



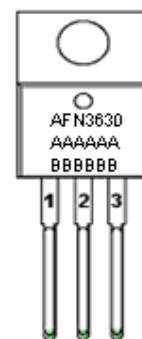
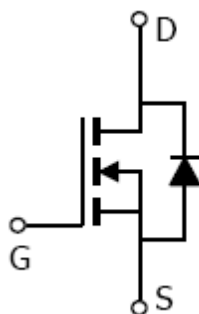
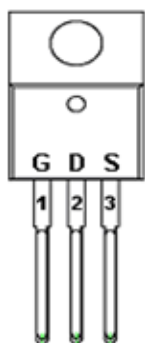
General Description

AFN3630, 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/20A, $R_{DS(ON)}=30m\Omega@V_{GS}=10V$
- 30V/15A, $R_{DS(ON)}=38m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- TO-220-3L package design

Pin Description (TO-220-3L)



Application

- Power Management in Desktop Computer
- DC/DC Converter
- LCD Display inverter

Pin Define

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | G | Gate |
| 2 | D | Drain |
| 3 | S | Source |

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|-----------------------------|-----------|------|----------|
| AFN3630T220TG | AFN3630 AAAAAA BBBBBB | TO-220-3L | Tube | 50 EA |

- ※ A Lot code
- ※ B Date code
- ※ AFN3630T220TG : Tube ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

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

| Parameter | Symbol | Value | Unit |
|---|-----------------|------------------------|--------------------|
| Drain-Source Voltage | V_{DSS} | 30 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current($T_J=150^\circ\text{C}$) | I_D | $T_A=25^\circ\text{C}$ | 20 |
| | | $T_A=70^\circ\text{C}$ | 15 |
| Pulsed Drain Current | I_{DM} | 25 | A |
| Continuous Source Current(Diode Conduction) | I_S | 9.0 | A |
| Power Dissipation | P_D | $T_A=25^\circ\text{C}$ | 75 |
| | | $T_A=70^\circ\text{C}$ | 150 |
| 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 | $^\circ\text{C/W}$ |

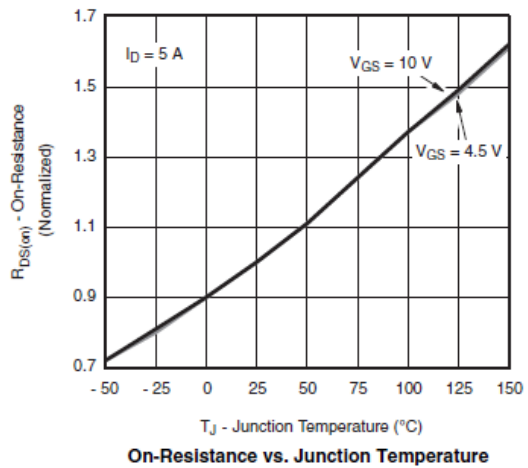
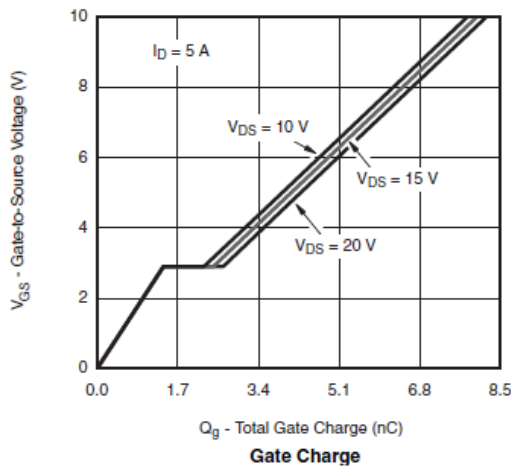
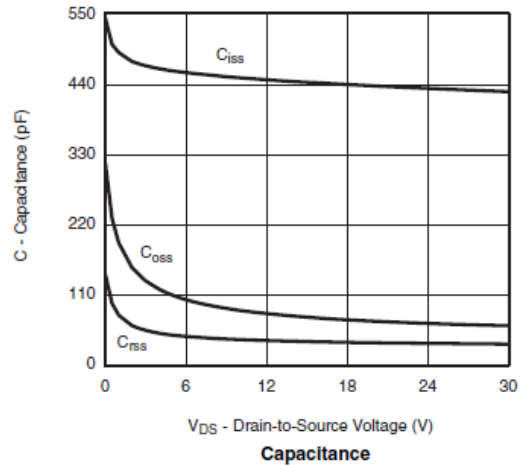
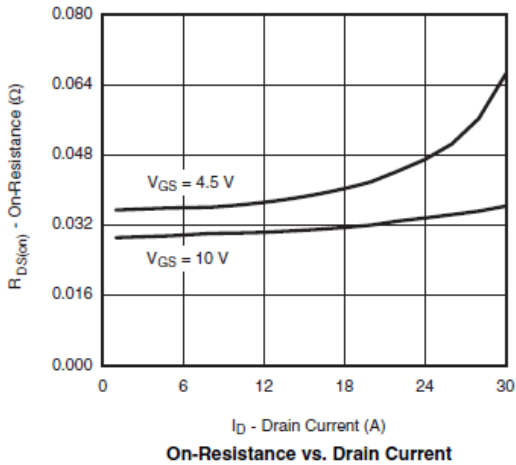
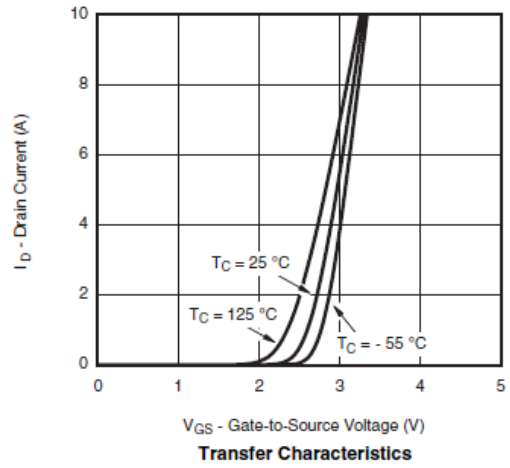
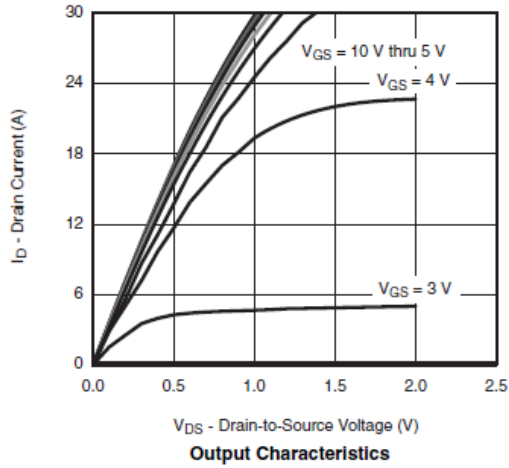
Electrical Characteristics

