

# 4V Drive Nch MOSFET

## RSJ650N10

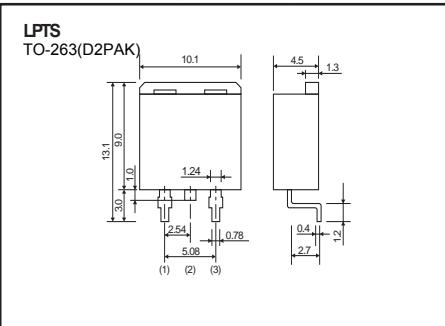
### ● Structure

Silicon N-channel MOSFET

### ● Features

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

### ● Dimensions (Unit : mm)



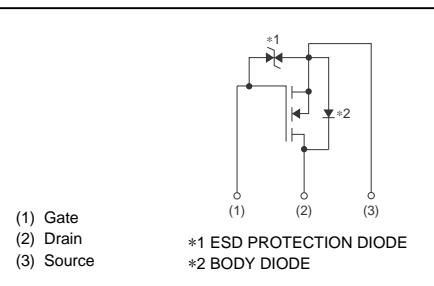
### ● Application

Switching

### ● Packaging specifications

Type	Package	Taping
	Code	TL
RSJ650N10	1000	○

### ● Inner circuit



### ● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V <sub>DSS</sub>	100	V
Gate-source voltage	V <sub>GSS</sub>	±20	V
Drain current	Continuous	I <sub>D</sub> *3	A
	Pulsed	I <sub>DP</sub> *1	A
Source current (Body Diode)	Continuous	I <sub>S</sub> *3	A
	Pulsed	I <sub>SP</sub> *1	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 Please use within the range of SOA.

### ● 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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I <sub>GSS</sub>	-	-	±10	µA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	100	-	-	V	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	-	-	1	µA	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	1	-	2.5	V	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub> *	-	6.5	9.1	mΩ	I <sub>D</sub> =32.5A, V <sub>GS</sub> =10V
		-	7	9.8		I <sub>D</sub> =32.5A, V <sub>GS</sub> =4V
Forward transfer admittance	Y <sub>fs</sub>   †	45	-	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =32.5A
Input capacitance	C <sub>iss</sub>	-	10780	-	pF	V <sub>DS</sub> =25V
Output capacitance	C <sub>oss</sub>	-	785	-	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	-	560	-	pF	f=1MHz
Turn-on delay time	t <sub>d(on)*</sub>	-	45	-	ns	V <sub>DD</sub> =50V, I <sub>D</sub> =32.5A
Rise time	t <sub>r</sub> *	-	170	-	ns	V <sub>GS</sub> =10V
Turn-off delay time	t <sub>d(off)*</sub>	-	640	-	ns	R <sub>L</sub> =1.54Ω
Fall time	t <sub>f</sub> *	-	480	-	ns	R <sub>G</sub> =10Ω
Total gate charge	Q <sub>g</sub> *	-	260	-	nC	V <sub>DD</sub> =50V, I <sub>D</sub> =32.5A
Gate-source charge	Q <sub>gs</sub> *	-	24	-	nC	V <sub>GS</sub> =10V
Gate-drain charge	Q <sub>gd</sub> *	-	60	-	nC	

\*Pulsed

## ● Body diode characteristics (Source-Drain)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V <sub>SD</sub> *	-	-	1.5	V	I <sub>s</sub> =65A, V <sub>GS</sub> =0V

\*Pulsed

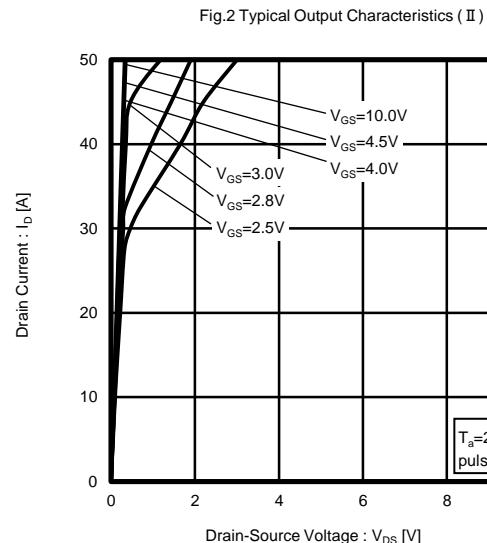
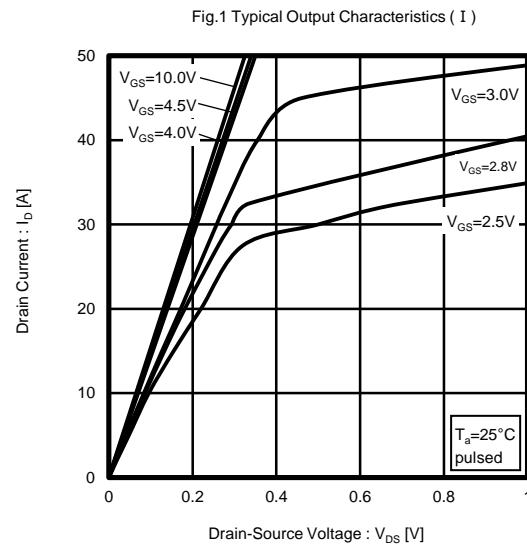
●Electrical characteristic curves ( $T_a=25^\circ\text{C}$ )

