



General Description

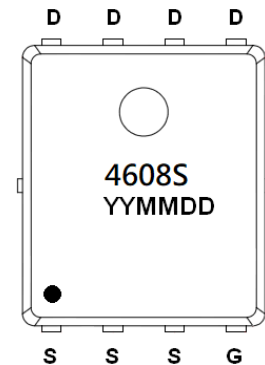
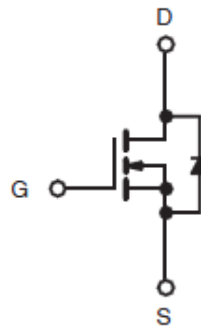
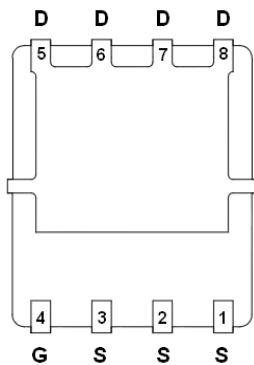
AFN4608S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- $I_D = 9A, R_{DS(ON)} = 12m\Omega @ V_{GS} = 10V$
- $I_D = 7A, R_{DS(ON)} = 15m\Omega @ V_{GS} = 4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- DFN5X6-8L package design

Pin Description (DFN5X6-8L)



Application

- Networking / Telecom / Server
- LED Lighting Applications
- Quick Charger Applications
- DC-DC Primary Side Switch

Pin Define

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

Ordering Information

| Part Ordering No. | Part Marking | Package | Unit | Quantity |
|-------------------|--------------|-----------|-------------|----------|
| AFN4608SFN568RG | 4608S | DFN5X6-8L | Tape & Reel | 2500 EA |

- ※ 4608S : Parts Code
- ※ YYMMDD : Date Code
- ※ AFN4608SFN568RG : 13" Tape & Reel ; Pb- Free ; Halogen- Free



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

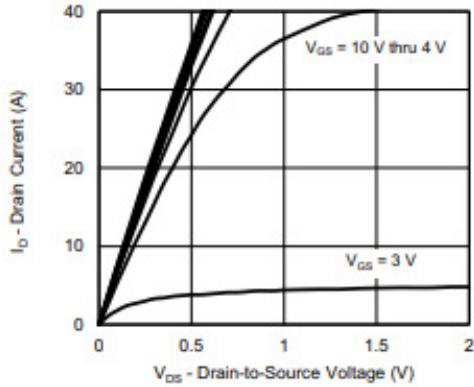
| Parameter | Symbol | Typical | Unit |
|--|--------------------------------|----------|--------------------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Gate -Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($T_J=150^\circ\text{C}$) | $T_C=25^\circ\text{C}$ | 40 | A |
| | $T_C=70^\circ\text{C}$ | 30 | |
| Pulsed Drain Current ($t=100\mu\text{s}$) | $T_A=25^\circ\text{C}$ | 9 | |
| | $T_A=70^\circ\text{C}$ | 7 | |
| Continuous Source Current (Diode Conduction) | $T_C=25^\circ\text{C}$ | 20 | W |
| | $T_A=25^\circ\text{C}$ | 3 | |
| Single Pulse Avalanche Current | $L=2\text{mH} / I_D=6\text{A}$ | I_{AS} | 8 |
| | | E_{AS} | 36 |
| Power Dissipation | $T_C=25^\circ\text{C}$ | 31 | W |
| | $T_C=75^\circ\text{C}$ | 20 | |
| Operating Junction Temperature | $T_A=25^\circ\text{C}$ | 5.0 | mJ |
| | $T_A=75^\circ\text{C}$ | 3.2 | |
| Storage Temperature Range | T_J | 150 | $^\circ\text{C}$ |
| Thermal Resistance-Junction to Ambient | T_{STG} | -55/150 | $^\circ\text{C}$ |
| Maximum Junction-to-Case (Drain) | $t \leq 10\text{ s}$ | 23 | $^\circ\text{C/W}$ |
| | Steady-State | 1.5 | |

