

4V Drive Pch+Pch MOS FET

SP8J1

●Structure

Silicon P-channel MOS FET

●Features

- 1) Low On-resistance. (40mΩ at 4.5V)
- 2) High Power Package. ($P_D=2.0W$)
- 3) High speed switching.
- 4) Low voltage drive. (4 V)

●Applications

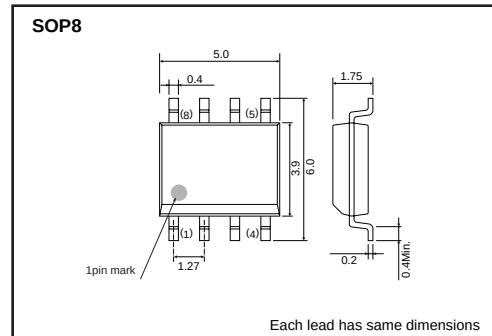
Power switching

DC-DC converter

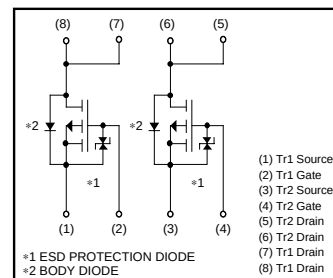
●Packaging specifications

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

●External dimensions (Unit : mm)



●Inner circuit



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

<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}	± 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	$^{\circ}C$
Range of Storage temperature	T_{stg}	-55 to +150	$^{\circ}C$

*1 $P_w \leq 10\mu s$, 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	$^{\circ}C / W$

* Mounted on a ceramic board.

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	$V_{GS}=\pm 20V$, $V_{DS}=0V$
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	$R_{DS(on)}$ *	—	30	42	mΩ	$I_D = -5.0A$, $V_{GS} = -10V$
		—	40	56	mΩ	$I_D = -2.5A$, $V_{GS} = -4.5V$
		—	45	63	mΩ	$I_D = -2.5A$, $V_{GS} = -4.0V$
Forward transfer admittance	$ Y_{fs} $ *	4.5	—	—	S	$V_{DS} = -10V$, $I_D = -2.5A$
Input capacitance	C_{iss}	—	1400	—	pF	$V_{DS} = -10V$
Output capacitance	C_{oss}	—	300	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	230	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	—	15	—	ns	$I_D = -2.5A$
Rise time	t_r *	—	30	—	ns	$V_{DD} \doteq -15V$
Turn-off delay time	$t_{d(off)}$ *	—	80	—	ns	$V_{GS} = -10V$
Fall time	t_f *	—	40	—	ns	$R_L=6\Omega$
Total gate charge	Q_g *	—	16	—	nC	$V_{DD} \doteq -15V$
Gate-source charge	Q_{gs} *	—	3.5	—	nC	$V_{GS} = -5V$
Gate-drain charge	Q_{gd} *	—	6.5	—	nC	$I_D = -5.0A$

