

4V Drive Nch MOSFET

RSD200N10

●Structure

Silicon N-channel MOSFET

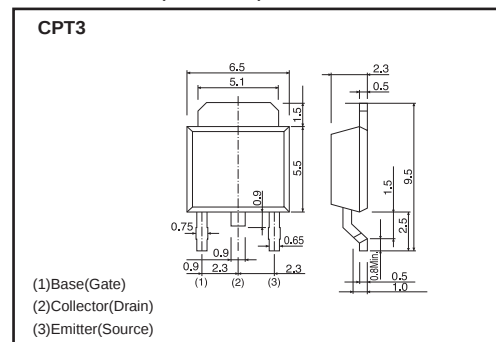
●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Wide SOA (safe operating area).
- 4) Gate-source voltage (V_{GS}) guaranteed to be $\pm 30V$.
- 5) Drive circuits can be simple.
- 6) Parallel use is easy.

●Applications

Switching

●Dimensions (Unit : mm)



●Packaging specifications

	Package	Taping
	Code	TL
Type	Basic ordering unit (pieces)	2500
RSD200N10		○

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

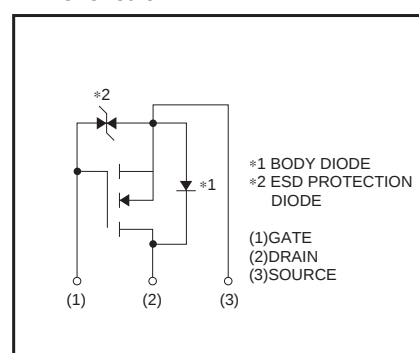
Parameter	Symbol	Limits	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	± 20	V
Drain current	Continuous I_D *3	± 20	A
	Pulsed I_{DP} *1	± 80	A
Source current (Body Diode)	Continuous I_S	20	A
	Pulsed I_{SP} *1	80	A
Avalanche Current	I_{AS} *2	20	A
Avalanche Energy	E_{AS} *2	85	mJ
Total power dissipation ($T_c=25^{\circ}C$)	P_D	20	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 $L \approx 265 \mu H$, $V_{DS}=50V$, $R_G=25\Omega$, Starting, $T_{ch}=25^{\circ}C$

*3 Limited only by maximum temperature allowed

●Inner circuit



●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	$R_{th(ch-c)}$	6.25	$^{\circ}C/W$

Transistors

●Electrical characteristics (Ta=25°C)

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}	100	–	–	V	I _D =1mA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}	–	–	10	μA	V _{DS} =100V, 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)} *	–	41	52	mΩ	I _D =10A, V _{GS} =10V
		–	44	58	mΩ	I _D =10A, V _{GS} =4.5V
		–	45	59	mΩ	I _D =10A, V _{GS} =4.0V
Forward transfer admittance	Y _{fs} *	14	–	–	S	I _D =10A, V _{DS} =10V
Input capacitance	C _{iss}	–	2200	–	pF	V _{DS} =25V
Output capacitance	C _{oss}	–	180	–	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	–	110	–	pF	f=1MHz
Turn-on delay time	t _{d(on)} *	–	18	–	ns	I _D =10A, V _{DD} ≒50V
Rise time	t _r *	–	61	–	ns	V _{GS} =10V
Turn-off delay time	t _{d(off)} *	–	128	–	ns	R _L =5Ω
Fall time	t _f *	–	193	–	ns	R _G =10Ω
Total gate charge	Q _g *	–	48.5	–	nC	V _{DD} ≒50V
Gate-source charge	Q _{gs} *	–	5.5	–	nC	I _D =20A
Gate-drain charge	Q _{gd} *	–	13	–	nC	V _{GS} =10V
						R _L =2.5Ω / R _G =10Ω

* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V _{SD} *	–	–	1.5	V	I _S = 20A, V _{GS} =0V

