AP3401CI

-30V P-Channel Enhancement Mode MOSFET

Description

The AP3401CI 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 =-4.0A

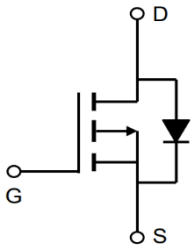
$R_{DS(ON)}$ < 68mΩ @ V_{GS}=4.5V **(Type：58mΩ)**

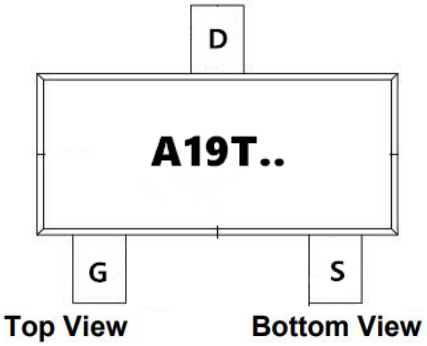
Application

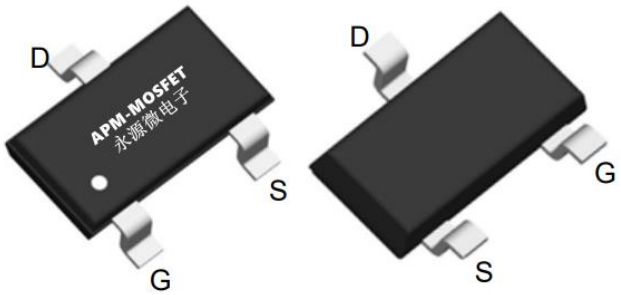
Battery protection

Load switch

Uninterruptible power supply







Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP3401CI	SOT23L	A19T..	3000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-4.0	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-2.3	A
IDM	Pulsed Drain Current note1	-14	A
P_D	Power Dissipation T_A = 25℃	1.1	W
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	125	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	150	℃/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	℃

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-30	-33	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}= -30V, V_{GS}=0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250μA	-0.5	-0.9	-1.5	V
RDS(on)	Static Drain-Source on-Resistance note2	V_{GS}= -4.5V, I_D= -3A	-	58	68	mΩ
		V_{GS}= -2.5V, I_D= -1A	-	71	96	mΩ
Ciss	Input Capacitance	V_{DS}= -15V, V_{GS}=0V, f=1.0MHz	-	553	-	pF
Coss	Output Capacitance		-	57	-	pF
Crss	Reverse Transfer Capacitance		-	35	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D= -3A, V_{GS}= -10V	-	6.5	-	nC
Qgs	Gate-Source Charge		-	1.4	-	nC
Qgd	Gate-Drain("Miller") Charge		-	1.7	-	nC
td(on)	Turn-on Delay Time	V_{DD}=-15V, I_D=-3A, V_{GS}=-10V,R_{GEN}=2.5Ω	-	10	-	ns
tr	Turn-on Rise Time		-	86	-	ns
td(off)	Turn-off Delay Time		-	150	-	ns
t_f	Turn-off Fall Time		-	357	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-4.2	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16.8	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= -4.2A	-	-0.8	-1.2	V

Note :

1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The power dissipation is limited by 150℃ 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

