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.

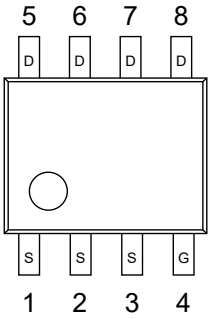
2.Features

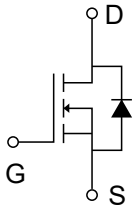
- $V_{DS\ (V)}$=30V
- I_D=10A
- $R_{DS(ON)}$<18mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<25mΩ(V_{GS}=4.5V)

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

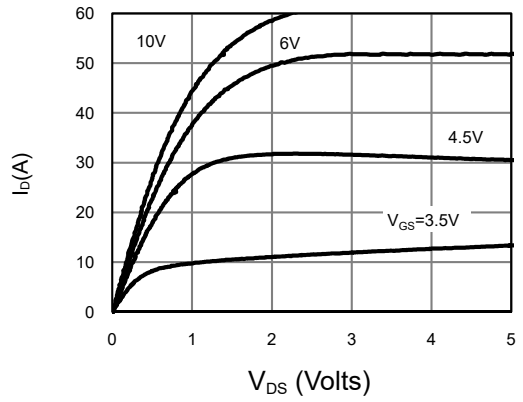


Fig 1: On-Region Characteristics

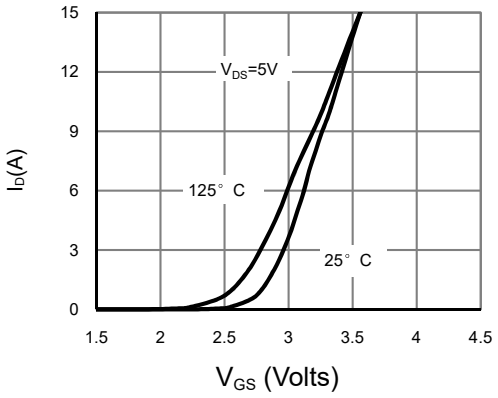


Figure 2: Transfer Characteristics

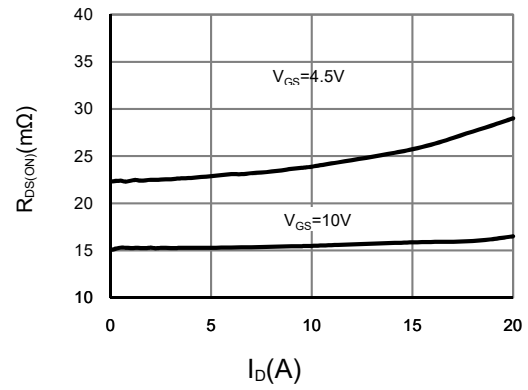


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

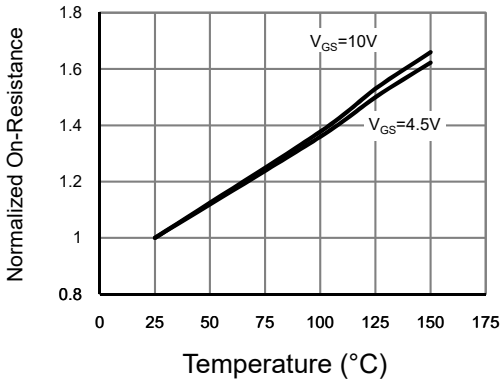


