



# FW4604

## Power MOSFET

30V, 6A, 39mΩ, -30V, -4.5A, 65mΩ, Complementary Dual SOIC8

ON Semiconductor®

<http://onsemi.com>

### Features

- On-state resistance Nch :  $R_{DS(on)1}=30m\Omega$ (typ.)  
Pch :  $R_{DS(on)1}=50m\Omega$ (typ.)
- 4.5V drive
- Halogen free compliance
- Nch + Pch MOSFET
- Protection diode in

### Specifications

Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$

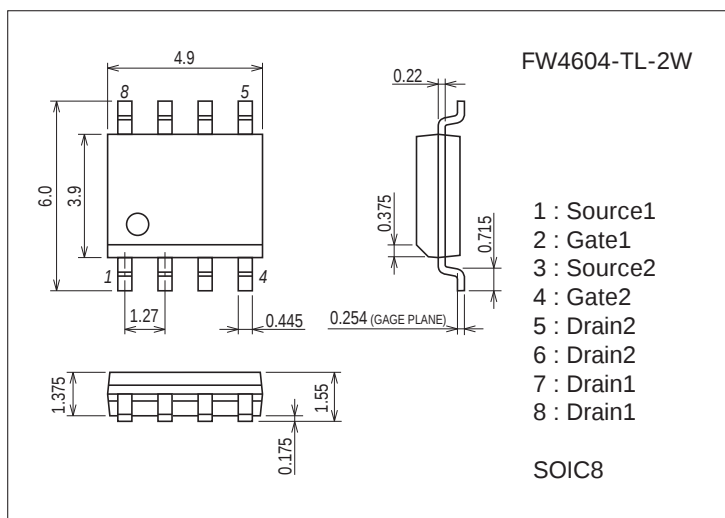
| Parameter                           | Symbol    | Conditions                                                                          | N-channel   | P-channel | Unit             |
|-------------------------------------|-----------|-------------------------------------------------------------------------------------|-------------|-----------|------------------|
| Drain to Source Voltage             | $V_{DSS}$ |                                                                                     | 30          | -30       | V                |
| Gate to Source Voltage              | $V_{GSS}$ |                                                                                     | $\pm 20$    | $\pm 20$  | V                |
| Drain Current (DC)                  | $I_D$     |                                                                                     | 6           | -4.5      | A                |
| Drain Current ( $PW \leq 10s$ )     | $I_{DP}$  | Duty cycle $\leq 1\%$                                                               | 6.5         | -5        | A                |
| Drain Current ( $PW \leq 10\mu s$ ) | $I_{DP}$  | Duty cycle $\leq 1\%$                                                               | 24          | -18       | A                |
| Allowable Power Dissipation         | $P_D$     | When mounted on ceramic substrate (2000mm <sup>2</sup> ×0.8mm) 1unit, $PW \leq 10s$ | 1.8         |           | W                |
| Total Dissipation                   | $P_T$     | When mounted on ceramic substrate (2000mm <sup>2</sup> ×0.8mm), $PW \leq 10s$       | 2.2         |           | W                |
| Channel Temperature                 | $T_{ch}$  |                                                                                     | 150         |           | $^\circ\text{C}$ |
| Storage Temperature                 | $T_{stg}$ |                                                                                     | -55 to +150 |           | $^\circ\text{C}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

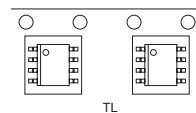
7072-001



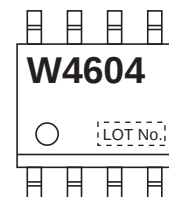
### Product & Package Information

- Package : SOIC8
- JEITA, JEDEC : SC-87, SOT-96
- Minimum Packing Quantity : 2,500 pcs./reel

