

1. Record Nr.	UNINA9911018803903321
Autore	Gontrand Christian
Titolo	Analog Devices and Circuits 1 : Analog Devices
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2024 ©2023
ISBN	9781394255474 1394255470 9781394255450 1394255454
Edizione	[1st ed.]
Descrizione fisica	1 online resource (260 pages)
Disciplina	621.3815
Soggetti	Analog electronic systems Bipolar transistors
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- Preface -- Introduction -- Chapter 1. Bipolar Junction Transistor -- 1.1. Introduction -- 1.1.1. A schematic technological embodiment of an integrated bipolar junction transistor -- 1.2. Transistor effect -- 1.2.1. Flows and currents -- 1.2.2. Compromises for bipolar junction transistor -- 1.2.3. Configurations and associated current gains -- 1.3. Bipolar junction transistor: some calculations -- 1.3.1. Various modes of operation -- 1.4. The NPN transistor -- Ebers-Moll model (1954: Jewell James Ebers and John L. Moll) -- 1.4.1. Gummel curves -- 1.4.2. Consideration of second-order effects for the static model -- 1.4.3. Early curves -- 1.4.4. Base width modulation -- Early effect -- 1.4.5. Ebers-Moll model wide signals -- 1.4.6. Current gain -- 1.5. Simple bipolar junction transistor model -- 1.6. Network of static characteristics of the bipolar junction transistor -- 1.6.1. Common emitter configuration -- 1.6.2. Common emitter configuration with emitter degeneration -- 1.7. Some applications -- 1.7.1. Current mirrors -- 1.7.2. Differential pair -- 1.7.3. Output stage -- 1.8. Application: operational amplifier -- 1.9. BiCMOS -- Chapter 2. MOSFET -- 2.1. Introduction -- 2.1.1. Base structure -- 2.1.2. Working

principle -- 2.2. MOS capability: electric model and curve $C(V)$ -- 2.3. Different types of MOS transistors -- 2.4. A CMOS technological process -- 2.5. Electric modeling of the NMOS enhancement transistor -- 2.6. Off state -- 2.7. Linear or ohmic or unsaturated regime -- 2.7.1. Saturation regime -- 2.7.2. High saturation velocity -- 2.7.3. Static characteristics -- 2.8. Applications -- 2.8.1. Digital inverter -- 2.8.2. Active resistor -- 2.8.3. MOS Single current mirror -- 2.8.4. MOS differential amplifier -- 2.9. Explained technological steps of a CMOS. Chapter 3. Devices Dedicated to Radio Frequency: Toward Nanoelectronics -- 3.1. Introduction -- 3.2. Model for HBT SiGeC and device structure -- 3.2.1. Modeling the drift-diffusion equation -- 3.3. MOS of the future? -- 3.3.1. Introduction -- 3.3.2. DGMOS -- 3.3.3. Transport in nanoscale MOSFETs -- 3.3.4. Numerical methods -- 3.4. Conclusion -- 3.5. MATLAB use -- 3.5.1. Computer-aided modelling and simulations: synopsis -- 3.5.2. Calculation of the second elementary member 1 -- 3.6. Conclusion -- Appendix -- References -- Index -- EULA.

Sommario/riassunto

This book, 'Analog Devices and Circuits 1' by Christian Gontrand, provides an in-depth exploration of analog electronic devices and circuits, focusing primarily on the technological and operational aspects of bipolar junction transistors (BJTs) and MOSFETs. It covers various configurations, calculations, and applications of these devices, including current mirrors, differential pairs, and operational amplifiers. The book also delves into the advanced concepts such as the Ebers–Moll model and network configurations. Additionally, it examines devices dedicated to radio frequency and the technological processes involved in CMOS. The content is tailored for electronics engineers, students, and researchers seeking a comprehensive understanding of analog device functionalities and circuit design.
