

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.

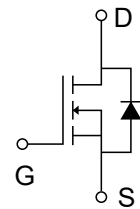
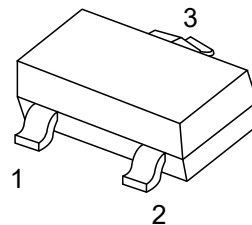
2.Features

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

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

* 1The value of R_{thJA} is measured with the device mounted on 1in² FR-4 board with 2oz.

Copper, in a still air environment with $T_A=25^{\circ}C$



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



6.1 Typical Characteristics

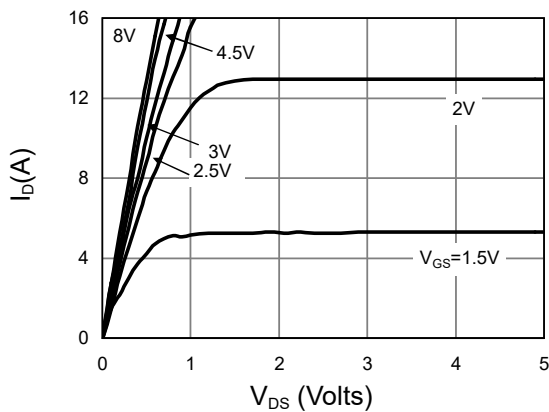


Fig 1: On-Region Characteristics

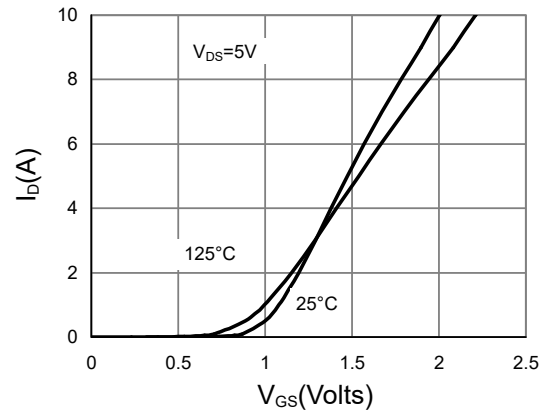


Figure 2: Transfer Characteristics

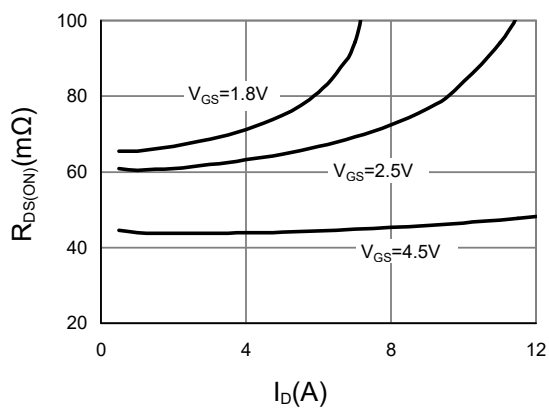


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

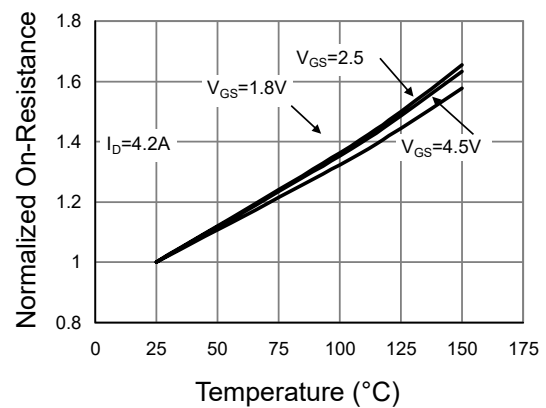


Figure 4: On-Resistance vs. Junction Temperature

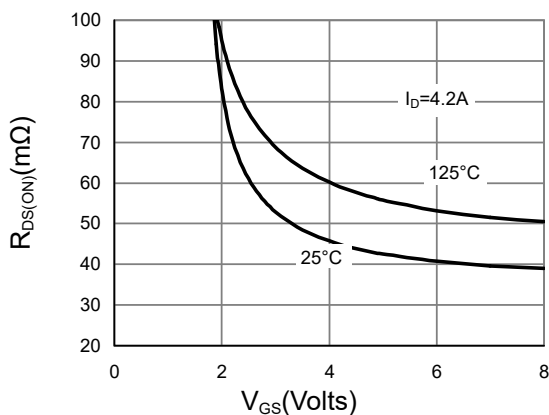


Figure 5: On-Resistance vs. Gate-Source Voltage

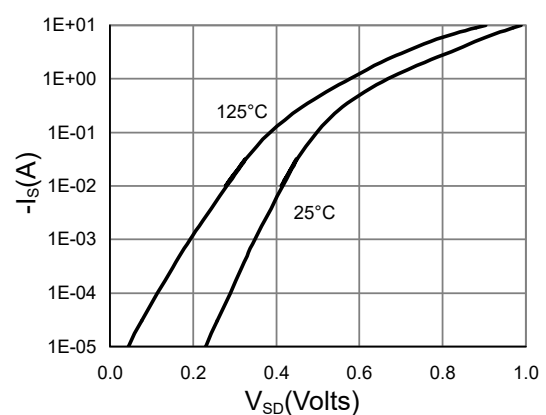
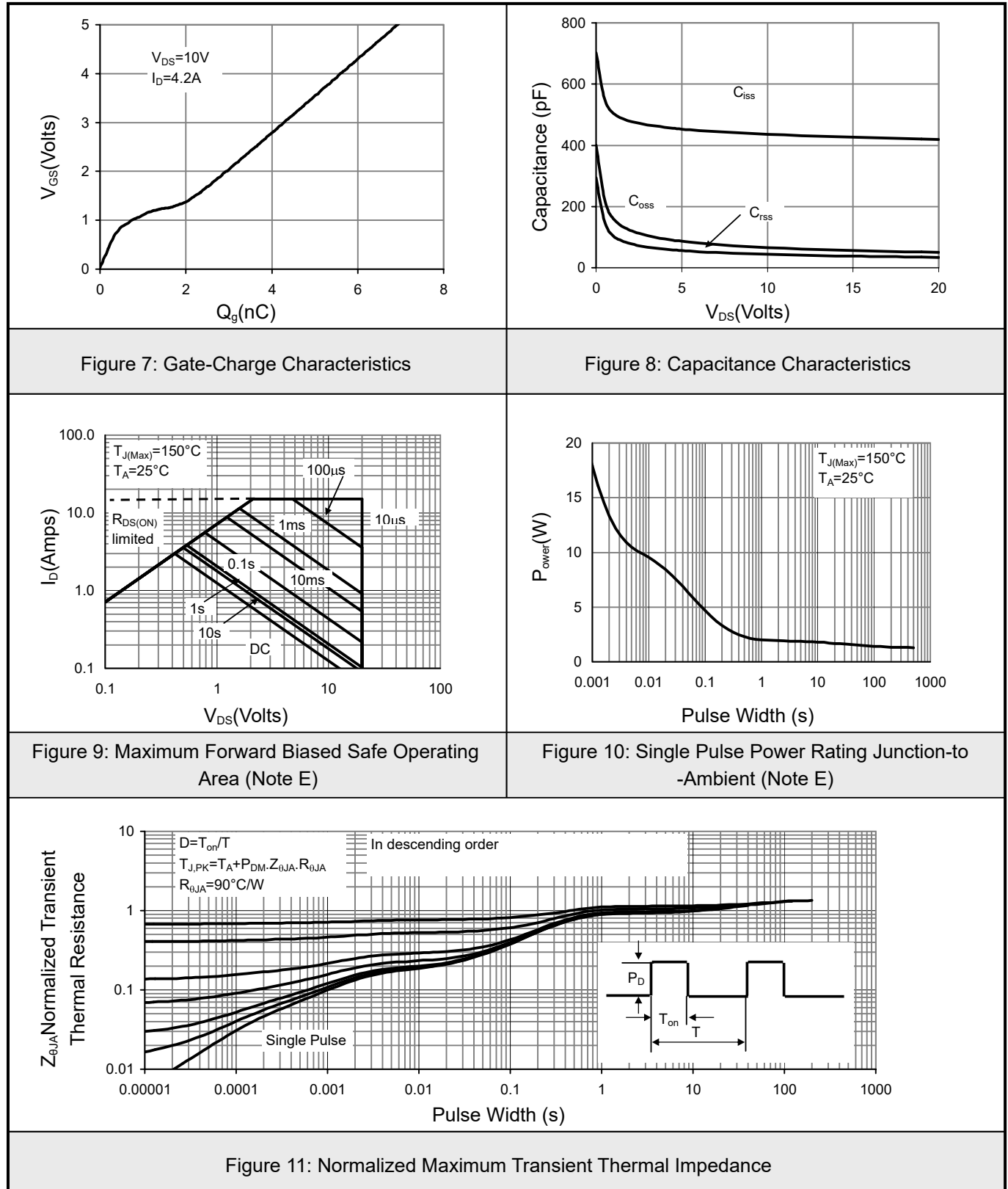


