UMW AO4466

30V N-Channel MOSFET

1.Description

The AO4466 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

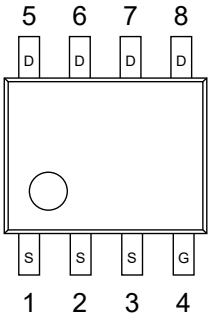
2.Features

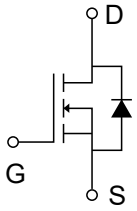
- $V_{DS\ (V)}$=30V
- I_D=10A
- $R_{DS(ON)}$<18mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<25mΩ(V_{GS}=4.5V)

3.Pinning information

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

SOP-8





4.Absolute Maximum Ratings T_A= 25°C

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current [AF]	T_A=25°C	I_D	10	A
	T_A=70°C		7	
Pulsed Drain Current [B]		I_{DM}	64	
Power Dissipation	T_A=25°C	P_D	3.1	W
	T_A=70°C		2	W
Avalanche Current [B, G]		I_{AR}	12	A
Repetitive avalanche energy 0.1mH [B, G]		E_{AR}	7	mJ
unction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

5.Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	36	40	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		62	75	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	18	24	°C/W

6.Electrical Characteristic (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
		T_J=55°C			5	μA
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	1.5	2.5	V
On state drain current	$I_{D(ON)}$	V_{GS}=4.5V, V_{DS}=5V	64			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A		13	18	mΩ
		V_{GS}=4.5V, I_D=5A		19	25	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=3A		17		S
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.75	1	V
Maximum Body-Diode Continuous Current	I_S				2.4	A
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz	298	373	448	pF
Output Capacitance	C_{oss}		46	67	88	pF
Reverse Transfer Capacitance	C_{rss}		24	41	58	pF
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	0.6	1.8	2.8	Ω
Total Gate Charge	Q_g(10V)	V_{GS}=10V, V_{DS}=15V, I_D=10A	5.7	7.1	8.6	nC
Total Gate Charge	Q_g(4.5V)		2.7	3.5	4.2	nC
Gate Source Charge	Q_{gs}			1.2		nC
Gate Drain Charge	Q_{gd}			1.6		nC
Turn-On DelayTime	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V, R_L=1.5Ω, R_{GEN}=3Ω		4.3		ns
Turn-On Rise Time	t_r			2.8		ns
Turn-Off DelayTime	$t_{D(off)}$			15.8		ns
Turn-Off Fall Time	t_f			3		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F=10A, dI/dt=100A/μs	8.4	10.5	12.6	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=10A, dI/dt=100A/μs	3.6	4.5	5.4	nC
Body Diode Reverse Recovery Time	t_{rr}	I_F=10A, dI/dt=500A/μs	4.7	6	7.2	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=10A, dI/dt=500A/μs	5.3	6.6	8	nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient.

D. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in ^{2} FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

F. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

G: L=100uH, V_{DD}=0V, R_G=0Ω, rated V_{DS}=30V and V_{GS}=10V

7.1Typical characteristic

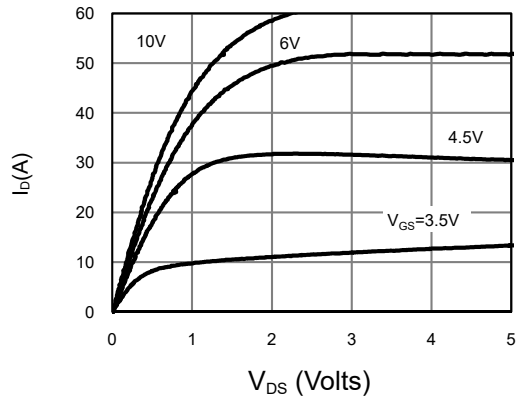


Fig 1: On-Region Characteristics

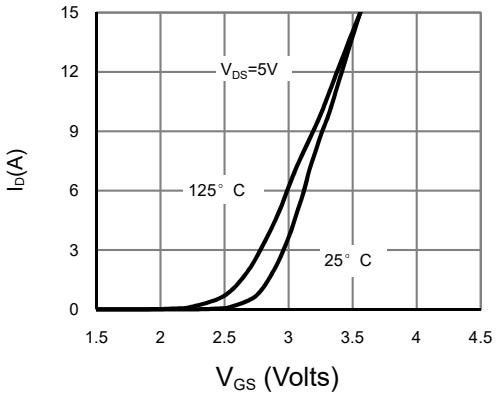


Figure 2: Transfer Characteristics

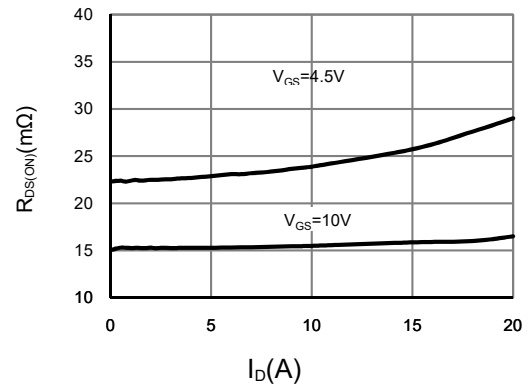


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

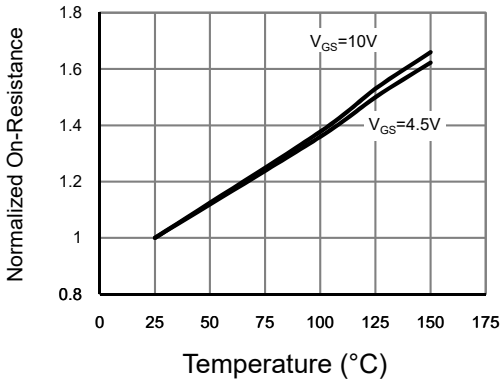


Figure 4: On-Resistance vs. Junction Temperature

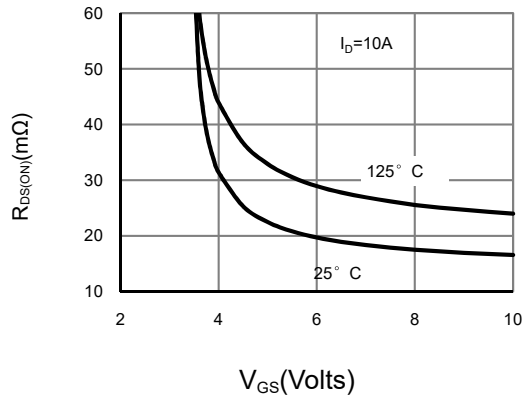


Figure 5: On-Resistance vs. Gate-Source Voltage