* Pulsed

Transistors

●Electrical characteristic curves

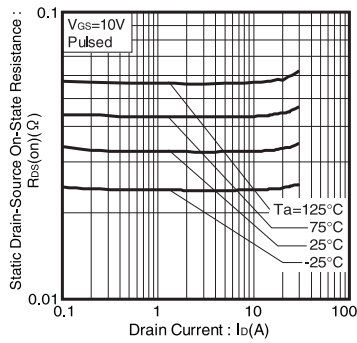


Fig.1 Static Drain-Source On-State Resistance vs. Drain Current

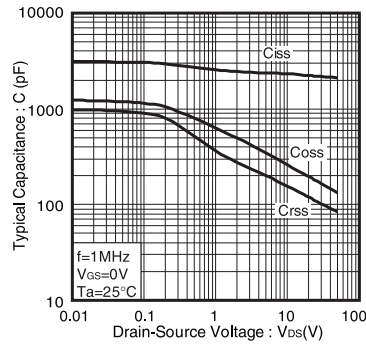


Fig.2 Typical Capacitance vs. Drain-Source Voltage

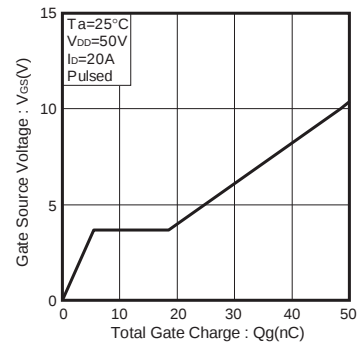


Fig.3 Dynamic Input Characteristics

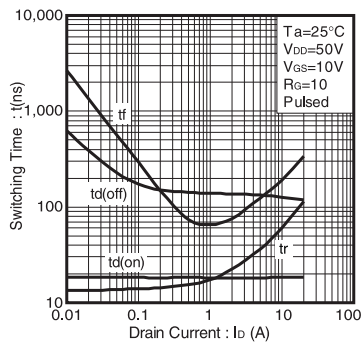


Fig.4 Switching Characteristics

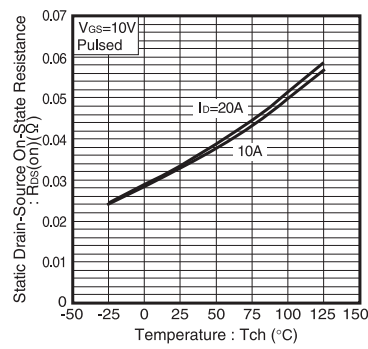


Fig.5 Static Drain-Source On-State Resistance vs. Channel Temperature

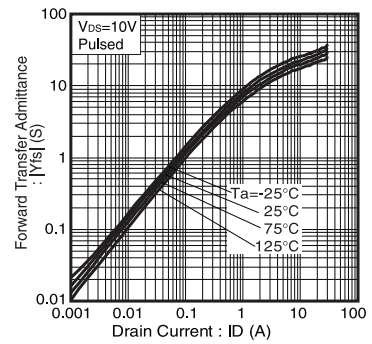


Fig.6 Forward Transfer Admittance vs. Pulsed

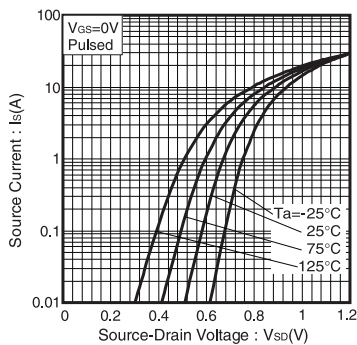


Fig.7 Source Current vs. Source-Drain Voltage

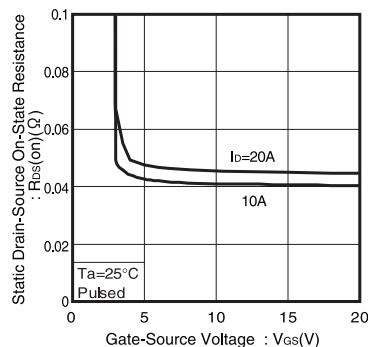


Fig.8 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

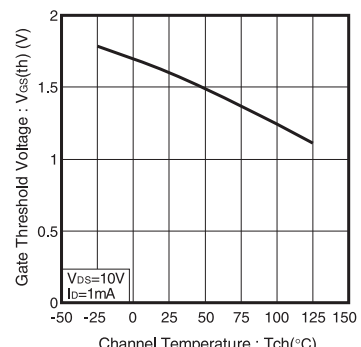


Fig.9 Gate Threshold Voltage vs. Channel Temperature

