



## General Description

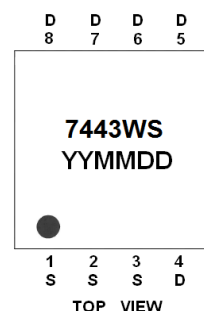
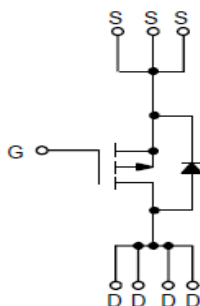
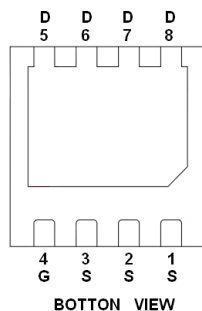
AFP7443WS, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

## Features

- $I_D = -12A, R_{DS(ON)} = 13m\Omega @ V_{GS} = -10V$
- $I_D = -10A, R_{DS(ON)} = 17m\Omega @ V_{GS} = -4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3X3-8L package design

## Pin Description ( DFN3X3-8L )



## Application

- DC-DC Converter
- POL

## Pin Define

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | S      | Source      |
| 2   | S      | Source      |
| 3   | S      | Source      |
| 4   | G      | Gate        |
| 5   | D      | Drain       |
| 6   | D      | Drain       |
| 7   | D      | Drain       |
| 8   | D      | Drain       |

## Ordering Information

| Part Ordering No. | Part Marking | Package   | Unit        | Quantity |
|-------------------|--------------|-----------|-------------|----------|
| AFP7443WSFN338RG  | 7443WS       | DFN3X3-8L | Tape & Reel | 5000 EA  |

※ YY year code

※ MM month code

※ DD date code

※ AFP7443WSFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



**Absolute Maximum Ratings**

(T<sub>A</sub>=25°C Unless otherwise noted)

| Parameter                                       | Symbol           | Value                | Unit |
|-------------------------------------------------|------------------|----------------------|------|
| Drain-Source Voltage                            | V <sub>DSS</sub> | -40                  | V    |
| Gate –Source Voltage                            | V <sub>GSS</sub> | ±20                  | V    |
| Continuous Drain Current(T <sub>J</sub> =150°C) | I <sub>D</sub>   | T <sub>A</sub> =25°C | -12  |
|                                                 |                  | T <sub>A</sub> =70°C | -10  |
| Pulsed Drain Current                            | I <sub>DM</sub>  | -60                  | A    |
| Continuous Source Current(Diode Conduction)     | I <sub>S</sub>   | -3                   | A    |
| Power Dissipation                               | P <sub>D</sub>   | T <sub>C</sub> =25°C | 28   |
|                                                 |                  | T <sub>C</sub> =70°C | 15   |
|                                                 |                  | T <sub>A</sub> =25°C | 3.2  |
|                                                 |                  | T <sub>A</sub> =70°C | 2.0  |
| Operating Junction Temperature                  | T <sub>J</sub>   | 150                  | °C   |
| Storage Temperature Range                       | T <sub>STG</sub> | -55/150              | °C   |
| Thermal Resistance Junction-to-Case (Drain)     | R <sub>θJC</sub> | 5                    | °C/W |
| Thermal Resistance-Junction to Ambient          | R <sub>θJA</sub> | 40                   |      |

