

4V Drive Nch MOSFET

RSD200N05

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Drive circuits can be simple.
- 4) Parallel use is easy.

●Application

Switching

●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
RSD200N05		○

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DSS}	45	V	
Gate-source voltage	V_{GSS}	±20	V	
Drain current	Continuous	I_D	±20	A
	Pulsed	I_{DP} *1	±40	A
Source current (Body Diode)	Continuous	I_S	16	A
	Pulsed	I_{SP} *1	40	A
Power dissipation	P_D *2	20	W	
Channel temperature	T_{ch}	150	°C	
Range of storage temperature	T_{stg}	-55 to +150	°C	

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

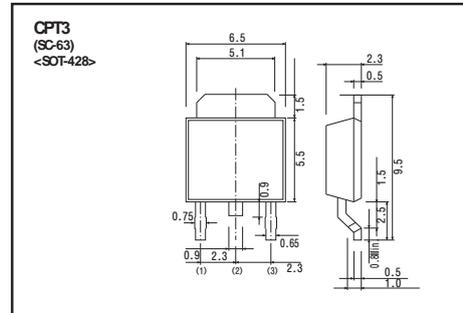
*2 $T_c = 25^\circ C$

●Thermal resistance

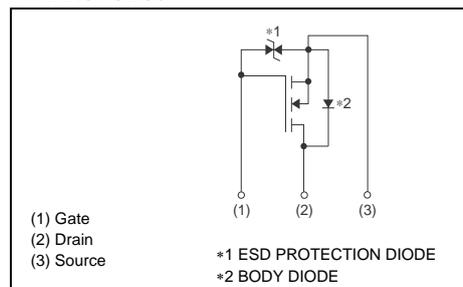
Parameter	Symbol	Limits	Unit
Channel to Case	$R_{th(ch-c)}$ *	6.25	°C / W

* $T_c = 25^\circ C$

●Dimensions (Unit : mm)



●Inner circuit



●Electrical characteristics (T_a = 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}	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)} *	-	20	28	mΩ	I _D =20A, V _{GS} =10V
		-	25	35		I _D =20A, V _{GS} =4.5V
		-	28	40		I _D =20A, V _{GS} =4.0V
Forward transfer admittance	Y _{fs} *	10	-	-	S	I _D =20A, V _{DS} =10V
Input capacitance	C _{iss}	-	950	-	pF	V _{DS} =10V
Output capacitance	C _{oss}	-	250	-	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	-	120	-	pF	f=1MHz
Turn-on delay time	t _{d(on)} *	-	10	-	ns	I _D =10A, V _{DD} ≒25V
Rise time	t _r *	-	20	-	ns	V _{GS} =10V
Turn-off delay time	t _{d(off)} *	-	50	-	ns	R _L =2.5Ω
Fall time	t _f *	-	20	-	ns	R _G =10Ω
Total gate charge	Q _g *	-	12	-	nC	V _{DD} ≒25V
Gate-source charge	Q _{gs} *	-	3.5	-	nC	I _D =20A,
Gate-drain charge	Q _{gd} *	-	4.0	-	nC	V _{GS} =5V

*Pulsed

●Body diode characteristics (Source-Drain) (T_a = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V _{SD} *	-	-	1.2	V	I _s =20A, V _{GS} =0V

*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics (I)

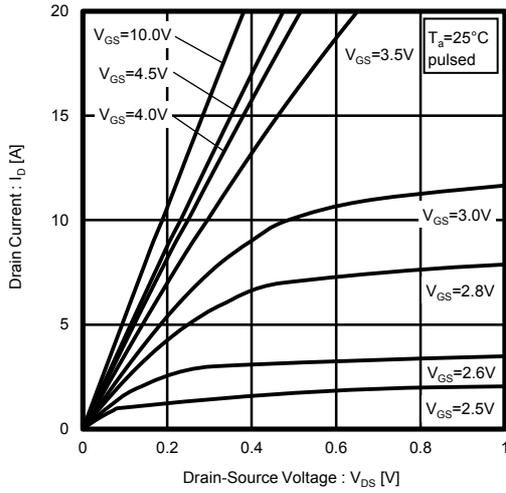


Fig.2 Typical Output Characteristics (II)

