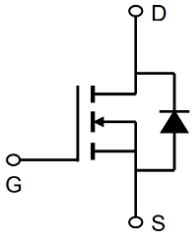
AP3404BI

30V N-Channel Enhancement Mode MOSFET

Description

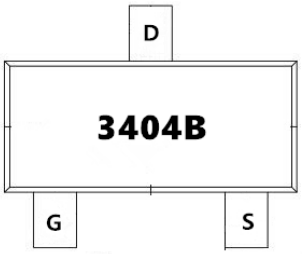
The AP3404BI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = 30V I_D =4.2A

$R_{DS(ON)}$ < 38mΩ @ V_{GS}=10V



Application

Lithium battery protection

Wireless impact

Mobile phone fast charging

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP3404BI	SOT23L	3404B	3000

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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	30	V
VGSS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current	4.2	A
I_D@T_A=70℃	Continuous Drain Current	2.6	A
IDM	Pulsed Drain Current	16	A
P_D	Power Dissipation T_A= 25℃	1	W
RθJA	Thermal Resistance, Junction to Ambient	125	℃/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	℃

Electrical Characteristics (T_C=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	32	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.2	1.5	2.5	V
RDS(on)	Static Drain-Source on-Resistance note2	V_{GS}=10V, I_D=4A	-	29	38	mΩ
		V_{GS}=4.5V, I_D=3A	-	45	65	
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz	-	233	-	pF
Coss	Output Capacitance		-	44	-	pF
Crss	Reverse Transfer Capacitance		-	33	-	pF
Q_g	Total Gate Charge	V_{DS}=15V, I_D=2A, V_{GS}=10V	-	3	-	nC
Q_{gs}	Gate-Source Charge		-	0.5	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	0.8	-	nC
td(on)	Turn-on Delay Time	V_{DS}=15V, I_D=4A, R_{GEN}=3Ω, V_{GS}=10V	-	4	-	ns
t_r	Turn-on Rise Time		-	2.1	-	ns
td(off)	Turn-off Delay Time		-	15	-	ns
t_f	Turn-off Fall Time		-	3.2	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	4	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	16	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=4A	-	-	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 I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

