UMW AO3414A

N-Channel Enhancement MOSFET

1.Description

The AO3414A 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.

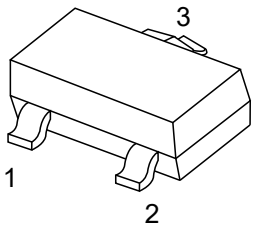
2.Features

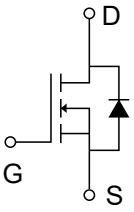
- $V_{DS\ (V)}$=20V
- I_D=4.2A(V_{GS}=4.5V)
- $R_{DS(ON)}$<26mΩ(V_{GS}=4.5V)
- $R_{DS(ON)}$<36mΩ(V_{GS}=2.5V)
- $R_{DS(ON)}$<57mΩ(V_{GS}=1.8V)

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	V
Continuous Drain Current *1	T_A=25°C	I_D	4.2	A
	T_A=70°C		3.2	
Pulsed Drain Current *2		I_{DM}	15	
Power Dissipation *1	T_A=25°C	P_D	1.4	W
	T_A=70°C		0.9	
Themal Resistance. Junction-to-Ambient *1		R_{thJA}	125	°C/W
Themal Resistance. Junction-to-Case		R_{thJC}	80	°C/W
Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

* 1The 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

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}=16V, V_{GS}=0V			1	μA
		V_{DS}=16V, V_{GS}=0V, T_J=55°C			5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.4	0.6	1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4.2A		23	26	mΩ
		V_{GS}=2.5V, I_D=3.7A		32	36	
		V_{GS}=1.8V, I_D=3.2A		48	57	
On state drain current	$I_{D(ON)}$	V_{GS}=4.5V, V_{DS}=5V	15			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=4.2A		11		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		436		pF
Output Capacitance	C_{oss}			66		pF
Reverse Transfer Capacitance	C_{rss}			44		pF
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		3		Ω
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=10V I_D=4.2A		6.2		nC
Gate Source Charge	Q_{gs}			1.6		nC
Gate Drain Charge	Q_{gd}			0.5		nC
Turn-On DelayTime	$t_{D(on)}$	V_{GS}=4.5V, V_{DS}=10V R_L=2.7Ω, R_{GEN}=6Ω		5.5		ns
Turn-On Rise Time	t_r			6.3		ns
Turn-Off DelayTime	$t_{D(off)}$			40		ns
Turn-Off Fall Time	t_f			12.7		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F=4A, dI/dt=100A/μs		12.3		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=4A, dI/dt=100A/μs		3.5		nC
Maximum Body-Diode Continuous Current	I_S				2	A
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.76	1	V

