4V Drive Nch + Pch MOSFET

SH8M12

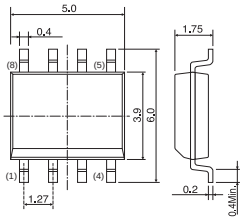
● Structure
Silicon N-channel MOSFET/
Silicon P-channel MOSFET

●Features
1) Low on-resistance.
2) High power package(SOP8).
3) Low voltage drive(4V drive).

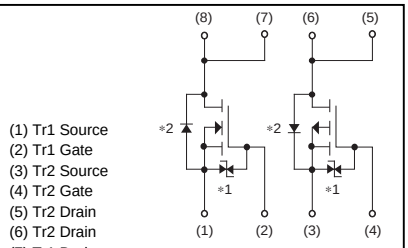
● Application
Switching

●Dimensions (Unit : mm)

SOP8



●Inner circuit



● Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SH8M12		O

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits		Unit
			Tr1 : N-ch	Tr2 : P-ch	
Drain-source voltage		V_{DSS}	30	−30	V
Gate-source voltage		V_{GSS}	±20	±20	V
Drain current	Continuous	I_D	±5	±4.5	A
	Pulsed	I_{DP} *1	±20	±18	A
Source current (Body Diode)	Continuous	I_S	1.6	−1.6	A
	Pulsed	I_{SP} *1	20	−18	A
Power dissipation		P_D *2	2.0		W / TOTAL
			1.4		W / ELEMENT
Channel temperature		Tch	150		°C
Range of storage temperature		Tstg	−55 to +150		°C

*1 Pw≤10μs, Duty cycle≤1%

*2 Mounted on a ceramic board.

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

<Tr1(Nch)>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DSS}$	30	-	-	V	I_D=1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=30V, V_{GS}=0V
Gate threshold voltage	$V_{GS(th)}$	1.0	-	2.5	V	V_{DS}=10V, I_D=1mA
Static drain-source on-state resistance	$R_{DS(on)}$*	-	30	42	mΩ	I_D=5A, V_{GS}=10V
		-	40	56		I_D=5A, V_{GS}=4.5V
			45	63		I_D=5A, V_{GS}=4V
Forward transfer admittance	$\|Y_{fs}\|$*	2.5	-	-	S	V_{DS}=10V, I_D=5A
Input capacitance	C_{iss}	-	250	-	pF	V_{DS}=10V
Output capacitance	C_{oss}	-	90	-	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	-	45	-	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$ *	-	6	-	ns	I_D=2.5A, V_{DD}≒15V
Rise time	t_r *	-	27	-	ns	V_{GS}=10V
Turn-off delay time	$t_{d(off)}$ *	-	26	-	ns	R_L=6Ω
Fall time	t_f *	-	5	-	ns	R_G=10Ω
Total gate charge	Q_g *	-	4.0	-	nC	I_D=5A, V_{DD}≒15V
Gate-source charge	Q_{gs} *	-	1.2	-	nC	V_{GS}=5V
Gate-drain charge	Q_{gd} *	-	1.2	-	nC	

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}*	-	-	1.2	V	I_s=5A, V_{GS}=0V

*Pulsed

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

<Tr2(Pch)>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DSS}$	−30	-	-	V	I_D=−1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}		-	−1	μA	V_{DS}=−30V, V_{GS}=0V
Gate threshold voltage	$V_{GS\ (th)}$	−1.0	-	−2.5	V	V_{DS}=−10V, I_D=−1mA
Static drain-source on-state resistance	$R_{DS\ (on)}$*	-	40	56	mΩ	I_D=−4.5A, V_{GS}=−10V
		-	55	77		I_D=−2.5A, V_{GS}=−4.5V
		-	60	84		I_D=−2.5A, V_{GS}=−4.0V
Forward transfer admittance	$\|Y_{fs}\|$*	3.5	-	-	S	V_{DS}=−10V, I_D=−4.5A
Input capacitance	C_{iss}	-	800	-	pF	V_{DS}=−10V
Output capacitance	C_{oss}	-	120	-	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	-	110	-	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$*	-	7	-	ns	I_D=−2.5A, V_{DD}≒ −15V
Rise time	t_r *	-	15	-	ns	V_{GS}=−10V
Turn-off delay time	$t_{d(off)}$*	-	70	-	ns	R_L=6Ω
Fall time	t_f *	-	50	-	ns	R_G=10Ω
Total gate charge	Q_g *	-	8.0	-	nC	I_D=−4.5A, V_{DD}≒ −15V
Gate-source charge	Q_{gs} *	-	2.5	-	nC	V_{GS}=−5V
Gate-drain charge	Q_{gd} *	-	3.0	-	nC	

