



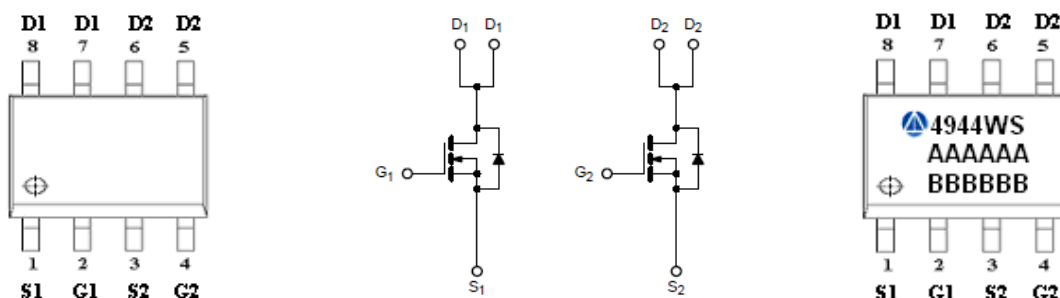
### General Description

AFN4944WS, N-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, and low in-line power loss are needed in commercial industrial surface mount applications.

### Features

- 30V/12A,  $R_{DS(ON)}=14m\Omega@V_{GS}=10V$
- 30V/10A,  $R_{DS(ON)}=17m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- SOP-8P package design

### Pin Description ( SOP-8P )



### Application

- Low Current DC/DC Conversion
- Load Switch
- CCFL Inverter
- Power Management in Notebook Computer

### Pin Define

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | S1     | Source 1    |
| 2   | G1     | Gate 1      |
| 3   | S2     | Source 2    |
| 4   | G2     | Gate 2      |
| 5   | D2     | Drain 2     |
| 6   | D2     | Drain 2     |
| 7   | D1     | Drain 1     |
| 8   | D1     | Drain 1     |

### Ordering Information

| Part Ordering No. | Part Marking | Package | Unit        | Quantity |
|-------------------|--------------|---------|-------------|----------|
| AFN4944WSS8RG     | 4944WS       | SOP-8P  | Tape & Reel | 2500 EA  |

- ※ A Lot code
- ※ B Date code
- ※ AFN4944WSS8RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



### Absolute Maximum Ratings

( $T_A=25^\circ\text{C}$  Unless otherwise noted)

| Parameter   | Symbol          | Value                  | Unit               |
|---|-----------------|------------------------|--------------------|
| Drain-Source Voltage                                | $V_{DS}$        | 30                     | V                  |
| Gate-Source Voltage                                 | $V_{GS}$        | $\pm 20$               | V                  |
| Continuous Drain Current( $T_J=150^\circ\text{C}$ ) | $I_D$           | $T_A=25^\circ\text{C}$ | 12                 |
|   |                 | $T_A=70^\circ\text{C}$ | 9                  |
| Pulsed Drain Current                                | $I_{DM}$        | 30                     | A                  |
| Continuous Source Current(Diode Conduction)         | $I_S$           | 1.5                    | A                  |
| Power Dissipation                                   | $P_D$           | $T_A=25^\circ\text{C}$ | 2.8                |
|   |                 | $T_A=70^\circ\text{C}$ | 1.8                |
| Operating Junction Temperature                      | $T_J$           | 150                    | $^\circ\text{C}$   |
| Storage Temperature Range                           | $T_{STG}$       | -55/150                | $^\circ\text{C}$   |
| Thermal Resistance-Junction to Ambient              | $R_{\theta JA}$ | 62.5                   | $^\circ\text{C/W}$ |

