

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.

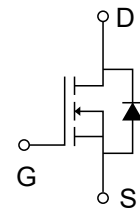
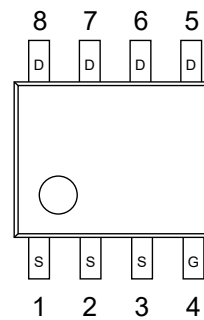
2.Features

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

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 $T_A=25^{\circ}C$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^{AF}	$T_A=25^{\circ}C$	I_D	10	A
	$T_A=70^{\circ}C$		7	
Pulsed Drain Current ^B		I_{DM}	64	
Power Dissipation	$T_A=25^{\circ}C$	P_D	3.1	W
	$T_A=70^{\circ}C$		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	$^{\circ}C$



5.Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	t ≤ 10s	R _{θJA}	36	40	°C/W
Maximum Junction-to-Ambient ^A	Steady-State		62	75	°C/W
Maximum Junction-to-Lead ^C	Steady-State	R _{θJL}	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 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. 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 impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

D. The static characteristics in Figures 1 to 6 are obtained using $<300\ \mu\text{s}$ 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 $T_A=25^{\circ}\text{C}$. The SOA curve provides a single pulse rating.

F. The current rating is based on the $t \leq 10\text{s}$ junction to ambient thermal resistance rating.

G: $L=100\mu\text{H}$, $V_{DD}=0\text{V}$, $R_G=0\Omega$, rated $V_{DS}=30\text{V}$ and $V_{GS}=10\text{V}$



