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# 4V Drive Nch MOSFET

## RSJ10HN06

### ● Structure

Silicon N-channel MOSFET

### ● Features

- 1) Low on-resistance.
- 2) Built-in G-S Protection Diode.
- 3) High power Package

### ● Application

Switching

### ● Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	1000
RSJ10HN06		○

### ● Absolute maximum ratings (T<sub>a</sub> = 25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V <sub>DSS</sub>	60	V	
Gate-source voltage	V <sub>GSS</sub>	±20	V	
Drain current	Continuous	I <sub>D</sub> *3	±100	A
	Pulsed	I <sub>DP</sub> *1	±200	A
Source current (Body Diode)	Continuous	I <sub>S</sub> *3	100	A
	Pulsed	I <sub>SP</sub> *1	200	A
Power dissipation	P <sub>D</sub> *2	100	W	
Channel temperature	T <sub>ch</sub>	150	°C	
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C	

\*1 P<sub>w</sub>≤10μs, Duty cycle≤1%

\*2 T<sub>c</sub>=25°C

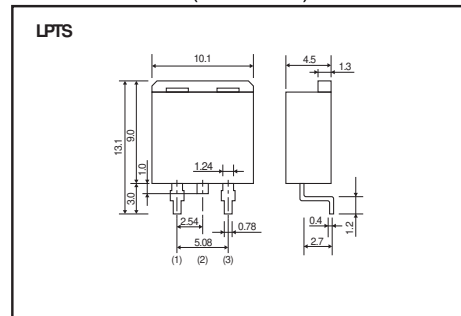
\*3 Limited only by maximum channel temperature allowed.

### ● Thermal resistance

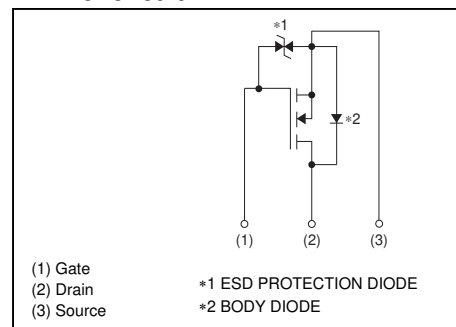
Parameter	Symbol	Limits	Unit
Channel to Case	R <sub>th</sub> (ch-c)*	1.25	°C / W

\* T<sub>c</sub>=25°C

### ● Dimensions (Unit : mm)



### ● Inner circuit



**●Electrical characteristics** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	-	-	$\pm 10$	$\mu\text{A}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	-	-	V	$I_D=1\text{mA}, V_{GS}=0\text{V}$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=60\text{V}, V_{GS}=0\text{V}$
Gate threshold voltage	$V_{GS(th)}$	1.0	-	2.5	V	$V_{DS}=10\text{V}, I_D=1\text{mA}$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	3.0	4.2	m $\Omega$	$I_D=50\text{A}, V_{GS}=10\text{V}$
		-	3.5	4.9		$I_D=50\text{A}, V_{GS}=4\text{V}$
Forward transfer admittance	$ Y_{fs} ^*$	60	-	-	S	$V_{DS}=10\text{V}, I_D=50\text{A}$
Input capacitance	$C_{iss}$	-	11000	-	pF	$V_{DS}=10\text{V}$
Output capacitance	$C_{oss}$	-	2000	-	pF	$V_{GS}=0\text{V}$
Reverse transfer capacitance	$C_{riss}$	-	1050	-	pF	$f=1\text{MHz}$
Turn-on delay time	$t_{d(on)}^*$	-	50	-	ns	$V_{DD}\approx 30\text{V}, I_D=50\text{A}$
Rise time	$t_r^*$	-	470	-	ns	$V_{GS}=10\text{V}$
Turn-off delay time	$t_{d(off)}^*$	-	420	-	ns	$R_L=0.6\Omega$
Fall time	$t_f^*$	-	710	-	ns	$R_G=10\Omega$
Total gate charge	$Q_g^*$	-	202	-	nC	$V_{DD}\approx 30\text{V}, I_D=50\text{A}$
Gate-source charge	$Q_{gs}^*$	-	35	-	nC	$V_{GS}=10\text{V}$
Gate-drain charge	$Q_{gd}^*$	-	42	-	nC	

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	$V_{SD}^*$	-	-	1.5	V	$I_s=100\text{A}, V_{GS}=0\text{V}$

\*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics ( I )