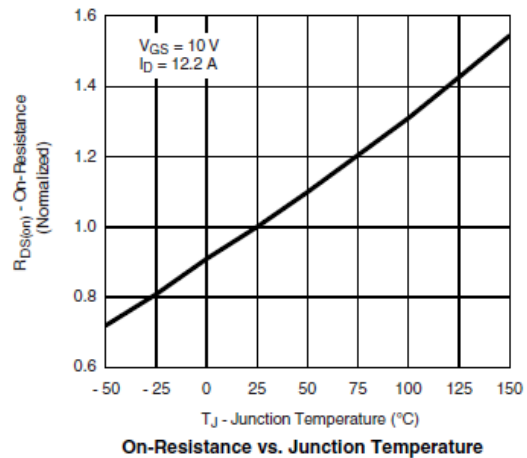
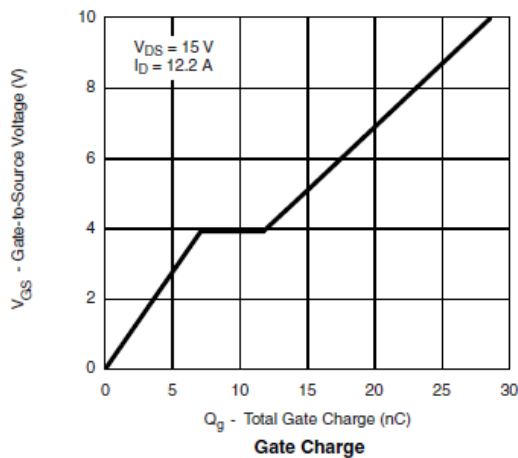
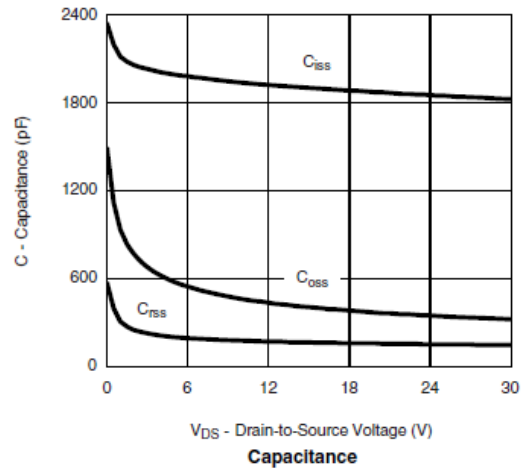
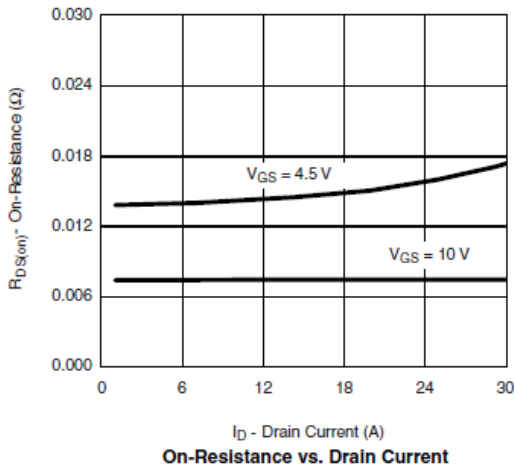
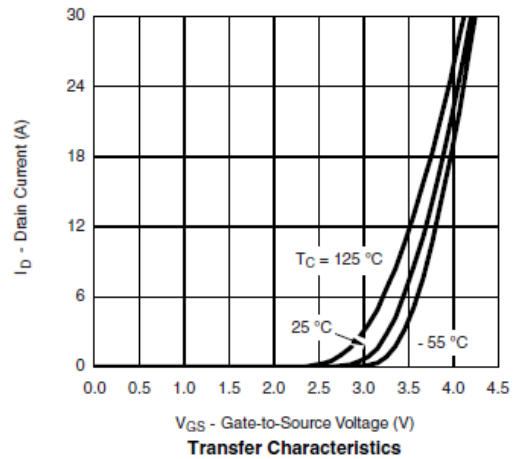
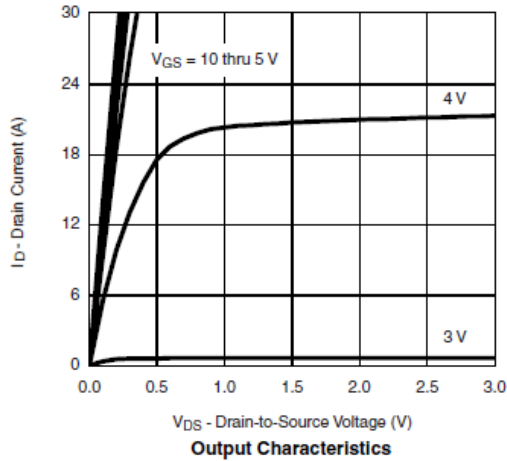
### Electrical Characteristics

