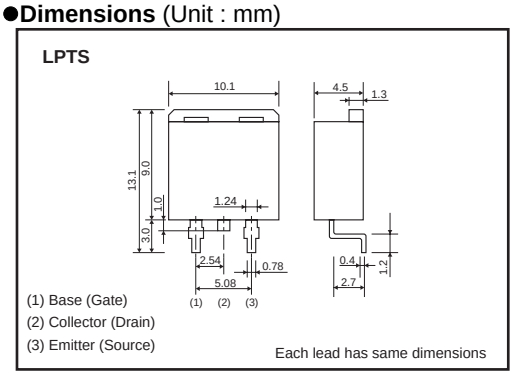
10V Drive Nch MOSFET

R5009ANJ

●Structure
Silicon N-channel MOSFET

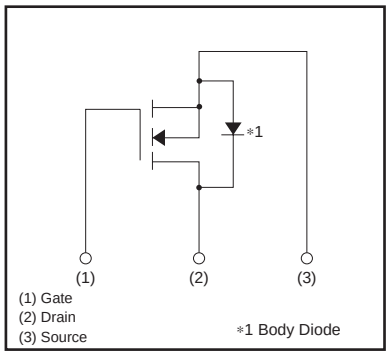
●Features
1) Low on-resistance.
2) Fast switching speed.
3) Wide SOA (safe operating area).
4) Gate-source voltage (V_{GSS}) guaranteed to be ±30V.
5) Drive circuits can be simple.
6) Parallel use is easy.

●Dimensions (Unit : mm)



●Applications
Switching

●Inner circuit



●Packaging specifications

	Package	Taping
	Code	TL
Type	Basic ordering unit (pieces)	1000
R5009ANJ		○

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	500	V
Gate-source voltage		V_{GSS}	30	V
Drain current	Continuous	I_D *3	±9	A
	Pulsed	I_{DP} *1	±36	A
Source current (Body Diode)	Continuous	I_S	9	A
	Pulsed	I_{SP} *1	36	A
Avalanche Current		I_{AS} *2	4.5	A
Avalanche Energy		E_{AS} *2	5.4	mJ
Total power dissipation (Tc=25°C)		P_D	50	W
Channel temperature		Tch	150	°C
Range of storage temperature		Tstg	−55 to +150	°C

*1 Pw≤10μs, Duty cycle≤1%
*2 L≒ 500μH, V_{DD}=50V, R_G=25Ω, Starting, Tch=25°C
*3 Limited only by maximum tempterature allowed

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	Rth(ch-c)	2.5	°C/W

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	±100	nA	V_{GS}=±30V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DSS}$	500	–	–	V	I_D=1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	100	μA	V_{DS}=500V, V_{GS}=0V
Gate threshold voltage	$V_{GS(th)}$	2.5	–	4.5	V	V_{DS}=10V, I_D=1mA
Static drain-source on-state resistance	$R_{DS(on)}$*	–	0.55	0.72	Ω	I_D=4.5A, V_{GS}=10V
Forward transfer admittance	$\|Y_{fs}\|$*	2.5	–	–	S	I_D=4.5A, V_{DS}=10V
Input capacitance	C_{iss}	–	650	–	pF	V_{DS}=25V
Output capacitance	C_{oss}	–	400	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	30	–	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$*	–	30	–	ns	I_D=4.5A, V_{DD}≒250V
Rise time	t_r*	–	20	–	ns	V_{GS}=10V
Turn-off delay time	$t_{d(off)}$*	–	62	–	ns	R_L=55.6Ω
Fall time	t_f*	–	28	–	ns	R_G=10Ω
Total gate charge	Q_g*	–	21	–	nC	V_{DD}≒250V I_D=9A V_{GS}=10V R_L=27.8Ω / R_G=10Ω
Gate-source charge	Q_{gs}*	–	5	–	nC	
Gate-drain charge	Q_{gd}*	–	9	–	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= 9A, V_{GS}=0V

