# UMW AOD484

30V N-Channel MOSFET

## 1.Features

- $V_{DS}$=30V
- $I_D$=25A
- $R_{DS(ON)}$ =7mΩ($V_{GS}$=10V)
- $R_{DS(ON)}$ =9mΩ($V_{GS}$=4.5V)

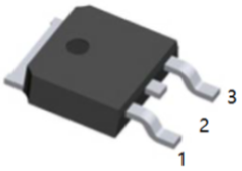
## 2.Applications

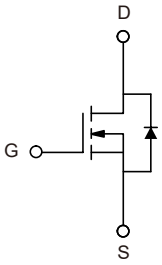
- OR-ing
- Server
- DC/DC

## 3.Pinning information

| Pin | Symbol | Description |
|---|---|---|
| 1 | G | GATE |
| 3 | S | SOURCE |
| 2 | D | DRAIN |

**TO-252(DPAK)**
**top view**




## 4.Absolute Maximum Ratings $T_A$=25°C unless otherwise noted

| Parameter | | Symbol | Maximum | Units |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous DrainCurrent ($T_J$=175°C) | $T_C$=25°C | $I_D$ | 25 | A |
| | $T_C$=70°C | | 22 | |
| | $T_A$=25°C | | 21.8[b,c] | |
| | $T_A$=70°C | | 18[b,c] | |
| Pulsed Drain Current | | $I_{DM}$ | 200 | |
| Avalanche Current Pulse | L = 0.1 mH | $I_{AS}$ | 39 | |
| Single Pulse Avalanche Energy | | $E_{AS}$ | 94.8 | mJ |
| Continuous Source-Drain Diode Current | $T_C$=25°C | $I_S$ | 50[a,e] | A |
| | $T_A$=25°C | | 3.13[b,c] | |

| | | | | |
|---|---|---|---|---|
| Maximum Power Dissipation | $T_C$=25°C | $P_D$ | 100[a] | W |
| | $T_C$=70°C | | 75 | |
| | $T_A$=25°C | | 3.25[b,c] | |
| | $T_A$=70°C | | 2.33[b,c] | |
| Operating Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55 to 175 | °C |

## 5.Thermal resist ance rating

| Parameter | | Symbol | Typ | Max | Units |
|---|---|---|---|---|---|
| Maximum Junction-to-Ambient [b,d] | t ≤ 10sec | $R_{thJA}$ | 32 | 40 | °C/W |
| Maximum Junction-to-Case | Steady-State | $R_{thJC}$ | 0.5 | 0.6 | °C/W |

Notes:

a. Based on $T_C$ = 25 °C.

b. Surface mounted on 1" x 1" FR4 board.

c. t = 10 sec.

d. Maximum under steady state conditions is 90 °C/W.

e. Calculated based on maximum junction temperature. Package limitation current is 90 A.