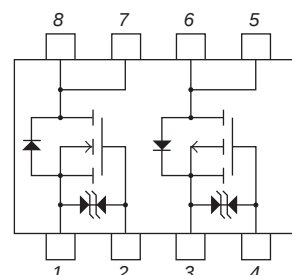
### Packing Type : TL



### Marking



### Electrical Connection

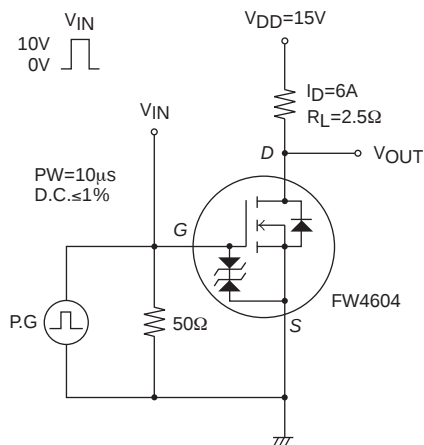


## Electrical Characteristics at Ta=25°C

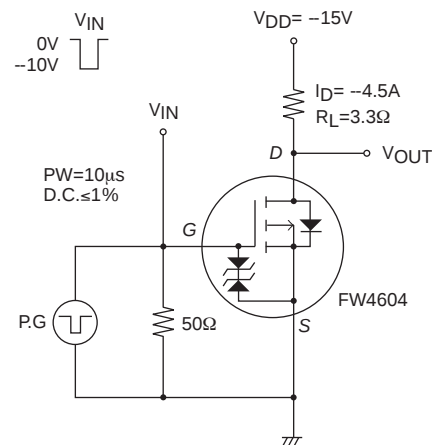
| Parameter                                  | Symbol        | Conditions                            | Ratings |       |          | Unit      |
|--------------------------------------------|---------------|---------------------------------------|---------|-------|----------|-----------|
|                                            |               |                                       | min     | typ   | max      |           |
| [N-channel]                                |               |                                       |         |       |          |           |
| Drain to Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=1mA, V_{GS}=0V$                  | 30      |       |          | V         |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=30V, V_{GS}=0V$               |         |       | 1        | $\mu A$   |
| Gate to Source Leakage Current             | $I_{GSS}$     | $V_{GS}=\pm 16V, V_{DS}=0V$           |         |       | $\pm 10$ | $\mu A$   |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=10V, I_D=1mA$                 | 1.7     |       | 2.6      | V         |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=10V, I_D=6A$                  |         | 3     |          | S         |
| Static Drain to Source On-State Resistance | $R_{DS(on)1}$ | $I_D=6A, V_{GS}=10V$                  |         | 30    | 39       | $m\Omega$ |
|                                            | $R_{DS(on)2}$ | $I_D=3A, V_{GS}=4.5V$                 |         | 50    | 70       | $m\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=10V, f=1MHz$                  |         | 490   |          | pF        |
| Output Capacitance                         | $C_{oss}$     |                                       |         | 85    |          | pF        |
| Reverse Transfer Capacitance               | $C_{rss}$     |                                       |         | 45    |          | pF        |
| Turn-ON Delay Time                         | $t_d(on)$     | See specified Test Circuit.           |         | 8     |          | ns        |
| Rise Time                                  | $t_r$         |                                       |         | 45    |          | ns        |
| Turn-OFF Delay Time                        | $t_d(off)$    |                                       |         | 31    |          | ns        |
| Fall Time                                  | $t_f$         |                                       |         | 28    |          | ns        |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=15V, V_{GS}=10V, I_D=6A$      |         | 9.1   |          | nC        |
| Gate to Source Charge                      | $Q_{gs}$      |                                       |         | 1.7   |          | nC        |
| Gate to Drain “Miller” Charge              | $Q_{gd}$      |                                       |         | 1.7   |          | nC        |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=6A, V_{GS}=0V$                   |         | 0.84  | 1.2      | V         |
| [P-channel]                                |               |                                       |         |       |          |           |
| Drain to Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D=-1mA, V_{GS}=0V$                 | -30     |       |          | V         |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS}=-30V, V_{GS}=0V$              |         |       | -1       | $\mu A$   |
| Gate to Source Leakage Current             | $I_{GSS}$     | $V_{GS}=\pm 16V, V_{DS}=0V$           |         |       | $\pm 10$ | $\mu A$   |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS}=-10V, I_D=-1mA$               | -1.7    |       | -2.6     | V         |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=-10V, I_D=-4.5A$              |         | 5.2   |          | S         |
| Static Drain to Source On-State Resistance | $R_{DS(on)1}$ | $I_D=-4.5A, V_{GS}=-10V$              |         | 50    | 65       | $m\Omega$ |
|                                            | $R_{DS(on)2}$ | $I_D=-2.5A, V_{GS}=-4.5V$             |         | 85    | 119      | $m\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=-10V, f=1MHz$                 |         | 430   |          | pF        |
| Output Capacitance                         | $C_{oss}$     |                                       |         | 105   |          | pF        |
| Reverse Transfer Capacitance               | $C_{rss}$     |                                       |         | 75    |          | pF        |
| Turn-ON Delay Time                         | $t_d(on)$     | See specified Test Circuit.           |         | 7.5   |          | ns        |
| Rise Time                                  | $t_r$         |                                       |         | 42    |          | ns        |
| Turn-OFF Delay Time                        | $t_d(off)$    |                                       |         | 43    |          | ns        |
| Fall Time                                  | $t_f$         |                                       |         | 40    |          | ns        |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=-15V, V_{GS}=-10V, I_D=-4.5A$ |         | 10    |          | nC        |
| Gate to Source Charge                      | $Q_{gs}$      |                                       |         | 2.0   |          | nC        |
| Gate to Drain “Miller” Charge              | $Q_{gd}$      |                                       |         | 2.5   |          | nC        |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=-4.5A, V_{GS}=0V$                |         | -0.86 | -1.5     | V         |