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

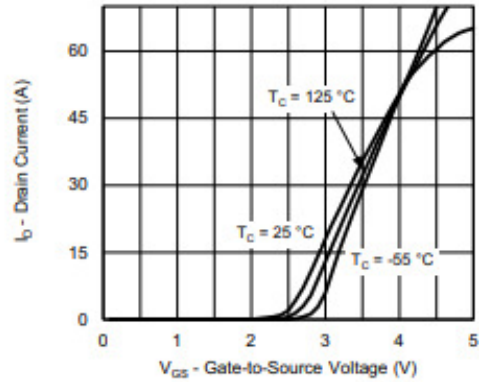
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|---|------|------|-----------|------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0\text{V}, I_D=250\mu\text{A}$ | 60 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ | 1.0 | | 2.0 | |
| Gate Leakage Current | I_{GSS} | $V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=48\text{V}, V_{GS}=0\text{V}$ | | | 1 | uA |
| | | $V_{DS}=48\text{V}, V_{GS}=0\text{V}$ $T_J=85^\circ\text{C}$ | | | 5 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS} \geq 5\text{V}, V_{GS}=10\text{V}$ | 30 | | | A |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10\text{V}, I_D=9\text{A}$ | | 8.5 | 12 | m Ω |
| | | $V_{GS}=4.5\text{V}, I_D=7\text{A}$ | | 10.5 | 15 | |
| Forward Transconductance | g_{FS} | $V_{DS}=30\text{V}, I_D=8\text{A}$ | | 38 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=2.0\text{A}, V_{GS}=0\text{V}$ | | 0.85 | 1.3 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=30\text{V}, V_{GS}=4.5\text{V}$ $I_D=8\text{A}$ | | 7.5 | 15 | nC |
| Gate-Source Charge | Q_{gs} | | | 4.5 | | |
| Gate-Drain Charge | Q_{gd} | | | 1.5 | | |
| Input Capacitance | C_{iss} | $V_{DS}=30\text{V}, V_{GS}=0\text{V}$ $f=1\text{MHz}$ | | 1050 | | pF |
| Output Capacitance | C_{oss} | | | 450 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 25 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=30\text{V}, R_L=3.45\Omega$ $I_D=8\text{A}, V_{GEN}=10\text{V}$ $R_G=1\Omega$ | | 10 | 20 | ns |
| | t_r | | | 25 | 50 | |
| Turn-Off Time | $t_{d(off)}$ | | | 20 | 40 | |
| | t_f | | | 10 | 20 | |