*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}*	-	-	−1.2	V	I_s=−4.5A, V_{GS}=0V

*Pulsed

●Electrical characteristic curves (Ta=25°C)

〈Tr.1(Nch)〉

Fig.1 Typical Output Characteristics(Ⅰ)

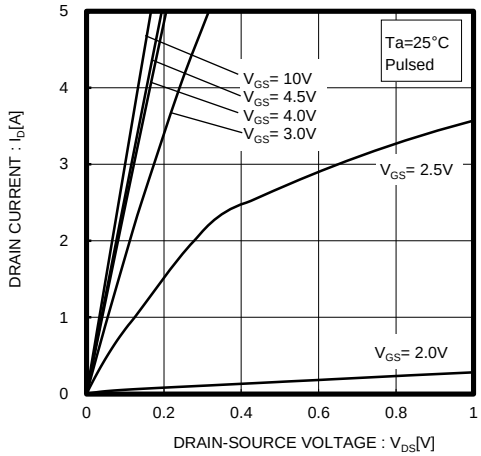


Fig.2 Typical Output Characteristics(Ⅱ)

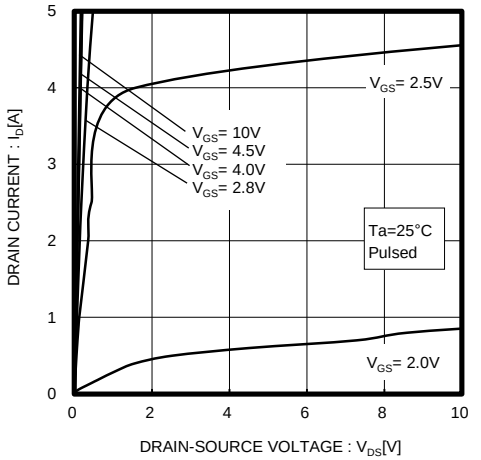


Fig.3 Typical Transfer Characteristics

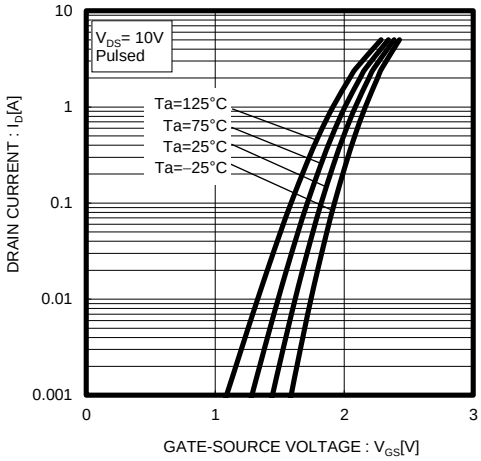


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

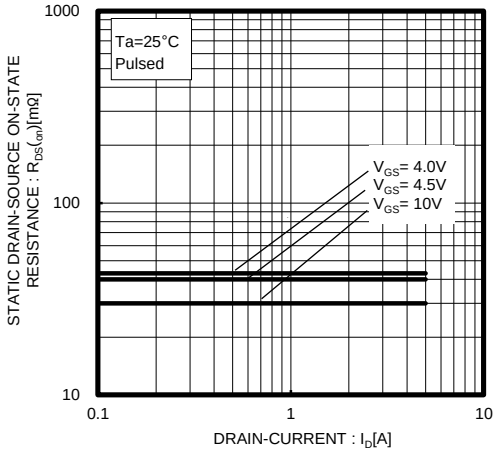


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