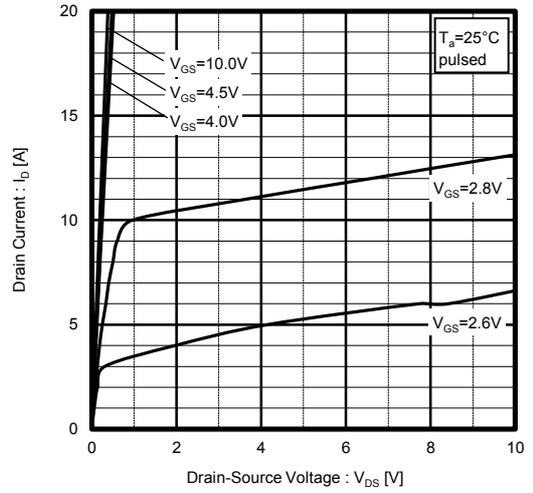


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

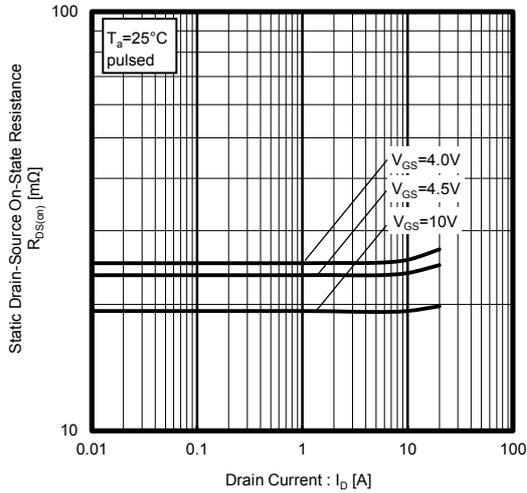


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

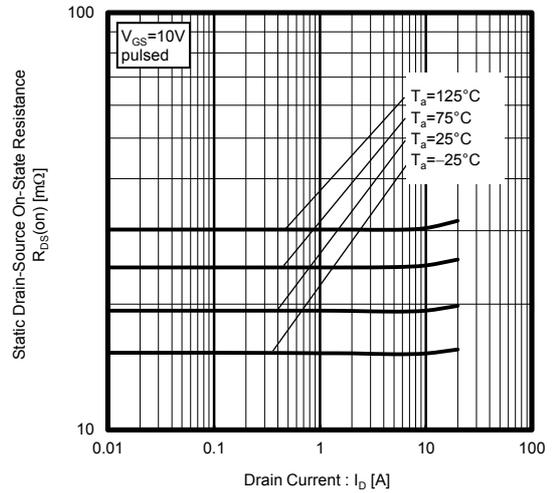


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

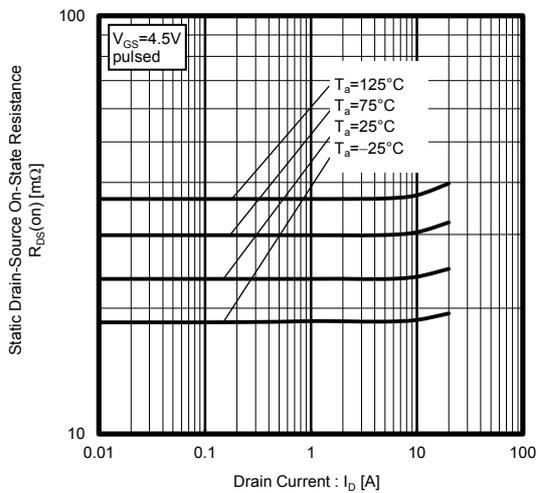


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

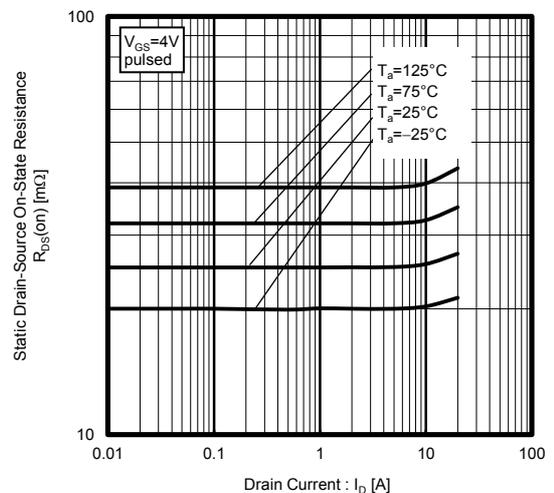


Fig.7 Forward Transfer Admittance vs. Drain Current

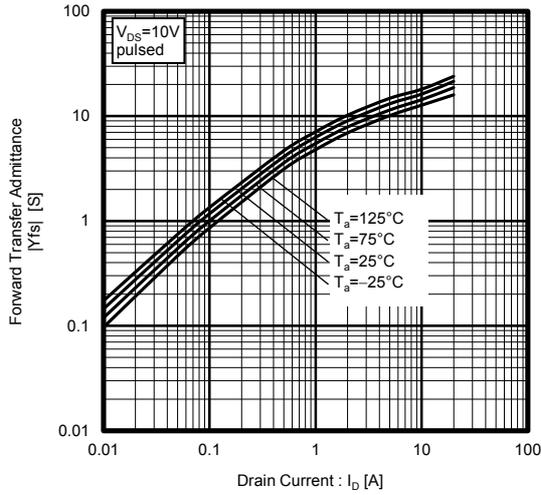


