

4V Drive Nch MOSFET

RSD175N10

● **Structure**

Silicon N-channel MOSFET

● **Features**

- 1) Low on-resistance.
- 4) 4V drive.
- 4) High power package.

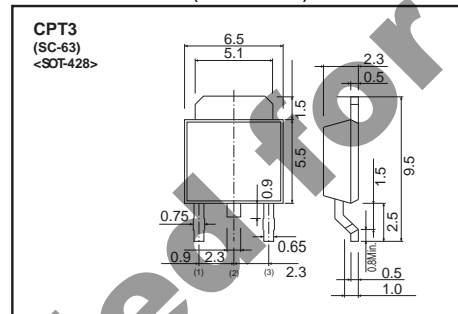
● **Application**

Switching

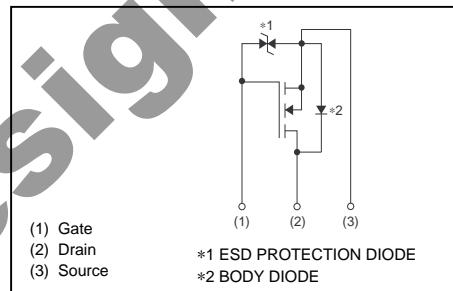
● **Packaging specifications**

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
RSD175N10		○

● **Dimensions (Unit : mm)**



● **Inner circuit**



● **Absolute maximum ratings (Ta = 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 *3	± 17.5	A
	Pulsed	I_{DP} *1	± 35	A
Source current (Body Diode)	Continuous	I_S *3	17.5	A
	Pulsed	I_{SP} *1	35	A
Power dissipation	P_D *2	20	W	
Channel temperature	Tch	150	°C	
Range of storage temperature	Tstg	-55 to +150	°C	

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

*2 $T_C = 25^\circ C$

*3 Please use within the range of SOA.

● **Thermal resistance**

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

* $T_C = 25^\circ C$

● **Electrical characteristics** (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	±10	μA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	100	-	-	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=100V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	-	75	105	mΩ	$I_D=8.8A, V_{GS}=10V$
		-	80	112		$I_D=8.8A, V_{GS}=4.5V$
		-	85	119		$I_D=8.8A, V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} $ *	5	-	-	S	$V_{DS}=10V, I_D=8.8A$
Input capacitance	C_{iss}	-	950	-	pF	$V_{DS}=25V$
Output capacitance	C_{oss}	-	85	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	-	55	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	-	10	-	ns	$V_{DD}=50V, I_D=8.8A$
Rise time	t_r *	-	25	-	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}$ *	-	60	-	ns	$R_L=5.7\Omega$
Fall time	t_f *	-	50	-	ns	$R_G=10\Omega$
Total gate charge	Q_g *	-	24	-	nC	$V_{DD}=50V, I_D=17.5A$
Gate-source charge	Q_{gs} *	-	3	-	nC	$V_{GS}=10V$
Gate-drain charge	Q_{gd} *	-	6	-	nC	

*Pulsed

● **Body diode characteristics** (Source-Drain)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD} *	-	-	1.5	V	$I_s=17.5A, V_{GS}=0V$

*Pulsed

● Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics (I)

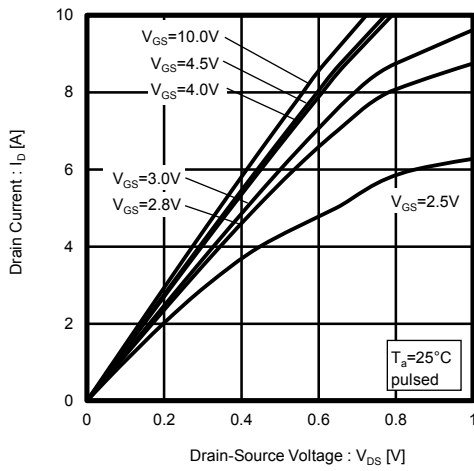


Fig.2 Typical Output Characteristics (II)