7.1Typical characteristic

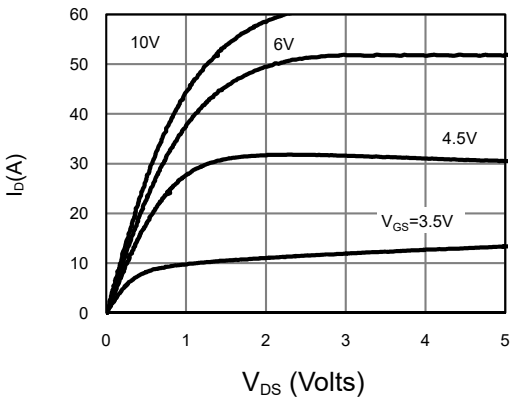


Fig 1: On-Region Characteristics

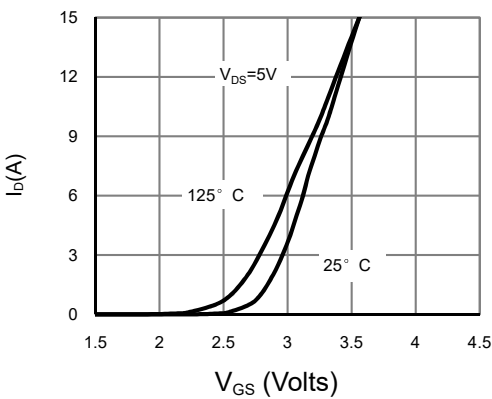


Figure 2: Transfer Characteristics

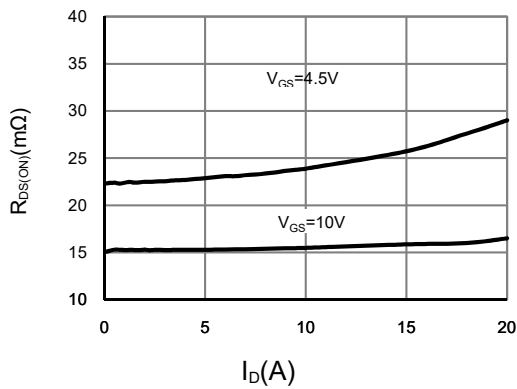


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

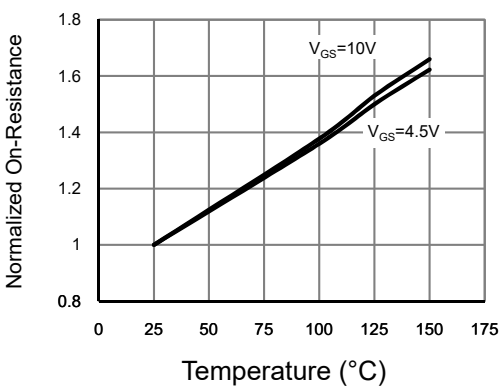


Figure 4: On-Resistance vs. Junction Temperature

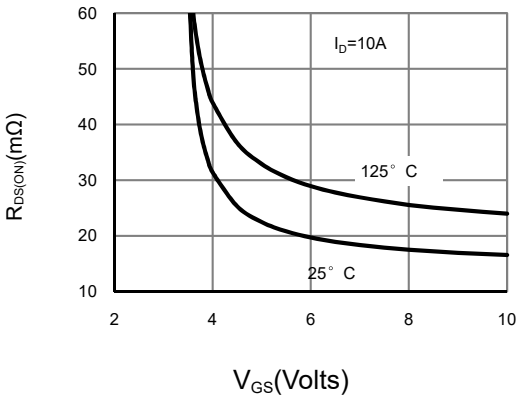


Figure 5: On-Resistance vs. Gate-Source Voltage

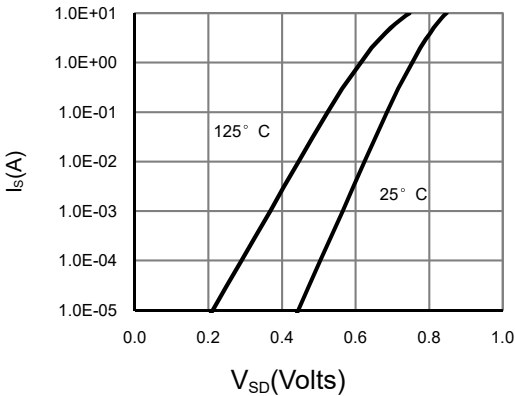


Figure 6: Body-Diode Characteristics



7.2 Typical characteristic

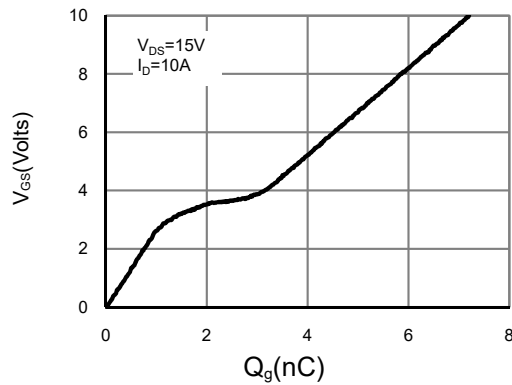


Figure 7: Gate-Charge Characteristics

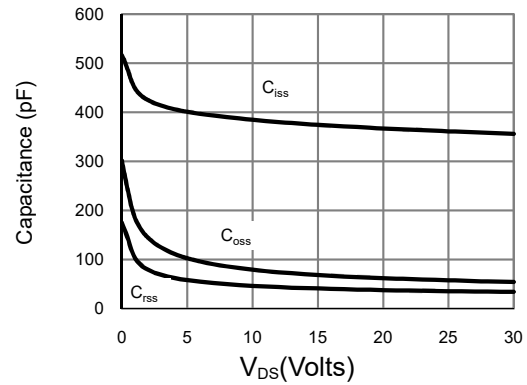


Figure 8: Capacitance Characteristics

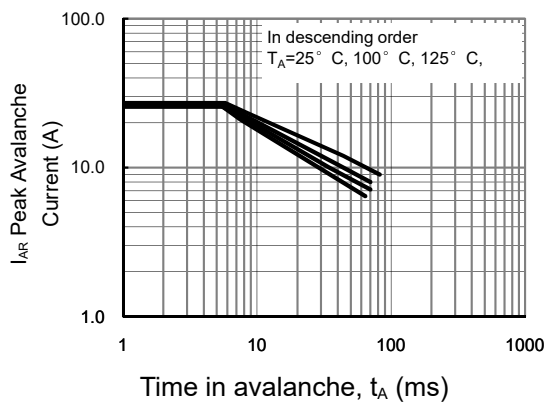


Figure 9: Single Pulse Avalanche capability

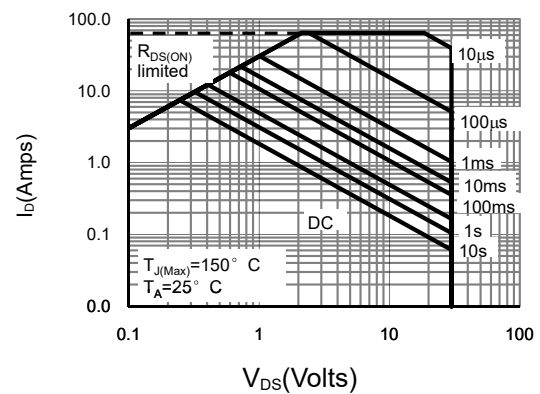


Figure 10: Maximum Forward Biased Safe Operating Area (Note E)