## Switching Time Test Circuit

[N-channel]

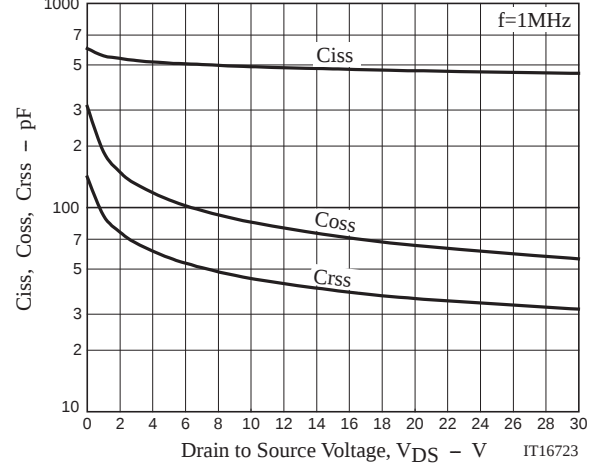
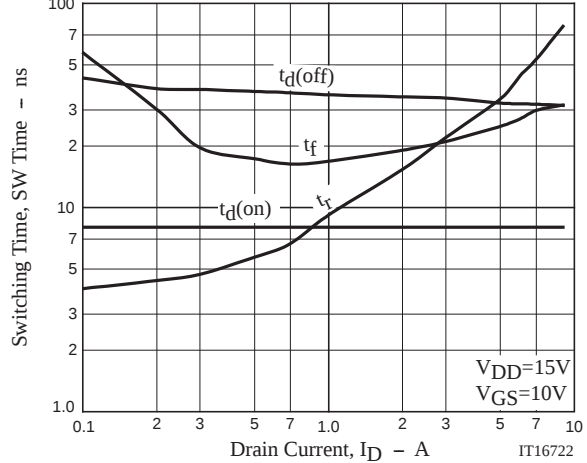
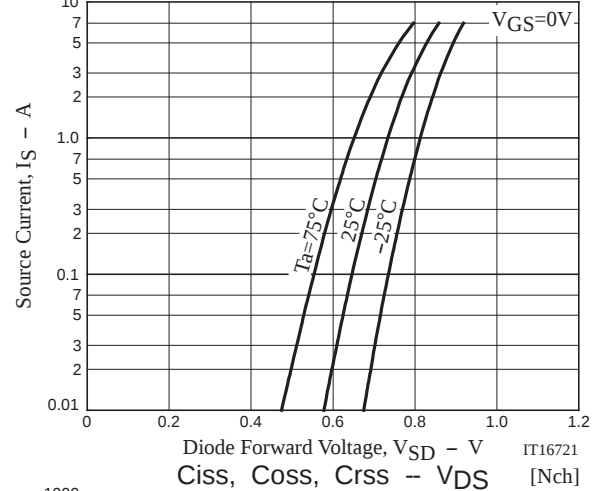