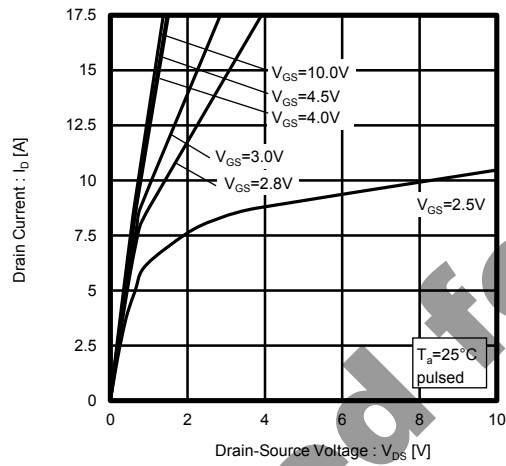


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

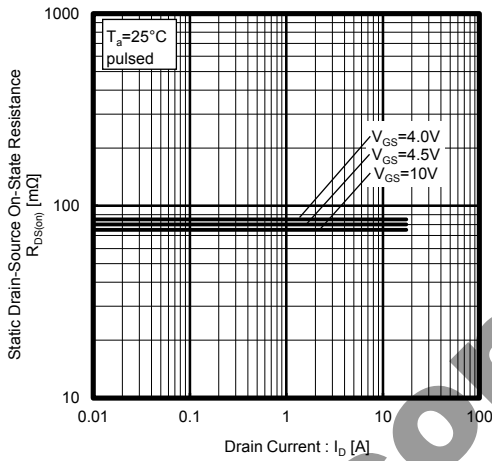


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

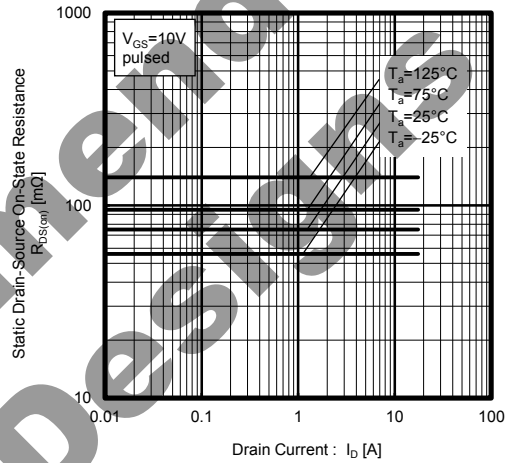


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

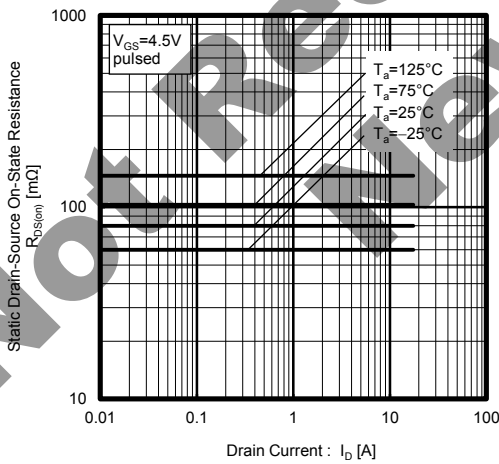


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

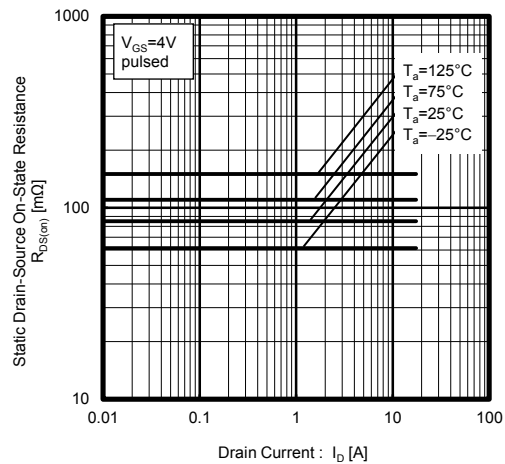


Fig.7 Forward Transfer Admittance vs. Drain Current

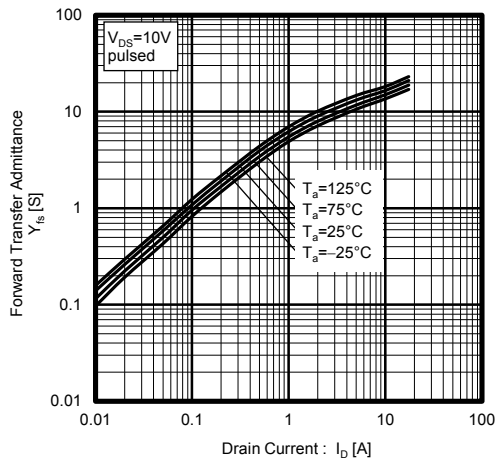


Fig.8 Typical Transfer Characteristics