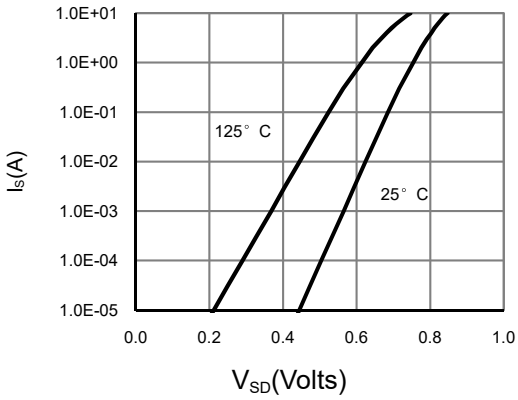


Figure 6: Body-Diode Characteristics

7.2Typical characteristic

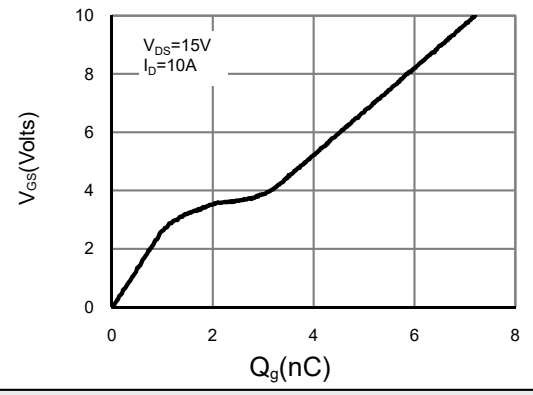


Figure 7: Gate-Charge Characteristics

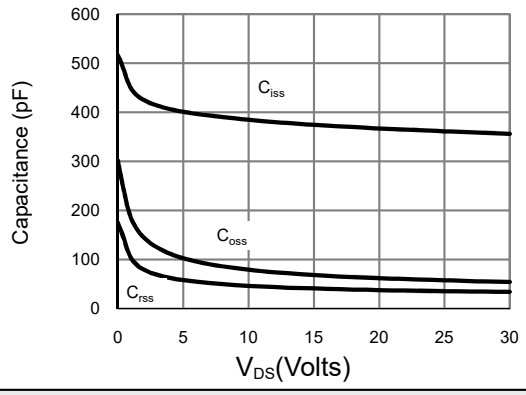


Figure 8: Capacitance Characteristics

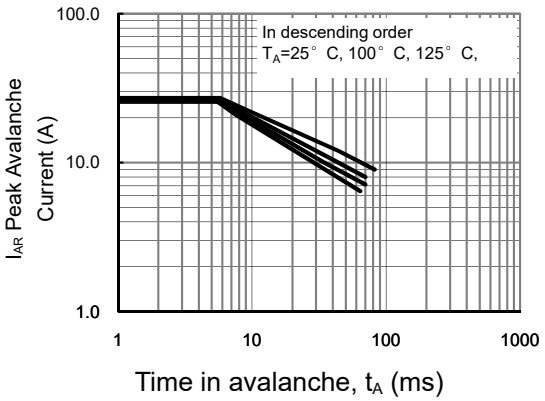


Figure 9: Single Pulse Avalanche capability

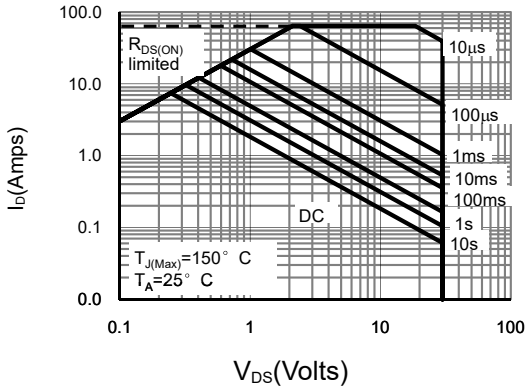


Figure 10: Maximum Forward Biased Safe Operating Area (Note E)

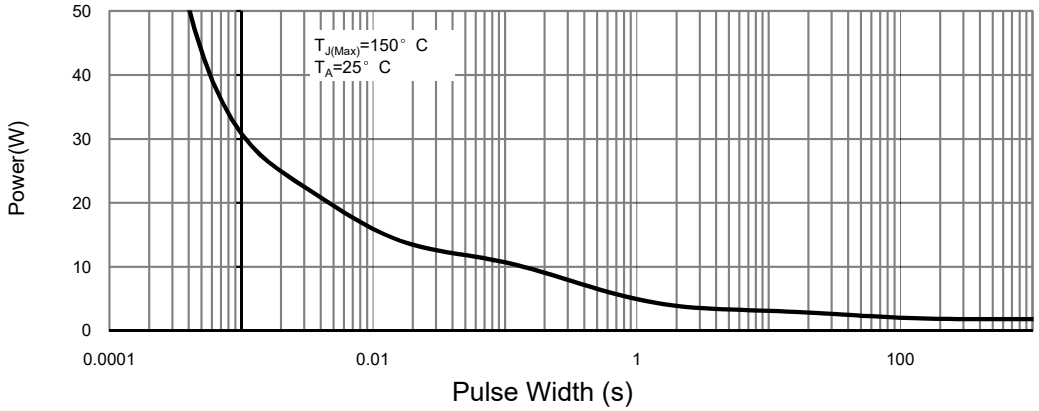


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note E)