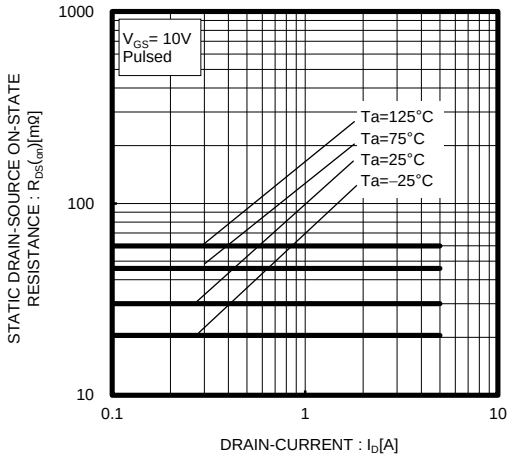


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

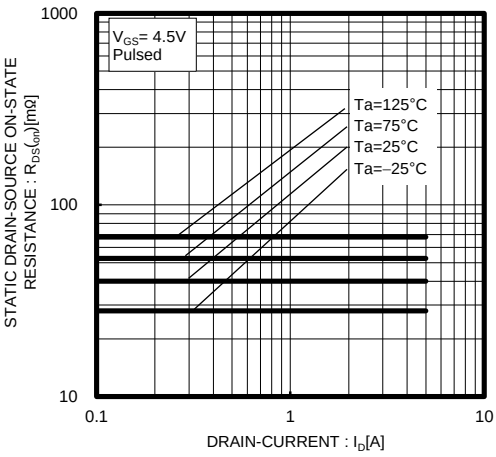


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

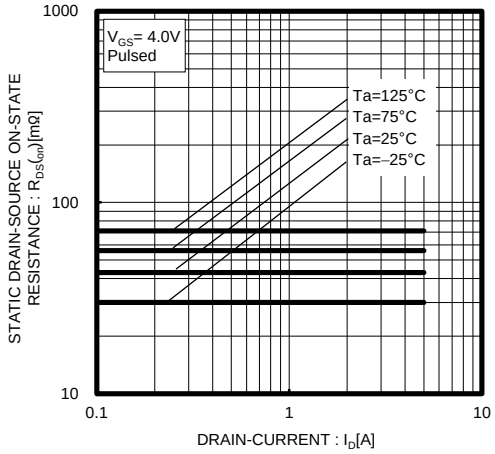


Fig.8 Forward Transfer Admittance vs. Drain Current

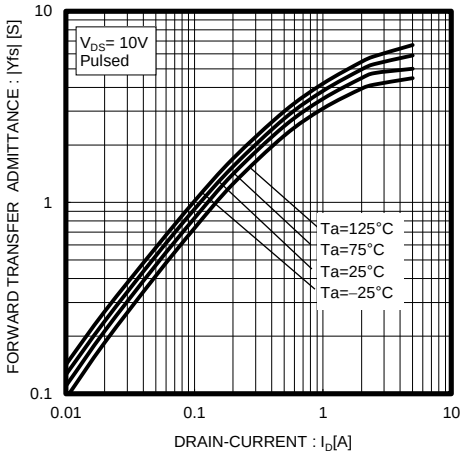


Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

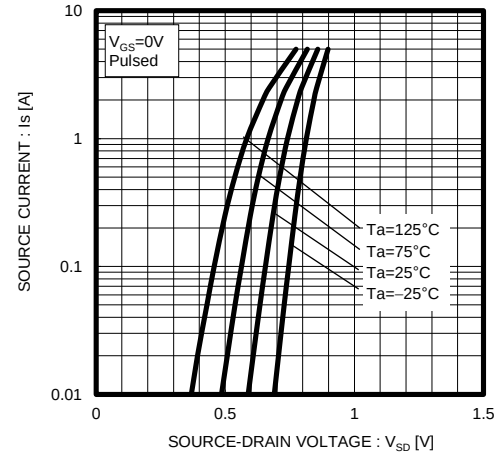


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

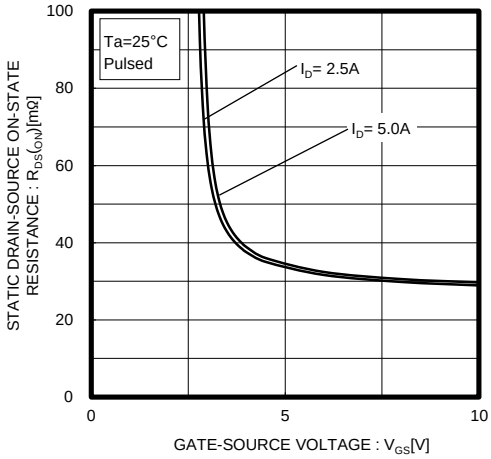


Fig.11 Switching Characteristics

