

Description

The AO3401 uses advanced trench technology to provide excellent $R_{DS(ON)}$. This device is suitable for use as a load switch or in PWM applications.

General Features

$V_{DS} = -30V, I_D = -4.2A$

$R_{DS(ON)} < 58m\Omega @ V_{GS} = -10V$

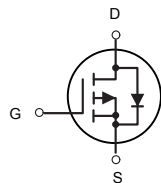
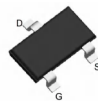
$R_{DS(ON)} < 75m\Omega @ V_{GS} = -4.5V$

Application

Battery protection

Load switch

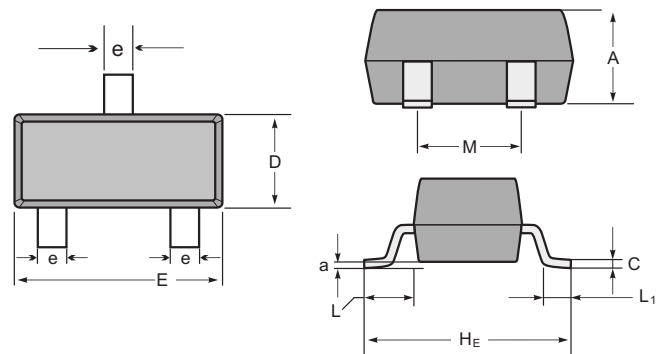
Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking
AO3401	SOT-23	A19T



SOT-23 mechanical data

UNIT		A	C	D	E	H _E	e	M	L	L ₁	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current-Continuous	-4.2	A
I_{DM}	Drain Current-Pulsed (Note 1)	-30	A
P_D	Maximum Power Dissipation	1.2	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	104	°C/W

AO3401

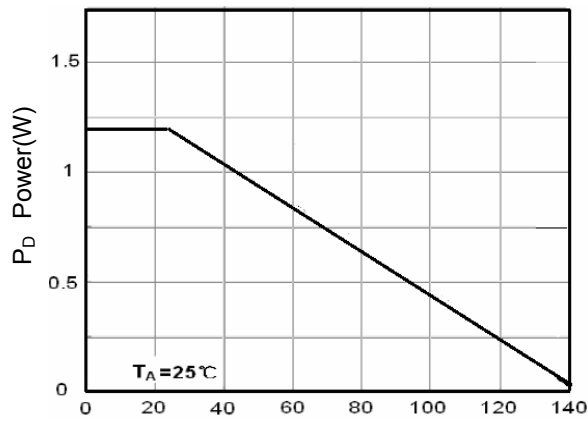
Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-30		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V,V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V,V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	-0.7	-1	-1.3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-4.2A	-	48	58	mΩ
		V _{GS} =-4.5V, I _D =-4A	-	59	78	mΩ
		V _{GS} =-2.5V, I _D =-1A		75	90	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V,I _D =-4.2A	-	10	-	S
Input Capacitance	C _{iss}	V _{DS} =-15V,V _{GS} =0V, F=1.0MHz	-	880	-	PF
Output Capacitance	C _{oss}		-	105	-	PF
Reverse Transfer Capacitance	C _{rss}		-	65	-	PF
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V,I _D =-4.2A V _{GS} =-10V,R _{GEN} =6Ω	-	7	-	nS
Turn-on Rise Time	t _r		-	3	-	nS
Turn-Off Delay Time	t _{d(off)}		-	30	-	nS
Turn-Off Fall Time	t _f		-	12	-	nS
Total Gate Charge	Q _g	V _{DS} =-15V,I _D =-4.2A,V _{GS} =-4.5V	-	8.5	-	nC
Gate-Source Charge	Q _{gs}		-	1.8	-	nC
Gate-Drain Charge	Q _{gd}		-	2.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V,I _S =-4.2A	-	-	-1.2	V

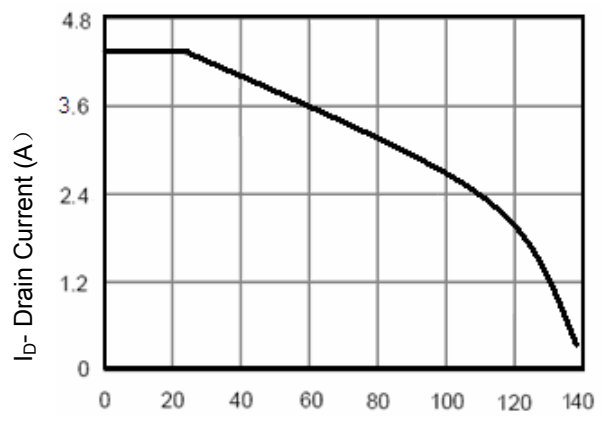
Notes:

- 1、Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2、Surface Mounted on FR4 Board, $t \leq 10$ sec.
- 3、Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4、Guaranteed by design, not subject to production

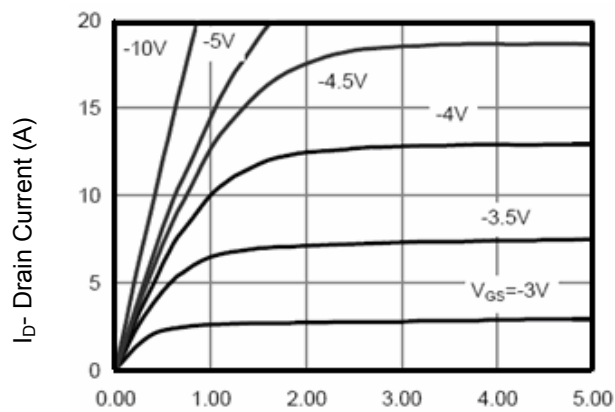
RATING AND CHARACTERISTIC CURVES (AO3401)



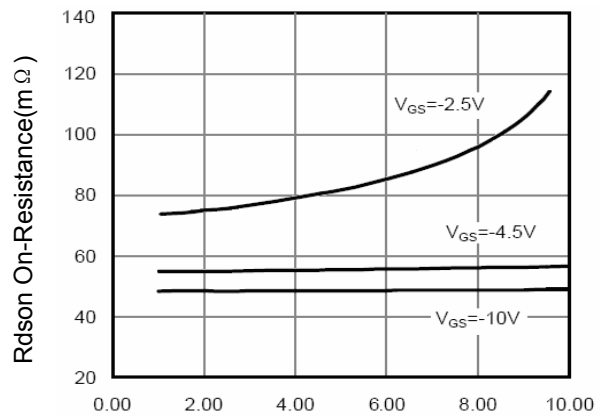
T_J -Junction Temperature($^{\circ}$ C)
Figure 1 Power Dissipation



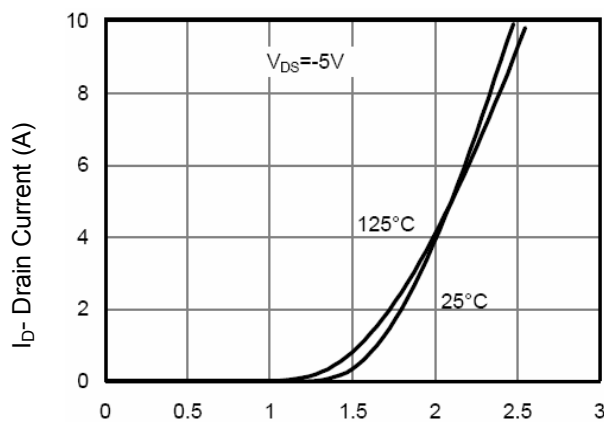
T_J -Junction Temperature($^{\circ}$ C)
Figure 2 Drain Current



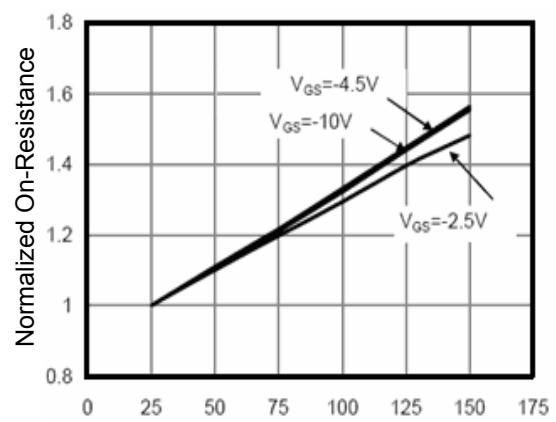
V_{DS} Drain-Source Voltage (V)
Figure 3 Output Characteristics