Transistors

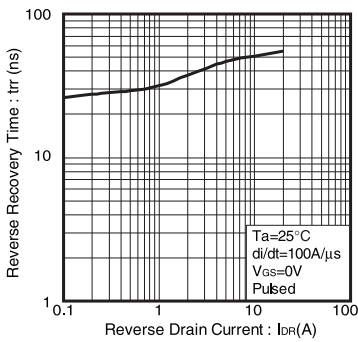


Fig.10 Reverse Recovery Time vs. Reverse Drain Current

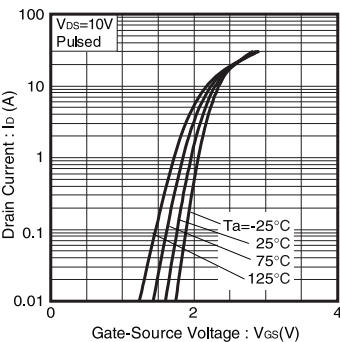


Fig.11 Typical Transfer Characteristics

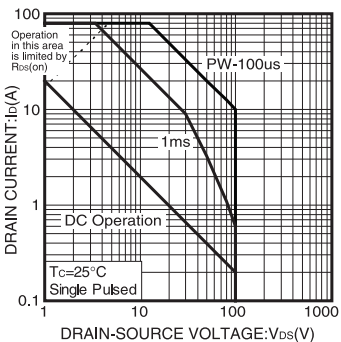


Fig.12 Maximum Safe Operating Area

Transistors

●Switching characteristics measurement circuit

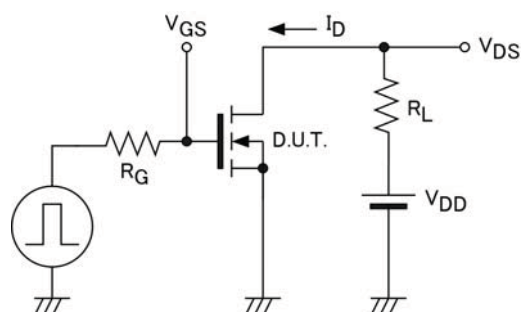


Fig.1-1 Switching time measurement circuit

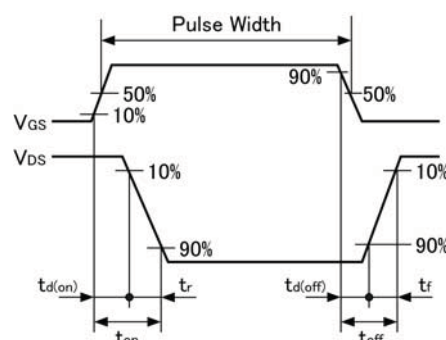


Fig.1-2 Switching waveforms

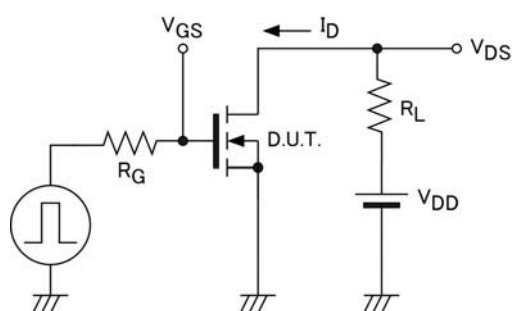


Fig.2-1 Gate charge measurement circuit

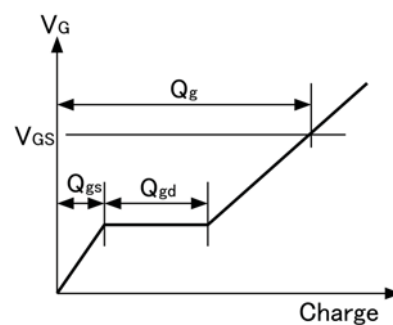


Fig.2-2 Gate charge waveform

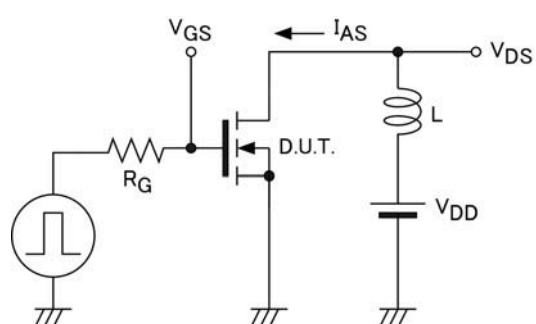


Fig.3-1 Avalanche measurement circuit

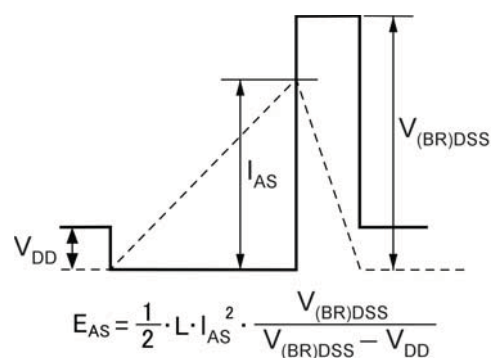


Fig.3-2 Avalanche waveform

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