# UMW FDS6679AZ

-30V P-Channel MOSFET

## 1.Features

- $V_{DS(V)}$=-30V
- $Q_g$=29.5nC
- $R_{DS(ON)}$=11mΩ($V_{GS}$=-10V)
- $R_{DS(ON)}$=15mΩ($V_{GS}$=4.5V)

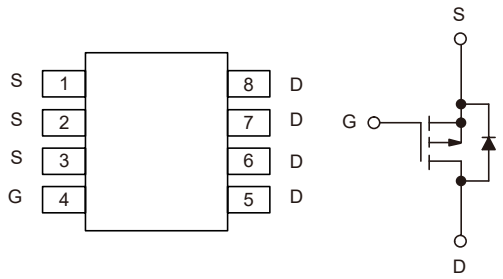
## 2.Applications

- Load Switch
- Notebook Adaptor Switch

## 3.Pinning information

| Pin | Symbol | Description |
|---|---|---|
| 1,2,3 | S | SOURCE |
| 4 | G | GATE |
| 5,6,7,8 | D | DRAIN |

**SOP-8**




## 4.Maximum ratings ($T_A$=25°C unless otherwise noted)

| Parameter | | Symbol | Ratings | Units |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | -30 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±25 | V |
| Drain Current - Continuous | (Note 1a) | $I_D$ | -13 | A |
| - Pulsed | | | -65 | A |
| Power Dissipation for Single Operation | (Note 1a) | $P_D$ | 2.5 | W |
| | (Note 1b) | | 1.2 | W |
| | (Note 1c) | | 1 | W |
| Operating and Storage Junction Temperature Range | | $T_J$,$T_{STG}$ | -55 to 150 | °C |

## 5.Thermal Characteristics

| Parameter | | Symbol | Ratings | Units |
|---|---|---|---|---|
| Thermal Resistance, Junction-to-Ambient | (Note 1a) | $R_{\theta JA}$ | 50 | °C/W |
| Thermal Resistance, Junction-to-Case | (Note 1) | $R_{\theta JC}$ | 25 | °C/W |

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

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{DS}$ | $V_{GS}$=0V, $I_D$=-250μA | -30 | | | V |
| $V_{DS}$ Temperature Coefficient | $\Delta V_{DS}/T_J$ | $I_D$=-250μA | | -34 | | mV/°C |
| $V_{GS(th)}$ Temperature Coefficient | $\Delta V_{GS(th)}/T_J$ | | | 5.3 | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -1.4 | | -2.5 | V |
| Gate-Source Leakage | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±25V | | | ±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 | | | -5 | |
| On-State Drain Current[a] | $I_{D(ON)}$ | $V_{DS}$≥-10V, $V_{GS}$=-10V | -30 | | | A |
| Drain-Source On-State Resistance[a] | $R_{DS(ON)}$ | $V_{GS}$=-10V, $I_D$=-10A | | 11 | | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-8A | | 15 | | |
| Forward Transconductance[a] | $g_{FS}$ | $V_{DS}$=-10V, $I_D$=-10A | | 28 | | S |
| **Dynamic** [b] | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-15V, $V_{GS}$=0V, f=1MHz | | 2550 | | pF |
| Output Capacitanc | $C_{oss}$ | | | 455 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 390 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-15V,$V_{GS}$=-10V | | 57 | 86 | nC |
| | | $I_D$=-10A | | 29.5 | 45 | |
| Gate Source Charge | $Q_{gs}$ | $V_{DS}$=-15V, $V_{GS}$=-4.5V | | 8 | | |
| Gate Drain Charge | $Q_{gd}$ | $I_D$=-10A | | 22 | | |
| Gate Resistance | $R_g$ | f=1MHz | 0.5 | 2.2 | 4.4 | Ω |
| Turn-On DelayTime | $t_{D(on)}$ | $V_{DD}$ =-15V, $R_L$=1.5Ω | | 13 | 25 | ns |
| Rise Time | $t_r$ | $I_D$≅-10A, $V_{GEN}$=-10V | | 12 | 24 | |
| Turn-Off DelayTime | $t_{D(off)}$ | $R_g$=1Ω | | 40 | 70 | |
| Fall Time | $t_f$ | | | 9 | 18 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | $t_{D(on)}$ | $V_{DD}$=-15V, $R_L$=1.5Ω<br>$I_D$≌-10V, $V_{GEN}$=-4.5V<br>$R_g$=1Ω | | 48 | 80 | ns |
| Rise Time | $t_r$ | | | 92 | 160 | ns |
| Turn-Off Delay Time | $t_{D(off)}$ | | | 34 | 60 | ns |
| Fall Time | $t_f$ | | | 19 | 35 | ns |
| **Drain-Source Body Diode Characteristics** | | | | | | |
| Continuous Source-Drain Diode Current | $I_S$ | $T_C$=25°C | | | -4.1 | A |
| Pulse Diode Forward Current | $I_{SM}$ | | | | -60 | A |
| Body Diode Voltage | $V_{SD}$ | $I_S$=-3A, $V_{GS}$=0V | | -0.75 | -1.2 | V |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$=-10A, dI/dt=100A/μs<br>$T_J$=25°C | | 27 | 45 | ns |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | | | 16 | 27 | nC |
| Reverse Recovery Fall Time | $t_a$ | | | 12 | | ns |
| Reverse Recovery Rise Time | $t_b$ | | | 15 | | ns |