7.3Typical characteristic

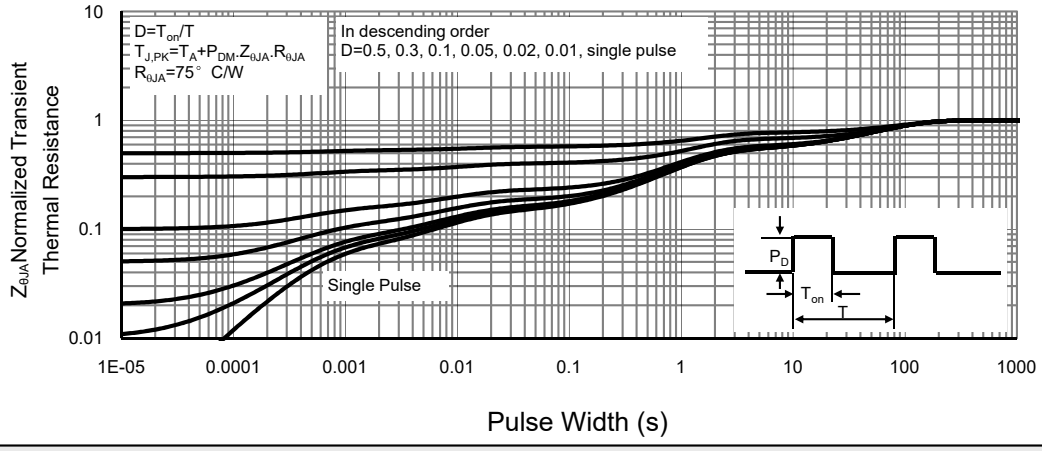
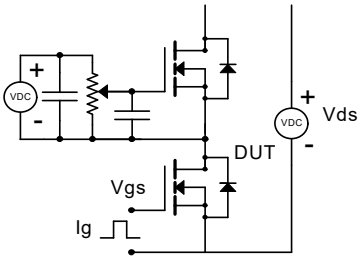
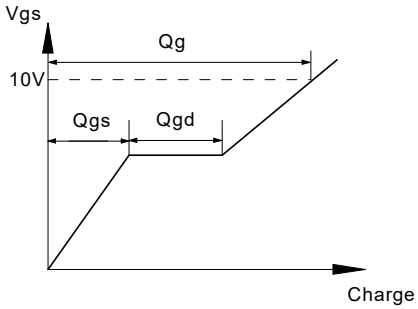


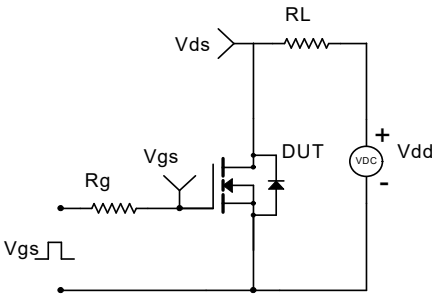
Figure 12: Normalized Maximum Transient Thermal Impedance

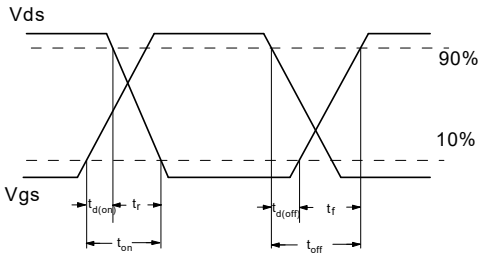
Gate Charge Test Circuit & Waveform



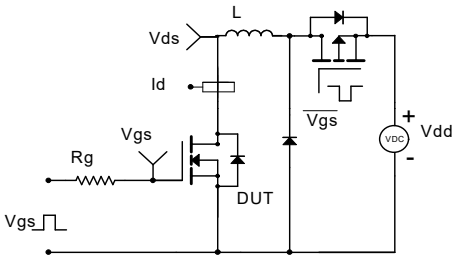


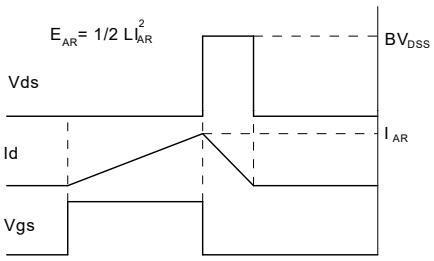
Resistive Switching Test Circuit & Waveforms