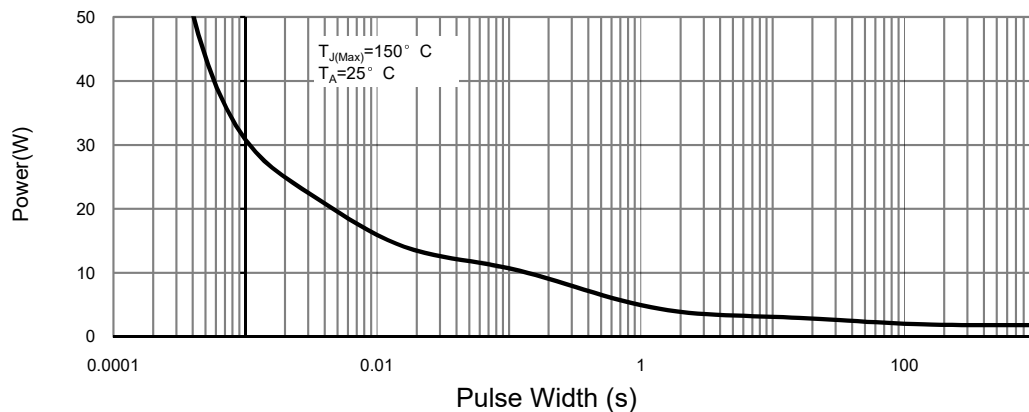


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note E)



7.3Typical characteristic

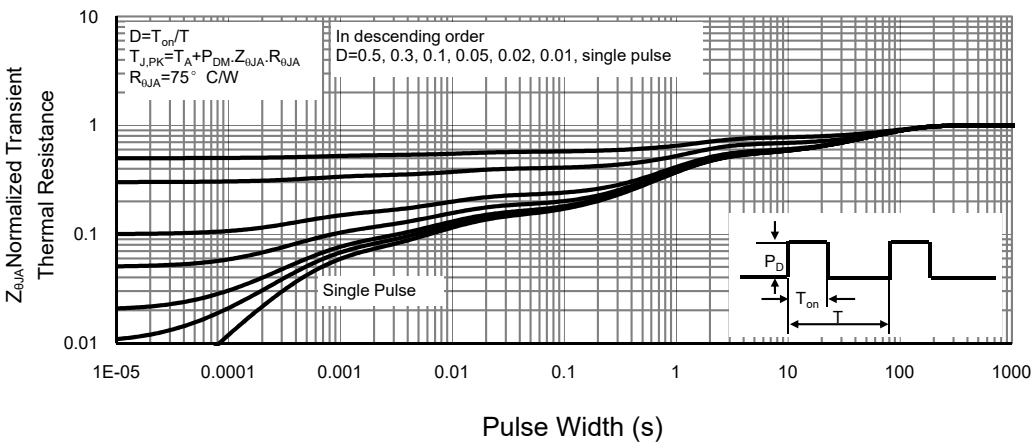
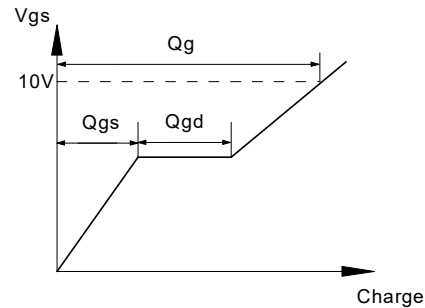
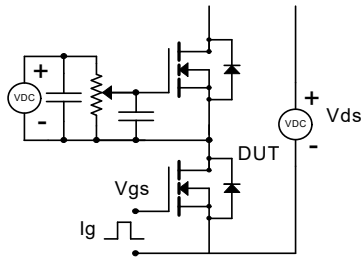


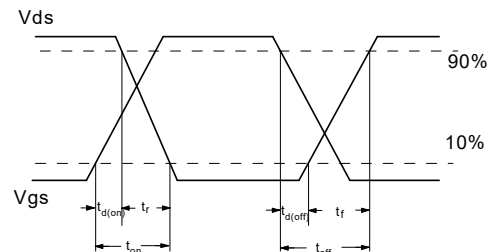
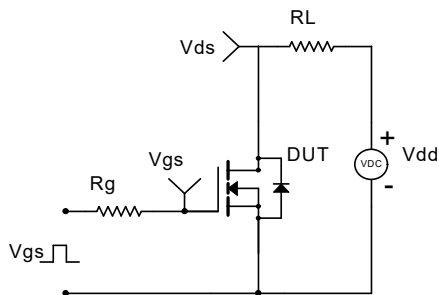
Figure 12: Normalized Maximum Transient Thermal Impedance



