

Transistors

10V Drive Nch MOS FET

RDN150N20

●Structure

Silicon N-channel
MOS FET

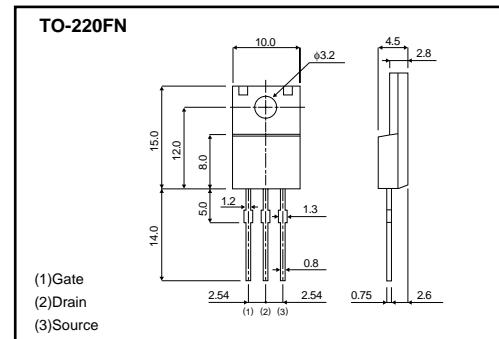
●Features

- 1) Low on-resistance.
- 2) Low input capacitance.
- 3) Excellent resistance to damage from static electricity.

●Application

Switching

●External dimensions (Unit : mm)



●Packaging specifications

Type	Package	Bulk
	Code	-
	Basic ordering unit (pieces)	500
RDN150N20		○

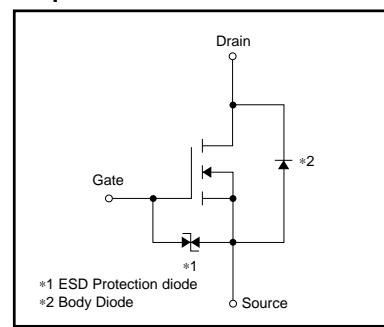
●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DSS}	200	V
Gate-Source Voltage	V _{GSS}	±30	V
Drain Current	Continuous	I _D	A
	Pulsed	I _{DP} *1	A
Reverse Drain Current	Continuous	I _{DR}	A
	Pulsed	I _{DRP} *1	A
Source Current (Body Diode)	Continuous	I _S	A
	Pulsed	I _{SP} *1	A
Avalanche Current	I _{AS} *2	15	A
Avalanche Energy	E _{AS} *2	210	mJ
Total Power Dissipation (T _C =25°C)	P _D	40	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

*1 P_w ≤ 10μs, Duty cycle ≤ 1%

*2 L ≈ 1.4mH, V_{DD}=50V, R_G=25Ω, 1Pulse, T_{ch}=25°C

●Equivalent circuit



*A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use the protection circuit when the fixed voltages are exceeded.

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	R _{th(ch-c)}	3.13	°C/W
Channel to ambient	R _{th(ch-a)}	62.5	°C/W

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} =±30V, V _{DS} =0V
Drain-Source Breakdown Voltage	V _{(BR) DSS}	200	—	—	V	I _D =250µA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{bss}	—	—	25	µA	V _{DS} =200V, 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 _{DSS (on)}	* —	0.12	0.16	Ω	I _D =7.5A, V _{GS} =10V
Forward Transfer Admittance	Y _{fs}	* 4.0	6.6	—	S	V _{DS} =10V, I _D =7.5A
Input Capacitance	C _{iss}	—	1224	—	pF	V _{DS} =10V
Output Capacitance	C _{oss}	—	443	—	pF	V _{GS} =0V
Reverse Transfer Capacitance	C _{rss}	—	154	—	pF	f=1MHz
Turn-On Delay Time	t _{d (on)}	* —	17	—	ns	I _D =7.5A, V _{DD} =100V
Rise Time	t _r	* —	37	—	ns	V _{GS} =10V
Turn-Off Delay Time	t _{d (off)}	* —	62	—	ns	R _L =13Ω
Fall Time	t _f	* —	31	—	ns	R _G =10Ω
Total Gate Charge	Q _g	* —	32.0	64.0	nC	V _{DD} =100V
Gate-Source Charge	Q _{gs}	* —	7.5	—	nC	V _{GS} =10V
Gate-Drain Charge	Q _{gd}	* —	13.0	—	nC	I _D =15A

* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V _{SD}	* —	—	2.0	V	I _S = 7.5A, V _{GS} =0V
Reverse recovery time	t _{rr}	* —	158	—	ns	I _{DR} = 15A, V _{GS} =0V
Reverse recovery charge	Q _{rr}	* —	0.79	—	µC	dI/dt= 100A / µs

* Pulsed

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● Electrical characteristic curves