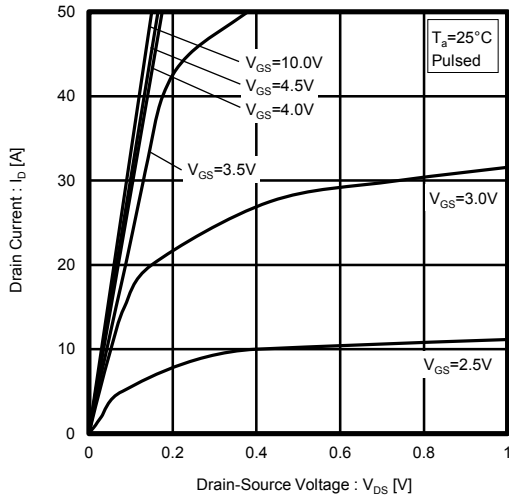


Fig.2 Typical Output Characteristics ( II )

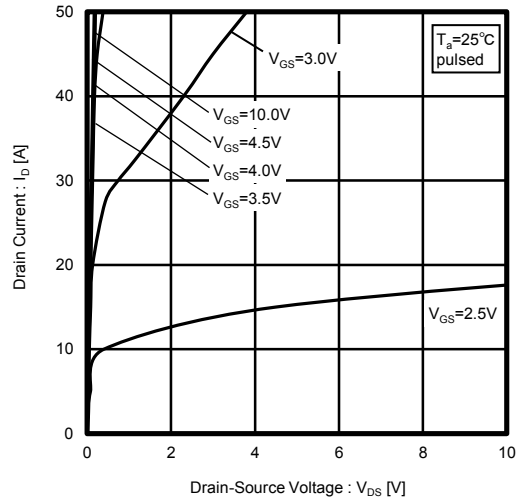


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

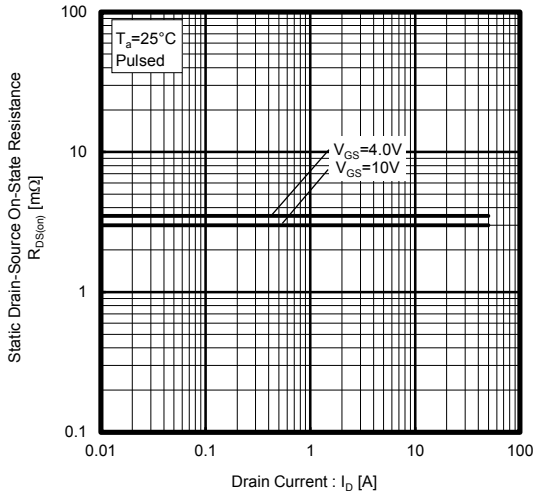


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

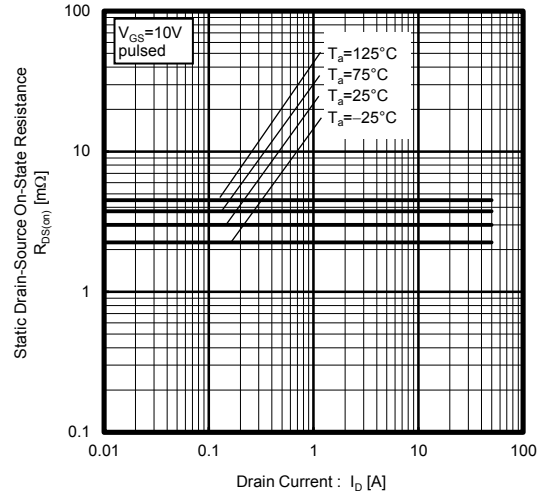


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

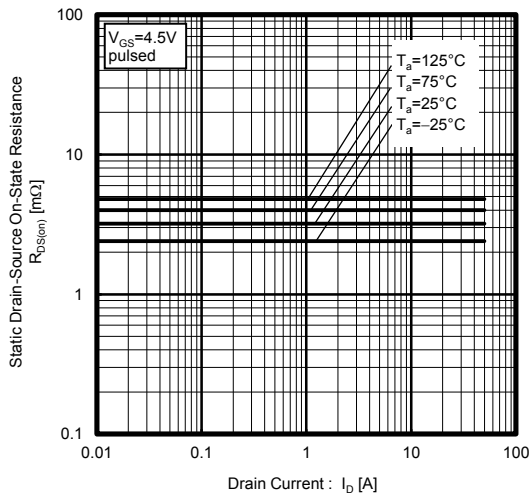


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

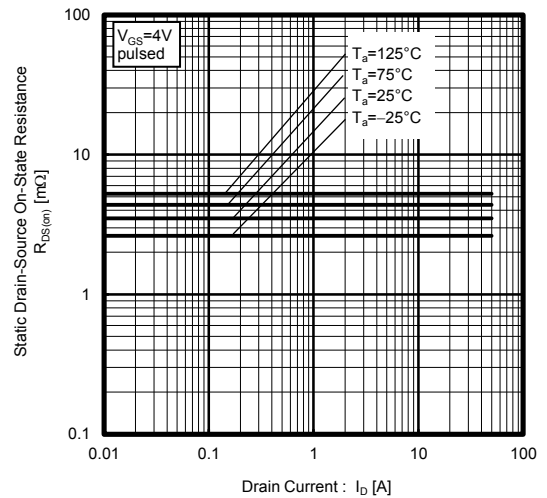


Fig.7 Forward Transfer Admittance vs. Drain Current

