

DESCRIPTION

The AO3407A is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The AO3407A meet the RoHS and Green Product requirement with full function reliability approved.

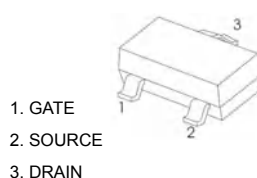
FEATURES

Green Device Available
Super Low Gate Charge
Excellent CdV/dt effect decline
Advanced high cell density Trench technology

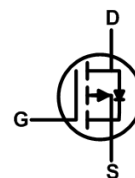
V_{DS} -30 V
 I_D -4.2 A
 $R_{DS(ON)}$ 41 m Ω

3407

SOT-23



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current	-4.2	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current	-3.6	A
I_{DM}	Pulsed Drain Current ²	-16	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1.5	W
$P_D@T_A=70^\circ\text{C}$	Total Power Dissipation ³	1.0	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	105	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ (t $\leq 10\text{s}$)	---	---	$^\circ\text{C/W}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	μA
Gate-Source Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Gate-Source Threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.5	-2.5	V
Drain-Source on-State Resistance ³	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.1A$	-	41	60	m Ω
		$V_{GS}=-4.5V, I_D=-3A$	-	53	85	
Dynamic Characteristics ⁴						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-15V,$ $f=1.0MHz$	-	530	-	pF
Output Capacitance	C_{oss}		-	70	-	
Reverse Transfer Capacitance	C_{rss}		-	56	-	
Switching Characteristics ⁴						
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-4.1A$	-	6.8	-	nC
Gate-Source Charge	Q_{gs}		-	1.0	-	
Gate-Drain Charge	Q_{gd}		-	1.4	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=-10V, V_{DS}=-15V,$ $R_L=15\Omega, R_{GEN}=2.5\Omega$	-	14	-	ns
Rise Time	t_r		-	61	-	
Turn-off Delay time	$t_{d(off)}$		-	19	-	
Fall Time	t_f		-	10	-	
Source-Drain Body Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$I_S=-4.1A, V_{GS}=0V$	-	-	-1.2	V
Continuous Source Current	I_S		-	-	-4.5	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^{\circ}\text{C}$.
2. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. This value is guaranteed by design hence it is not included in the production test.

