UMW AO3416A

N-Channel MOSFET

1.Description

The AO3416A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V.This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

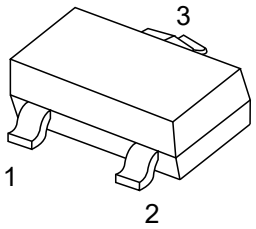
2.Features

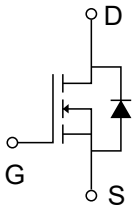
- $V_{DS\ (V)}$=20V
- I_D=6.5A
- $R_{DS(ON)}$<25mΩ(V_{GS}=4.5V)
- $R_{DS(ON)}$<33mΩ(V_{GS}=2.5V)
- $R_{DS(ON)}$<51mΩ(V_{GS}=1.8V)

3.Pinning information

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

SOT-23





4.Absolute Maximum Ratings T_A= 25°C

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current	T_A=25°C	I_D	6.5	A
	T_A=70°C		5	
Pulsed Drain Current		I_{DM}	30	
Power Dissipation	T_A=25°C	P_D	1.4	W
	T_A=70°C		0.9	
Thermal Resistance.Junction- to-Ambient	t ≤10sec	R_{thJA}	90	°C/W
	Steady State		125	
Thermal Resistance.Junction- to-Lead		R_{thJF}	80	
Junction Temperature		T_J	-55 to 150	°C
Storage Temperature Range		T_{STG}	-55 to 150	

5.Electrical Characteristics T_A= 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
		V_{DS}=20V, V_{GS}=0V, T_A=70°C			5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.4		1.1	V
On-State Drain Current	$I_{D(ON)}$	V_{DS}=5V, V_{GS}=4.5V	30			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=6.5A			25	mΩ
		V_{GS}=2.5V, I_D=5.5A			33	
		V_{GS}=1.8V, I_D=5A			51	
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=6.5A		50		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=10V, f=1MHz		1295	1650	pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			87		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.8		KΩ
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=10V I_D=6.5A		10		nC
Gate Source Charge	Q_{gs}			4.2		
Gate Drain Charge	Q_{gd}			2.6		
Turn-On DelayTime	$t_{D(on)}$	V_{DS}=10V, V_{GEN}=4.5V R_L=1.54Ω, R_{GEN}=3Ω		280		ns
Turn-On Rise Time	t_r			328		
Turn-Off DelayTime	$t_{D(off)}$			3.76		
Turn-Off Fall Time	t_f			2.24		
Body Diode Reverse Recovery Time	t_{rr}	I_F=6.5A, dI/dt=100A/μs		31	41	
Body Diode Reverse Recovery Charge	Q_{rr}			6.8		nC
Maximum Body-Diode Continuous Current	I_S				2	A
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.62	1	V

*1 Pulse test: PW ≤ 300u s duty cycle≤ 2%.

