4V Drive Nch MOSFET

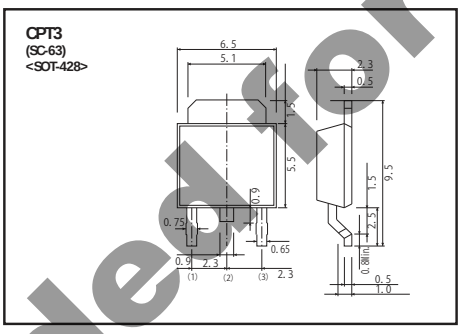
RSD050N10

●Structure
Silicon N-channel MOSFET

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

●Applications
Switching

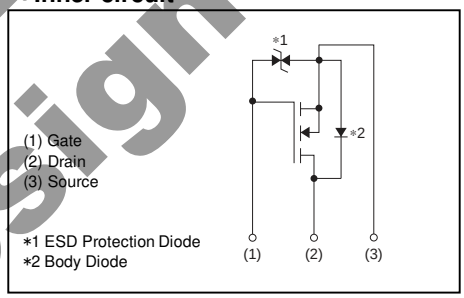
●Dimensions (Unit : mm)



●Packaging specifications

Type	Package	CPT3
	Code	TL
	Basic ordering unit (pieces)	2500

●Inner circuit



●Absolute maximum ratings (T_a=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	100	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±5.0	A
	Pulsed	I_{DP} *1	±20	A
Source current (Body Diode)	Continuous	I_S	5.0	A
	Pulsed	I_{SP} *1	20	A
Power dissipation		P_D *2	15	W
Channel temperature		T_{ch}	150	°C
Range of storage temperature		T_{stg}	−55 to +150	°C

*1 Pw≦10μs, Duty cycle≦1%
*2 T_c=25°C

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to Case	$R_{th\ (ch-c)}$ *	8.33	°C / W

* T_c=25°C

●**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	$V_{(BR)DSS}$	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	$R_{DS\ (on)}$*	-	135	190	mΩ	I_D=5.0A, V_{GS}=10V
		-	142	200		I_D=5.0A, V_{GS}=4.5V
		-	145	205		I_D=5.0A, V_{GS}=4.0V
Forward transfer admittance	$\|Y_{fs}\|$*	2.5	-	-	S	I_D=5.0A, V_{DS}=10V
Input capacitance	C_{iss}	-	530	-	pF	V_{DS}=25V
Output capacitance	C_{oss}	-	50	-	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	-	30	-	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$*	-	10	-	ns	I_D=2.5A, V_{DD}≒ 50V
Rise time	t_r *	-	15	-	ns	V_{GS}=10V
Turn-off delay time	$t_{d(off)}$*	-	45	-	ns	R_L=20Ω
Fall time	t_f *	-	15	-	ns	R_G=10Ω
Total gate charge	Q_g *	-	14	-	nC	V_{DD}≒ 50V
Gate-source charge	Q_{gs} *	-	1.7	-	nC	I_D=5.0A,
Gate-drain charge	Q_{gd} *	-	3.0	-	nC	V_{GS}=10V

*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=5.0A, V_{GS}=0V

*Pulsed

●Electrical characteristic curves (T_a=25°C)

Fig.1 Typical Output Characteristics (Ⅰ)

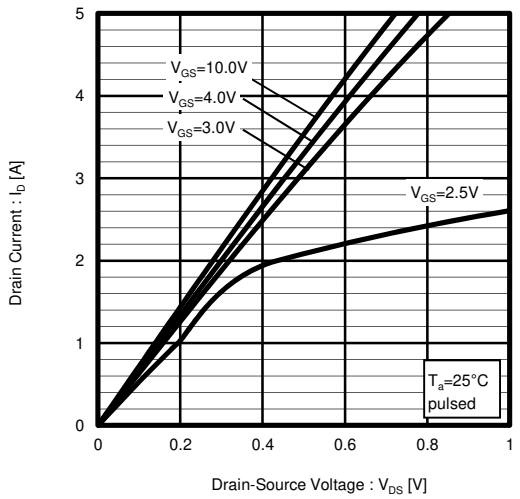


Fig.2 Typical Output Characteristics (Ⅱ)