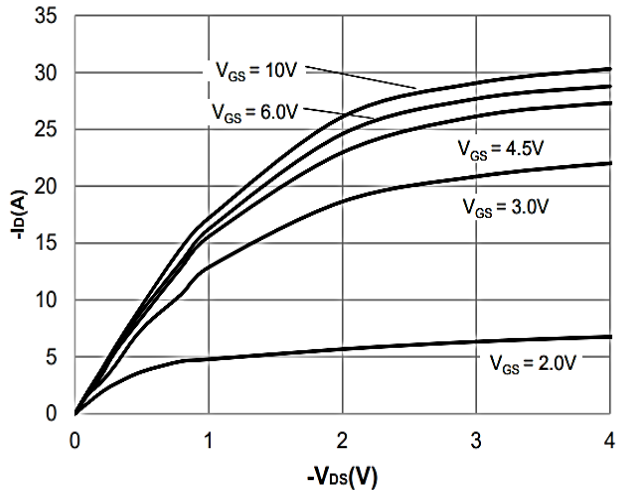


Figure1: Output Characteristics

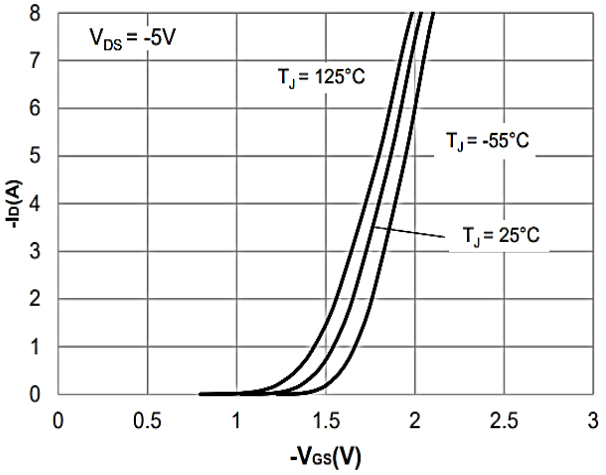


Figure 2: Typical Transfer Characteristics

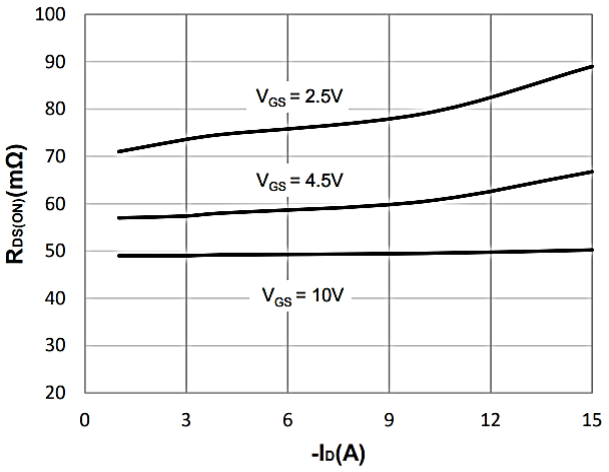


Figure 3:On-resistance vs. Drain Current

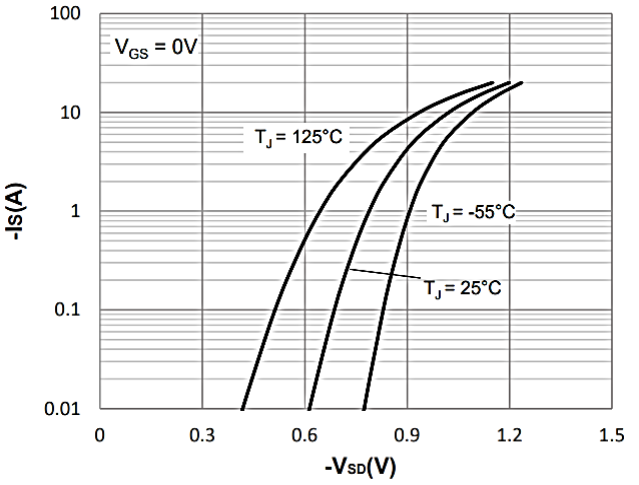


Figure 4: Body Diode Characteristics

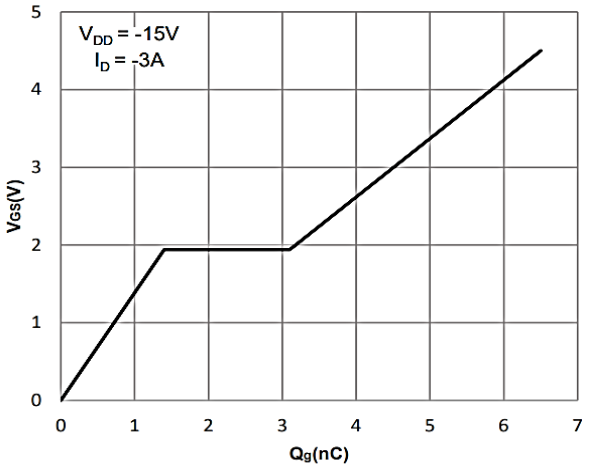


Figure 5: Gate Charge Characteristics

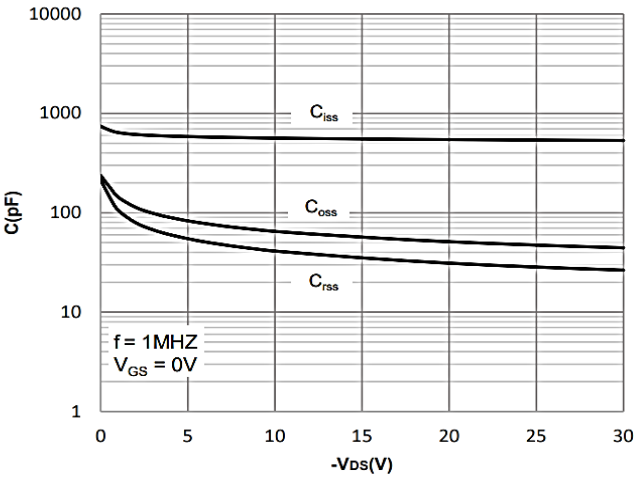


