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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



4V Drive Nch MOSFET

RSJ550N10

● Structure

Silicon N-channel MOSFET

● Features

- 1) Low on-resistance.
- 2) High Power Package.
- 3) 4V drive.

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	1000
RSJ550N10		○

● 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	± 55	A
	Pulsed	I_{DP} *1	± 110	A
Source current (Body Diode)	Continuous	I_S *3	55	A
	Pulsed	I_{SP} *1	110	A
Power dissipation		P_D *2	100	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 $T_C = 25^\circ C$

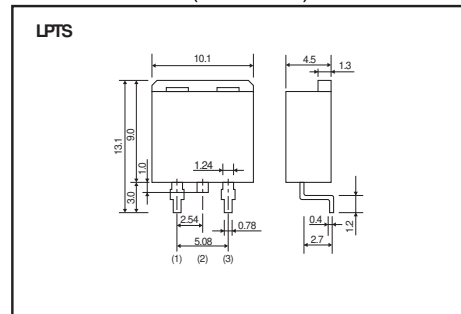
*3 Please use within the range of SOA.

● Thermal resistance

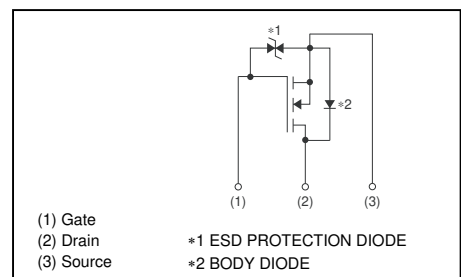
Parameter	Symbol	Limits	Unit
Channel to Case	$R_{th}(ch-c)^*$	1.25	°C / W

* $T_C = 25^\circ C$

● Dimensions (Unit : mm)



● Inner circuit



● 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	$R_{DS(on)}^*$	-	12	16.8	mΩ	$I_D=27.5A, V_{GS}=10V$
		-	13.5	18.9		$I_D=27.5A, V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} ^{\dagger}$	30	-	-	S	$V_{DS}=10V, I_D=27.5A$
Input capacitance	C_{ISS}	-	6150	-	pF	$V_{DS}=25V$
Output capacitance	C_{OSS}	-	460	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{RSS}	-	320	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	32	-	ns	$V_{DD}\approx 50V, I_D=27.5A$
Rise time	t_r^*	-	105	-	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}^*$	-	375	-	ns	$R_L=1.82\Omega$
Fall time	t_f^*	-	360	-	ns	$R_G=10\Omega$
Total gate charge	Q_g^*	-	143	-	nC	$V_{DD}\approx 50V, I_D=27.5A$
Gate-source charge	Q_{gs}^*	-	16	-	nC	$V_{GS}=10V$
Gate-drain charge	Q_{gd}^*	-	34	-	nC	

*Pulsed

● Body diode characteristics (Source-Drain)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}^*	-	-	1.5	V	$I_S=55A, V_{GS}=0V$

*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics (I)