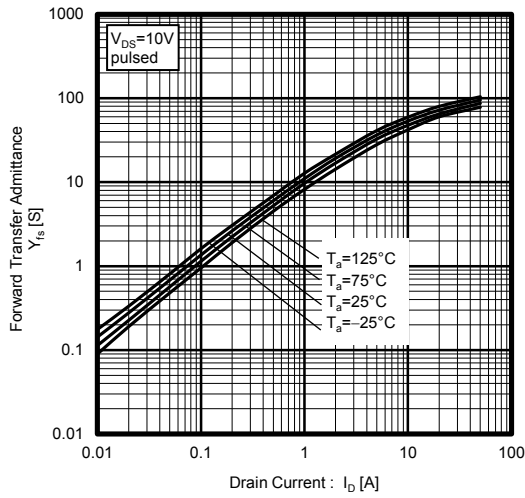


Fig.8 Typical Transfer Characteristics

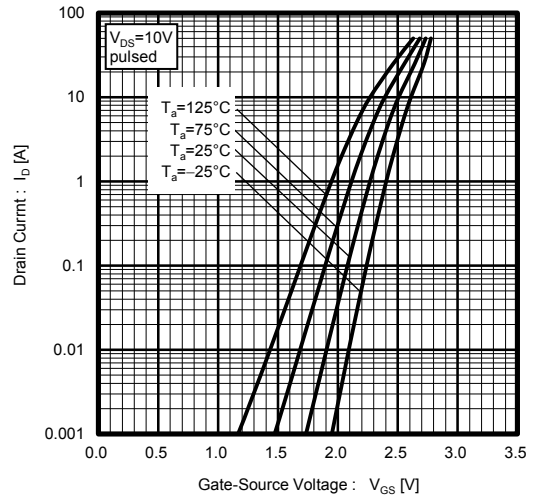


Fig.9 Source Current vs. Source-Drain Voltage

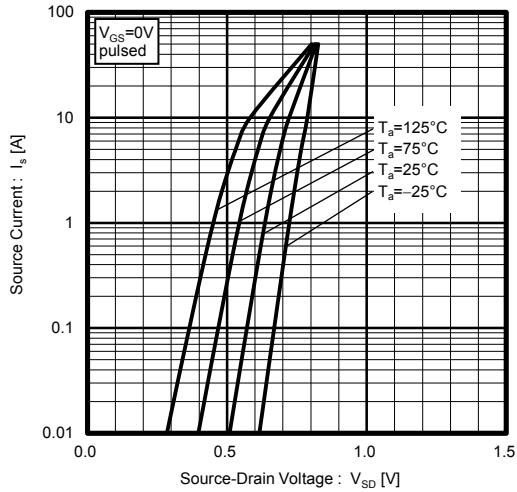


Fig.10 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

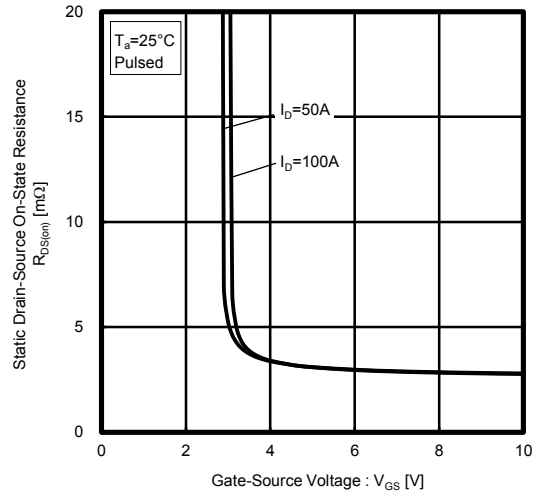


Fig.11 Switching Characteristics

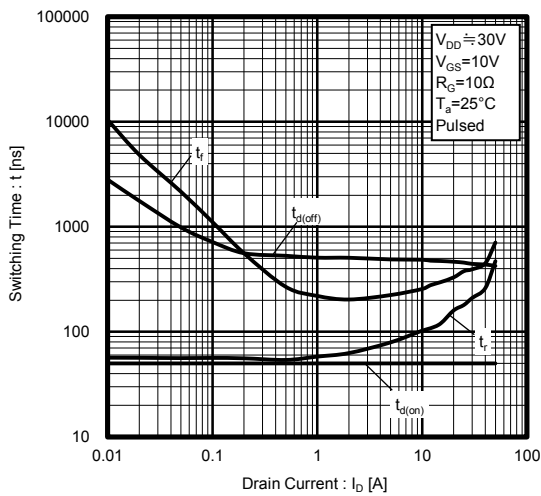


Fig.12 Dynamic Input Characteristics

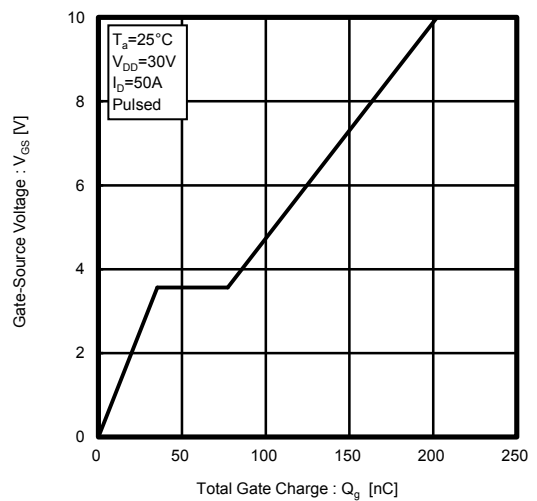


Fig.13 Typical Capacitance vs. Drain-Source Voltage