## 6.Specifications ($T_J$=25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{DS}$ | $V_{DS}$=0V, $I_D$=250μA | 30 | | | V |
| $V_{DS}$ Temperature Coefficient | $\Delta V_{DS}/T_J$ | $I_D$=250μA | | 35 | | mV/°C |
| $V_{GS(th)}$ Temperature Coefficient | $\Delta V_{GS(th)}/T_J$ | | | -7.5 | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.5 | | 2 | V |
| Gate-Source Leakage | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=30V, $V_{GS}$=0V | | | 1 | μA |
| | | $V_{DS}$=30V, $V_{GS}$=0V, $T_J$=55°C | | | 10 | |
| On-State Drain Current[a] | $I_{D(ON)}$ | $V_{DS}$≥5V, $V_{GS}$=10V | 90 | | | A |
| Drain-Source On-State Resistance[a] | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=21.8A | | 7 | | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=18A | | 9 | | |
| Forward Transconductance[a] | $g_{FS}$ | $V_{DS}$=15V, $I_D$=21.8A | | 160 | | S |
| **Dynamic** [b] | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=15V, $V_{GS}$=0V, f=1MHz | | 2201 | | pF |
| Output Capacitanc | $C_{oss}$ | | | 525 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 370 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=15V,$V_{GS}$=10V,$I_D$=21.8A | | 35 | 45 | nC |
| | | $V_{DS}$=15V, $V_{GS}$=4.5V $I_D$=21.8A | | 25 | 35 | |
| Gate Source Charge | $Q_{gs}$ | | | 15 | | |
| Gate Drain Charge | $Q_{gd}$ | | | 20 | | |
| Gate Resistance | $R_g$ | f=1MHz | | 1.4 | 2.1 | Ω |
| Turn-On DelayTime | $t_{D(on)}$ | $V_{DD}$ =15V, $R_L$=0.625Ω $I_D$≌24A, $V_{GEN}$=10V $R_g$=1Ω | | 18 | 27 | ns |
| Rise Time | $t_r$ | | | 11 | 17 | |
| Turn-Off DelayTime | $t_{D(off)}$ | | | 70 | 105 | |
| Fall Time | $t_f$ | | | 10 | 15 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | $t_{D(on)}$ | $V_{DD}$=15V, $R_L$=0.67Ω<br>$I_D$≌22.5V, $V_{GEN}$=4.5V<br>$R_g$=1Ω | | 55 | 83 | ns |
| Rise Time | $t_r$ | | | 180 | 270 | ns |
| Turn-Off Delay Time | $t_{D(off)}$ | | | 55 | 83 | ns |
| Fall Time | $t_f$ | | | 12 | 18 | ns |
| **Drain-Source Body Diode Characteristics** | | | | | | |
| Continuous Source-Drain Diode Current | $I_S$ | $T_C$=25°C | | | 120 | A |
| Pulse Diode Forward Current | $I_{SM}$ | | | | 120 | A |
| Body Diode Voltage | $V_{SD}$ | $I_S$=22A | | 0.8 | 1.2 | V |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$=20A, dI/dt=100A/μs<br>$T_J$=25°C | | 52 | 78 | ns |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | | | 70.2 | 105 | nC |
| Reverse Recovery Fall Time | $t_a$ | | | 27 | | ns |
| Reverse Recovery Rise Time | $t_b$ | | | 25 | | ns |

Notes:

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

b. Guaranteed by design, not subject to production testing.

