| 1 / MPN: | AO4812 |
|---|---|
| ZTAI / MPN: | AO4812QSP-QTR |

# *30V N-Channel Enhancement Mode MOSFET*

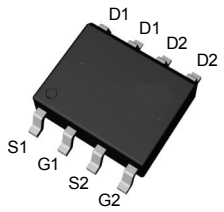
## Features

- 30V/8A,
  $R_{DS(ON)}$= 17mΩ(max.) @ $V_{GS}$= 10V
  $R_{DS(ON)}$= 24mΩ(max.) @ $V_{GS}$= 4.5V
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- 100% UIS Tested

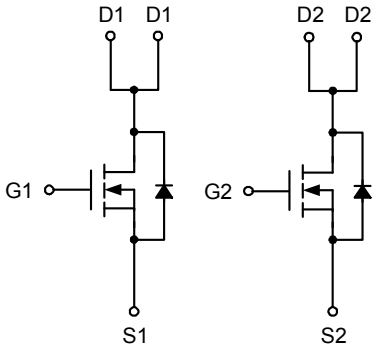
## Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

## Pin Description




Top View of SOP-8




N-Channel MOSFET

## Absolute Maximum Ratings ($T_A$ = 25°C Unless Otherwise Noted)

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | | 30 | V |
| $V_{GSS}$ | Gate-Source Voltage | | ±20 | |
| $I_D$[a] | Continuous Drain Current ($V_{GS}$=10V) | $T_A$=25°C | 8 | A |
| | | $T_A$=70°C | 6.5 | |
| $I_{DM}$[a] | 300μs Pulsed Drain Current ($V_{GS}$=10V) | | 40 | |
| $I_S$[a] | Diode Continuous Forward Current | | 1 | |
| $I_{AS}$[b] | Avalanche Current (Single Pulse) | | 9 | |
| $E_{AS}$[b] | Avalanche Energy, Single Pulse (L=0.5mH) | | 20 | mJ |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | |
| $P_D$[a] | Maximum Power Dissipation | $T_A$=25°C | 1.7 | W |
| | | $T_A$=70°C | 1.08 | |
| $R_{\theta JA}$[a] | Thermal Resistance-Junction to Ambient | t ≤ 10s | 48 | °C/W |
| | | Steady State | 74 | |
| $R_{\theta JL}$ | Thermal Resistance-Junction to Lead | Steady State | 32 | |

Note a : Surface Mounted on 1in$^2$ pad area, t ≤ 10sec. Maximum Power dissipation is calculated from $R_{\theta JA}$ (worst) =62.5 °C/W under t ≤ 10s.

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_j$=25°C).

## Electrical Characteristics ($T_A$ = 25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | 4822 | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| **Static Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_{DS}$=250μA | 30 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=24V, $V_{GS}$=0V | - | - | 1 | μA |
| | | $T_J$=85°C | - | - | 30 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_{DS}$=250μA | 1.0 | 1.5 | 1.9 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| $R_{DS(ON)}$[a] | Drain-Source On-state Resistance | $V_{GS}$=10V, $I_{DS}$=8A | - | 17.5 | 27 | mΩ |
| | | $V_{GS}$=4.5V, $I_{DS}$=7A | - | 23 | 30 | |
| | | $V_{GS}$=2.5V, $I_{DS}$=7A | - | 35 | 45 | |
| Gfs | Forward Transconductance | $V_{DS}$=5V, $I_{DS}$=8A | - | 32 | - | S |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$[a] | Diode Forward Voltage | $I_{SD}$=1A, $V_{GS}$=0V | - | 0.7 | 1.1 | V |
| $t_{rr}$[b] | Reverse Recovery Time | $I_{SD}$=8A, $dI_{SD}/dt$=100A/μs | - | 15.5 | - | ns |
| $Q_{rr}$[b] | Reverse Recovery Charge | | - | 6.5 | - | nC |