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

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|---|------|------|-----------|------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu\text{A}$ | 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} | $V_{DS}=30V, V_{GS}=0V$ | | | 1 | uA |
| | | $V_{DS}=30V, V_{GS}=0V$ $T_J=85^\circ\text{C}$ | | | 10 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS} \geq 5V, V_{GS}=10V$ | 10 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=20A$ | | 26 | 30 | m Ω |
| | | $V_{GS}=4.5V, I_D=15A$ | | 32 | 38 | |
| Forward Transconductance | g_{FS} | $V_{DS}=10V, I_D=5.0A$ | | 16 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=3.4A, V_{GS}=0V$ | | 0.85 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=15V, V_{GS}=4.5V$ $I_D=5A$ | | 4 | 8 | nC |
| Gate-Source Charge | Q_{gs} | | | 2 | | |
| Gate-Drain Charge | Q_{gd} | | | 1.2 | | |
| Input Capacitance | C_{iss} | $V_{DS}=15V, V_{GS}=0V$ $f=1\text{MHz}$ | | 520 | | pF |
| Output Capacitance | C_{oss} | | | 80 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 40 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=15V, R_L=3\Omega$ $I_D=5A, V_{GEN}=10V$ $R_G=1\Omega$ | | 5 | 10 | ns |
| | t_r | | | 10 | 18 | |
| Turn-Off Time | $t_{d(off)}$ | | | 10 | 20 | |
| | t_f | | | 6 | 12 | |

