AP3404CI

30V N-Channel Enhancement Mode MOSFET

Description

The AP3404CI 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 =5.2A

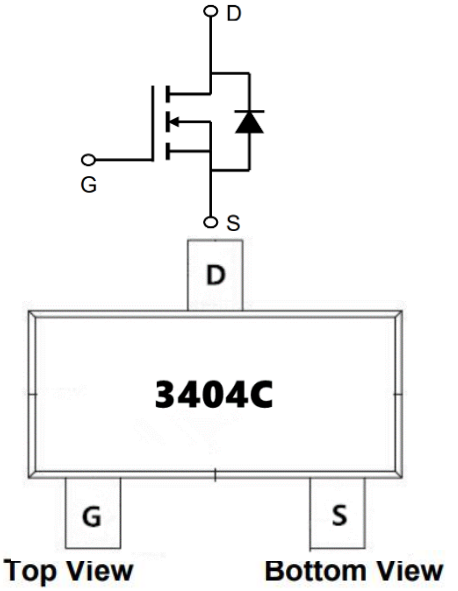
$R_{DS(ON)}$ < 38mΩ @ V_{GS}=10V （Type：29mΩ）

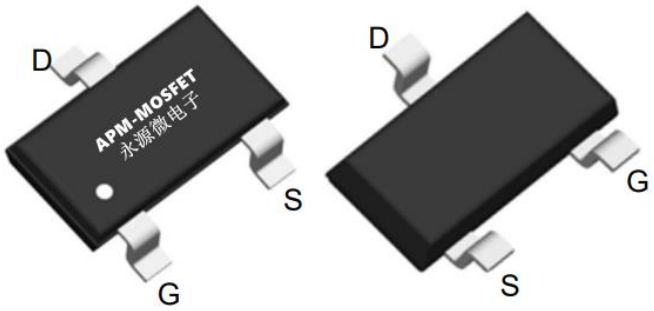
Application

Lithium battery protection

Wireless impact

Mobile phone fast charging





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP3404CI	SOT23L	3404C	3000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	30	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current	5.2	A
I_D@T_A=70℃	Continuous Drain Current	3.5	A
IDM	Pulsed Drain Current[2]	18	A
P_D@T_A=25℃	Total Power Dissipation[3]	1.25	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Thermal Resistance Junction-ambient [1]	125	℃/W
RθJA	Thermal Resistance Junction-Ambient [1]	85	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	I_D = 250mA, V_{GS} = 0V	30	-	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1.0	mA
IGSS	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250mA	1.0	1.4	2.5	V
RDS(ON)	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 4A	-	29	38	mW
		V_{GS} = 4.5V, I_D = 3A	-	39	65	mW
R_g	Gate Resistance	f = 1MHz	-	27	-	W
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS} =15V, f=1MHz	-	243	-	pF
Coss	Output Capacitance		-	40	-	pF
C_{rss}	Reverse Transfer Capacitance		-	31	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 4.5V V_{DS} = 15V, I_D = 3A	-	6	-	nC
Q_{gs}	Gate Source Charge		-	1	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1	-	nC
td(on)	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V I_D= 3A, R_{GEN} = 2.7W	-	2	-	ns
t_r	Turn-On Rise Time		-	6	-	ns
td(off)	Turn-Off DelayTime		-	24	-	ns
t_f	Turn-Off Fall Time		-	14	-	ns
IS	Maximum Continuous Body Diode Forward Current		-	-	4	A
ISM	Maximum Pulsed Body Diode Forward Current		-	-	15	A
VSD	Body Diode Forward Voltage	V_{GS} = 0V, I_S = 4A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 3A, di/dt = 100A/us	-	5	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	1.5	-	nC

