

# 10V Drive Nch MOSFET

**R5016ANJ**

## ● Structure

Silicon N-channel MOSFET

## ●Features

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

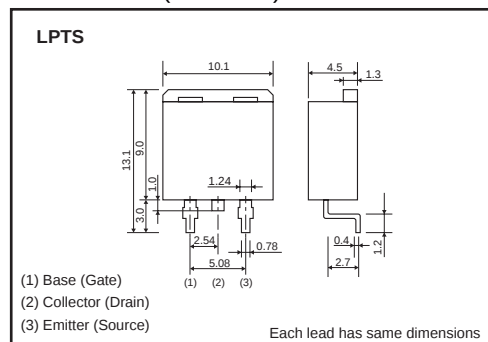
## ●Applications

## Switching

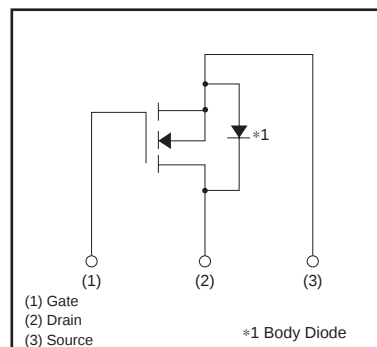
### ●Packaging specifications

|          |                              |        |
|----------|------------------------------|--------|
| Type     | Package                      | Taping |
|          | Code                         | TL     |
|          | Basic ordering unit (pieces) | 1000   |
| R5016ANJ |                              | ○      |

●Dimensions (Unit : mm)



- Inner circuit



●Absolute maximum ratings (Ta=25°C)

| Parameter                         |            | Symbol             | Limits      | Unit |
|-----------------------------------|------------|--------------------|-------------|------|
| Drain-source voltage              |            | V <sub>DSS</sub>   | 500         | V    |
| Gate-source voltage               |            | V <sub>GSS</sub>   | ±30         | V    |
| Drain current                     | Continuous | I <sub>D</sub> *3  | ±16         | A    |
|                                   | Pulsed     | I <sub>DP</sub> *1 | ±64         | A    |
| Source current<br>(Body Diode)    | Continuous | I <sub>S</sub> *3  | 16          | A    |
|                                   | Pulsed     | I <sub>SP</sub> *1 | 64          | A    |
| Avalanche Current                 |            | I <sub>AS</sub> *2 | 8           | A    |
| Avalanche Energy                  |            | E <sub>AS</sub> *2 | 18          | mJ   |
| Total power dissipation (Tc=25°C) |            | P <sub>D</sub>     | 100         | W    |
| Channel temperature               |            | T <sub>ch</sub>    | 150         | °C   |
| Range of storage temperature      |            | T <sub>stg</sub>   | -55 to +150 | °C   |

\*1  $P_w \leq 10\mu s$ , Duty cycle  $\leq 1\%$

\*2  $L = 500\mu\text{H}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\Omega$ , Starting,  $T_{ch} = 25^\circ\text{C}$

\*3 Limited only by maximum temperature allowed

- Thermal resistance

| Parameter       | Symbol    | Limits | Unit |
|-----------------|-----------|--------|------|
| Channel to case | Rth(ch-c) | 1.25   | °C/W |

## ●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          | $V_{(BR)DSS}$  | 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 | $R_{DS(on)}^*$ | –    | 0.21 | 0.27 | Ω    | $I_D=8A$ , $V_{GS}=10V$                           |
| Forward transfer admittance             | $ Y_{fs} ^*$   | 6.0  | –    | –    | S    | $I_D=8A$ , $V_{DS}=10V$                           |
| Input capacitance                       | $C_{iss}$      | –    | 1800 | –    | pF   | $V_{DS}=25V$                                      |
| Output capacitance                      | $C_{oss}$      | –    | 750  | –    | pF   | $V_{GS}=0V$                                       |
| Reverse transfer capacitance            | $C_{rss}$      | –    | 55   | –    | pF   | $f=1MHz$                                          |
| Turn-on delay time                      | $t_{d(on)}^*$  | –    | 40   | –    | ns   | $I_D=8A$ , $V_{DD} \approx 250V$                  |
| Rise time                               | $t_r^*$        | –    | 50   | –    | ns   | $V_{GS}=10V$                                      |
| Turn-off delay time                     | $t_{d(off)}^*$ | –    | 150  | –    | ns   | $R_L=31.3\Omega$                                  |
| Fall time                               | $t_f^*$        | –    | 55   | –    | ns   | $R_G=10\Omega$                                    |
| Total gate charge                       | $Q_g^*$        | –    | 50   | –    | nC   | $V_{DD} \approx 250V$                             |
| Gate-source charge                      | $Q_{gs}^*$     | –    | 9.5  | –    | nC   | $I_D=16A$                                         |
| Gate-drain charge                       | $Q_{gd}^*$     | –    | 21   | –    | nC   | $V_{GS}=10V$<br>$R_L=15.6\Omega$ / $R_G=10\Omega$ |