## 7.1Typical characteristic 25 °C, unless otherwise noted

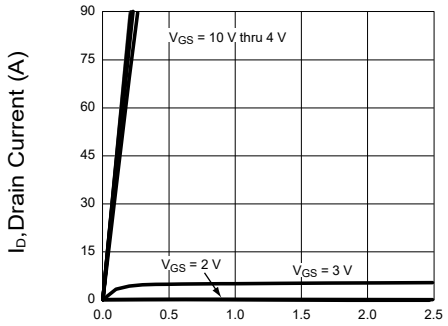



Figure 1: Output Characteristics

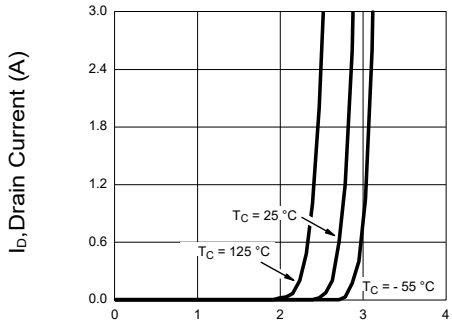



Figure 2: Transfer Characteristics

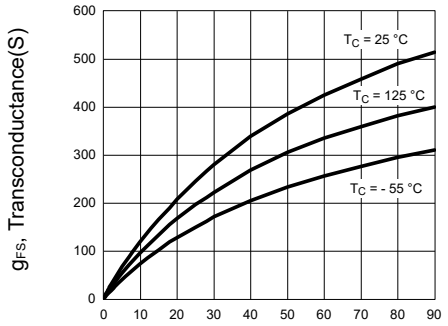



Figure 3: Transconductance

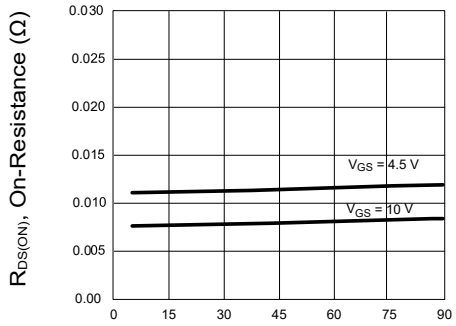



Figure 4: $R_{DS(ON)}$ vs. Drain Current

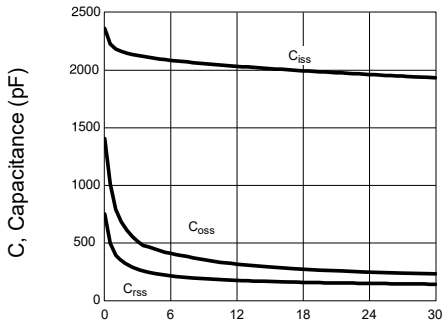



Figure 5: Capacitance

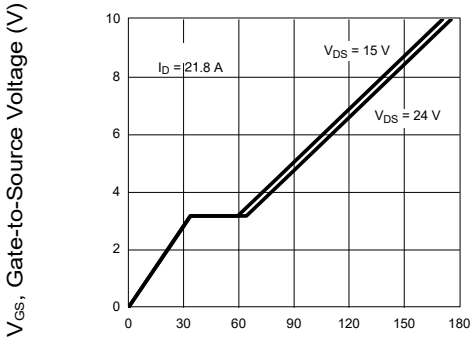



Figure 6: Gate Charge

## 7.2Typical characteristic 25 °C, unless otherwise noted

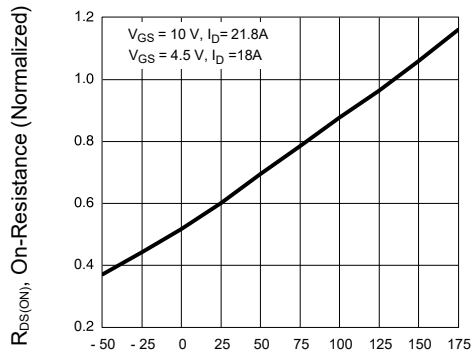



Figure 7: On-Resistance vs. Junction Temperature

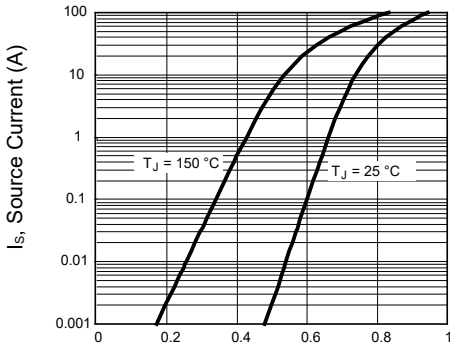



Figure 8: Forward Diode Voltage vs. Temperature

