4V Drive Nch MOSFET

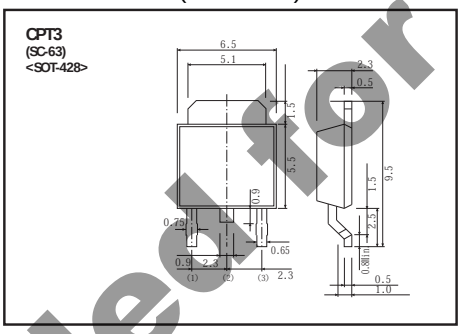
RSD050N06

●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

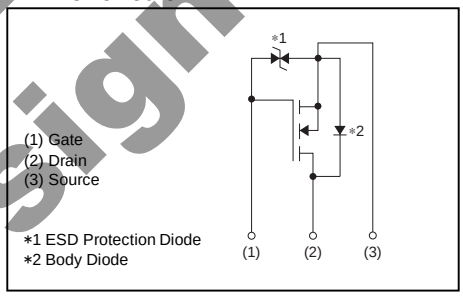
●Dimensions (Unit : mm)



●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}	60	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±5.0	A
	Pulsed	I_{DP} *1	±15	A
Source current (Body Diode)	Continuous	I_S	5.0	A
	Pulsed	I_{SP} *1	15	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

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●**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	$V_{(BR)DSS}$	60	-	-	V	I_D=1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=60V, V_{GS}=0V
Gate threshold voltage	$V_{GS\ (th)}$	1.0	-	3.0	V	V_{DS}=10V, I_D=1mA
Static drain-source on-state resistance	$R_{DS\ (on)}$ *	-	78	109	mΩ	I_D=5.0A, V_{GS}=10V
		-	94	131		I_D=5.0A, V_{GS}=4.5V
		-	100	140		I_D=5.0A, V_{GS}=4.0V
Forward transfer admittance	$\|Y_{fs}\|$*	3.5	-	-	S	I_D=5.0A, V_{DS}=10V
Input capacitance	C_{iss}	-	290	-	pF	V_{DS}=10V
Output capacitance	C_{oss}	-	90	-	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	-	35	-	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$*	-	8	-	ns	I_D=2.5A, V_{DD}≒ 30V
Rise time	t_r *	-	17	-	ns	V_{GS}=10V
Turn-off delay time	$t_{d(off)}$*	-	26	-	ns	R_L=12Ω
Fall time	t_f *	-	8	-	ns	R_G=10Ω
Total gate charge	Q_g *	-	8.0	-	nC	V_{DD}≒ 30V
Gate-source charge	Q_{gs} *	-	1.4	-	nC	I_D=5.0A
Gate-drain charge	Q_{gd} *	-	1.4	-	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

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●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics (Ⅰ)

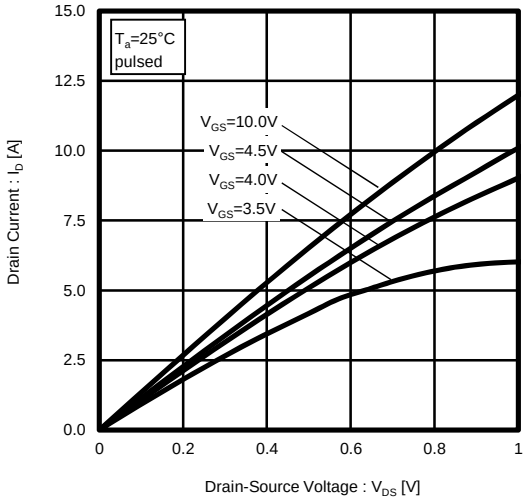


Fig.2 Typical Output Characteristics (Ⅱ)