Figure 4: On-Resistance vs. Junction Temperature

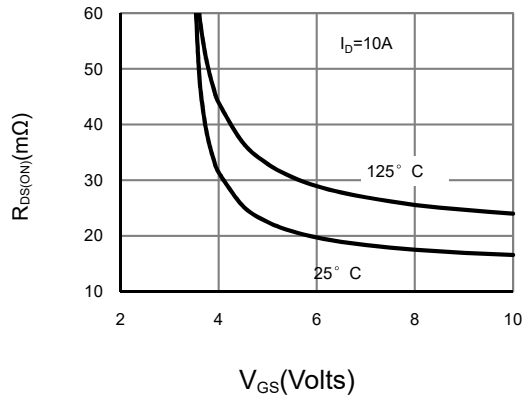


Figure 5: On-Resistance vs. Gate-Source Voltage

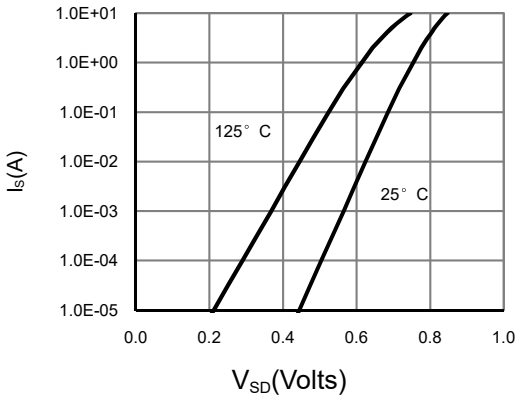


Figure 6: Body-Diode Characteristics

7.2Typical characteristic

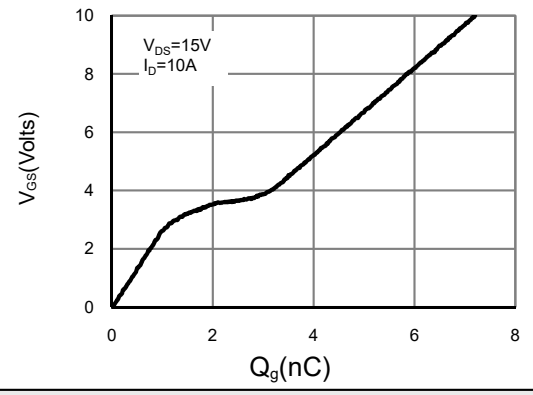


Figure 7: Gate-Charge Characteristics

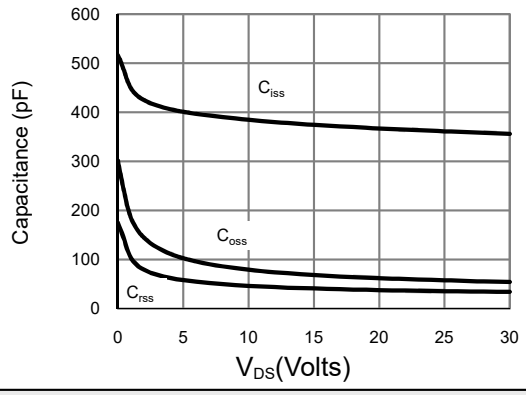


Figure 8: Capacitance Characteristics

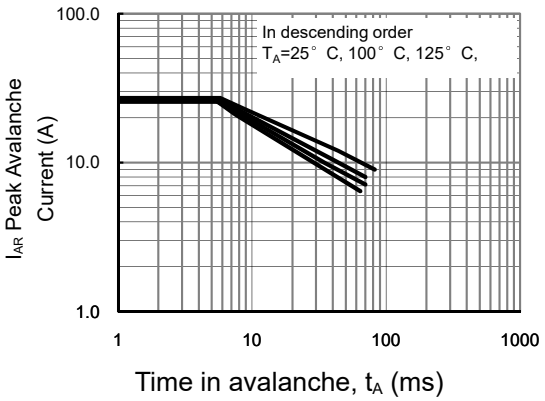


Figure 9: Single Pulse Avalanche capability

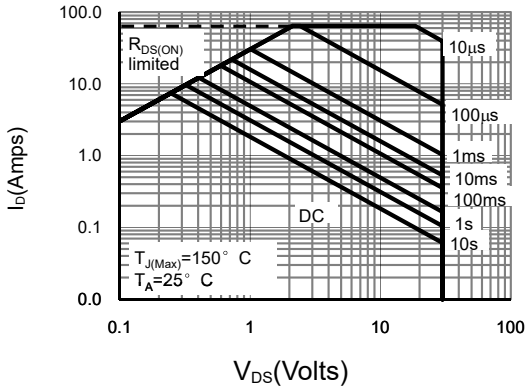


Figure 10: Maximum Forward Biased Safe Operating Area (Note E)