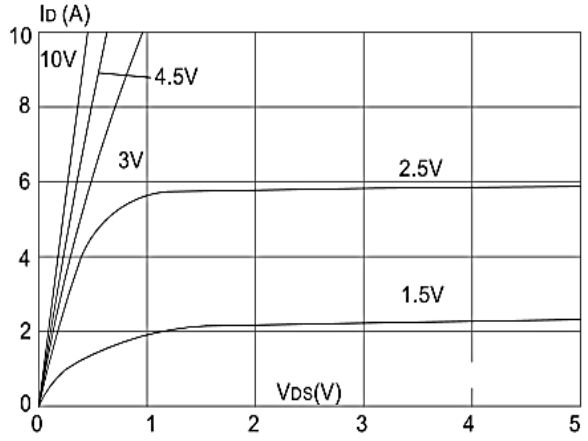


Figure1: Output Characteristics

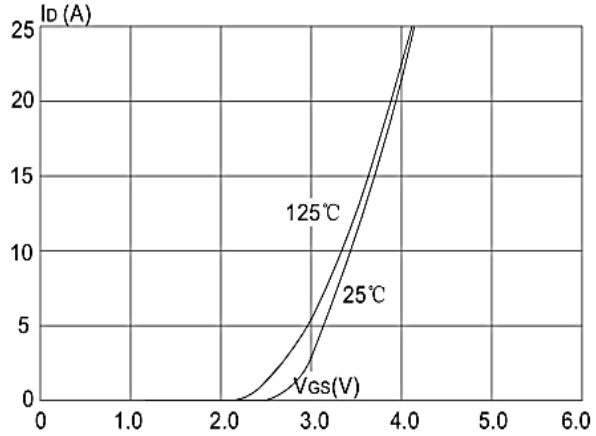


Figure 2: Typical Transfer Characteristics

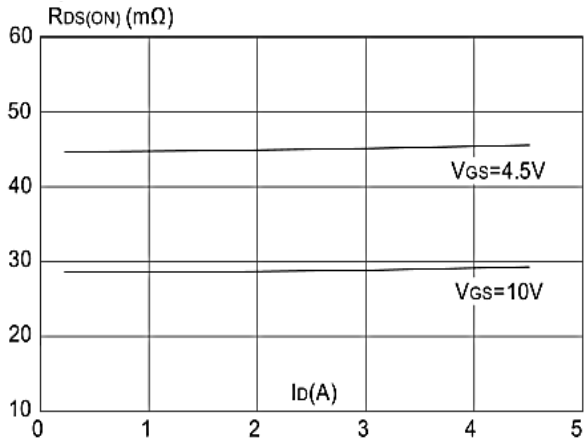


Figure 3:On-resistance vs. Drain Current

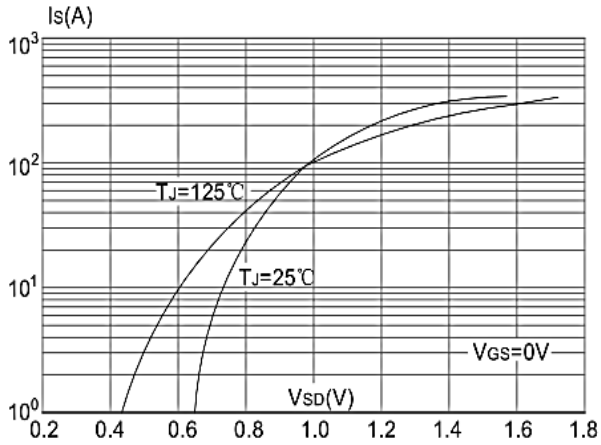


Figure 4: Body Diode Characteristics

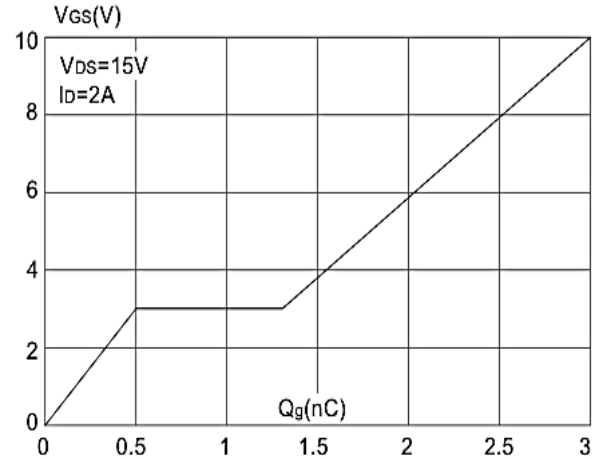


Figure 5: Gate Charge Characteristics

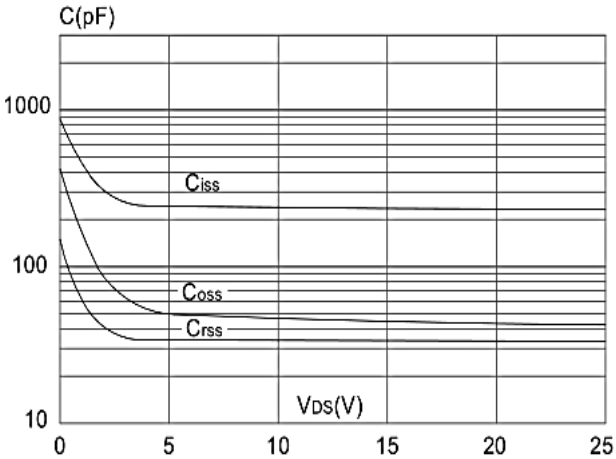


Figure 6: Capacitance Characteristics

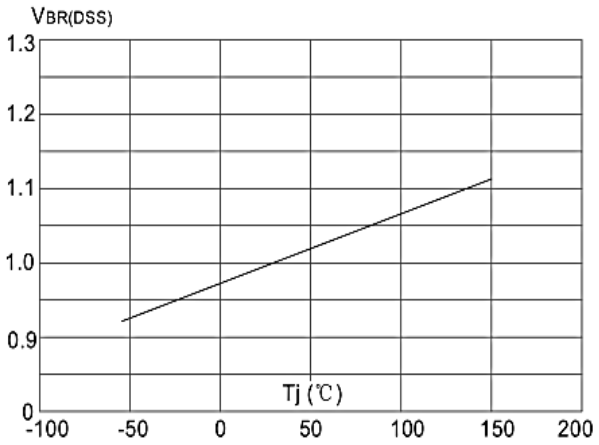


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

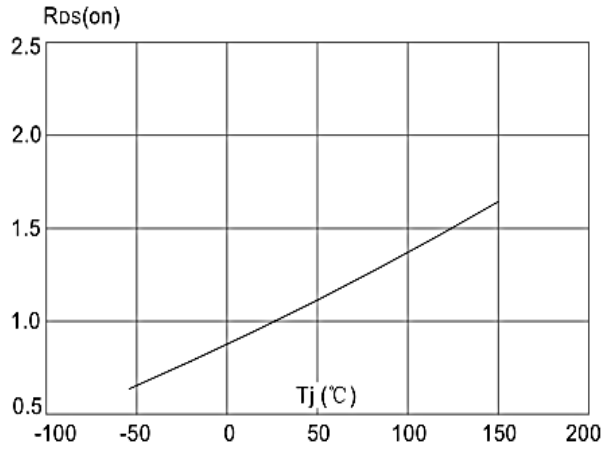