6.1Typical Characterisitics

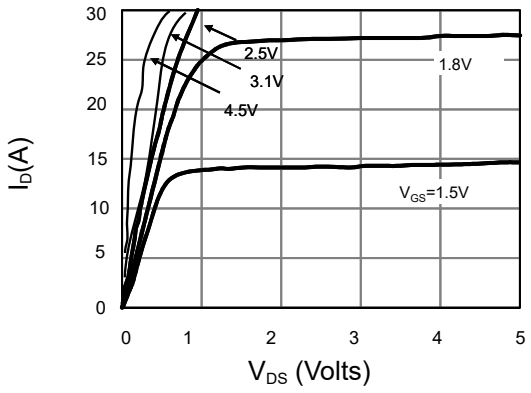


Fig 1: On-Region Characteristics

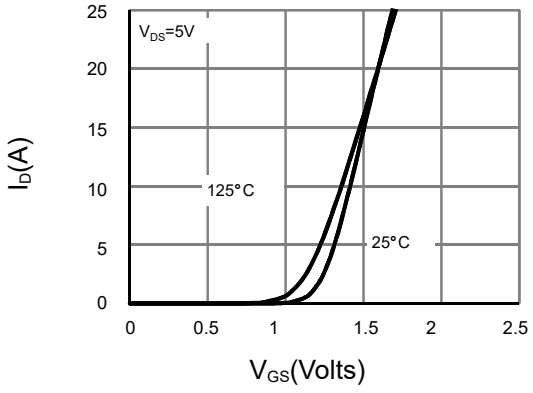


Figure 2: Transfer Characteristics

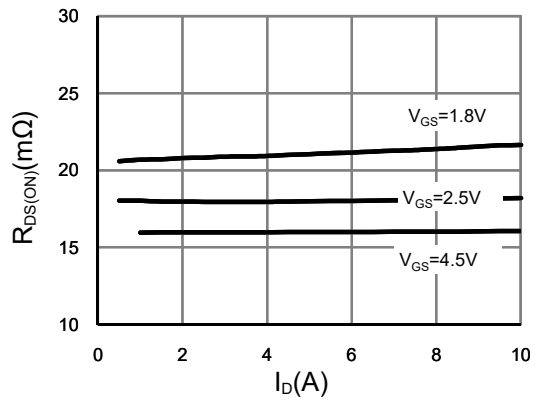


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

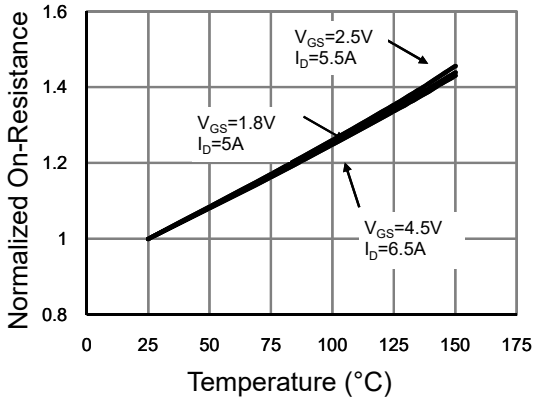


Figure 4: On-Resistance vs. Junction Temperature

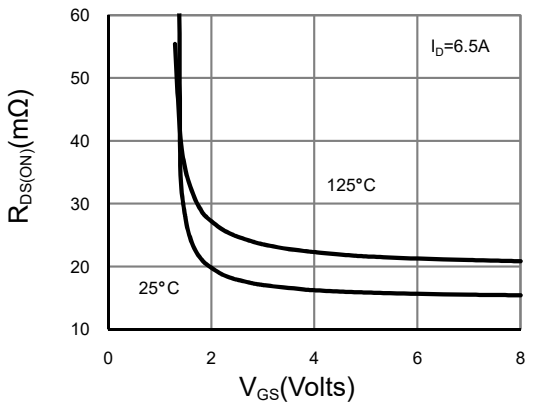


Figure 5: On-Resistance vs. Gate-Source Voltage

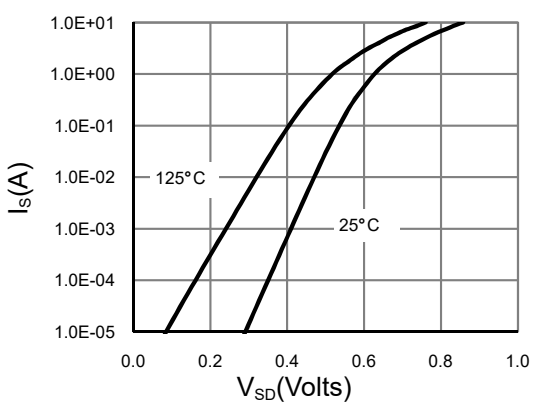


Figure 6: Body-Diode Characteristics

6.2Typical Characterisitics

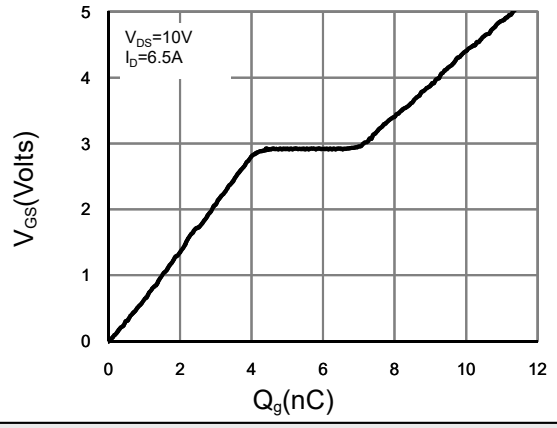


Figure 7: Gate-Charge Characteristics

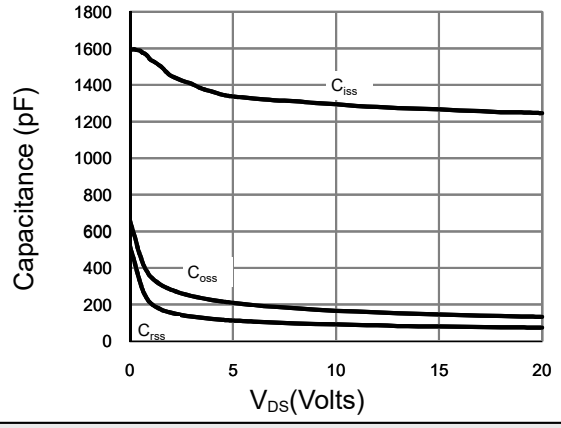


Figure 8: Capacitance Characteristics

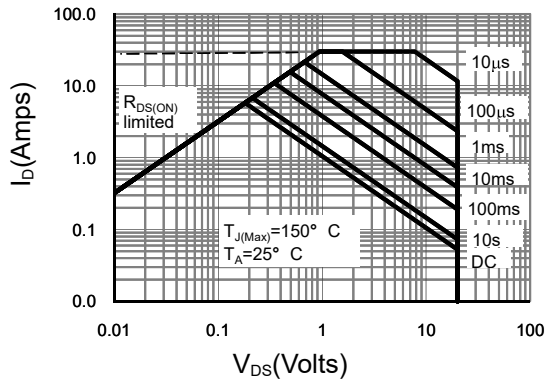


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

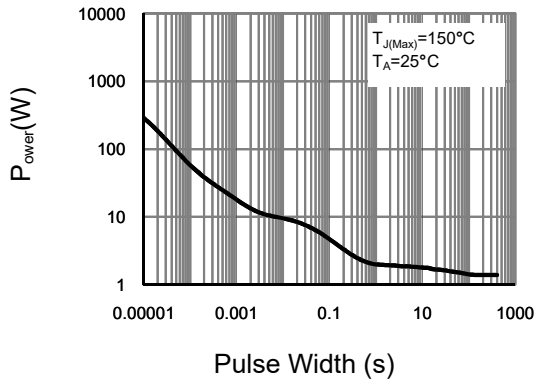


Figure 10: Single Pulse Power Rating Junction-to -Ambient (Note E)

