

## 1. Description

The AO3481 provide excellent RDS(ON) , low gate charge and operation gate voltages as low as 2.5V. This device is suitable for use as a load switch or other general applications.

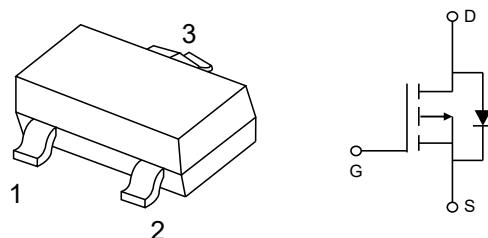
## 2. Features

- $V_{DS}(V)=-30V$
- $I_D = -4A$
- $R_{DS(ON)} < 41m\Omega (V_{GS}=-10V)$
- $R_{DS(ON)} < 47m\Omega (V_{GS}=-4.5V)$
- RoHS and Halogen-Free Compliant

## 3. Pinning information

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

SOT-23



## 4. Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	-4	A
$T_A=70^\circ C$		-3.2	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-27	
Power Dissipation <sup>B</sup>	$P_D$	1.4	W
$T_A=70^\circ C$		0.9	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C

## 5. Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	70	90	°C/W
Maximum Junction-to-Ambient <sup>A,D</sup>		100	125	°C/W
Maximum Junction-to-Lead	$R_{\theta JL}$	63	80	°C/W