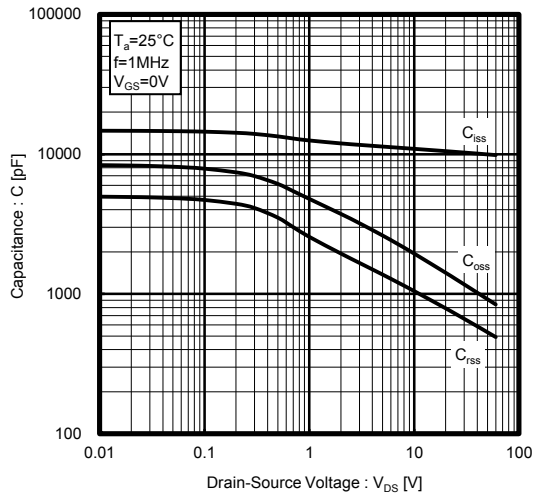
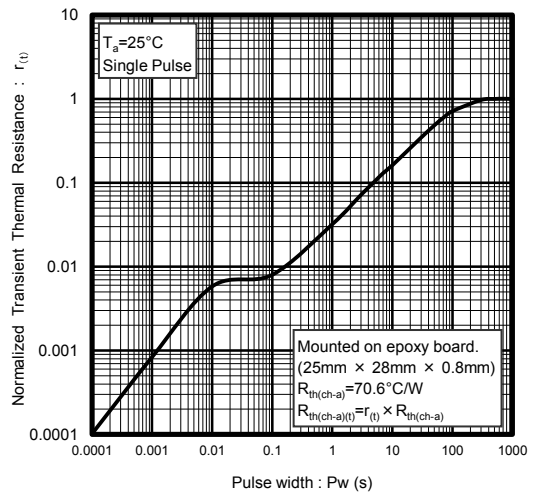


Fig.14 Normalized Transient Thermal Resistance v.s. Pulse Width



●Electrical characteristics (T<sub>a</sub> = 25°C)

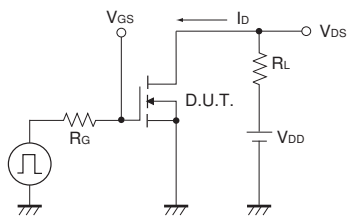


Fig.1-1 Switching Time Measurement Circuit

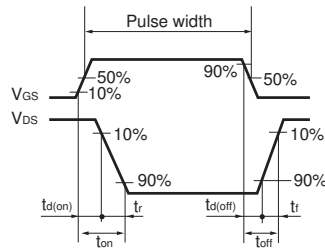


Fig.1-2 Switching Waveforms

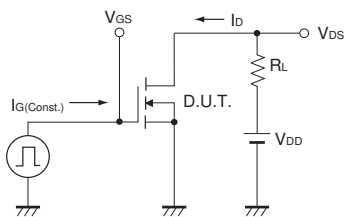


Fig.2-1 Gate Charge Measurement Circuit

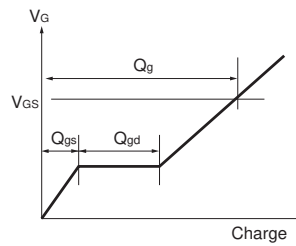


Fig.2-2 Gate Charge Waveform

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