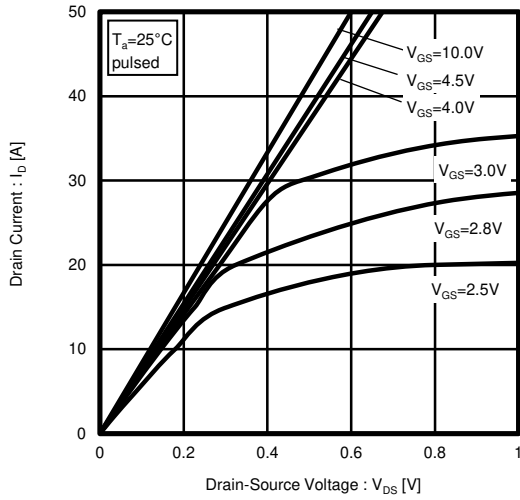


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

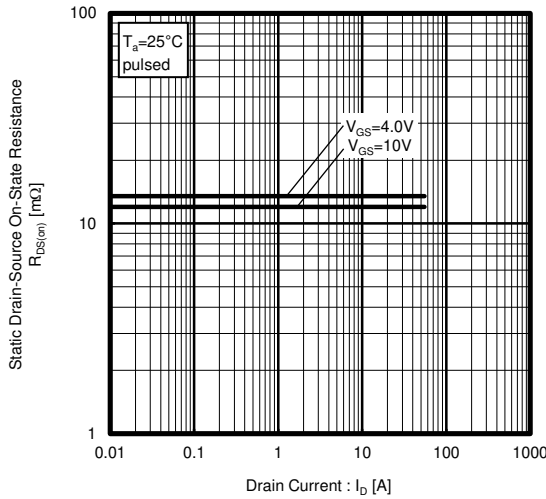


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

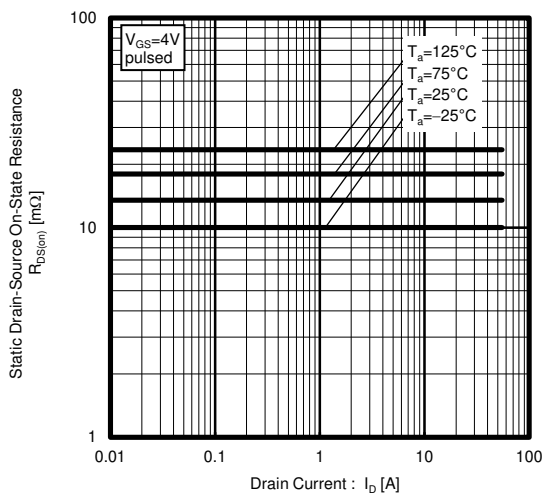


Fig.2 Typical Output Characteristics (II)