RATING AND CHARACTERISTIC CURVES

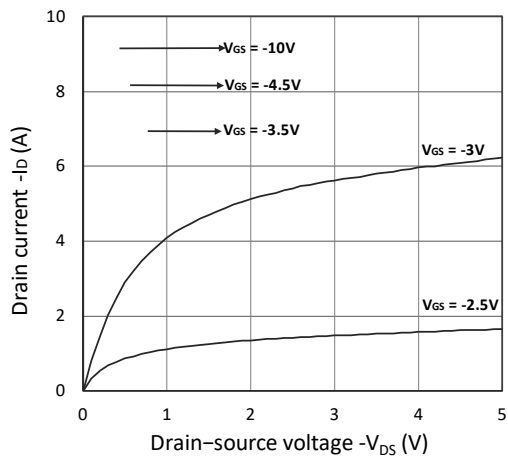


Figure 1. Output Characteristics

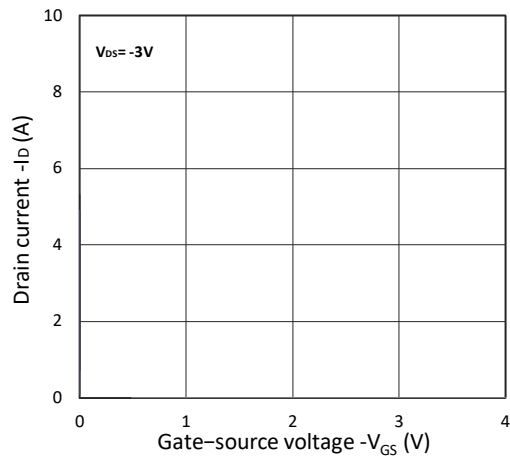


Figure 2. Transfer Characteristics

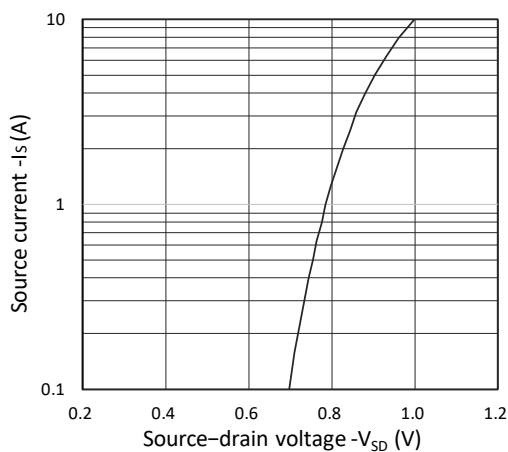


Figure 3. Forward Characteristics of Reverse

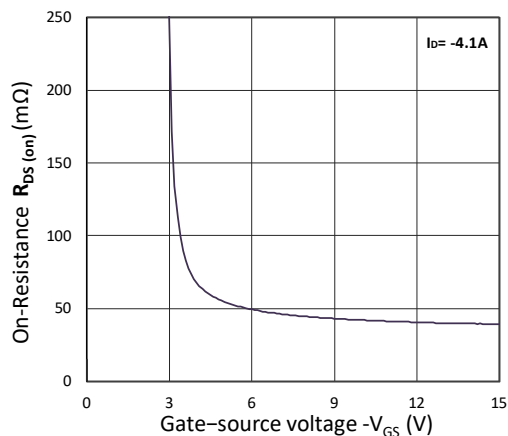


Figure 4. $R_{DS(on)}$ vs. V_{GS}

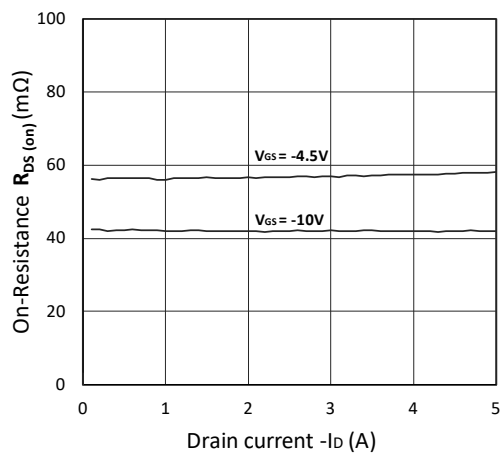


Figure 5. $R_{DS(on)}$ vs. I_D

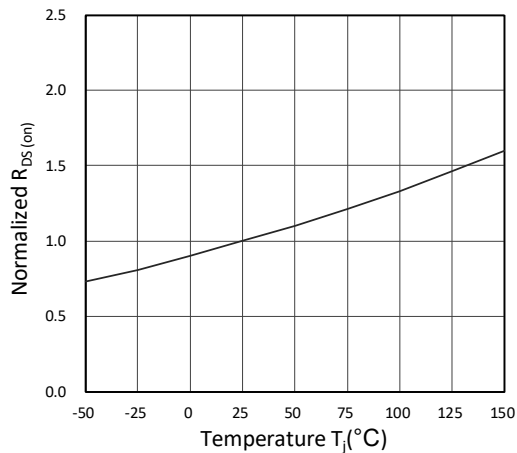


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

RATING AND CHARACTERISTIC CURVES

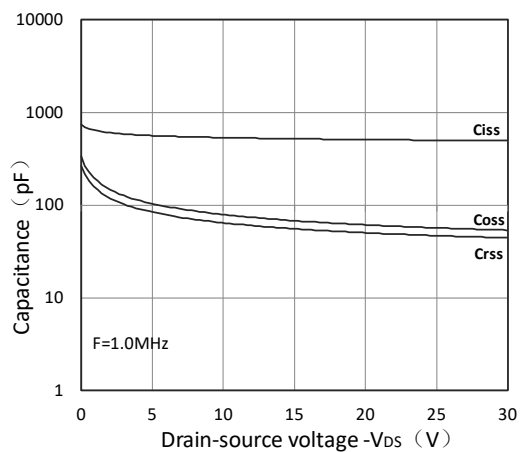


Figure 7. Capacitance Characteristics

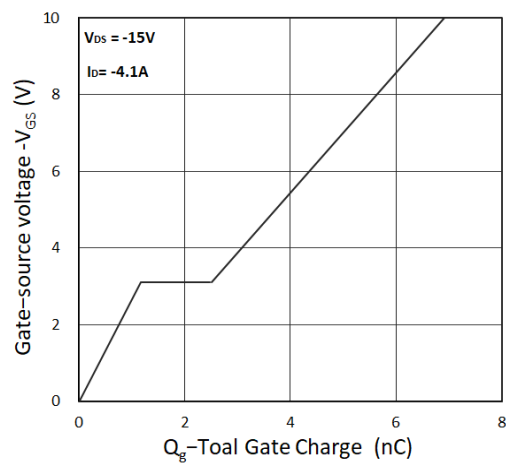
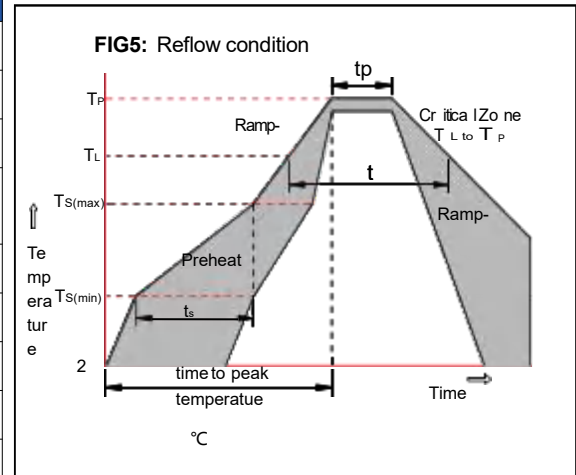


Figure 8. Gate Charge Characteristics

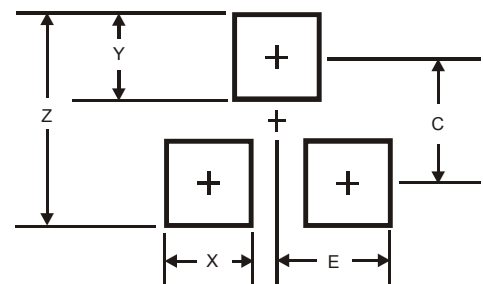
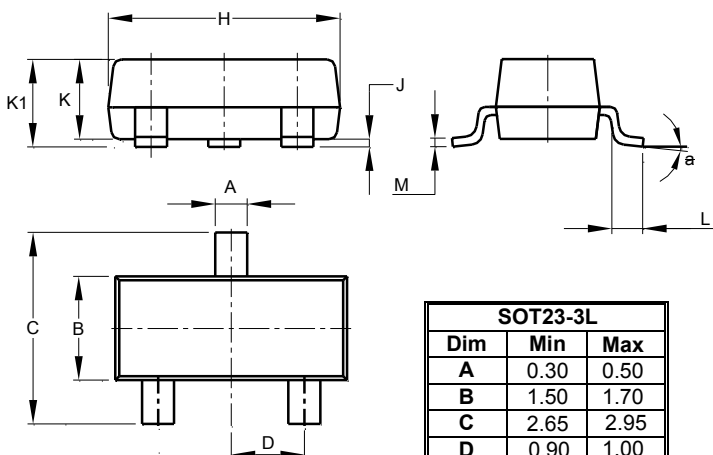
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



Package Dimensions & Suggested Pad Layout

SOT23-3L



Dimensions	SOT23-3L
Z	3.3
X	0.9
Y	1.0
C	2.3
E	1.40

Tape & reel specification

Technical drawing of a tape reel showing top, side, and cross-sectional views with dimensions.