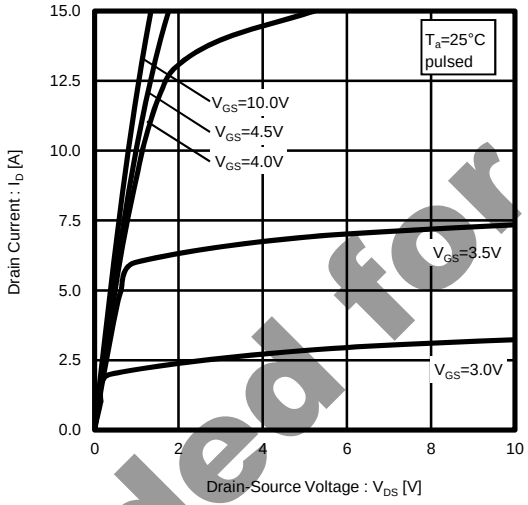


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

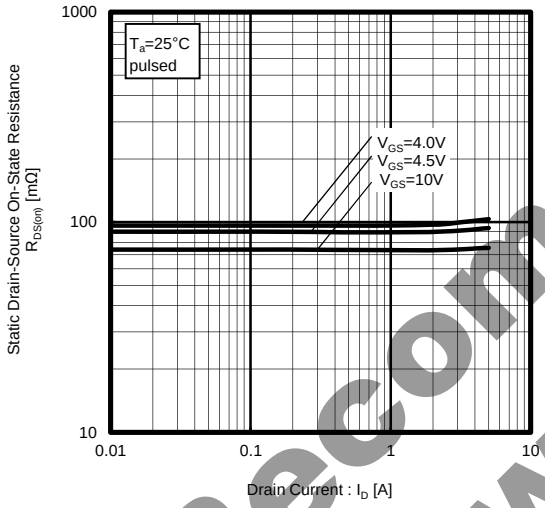


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

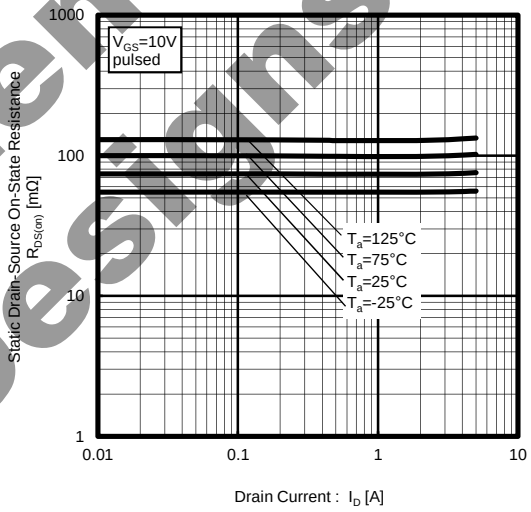


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

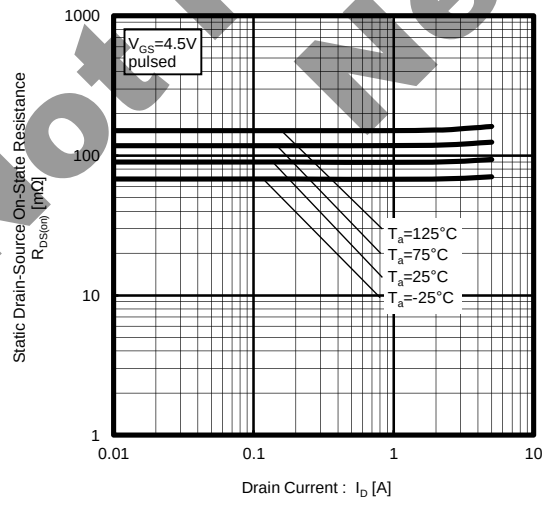
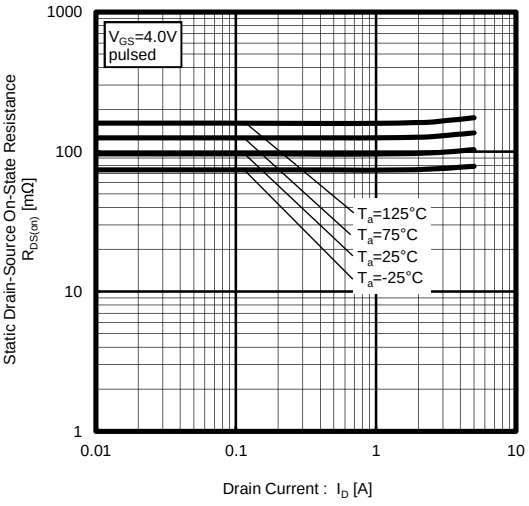


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current



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Fig.7 Forward Transfer Admittance vs. Drain Current