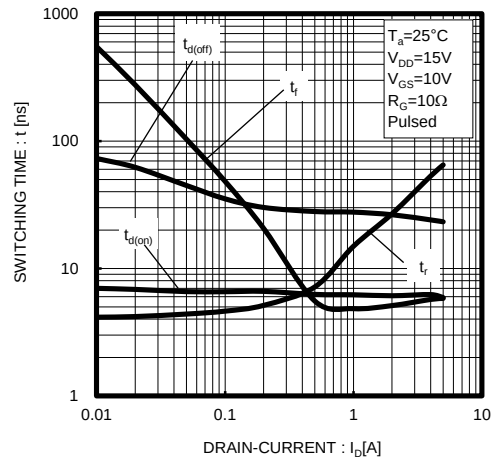


Fig.12 Dynamic Input Characteristics

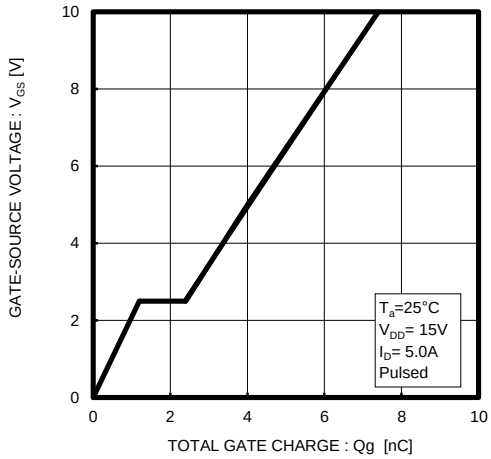


Fig.13 Typical Capacitance vs. Drain-Source Voltage

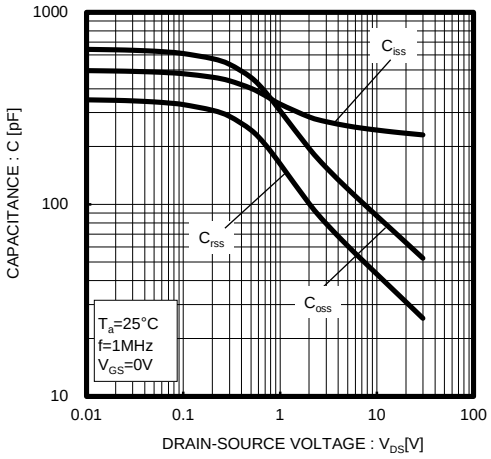


Fig.14 Maximum Safe Operating Aera

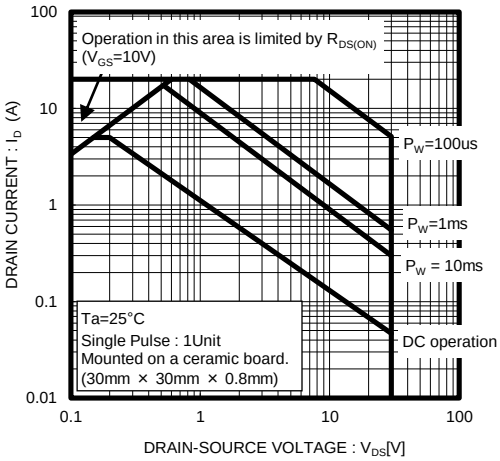
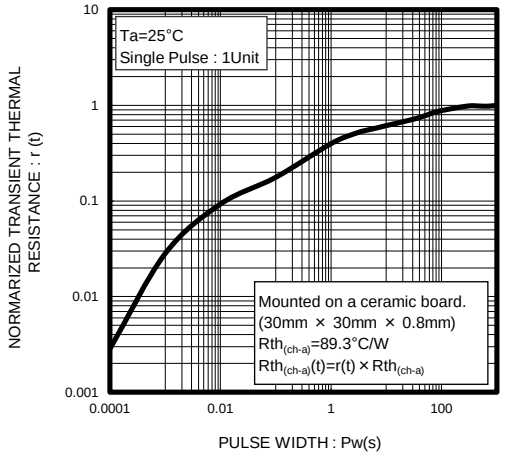


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width



〈Tr.2(Pch)〉

Fig.1 Typical Output Characteristics(Ⅰ)

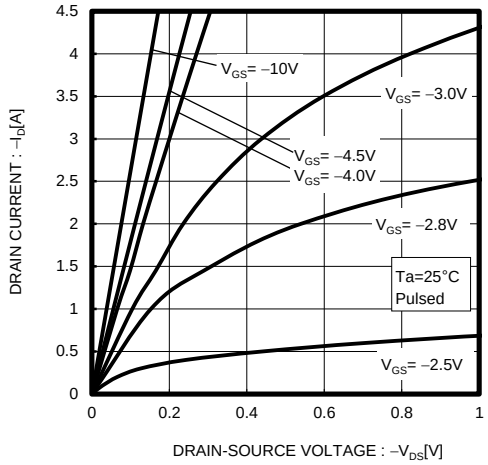


Fig.2 Typical Output Characteristics(Ⅱ)

