



General Description

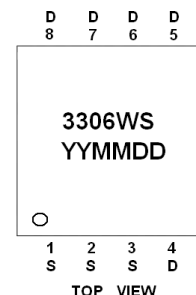
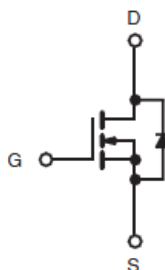
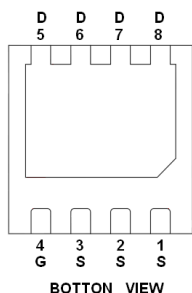
AFN3306WS, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, 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

- 30V/20A, $R_{DS(ON)}=4.0m\Omega@V_{GS}=10V$
- 30V/15A, $R_{DS(ON)}=5.8m\Omega@V_{GS}=4.5V$
- 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 |
|-------------------|--------------|-----------|-------------|----------|
| AFN3306WSFN338RG | 3306WS | DFN3X3-8L | Tape & Reel | 5000 EA |

※ YY year code

※ MM month code

※ DD date code

※ AFN3306WSFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

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

| Parameter | Symbol | Typical | Unit |
|---|-----------------|--------------------------|-----------------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current($T_J=150^{\circ}\text{C}$) | I_D | $T_A=25^{\circ}\text{C}$ | 40 |
| | | $T_A=70^{\circ}\text{C}$ | 30 |
| Pulsed Drain Current | I_{DM} | 80 | A |
| Continuous Source Current(Diode Conduction) | I_S | 40 | A |
| Power Dissipation | P_D | $T_C=25^{\circ}\text{C}$ | 36 |
| | | $T_C=70^{\circ}\text{C}$ | 18 |
| Operating Junction Temperature | T_J | 150 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -55/150 | $^{\circ}\text{C}$ |
| Thermal Resistance Junction-to-Case (Drain) | $R_{\theta JC}$ | 5 | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance-Junction to Ambient | $R_{\theta JA}$ | 40 | |

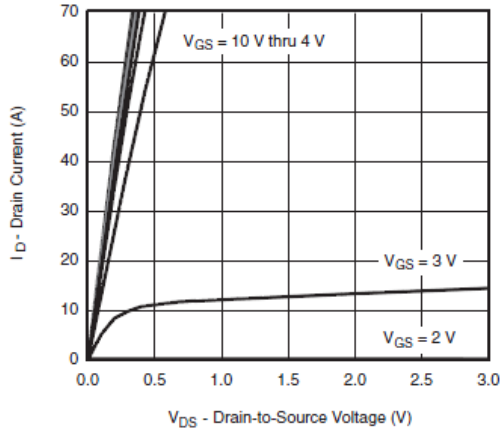
Electrical Characteristics

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

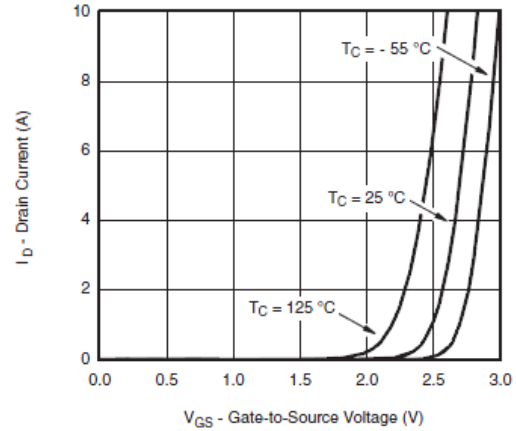
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|--------------|---|------|------|-----------|------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DS}$ | $V_{GS}=0V, I_D=250\mu\text{A}$ | 30 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 1.0 | | 2.0 | |
| Gate Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=24V, V_{GS}=0V$ | | | 1 | uA |
| | | $V_{DS}=24V, V_{GS}=0V$ $T_J=85^{\circ}\text{C}$ | | | 10 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS} \geq 5V, V_{GS}=10V$ | 15 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=20A$ | | 2.5 | 4.0 | m Ω |
| | | $V_{GS}=4.5V, I_D=15A$ | | 4.2 | 5.8 | |
| Forward Transconductance | g_{FS} | $V_{DS}=15V, I_D=10A$ | | 24 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=10A, V_{GS}=0V$ | | 0.8 | 1.3 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=15V, V_{GS}=10V$ $I_D \equiv 15A$ | | 50 | 70 | nC |
| Gate-Source Charge | Q_{gs} | | | 10 | | |
| Gate-Drain Charge | Q_{gd} | | | 8 | | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V$ $f=1\text{MHz}$ | | 2800 | | pF |
| Output Capacitance | C_{oss} | | | 550 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 300 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=15V, R_L=0.3\Omega$ $I_D \equiv 15A, V_{GEN}=10V$ $R_G=2.5\Omega$ | | 12 | 20 | ns |
| | t_r | | | 12 | 20 | |
| Turn-Off Time | $t_{d(off)}$ | | | 30 | 45 | |
| | t_f | | | 10 | 20 | |