* Pulsed

●Electrical characteristics curves

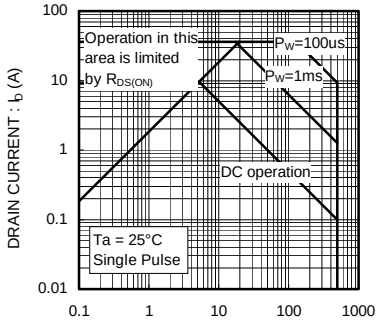


Fig.1 Maximum Safe Operating Area

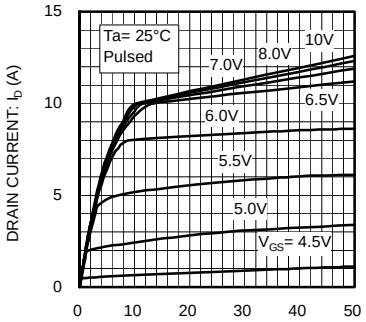


Fig.2 Typical Output Characteristics(Ⅰ)

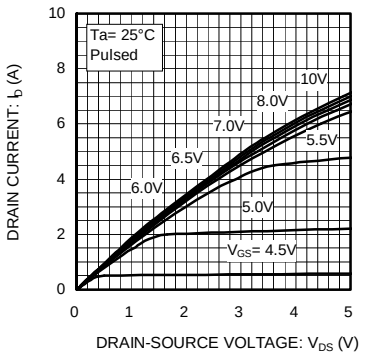


Fig.3 Typical Output Characteristics(Ⅱ)

