

## Is Now Part of



# ON Semiconductor®

# To learn more about ON Semiconductor, please visit our website at www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (\_), the underscore (\_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (\_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at <a href="www.onsemi.com">www.onsemi.com</a>. Please email any questions regarding the system integration to Fairchild <a href="guestions@onsemi.com">guestions@onsemi.com</a>.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor 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. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any EDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officer



## **FDG6308P**

## P-Channel 1.8V Specified PowerTrench® MOSFET

## **General Description**

This P-Channel 1.8V specified MOSFET uses Fairchild's advanced low voltage PowerTrench process. It has been optimized for battery power management applications.

## **Applications**

- · Battery management
- Load switch

#### **Features**

• -0.6 A, -20 V.  $\begin{aligned} R_{DS(ON)} &= 0.40 \ \Omega \ @ \ V_{GS} = -4.5 \ V \\ R_{DS(ON)} &= 0.55 \ \Omega \ @ \ V_{GS} = -2.5 \ V \\ R_{DS(ON)} &= 0.80 \ \Omega \ @ \ V_{GS} = -1.8 \ V \end{aligned}$ 

· Low gate charge

S 1 or 4

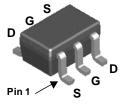
D 3 or 6

- High performance trench technology for extremely low  $R_{\mbox{\scriptsize DS(ON)}}$
- Compact industry standard SC70-6 surface mount package

6 or 3 D

5 or 2 G

4 or 1 S



SC70-6

The pinouts are symmetrical; pin 1 and pin 4 are interchangeable.

Absolute Maximum Ratings T<sub>A</sub>=25°C unless otherwise noted

| Symbol                            | Parameter  |          | Ratings     | Units |
|-----------------------------------|--|----------|-------------|-------|
| V <sub>DSS</sub>                  | Drain-Source Voltage                             |          | -20         | V     |
| V <sub>GSS</sub>                  | Gate-Source Voltage                              |          | ± 8         | V     |
| I <sub>D</sub>                    | Drain Current - Continuous                       | (Note 1) | -0.6        | Α     |
|                                   | - Pulsed   |          | -1.8        |       |
| P <sub>D</sub>                    | Power Dissipation for Single Operation           | (Note 1) | 0.3         | W     |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Junction Temperature Range |          | -55 to +150 | °C    |

### **Thermal Characteristics**

R<sub>BIA</sub> Thermal Resistance, Junction-to-Ambient (Note 1) 415 °C/W

**Package Marking and Ordering Information** 

| Device Marking | Device   | Reel Size | Tape width | Quantity   |
|----------------|----------|-----------|------------|------------|
| .08            | FDG6308P | 7"        | 8mm        | 3000 units |