Fig.8 Typical Transfer Characteristics

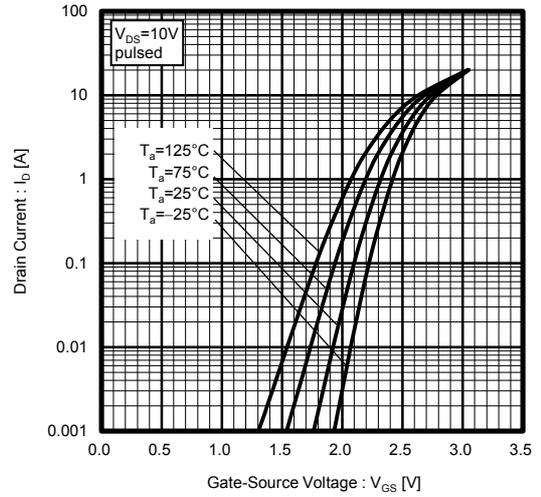


Fig.9 Source Current vs. Source-Drain Voltage

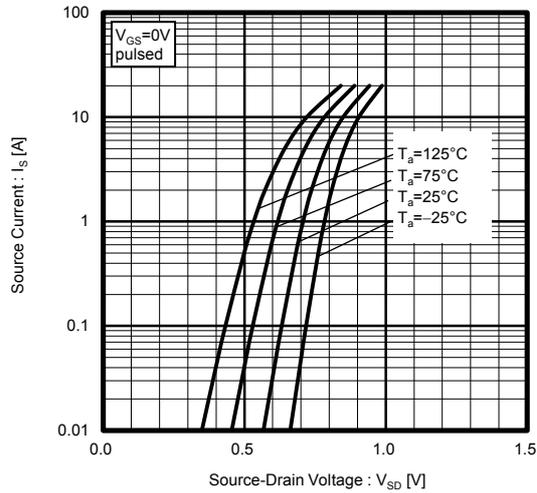


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

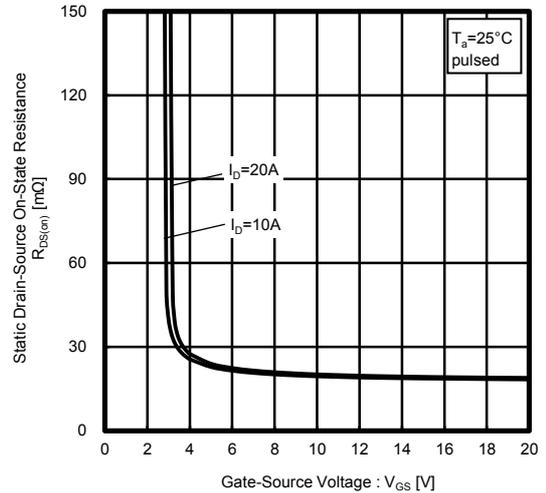


Fig.11 Switching Characteristics

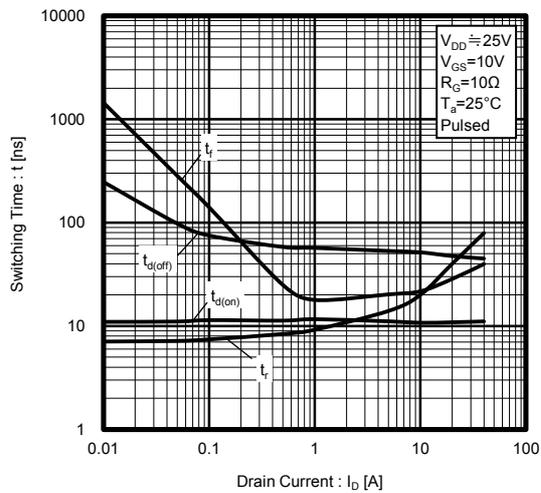


Fig.12 Dynamic Input Characteristics

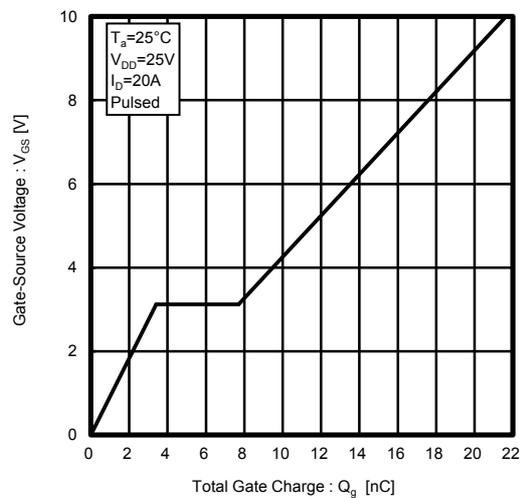


Fig.13 Typical Capacitance vs. Drain-Source Voltage

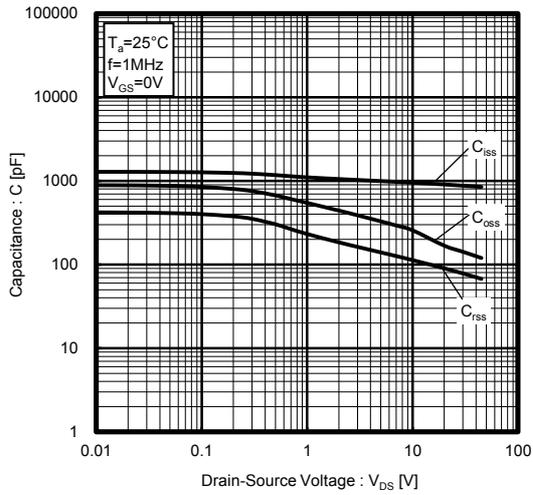


Fig.14 Maximum Safe Operating Area