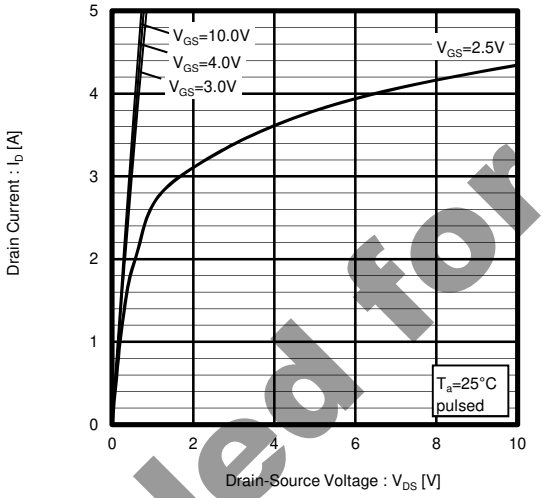


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

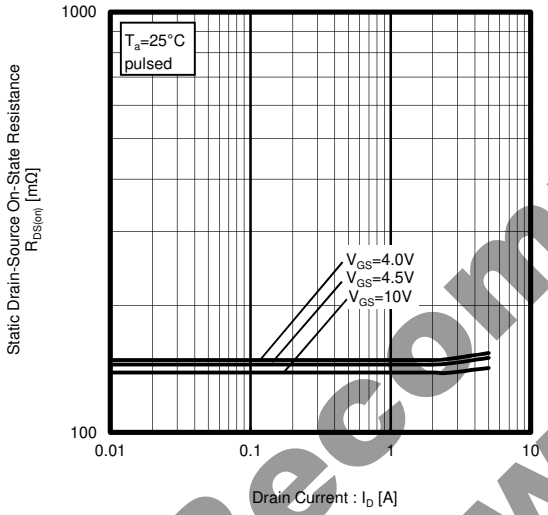


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

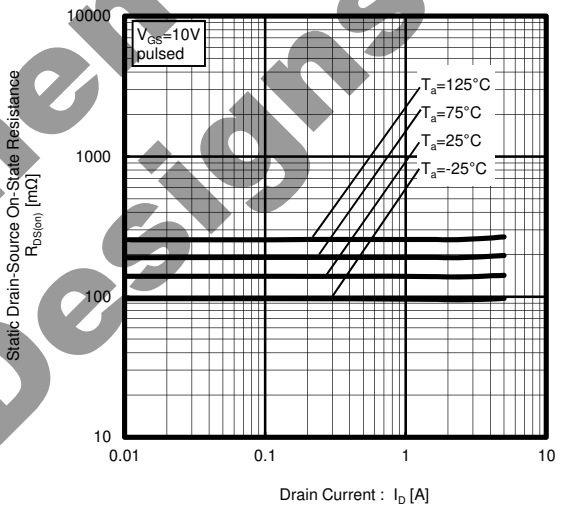


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

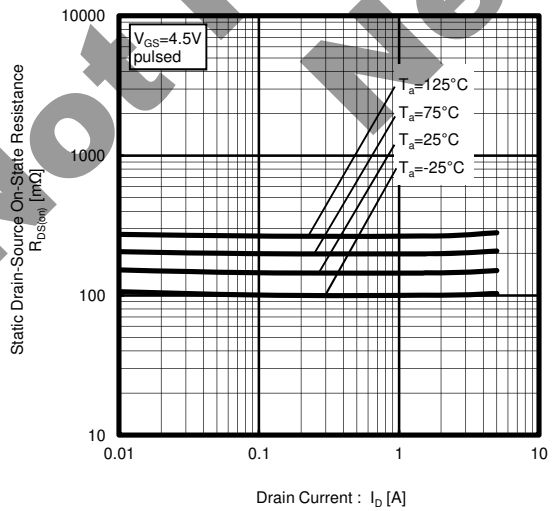


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