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

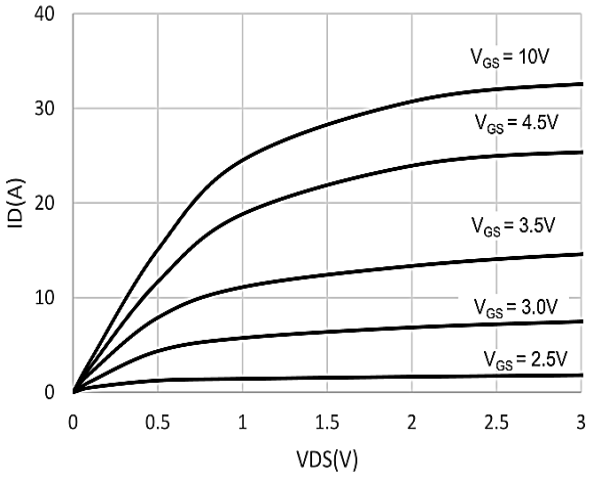


Figure 1: Output Characteristics

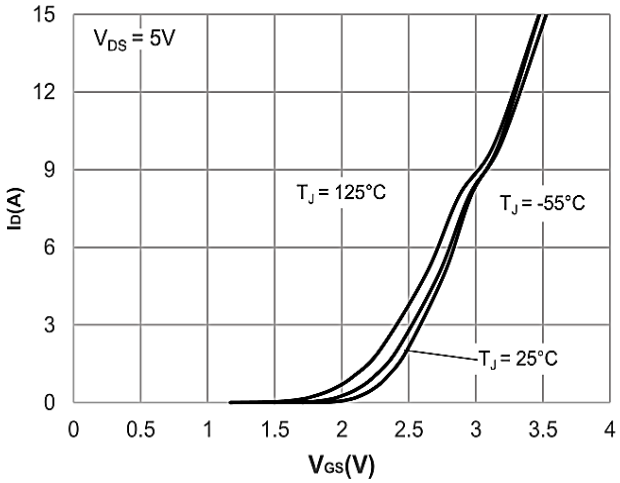


Figure 2: Typical Transfer Characteristics

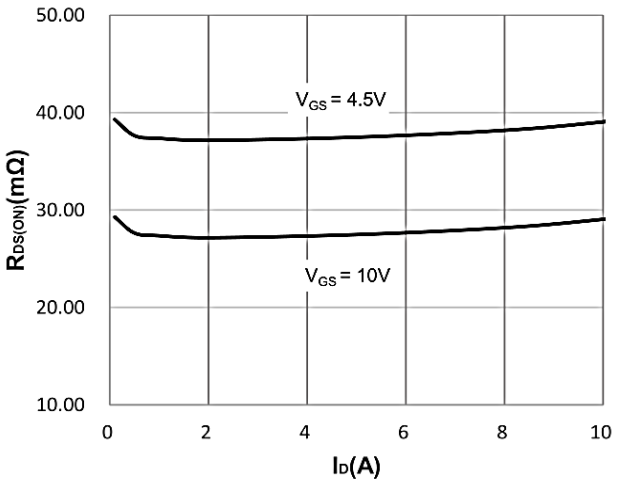


Figure 3: On-resistance vs. Drain Current

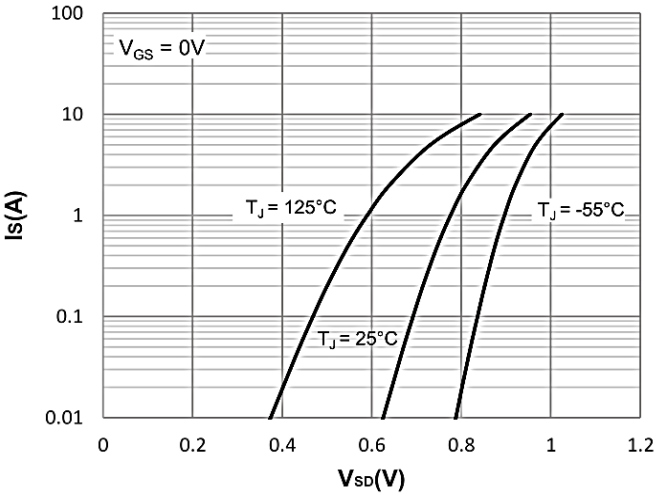


Figure 4: Body Diode Characteristics