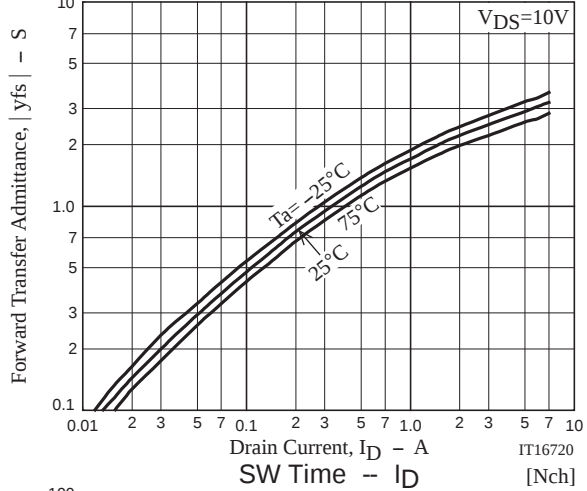
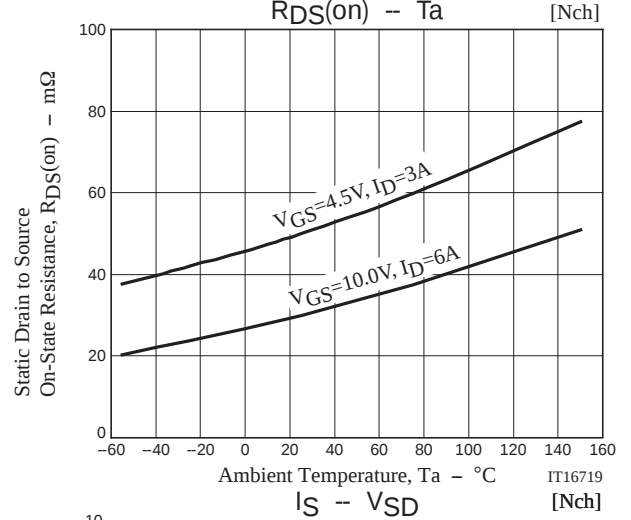
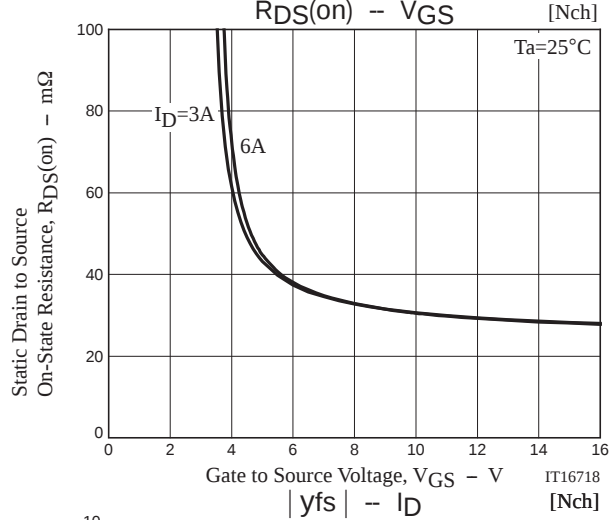
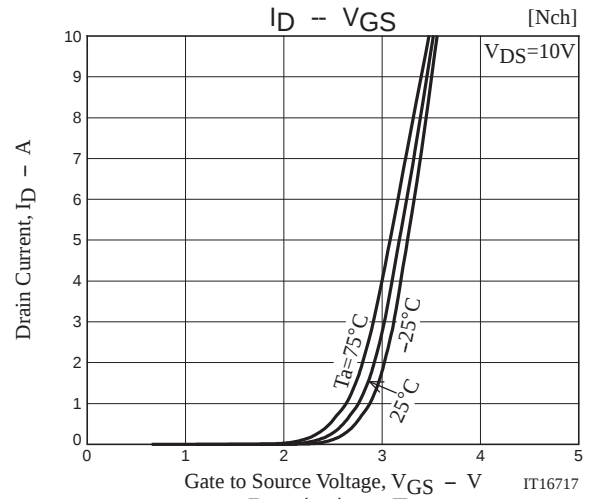
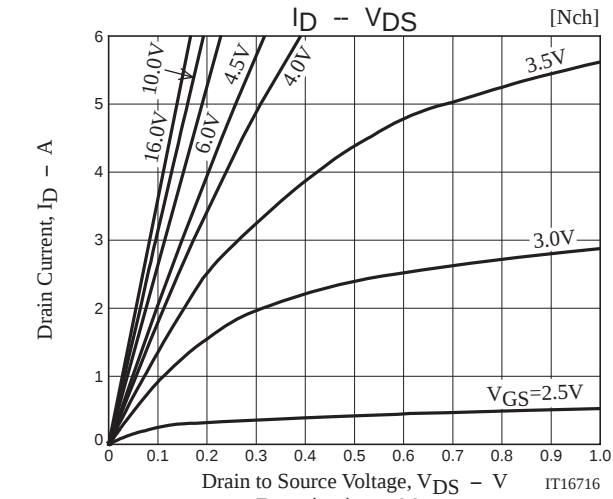


