

# 4V Drive Nch MOSFET

## RSJ650N10

### ● Structure

Silicon N-channel MOSFET

### ● Features

- 1) Low on-resistance.
- 2) High power package.
- 3) 4V drive.

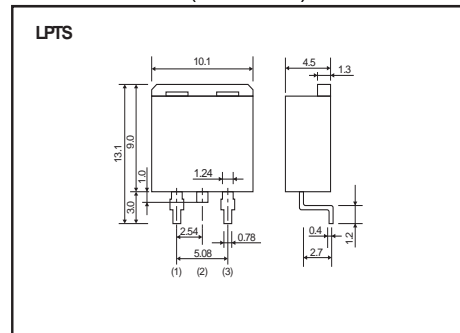
### ● Application

Switching

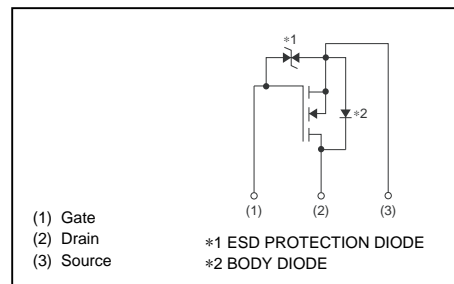
### ● Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	1000
RSJ650N10		○

### ● 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	$V_{GSS}$	$\pm 20$	V	
Drain current	Continuous	$I_D$ *3	$\pm 65$	A
	Pulsed	$I_{DP}$ *1	$\pm 130$	A
Source current (Body Diode)	Continuous	$I_S$ *3	65	A
	Pulsed	$I_{SP}$ *1	130	A
Power dissipation	$P_D$ *2	100	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	$R_{th}(ch-c)^*$	1.25	°C / W

\*  $T_C = 25^\circ C$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	-	-	$\pm 10$	$\mu A$	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	100	-	-	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS}=100V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	-	6.5	9.1	m $\Omega$	$I_D=32.5A, V_{GS}=10V$
		-	7	9.8		$I_D=32.5A, V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} $ *	45	-	-	S	$V_{DS}=10V, I_D=32.5A$
Input capacitance	$C_{iss}$	-	10780	-	pF	$V_{DS}=25V$
Output capacitance	$C_{oss}$	-	785	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	-	560	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	-	45	-	ns	$V_{DD}=50V, I_D=32.5A$
Rise time	$t_r$ *	-	170	-	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}$ *	-	640	-	ns	$R_L=1.54\Omega$
Fall time	$t_f$ *	-	480	-	ns	$R_G=10\Omega$
Total gate charge	$Q_g$ *	-	260	-	nC	$V_{DD}=50V, I_D=32.5A$
Gate-source charge	$Q_{gs}$ *	-	24	-	nC	$V_{GS}=10V$
Gate-drain charge	$Q_{gd}$ *	-	60	-	nC	

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	$V_{SD}$ *	-	-	1.5	V	$I_S=65A, V_{GS}=0V$

\*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics ( I )

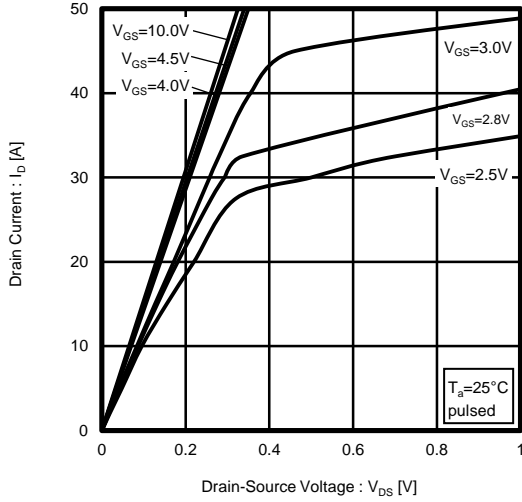


Fig.2 Typical Output Characteristics ( II )