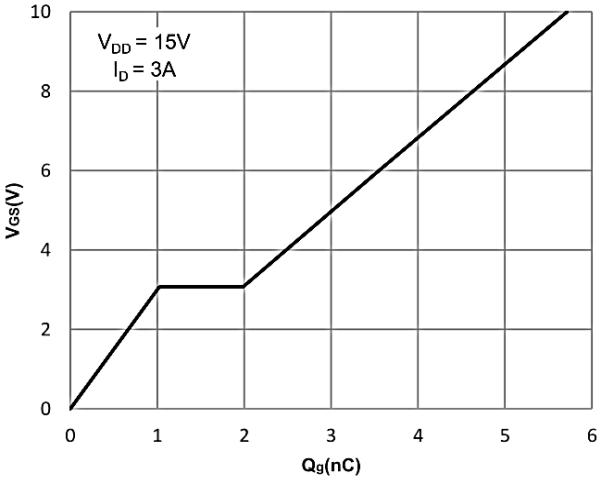


Figure 5: Gate Charge Characteristics

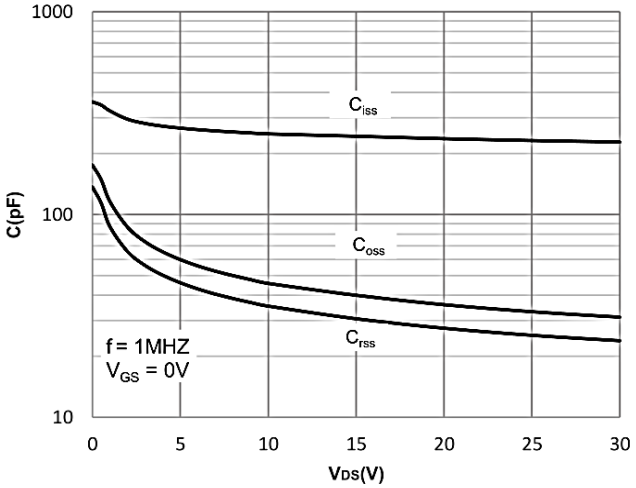


Figure 6: Capacitance Characteristics

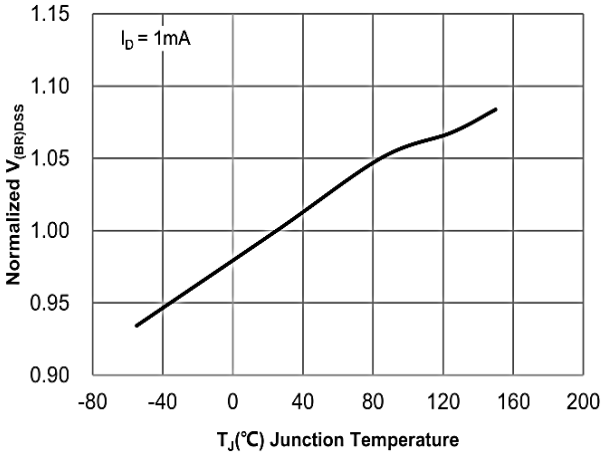


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

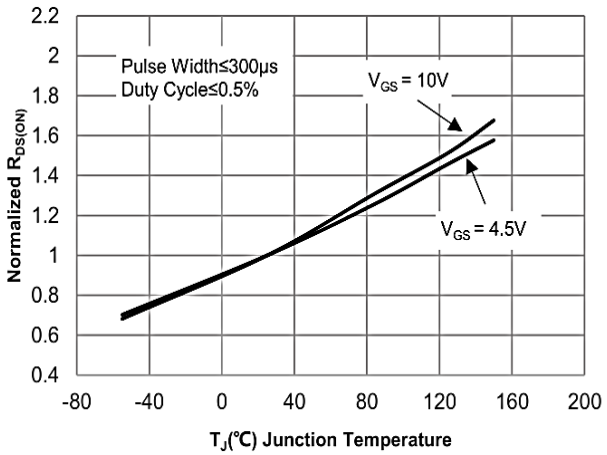


Figure 8: Normalized on Resistance vs. Junction Temperature

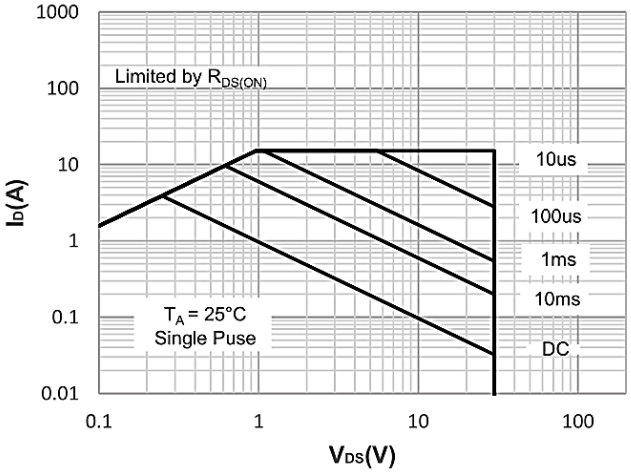


