

AO3401

DATASHEET

Specification Revision History:

Version	Date	Description
V1.0	2022/05	New
V1.1	2023/01	Modify Ordering Information
V1.2	2024/02	Modify Ordering Information
V1.3	2025/05	Add application precautions and overall typesetting.

Description

The A03401 uses advanced Trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

※ $V_{DS} = -30V$ $I_D = -4.5A$

※ $R_{DS(ON)} < 50m\Omega$ @ $V_{GS} = 10V$

Applications

※Battery protection

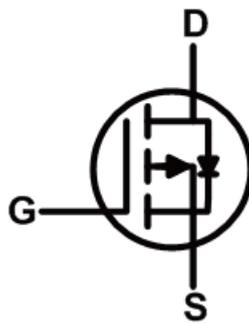
※Load switch

※Uninterruptible power supply

The appearance of the product



SOT-23



Equivalent Circuit

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
A03401	SOT-23	A19T	REEL	3000PCS/REEL

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-30	V
V _{GS}	Gate-Source Voltage	±12	V
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ -10V _i	-4.5	A
I _D @T _A =100°C	Continuous Drain Current, V _{GS} @ -10V _i	-3.3	A
I _{DM}	Pulsed Drain Current ²	-20.4	A
P _D @T _A =25°C	Total Power Dissipation ³	2.15	W
T _{STG}	Storage Temperature Range	-55 to +150	°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance Junction-ambient 1	125	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	104	°C/W

Electrical Characteristics (TA=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
On/Off States						
B _{VDS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-30	-34	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-5A	---	45	50	mΩ
		V _{GS} =-4.5V, I _D =-4A	---	45	55	
		V _{GS} =-2.5V, I _D =-1A	---	55	80	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-0.5	-1.0	-1.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = -30V, V _{GS} = 0V,	---	---	-1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz	---	745	---	pF
C _{oss}	Output Capacitance		---	70	---	
C _{rss}	Reverse Transfer Capacitance		---	57	---	
Q _g	Total Gate Charge (4.5V)	V _{DS} = -15V, I _D = -5.1A, V _{GS} = -10V	---	8	---	nC
Q _{gs}	Gate-Source Charge		---	1.8	---	
Q _{gd}	Gate-Drain Charge		---	2.7	---	
Switching Characteristics						
T _{d(on)}	Turn-On Delay Time	V _{DD} = -15V, I _D = -1A, V _{GS} = -10V, R _{GEN} = 2.5Ω	---	7	---	ns
T _r	Rise Time		---	3	---	
T _{d(off)}	Turn-Off Delay Time		---	30	---	
T _f	Fall Time		---	12	---	
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		---	---	-4.5	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		---	---	-16.4	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =-5.1A	---	-0.8	-1.2	V

Note:

1. The data tested by surface mounted on a 1 inch 2 FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The power dissipation is limited by 150°C junction temperature
4. The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation.