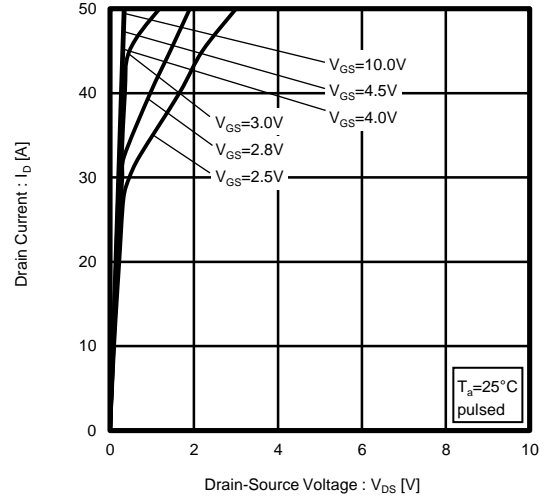


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

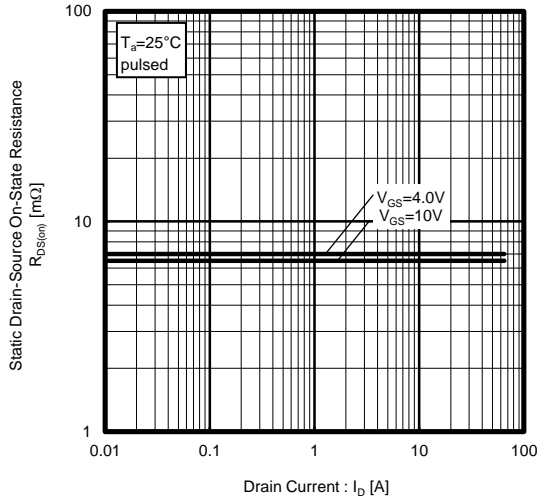


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current

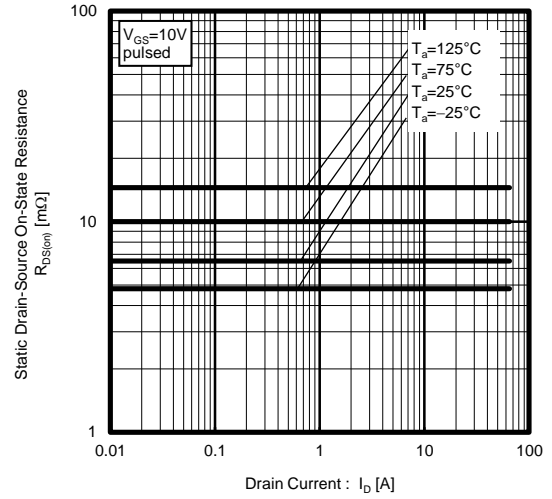


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

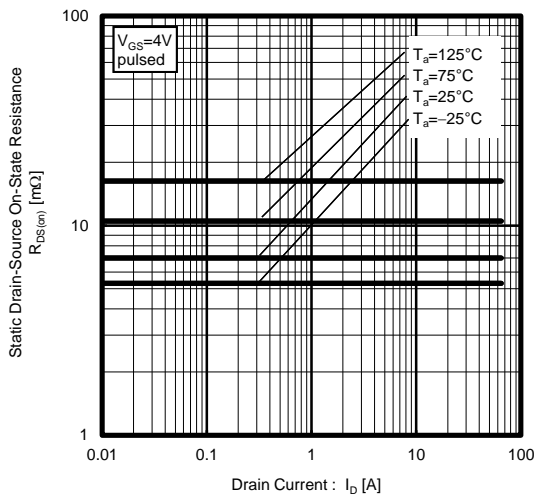


Fig.6 Forward Transfer Admittance vs. Drain Current

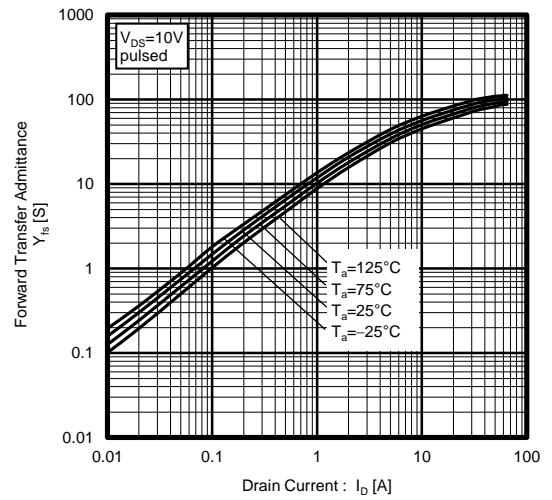


Fig.7 Typical Transfer Characteristics

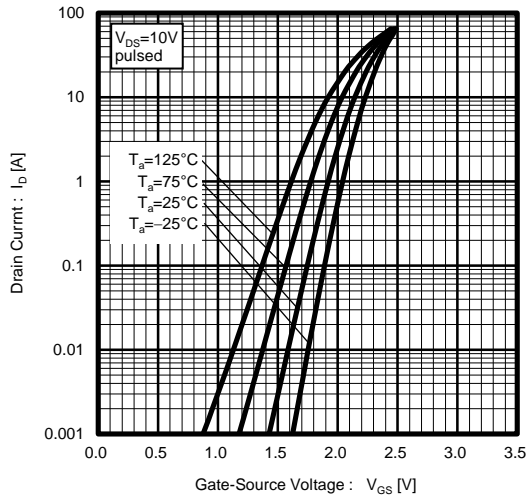