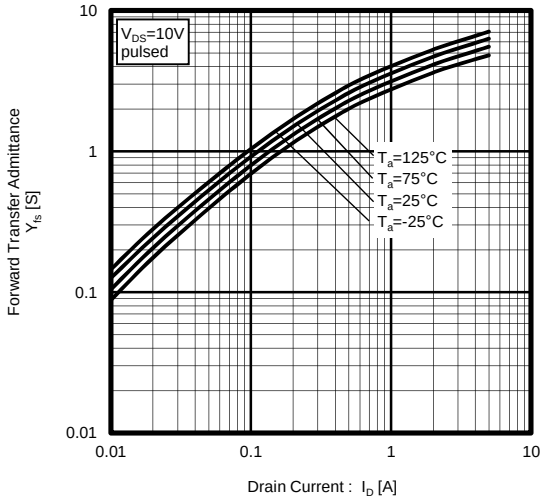
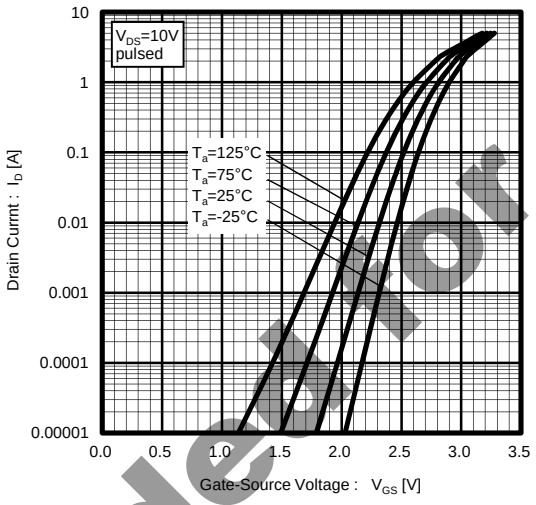


Fig.8 Typical Transfer Characteristics



Fif.9 Source Current vs. Source-Drain Voltage

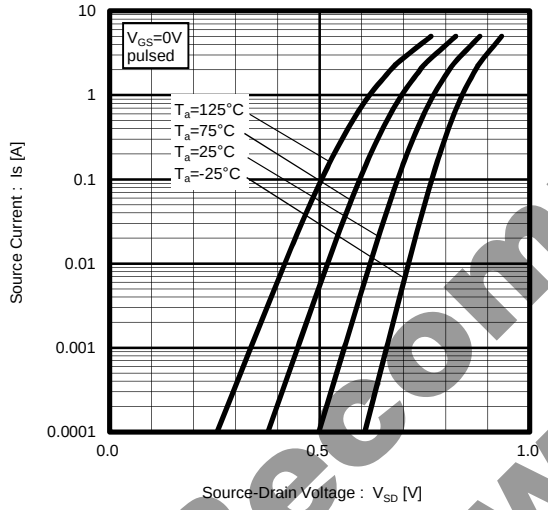


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

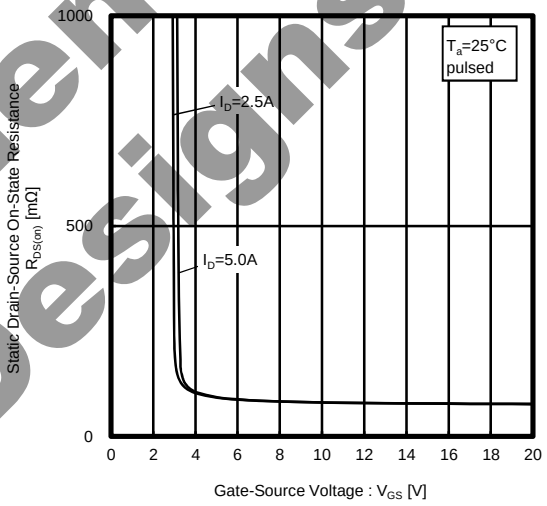


Fig.11 Switching Characteristics

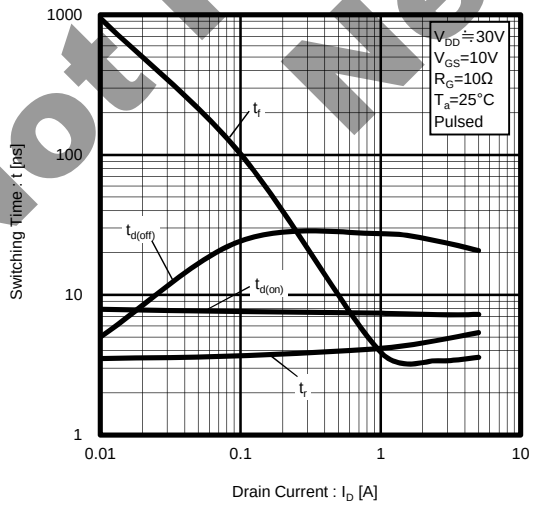
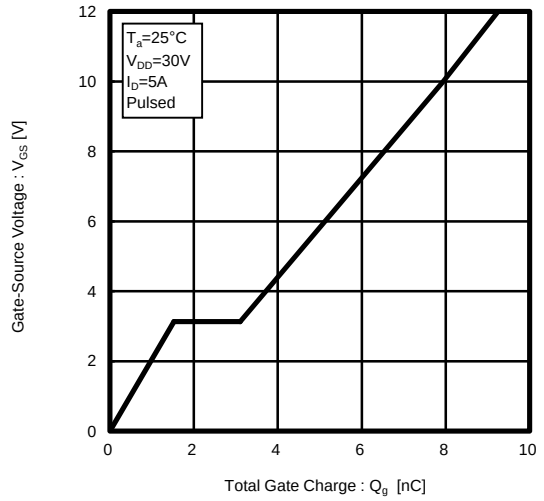