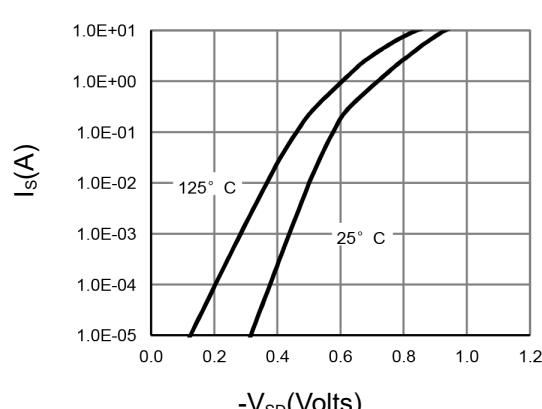
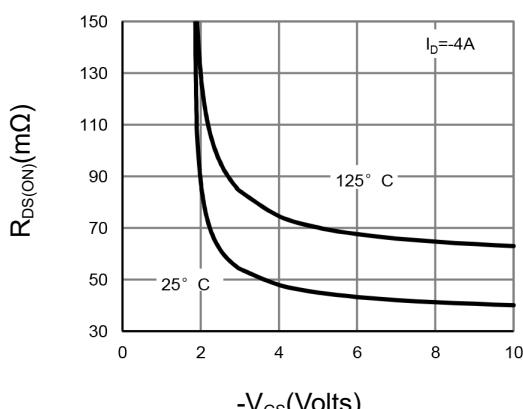
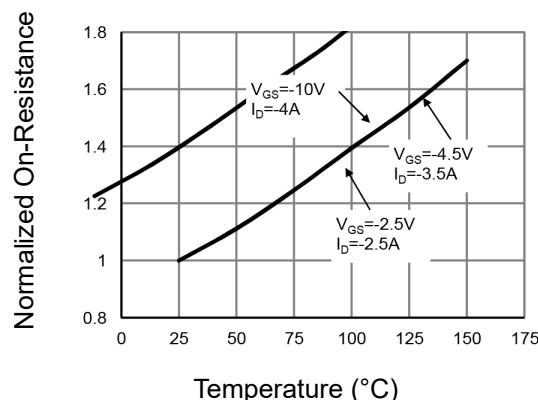
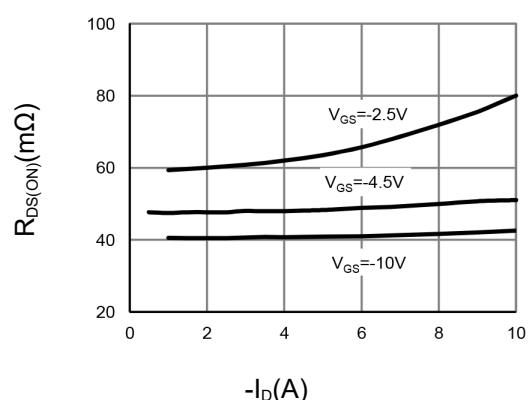
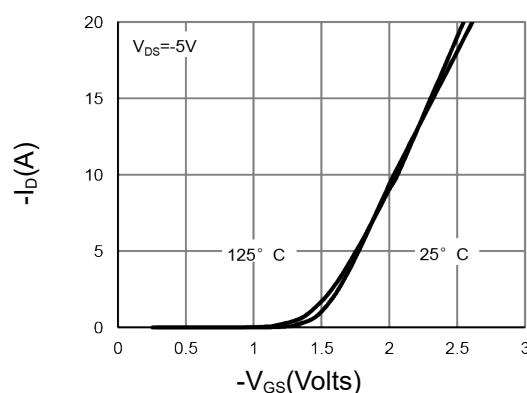
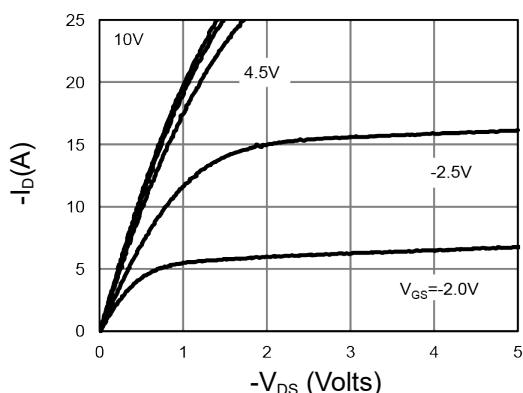
## 6. Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$I_D=-250\mu\text{A}, V_{\text{GS}}=0\text{V}$	-30			V
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{\text{DS}}=-30\text{V}, V_{\text{GS}}=0\text{V}$ $T_J=55^\circ\text{C}$			-1	$\mu\text{A}$
					-5	
Gate-Body leakage current	$I_{\text{GSS}}$	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=\pm 12\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=-250\mu\text{A}$	-0.5	-0.9	-1.3	V
On-State Drain Current	$I_{\text{D}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, V_{\text{DS}}=-5\text{V}$	-27			A
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, I_D=-4.0\text{A}$		41	50	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_D=-3.5\text{A}$		47	60	$\text{m}\Omega$
		$V_{\text{GS}}=-2.5\text{V}, I_D=-2.5\text{A}$		60	85	$\text{m}\Omega$
Forward Transconductance	$g_{\text{FS}}$	$V_{\text{DS}}=-5\text{V}, I_D=-4.0\text{A}$		17		S
Diode Forward Voltage	$V_{\text{SD}}$	$I_S=-1\text{A}, V_{\text{GS}}=0\text{V}$		-0.7	-1	V
Maximum Body-Diode Continuous Current	$I_S$				-2	A
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=-15\text{V}, f=1\text{MHz}$		645		pF
Output Capacitance	$C_{\text{oss}}$			80		pF
Reverse Transfer Capacitance	$C_{\text{rss}}$			55		pF
Gate resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, f=1\text{MHz}$	4	7.8	12	$\Omega$
Total Gate Charge	$Q_g(10\text{V})$	$V_{\text{GS}}=-10\text{V}, V_{\text{DS}}=-15\text{V}$ $I_D=-4.0\text{A}$		14	20	nC
Total Gate Charge	$Q_g(4.5\text{V})$			7		nC
Gate Source Charge	$Q_{\text{gs}}$			1.5		nC
Gate Drain Charge	$Q_{\text{gd}}$			2.5		nC
Turn-On Delay Time	$t_{\text{D}(\text{on})}$	$V_{\text{GS}}=-10\text{V}, V_{\text{DS}}=-15\text{V}$ $R_L=3.75\Omega, R_{\text{GEN}}=3\Omega$		6.5		ns
Turn-On Rise Time	$t_r$			3.5		ns
Turn-Off Delay Time	$t_{\text{D}(\text{off})}$			41		ns
Turn-Off Fall Time	$t_f$			9		ns
Body Diode Reverse Recovery Time	$t_{\text{rr}}$	$I_F=-4.0\text{A}, dI/dt=100\text{A}/\mu\text{s}$		11		ns
Body Diode Reverse Recovery Charge	$Q_{\text{rr}}$	$I_F=-4.0\text{A}, dI/dt=100\text{A}/\mu\text{s}$		3.5		nC