Figure 6: Body-Diode Characteristics

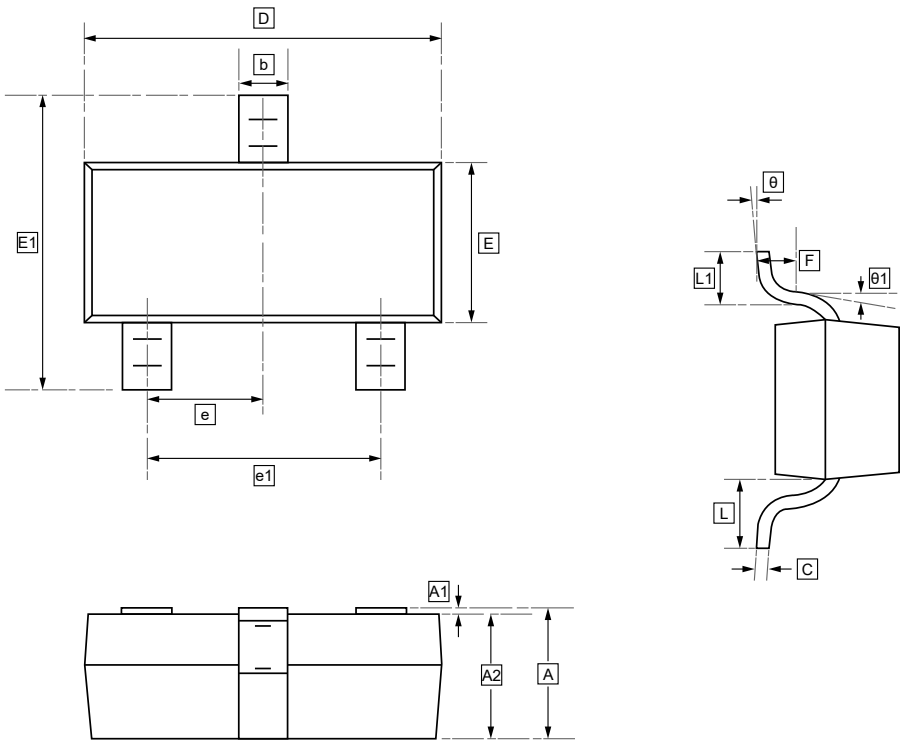


6.2 Typical Characteristics





7.SOT-23 Package Outline Dimensions



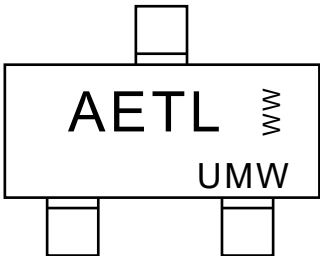
DIMENSIONS (mm are the original dimensions)

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



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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