Figure 9: Maximum Safe Operating Area

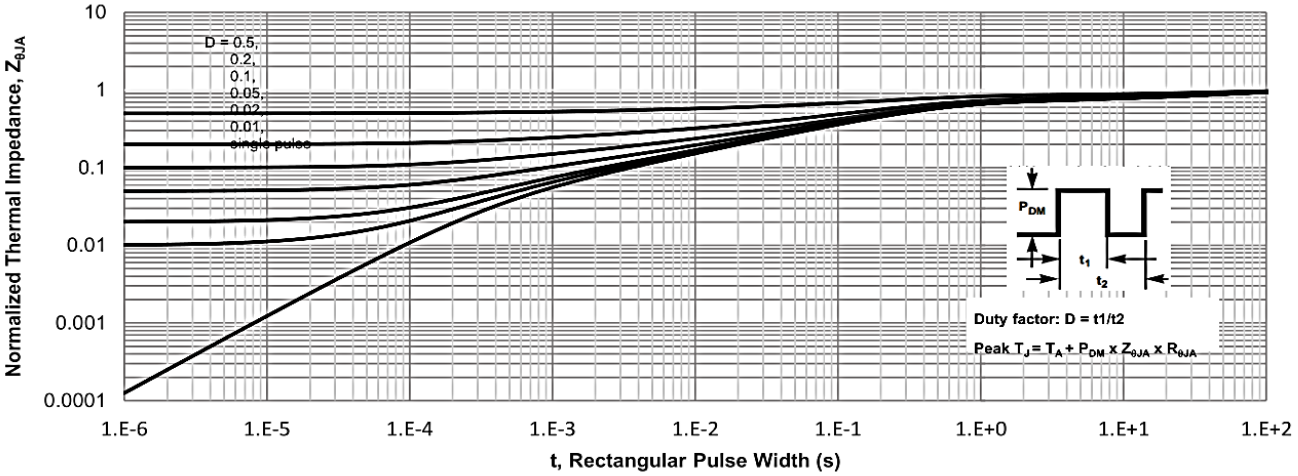
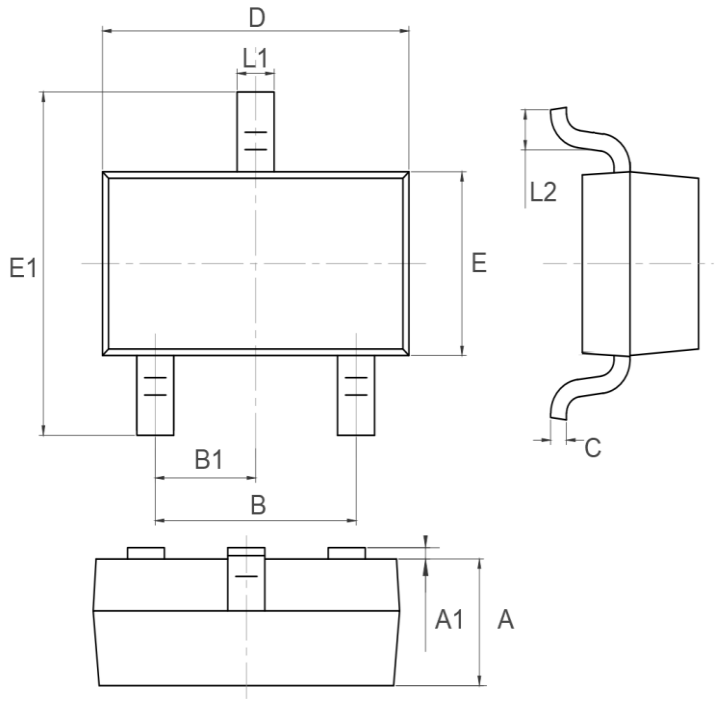


Figure 10: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-SOT23L-Single



Symbol	Dim in mm		
	Min	Typ	Max
A	0.9	1	1.1
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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Edition	Date	Change
REV1.0	2024/2/1	Initial release