Fig.8 Source Current vs. Source-Drain Voltage

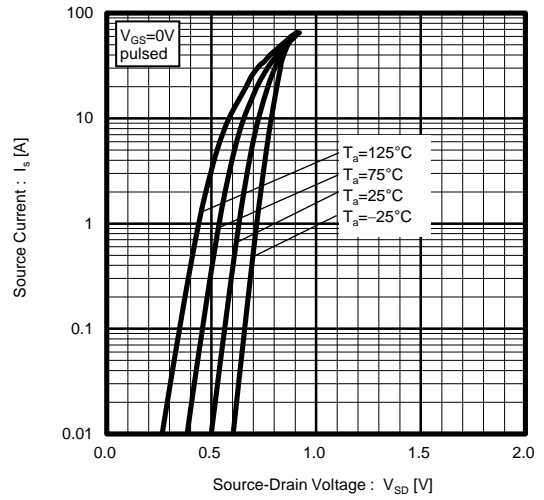


Fig.9 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

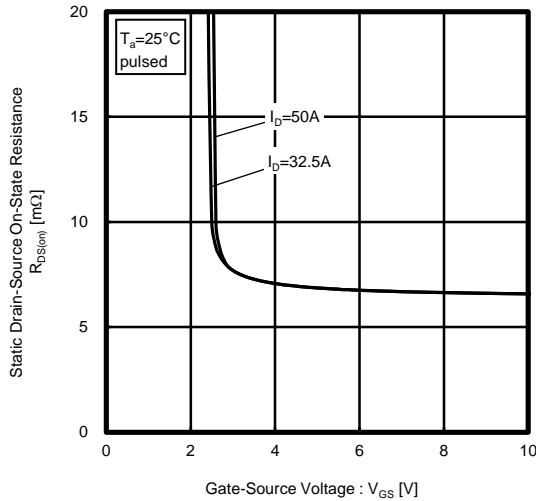


Fig.10 Switching Characteristics

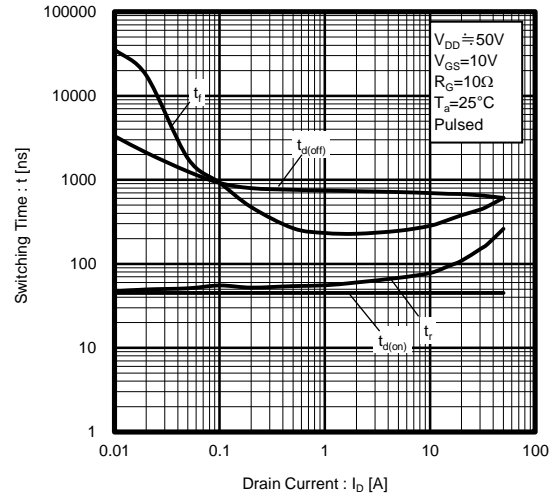


Fig.11 Dynamic Input Characteristics

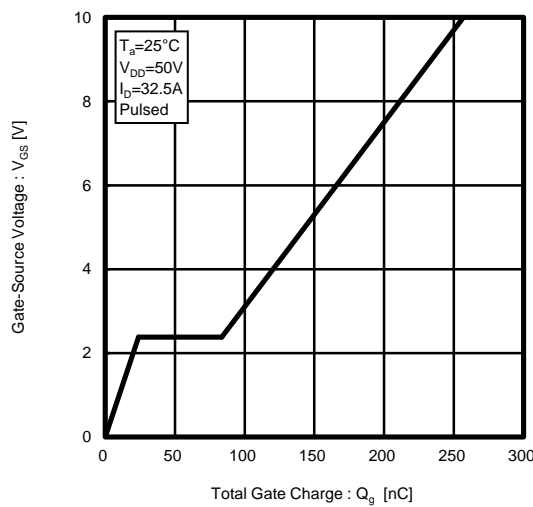


Fig.12 Typical Capacitance vs. Drain-Source Voltage

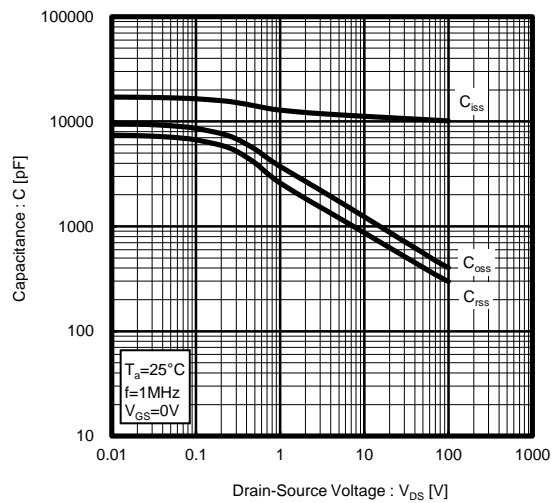


Fig.13 Normalized Transient Thermal Resistance v.s. Pulse Width