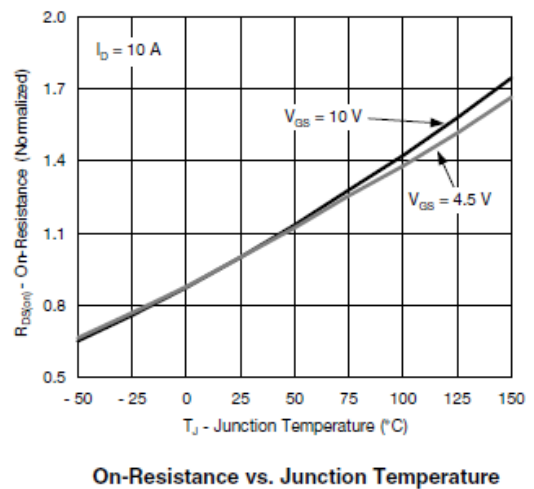
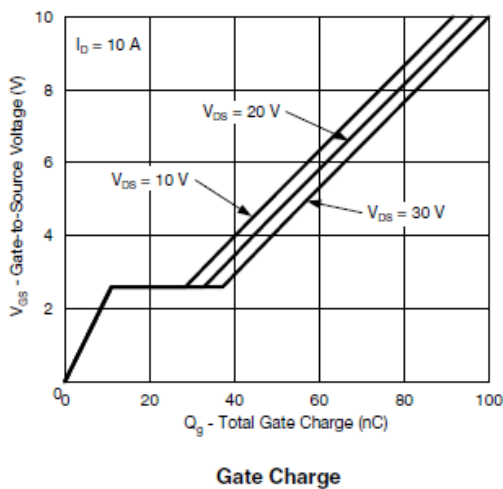
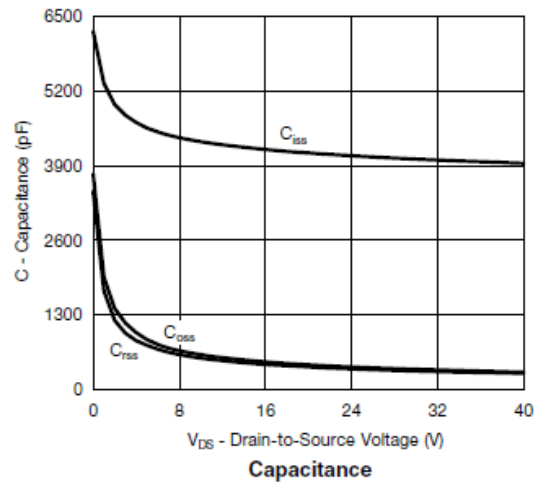
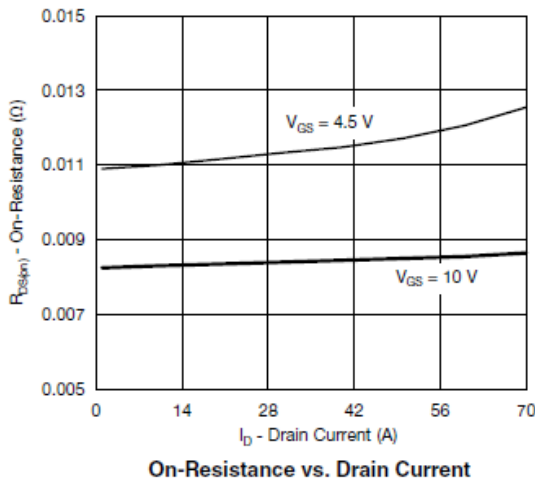
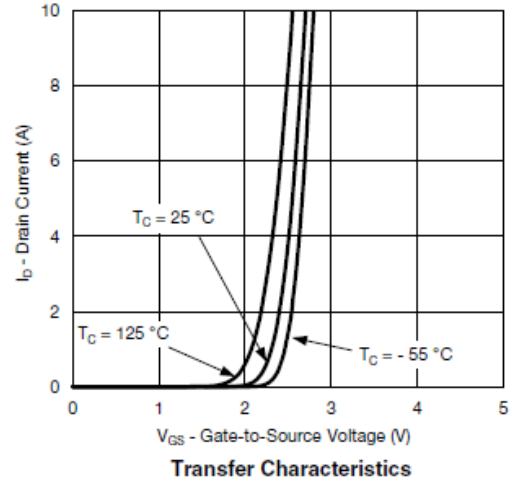
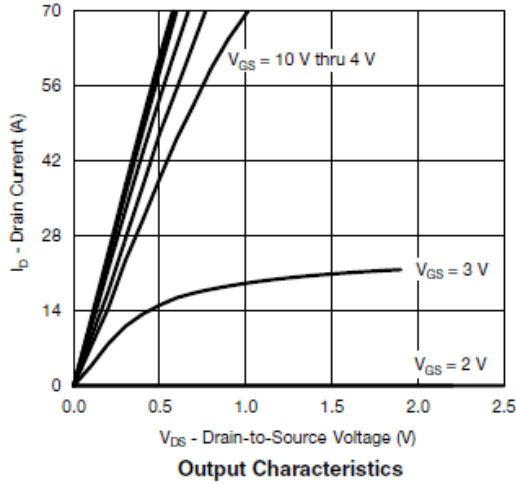
**Electrical Characteristics**

