q_{gd} *	—	10	—	nC	$I_D=−7A$

*Pulsed

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	—	—	−1.2	V	$I_S=−1.6A$, $V_{GS}=0V$

Transistors

●Electrical characteristic curves

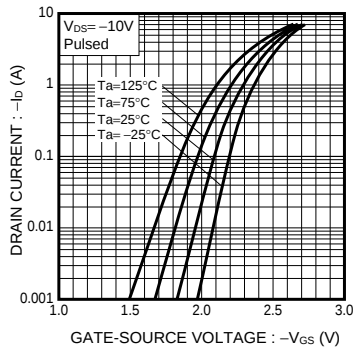


Fig.1 Typical Transfer Characteristics

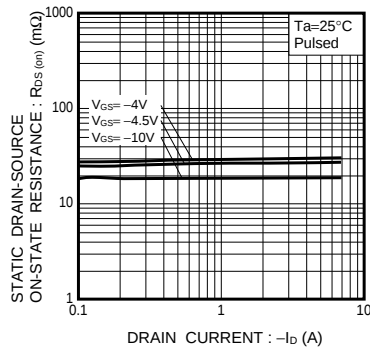


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

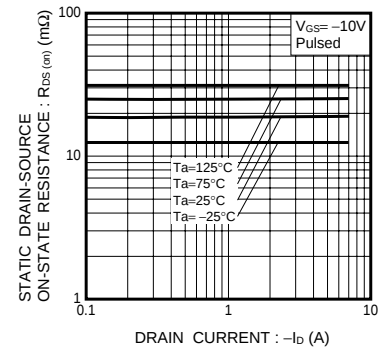


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

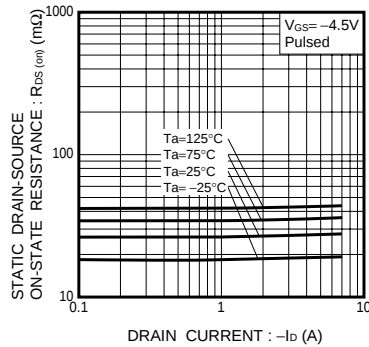


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

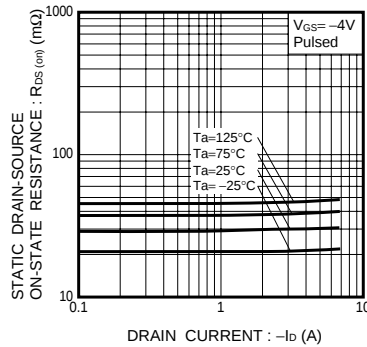


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

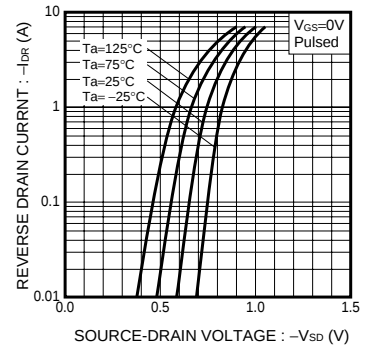


Fig.6 Reverse Drain Current Source-Drain Current

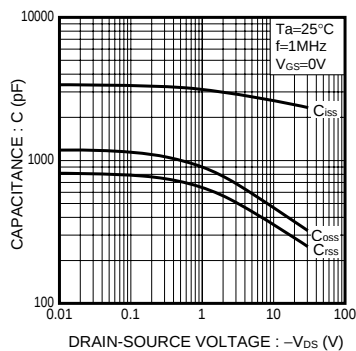


Fig.7 Typical Capacitance vs. Drain-Source Voltage

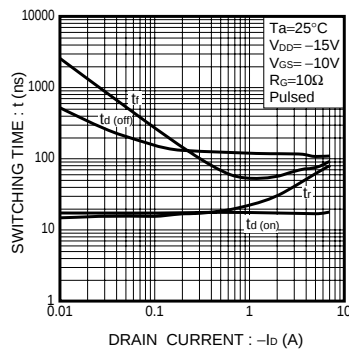


Fig.8 Switching Characteristics

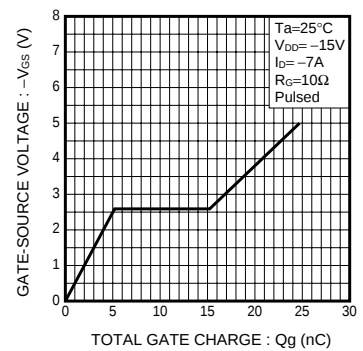


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

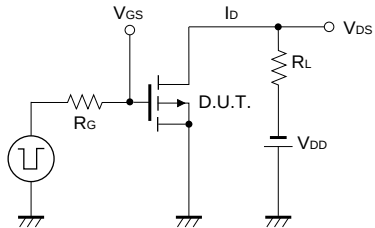


Fig.10 Switching Time Test Circuit

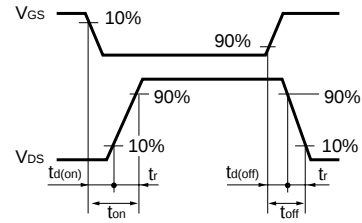


Fig.11 Switching Time Waveforms

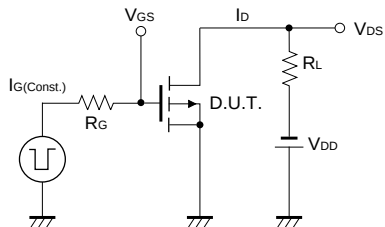


Fig.12 Gate Charge Test Circuit

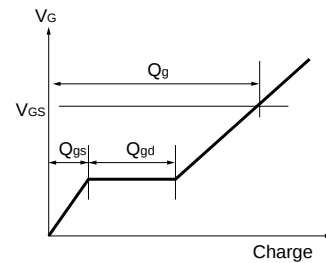


Fig.13 Gate Charge Waveform

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