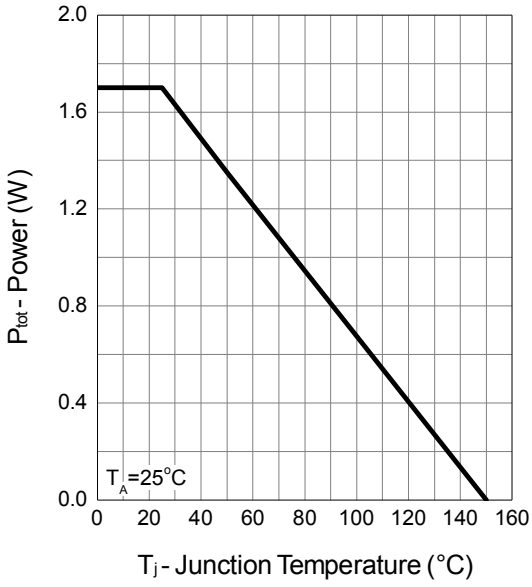
## Electrical Characteristics (Cont.) ($T_A$ = 25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | 4822 | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| **Dynamic Characteristics** [b] | | | | | | |
| $R_G$ | Gate Resistance | $V_{GS}$=0V,$V_{DS}$=0V,F=1MHz | 1.3 | 1.7 | 2.3 | Ω |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V, $V_{DS}$=15V, Frequency=1.0MHz | - | 780 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 95 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 57 | - | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}$=15V, $R_L$=15Ω, $I_{DS}$=1A, $V_{GEN}$=10V, $R_G$=6Ω | - | 5.9 | 10 | ns |
| $t_r$ | Turn-on Rise Time | | - | 10 | 17 | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | - | 17 | 35 | |
| $t_f$ | Turn-off Fall Time | | - | 4 | 9 | |
| **Gate Charge Characteristics** [b] | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=15V, $V_{GS}$=10V, $I_{DS}$=8A | - | 10.2 | 14 | nC |
| | Total Gate Charge | $V_{DS}$=15V, $V_{GS}$=4.5V, $I_{DS}$=8A | - | 5.3 | - | |
| $Q_{gth}$ | Threshold Gate Charge | | - | 0.78 | - | |
| $Q_{gs}$ | Gate-Source Charge | | - | 1.7 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 2.2 | - | |

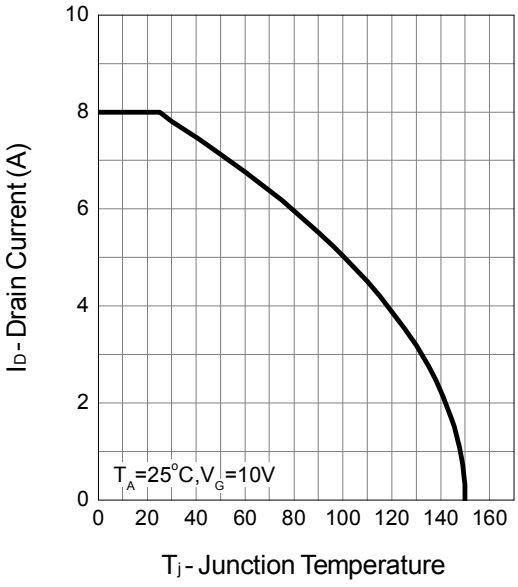
Note a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note b : Guaranteed by design, not subject to production testing.