Typical Characteristics

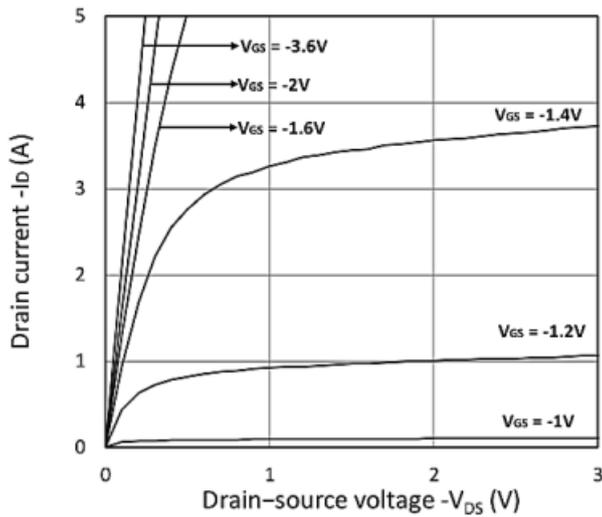


Figure 1. Output Characteristics

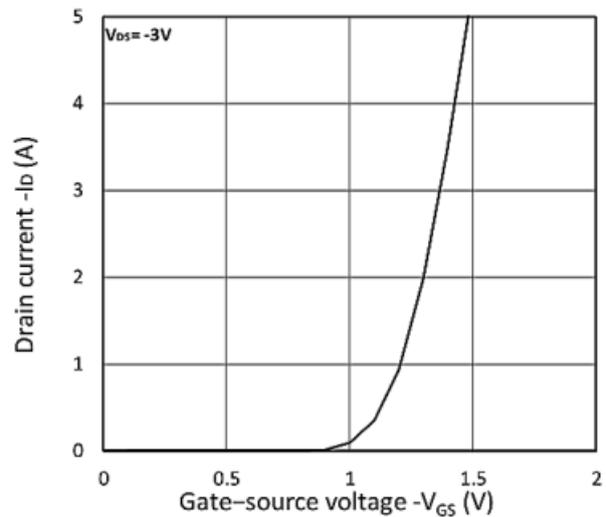


Figure 2. Transfer Characteristics

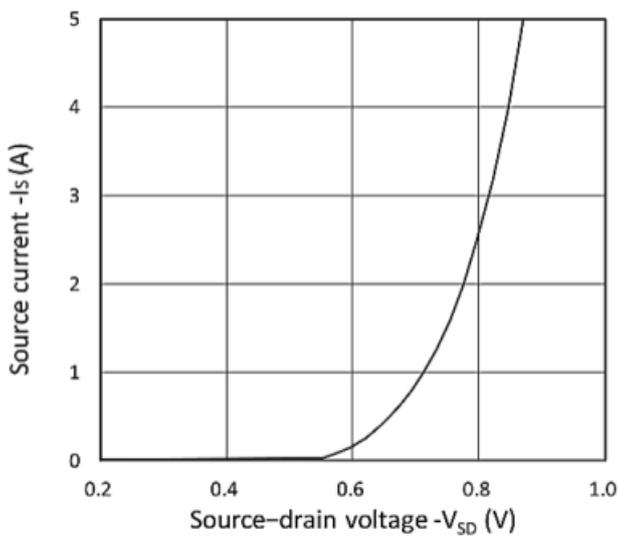


Figure 3. Forward Characteristics of Reverse

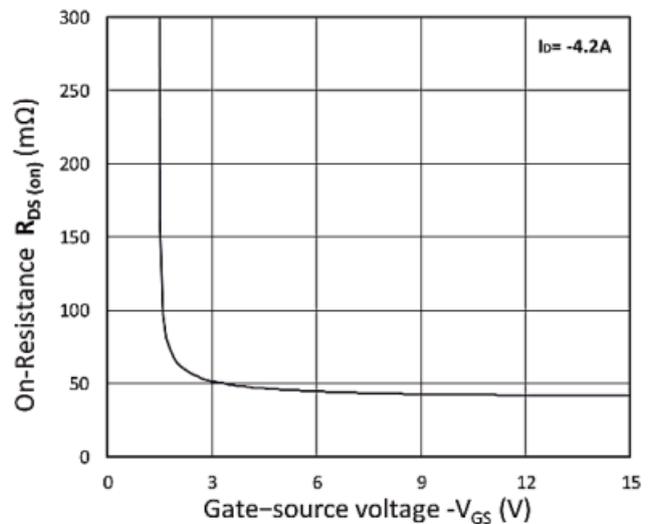


