

1. Record Nr.	UNINA9910830286103321
Autore	Randa James
Titolo	Precision measurement of microwave thermal noise / / James Randa
Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley & Sons, , [2023] ©2023
ISBN	9781119910107 1-119-91011-0 1-119-91010-2 1-119-91012-9
Descrizione fisica	1 online resource (179 pages)
Disciplina	621.3813
Soggetti	Dispositus de microones Microones - Mesuraments Microwave devices Microwave measurements
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Preface -- Chapter 1 Background -- 1.1 Nyquist's Theorem and Noise Temperature -- 1.1.1 Nyquist's Theorem -- 1.1.2 Limits and Numbers -- 1.1.3 Definition of Noise Temperature -- 1.1.4 Excess Noise Ratio and T0 -- 1.2 Microwave Networks -- 1.2.1 Notation -- 1.2.2 Noise Correlation Matrix and Bosma's Theorem -- 1.2.3 Power Ratios -- 1.2.4 Noise Temperature Translation Through a Passive Device -- References -- References -- Chapter 2 NoiseTemperature Standards -- 2.1 Introduction -- 2.2 Ambient Standards -- 2.3 Hot (Oven) Standards -- 2.4 Cryogenic Standards -- 2.4.1 Coaxial Standards -- 2.4.2 Waveguide Standards -- 2.5 Other Standards and Noise Sources -- 2.5.1 Tunable Primary Standards -- 2.5.2 "Equivalent Hot Standard" Based on RF Power -- 2.5.3 Secondary Standards -- 2.5.4 Synthetic Primary Standards -- References -- Chapter 3 NoiseTemperature Measurement -- 3.1 Background -- 3.2 TotalPower Radiometer -- 3.2.1 Idealized Case -- 3.2.2 Nonideal Case -- 3.2.3 Radiometer Equation for Isolated TotalPower Radiometer -- 3.2.4 TotalPower

Radiometer Design -- 3.2.5 Radiometer Testing -- 3.3 TotalPower
Radiometer Uncertainties -- 3.3.1 TypeA Uncertainties -- 3.3.2 TypeB
Uncertainties -- 3.3.3 Sample Results -- 3.4 Other Radiometer Designs
-- 3.4.1 Switching or Dicke Radiometer -- 3.4.2 Digital Radiometer --
3.5 Measurements through Adapters -- 3.6 Traceability and Inter
laboratory Comparisons -- References -- Chapter 4 Amplifier Noise --
4.1 Noise Figure, Effective Input Noise Temperature -- 4.2 Noise
Temperature Definition Revisited -- 4.3 Noise Figure Measurement,
Simple Case -- 4.4 Definition of Noise Parameters -- 4.4.1 Circuit
Treatment of Noisy Amplifier -- 4.4.2 Wave Representation of Noise
Parameters -- 4.5 Measurement of Noise Parameters -- 4.5.1 General
Measurement Setup.
4.5.2 Fit to NoiseFigure Parameterization -- 4.5.3 Fit to Noise
Temperature or Power Parameterization -- 4.5.4 Possible Variations
When Using the Wave Formulation -- 4.5.5 Choice of Input
Terminations -- 4.5.6 Commercial Systems, SourcePull Measurements
-- 4.5.7 Frequency-Variation Method -- 4.6 Uncertainty Analysis for
NoiseParameter Measurements -- 4.6.1 Simple Considerations --
4.6.2 Full Analysis -- 4.6.3 Input Uncertainties -- 4.6.4 General
Features and Sample Results -- 4.7 Simulations and Strategies --
References -- Chapter 5 OnWafer Noise Measurements -- 5.1
Introduction -- 5.2 OnWafer Microwave Formalism -- 5.2.1 Traveling
Waves vs. Pseudo Waves -- 5.2.2 OnWafer Reference Planes -- 5.3
NoiseTemperature Measurements -- 5.4 OnWafer NoiseParameter
Measurements -- 5.4.1 General -- 5.4.2 RadiometerBased Systems --
5.4.3 Commercial Systems and ReferencePlane Considerations -- 5.4.4
"Enhanced" or ModelAssisted Measurements -- 5.5 Uncertainties --
5.5.1 Differences from Packaged Amplifiers -- 5.5.2 General Features
and Properties -- 5.5.3 Measurement Strategies -- References --
Chapter 6 NoiseParameter Checks and Verification -- 6.1
Measurement of Passive or Previously Measured Devices -- 6.2 Physical
Bounds and Model Predictions -- 6.3 Tandem or Hybrid Measurements
-- References -- Chapter 7 Cryogenic Amplifiers -- 7.1 Background --
7.1.1 Introduction -- 7.1.2 VacuumFluctuation Contribution -- 7.2
Measurement of the Matched Noise Figure -- 7.2.1 ColdAttenuator
Method -- 7.2.2 Internal Hot-Cold Method -- 7.2.3 Full
Characterization Measurements -- 7.3 NoiseParameter Measurement
-- References -- Chapter 8 Multiport Amplifiers -- 8.1 Introduction --
8.2 Formalism and Noise Matrix -- 8.3 Definition of Noise Figure for
Multiports -- 8.4 Degradation of SignaltoNoise Ratio.
8.5 ThreePort Example - Differential Amplifier with Reflectionless
Terminations -- 8.5.1 Motivation -- 8.5.2 Characteristic Noise
Temperature, Gains, and Effective Input Noise Temperature -- 8.5.3
Noise Figure -- 8.5.4 Practical Applications -- 8.6 FourPort Example
with Reflectionless Terminations -- References -- Chapter 9 Remote
Sensing Connection -- 9.1 Introduction -- 9.2 Theory for Standard
Radiometer -- 9.3 StandardRadiometer Measurements -- 9.3.1
Determination of -- 9.3.2 Determination of Illumination Efficiency,
IE -- 9.3.2.1 Measurements of a Standard Target -- 9.4 Standard
Target Design -- 9.5 Target Reflectivity Effects -- 9.5.1 Effect of Target
Reflectivity -- 9.5.2 Measurement of Target Reflectivity -- References
-- Index -- EULA.