# Typical Operating Characteristics

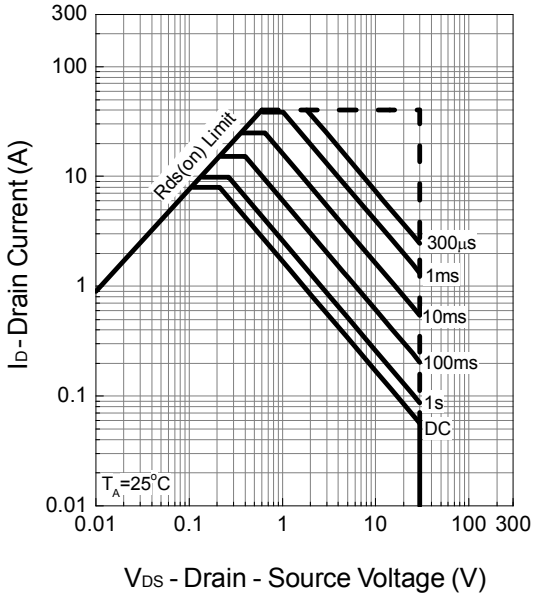
### Power Dissipation



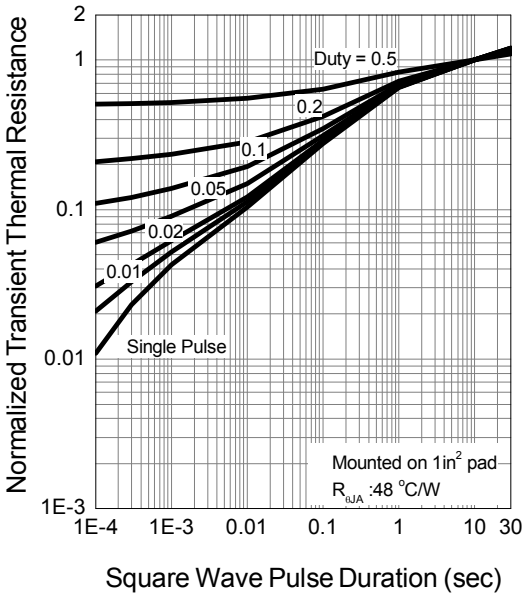

### Drain Current




### Safe Operation Area

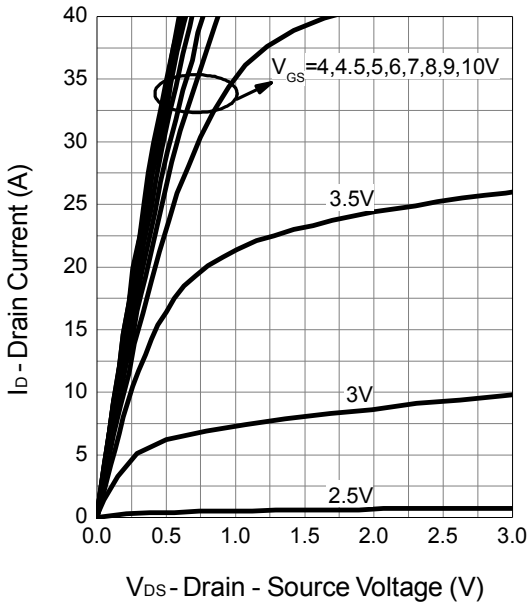



### Thermal Transient Impedance

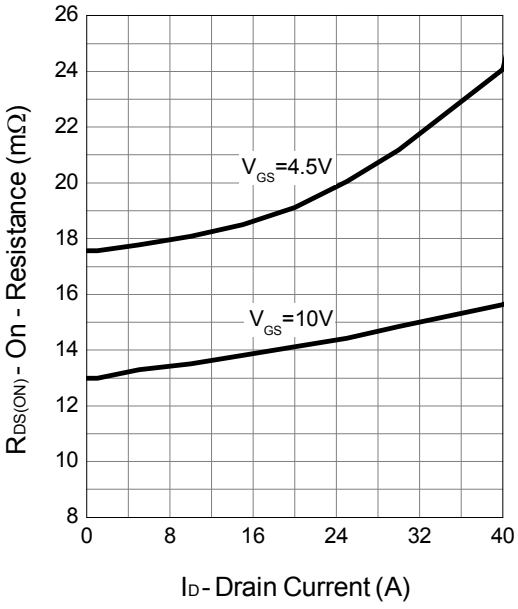


# Typical Operating Characteristics (Cont.)

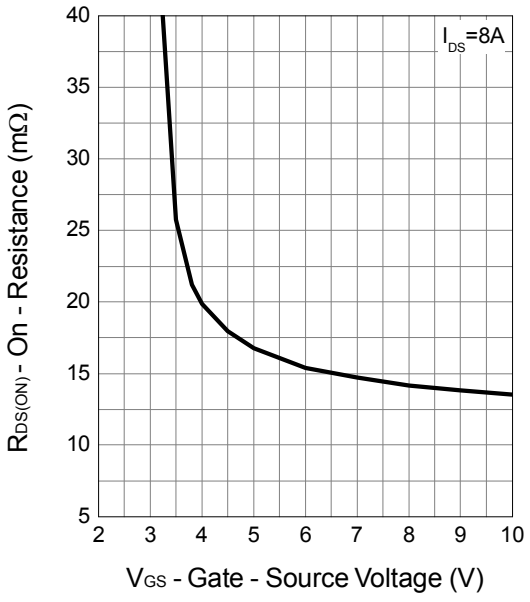
**Output Characteristics**



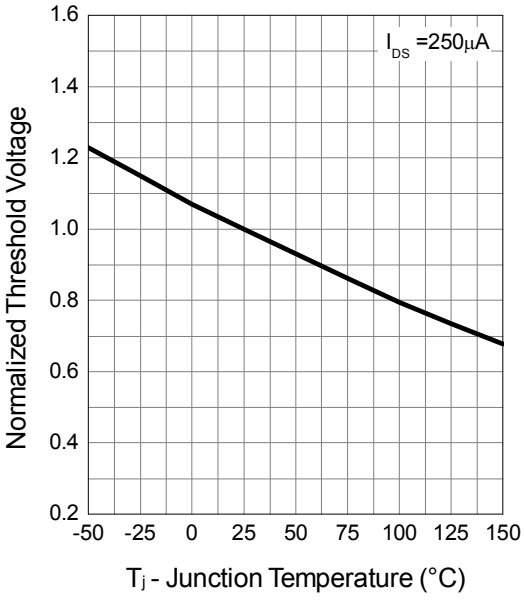