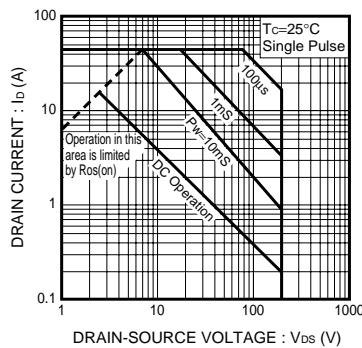


Fig.1 Maximum Safe Operating Area

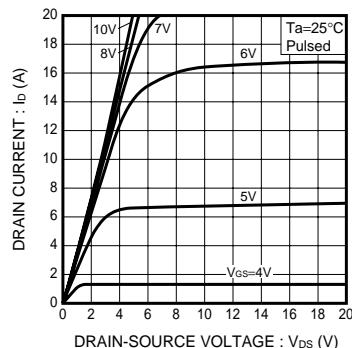


Fig.2 Typical Output Characteristics

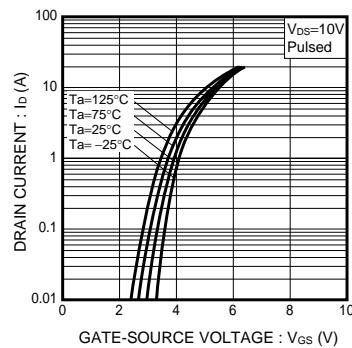


Fig.3 Typical Transfer Characteristics

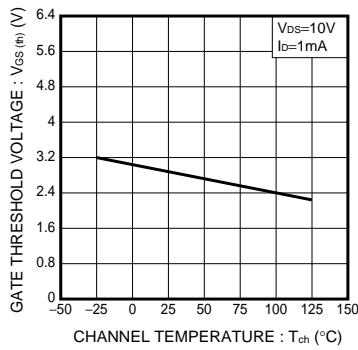


Fig.4 Gate Threshold Voltage vs. Channel Temperature

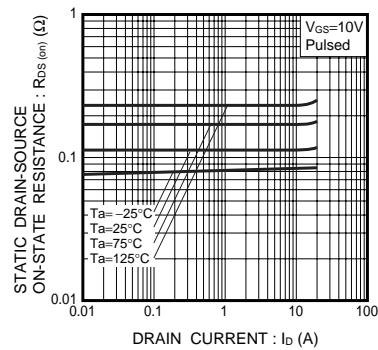


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

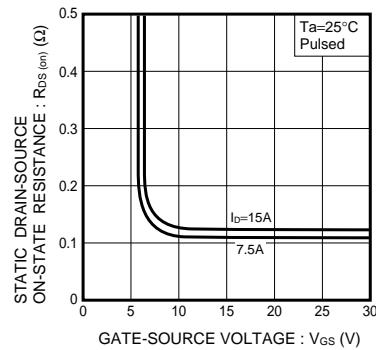


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

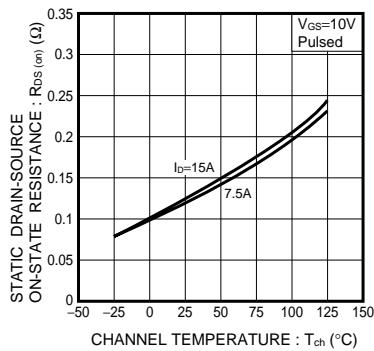


Fig.7 Static Drain-Source On-State Resistance vs. Channel Temperature

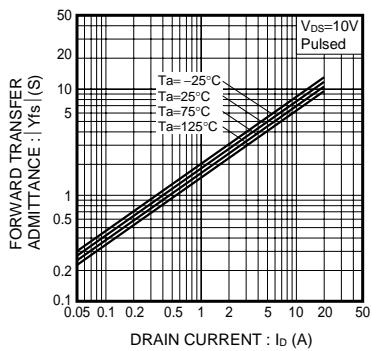


Fig.8 Forward Transfer Admittance vs. Drain Current

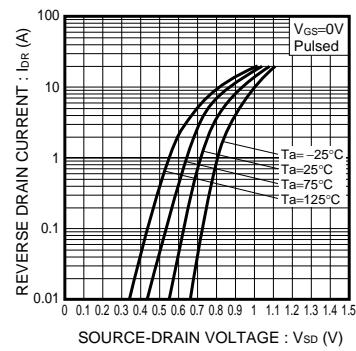


Fig.9 Reverse Drain Current vs. Source-Drain Voltage

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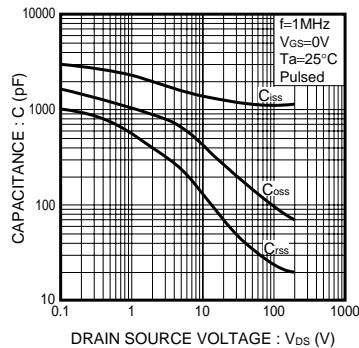
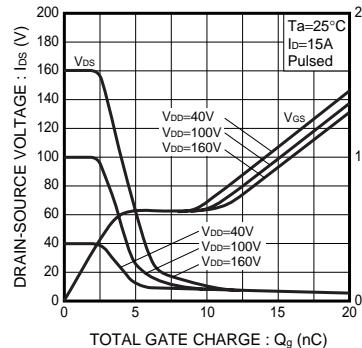
Fig.10 Typical Capacitance vs.
Drain-Source Voltage

Fig.11 Dynamic Input Characteristics

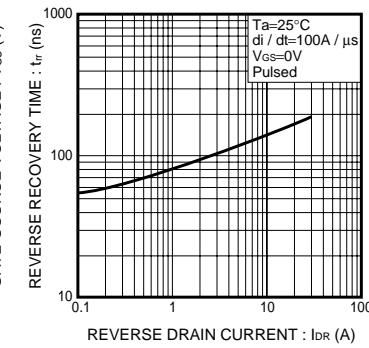
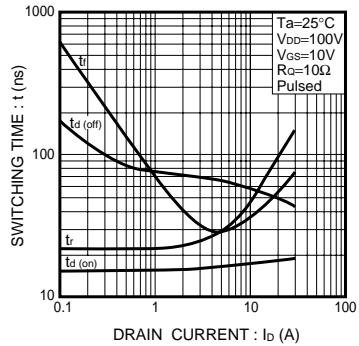
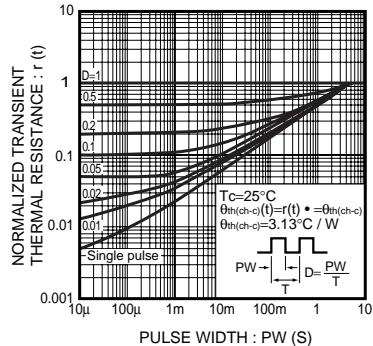
Fig.12 Reverse Recovery Time
vs. Reverse Drain Current

Fig.13 Switching Characteristics

Fig.14 Normalized Transient
Thermal Resistance vs.
Pulse Width

Appendix

Notes

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