

BOOK REVIEW

KIVER (M S): *Transistor and Integrated-Electronics*. 4th Ed. McGraw-Hill, Kogakusha. Tokyo, 1972. Pp. X + 675. \$ 4.90; Rs. 39.20.

The literature on transistor electronics is extensive and if in this field a book is to come out in its fourth edition, it must have some unusual and virile qualities. Milton S. Kiver's *Transistor and Integrated Electronics* has achieved this measure of popularity by a practical oriented exposition aimed at those who are *NOT* professional electronic engineers. The book is designed for the persons who use electronics as a tool and who want mainly a working knowledge of the use of semiconductor devices, largely transistors and integrated circuit chips. This group includes also electronic technicians for whom a simple understanding of the many solid state devices is a great help.

The book starts with a chapter on the modern electronic theory of semiconductors, which is followed by a chapter on the basic principles of a *p-n* junction, a diode and a junction transistor. The third chapter examines the characteristics of transistors under different circuit configurations and the effects of frequency, power and temperature upon transistor operation.

The fourth chapter deviates from the usual run of the books in this area and deals with the stages and evolution of the manufacturing processes. A description of the diffusion technique, mesa structures, epitaxial growth and above all the details of the planar processes gives not only an idea about the "whys" and the "hows" of the devices but also forms a neat introduction to the fabrication of integrated circuits. The different packaging techniques are also mentioned to give a rounded picture of the manufacturing processes.

The fifth chapter is devoted to the different types of junction and MOS field effect transistors and their characteristics. The next two chapters deal with relatively conventional topics of transistor amplifiers and oscillators. The unconventional part is a description of the construction and use of power transistors including practical details on heat sinks, their design and use. The eighth chapter deals with the fabrication of integrated circuits, encompassing monolithic and hybrid varieties as well as LSI chips. Here also the various processing stages of the different types of I.C.s are explained succinctly with sketches and photographs. The next three, somewhat

lengthy, chapters deal with the use of transistors and integrated circuits in AM/FM radio systems, computers, and in television systems. These form the major commercial consumer outlets of electronic devices and the author has decided to devote considerable space to these topics, starting with the simple ideas and going into more complicated circuits.

Chapter 12 deals with other solid state devices like Gunn diodes, LEDs, phototransistors, Zener diodes, varactor diodes, SCRs, UJTs, tunnel diodes and semiconductor lasers. By necessity only brief descriptions are given. Chapter 13 is concerned with the detailed design procedures for transistor amplifiers, a relatively common feature of most books on electronics. The next chapter is, however, an unusual one which deals with the servicing of transistor equipment. This contains quite a number of useful tips not only in the systematic methodology but also about the practical hints for a clean job. The final chapter contains a list of experiments using transistors, which give an understanding of the variety of circuit operations and the broad design considerations involved.

The book is distinctly biased towards practical work. The mathematics is quite minimal. Numerical values of the components for the typical operation are given in every circuit. Actual photographs of the devices give a feel for them. Each chapter has 15-45 questions to test the understanding. One is not able to spot any major mistake except for an embarrassing interchange of pages 584 and 621.

The book can be used for self study and in the electronics courses in universities and colleges and perhaps even in polytechnics for the advanced students. Even for the professional electronics students, it can be used for supplementary reading. The book has been designed for those who, with their primary interests and learning elsewhere, are interested in electronic devices and their uses. In this task the book has succeeded very well and the fourth edition is likely to continue the success.

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