(T<sub>A</sub>=25°C Unless otherwise noted)

| Parameter                       | Symbol               | Conditions                                                                                                      | Min. | Typ  | Max. | Unit |
|---------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------|------|------|------|------|
| <b>Static</b>                   |                      |                                                                                                                 |      |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> = -250uA                                                                    | -40  |      |      | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = -250uA                                                      | -1.0 |      | -2.0 |      |
| Gate Leakage Current            | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V                                                                     |      |      | ±100 | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> = -32V, V <sub>GS</sub> =0V                                                                     |      |      | -1   | uA   |
|                                 |                      | V <sub>DS</sub> = -32V, V <sub>GS</sub> =0V<br>T <sub>J</sub> =85°C                                             |      |      | -20  |      |
| On-State Drain Current          | I <sub>D(on)</sub>   | V <sub>DS</sub> ≥ -10V, V <sub>GS</sub> = -10V                                                                  | -25  |      |      | A    |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub>  | V <sub>GS</sub> = -10V, I <sub>D</sub> = -12A                                                                   |      | 10   | 13   | mΩ   |
|                                 |                      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A                                                                  |      | 14   | 17   |      |
| Forward Transconductance        | g <sub>FS</sub>      | V <sub>DS</sub> = -10V, I <sub>D</sub> = -12A                                                                   |      | 40   |      | S    |
| Diode Forward Voltage           | V <sub>SD</sub>      | I <sub>S</sub> = -1A, V <sub>GS</sub> =0V                                                                       |      | -0.8 | -1.3 | V    |
| <b>Dynamic</b>                  |                      |                                                                                                                 |      |      |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =-20V, V <sub>GS</sub> =-4.5V<br>I <sub>D</sub> = -10A                                          |      | 45   | 90   | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      |                                                                                                                 |      | 10   |      |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      |                                                                                                                 |      | 20   |      |      |
| Input Capacitance               | C <sub>iss</sub>     | V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V<br>f=1MHz                                                            |      | 4150 |      | pF   |
| Output Capacitance              | C <sub>oss</sub>     |                                                                                                                 |      | 435  |      |      |
| Reverse Transfer Capacitance    | C <sub>rss</sub>     |                                                                                                                 |      | 400  |      |      |
| Turn-On Time                    | t <sub>d(on)</sub>   | V <sub>DD</sub> =-20V, R <sub>L</sub> =2Ω<br>I <sub>D</sub> =-10A, V <sub>GEN</sub> =-10V<br>R <sub>G</sub> =1Ω |      | 15   | 30   | ns   |
|                                 | t <sub>r</sub>       |                                                                                                                 |      | 15   | 30   |      |
| Turn-Off Time                   | t <sub>d(off)</sub>  |                                                                                                                 |      | 55   | 110  |      |
|                                 | t <sub>f</sub>       |                                                                                                                 |      | 12   | 25   |      |

