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Transistor

4V Drive Nch+Nch MOSFET

SP8K22

●Structure

Silicon N-channel
MOSFET

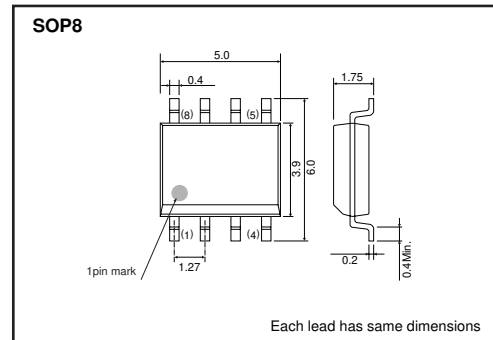
●Features

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

●Applications

Power switching , DC / DC converter , Inverter

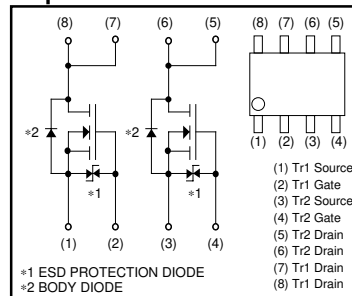
●Dimensions (Unit : mm)



●Packaging dimensions

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SP8K22		○

●Equivalent circuit



*1 ESD PROTECTION DIODE
*2 BODY DIODE
*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.

●Absolute maximum ratings (Ta=25°C)

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

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} *1	± 18 A
Source current (Body diode)	Continuous	I_S	1 A
	Pulsed	I_{SP} *1	18 A
Total power dissipation	P_D *2	2	W / TOTAL
		1.4	W / ELEMENT
Chanel temperature	T_{ch}	150	°C
Range of Storage temperature	T_{stg}	-55 to +150	°C

*1 $PW \leq 10\mu s$, Duty cycle $\leq 1\%$

*2 Mounted on a ceramic board

Transistor

●Electrical characteristics (Ta=25°C)

<It is the same characteristics for the 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}	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	mΩ	I _D = 4.5A, V _{GS} = 4.5V
		–	46	64	mΩ	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	–	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	–	70	–	pF	f=1MHz
Turn-on delay time	t _{d (on)} *	–	12	–	ns	V _{DD} ≐ 25V I _D = 2.5A
Rise time	t _r *	–	18	–	ns	V _{GS} = 10V
Turn-off delay time	t _{d (off)} *	–	42	–	ns	R _L = 10Ω
Fall time	t _f *	–	12	–	ns	R _G =10Ω
Total gate charge	Q _g *	–	6.8	9.6	nC	V _{DD} ≐ 25V, V _{GS} = 5V
Gate-source charge	Q _{gs} *	–	2.0	–	nC	I _D = 4.5A
Gate-drain charge	Q _{gd} *	–	2.9	–	nC	R _L = 5.6Ω, R _G = 10Ω

*Pulsed

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	V _{SD} *	–	–	1.2	V	I _S =4.5A/V _{GS} =0V