Notes:

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

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

## 7.1Typical Characterisitics

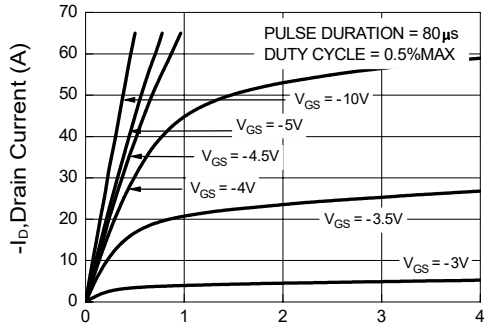



Figure 1: Output Characteristics

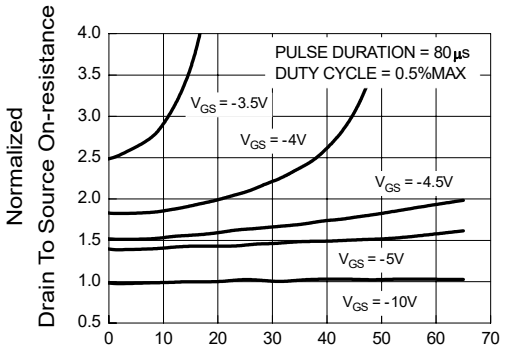



Figure 2: Normalized On-Resistance vs DrainCurrent and Gate Voltage

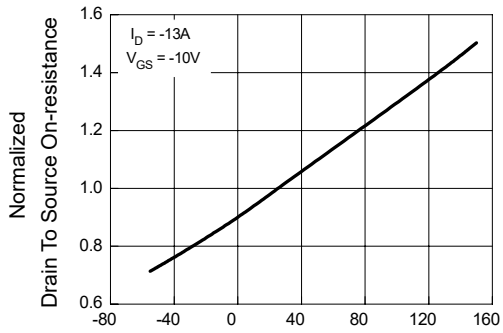



Figure 3: Normalized On Resistance vs Junction Temperature

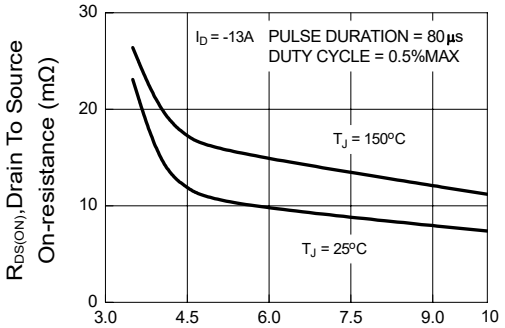



Figure 4: On-Resistance vs Gate to Source Voltage

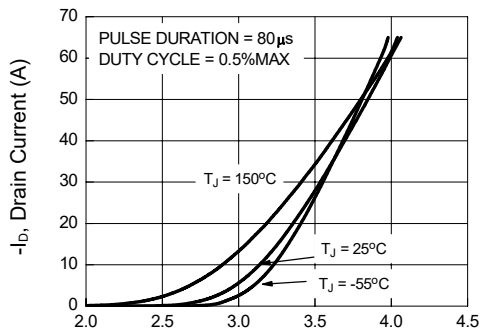



Figure 5: Transfer Characteristics

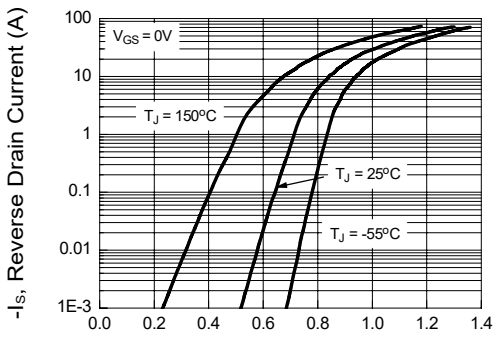



Figure 6: Source to Drain Diode Forward Voltage vs Source Current

## 7.2Typical Characterisitics

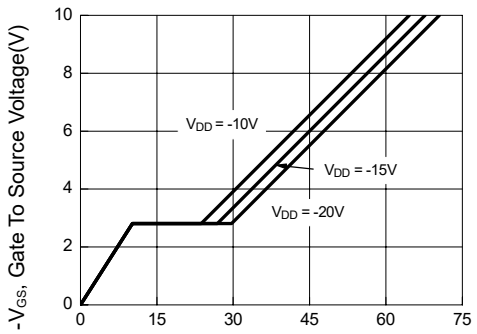



