

Fundamentals of Distributed Amplification



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Distributed amplification is one of the more powerful yet curiously under-utilised tools available to today's designers. In the hands of savvy engineers, distributed amplification allows the simultaneous optimisation of gain-bandwidth, phase linearity, and noise figure. In addition, at optical frequencies distributed amplification reduces dependence on temperature and signal polarisation. This work sets out to demystify this powerful technology as it surveys the current state-of-the-art with an emphasis on practical applications. From historical perspectives and theory to device design and implementation, "Fundamentals of Distributed Amplification" covers everything needed to integrate superior performance amplifiers into FETs, vacuum and parametric devices, semiconductor lasers, transistors, and many other devices. In addition to its coverage of the principles of distributed amplification, this detailed reference: develops thorough derivations of the relevant equations for distributed amplifiers, based on unilateral models of active devices; generates analysis based on bilateral models to account for reverse isolation, transient threshold, and tightly coupled systems; and discusses transient response and amplifier implementation in detail. The book also features a special, comprehensive section on developments in distributed optical amplifiers, including traveling wave semiconductor laser amplifiers and distributed erbium-doped fiber amplifiers. Researchers, microwave and device engineers, students, teachers of university courses and intensive industry short courses, should all find this book useful.

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