Figure 6: Capacitance Characteristics

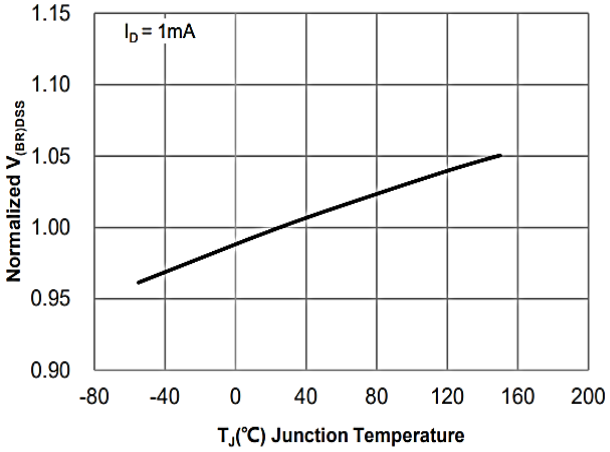


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

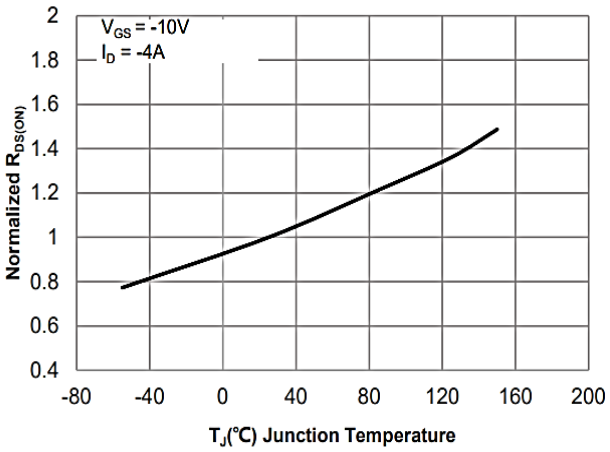


Figure 8: Normalized on Resistance vs. Junction Temperature

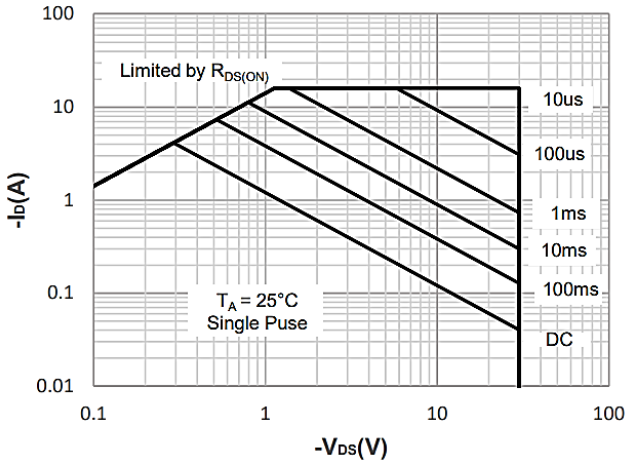


Figure 9: Maximum Safe Operating Area

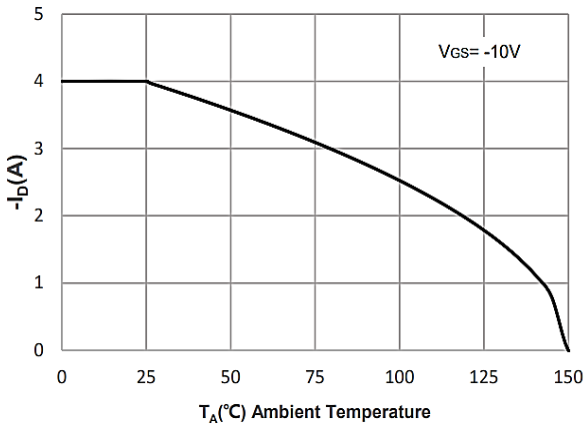


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

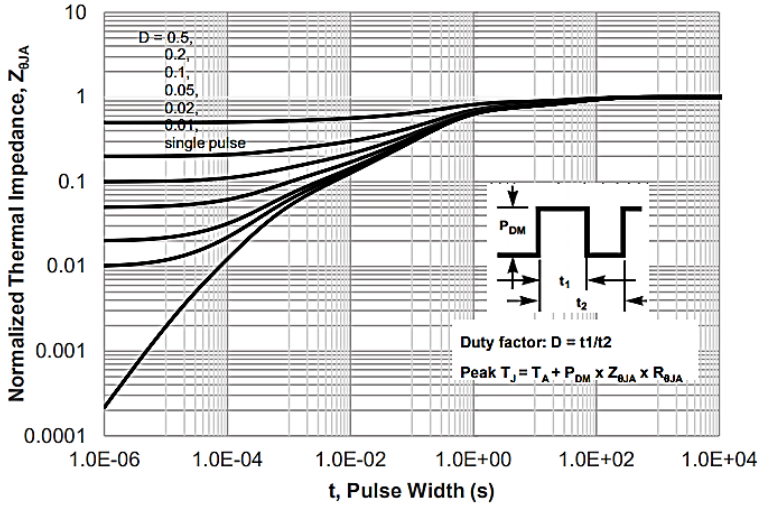