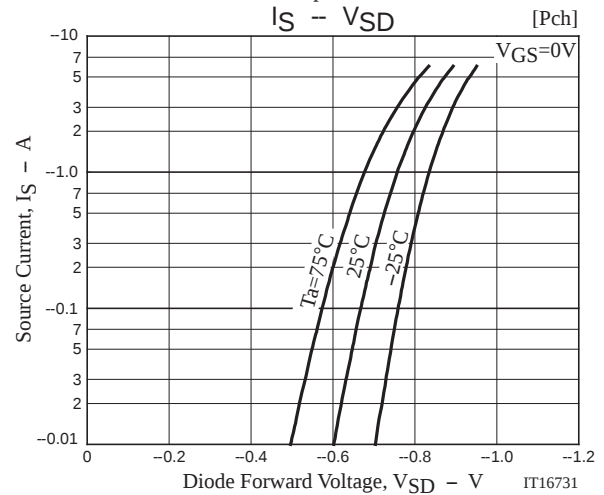
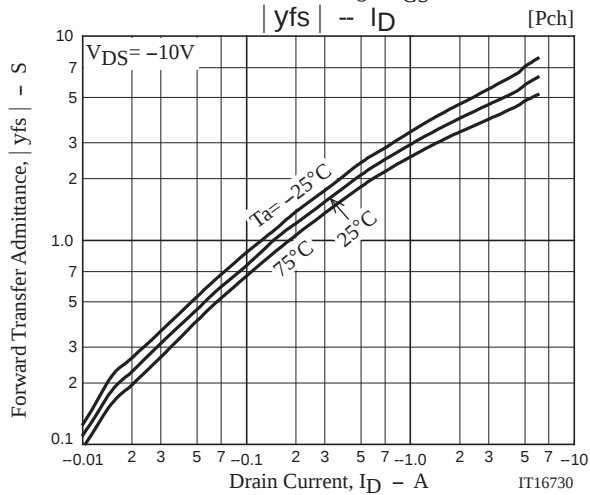
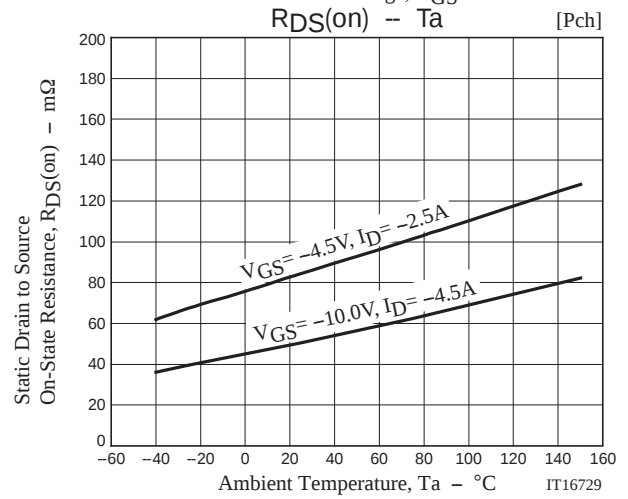
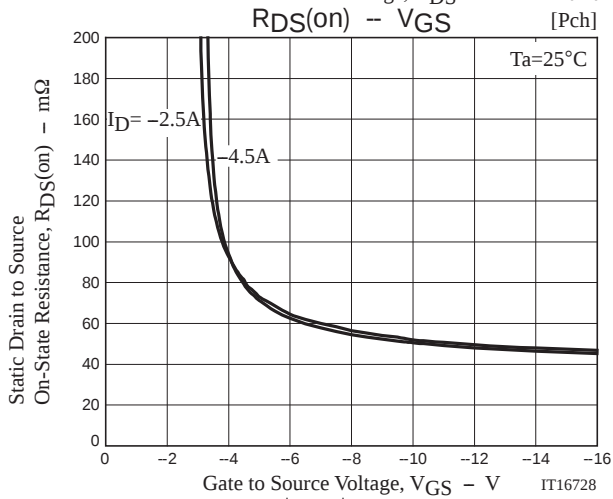