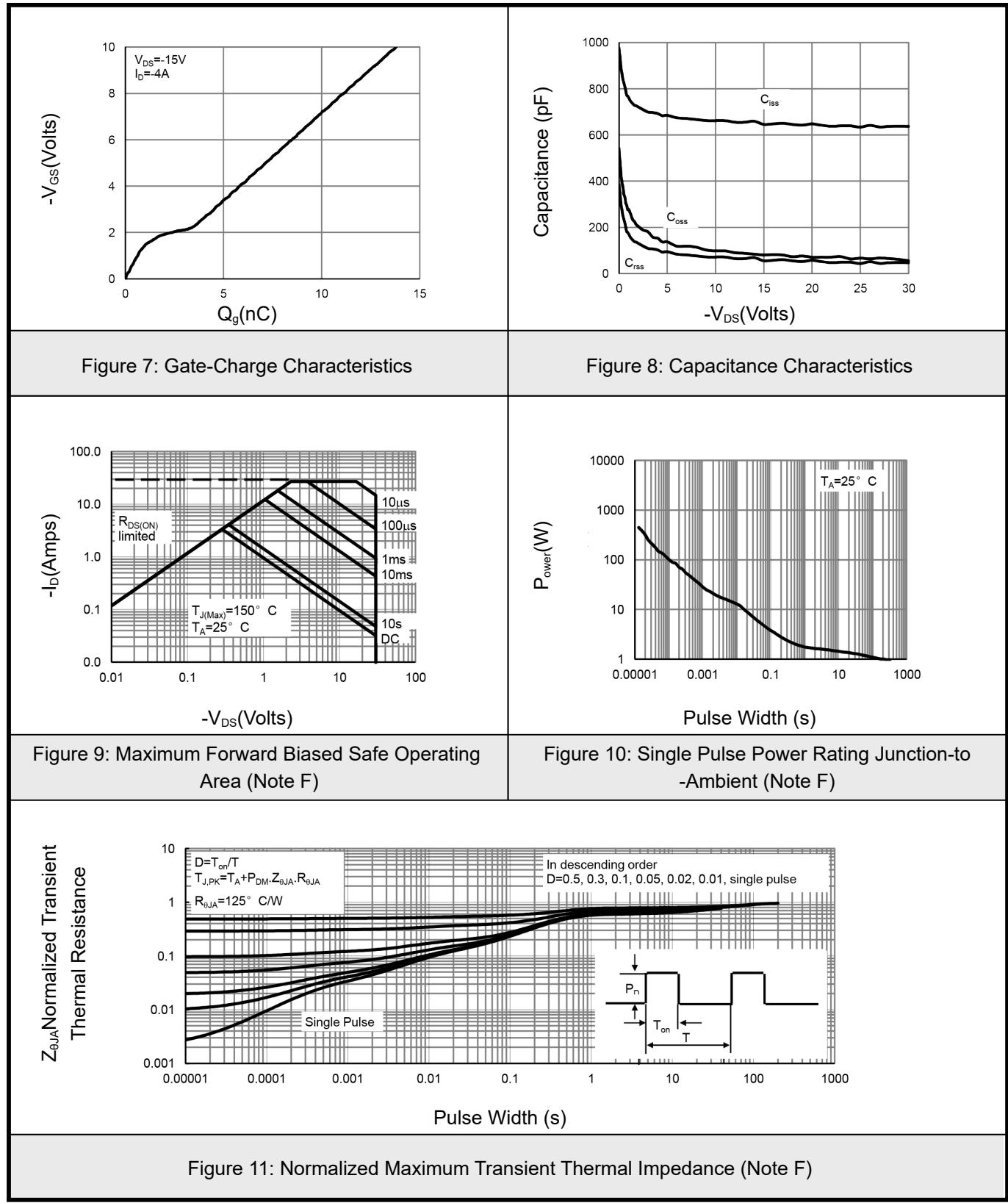


- A. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.
- B. The power dissipation  $P_D$  is based on  $T_{J(MAX)} = 150^\circ\text{C}$ , using  $\leq 10\text{s}$  junction-to-ambient thermal resistance.
- C. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)} = 150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J = 25^\circ\text{C}$ .
- D. The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to lead  $R_{\theta JL}$  and lead to ambient.
- E. The static characteristics in Figures 1 to 6 are obtained using  $<300\mu\text{s}$  pulses, duty cycle 0.5% max.