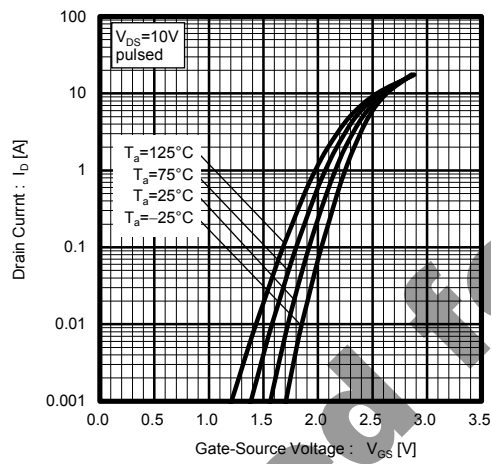


Fig.9 Source Current vs. Source-Drain Voltage

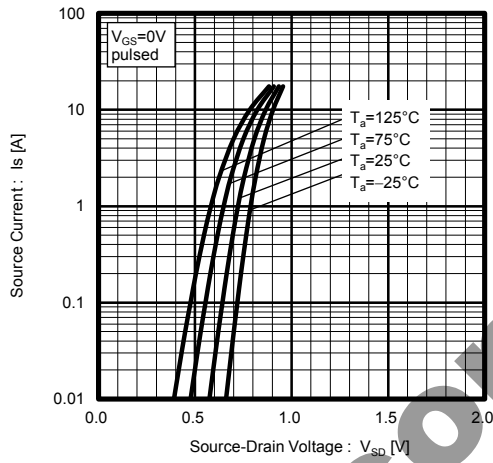


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

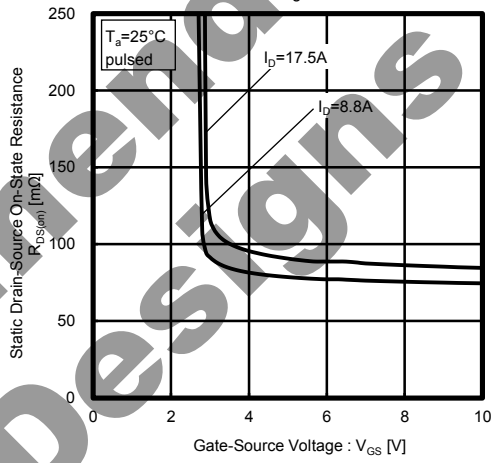


Fig.11 Switching Characteristics

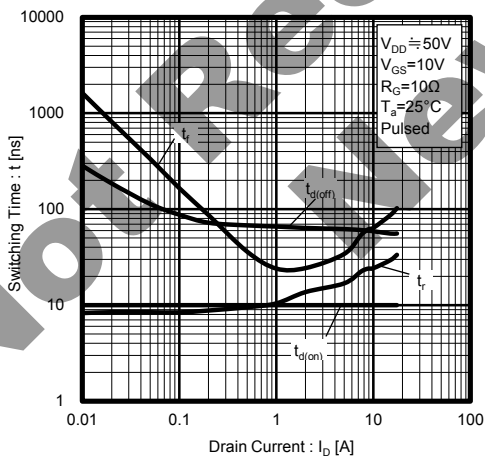


Fig.12 Dynamic Input Characteristics

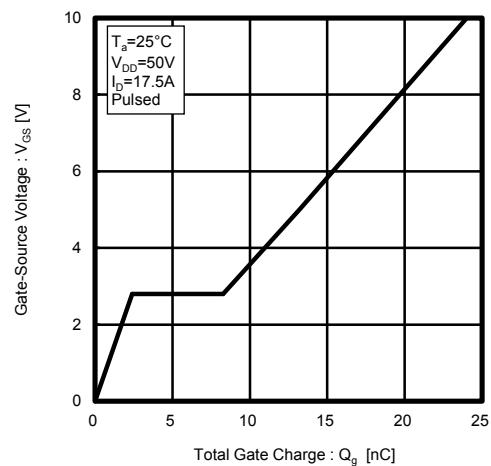


Fig.13 Typical Capacitance vs. Drain-Source Voltage

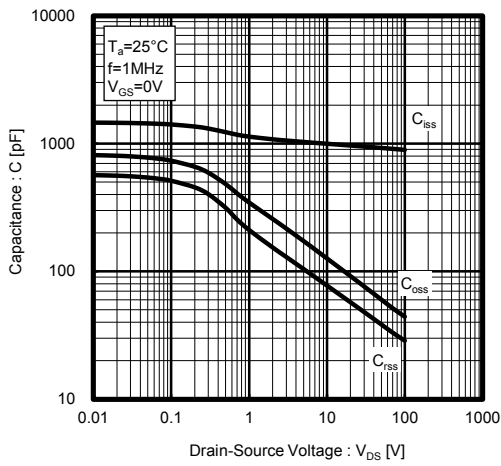


Fig.14 Normalized Transient Thermal Resistance v.s. Pulse Width