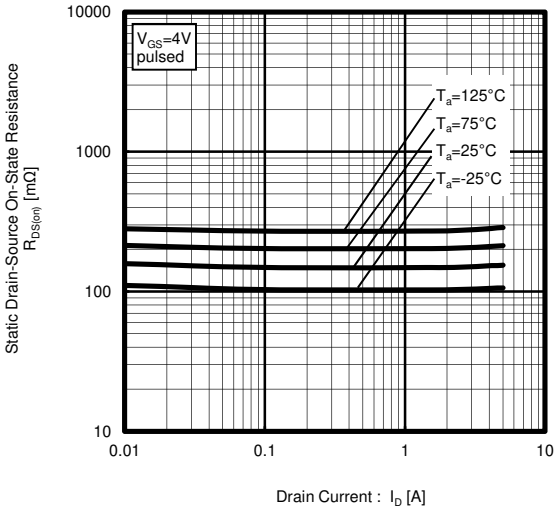


Fig.7 Forward Transfer Admittance vs. Drain Current

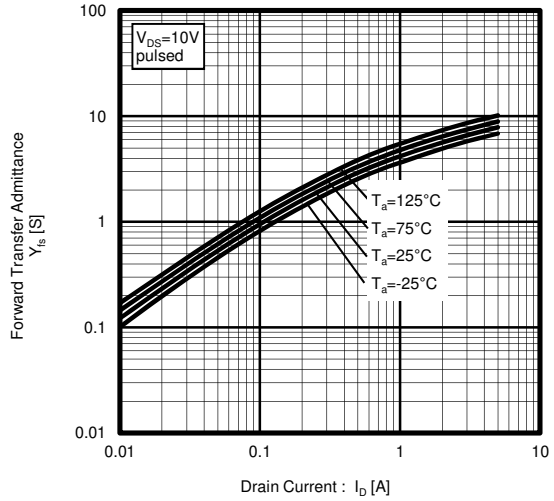


Fig.8 Typical Transfer Characteristics

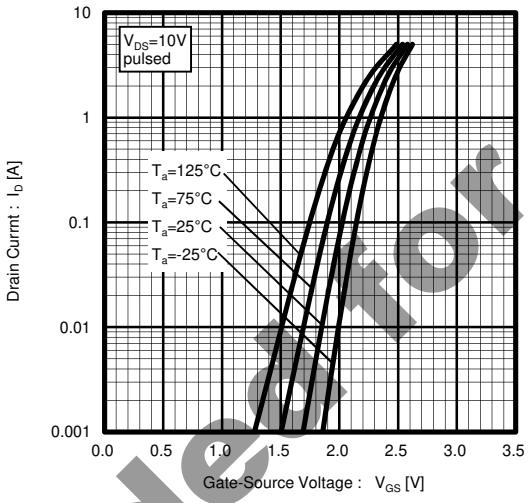


Fig.9 Source Current vs. Source-Drain Voltage

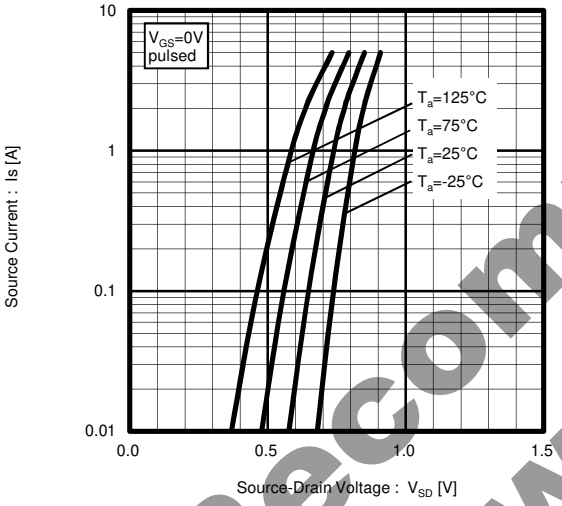


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

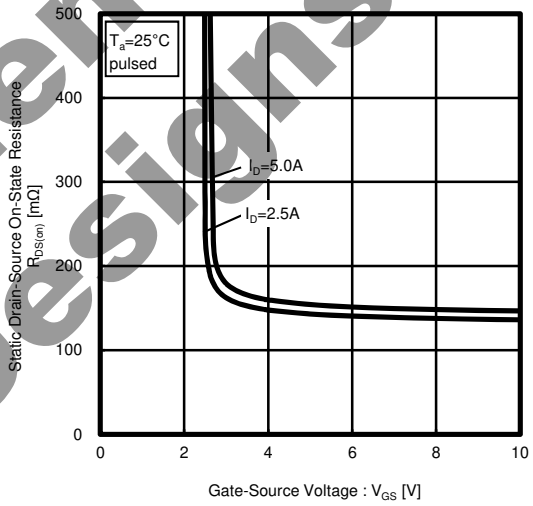