**Drain-Source On Resistance**




**Gate-Source On Resistance**

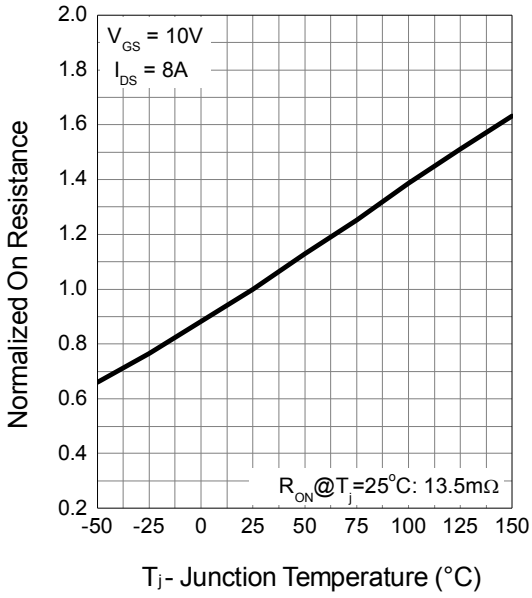



**Gate Threshold Voltage**

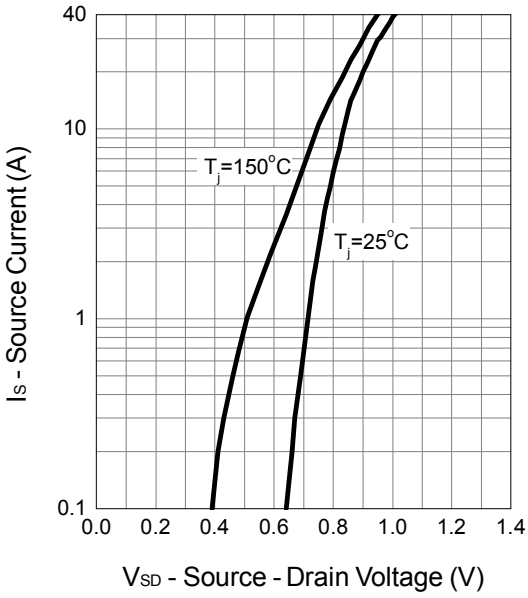


# Typical Operating Characteristics (Cont.)

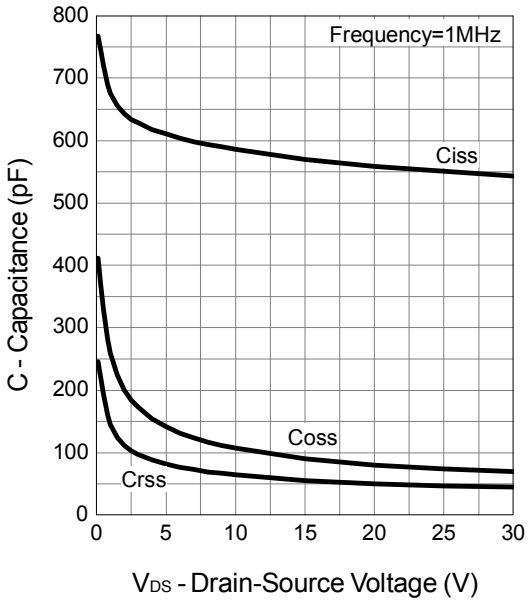
**Drain-Source On Resistance**



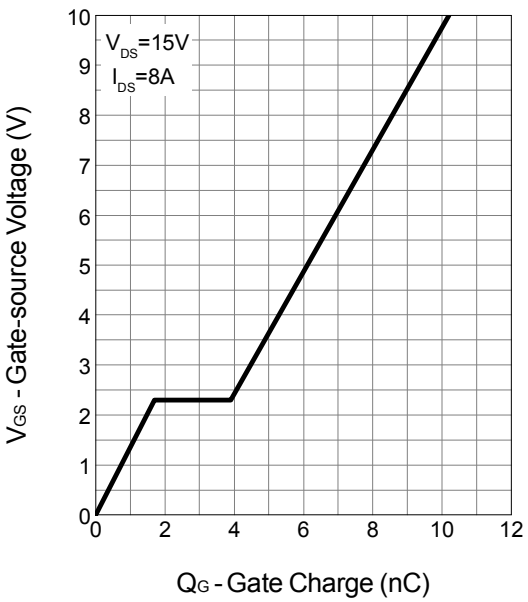

**Source-Drain Diode Forward**




**Capacitance**




**Gate Charge**



## Typical Operating Characteristics (Cont.)