

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.

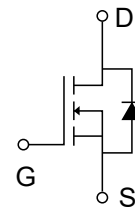
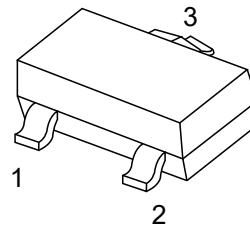
2.Features

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

3.Pinning information

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

SOT-23



4.Absolute Maximum Ratings $T_A=25^{\circ}C$

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



5. Electrical Characteristics $T_A = 25^\circ\text{C}$

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

*1 Pulse test: $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.



6.1 Typical Characteristics

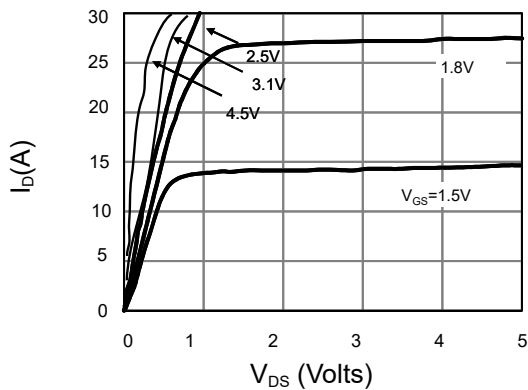


Fig 1: On-Region Characteristics

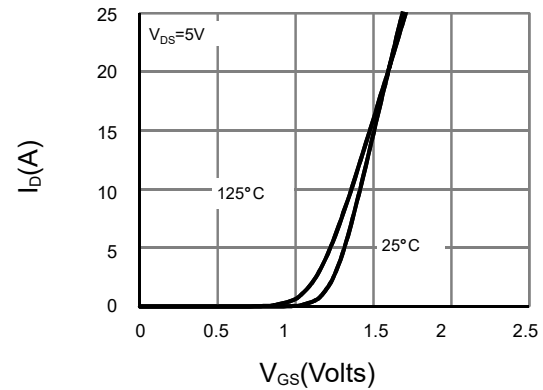


Figure 2: Transfer Characteristics

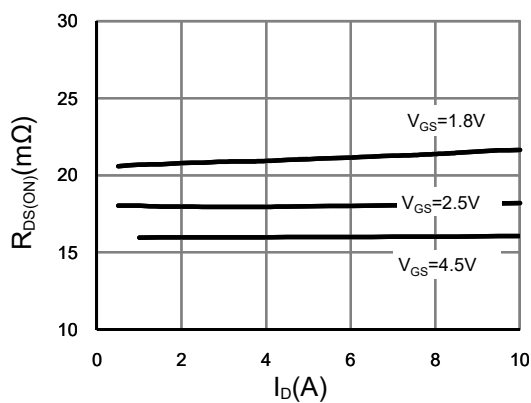


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

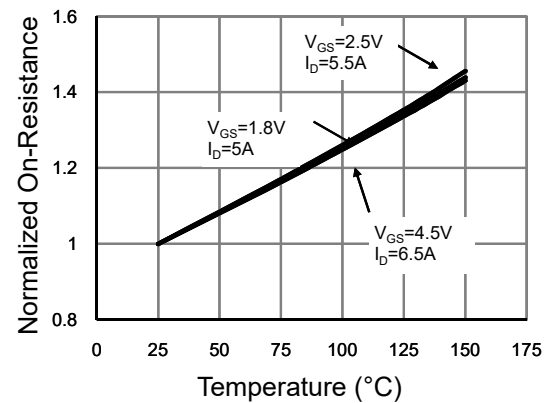


Figure 4: On-Resistance vs. Junction Temperature

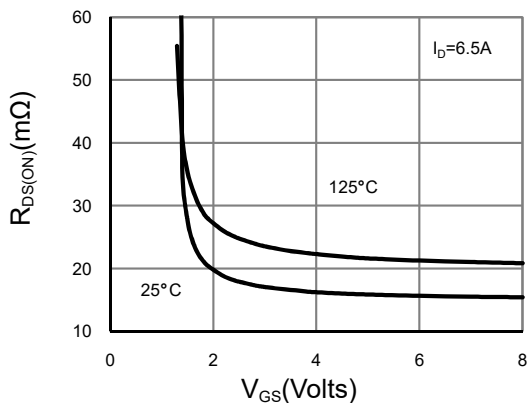


Figure 5: On-Resistance vs. Gate-Source Voltage

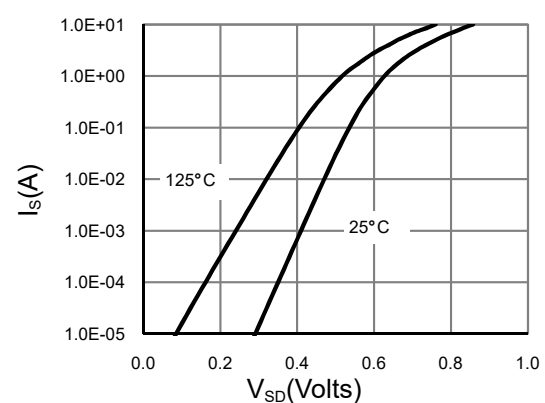


Figure 6: Body-Diode Characteristics



6.2 Typical Characteristics

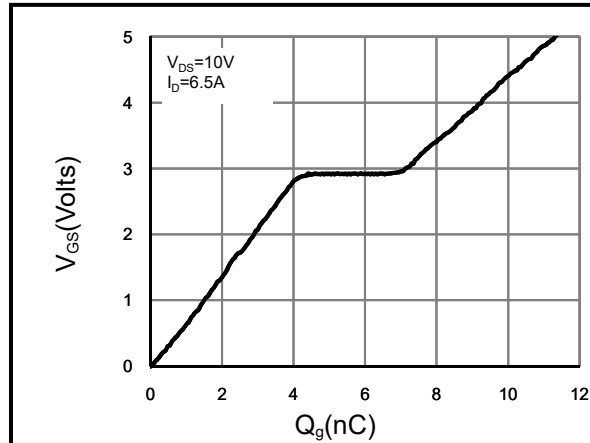


Figure 7: Gate-Charge Characteristics

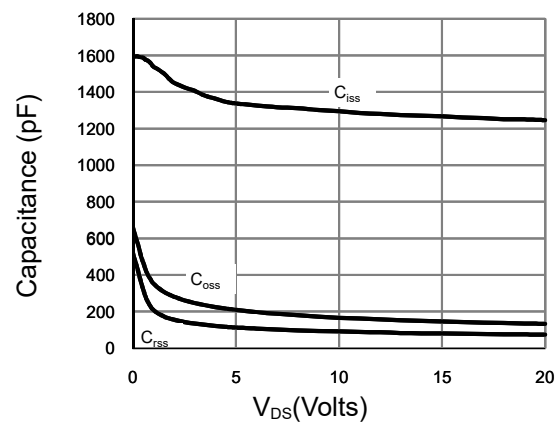


