

10V Drive Nch MOSFET

ZDS020N60

● Structure

Silicon N-channel MOSFET

● Features

- 1) Low on-resistance.
- 2) High-speed switching.
- 3) Wide SOA.

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
ZDS020N60		○

● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DSS}	600	V	
Gate-source voltage	V_{GSS}	±30	V	
Drain current	Continuous	I_D	±0.63	A
	Pulsed	I_{DP} *1	±2.5	A
Source current (Body Diode)	Continuous	I_S	0.63	A
	Pulsed	I_{SP} *1	2.5	A
Power dissipation	P_D *2	2	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 $\leq 1\%$

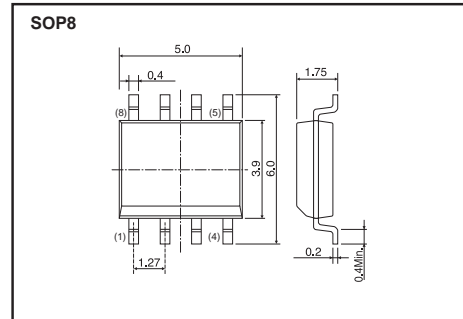
*2 Mounted on a ceramic board.

● Thermal resistance

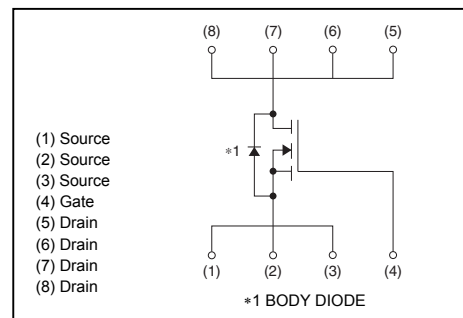
Parameter	Symbol	Limits	Unit
Channel to Ambient	$R_{th(ch-a)}$	62.5	°C / W

*Mounted on a ceramic board.

● Dimensions (Unit : mm)



● Inner circuit



● Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 30V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	600	-	-	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	-	-	100	μA	$V_{DS}=600V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	2.0	-	4.0	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)^*}$	-	4.4	5.0	Ω	$I_D=0.5A, V_{GS}=10V$
Forward transfer admittance	$ Y_{fs} ^*$	0.05	0.5	-	S	$I_D=0.5A, V_{DS}=10V$
Input capacitance	C_{iss}	-	310	-	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	-	145	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	-	40	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	25	-	ns	$I_D=600mA, V_{DD}^*=200V$
Rise time	t_r^*	-	20	-	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}^*$	-	65	-	ns	$R_L=333\Omega$
Fall time	t_f^*	-	65	-	ns	$R_G=50\Omega$
Total gate charge	Q_g^*	-	12	20	nC	$I_D=600mA, V_{DD}^*=450V$
Gate-source charge	Q_{gs}^*	-	3	-	nC	$V_{GS}=10V$
Gate-drain charge	Q_{gd}^*	-	5	-	nC	

*Pulsed

● Body diode characteristics (Source-Drain) (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}^*	-	-	1.5	V	$I_s=1A, V_{GS}=0V$

*Pulsed

●Electrical characteristic curves (Ta=25°C)

Fig.1 Typical Output Characteristics (I)

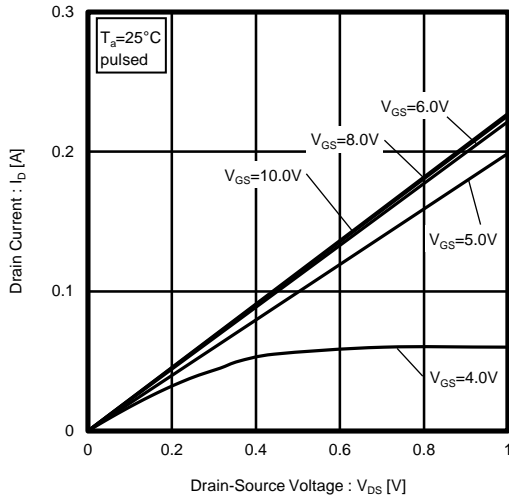


Fig.2 Typical Output Characteristics (II)