- F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, assuming a maximum junction temperature of  $T_{J(MAX)} = 150^\circ\text{C}$ . The SOA curve provides a single pulse rating.

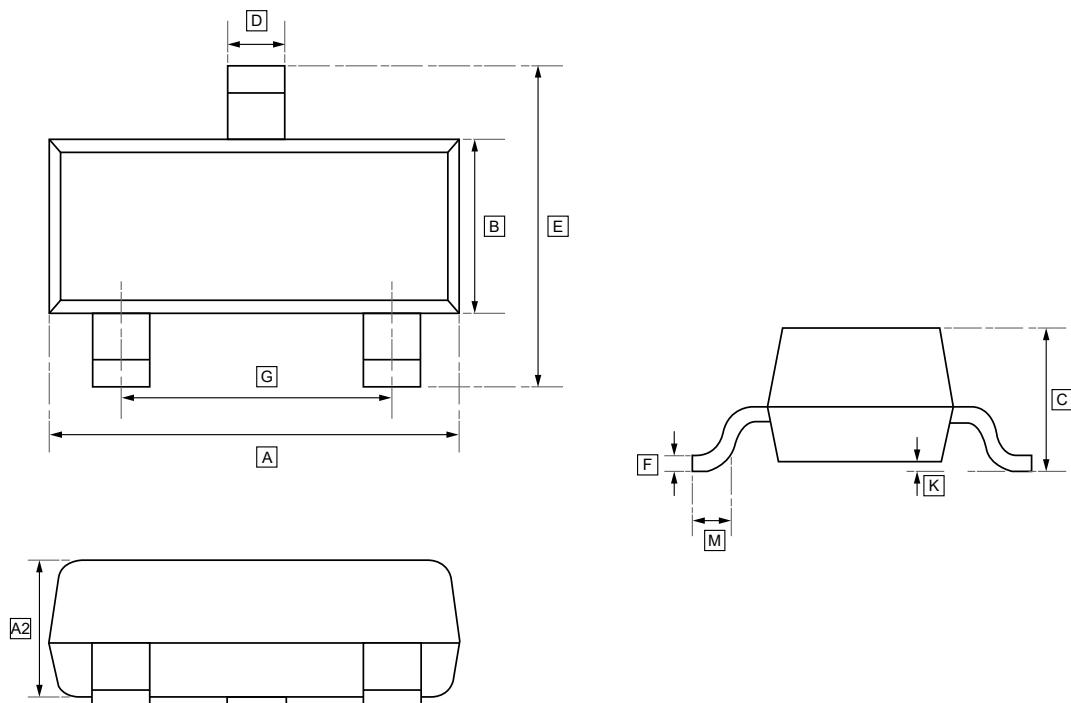
## 7.1 Typical Characteristics



## 7.2 Typical Characteristics



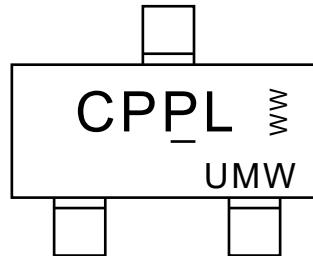
## 8.SOT-23 Package Outline Dimensions



### DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	G	K	M	A2	F
<b>Min</b>	2.85	1.20	0.90	0.40	2.25	1.80	0.00	0.30	0.95	0.095
<b>Max</b>	3.04	1.40	1.10	0.50	2.55	2.00	0.10	-	1.05	0.115

## 9.Ordering information



WW: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW AO3481	SOT-23	3000	Tape and reel



## 10. Disclaimer

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