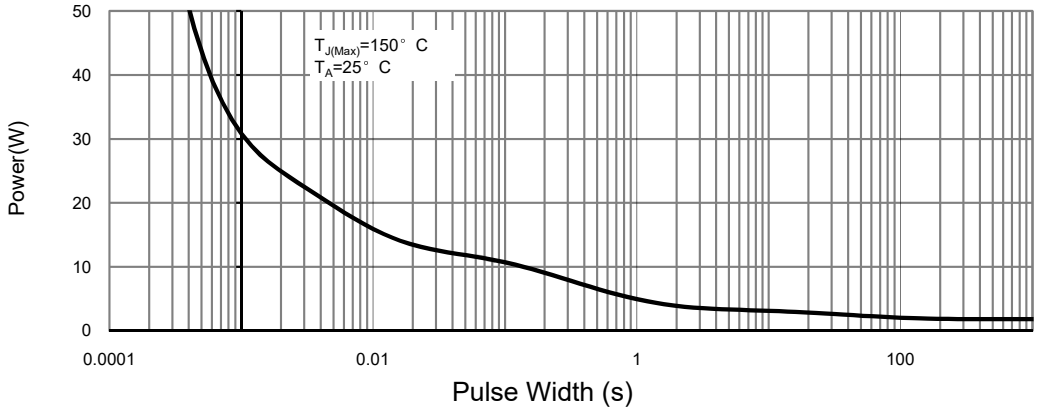


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note E)

7.3Typical characteristic

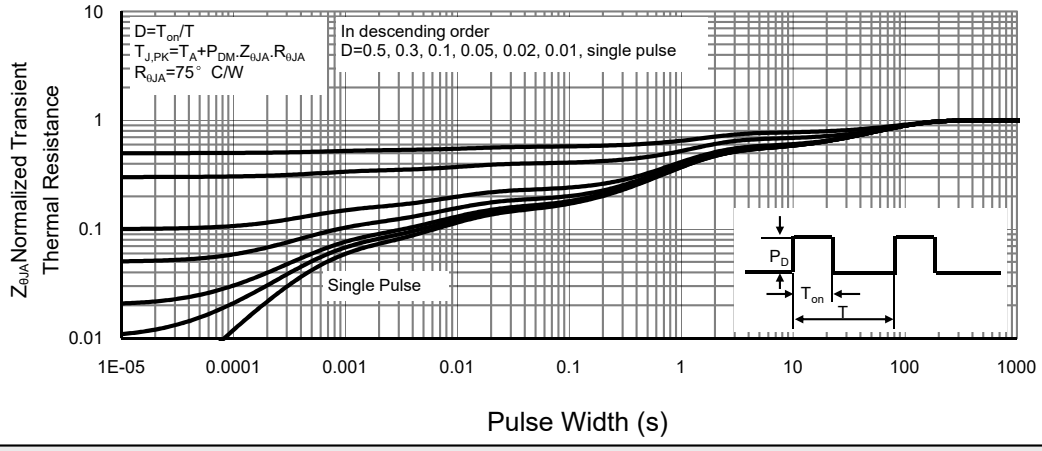
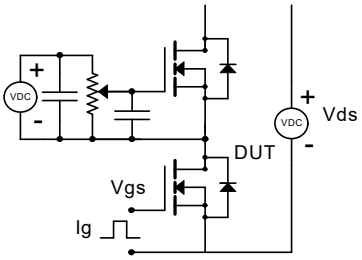
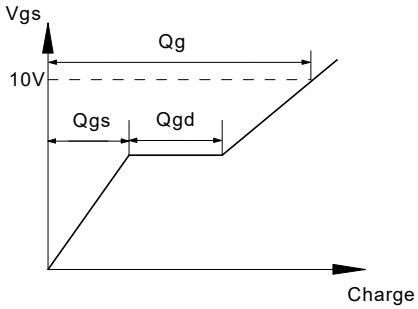


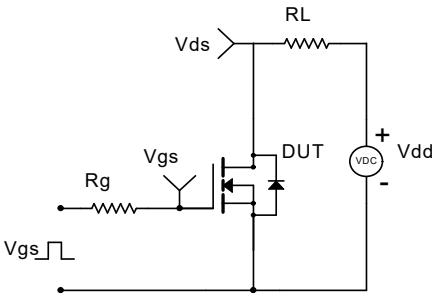
Figure 12: Normalized Maximum Transient Thermal Impedance