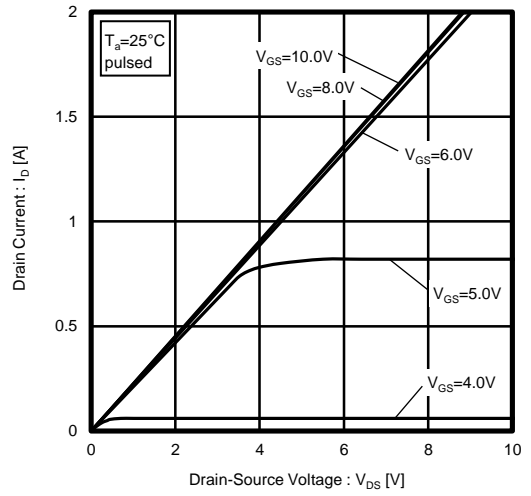


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

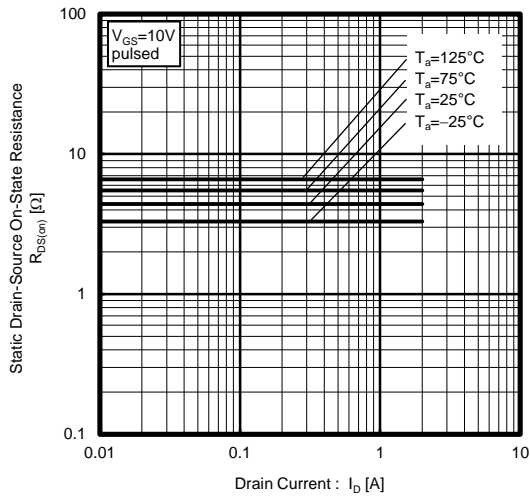


Fig.4 Forward Transfer Admittance vs. Drain Current

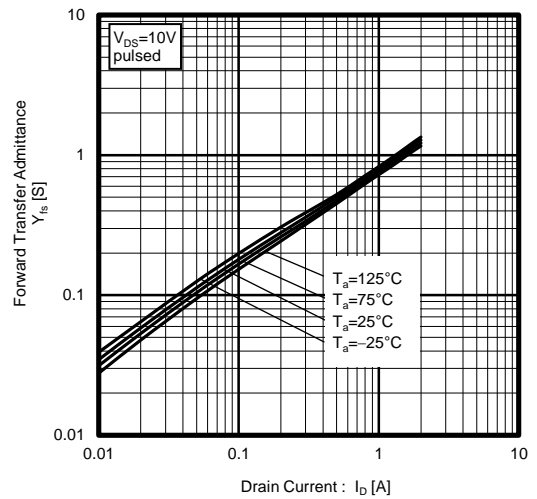


Fig.5 Typical Transfer Characteristics

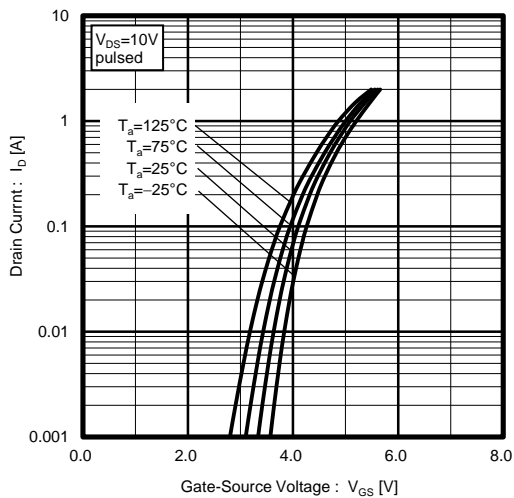


Fig.6 Source Current vs. Source-Drain Voltage

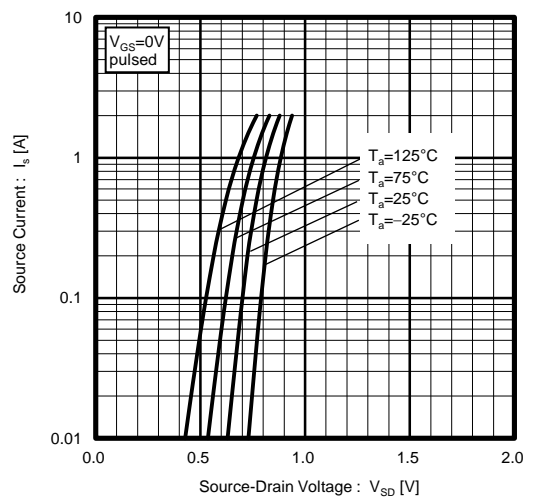


Fig.7 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

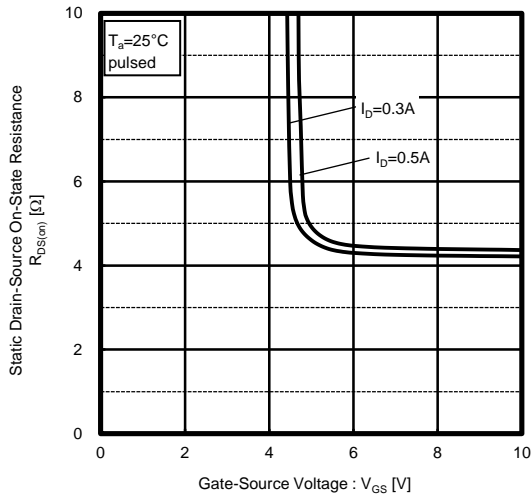


Fig.8 Switching Characteristics

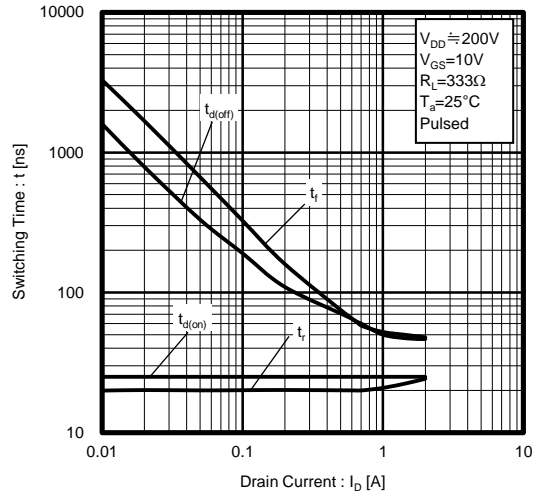


Fig.9 Dynamic Input Characteristics

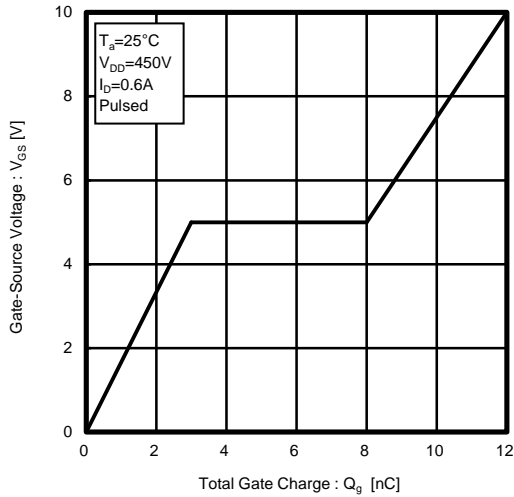