( $T_A=25^\circ\text{C}$  Unless otherwise noted)

| Parameter                       | Symbol       | Conditions  | Min. | Typ  | Max.      | Unit       |
|---------------------------------|--------------|---|------|------|-----------|------------|
| <b>Static</b>                   |              |   |      |      |           |            |
| Drain-Source Breakdown Voltage  | $V_{(BR)DS}$ | $V_{GS}=0V, I_D=250\mu\text{A}$   | 30   |      |           | V          |
| Gate Threshold Voltage          | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$   | 1.0  |      | 2.0       |            |
| Gate Leakage Current            | $I_{GSS}$    | $V_{DS}=0V, V_{GS}=\pm 20V$   |      |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current | $I_{DSS}$    | $V_{DS}=24V, V_{GS}=0V$   |      |      | 1         | uA         |
|                                 |              | $V_{DS}=24V, V_{GS}=0V$<br>$T_J=85^\circ\text{C}$                           |      |      | 10        |            |
| On-State Drain Current          | $I_{D(on)}$  | $V_{DS} \geq 5V, V_{GS}=10V$  | 30   |      |           | A          |
| Drain-Source On-Resistance      | $R_{DS(on)}$ | $V_{GS}=10V, I_D=12A$   |      | 12   | 14        | m $\Omega$ |
|                                 |              | $V_{GS}=4.5V, I_D=10A$  |      | 15   | 17        |            |
| Forward Transconductance        | $g_{FS}$     | $V_{DS}=10V, I_D=12A$   |      | 32   |           | S          |
| Diode Forward Voltage           | $V_{SD}$     | $I_S=12A, V_{GS}=0V$  |      | 0.8  | 1.3       | V          |
| <b>Dynamic</b>                  |              |   |      |      |           |            |
| Total Gate Charge               | $Q_g$        | $V_{DS}=15V, V_{GS}=10V$<br>$I_D \equiv 11A$                                |      | 18   | 35        | nC         |
| Gate-Source Charge              | $Q_{gs}$     |   |      | 6    |           |            |
| Gate-Drain Charge               | $Q_{gd}$     |   |      | 4    |           |            |
| Input Capacitance               | $C_{iss}$    | $V_{DS}=15V, V_{GS}=0V$<br>$f=1\text{MHz}$                                  |      | 1080 |           | pF         |
| Output Capacitance              | $C_{oss}$    |   |      | 180  |           |            |
| Reverse Transfer Capacitance    | $C_{rss}$    |   |      | 100  |           |            |
| Turn-On Time                    | $t_{d(on)}$  | $V_{DD}=15V, R_L=15\Omega$<br>$I_D \equiv 1A, V_{GEN}=10V$<br>$R_G=6\Omega$ |      | 10   | 20        | ns         |
|                                 | $t_r$        |   |      | 10   | 20        |            |
| Turn-Off Time                   | $t_{d(off)}$ |   |      | 40   | 70        |            |
|                                 | $t_f$        |   |      | 12   | 25        |            |