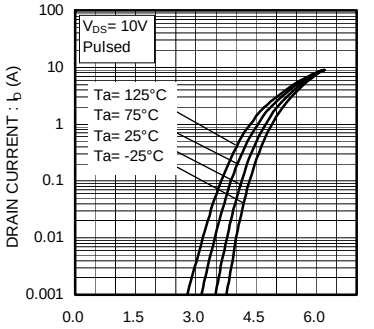


Fig.4 Typical Transfer Characteristics

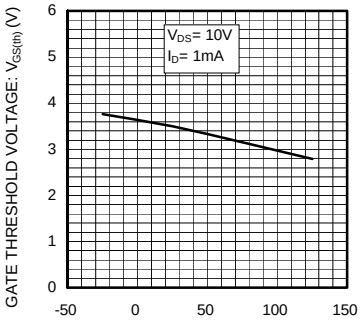


Fig.5 Gate Threshold Voltage vs. Channel Temperature

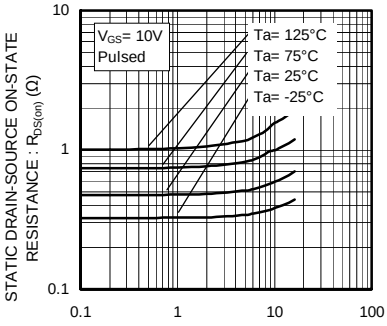


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

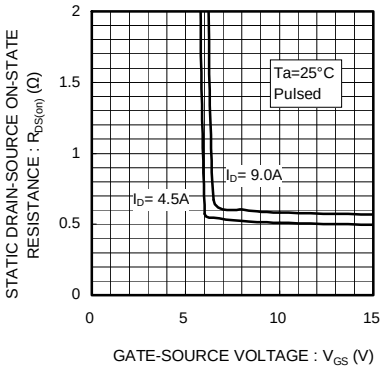


Fig.7 Static Drain-Source On-State Resistance vs. Gate Source Voltage

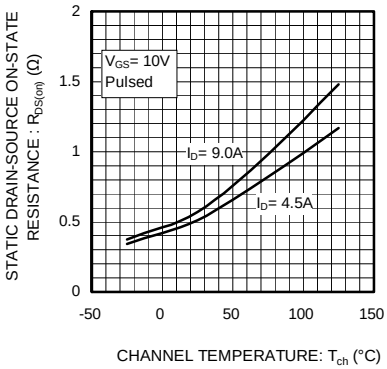


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

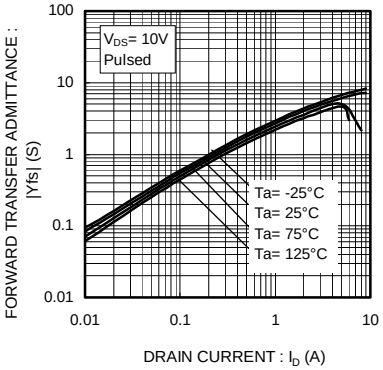


Fig.9 Forward Transfer Admittance vs. Drain Current

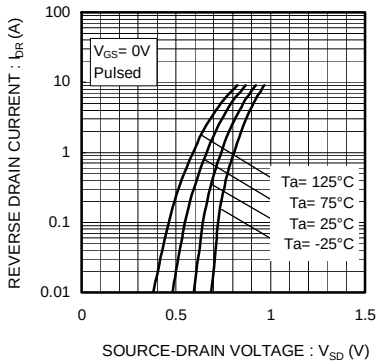


Fig.10 Reverse Drain Current vs. Sourse-Drain Voltage

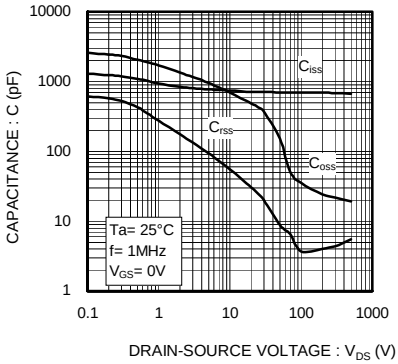


Fig.11 Typical Capacitance vs. Drain-Source Voltage

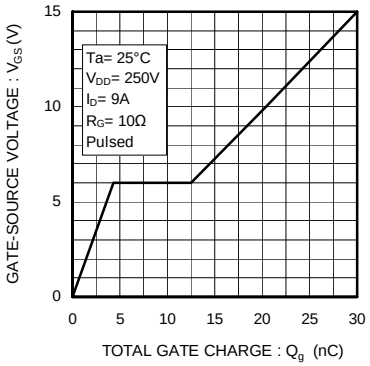


Fig.12 Dynamic Input Characteristics

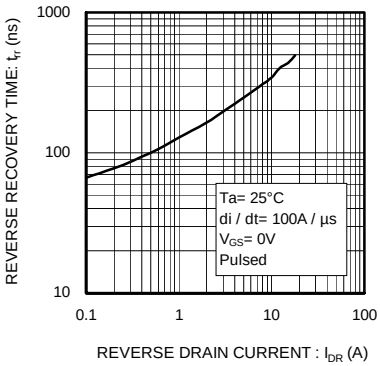


Fig.13 Reverse Recovery Time vs.Reverse Drain Current

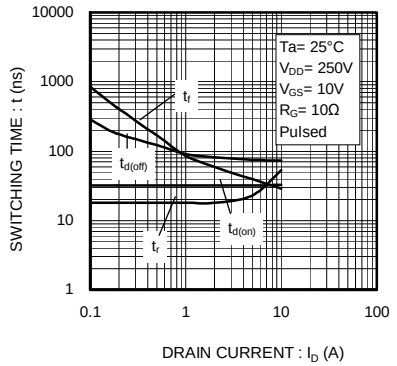


Fig.14 Switching Characteristics