Top View: Shows a rectangular reel with width W and height E . The tape width is F . The distance from the edge to the first hole is A_0 . The pitch between holes is P_0, P_2, P_1 . The hole diameters are $\varnothing D_0$ and $\varnothing D_1$.

Side View: Shows the reel profile with dimensions B_0 (height), K_0 (base width), and T (tape thickness).

Cross-section A-A: Shows the tape cross-section with width A_0 .

Cross-section B-B: Shows the reel cross-section with dimensions B_0 and K_0 .

Symbol	Dimension (mm)
P0	4.00±0.20
P1	4.00±0.20
P2	2.00±0.20
D0	1.55±0.20
D1	1.05±0.20
E	1.55±0.20
F	3.60±0.20
W	8.00±0.20
A0	3.80±0.20
B0	3.50±0.20
K0	1.55±0.20
T	0.25±0.15
D2	178.0±5.0
D3	55Min.
D4	R24.0±3.0
G	R82.0±3.0
I	13.0±2.0
W1	11.0±3.0

Quantity: 3000PCS

Technical drawing of a 7 inch reel showing top and side views with dimensions.

Top View: Shows a circular reel with diameter D_4 . The distance from the center to the edge is G . The distance from the center to the hole is I .

Side View: Shows the reel profile with dimensions D_3 (height), D_2 (width), and W_1 (base width).