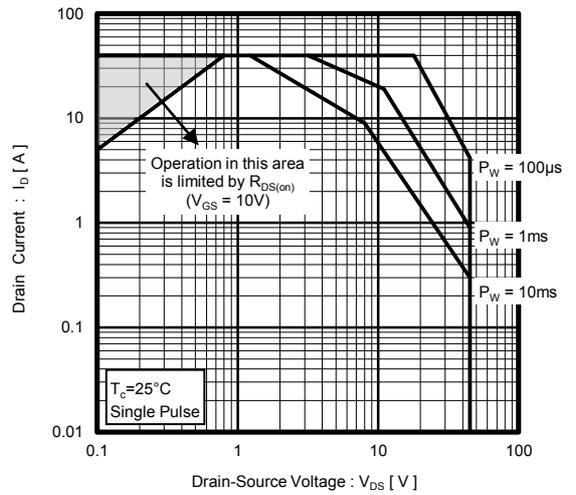
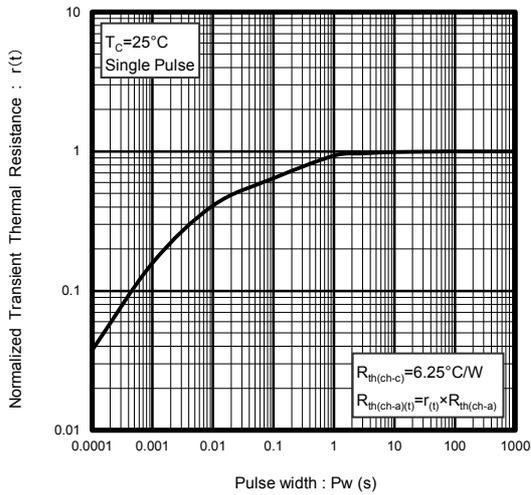


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



● Measurement circuits

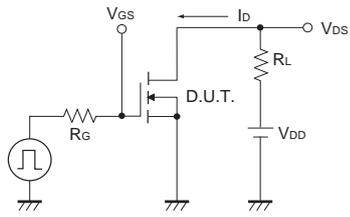


Fig.1-1 Switching Time Measurement Circuit

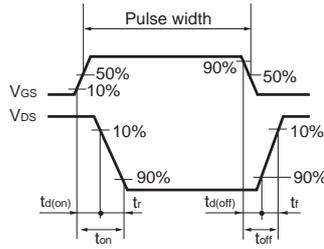


Fig.1-2 Switching Waveforms

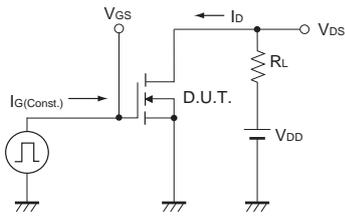


Fig.2-1 Gate Charge Measurement Circuit

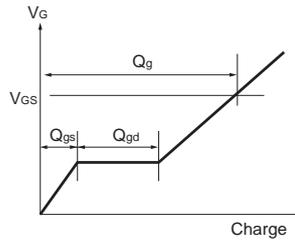


Fig.2-2 Gate Charge Waveform

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