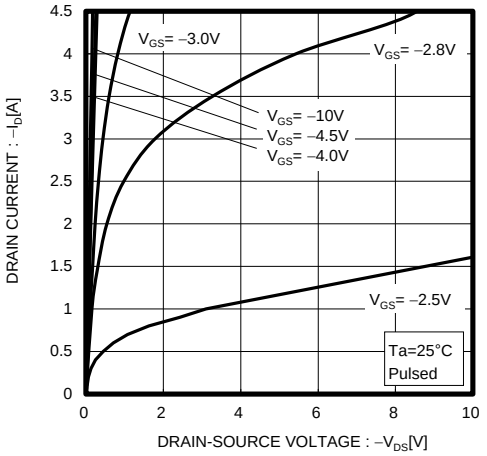


Fig.3 Typical Transfer Characteristics

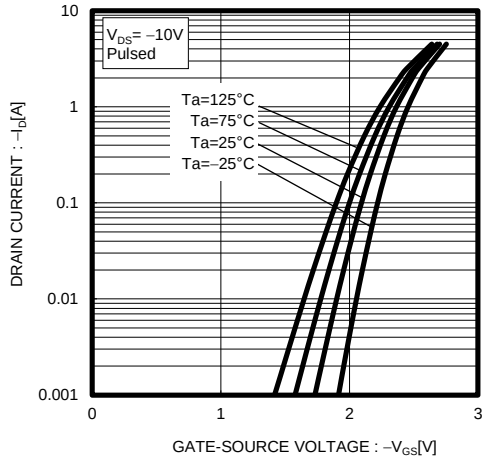


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

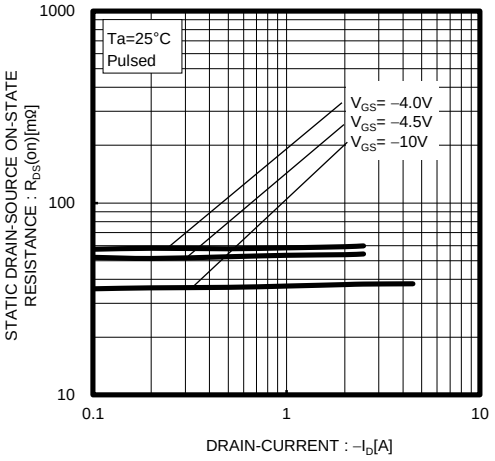


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

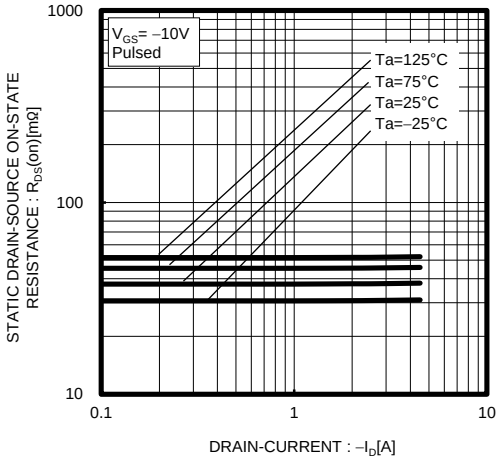


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

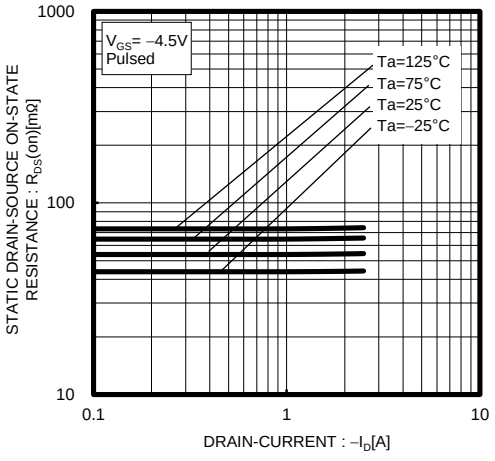


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

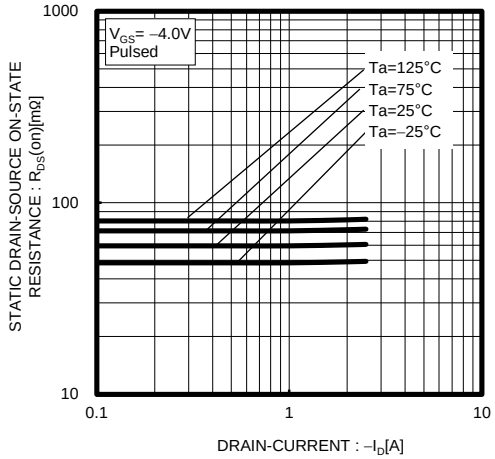


Fig.8 Forward Transfer Admittance vs. Drain Current

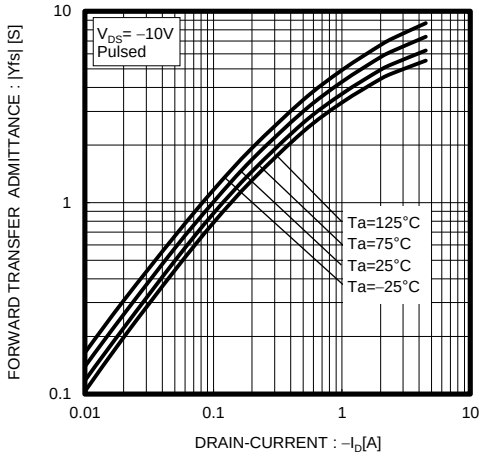


Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

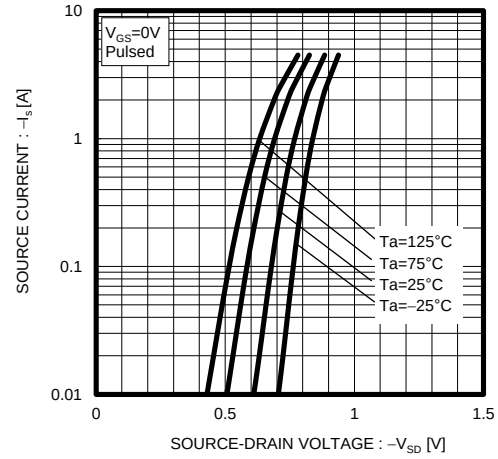


Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

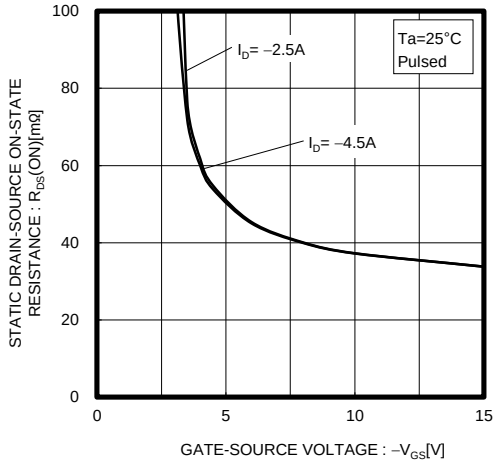


Fig.11 Switching Characteristics

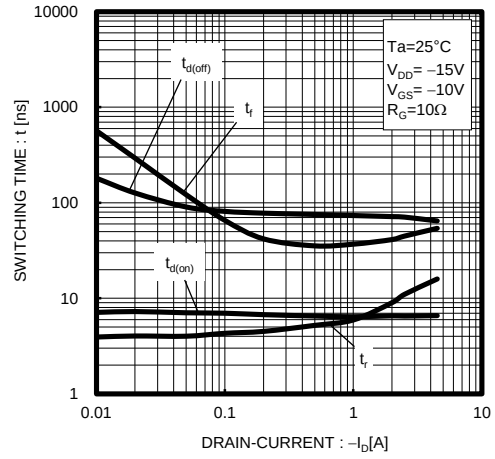


Fig.12 Dynamic Input Characteristics

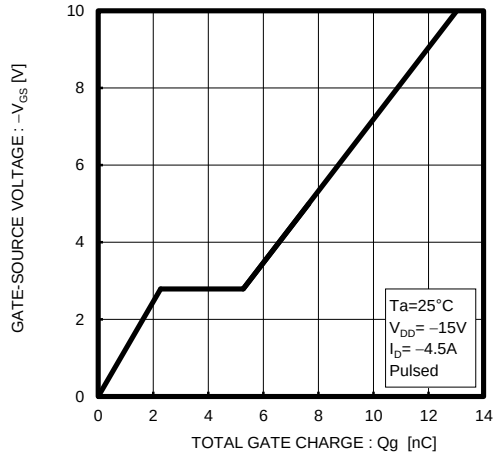


Fig.13 Typical Capacitance vs. Drain-Source Voltage

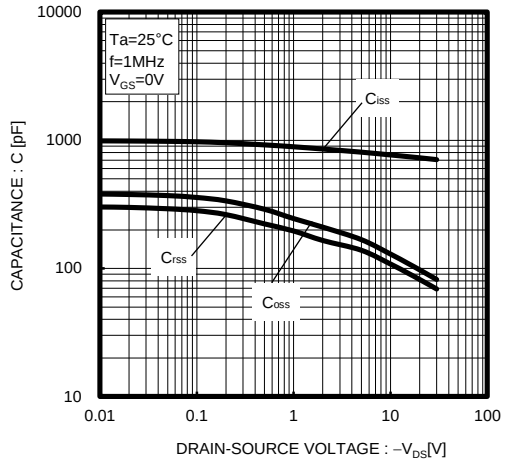


Fig.14 Maximum Safe Operating Aera

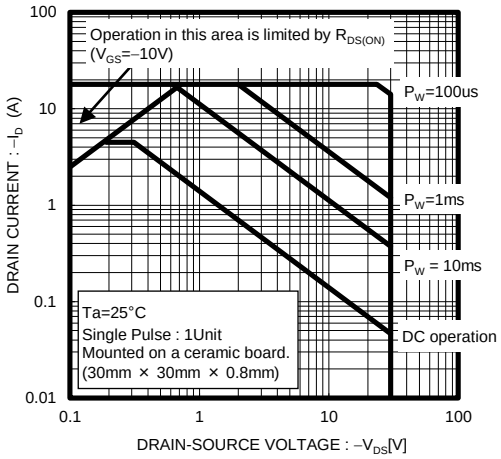
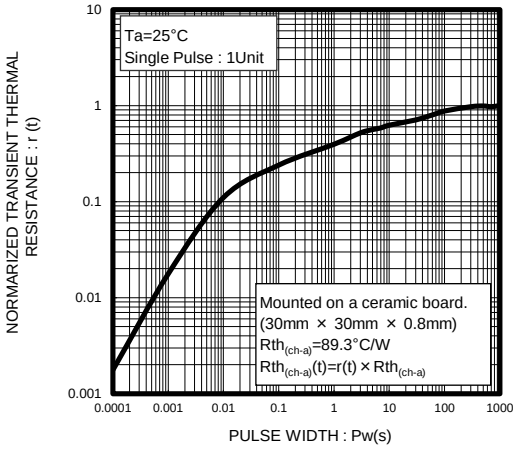