Fig.11 Switching Characteristics

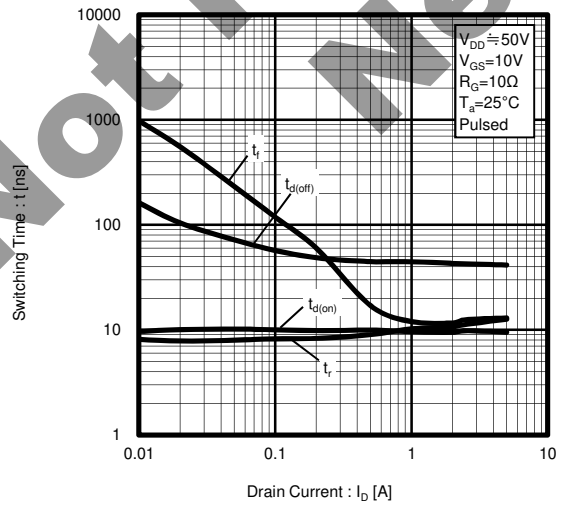


Fig.12 Dynamic Input Characteristics

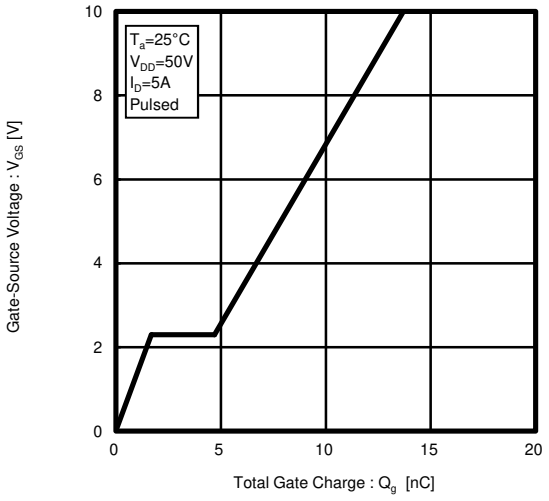


Fig.13 Typical Capacitance vs. Drain-Source Voltage

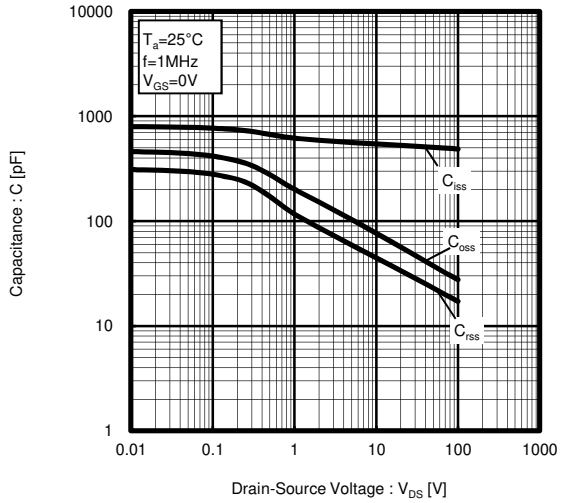


Fig.14 Maximum Safe Operating Area

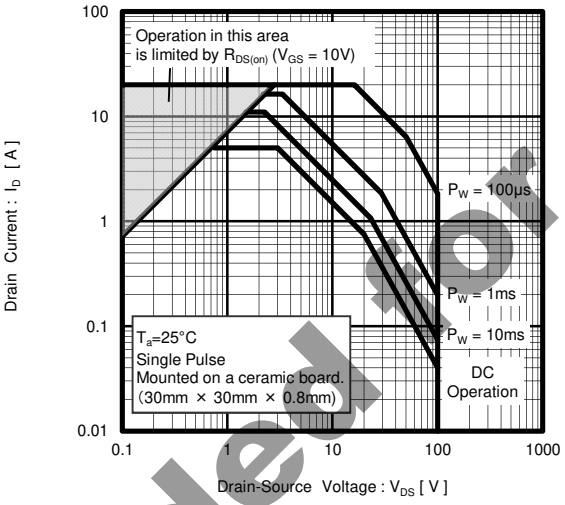
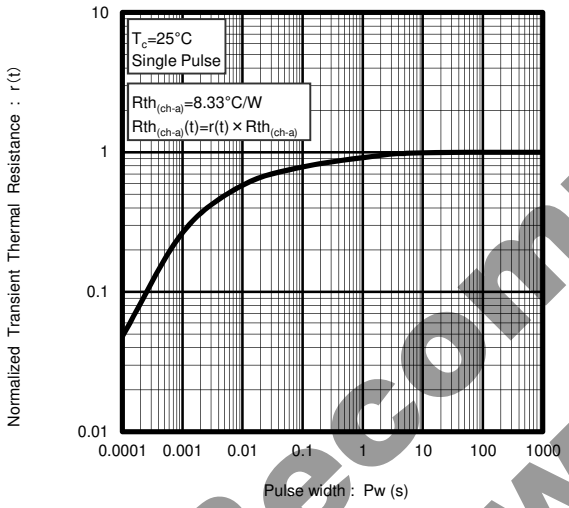


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