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

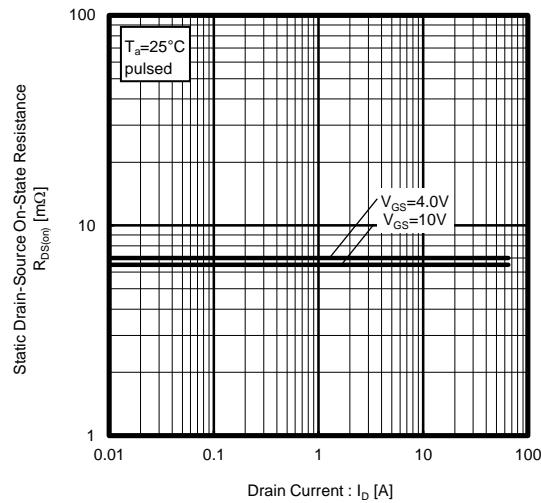


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

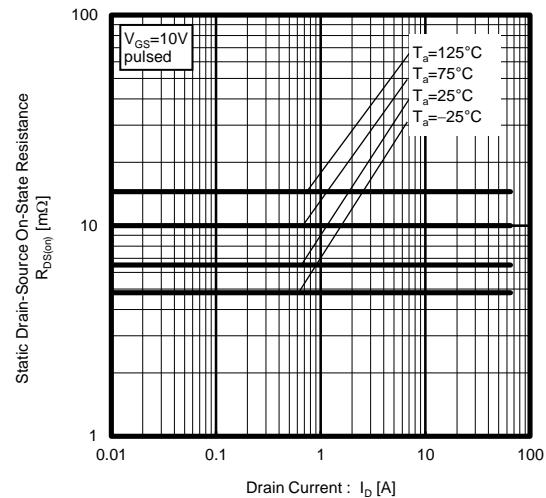


Fig.6 Forward Transfer Admittance vs. Drain Current

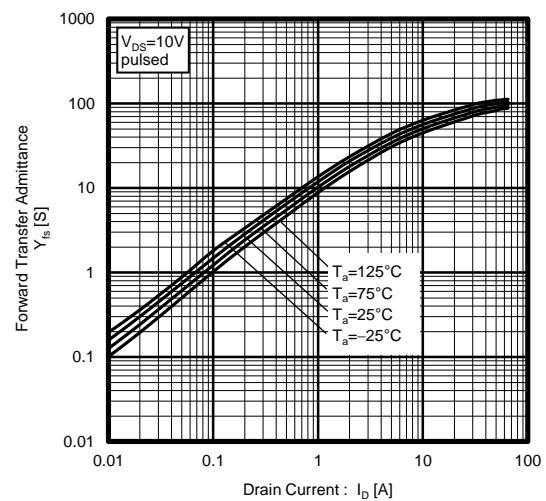
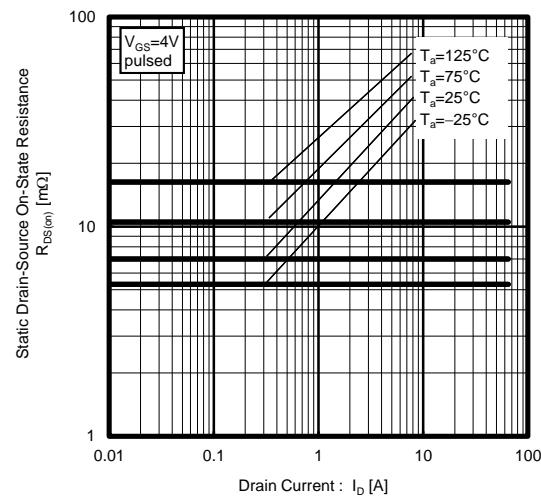