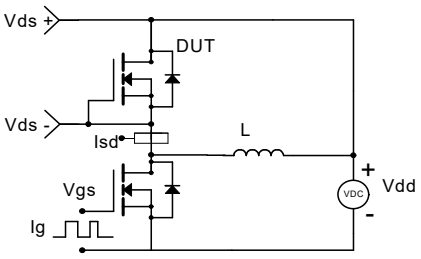


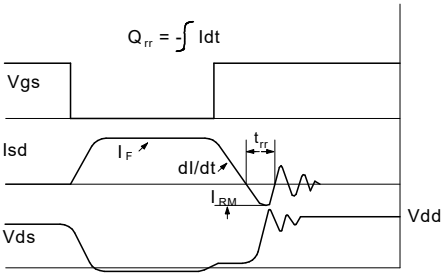
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



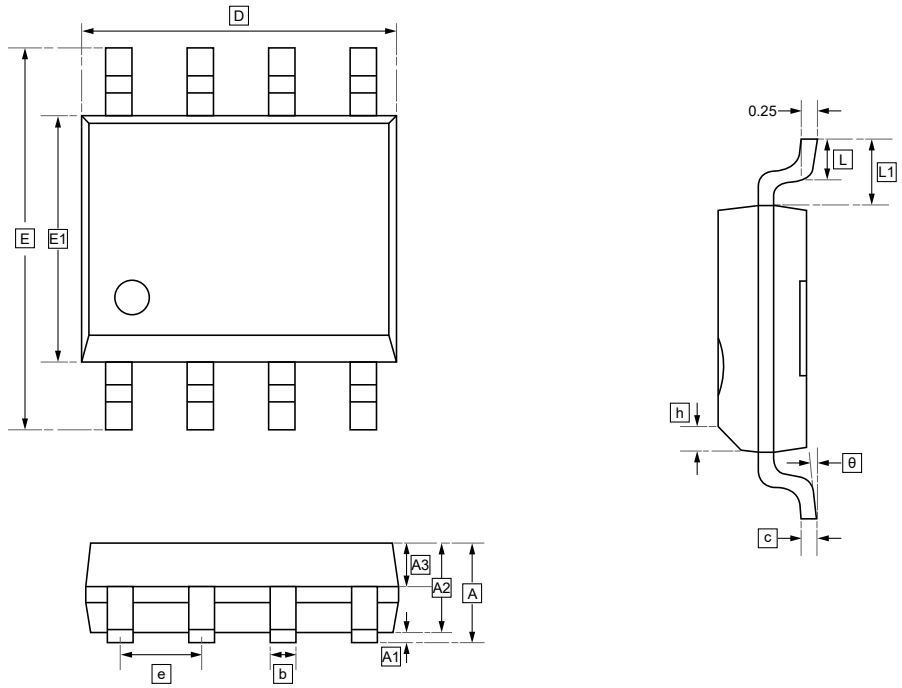


Diode Recovery Test Circuit & Waveforms





8.SOP-8 Package Outline Dimensions

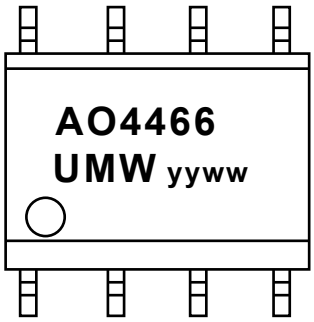


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.70	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.10	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 AO4466	SOP-8	3000	Tape and reel

10.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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