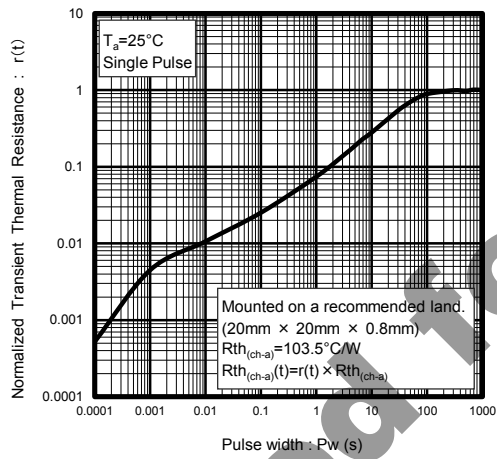
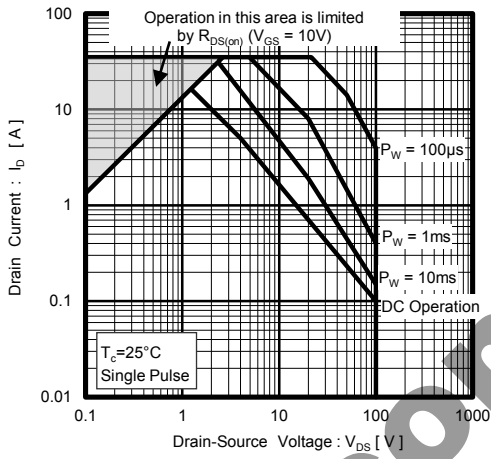


Fig.15 Maximum Safe Operating Area



Not Recommended for New Designs

● Measurement circuits

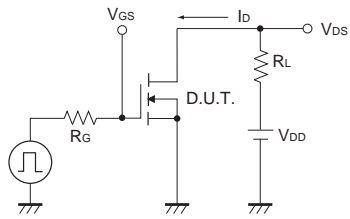


Fig.1-1 Switching Time Measurement Circuit

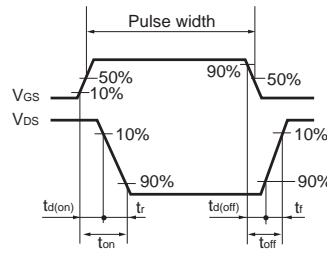


Fig.1-2 Switching Waveforms

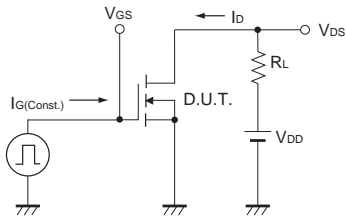


Fig.2-1 Gate Charge Measurement Circuit

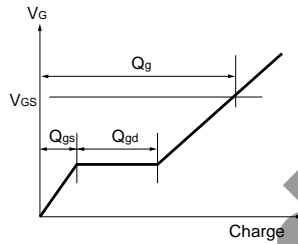


Fig.2-2 Gate Charge Waveform

Not Recommended for New Designs

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