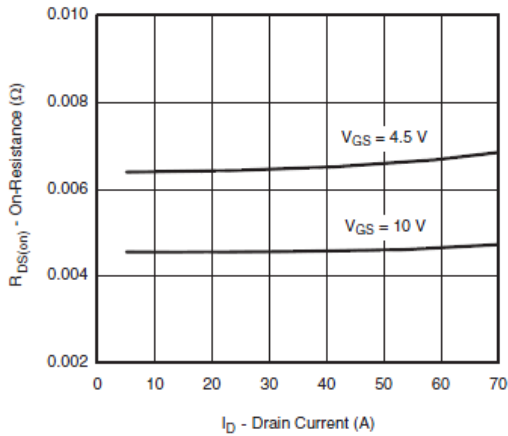
Typical Characteristics



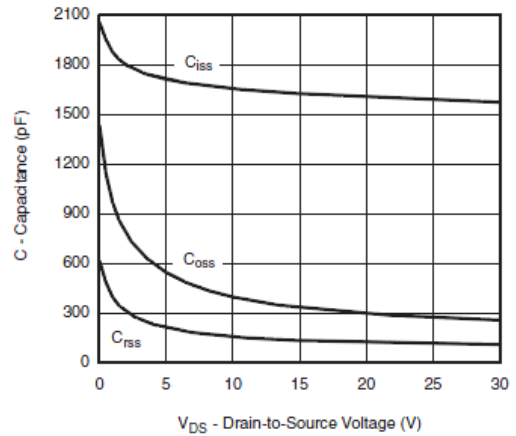
Output Characteristics



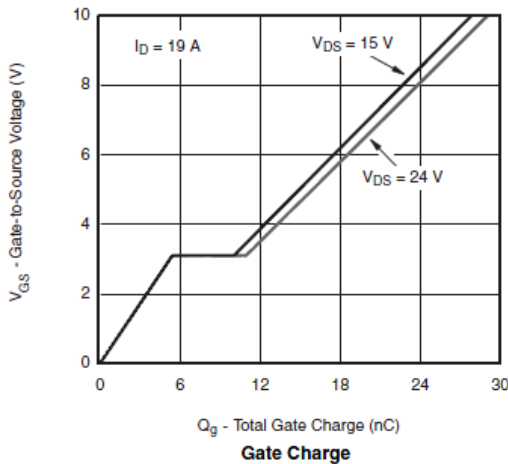
Transfer Characteristics



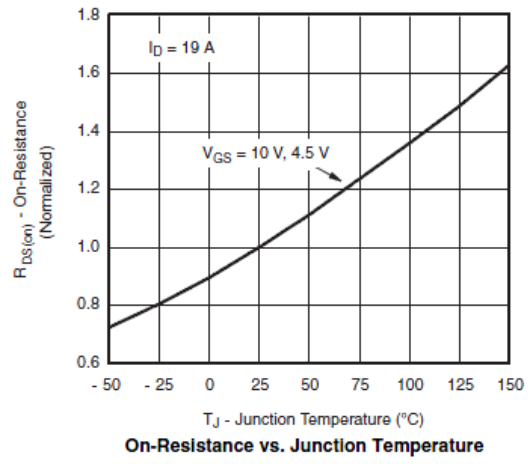
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



