# The Research of Lithium Battery Characteristic and Charger Design


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**ABSTRACT**

In view of the fact that the nowadays uses electronic products, for example:cell phone, notebook, digiatal camera....And so on the product all does take the li-ion battery as its energy originates, because the liion battery has the high energy density, the weight light, low internal resistance, the cycle-index long, self-discharge rate is low and so on the merit, because of initiates us to interest of the li-ion battery research. This research is tests the li-ion battery the charge&discharge characteristic, therefore in view of the battery voltage, the current, the temperature and internal resistance four kind of parameters, penetrates NI DAQ CARD to pick up the data, and to LABVIEW monitors each kind of parameter, obtains the data, finally makes the numerical analysis using MATLAB, Optimizes in order to . The battery manages the monitor system mainly is different monitors units by three the group to become, is battery voltage, the current monitor units, another for temperature monitoring part. This system slightly revises promptly may use to any battery controls and monitors. Then we each parameter which obtain in the basis, designs a input voltage to be possible in AC110 ～ 220V, the charging current approximately in during 250～300 mA, simple also is cheap ( NT$50) the li-ion handset battery charger, Is good after the actual test effect.



Keywords : LI-ION BATTERY, NI DAQ CADR,LABVIEW


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**REFERENCES**


1. National Instruments, “ Labview Basics Course Manual ” ,1999. 2. National Instruments, “ DAQ 6023E/6024E/6025E UserManual ” ,1999. 3. 惠汝生, “ 自動量測系統—LabVIEW ” ,全華科技圖書股份有限公司,2002. 4. 謝勝治, “ 圖控式程式語言—LabVIEW ” ,全華科技圖書股份有限公司,1998. 5.蕭子健,劉建昇,楊雅齡, “ LabVIEW 網路篇 ” ,高立圖書有限公司,2001. 6.楊家論, “ 二次鋰離子電池性能介紹 ” , 工業材料126 期,86 年5月. 7.洪為民, “ 二次鋰離子電池產品和性能介紹 ” ,工業材料117期 ,85 年9 月. 8.許雪萍、陳金銘、施得旭、林月微、施慶意, “ 鋰離子電池材料 技術 ” , 工業材料126 期,86 年6 月. 9.陳銘鋒,蔡嬪嬪, “ 充電式鋰電池之簡介及其最新發展趨勢 ” , 材料與社會 第66

期,81 年6 月. 10.姚慶意, “ 鋰離子電池新技術簡介 ”,工業材料131 期,86 年11月. 11.余建政,俞克維,林義隆,白能勝, “ MATLAB 6.X 使用入門 ”, 文京開發出版有限公司。 12.曾寶貞, “ 左右鋰離子電池性能的電極材料 ”,工業材料138期,87 年6 月. 13.張智星, “ MATLAB 程式設計與應用 ”,清蔚科技股份有限公司。 14.Joseph A. Carcone, “ Performance of Lithium-ion Battery Systems ”,Proceedings of the WESCON,pp242-248,1994. 15, Boyd Carter,James Matsumoto,Alonzo Prater,and Dennis Smith, “ Lithium ion Battery Performance and Charge Control ”,Proceedings of the 31st Intersociety Energy Conversion Engineering Conference,pp.363-368,1996. 16. Henry Oman, “ Battery news from the 32nd Intersociety Energy Conversion Engineering Conference ”,IEEE AES systems magazine,pp.23-31,March,1998. 17. Isaacson, Mark. J and associates, “ Li-ion Batteries for Space Applications ”, Proceedings of the 32nd Intersociety Energy Conversion Engineering Conference,pp. 31-34,1997. 18. Hossain, Sohrab and associates, “ Lithium Ion Cells for Aerospace Applications ”, Proceedings of the 32nd Intersociety Energy Conversion Engineering Conference,pp. 35-48,1997. 19. Chuck Lurie, “ Evaluation of Lithium Ion Cells for Space Applications ”, Proceedings of the 32nd Intersociety Energy Conversion Engineering Conference,pp.58-63,1997. 20.Perrone. David and Di Stefano, “ Survey of Lithium-ion Battery Performance for Potential Use in NASA Mission ”,Proceedings of the 32nd Intersociety Energy Conversion Engineering Conference,pp.39-41,1997. 21. W. F. Bentley and D. K. Heacock, “ Battery Management Consideration for Multichemistry System ”,IEEE AES system magazine,pp.23-26,May,1996. 22. M. Gonzalez, Miguel A. prerez, J. Diaz and F.j. Ferrero, “ Ni-Cd and Ni-MH Battery Optimized Fast-Charge method for Portable Telecommunication Application ”,Proceedings of the Eighteenth Annual International Telecommunications Energy Conference,pp.522-529,1996. 23. Zafar Ullah, Brian Burford and Dilip S, “ Fast Intelligent Battery Charging: Neural-Fuzzy Approach ”, IEEE AES system magazine,pp.26-29,May,1996. 24. Dele Stolitzka and William S. Dawson, “ When is It Intelligent to Use a Smart Battery? ”, Proceedings of the Ninth Annual Battery Conference on Applications and Advances ,pp.173-178,1994. 25. James H. Aylor, Alfred Thieme and Barry W. Johnson, “ A Battery State-of-Charge Indicator for Electric Wheelchairs ”, IEEE Trans. Industrial Electronics, vol.39, no.5,pp.398-409,October,1992. 26. L.Bowen,R. Zarr,and S. Denton, “ A microcontroller controlled Battery fuel Gauge and Charger ”, Proceedings of the Ninth Annual Battery Conference on Applications and Advances,pp.179-184.1994. 27. Hartmut Sumann, “ Genetic Optimization of Fuzzy System for Charging Batteries ”, IEEE Trans. Industrial Electronics, vol.43,no.5,pp.398-409,October,1996. 28.Y. C. Liang and T. K. NG, “ Design of Battery Charging System With Fuzzy Logic Controller ”,International Journal of Electronics,vol.75,no.1,pp.75-86,1993. 29. Assilian, p., “ Artificial Intelligence in the control of real dynamical systems ”,Ph.D.dissertation,London University,1974. 30.Jeong Jun Song and Sunwon Park, “ A Fuzzy Dynamic Learning Controller for Chemical Process Control ”, Fuzzy Sets and Systems,vol.54,pp.121-133,1993. 31. Von Altrock. C, Krause. B, and Zimmermann. H. J, “ Advanced fuzzy logic control of model car in extreme Situations ”, Fuzzy Sets and Systems,vol.48,pp.41-52,1992. 32. Chin. Teng. Lin, and C.S George. Lee, “ Neural Fuzzy Systems ”, Prentice-Hall,1996 33. EM78247/447 User Menu,Elan Microelectronic Corp. 34. 洪為民, “ 鋰離子二次電池原理、特性與應用 ”, 材料與社會, 29 期,pp.97-102,1993. 35.Power Integrations 公司產品手冊,2000. 36.沙占友等, “ 恒壓／恒流輸出式單片開關電源的設計原理 ”, 電源技術應用,2000(12). 37.沙占友, “ 低壓差集成穩壓器的應用 ”,積體電路應,2000(2)