Switching (45V, 4.5A)

SP8K22

●Features

1) Built-in G-S Protection Diode.
2) Small and Surface Mount Package (SOP8).

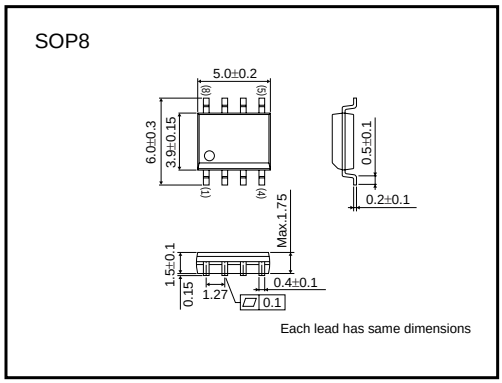
●Applications

Power switching , DC / DC converter , Inverter

●Structure

Silicon N-channel
MOS FET

●External dimensions (Unit : mm)



●Packaging dimensions

Package	Taping
Code	TB
Basic ordering unit(pieces)	2500

●Absolute maximum ratings (Ta=25°C)

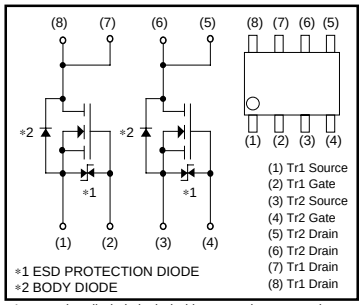
It is the same ratings for the Tr. 1 and Tr. 2.

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	45	V
Gate-source voltage		V_{GSS}	20	V
Drain current	Continuous	I_D	±4.5	A
	Pulsed	I_{DP}	±18	A *1
Source current (Body diode)	Continuous	I_S	1	A
	Pulsed	I_{SP}	18	A *1
Total power dissipation		P_D	2	W/TOTAL *2
			1.4	W/ELEMENT*2
Chanel temperature		T_{ch}	150	°C
Range of Storage temperature		T_{stg}	-55 to +150	°C

*1 PW≦10μs、Duty cycle≦1%

*2 Mounted on a ceramic board

●Equivalent circuit



∗A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use the protection circuit when the fixed voltages are exceeded.

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

It is the same characteristics for the Tr. 1 and Tr. 2.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Gate-source leakage	I_{GSS}	—	—	10	μA	V_{GS}=20V/V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DSS}$	45	—	—	V	I_D=1mA/V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	V_{DS}=45V/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	$R_{DS(on)}$ *	—	33	46	mΩ	I_D=4.5A/V_{GS}=10V
		—	41	57		I_D=4.5A/V_{GS}=4.5V
		—	46	64		I_D=4.5A/V_{GS}=4.0V
Forward transfer admittance	$\|Y_{fs}\|$ *	3.5	—	—	S	V_{DS}=10V/I_D=4.5A
Input capacitance	C_{iss}	—	550	—	pF	V_{DS}=10V
Output capacitance	C_{oss}	—	140	—		V_{GS}=0V
Reverce transfer capacitance	C_{rss}	—	70	—		f=1MHz
Turn-on delay time	$t_{d(on)}$ *	—	12	—	ns	V_{DD}=25V
Rise time	t_r *	—	18	—		I_D=2.5A
Turn-off delay time	$t_{d(off)}$ *	—	42	—		V_{GS}=10V
Fall time	t_f *	—	12	—		R_L=10Ω/R_G=10Ω
Total gate charge	Q_g *	—	6.8	9.6	nC	V_{DD}=25V/I_D=4.5A
Gate-source charge	Q_{gs} *	—	2.0	—		V_{GS}=5V
Gate-drain charge	Q_{gd} *	—	2.9	—		R_L=5.6Ω/R_G=10Ω

* pulsed

Body diode characteristics (Source-Drain)

It is the same characteristics for the Tr. 1 and Tr. 2.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	V_{SD} *	—	—	1.2	V	I_S=4.5A/V_{GS}=0V