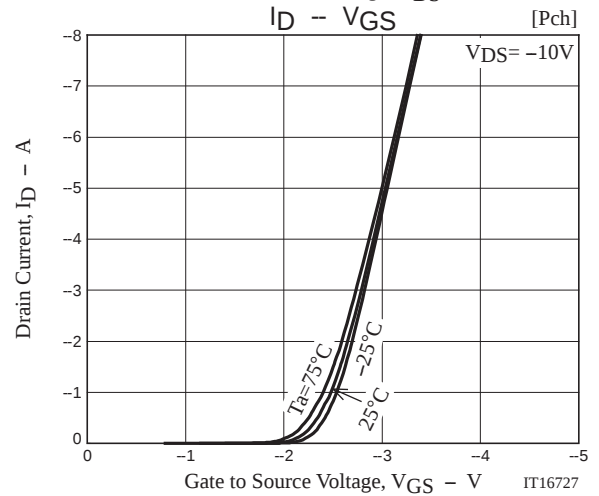
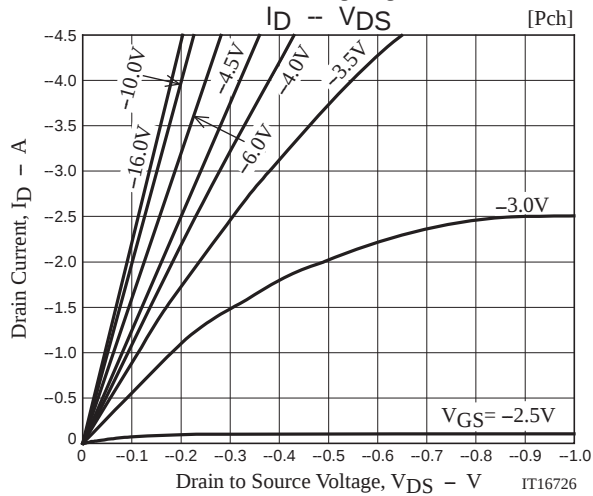
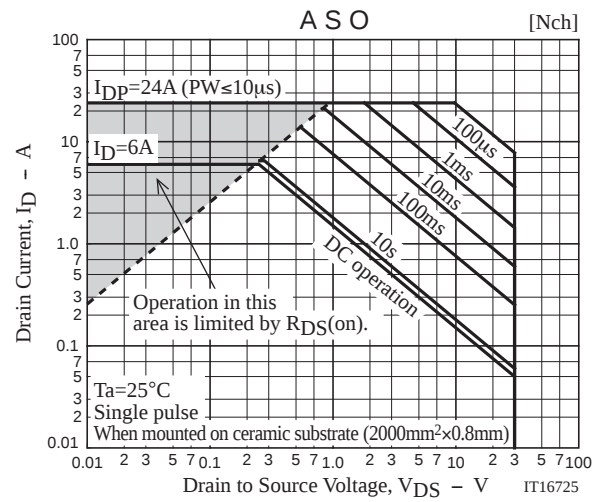
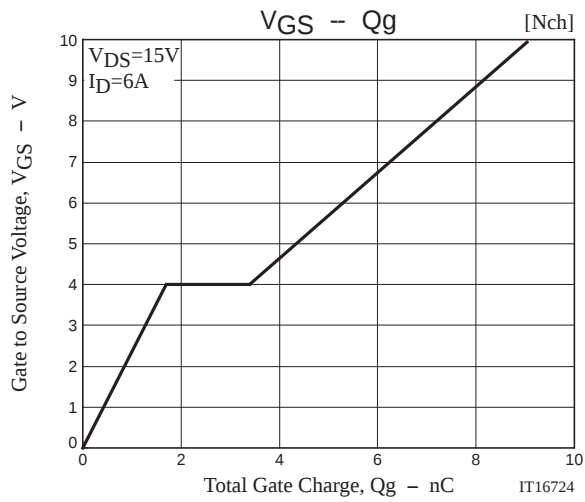
[P-channel]