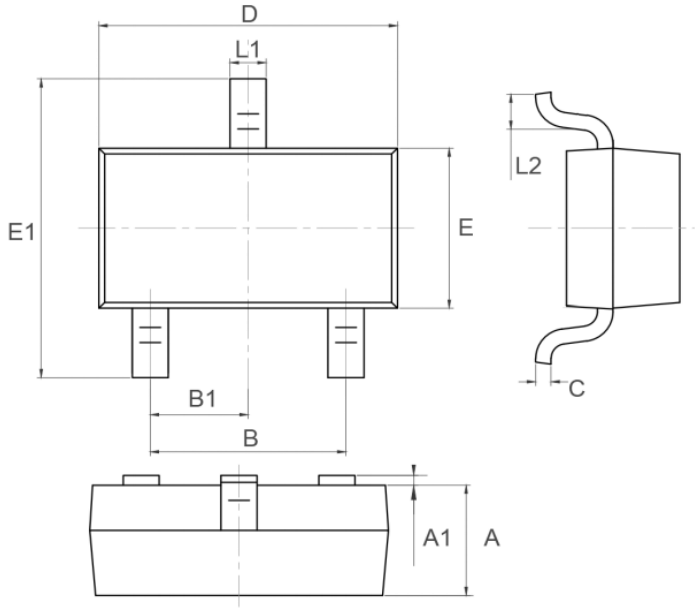


Figure.11: Maximum Effective TransientThermal Impedance, Junction-to-Ambient

Package Mechanical Data-SOT23L



Symbol	Dim in mm		
	Min.	Typ.	Max.
A	0.9	1	1.15
A1	0	0.05	0.1
B	1.8	1.9	2
B1	0.95TYP		
C	0.08	0.115	0.15
D	2.8	2.9	3
E	1.2	1.3	1.4
E1	2.25	2.4	2.55
L1	0.3	0.4	0.5
L2	0.2	0.35	0.5

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-30V P-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2018/11/31	Initial release