6.1Typical Characterisitics

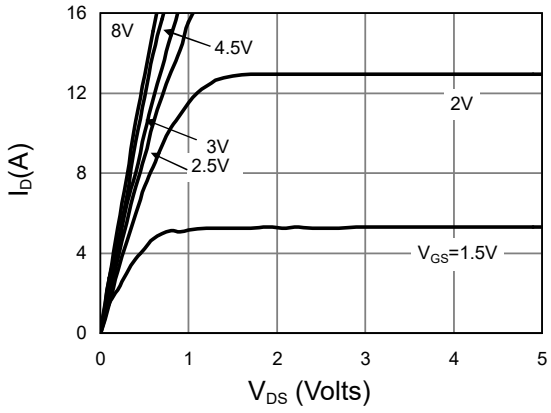


Fig 1: On-Region Characteristics

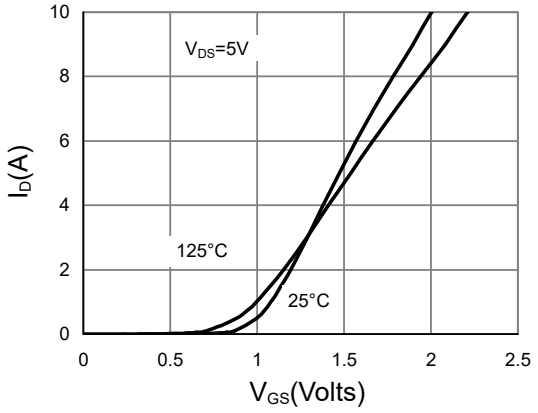


Figure 2: Transfer Characteristics

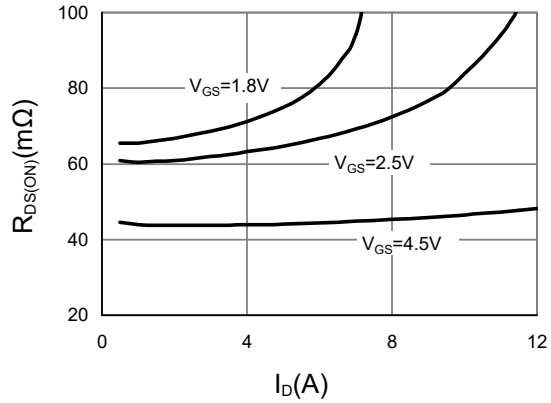


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

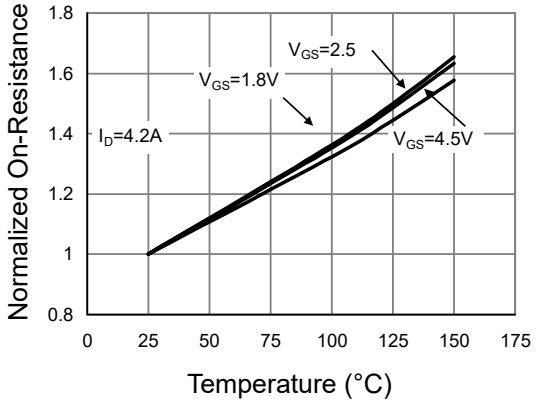


Figure 4: On-Resistance vs. Junction Temperature

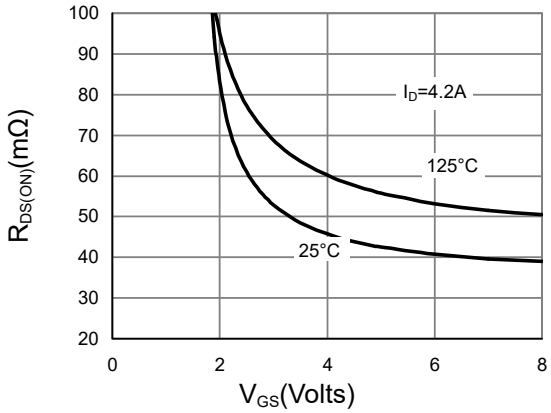


Figure 5: On-Resistance vs. Gate-Source Voltage

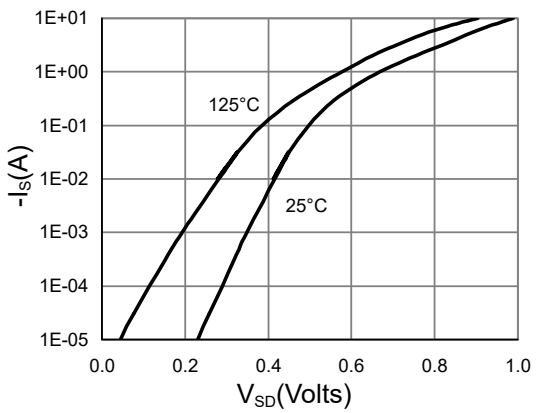


Figure 6: Body-Diode Characteristics

6.2Typical Characterisitics

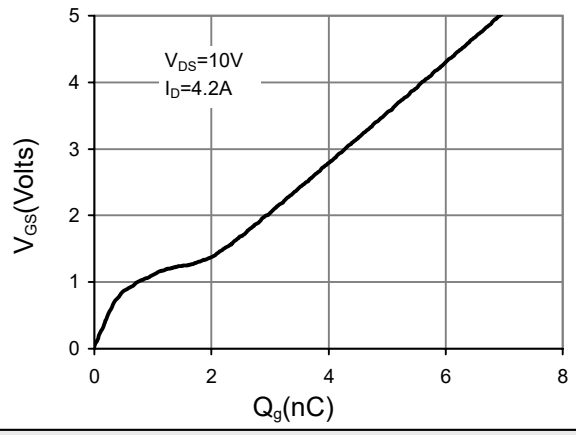


Figure 7: Gate-Charge Characteristics