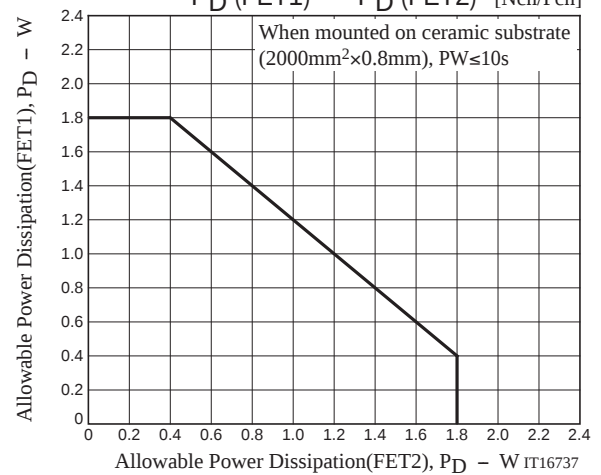
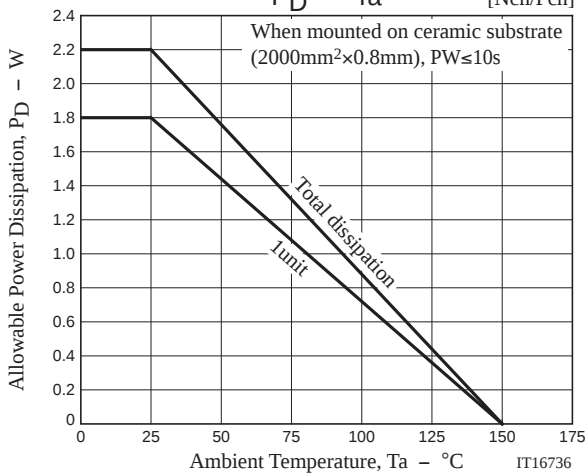
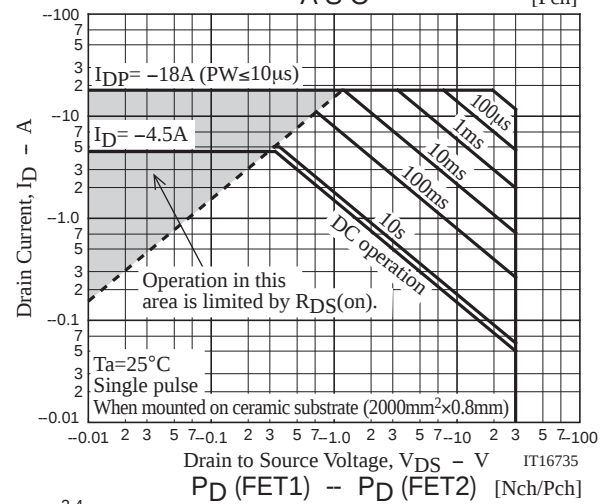
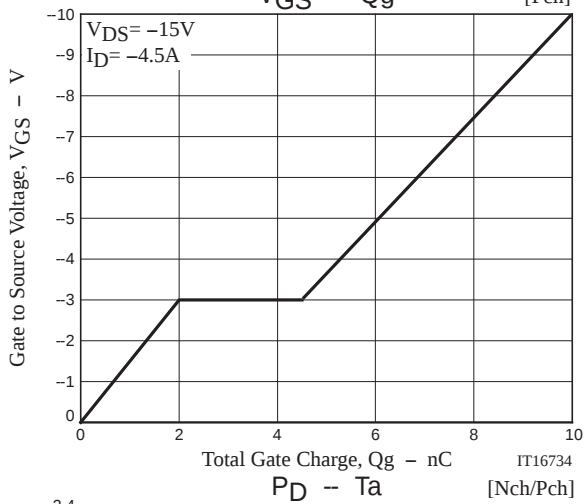
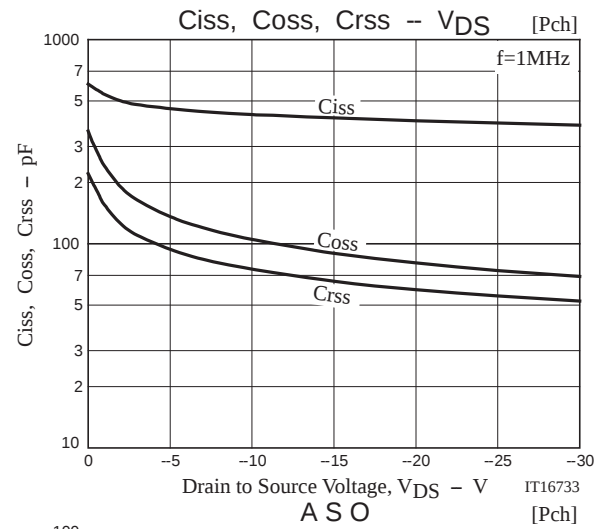
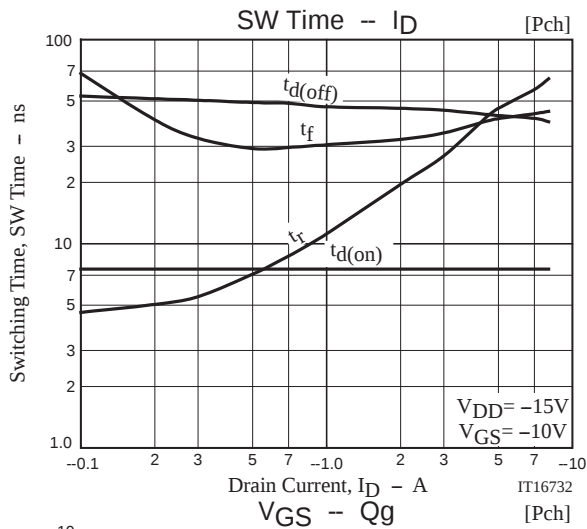