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

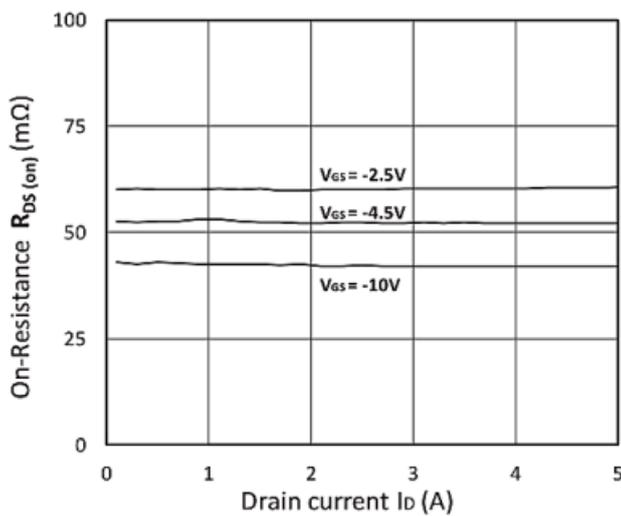


Figure 5. $R_{DS(ON)}$ vs. I_D

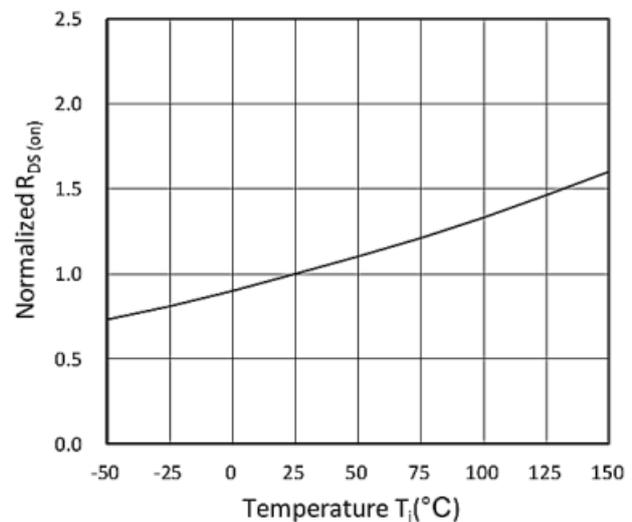
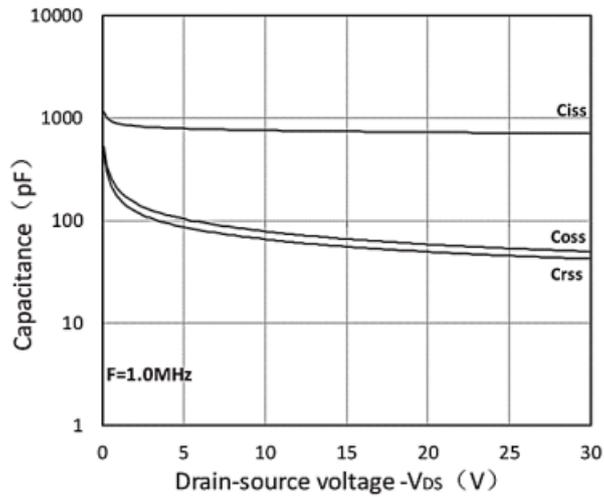
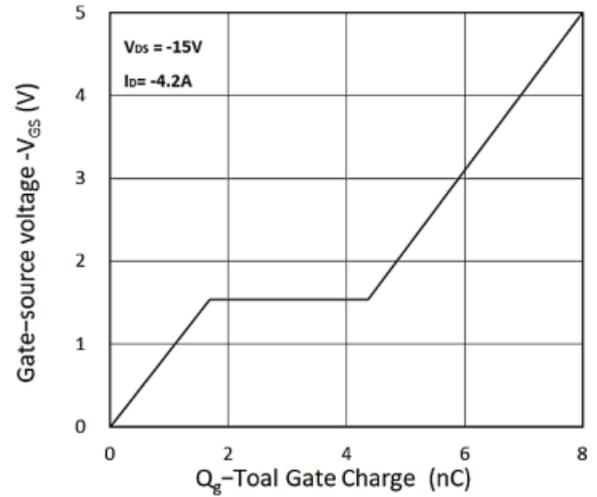
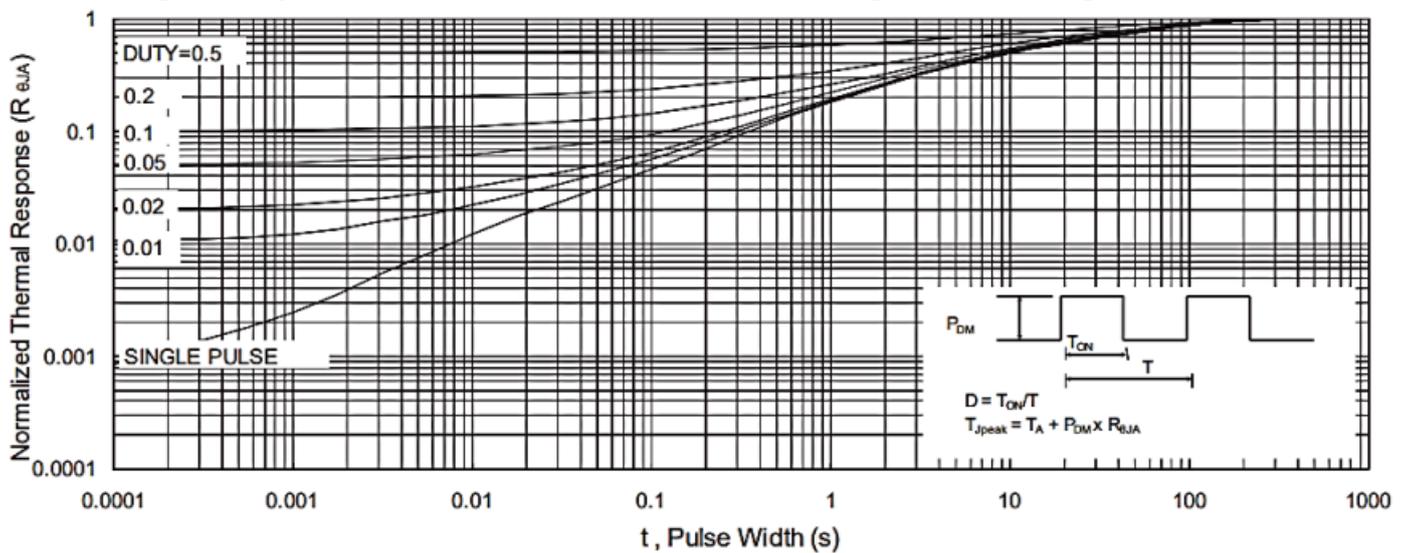
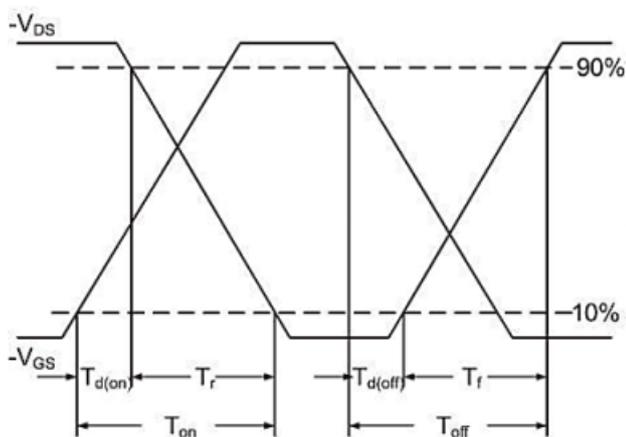
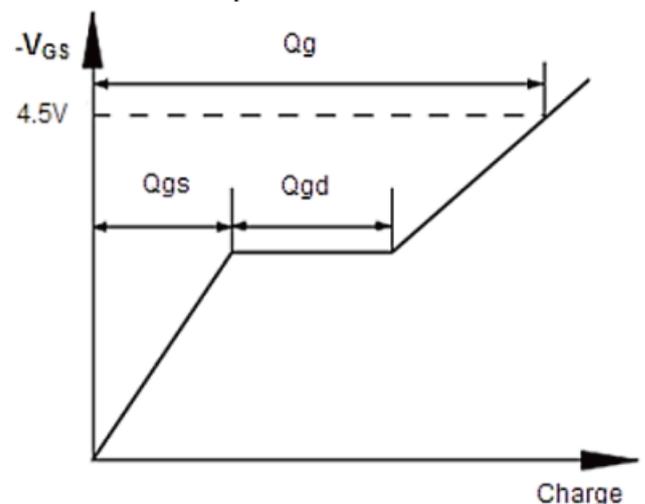
