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Nota di contenuto	THE DESIGN OF MODERN MICROWAVE OSCILLATORS FOR WIRELESS APPLICATIONS; CONTENTS; Foreword; Preface; Biographies; 1 Introduction; 1.1 Organization; 2 General Comments on Oscillators; 2.1 Sinusoidal Oscillators; 2.2 Phase Noise Effects; 2.3 Specifications of Oscillators and VCOs; 2.4 History of Microwave Oscillators; 2.5 Three Approaches to Designing Microwave Oscillators; 2.6 Colpitts Oscillator, Grounded Base Oscillator, and Meissen Oscillator; 2.7 Three-Reactance Oscillators Using Y-Parameters: An Introduction; 2.8 Voltage-Controlled Oscillators (VCOs); 3 Transistor Models; 3.1 Introduction 3.2 Bipolar Transistors3.3 Field-Effect Transistors (FETs); 3.4 Tuning Diodes; 4 Large-Signal S-Parameters; 4.1 Definition; 4.2 Large-Signal S-Parameter Measurements; 5 Resonator Choices; 5.1 LC Resonators; 5.2 Microstrip Resonators; 5.3 Ceramic Resonators; 5.4 Dielectric Resonators; 5.5 YIG-Based Resonators; 6 General Theory of Oscillators; 6.1 Oscillator Equations; 6.2 Large-Signal Oscillator Design; 7 Noise in Oscillators; 7.1 Linear Approach to the Calculation of Oscillator Phase

Noise; 7.2 The Lee and Hajimiri Noise Model

7.3 Nonlinear Approach to the Calculation of Oscillator Phase Noise7.4 Phase Noise Measurements; 7.5 Support Circuits; 8 Calculation and Optimization of Phase Noise in Oscillators; 8.1 Introduction; 8.2 Oscillator Configurations; 8.3 Oscillator Phase Noise Model for the Synthesis Procedure; 8.4 Phase Noise Analysis Based on the Negative Resistance Model; 8.5 Phase Noise Analysis Based on the Feedback Model; 8.6 2400 MHz MOSFET-Based Push-Pull Oscillator; 8.7 Phase Noise, Biasing, and Temperature Effects; 9 Validation Circuits; 9.1 1000 MHz CRO

9.2 4100 MHz Oscillator with Transmission Line Resonators9.3 2000 MHz GaAs FET-Based Oscillator; 9.4 77 GHz SiGe Oscillator; 9.5 900-1800 MHz Half-Butterfly Resonator-Based Oscillator; 10 Systems of Coupled Oscillators; 10.1 Mutually Coupled Oscillators Using the Classical Pendulum Analogy; 10.2 Phase Condition for Mutually Locked (Synchronized) Coupled Oscillators; 10.3 Dynamics of Coupled Oscillators; 10.4 Dynamics of N-Coupled (Synchronized) Oscillators; 10.5 Oscillator Noise; 10.6 Noise Analysis of the Uncoupled Oscillator

10.7 Noise Analysis of Mutually Coupled (Synchronized) Oscillators10.8 Noise Analysis of N-Coupled (Synchronized) Oscillators; 10.9 N-Push Coupled Mode (Synchronized) Oscillators; 10.10 Ultra-Low-Noise Wideband Oscillators; 11 Validation Circuits for Wideband Coupled Resonator VCOs; 11.1 300-1100 MHz Coupled Resonator Oscillator; 11.2 1000-2000/2000-4000 MHz Push-Push Oscillator; 11.3 1500-3000/3000-6000 MHz Dual Coupled Resonator Oscillator; 11.4 1000-2000/2000-4000 MHz Hybrid Tuned VCO; References; Appendix A Design of an Oscillator Using Large-Signal S-Parameters

Appendix B Example of a Large-Signal Design Based on Bessel Functions

Sommario/riassunto	Delivering the best possible solution for phase noise and output power efficiency in oscillatorsThis complete and thorough analysis of microwave oscillators investigates all aspects of design, with particular emphasis on operating conditions, choice of resonators and transistors, phase noise, and output power. It covers both bipolar transistors and FETs. Following the authors' guidance, readers learn how to design microwave oscillators and VCOs that can be tuned over a very wide frequency range, yet have good phase noise, are low cost, and are small in size. All the essential topics in osc