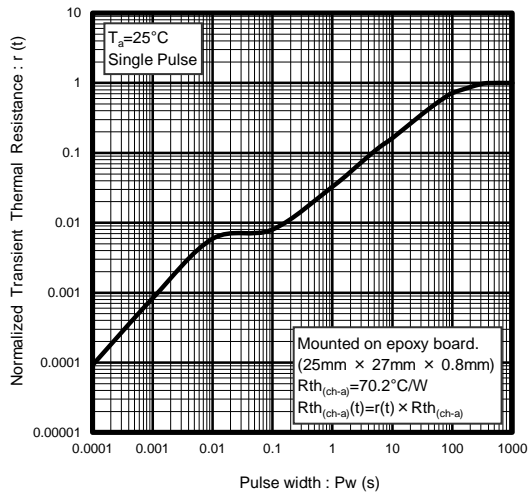
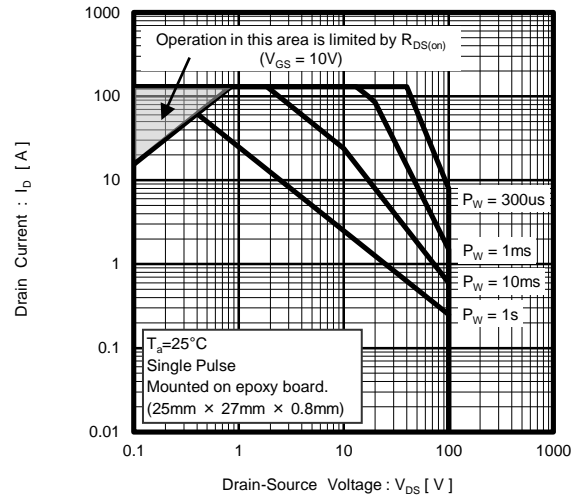


Fig.14 Maximum Safe Operating Area



● Measurement circuits

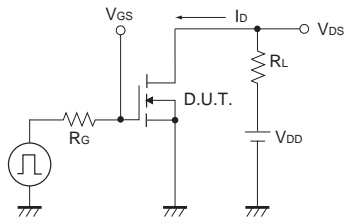


Fig.1-1 Switching Time Measurement Circuit

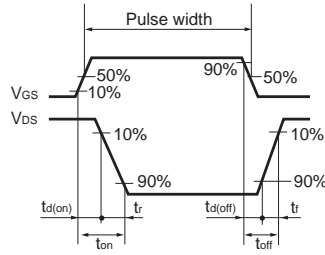


Fig.1-2 Switching Waveforms

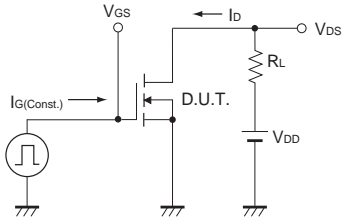


Fig.2-1 Gate Charge Measurement Circuit

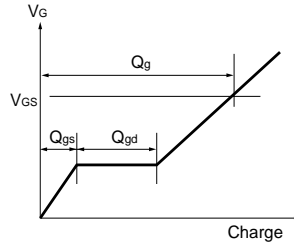


Fig.2-2 Gate Charge Waveform

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