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Nota di contenuto	Noise in High-Frequency Circuits and Oscillators; Contents; Preface; 1 Mathematical and System-oriented Fundamentals; 1.1 Introduction; 1.1.1 Technical relevance of noise; 1.1.2 Physical origins of noise; 1.1.3 General characteristics of noise signals; 1.2 Mathematical basics for the description of noise signals; 1.2.1 Stochastic process and probability density; 1.2.2 Compound probability density and conditional probability; 1.2.3 Mean value and moments; 1.2.4 Auto- and cross-correlation function; 1.2.5 Description of noise signals in the frequency domain 1.2.6 Characteristic function and the central limit theorem1.2.7 Interrelationship between moments of different orders; 1.3 Transfer of noise signals by linear networks; 1.3.1 Impulse response and transfer function; 1.3.2 Transformation of the autocorrelation function and the power spectrum; 1.3.3 Correlation between input and output noise

signals; 1.3.4 Superposition of partly correlated noise signals; 2 Noise of Linear One- and Two-Ports; 2.1 Noise of one-ports; 2.1.1 Thermal noise of resistors; 2.1.2 Networks of resistors of identical temperature; 2.1.3 The RC-circuit
2.1.4 Thermal noise of complex impedances2.1.5 Available noise power and equivalent noise temperature; 2.1.6 Networks with inhomogeneous temperature distribution; 2.1.7 Dissipation theorem; 2.2 Noise of two-ports; 2.2.1 Description of the internal noise by current and voltage sources; 2.2.2 Noise equivalent sources for two-ports at homogeneous temperature; 2.2.3 Noise description by waves; 2.2.4 Noise of circulators and isolators; 2.2.5 Noise waves for thermally noisy two-ports at a homogeneous temperature; 2.2.6 Equivalent noise waves for linear amplifiers
2.3 Noise figure of linear two-ports2.3.1 Definition of the noise figure; 2.3.2 Calculation of the noise figure based on equivalent circuits; 2.3.3 Noise figure of two-ports with thermal noise; 2.3.4 Noise figure of cascaded two-ports; 2.3.5 Noise matching; 3 Measurement of Noise Parameters; 3.1 Measurement of noise power; 3.1.1 Power measurement on the basis of a thermocouple; 3.1.2 Thermistor bridge; 3.1.3 Power measurements with Schottky-diodes; 3.1.4 Power measurements with field effect transistors; 3.1.5 Power measurements with analog multipliers
3.1.6 Power measurements with a digital detector3.1.7 Power measurements with a spectrum analyzer; 3.1.8 Errors in noise power measurements; 3.2 Measurement of the correlation function and the cross-spectrum; 3.3 Illustrative interpretation of the correlation; 3.4 Measurement of the equivalent noise temperature of a one-port; 3.5 Special radiometer circuits; 3.5.1 Dicke-Radiometer; 3.5.2 Problems with mismatched devices under test; 3.5.3 Compensation radiometers; 3.5.4 Correlation radiometer; 3.5.5 Fundamental errors of noise power or noise temperature measurements
3.5.6 Principle errors of a correlation radiometer or correlator

Sommario/riassunto

A classroom-tested book addressing key issues of electrical noiseThis book examines noise phenomena in linear and nonlinear high-frequency circuits from both qualitative and quantitative perspectives. The authors explore important noise mechanisms using equivalent sources and analytical and numerical methods. Readers learn how to manage electrical noise to improve the sensitivity and resolution of communication, navigation, measurement, and other electronic systems.Noise in High-Frequency Circuits and Oscillators has its origins in a university course taught by the authors. As