* pulsed

Transistor

●Electrical characteristic curves

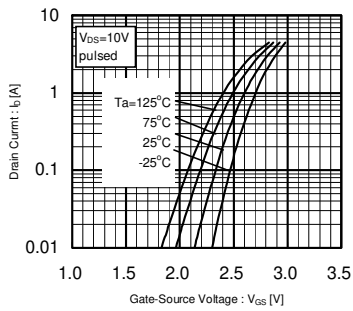


Fig.1 Typical Transfer Characteristics

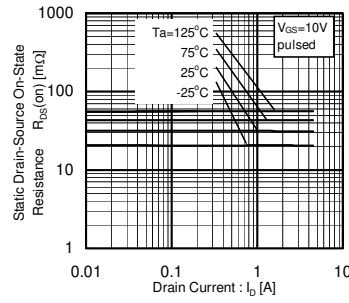


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

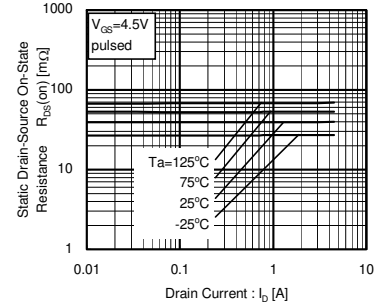


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

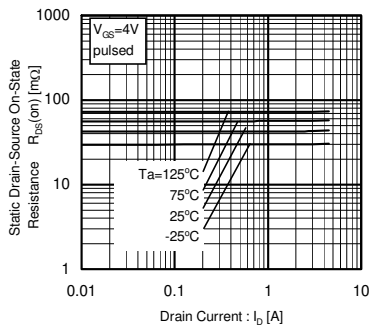


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

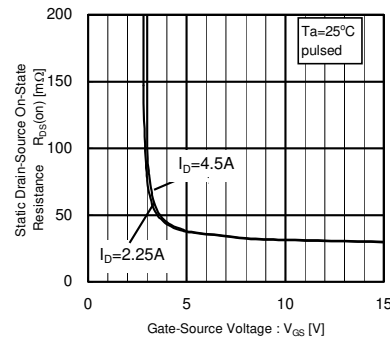


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

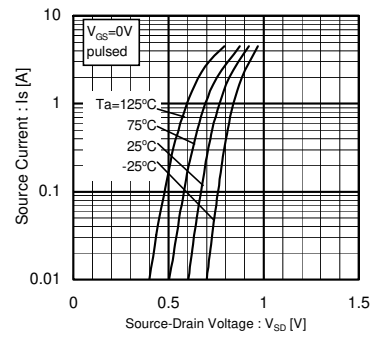


Fig.6 Source-Current vs. Source-Drain Voltage

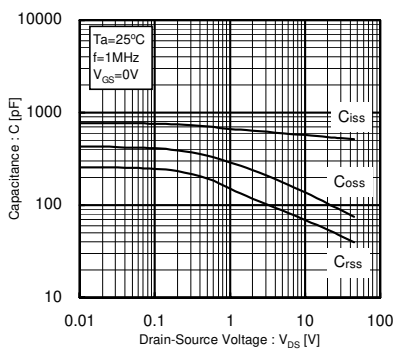


Fig.7 Typical capacitance vs. Source-Drain Voltage

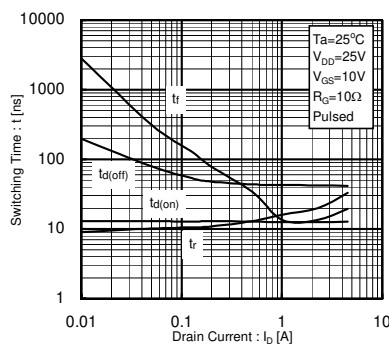


Fig.8 Switching Characteristics

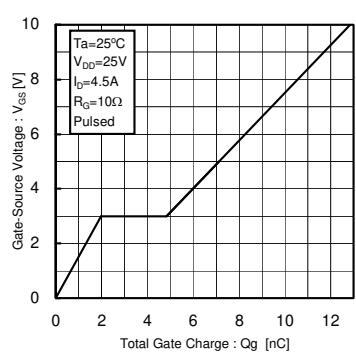


Fig.9 Dynamic Input Characteristics

Transistor

● Measurement circuits

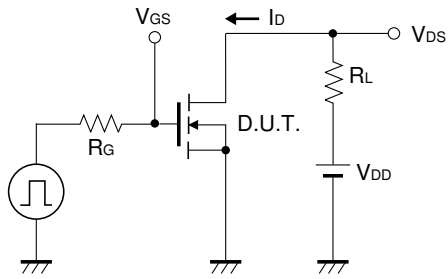


Fig.10 Switching Time Test Circuit

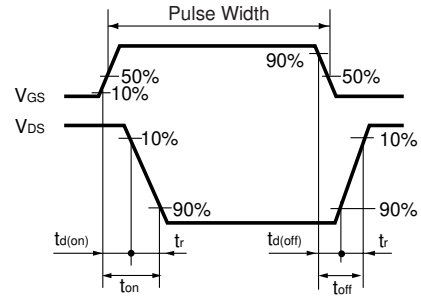


Fig.11 Switching Time Waveforms

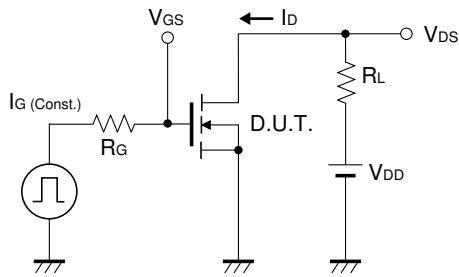


Fig.12 Gate Charge Test Circuit

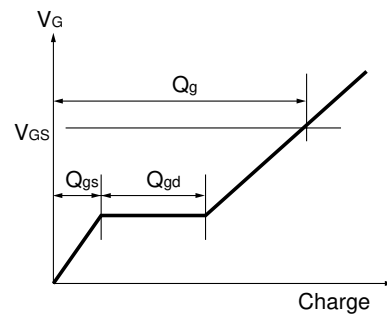


Fig.13 Gate Charge Waveform

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