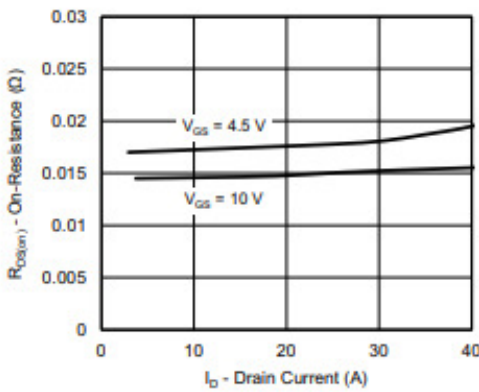
Typical Characteristics



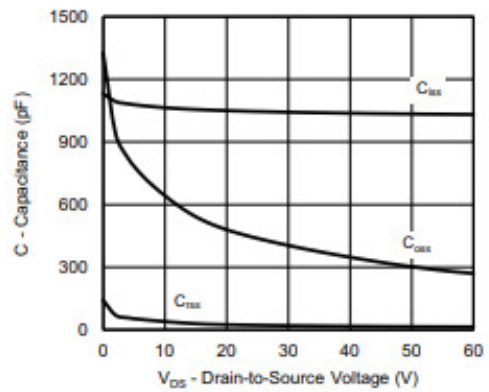
Output Characteristics



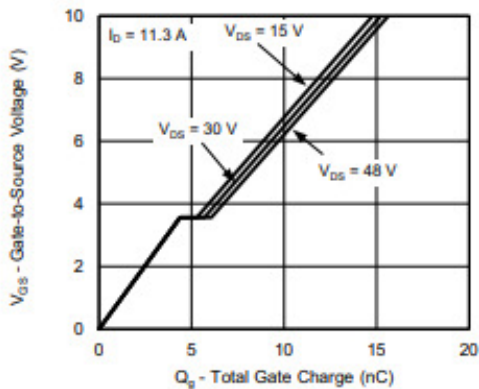
Transfer Characteristics



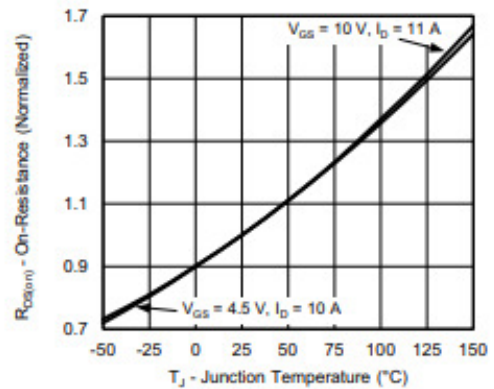
On-Resistance vs. Drain Current



Capacitance



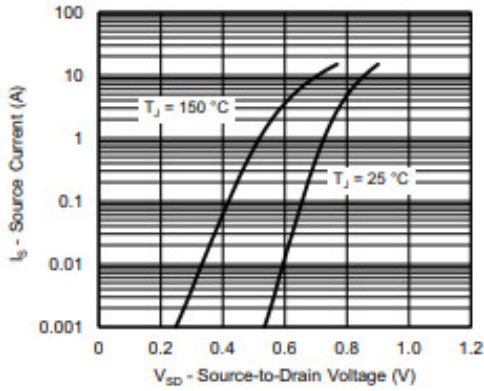
Gate Charge



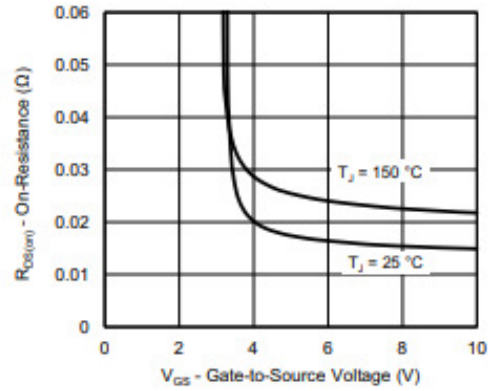
On-Resistance vs. Junction Temperature



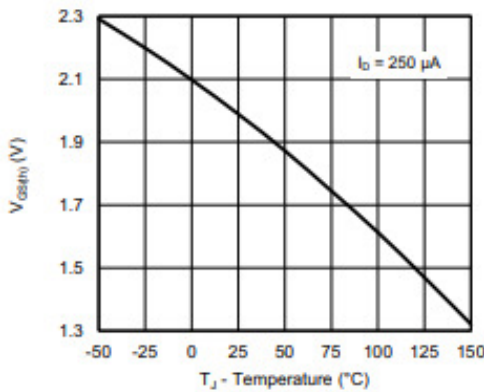
Typical Characteristics



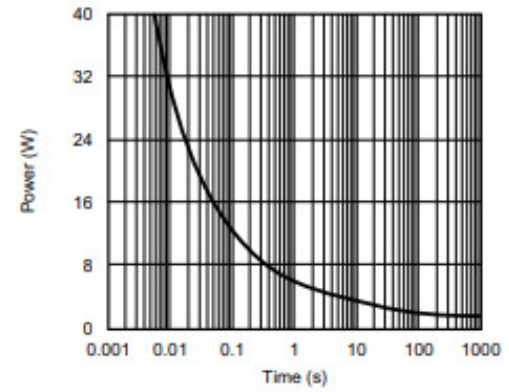
Source-Drain Diode Forward Voltage



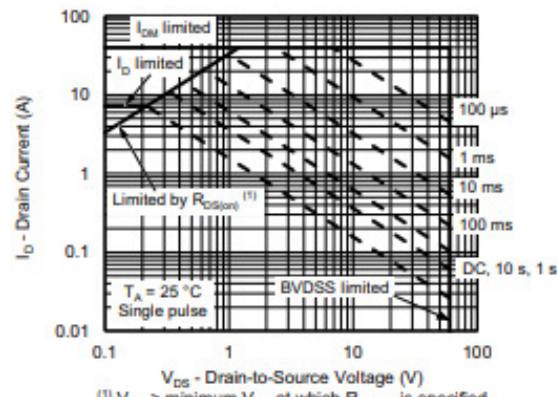
On-Resistance vs. Gate-to-Source Voltage