Figure 7: Gate Charge Characteristics

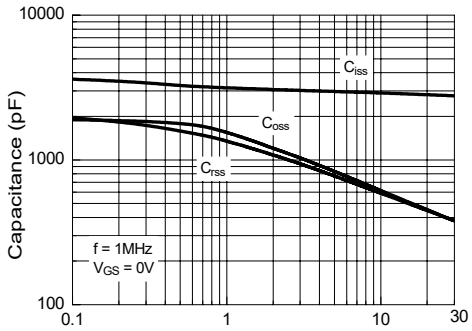



Figure 8: Capacitance vs Drain to Source Voltage

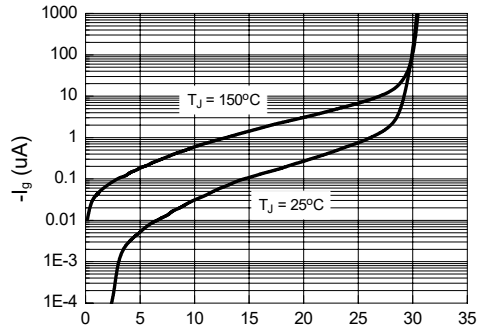



Figure 9: $I_g$ vs $V_{GS}$

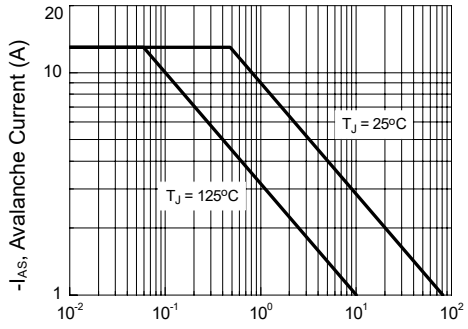



Figure 10: Unclamped Inductive Switching Capability

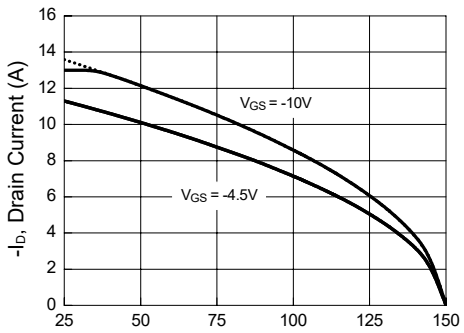



Figure 11: Maximum Continuous Drain Current vs Ambient Temperature

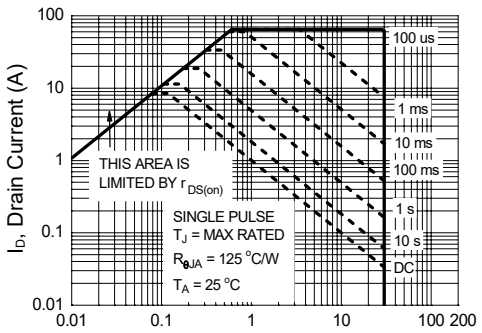



Figure 12: Forward Bias Safe Operating Area

## 7.3Typical Characterisitics

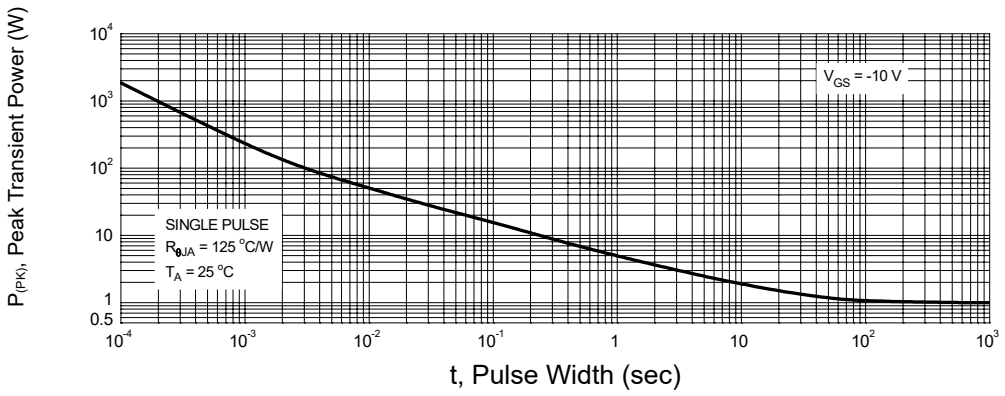



Figure 13: Single Pulse Maximum Power Dissipation

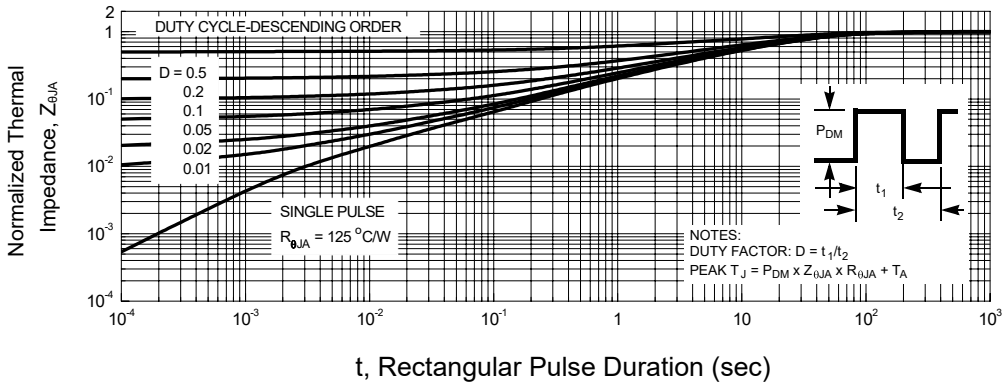
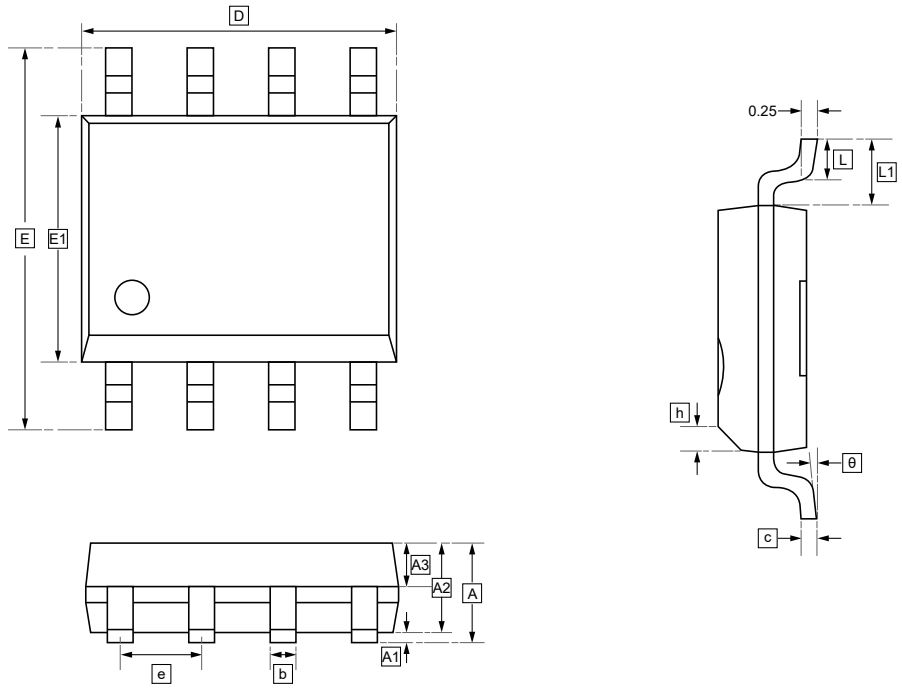