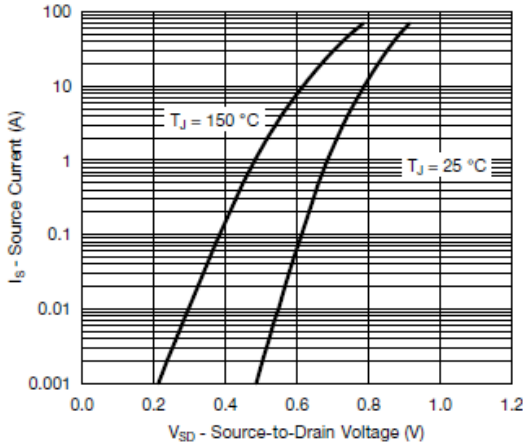


## Typical Characteristics

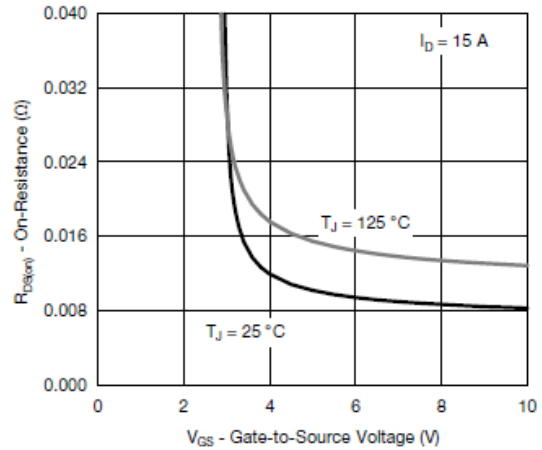




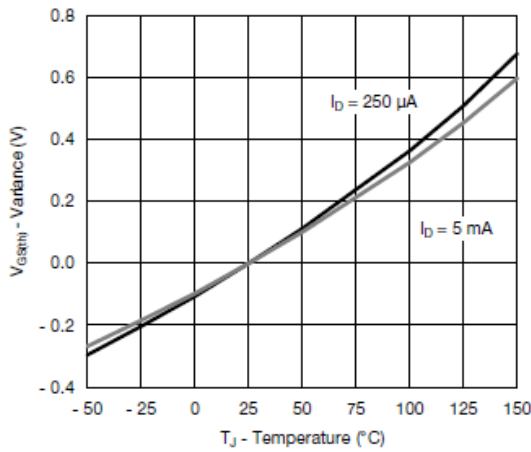
## Typical Characteristics



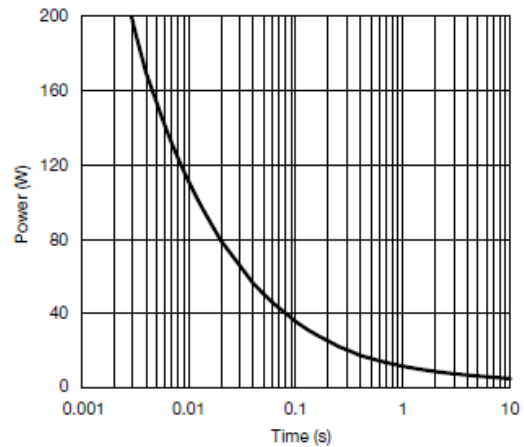
Source-Drain Diode Forward Voltage



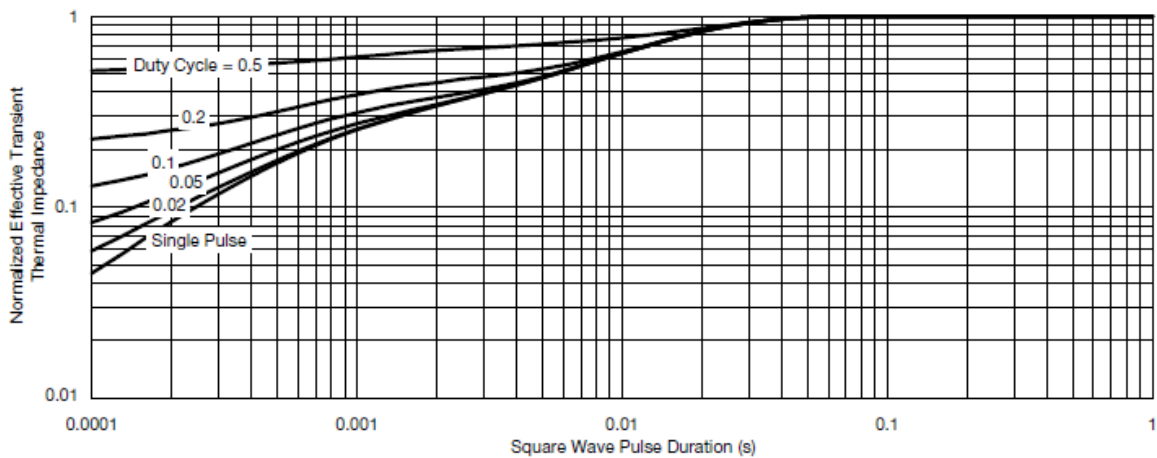
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case