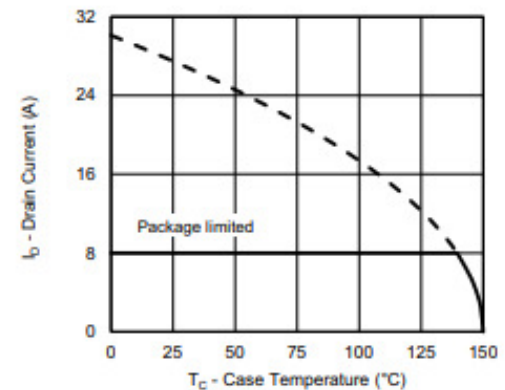
Threshold Voltage



Single Pulse Power



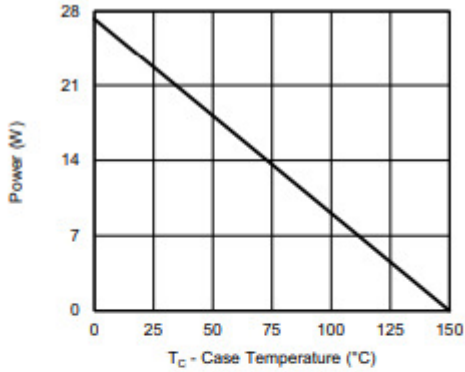
Safe Operating Area, Junction-to-Ambient



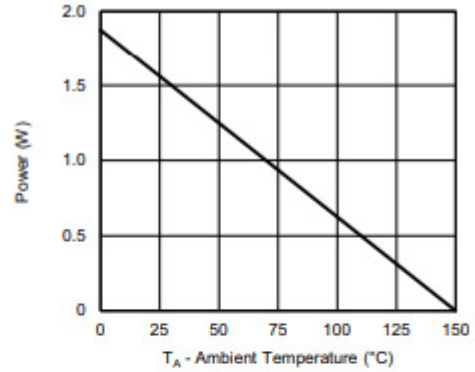
Current Derating ^a



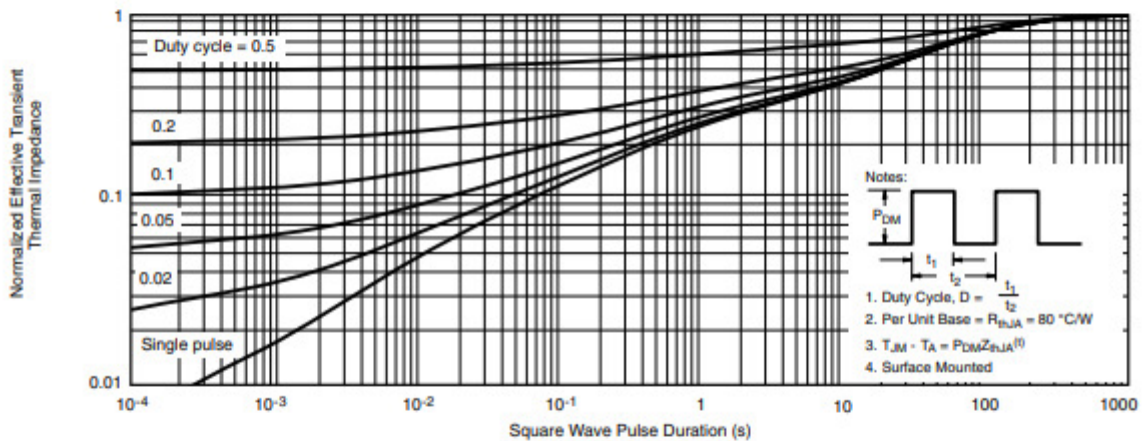
Typical Characteristics



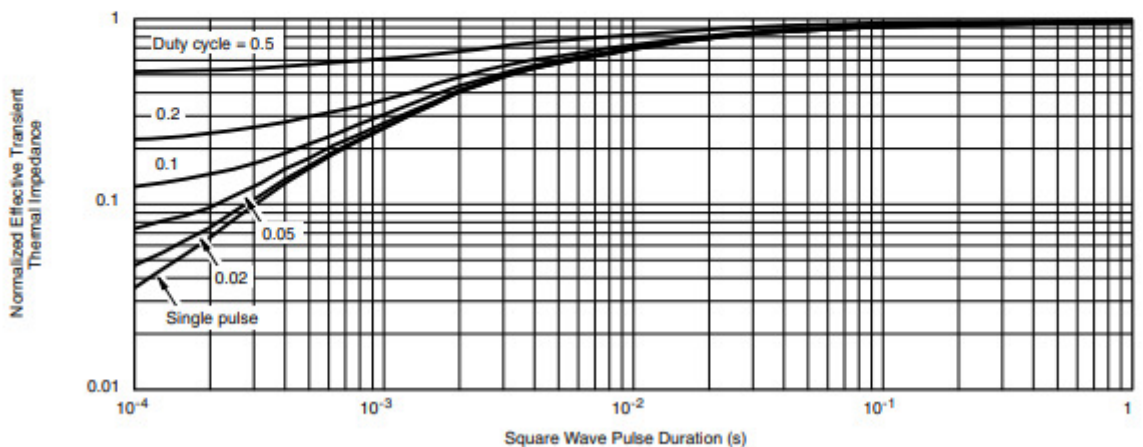
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case