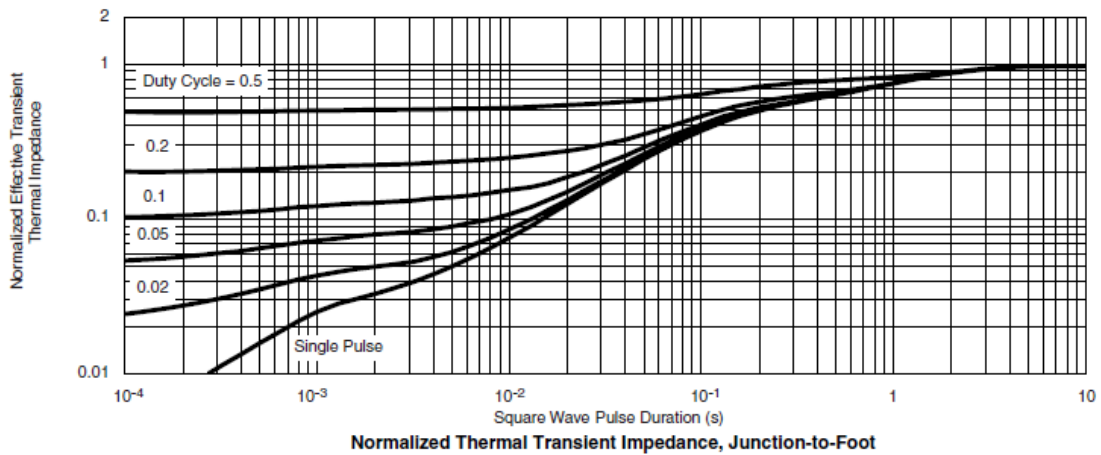
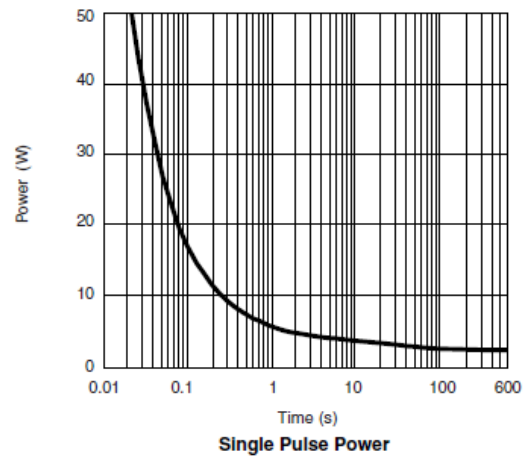
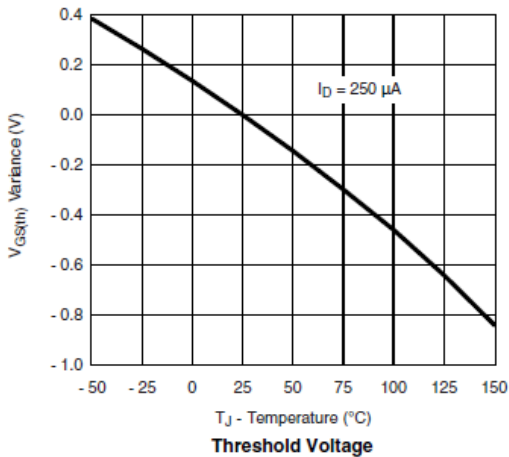
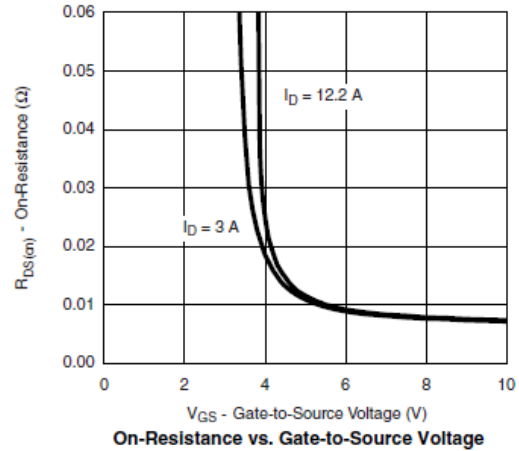
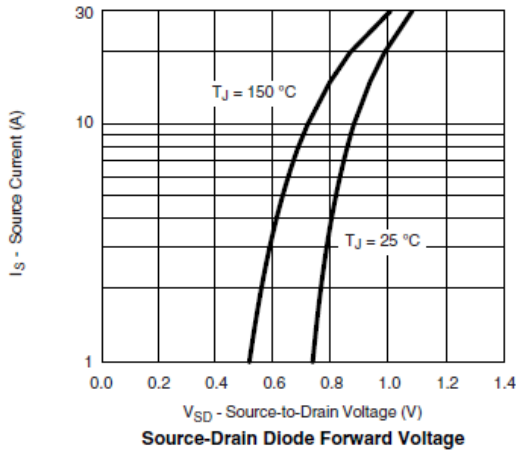