Figure 8: Capacitance Characteristics

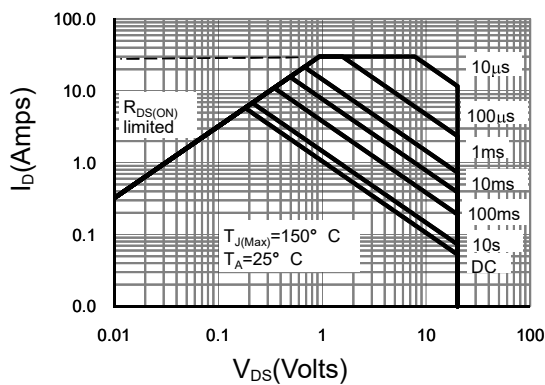


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

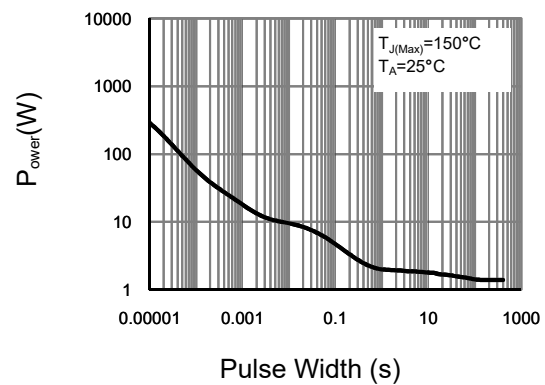


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

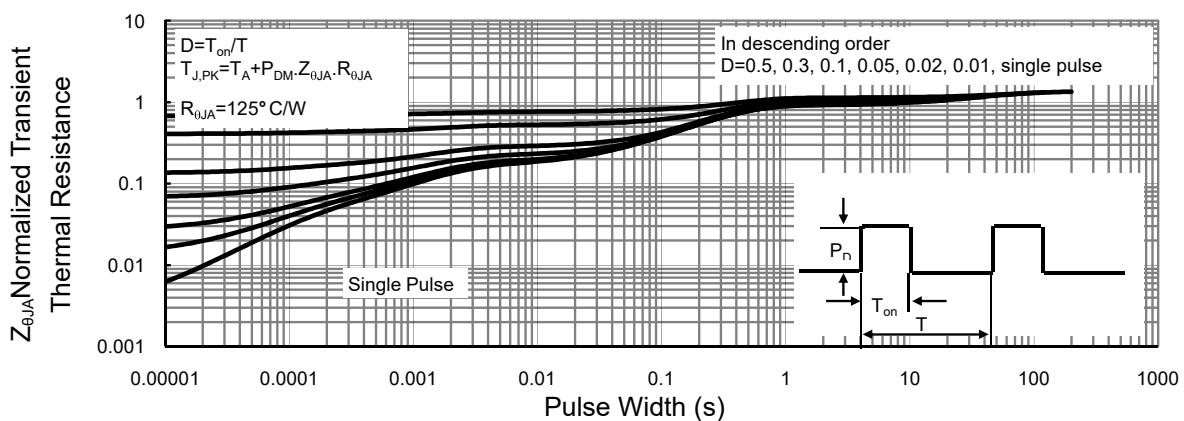
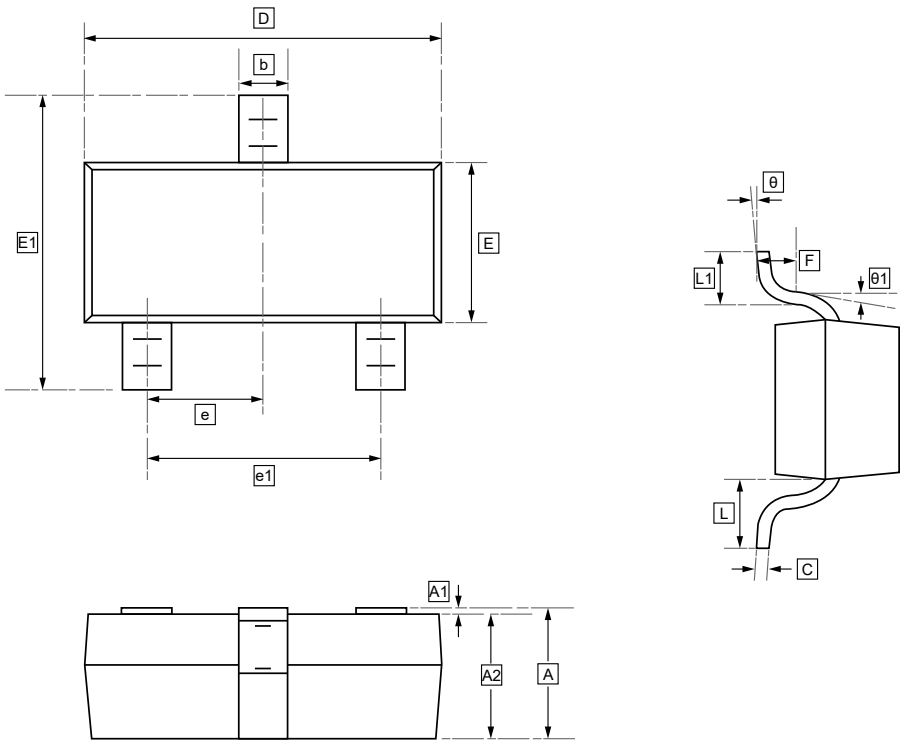


Figure 11: Normalized Maximum Transient Thermal Impedance



7.SOT-23 Package Outline Dimensions



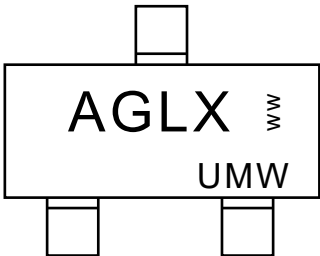
DIMENSIONS (mm are the original dimensions)

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

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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