Typical Characteristics

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

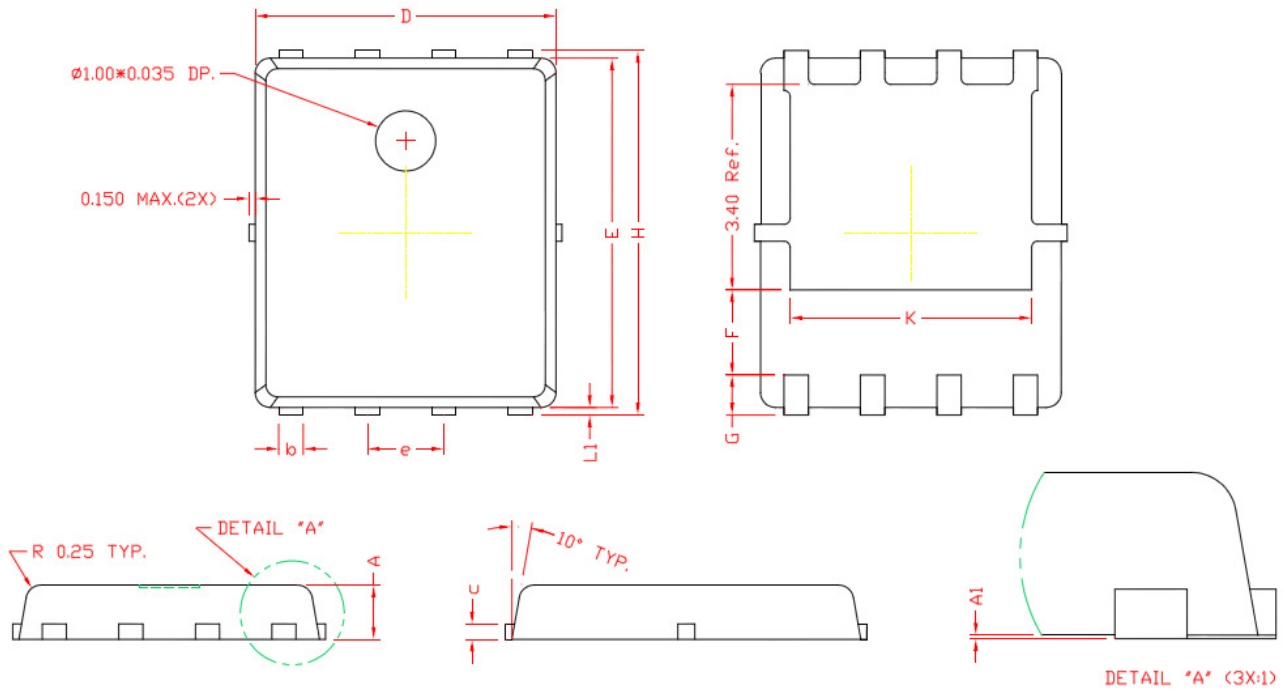


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN5X6-8L)



DIMENSIONS

| REF. | Millimeters | | REF. | Millimeters | |
|------|-------------|------|------|-------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 0.80 | 1.00 | E | 5.70 | 5.90 |
| A1 | 0.00 | 0.05 | e | 1.27 BSC. | |
| b | 0.35 | 0.49 | H | 5.95 | 6.20 |
| c | 0.254 Ref. | | L1 | 0.10 | 0.18 |
| D | 4.90 | 5.10 | G | 0.60 Ref. | |
| F | 1.40 Ref. | | K | 4.00 Ref. | |

©2010 Alfa-MOS Technology Corp.
 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
 ©<http://www.alfa-mos.com>