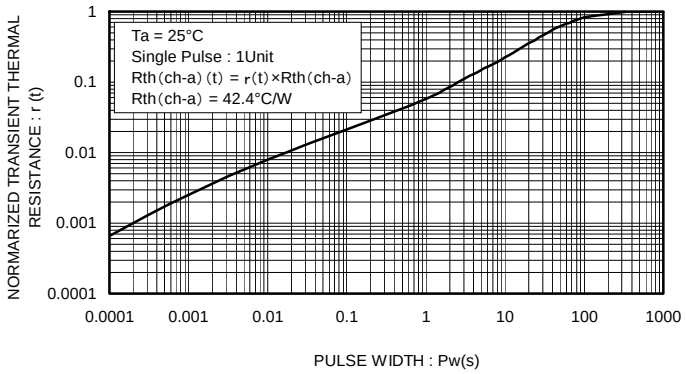


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

●**Switching characteristics measurement circuit**

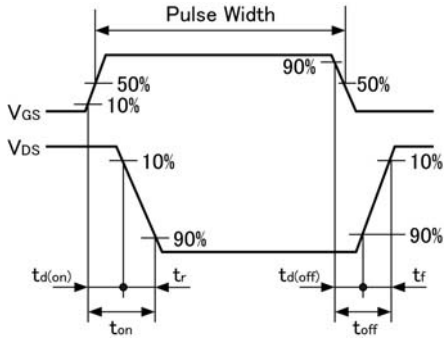


Fig.1-1 Switching time measurement circuit

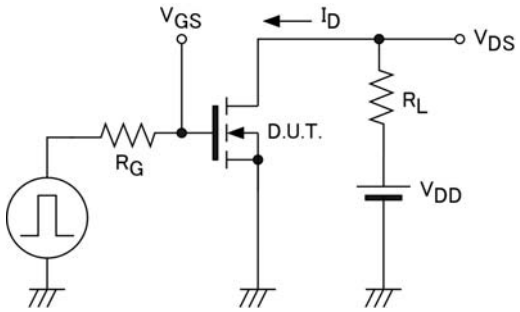


Fig.1-2 Switching waveforms

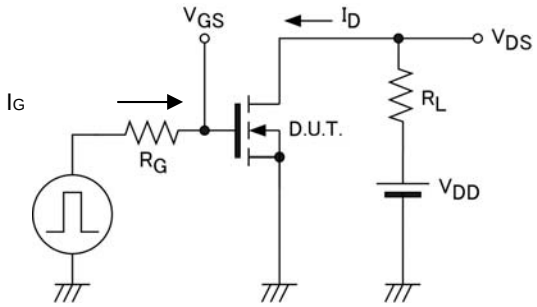


Fig.2-1 Gate charge measurement circuit

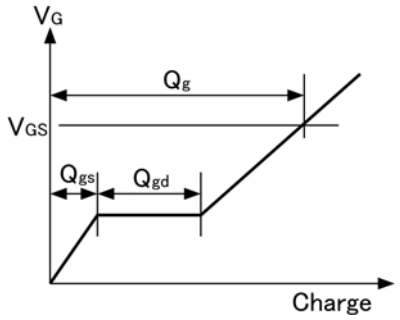


Fig.2-2 Gate charge waveform

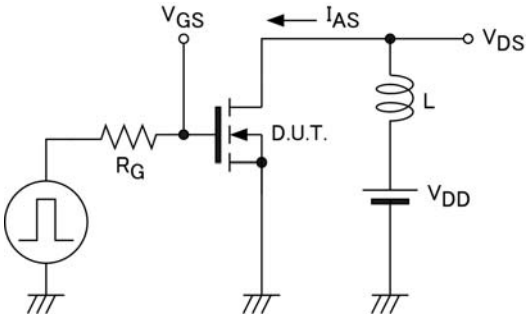


Fig.3-1 Avalanche measurement circuit

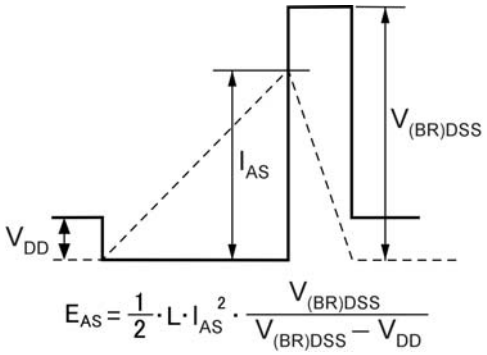


Fig.3-2 Avalanche waveform

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM CO.,LTD.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact your nearest sales office.

ROHM Customer Support System

THE AMERICAS / EUROPE / ASIA / JAPAN

www.rohm.com

Contact us : webmaster@rohm.co.jp

ROHM Co.,Ltd. 21 Saiin Mizosaki-cho, Ukyo-ku, Kyoto 615-8585, Japan
TEL : +81-75-311-2121
FAX : +81-75-315-0172

ROHM SEMICONDUCTOR