## Typical Characteristics





## Typical Characteristics





## Typical Characteristics

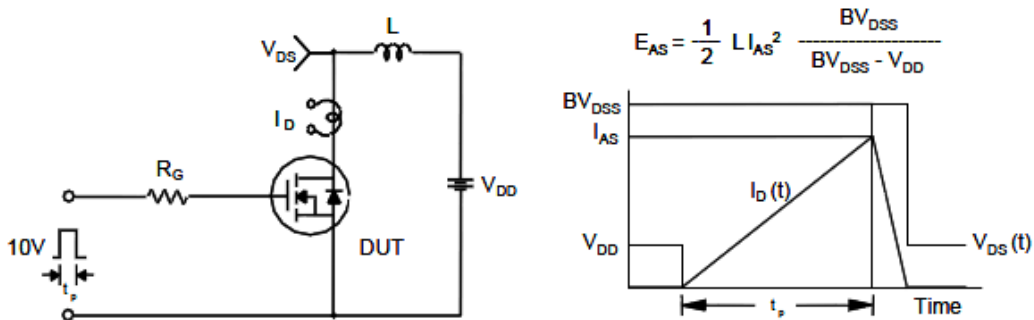
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

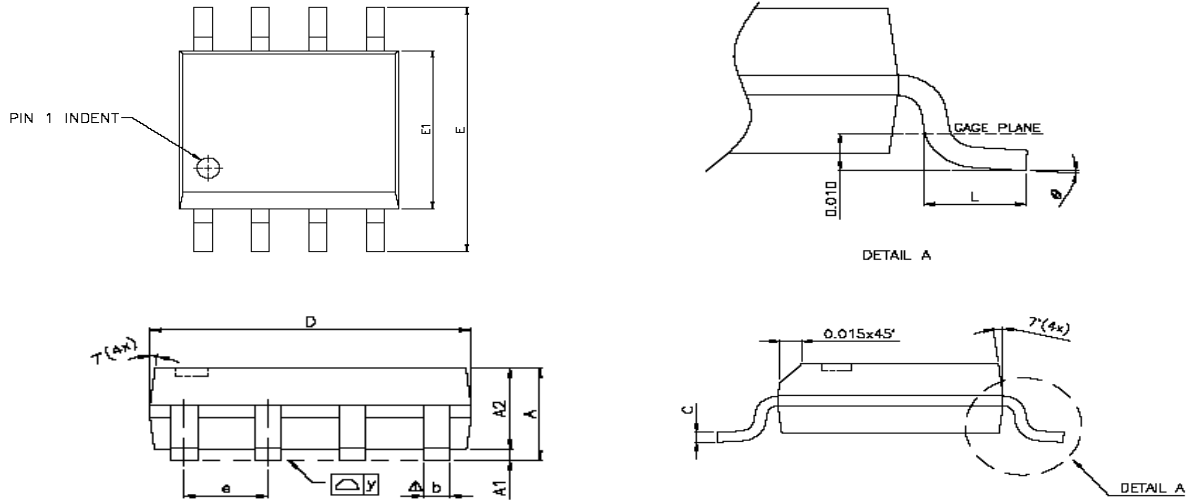


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( SOP-8P )**



| SYMBOLS       | DIMENSIONS IN MILLIMETERS |      |       | DIMENSIONS IN INCHES |       |        |
|---------------|---------------------------|------|-------|----------------------|-------|--------|
|               | MIN                       | NOM  | MAX   | MIN                  | NOM   | MAX    |
| A             | 1.47                      | 1.60 | 1.73  | 0.058                | 0.063 | 0.068  |
| A1            | 0.10                      | —    | 0.25  | 0.004                | —     | 0.010  |
| A2            | —                         | 1.45 | —     | —                    | 0.057 | —      |
| b             | 0.33                      | 0.41 | 0.51  | 0.013                | 0.016 | 0.020  |
| C             | 0.19                      | 0.20 | 0.25  | 0.0075               | 0.008 | 0.0098 |
| D             | 4.80                      | 4.85 | 4.95  | 0.189                | 0.191 | 0.195  |
| E             | 5.80                      | 6.00 | 6.20  | 0.228                | 0.236 | 0.244  |
| E1            | 3.80                      | 3.90 | 4.00  | 0.150                | 0.154 | 0.157  |
| e             | —                         | 1.27 | —     | —                    | 0.050 | —      |
| L             | 0.38                      | 0.71 | 1.27  | 0.015                | 0.028 | 0.050  |
| $\Delta$ y    | —                         | —    | 0.076 | —                    | —     | 0.003  |
| $\varnothing$ | 0°                        | —    | 8°    | 0°                   | —     | 8°     |

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 2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)  
 Tel : 886 2) 2651 3928  
 Fax : 886 2) 2786 8483  
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