I_D - Drain Current (A)
Figure 4 Drain-Source On-Resistance

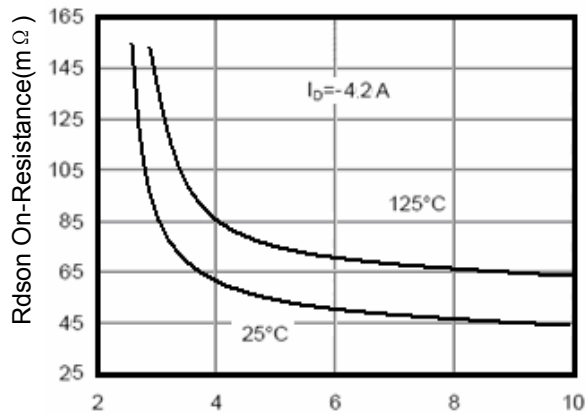


V_{GS} Gate-Source Voltage (V)
Figure 5 Transfer Characteristics

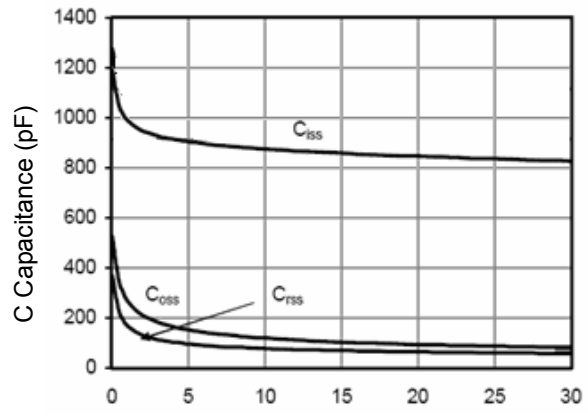


T_J -Junction Temperature($^{\circ}$ C)
Figure 6 Drain-Source On-Resistance

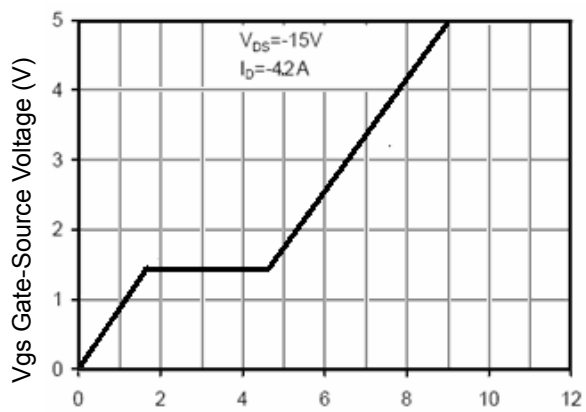
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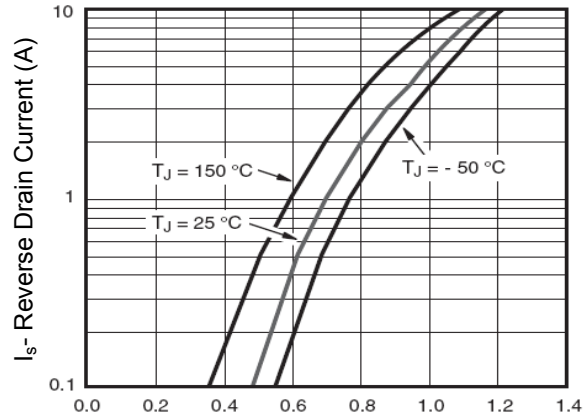
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 9 Gate Charge



Vsd Source-Drain Voltage (V)
Figure 10 Source- Drain Diode Forward

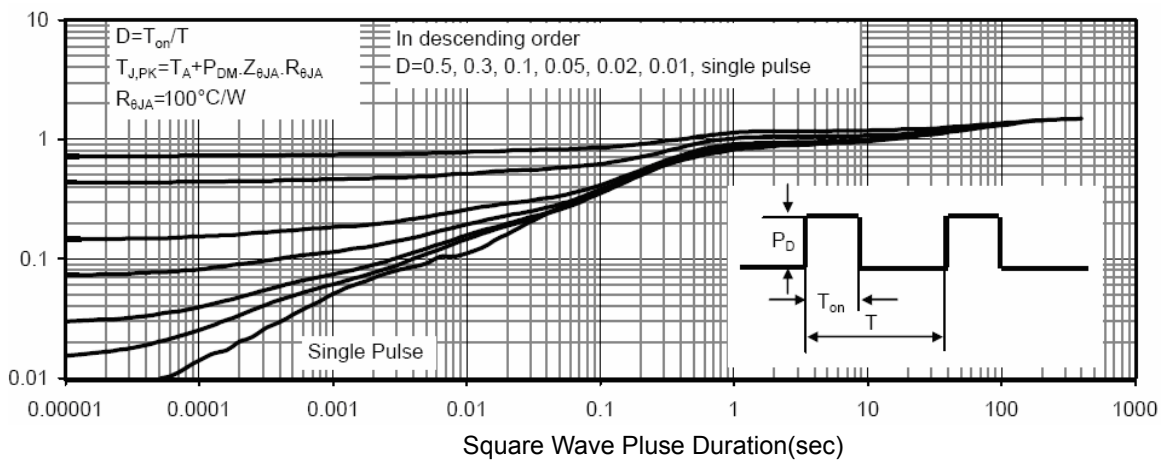


Figure 14 Normalized Maximum Transient Thermal Impedance