\* Pulsed

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

| Parameter       | Symbol     | Min. | Typ. | Max. | Unit | Conditions              |
|-----------------|------------|------|------|------|------|-------------------------|
| Forward voltage | $V_{SD}^*$ | –    | –    | 1.5  | V    | $I_S=16A$ , $V_{GS}=0V$ |

\* Pulsed

# ●Electrical characteristics curves

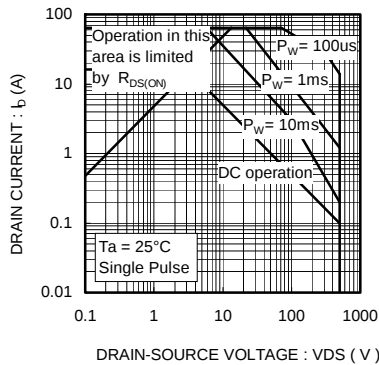


Fig.1 Maximum Safe Operating Area

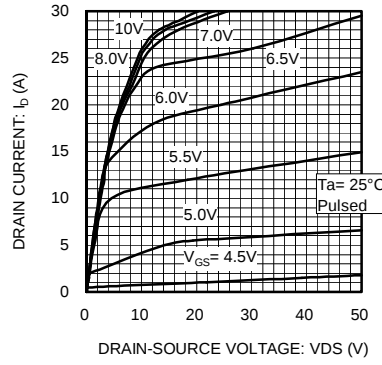


Fig.2 Typical Output Characteristics(I)

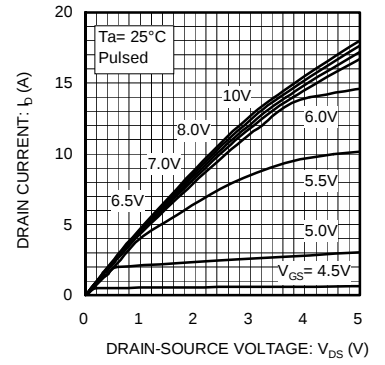


Fig.3 Typical Output Characteristics(II)