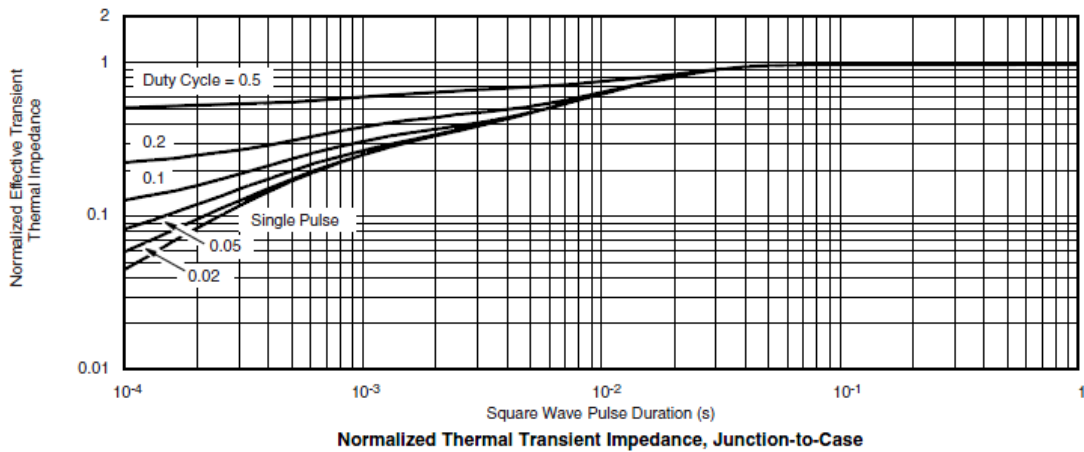
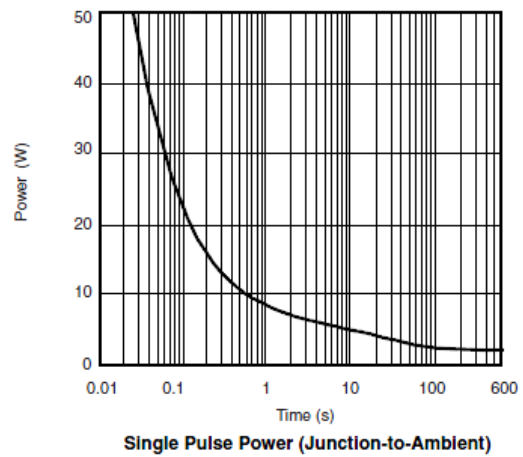
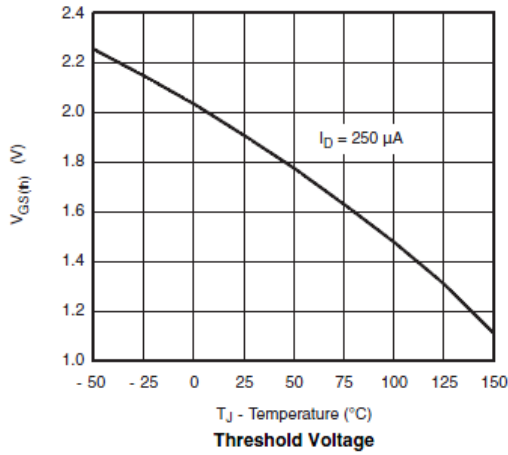
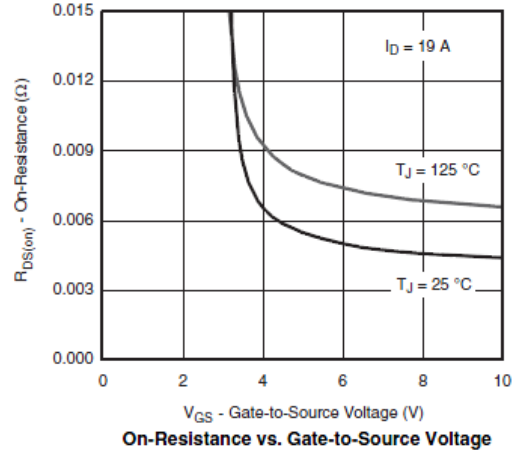
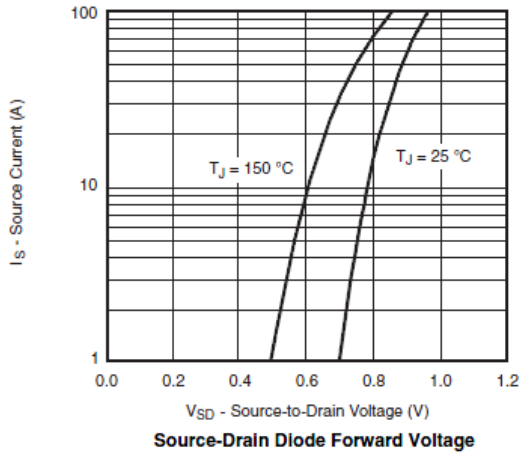
Gate Charge



On-Resistance vs. Junction Temperature



Typical Characteristics





Typical Characteristics

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

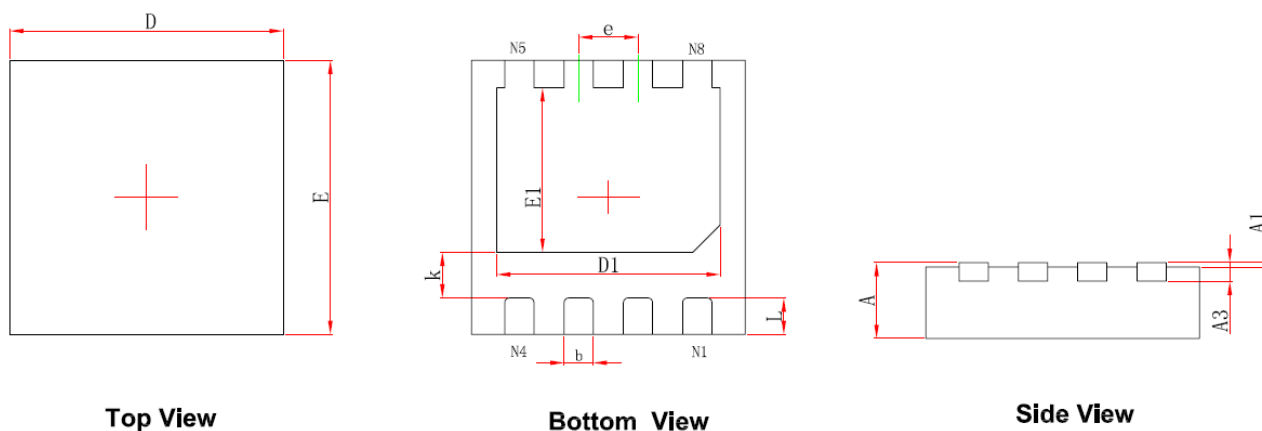


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN3X3-8L)



| 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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