* pulsed

●**Electrical characteristic curves**

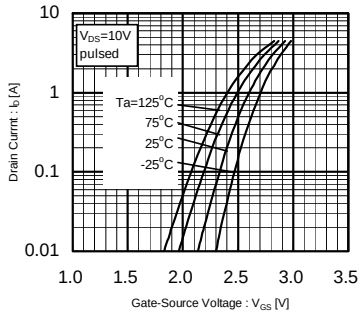


Fig.1 Typical Transfer Characteristics

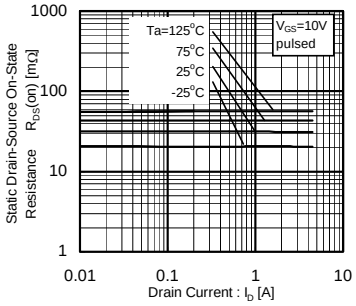


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

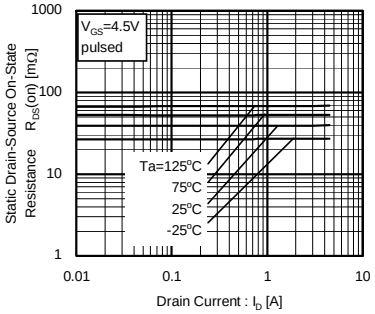


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

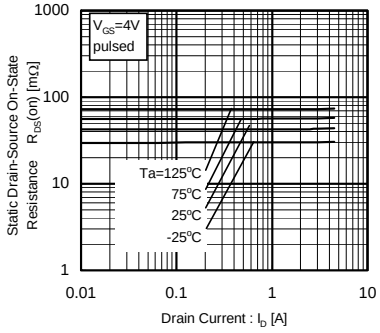


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

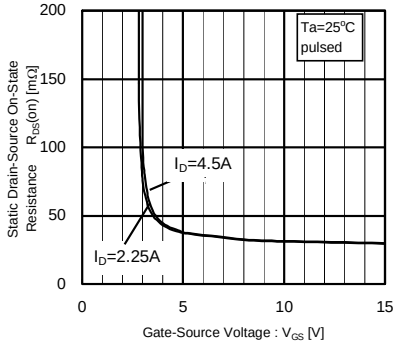


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

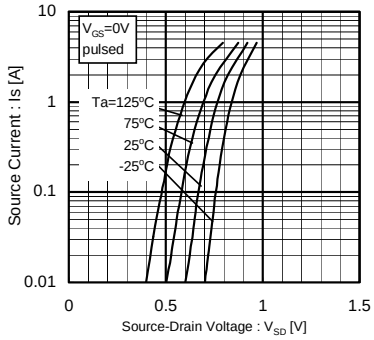


Fig.6 Source-Current vs. Source-Drain Voltage

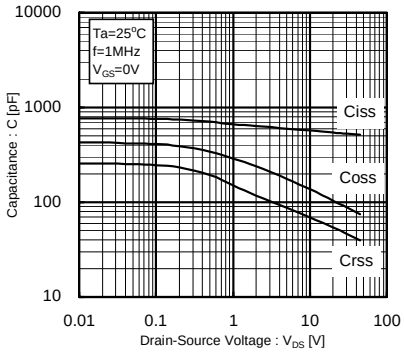


Fig.7 Typical capacitance vs. Source-Drain Voltage

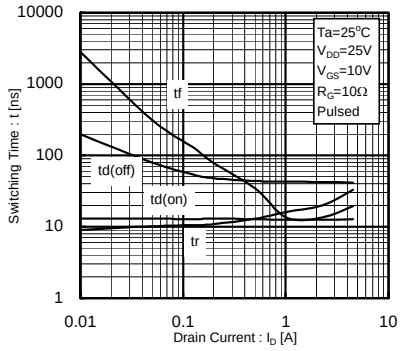


Fig.8 Switching Characteristics

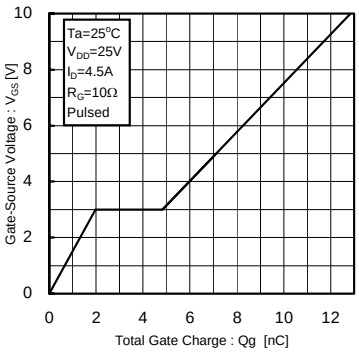


Fig.9 Dynamic Input Characteristics

●**Measurement circuits**

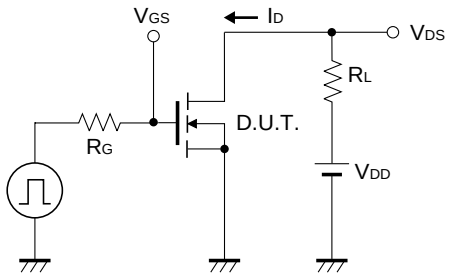


Fig.10 Switching Time Test Circuit

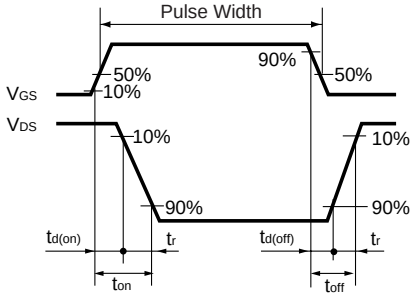


Fig.11 Switching Time Waveforms

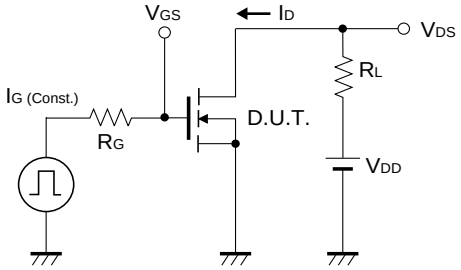


Fig.12 Gate Charge Test Circuit

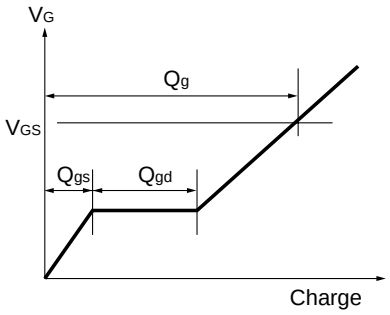


Fig.13 Gate Charge Waveform

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