## Ordering Information

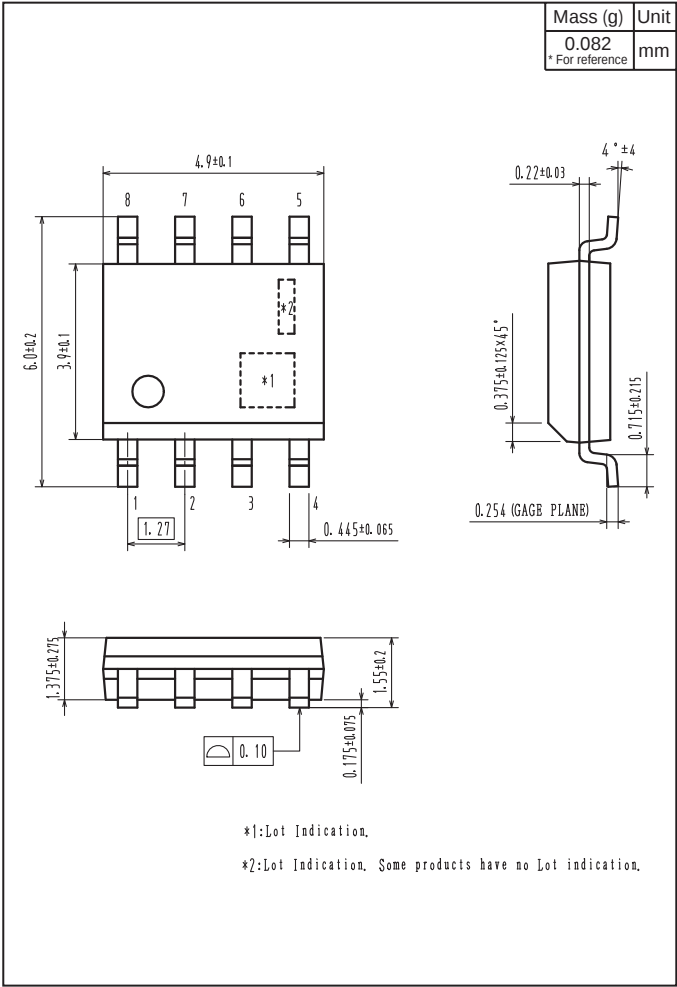
| Device       | Package | Shipping       | memo                     |
|--------------|---------|----------------|--------------------------|
| FW4604-TL-2W | SOIC8   | 2,500pcs./reel | Pb-Free and Halogen Free |



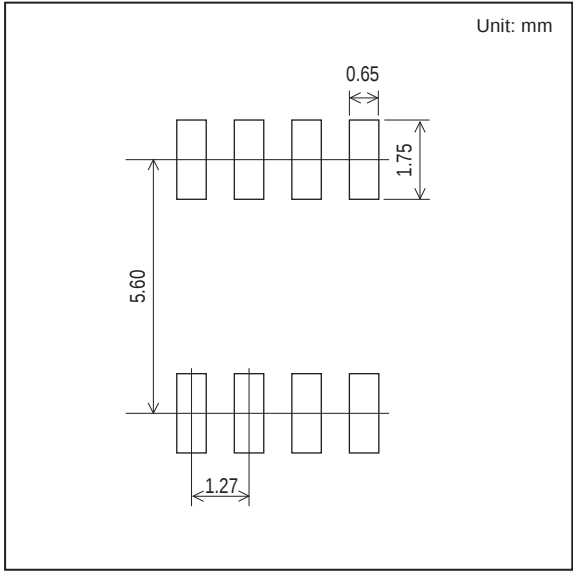




Outline Drawing  
FW4604-TL-2W



Land Pattern Example



Note on usage : Since the FW4604 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

ON Semiconductor and the ON logo are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## 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