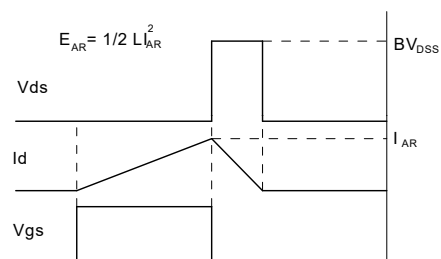
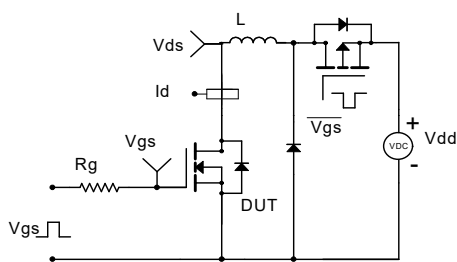
Gate Charge Test Circuit & Waveform



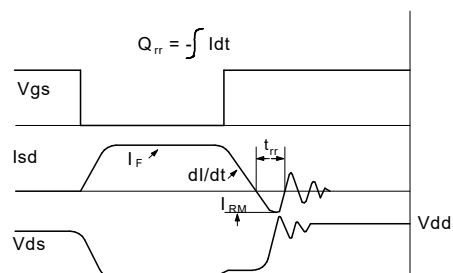
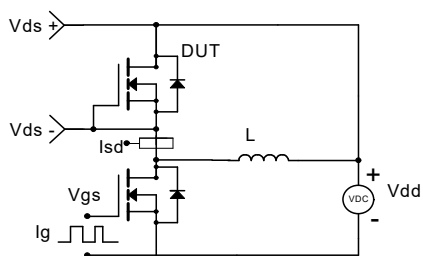
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

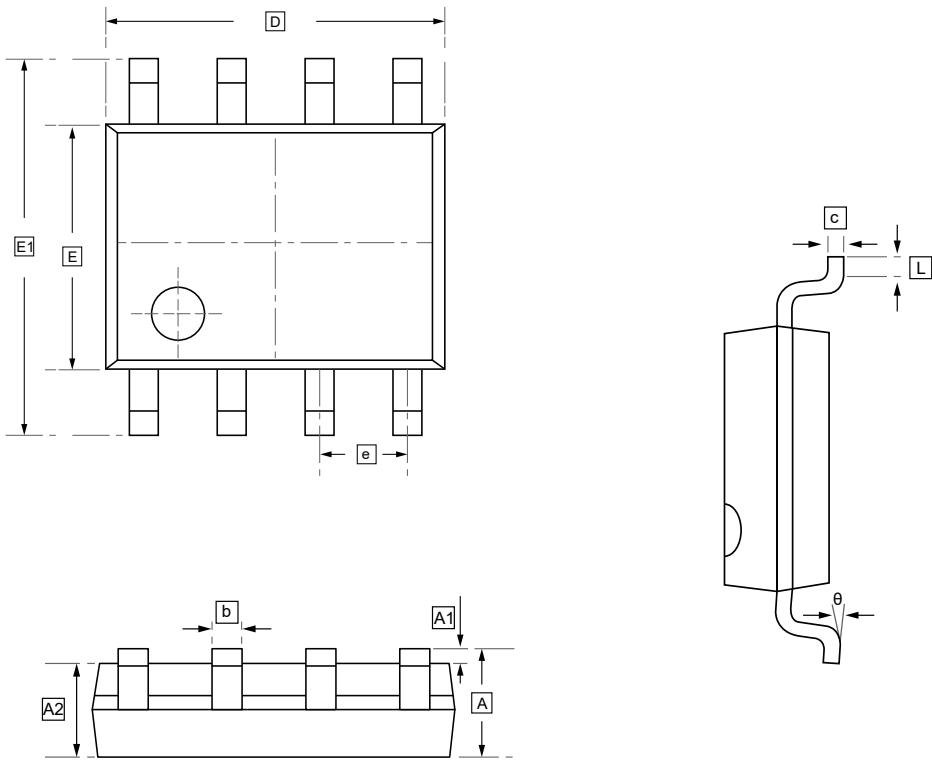


Diode Recovery Test Circuit & Waveforms





8.SOP-8 Package Outline Dimensions

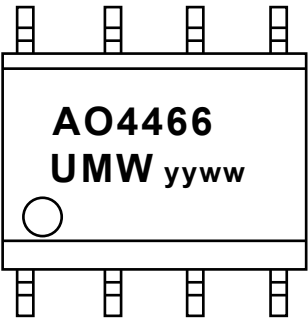


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	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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