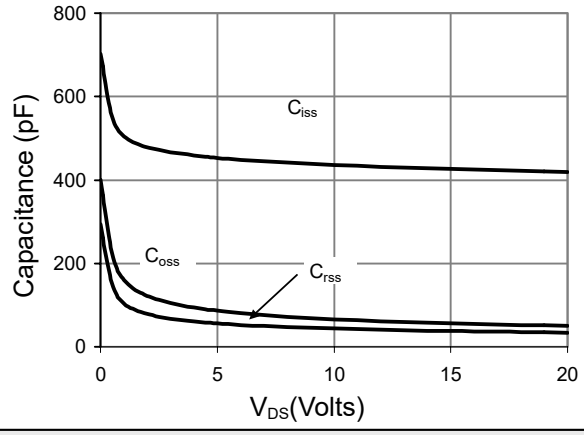


Figure 8: Capacitance Characteristics

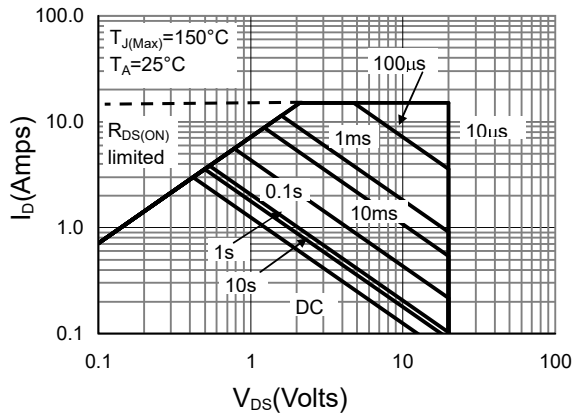


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

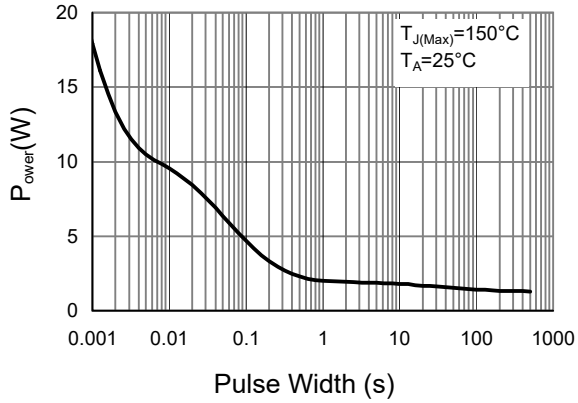


Figure 10: Single Pulse Power Rating Junction-to -Ambient (Note E)

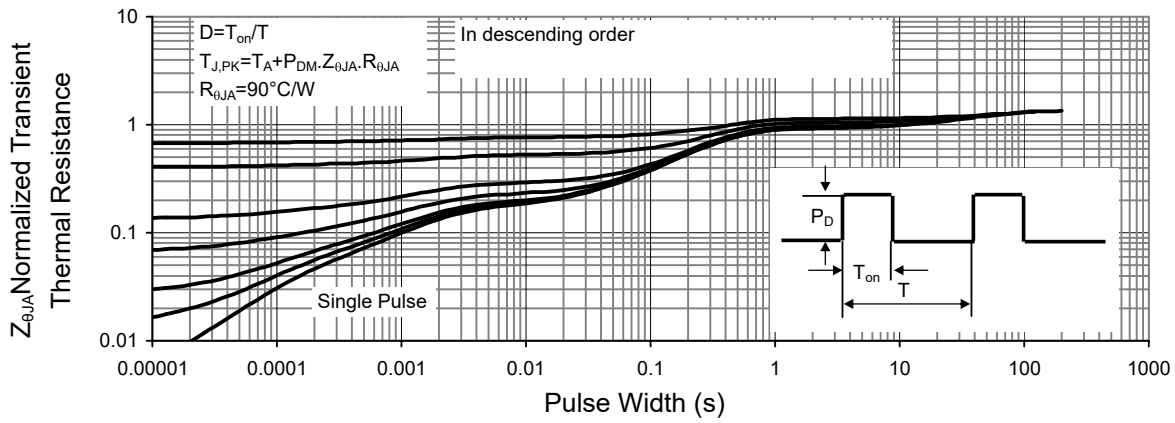
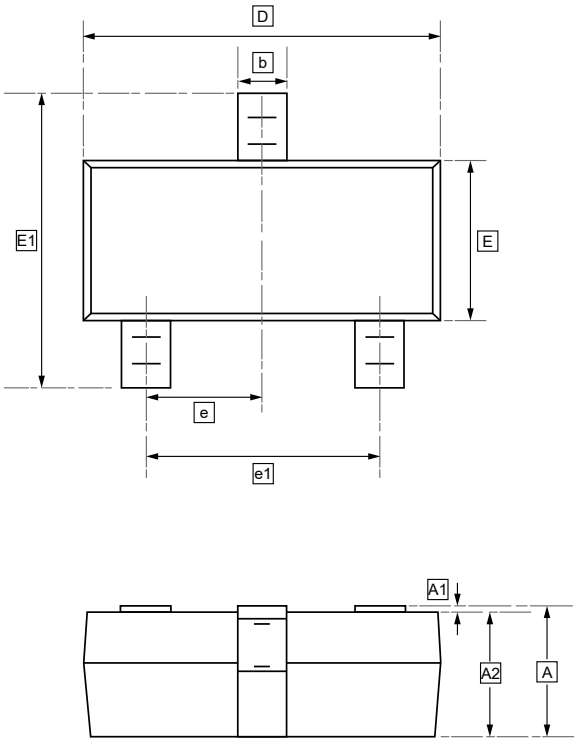


Figure 11: Normalized Maximum Transient Thermal Impedance

7.SOT-23 Package Outline Dimensions

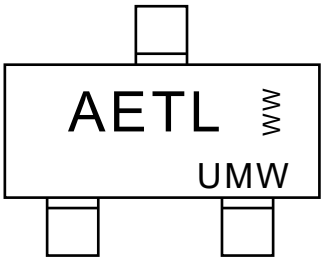


DIMENSIONS (mm are the original dimensions)

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 AO3414A	SOT-23	3000	Tape and reel

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