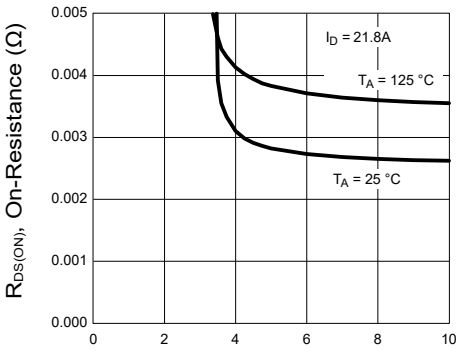



Figure 9: $R_{DS(ON)}$ vs. $V_{GS}$ vs. Temperature

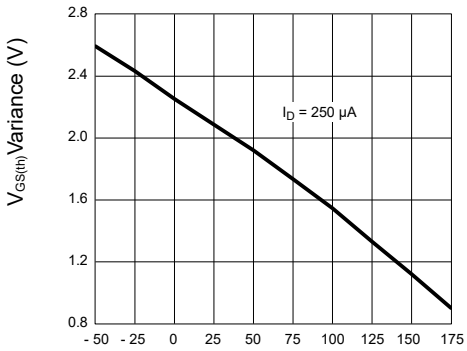



Figure 10: Threshold Voltage

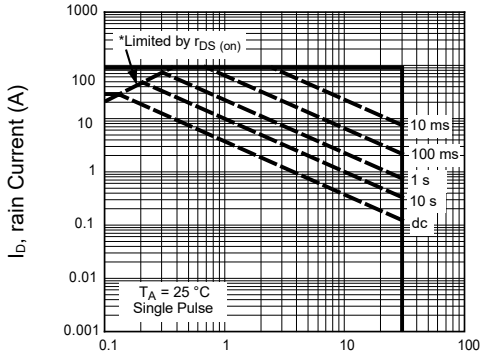



Figure 11: Safe Operating Area, Junction-to-Ambient

## 7.3Typical characteristic 25 °C, unless otherwise noted

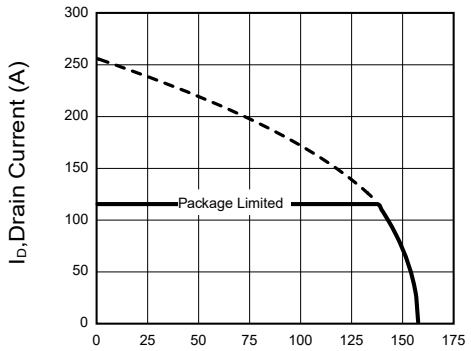



Figure 12: Current Derating*

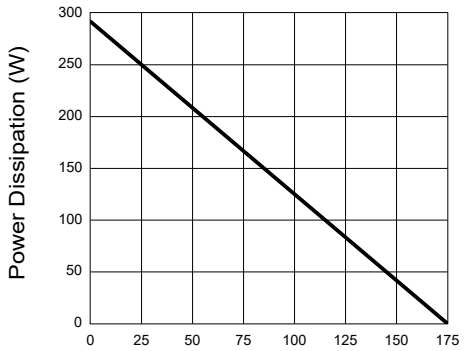



Figure 13: Power Derating

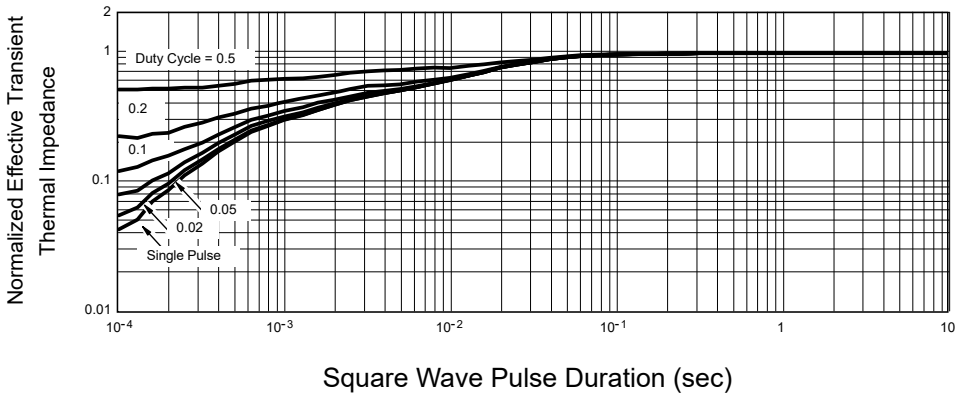
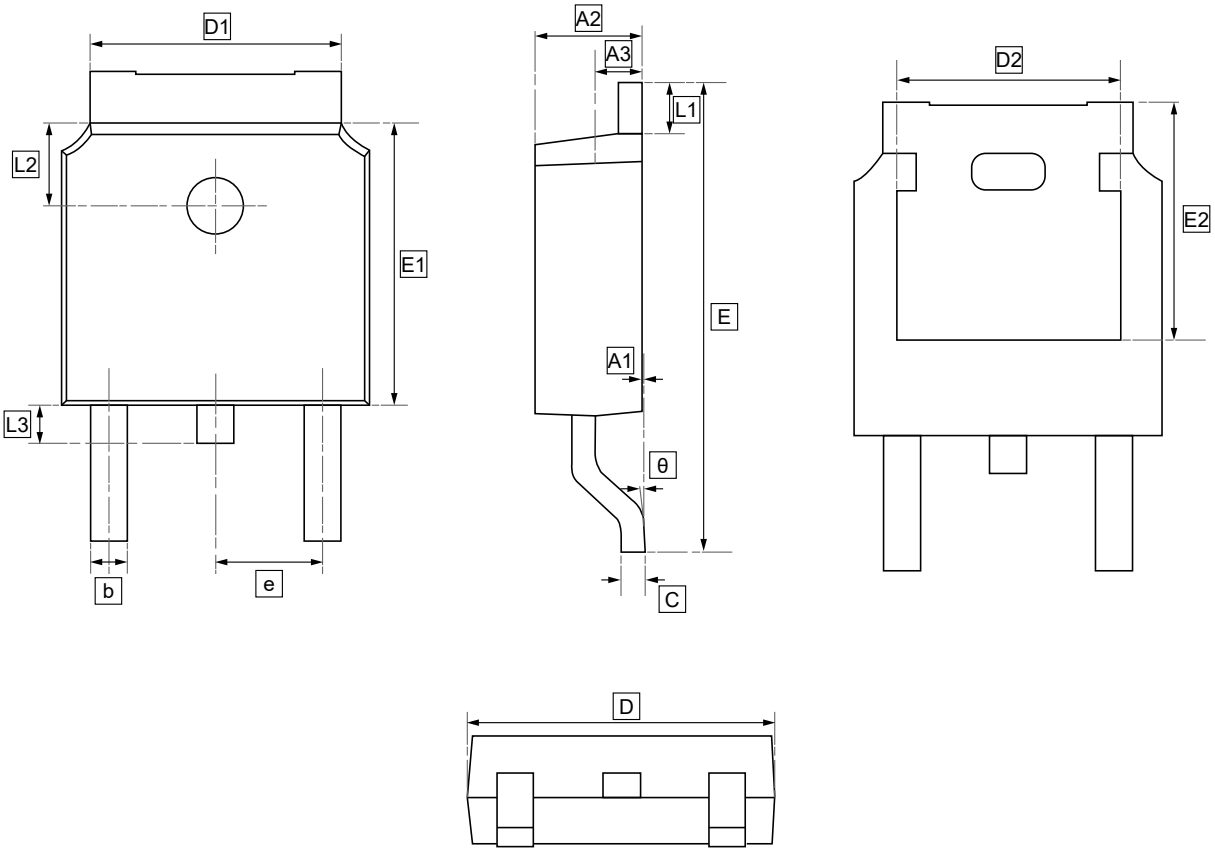



Figure 14: Normalized Thermal Transient Impedance, Junction-to-Case

* The power dissipation $P_D$ is based on $T_{J(max)}$ =175 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