*Pulsed

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

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

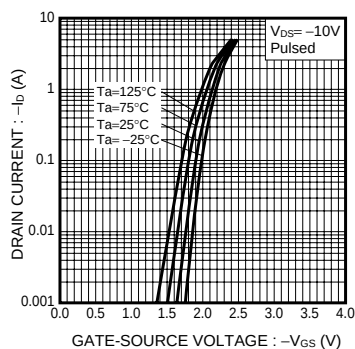


Fig.1 Typical Transfer Characteristics

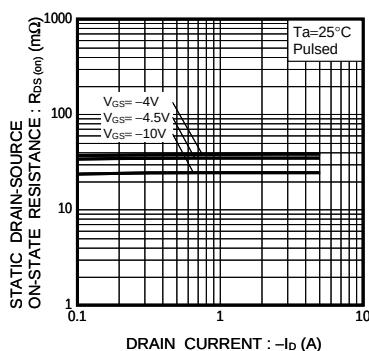


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

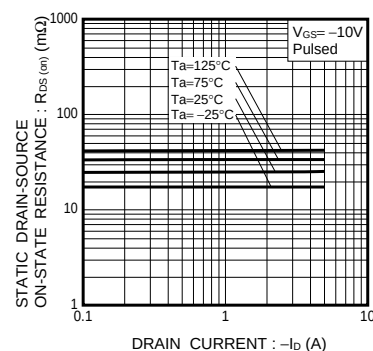


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

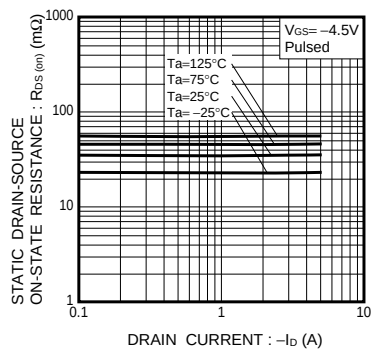


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

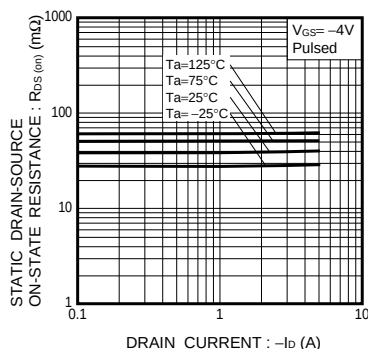


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

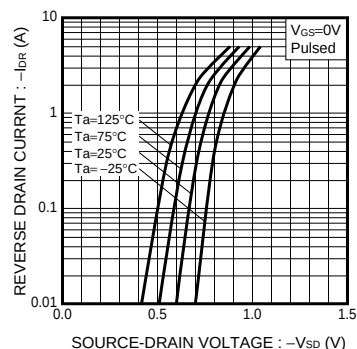


Fig.6 Reverse Drain Current Source-Drain Current

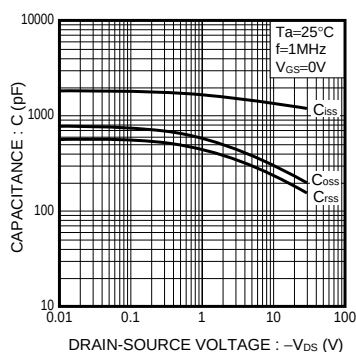


Fig.7 Typical Capacitance vs. Drain-Source Voltage

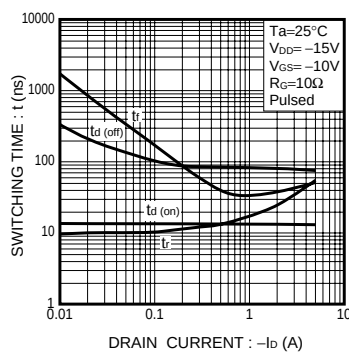


Fig.8 Switching Characteristics

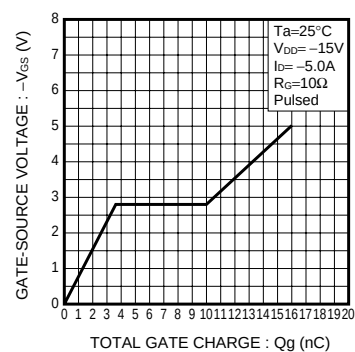


Fig.9 Dynamic Input Characteristics

Transistors

●Measurement circuits

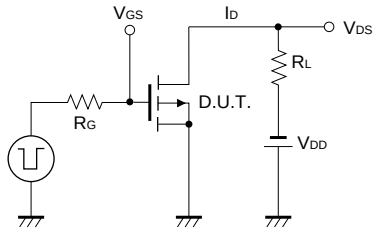


Fig.10 Switching Time Test Circuit

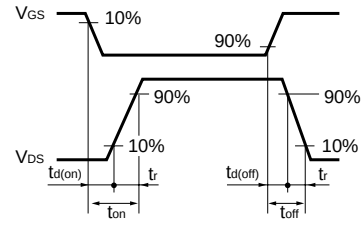


Fig.11 Switching Time Waveforms

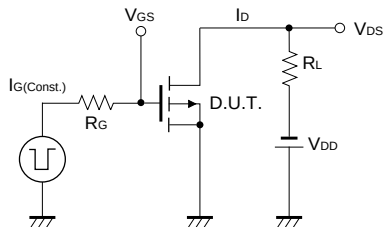


Fig.12 Gate Charge Test Circuit

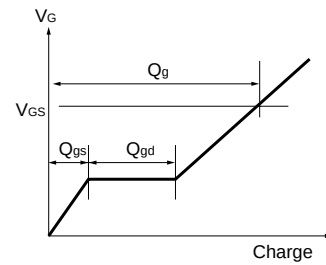


Fig.13 Gate Charge Waveform

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