Fig.10 Typical Capacitance vs. Drain-Source Voltage

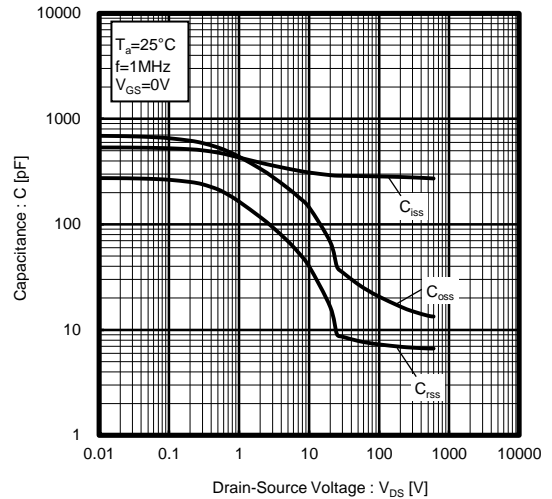
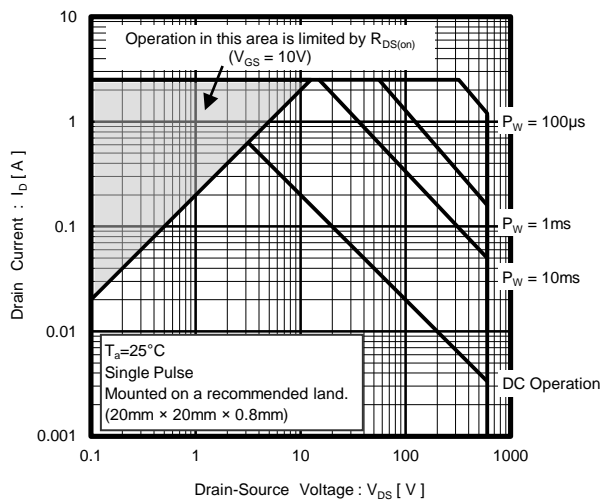


Fig.11 Maximum Safe Operating Area



● Measurement circuits

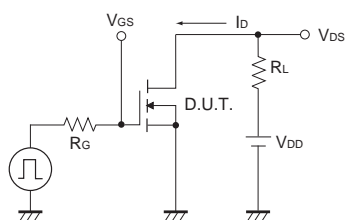


Fig.1-1 Switching Time Measurement Circuit

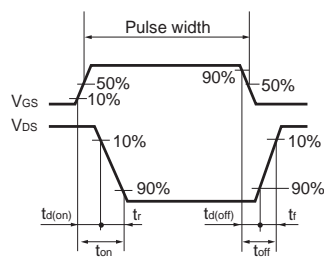


Fig.1-2 Switching Waveforms

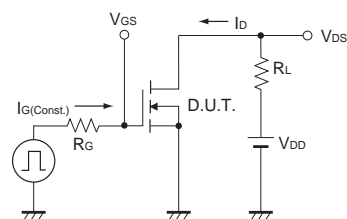


Fig.2-1 Gate Charge Measurement Circuit

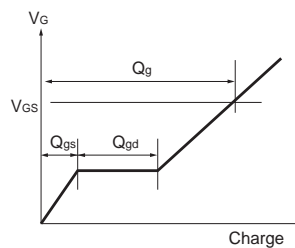


Fig.2-2 Gate Charge Waveform

● Notice

This product might cause chip aging and breakdown under the large electrified environment. Please consider to design ESD protection circuit.

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