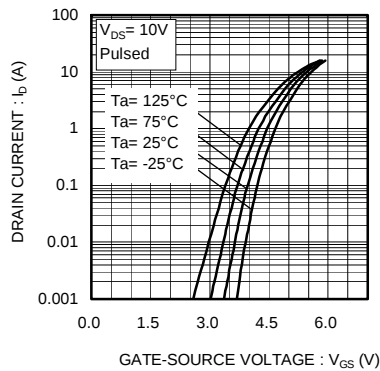


Fig.4 Typical Transfer Characteristics

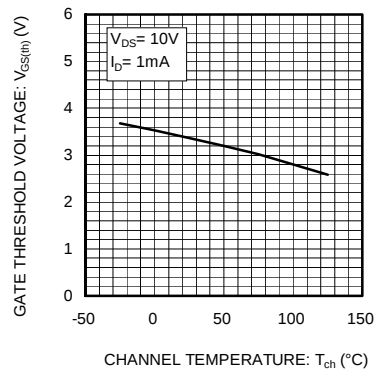


Fig.5 Gate Threshold Voltage vs. Channel Temperature

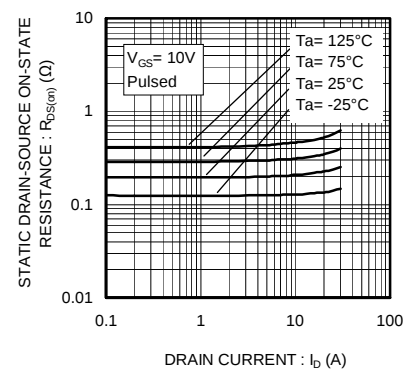


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

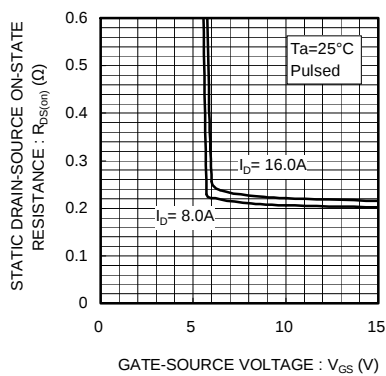


Fig.7 Static Drain-Source On-State Resistance vs. Gate Source Voltage

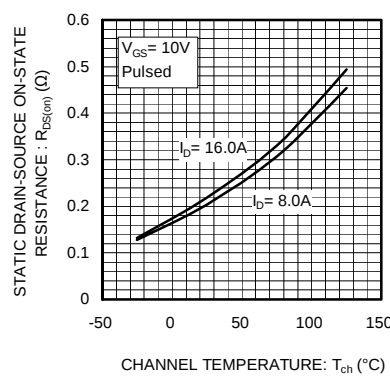


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

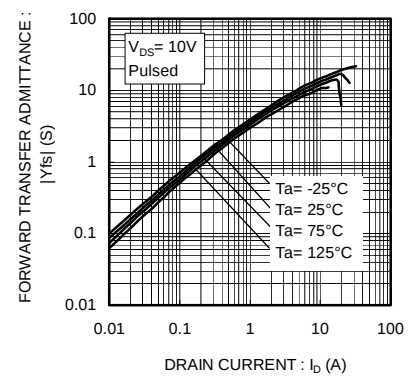


Fig.9 Forward Transfer Admittance vs. Drain Current

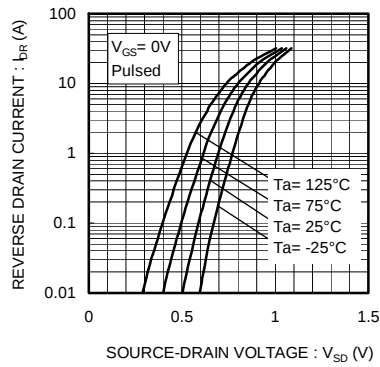


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

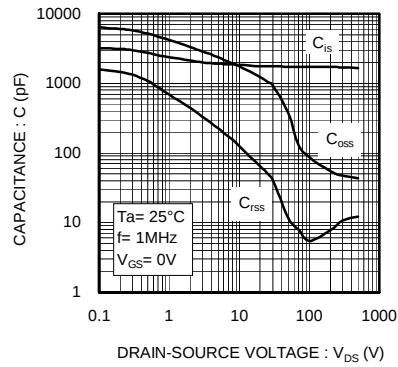


Fig.11 Typical Capacitance vs. Drain-Source Voltage

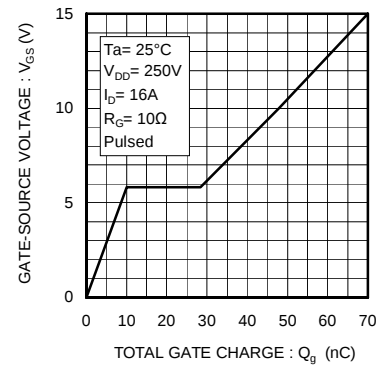


Fig.12 Dynamic Input Characteristics

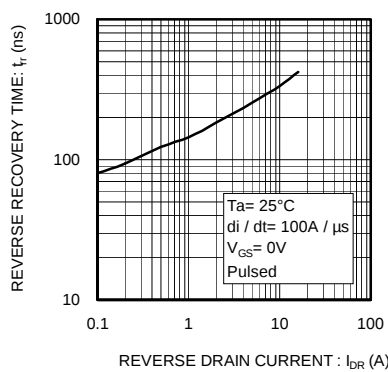