Figure 8: Normalized on Resistance vs Junction Temperature

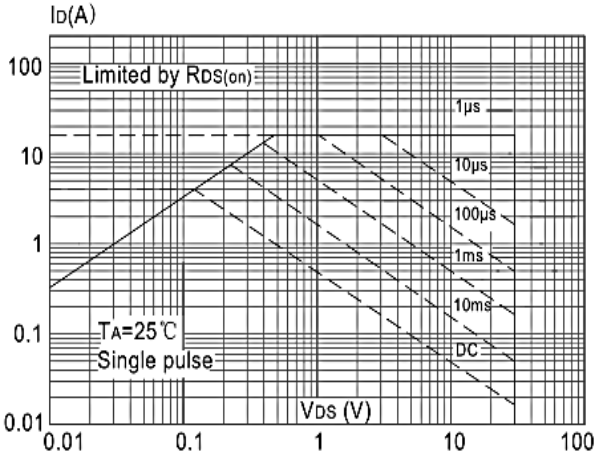


Figure 9: Maximum Safe Operating Area vs. Case Temperature

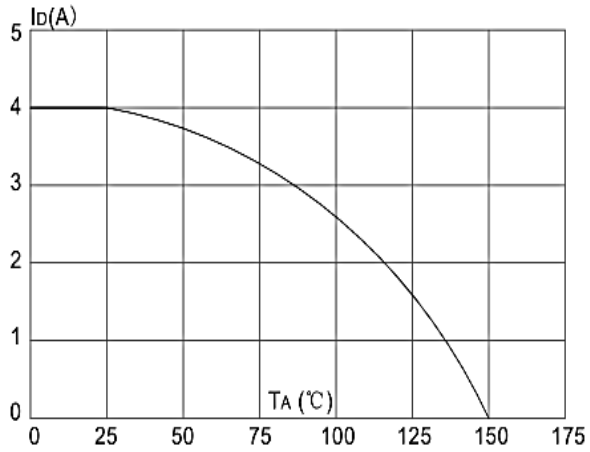


Figure 10: Maximum Continuous Drain Current

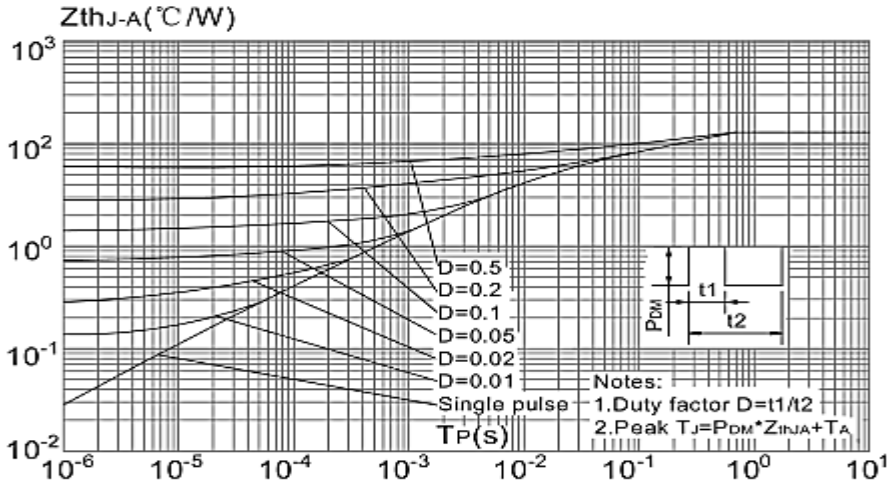
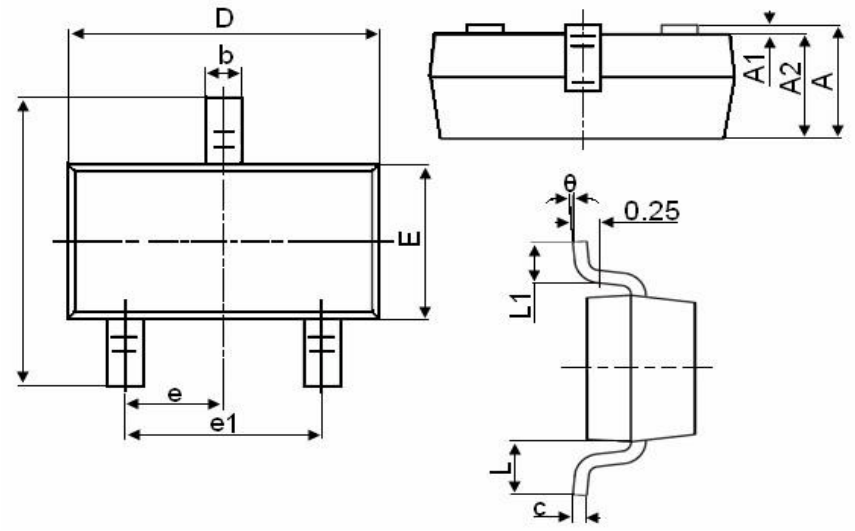


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data-SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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30V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve3.8	2018/1/31	Initial release
Rve3.9	2020/8/01	Reduce RDS(on)