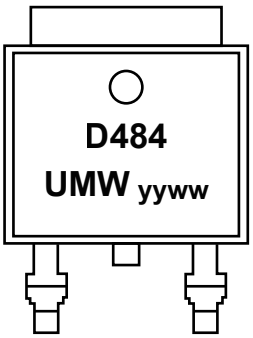
## 8.TO-252 Package Outline Dimensions




**DIMENSIONS (mm are the original dimensions)**

| Symbol | A1 | A2 | A3 | b | c | D | D1 | D2 | E | E1 | E2 | e | L1 | L2 | L3 | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 0.00 | 2.18 | 0.90 | 0.65 | 0.46 | 6.35 | 4.95 | 4.32 | 9.40 | 5.97 | 5.21 | 2.286 | 0.89 | 1.70 | 0.60 | 0.00 |
| Max | 0.13 | 2.39 | 1.10 | 0.85 | 0.61 | 6.73 | 5.46 | 4.90 | 10.41 | 6.22 | 5.38 | BSC | 1.27 | 1.90 | 1.00 | 8.00 |

## 9.Ordering information




yy: Year Code
ww: Week Code

| Order Code | Package | Base QTY | Delivery Mode |
|---|---|---|---|
| UMW AOD484 | TO-252 | 2500 | Tape and reel |

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