Figure 14: Junction-to-Ambient Transient Thermal Response Curve

## 8.SOP-8 Package Outline Dimensions

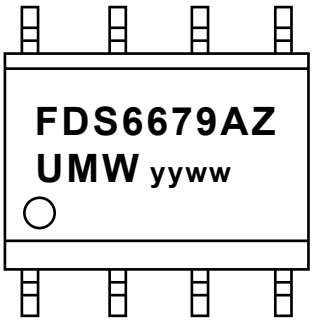



**DIMENSIONS (mm are the original dimensions)**

| Symbol | A | A1 | A2 | A3 | b | c | D | E | E1 | e | h | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Min** | - | 0.05 | 1.30 | 0.60 | 0.39 | 0.20 | 4.80 | 5.80 | 3.80 | 1.24 | 0.30 | 0.50 |
| **Max** | 1.75 | 0.20 | 1.50 | 0.70 | 0.47 | 0.24 | 5.00 | 6.20 | 4.00 | 1.30 | 0.50 | 0.80 |

| Symbol | L1 | θ |
|---|---|---|
| **Min** | 1.00 | 0° |
| **Max** | 1.10 | 8° |

## 9.Ordering information




yy: Year Code
ww: Week Code

| Order Code | Package | Base QTY | Delivery Mode |
|---|---|---|---|
| UMW FDS6679AZ | SOP-8 | 3000 | Tape and reel |

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