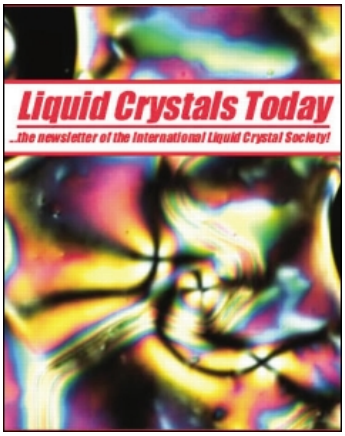

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Liquid Crystal Display Drivers - Techniques and Circuits

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Book Review

Liquid Crystal Display Drivers – Techniques and Circuits, by David J.R. Cristaldi, Salvatore Pennisi and Francesco Pulvirenti, Springer Verlag, 2009, 298 pp., US$159, ISBN: 978-9048122547.

Recent improvements in liquid crystal display (LCD) panels for multimedia and medical products have led to the publication of numerous books on this topic. Most of these books focus on the materials and/or LCD technologies. They are often written from the physics or chemistry point of view, or even from a historical perspective. This book, *Liquid Crystal Display Drivers – Techniques and Circuits*, is different. The authors, David J.R. Cristaldi, Salvatore Pennisi and Francesco Pulvirenti, deal with LCDs from the electronic engineering point of view, and specifically focus on reliable techniques, architectures and design solutions amenable to efficiently designing driving circuits for such systems. Beginning with an introduction to the physical-chemical properties of liquid crystal (LC) substances, this book addresses the LC evolution and application to LCDs, and examines and explains techniques and suitable schemes for passive-matrix and active-matrix LCDs. Finally, charge pump circuits for LCD drivers are also provided.

There are numerous research papers and technical reports related to LCD drivers. The authors have devoted considerable time to exploring and adopting many practical approaches and circuit solutions from previous publications. This book is valuable for both integrated circuit (IC) and system design engineers in the field of LCDs. It is also a good textbook for scientific researchers, educators and students.

All the authors are experts in the display field. As an educator, Dr Pennisi has not only published many papers related to LCDs, but also had much collaboration experience in the industry. Dr Pulvirenti has 18 years of industrial experience. He successfully developed more than 20 display drivers, most of them industrialised. The contents of this book were used for training students in academia for several years. Dr Cristaldi, who received a PhD degree in 2009, is one of the graduate students. Hence, the authors have not only the necessary, but also abundant, specialty to write this book.

I am an educator, and my research focuses on LCD driver design. I enjoyed reading this book and learned much from it. The book is very concise and clearly organised. It begins with LC substances and LCD operations. Most people who study or work in electronic engineering are not familiar with this field. The first two chapters of this book provide the necessary knowledge. Vivid photos and figures allow even non-experts to quickly catch on to the basic LC characteristics and LCD operations. After describing the LCD operations, this book examines LCD addressing techniques and their drivers for passive-matrix LCDs and active-matrix LCDs. These four chapters are the core of the book, as any LCD engineer must be familiar with the LCD addressing techniques and operations. The advantages and disadvantages of different addressing techniques are discussed. I was fascinated with the discussion of LCD drivers. The writing is based on a hierarchical approach: from the overall architecture down to schematic diagrams. This book not only provides functional building blocks, but also shows detailed transistor-level circuits. As a result, this book is very helpful for beginners in this field. Many new but practical approaches are also included, allowing advanced engineers to boost their specialty. An example of a colour super-twisted nematic LCD driver IC is also presented. This can help the readers to thoroughly understand the whole driving system. The appendices, which include other flat panel displays, display specifications and colour perceptions and descriptions, provide readers with further useful information.

This book covers what LCD engineers need to know. I recommend this book to both beginner and expert LCD engineers, scientific researchers, educators, students and anyone who is interested in LCDs.

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