Fig.7 Typical Transfer Characteristics

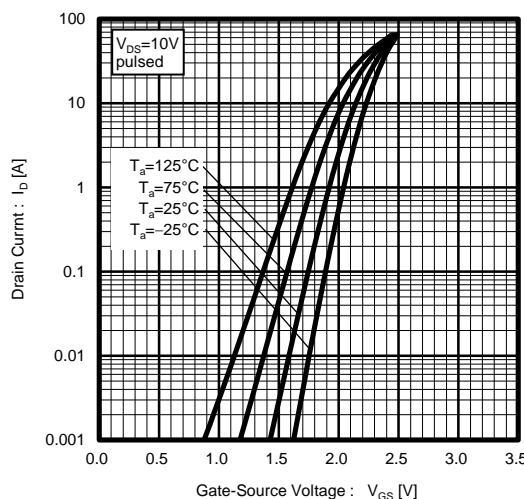


Fig.8 Source Current vs. Source-Drain Voltage

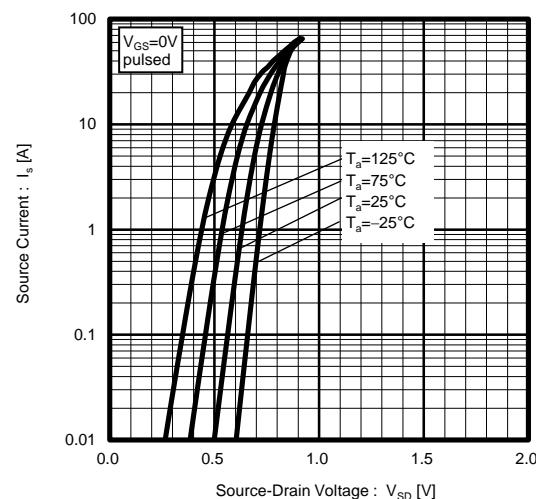


Fig.9 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

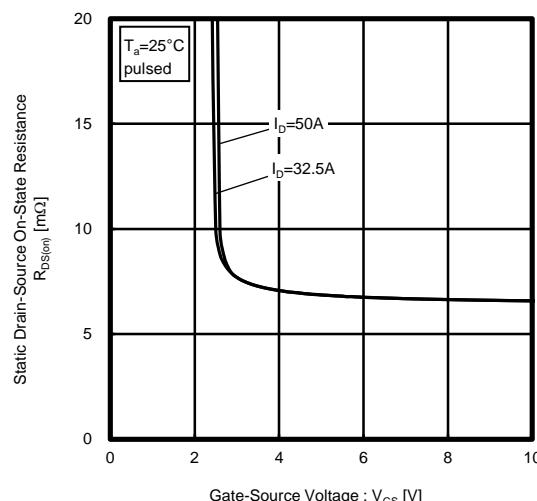


Fig.10 Switching Characteristics

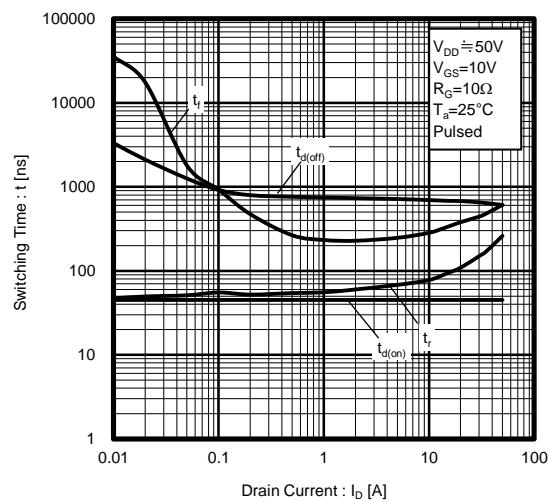


Fig.11 Dynamic Input Characteristics

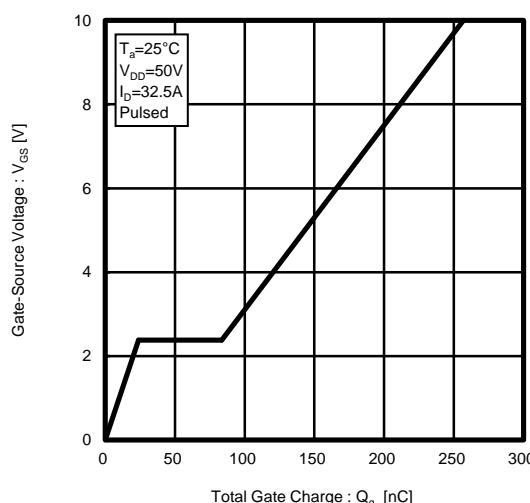


Fig.12 Typical Capacitance vs. Drain-Source Voltage

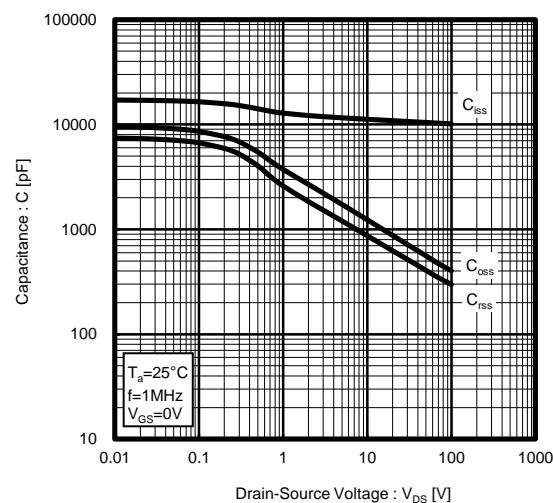