Fig.13 Reverse Recovery Time vs. Reverse Drain Current

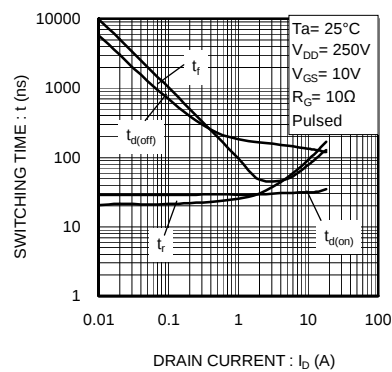


Fig.14 Switching Characteristics

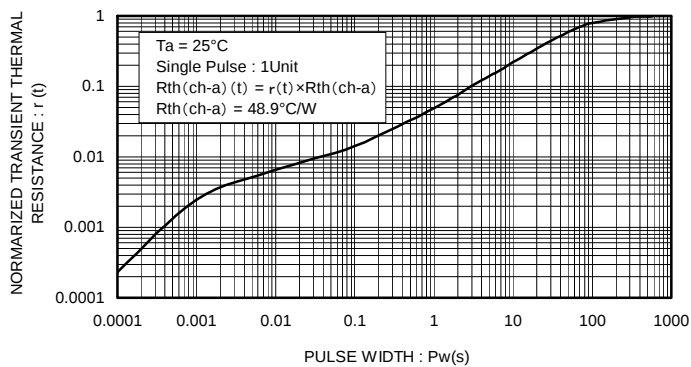


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

# ●Switching characteristics measurement circuit

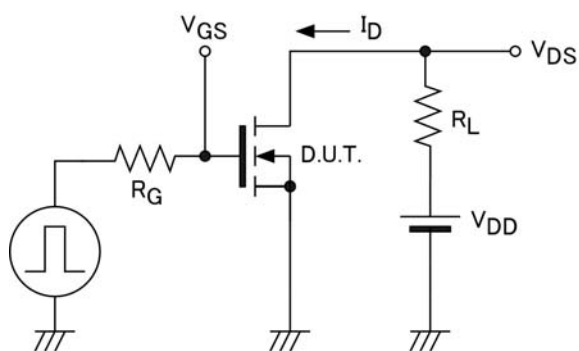


Fig.1 Switching time measurement circuit

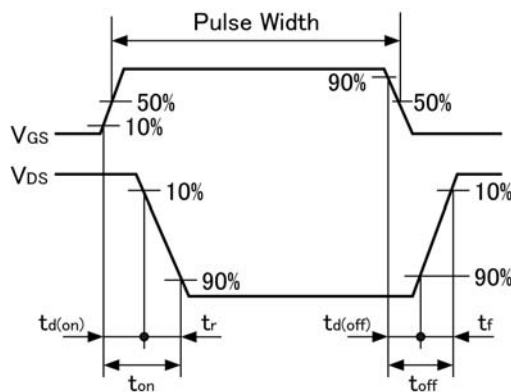


Fig.2 Switching waveforms

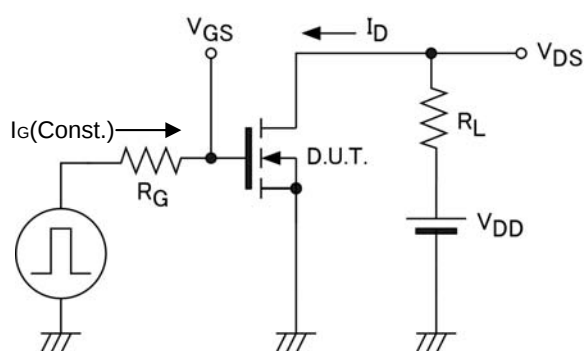


Fig.3 Gate charge measurement circuit

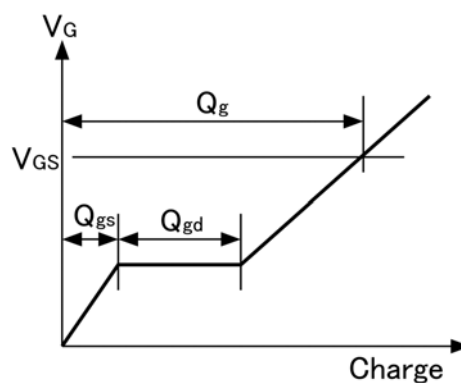


Fig.4 Gate charge waveform

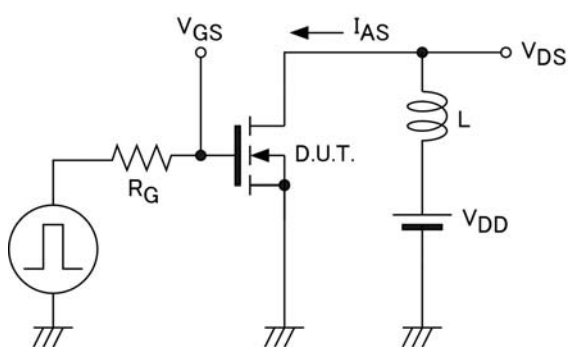


Fig.5 Avalanche measurement circuit

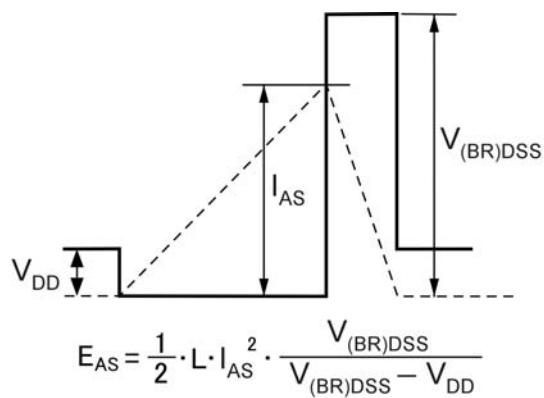


Fig.6 Avalanche waveform

### 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](http://www.rohm.com)

Contact us : [webmaster@rohm.co.jp](mailto:webmaster@rohm.co.jp)

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9