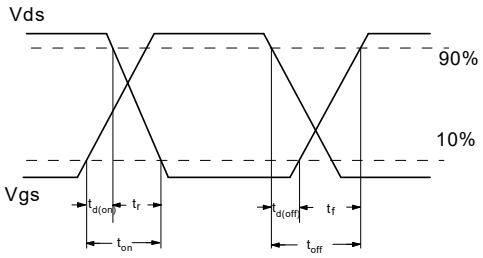
Gate Charge Test Circuit & Waveform



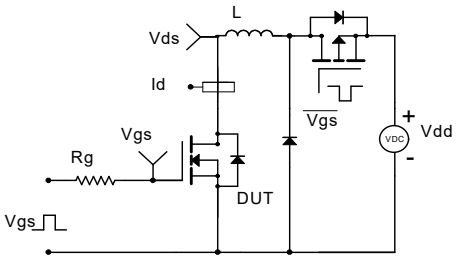


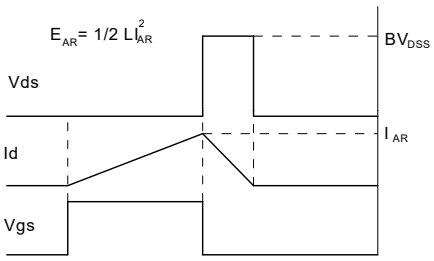
Resistive Switching Test Circuit & Waveforms



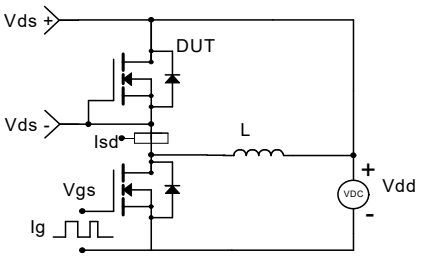


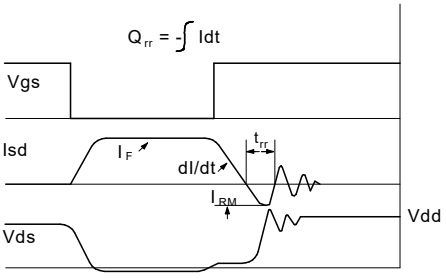
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



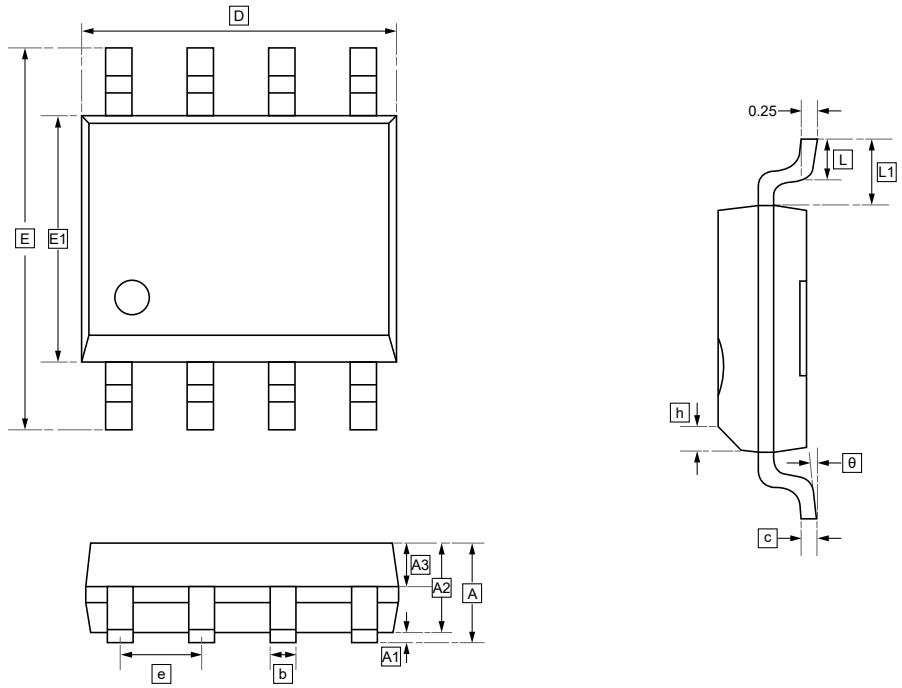


Diode Recovery Test Circuit & Waveforms





8.SOP-8 Package Outline Dimensions

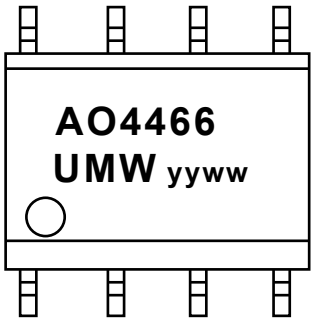


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.80	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 AO4466	SOP-8	3000	Tape and reel

10.Disclaimer

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