Fig.12 Dynamic Input Characteristics



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Fig.13 Typical Capacitance vs. Drain-Source Voltage

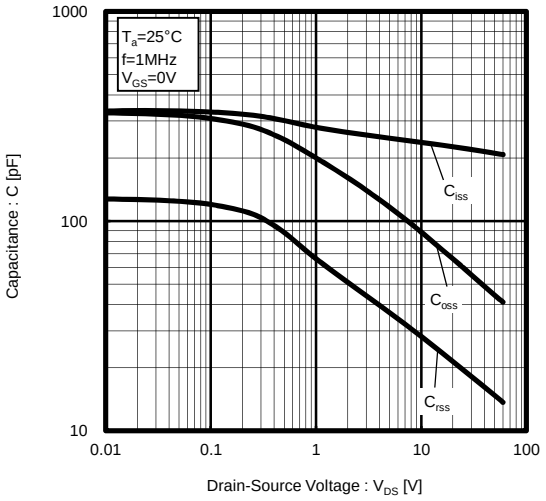


Fig.14 Maximum Safe Operating Area

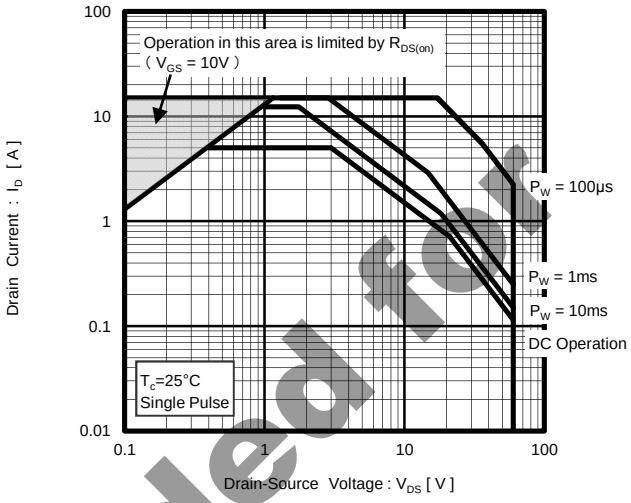
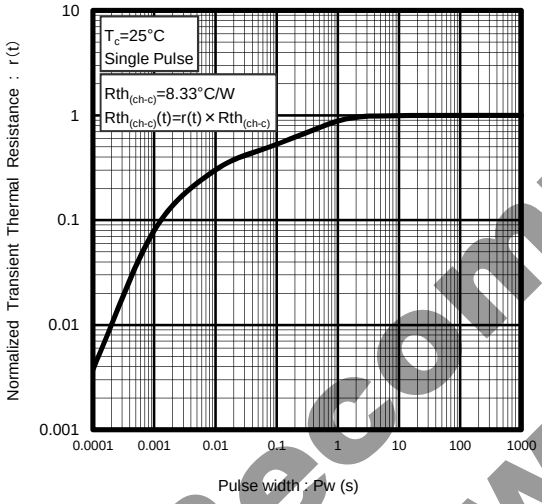


Fig.15 Normalized Transient Thermal Resistance v.s. Pulse Width



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●**Measurement circuits**

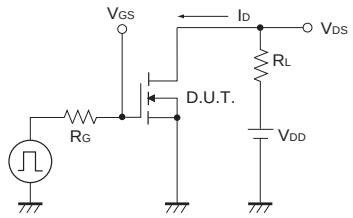


Fig.1-1 Switching Time Measurement Circuit

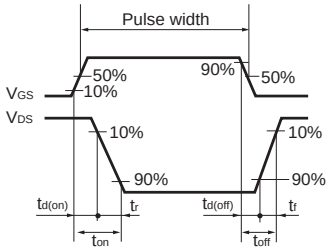


Fig.1-2 Switching Waveforms

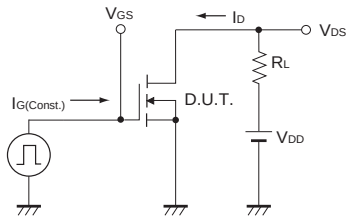


Fig.2-1 Gate Charge Measurement Circuit

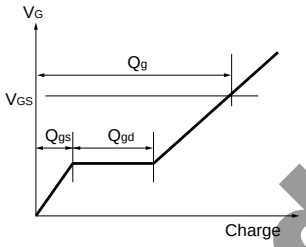


Fig.2-2 Gate Charge Waveform

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