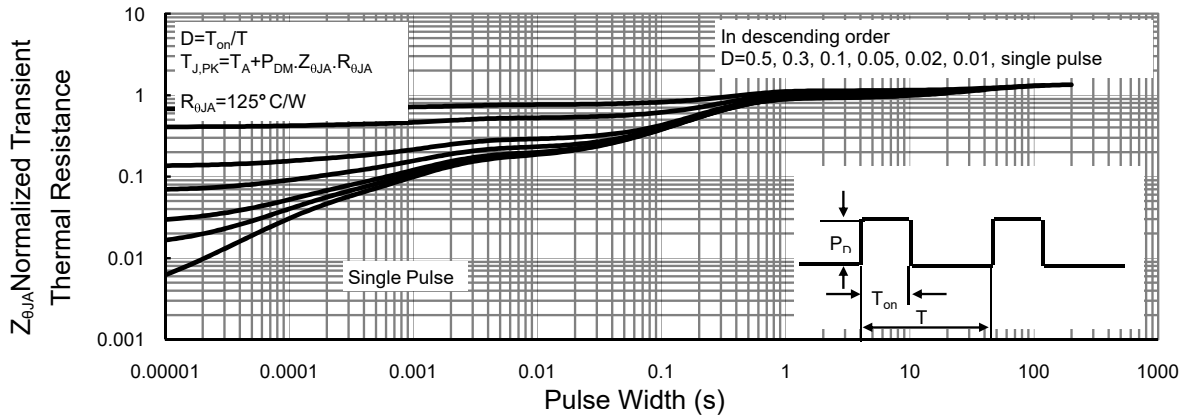
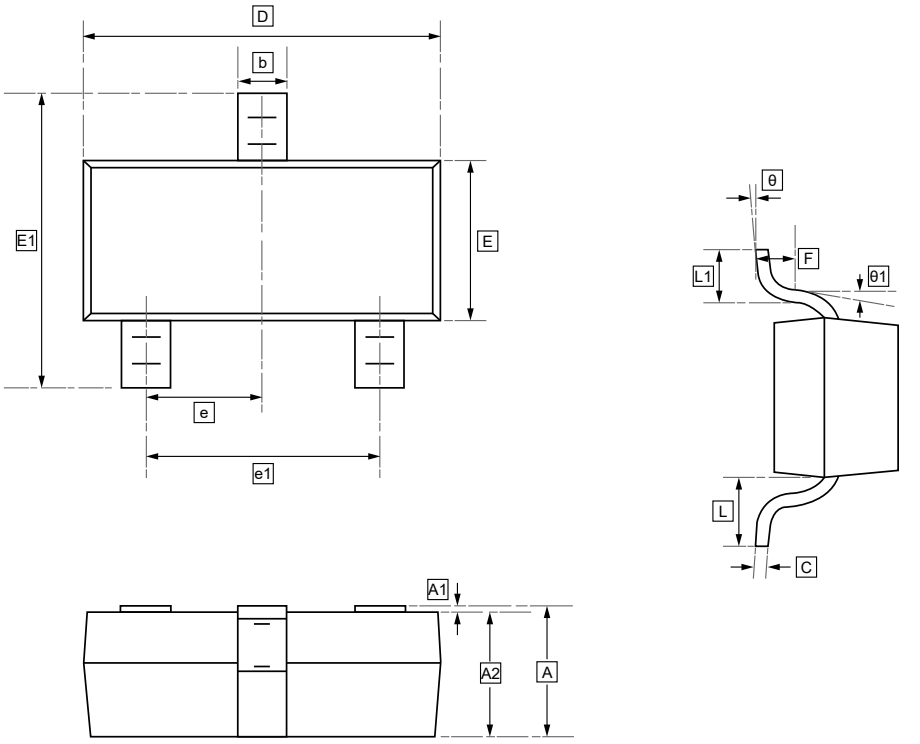


Figure 11: Normalized Maximum Transient Thermal Impedance

7.SOT-23 Package Outline Dimensions

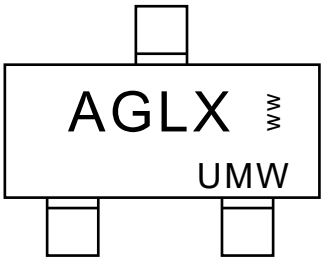


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°

8.Ordering information



ww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW AO3416A	SOT-23	3000	Tape and reel

9.Disclaimer

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