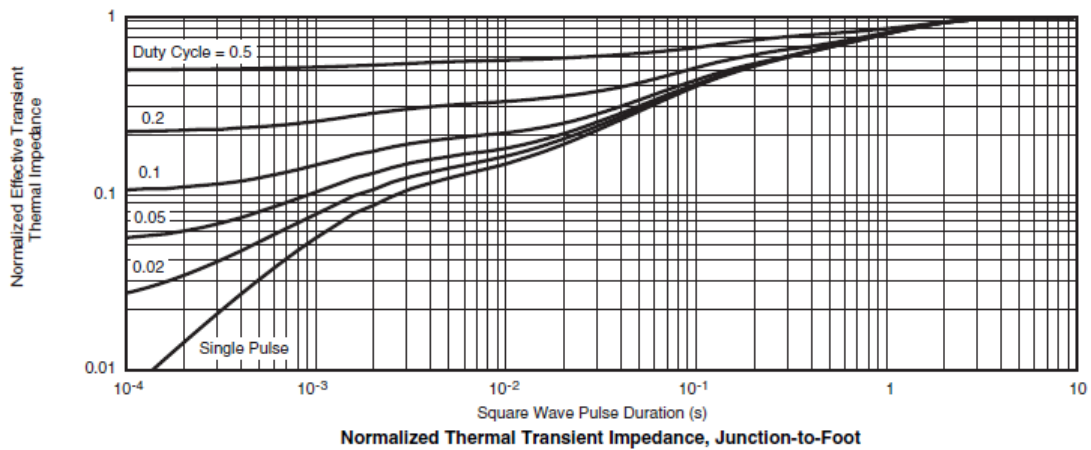
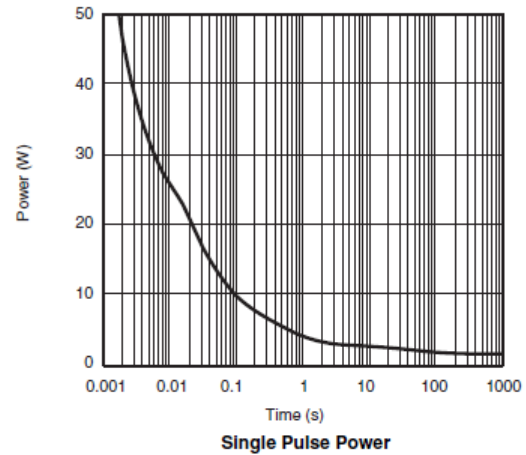
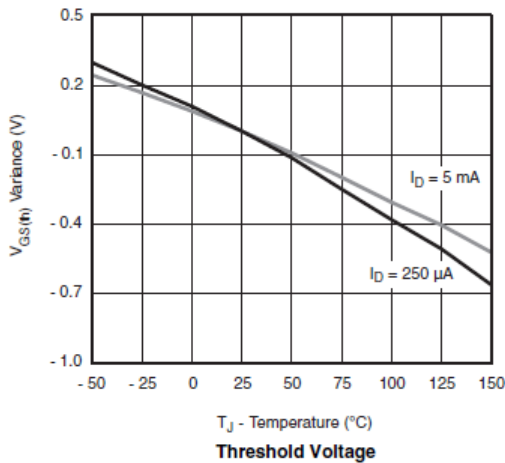
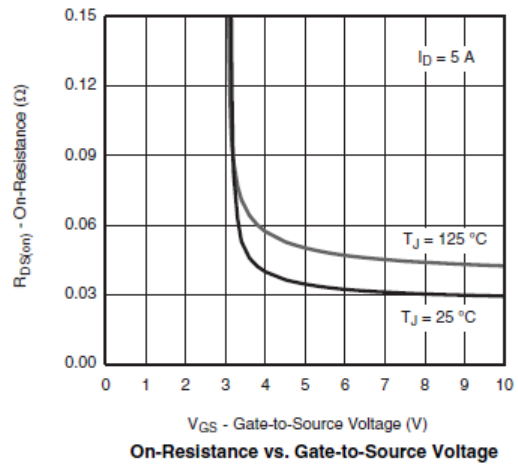
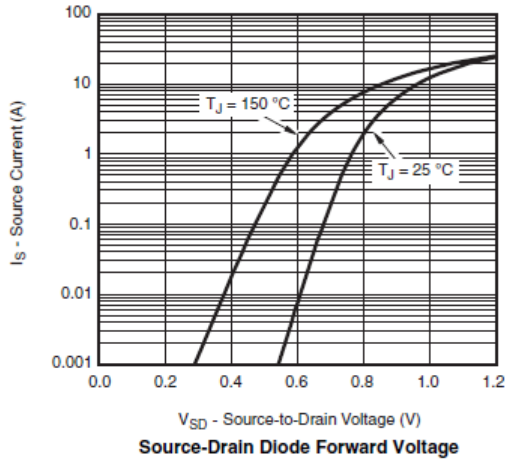


Typical Characteristics





Typical Characteristics





Typical Characteristics

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

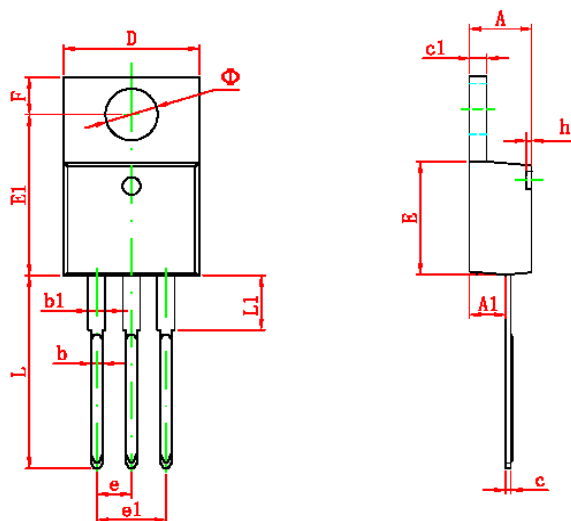


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (TO-220-3L)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.470 | 4.670 | 0.176 | 0.184 |
| A1 | 2.520 | 2.820 | 0.099 | 0.111 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.310 | 0.530 | 0.012 | 0.021 |
| c1 | 1.170 | 1.370 | 0.046 | 0.054 |
| D | 10.010 | 10.310 | 0.394 | 0.406 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| E1 | 12.060 | 12.460 | 0.475 | 0.491 |
| e | 2.540 TYP | | 0.100 TYP | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| F | 2.590 | 2.890 | 0.102 | 0.114 |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| L | 13.400 | 13.800 | 0.528 | 0.543 |
| L1 | 3.560 | 3.960 | 0.140 | 0.156 |
| • • | 3.735 | 3.935 | 0.147 | 0.155 |

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