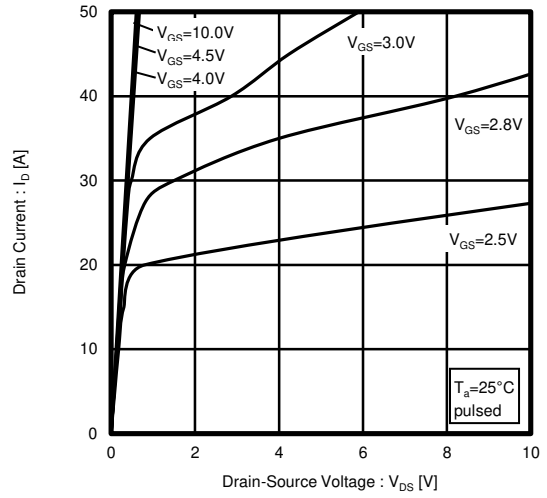


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

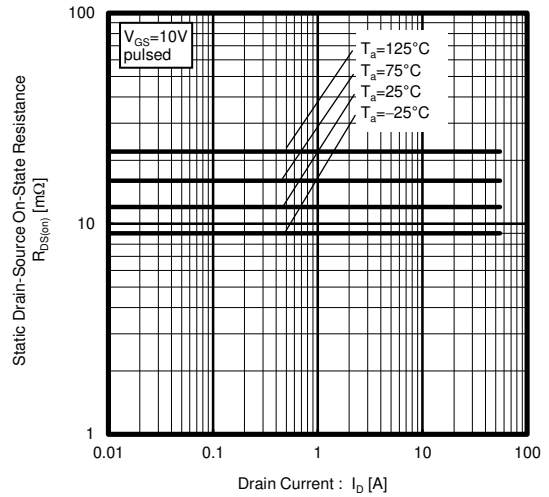


Fig.6 Typical Transfer Characteristics

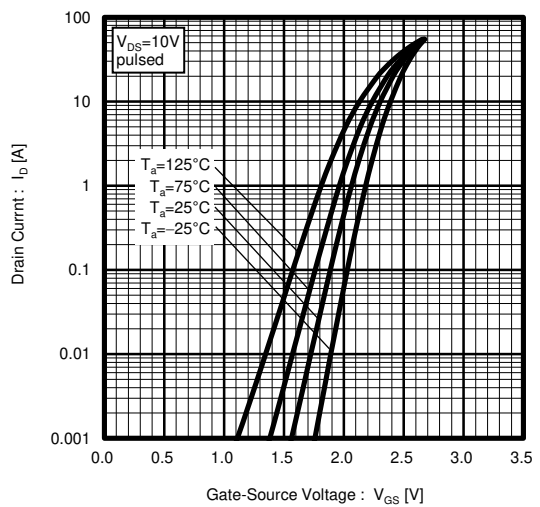


Fig.7 Source Current vs. Source-Drain Voltage

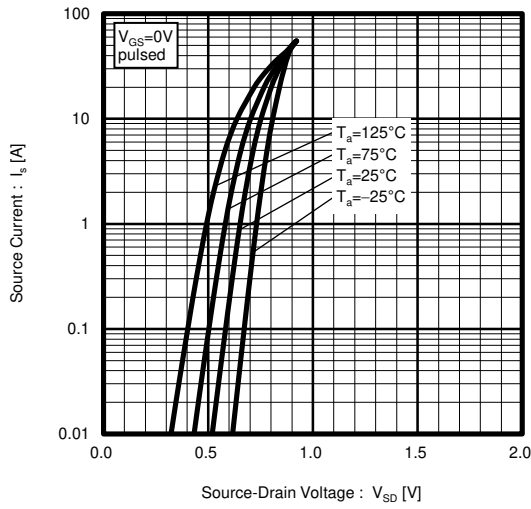


Fig.8 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

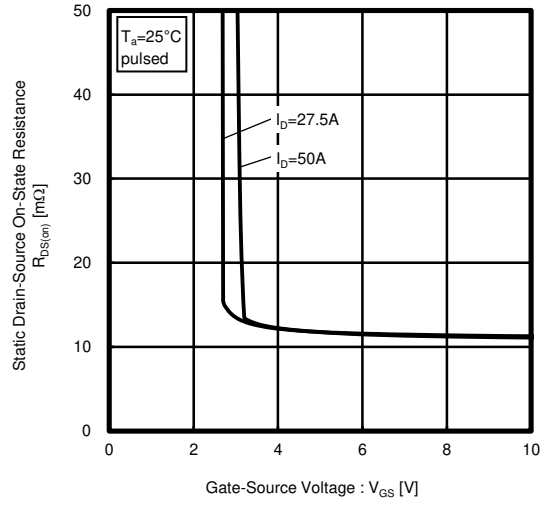


Fig.9 Switching Characteristics

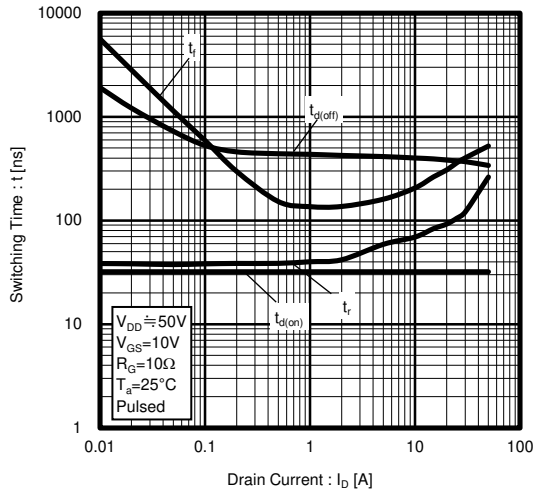


Fig.10 Dynamic Input Characteristics

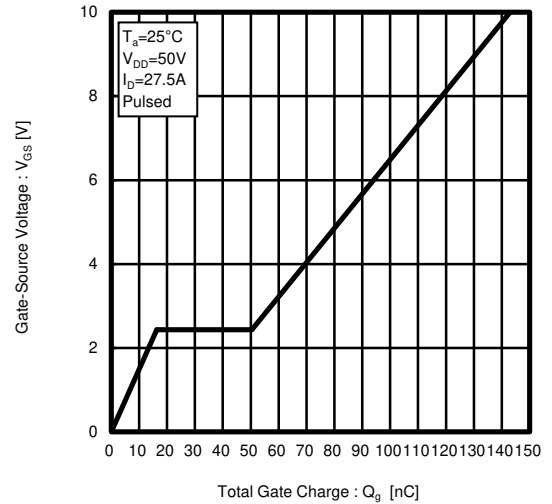


Fig.11 Typical Capacitance vs. Drain-Source Voltage