**Typical Characteristics**

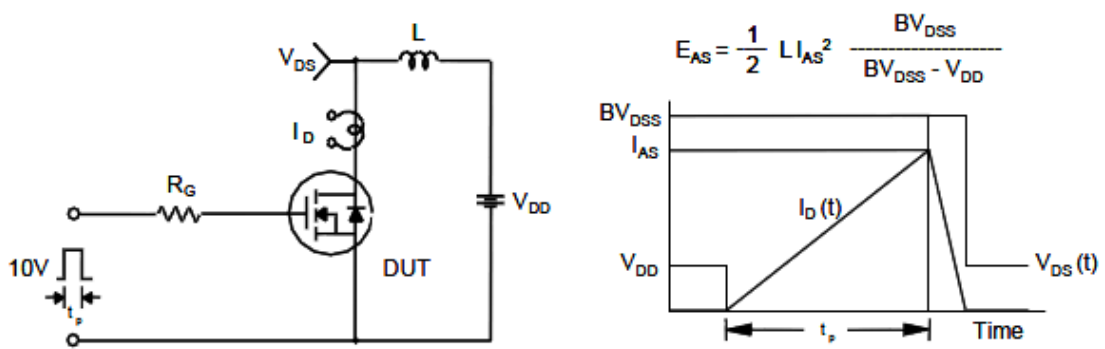
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

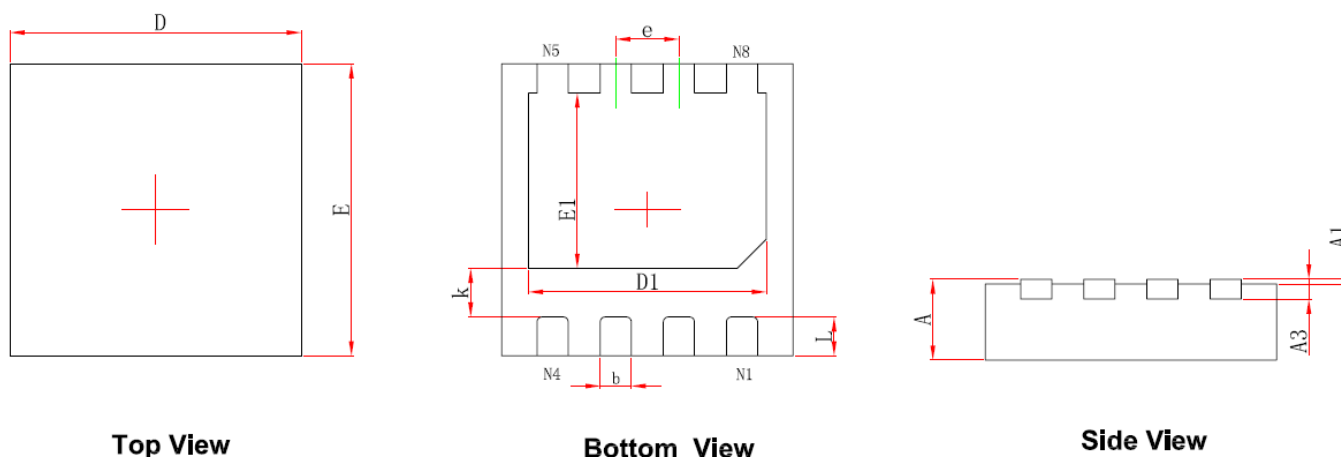


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( DFN3X3-8L )**



**Top View**

**Bottom View**

**Side View**

| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.800                     | 0.900 | 0.031                | 0.035 |
| A1     | 0.000                     | 0.050 | 0.000                | 0.002 |
| A3     | 0.203REF.                 |       | 0.008REF.            |       |
| D      | 2.924                     | 3.076 | 0.115                | 0.121 |
| E      | 2.924                     | 3.076 | 0.115                | 0.121 |
| D1     | 2.350                     | 2.550 | 0.093                | 0.100 |
| E1     | 1.700                     | 1.900 | 0.067                | 0.075 |
| k      | 0.450                     | 0.550 | 0.018                | 0.022 |
| b      | 0.270                     | 0.370 | 0.011                | 0.015 |
| e      | 0.650TYP.                 |       | 0.026TYP.            |       |
| L      | 0.324                     | 0.476 | 0.013                | 0.019 |

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