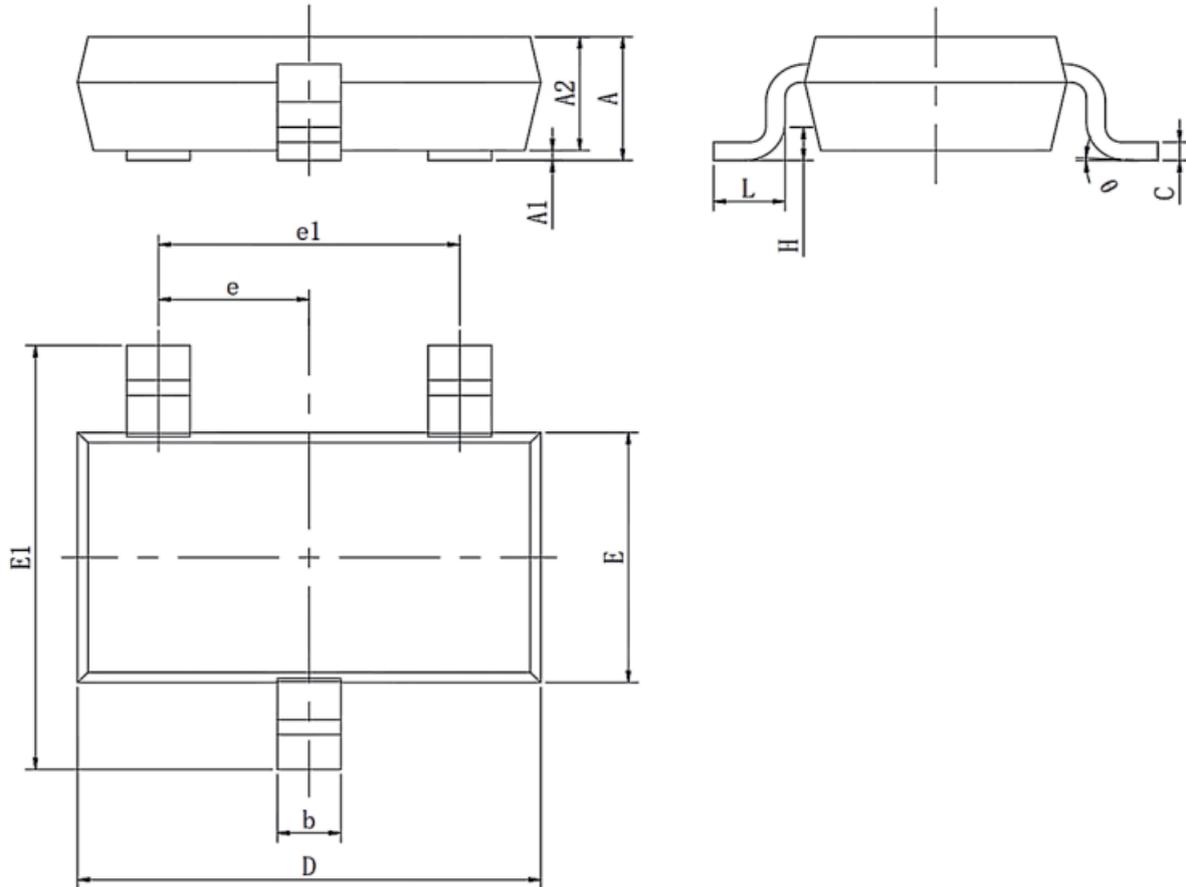


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics


Figure 7. Capacitance Characteristics

Figure 8. Gate Charge Characteristics

Figure 9 Normalized Maximum Transient Thermal Impedance

Figure.10 Switching Time Waveform

Figure.11 Gate Charge Waveform

Outline Dimensions
SOT-23
Unit : mm


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
C	0.080	0.200	0.003	0.008
D	2.800	3.020	0.110	0.119
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.95 (BSC)		0.037(BSC)	
e1	1.90 (BSC)		0.075(BSC)	
L	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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