●**Measurement circuits**

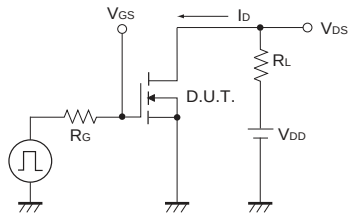


Fig.1-1 Switching time measurement circuit

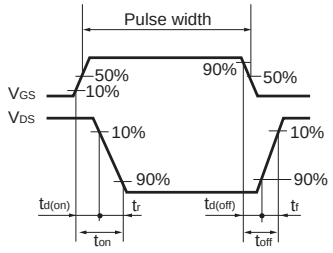


Fig.1-2 Switching waveforms

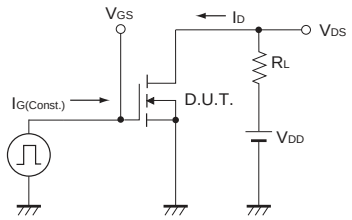


Fig.2-1 Gate charge measurement circuit

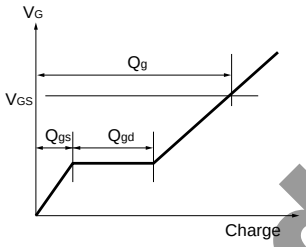


Fig.2-2 Gate Charge Waveform

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