| Symbol                                 | Parameter   | Test Conditions  | Min  | Тур                          | Max                          | Units |
|--|---|--|------|------------------------------|------------------------------|-------|
| Off Char                               | acteristics                                       |  |      | •                            |                              |       |
| BV <sub>DSS</sub>                      | Drain–Source Breakdown<br>Voltage                 | $V_{GS} = 0 \text{ V}, \qquad I_{D} = -250 \mu\text{A}$  | -20  |                              |                              | V     |
| ΔBV <sub>DSS</sub><br>ΔT <sub>J</sub>  | Breakdown Voltage Temperature Coefficient         | $I_D = -250 \mu\text{A}$ , Referenced to 25°C  |      | -15                          |                              | mV/°C |
| I <sub>DSS</sub>                       | Zero Gate Voltage Drain Current                   | $V_{DS} = -16 \text{ V},  V_{GS} = 0 \text{ V}$  |      |                              | -1                           | μΑ    |
| I <sub>GSSF</sub>                      | Gate-Body Leakage, Forward                        | $V_{GS} = -8 \text{ V},  V_{DS} = 0 \text{ V}$   |      |                              | -100                         | nA    |
| I <sub>GSSR</sub>                      | Gate-Body Leakage, Reverse                        | $V_{GS} = 8 \text{ V}, \qquad V_{DS} = 0 \text{ V}$  |      |                              | 100                          | nA    |
| On Char                                | acteristics (Note 2)                              |  |      |                              |                              |       |
| $V_{GS(th)}$                           | Gate Threshold Voltage                            | $V_{DS} = V_{GS}$ , $I_D = -250 \mu A$   | -0.4 | -0.9                         | -1.5                         | V     |
| $\frac{\Delta V_{GS(th)}}{\Delta T_J}$ | Gate Threshold Voltage<br>Temperature Coefficient | $I_D = -250 \mu\text{A}$ , Referenced to 25°C  |      | 2                            |                              | mV/°C |
| R <sub>DS(on)</sub>                    | Static Drain–Source<br>On–Resistance              | $\begin{split} &V_{GS} = -4.5 \text{ V}, \ I_D = -0.6 \text{ A} \\ &V_{GS} = -2.5 \text{ V}, \ I_D = -0.5 \text{ A} \\ &V_{GS} = -1.8 \text{ V}, \ I_D = -0.4 \text{ A} \\ &V_{GS} = -4.5 \text{ V}, \ I_D = -0.6 \text{ A}, \ T_J = 125 ^{\circ}\text{C} \end{split}$ |      | 0.27<br>0.36<br>0.55<br>0.35 | 0.40<br>0.55<br>0.80<br>0.56 | Ω     |
| I <sub>D(on)</sub>                     | On-State Drain Current                            | $V_{GS} = -4.5 \text{ V}, \ V_{DS} = -5 \text{ V}$   | -2   |                              |                              | Α     |
| <b>G</b> FS                            | Forward Transconductance                          | $V_{DS} = -5 \text{ V},  I_{D} = -0.6 \text{ A}$   |      | 2.1                          |                              | S     |
| Dynamic                                | Characteristics                                   |  |      |                              |                              |       |
| C <sub>iss</sub>                       | Input Capacitance                                 | $V_{DS} = -10 \text{ V},  V_{GS} = 0 \text{ V},$   |      | 153                          |                              | pF    |
| Coss                                   | Output Capacitance                                | f = 1.0 MHz  |      | 25                           |                              | pF    |
| C <sub>rss</sub>                       | Reverse Transfer Capacitance                      |  |      | 9                            |                              | pF    |
| Switchin                               | g Characteristics (Note 2)                        |  |      |                              |                              |       |
| t <sub>d(on)</sub>                     | Turn-On Delay Time                                | $V_{DD} = -10 \text{ V},  I_D = 1 \text{ A},$  |      | 5                            | 10                           | ns    |
| t <sub>r</sub>                         | Turn-On Rise Time                                 | $V_{GS} = -4.5 \text{ V}, R_{GEN} = 6 \Omega$  |      | 15                           | 27                           | ns    |
| t <sub>d(off)</sub>                    | Turn-Off Delay Time                               |  |      | 7                            | 14                           | ns    |
| t <sub>f</sub>                         | Turn-Off Fall Time                                |  |      | 1.6                          | 3.2                          | ns    |
| Qg                                     | Total Gate Charge                                 | $V_{DS} = -10 \text{ V}, I_{D} = -0.6 \text{ A},$  |      | 1.8                          | 2.5                          | nC    |
| Q <sub>gs</sub>                        | Gate-Source Charge                                | $V_{GS} = -4.5 \text{ V}$  |      | 0.3                          |                              | nC    |
| $Q_{gd}$                               | Gate-Drain Charge                                 |  |      | 0.4                          |                              | nC    |
| Drain-So                               | ource Diode Characteristics                       | s and Maximum Ratings  |      |                              |                              |       |
| Is                                     | Maximum Continuous Drain-Sour                     |  |      |                              | -0.25                        | Α     |
| V <sub>SD</sub>                        | Drain–Source Diode Forward<br>Voltage             | $V_{GS} = 0 \text{ V}, \qquad I_{S} = -0.25 \text{ A}(\text{Note 2})$  |      | -0.77                        | -1.2                         | V     |

#### Notes

<sup>1.</sup>  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design while  $R_{\theta JA}$  is determined by the user's board design.  $R_{\theta JA} = 415^{\circ}$ C/W when mounted on a minimum pad .