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width



● **Measurement circuits**

<Tr1(Nch)>

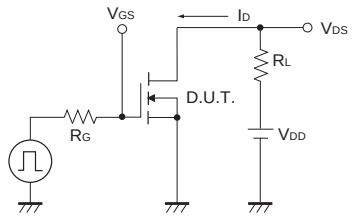


Fig.1-1 Switching Time Measurement Circuit

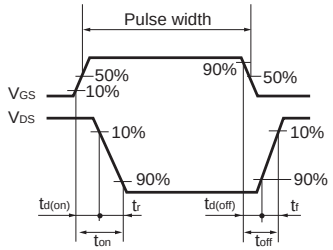


Fig.1-2 Switching Waveforms

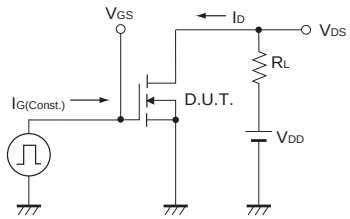


Fig.2-1 Gate Charge Measurement Circuit

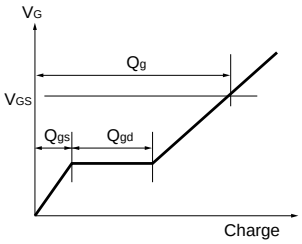


Fig.2-2 Gate Charge Waveform

<Tr2(Pch)>

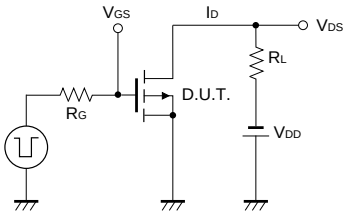


Fig.3-1 Switching Time Measurement Circuit

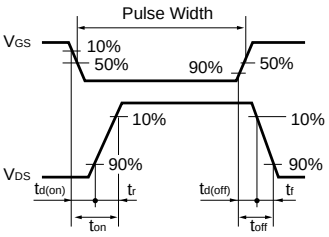


Fig.3-2 Switching Waveforms

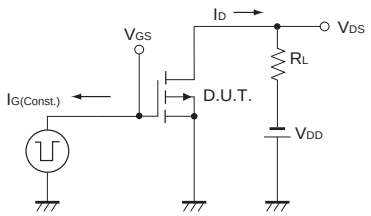


Fig.4-1 Gate Charge Measurement Circuit

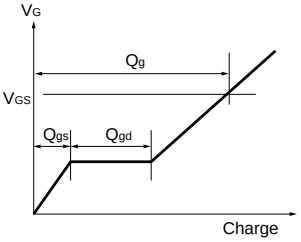


Fig.4-2 Gate Charge Waveform

● **Notice**

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

Notes

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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.

ROHM SEMICONDUCTOR

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

ROHM Customer Support System

http://www.rohm.com/contact/

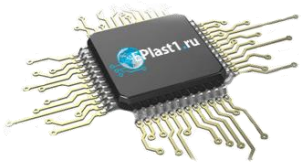
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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