Fig.13 Normalized Transient Thermal Resistance v.s. Pulse Width

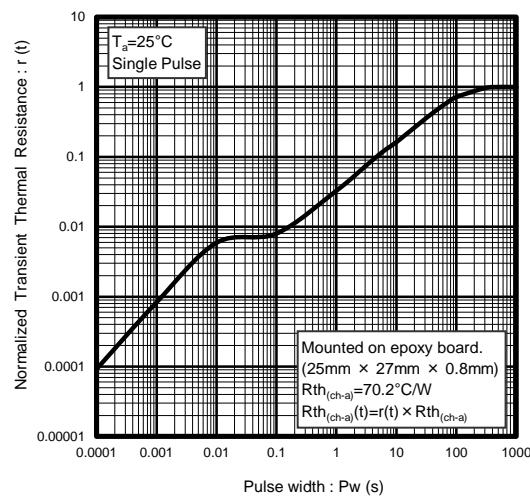
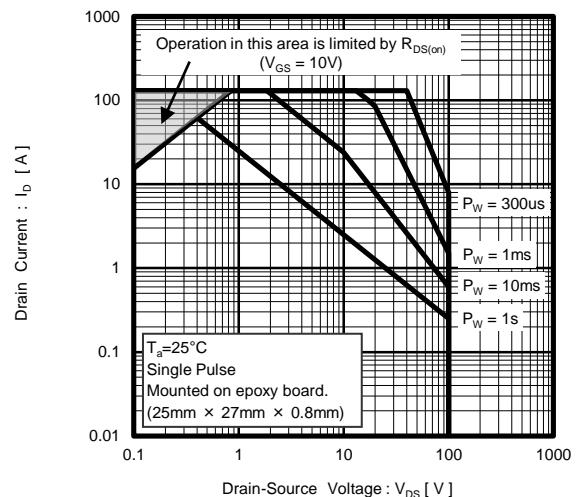


Fig.14 Maximum Safe Operating Area



● Measurement circuits

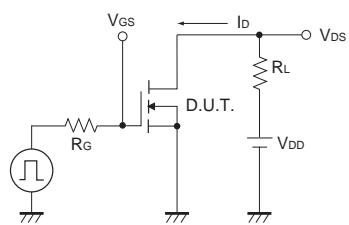


Fig.1-1 Switching Time Measurement Circuit

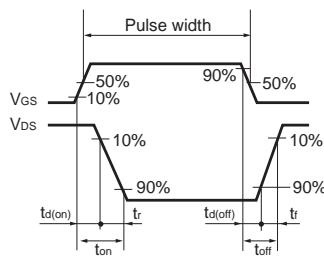


Fig.1-2 Switching Waveforms

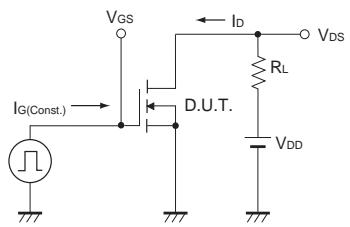


Fig.2-1 Gate Charge Measurement Circuit

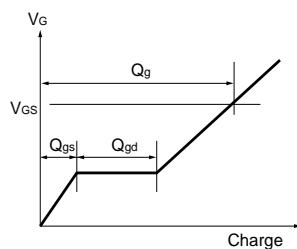


Fig.2-2 Gate Charge Waveform

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