**<sup>2.</sup>** Pulse Test: Pulse Width <  $300\mu$ s, Duty Cycle < 2.0%

## **Typical Characteristics**

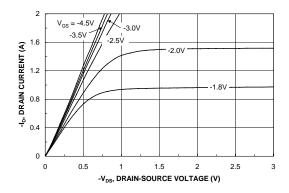


Figure 1. On-Region Characteristics.

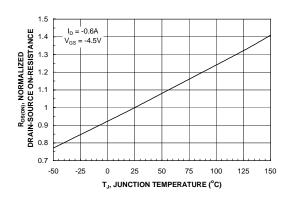


Figure 3. On-Resistance Variation with Temperature.

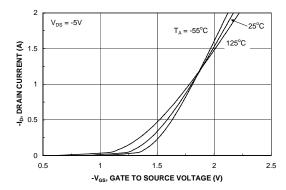


Figure 5. Transfer Characteristics.

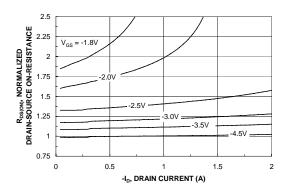


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

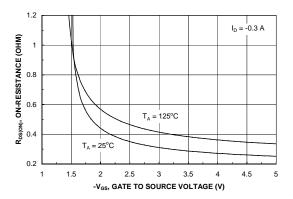


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

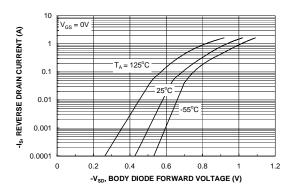
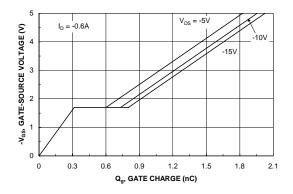


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

## **Typical Characteristics**



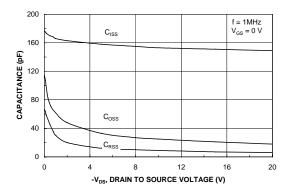


Figure 7. Gate Charge Characteristics.

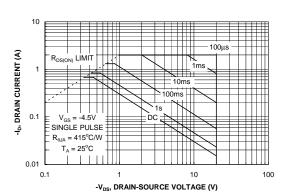


Figure 8. Capacitance Characteristics.

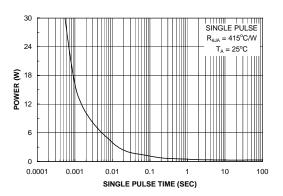


Figure 9. Maximum Safe Operating Area.



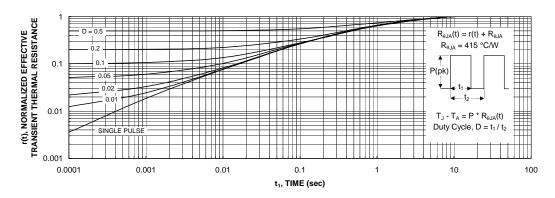


Figure 11. Transient Thermal Response Curve.

Thermal characterization performed using the conditions described in Note 1. Transient thermal response will change depending on the circuit board design.

ON Semiconductor and in are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at <a href="www.onsemi.com/site/pdt/Patent-Marking.pdf">www.onsemi.com/site/pdt/Patent-Marking.pdf</a>. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor 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. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and exp

### **PUBLICATION ORDERING INFORMATION**

#### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor 19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada Email: orderlit@onsemi.com N. American Technical Support: 800–282–9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support: Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81–3–5817–1050

ON Semiconductor Website: www.onsemi.com

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

# **Mouser Electronics**

**Authorized Distributor** 

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

**ON Semiconductor:** 

FDG6308P

## **ПОСТАВКА** ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

многоканальный

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001 Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

# 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

Skype отдела продаж:

moschip.ru moschip.ru\_6 moschip.ru 4 moschip.ru 9