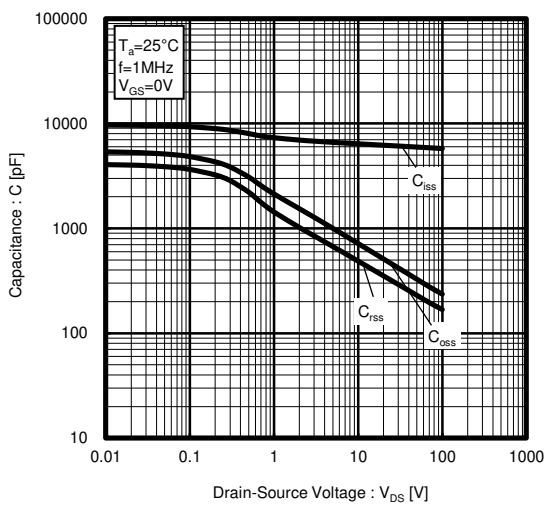


Fig.12 Normalized Transient Thermal Resistance v.s. Pulse Width

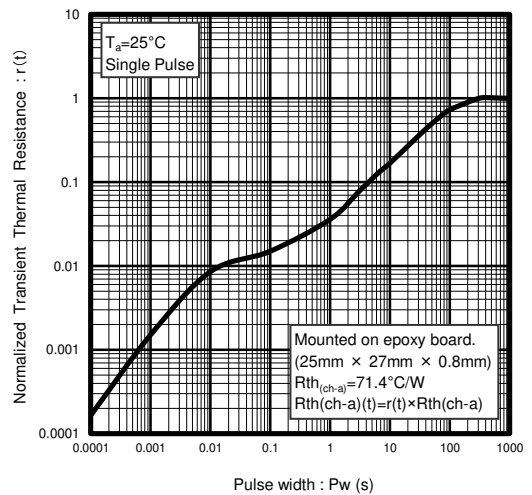
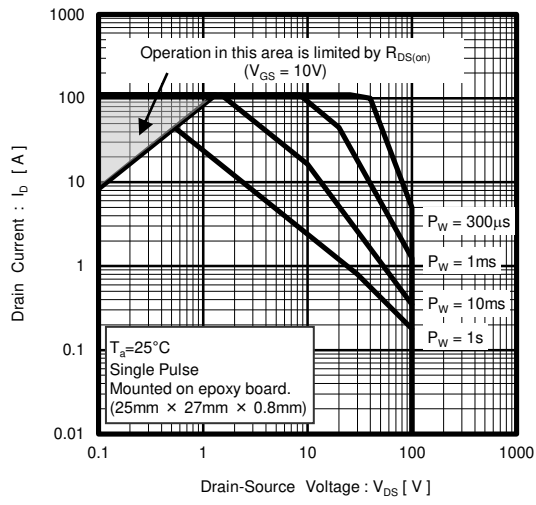


Fig.13 Maximum Safe Operating Area



● Measurement circuits

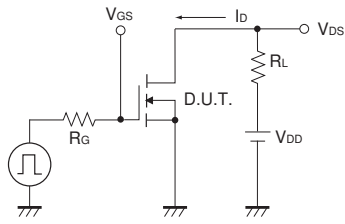


Fig.1-1 Switching Time Measurement Circuit

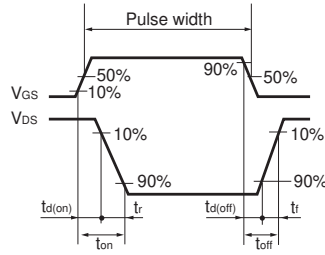


Fig.1-2 Switching Waveforms

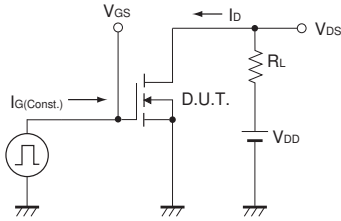


Fig.2-1 Gate Charge Measurement Circuit

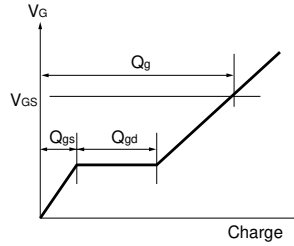


Fig.2-2 Gate Charge Waveform

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