

ICS 31.200
CCS L56



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 44924-2024

**Semiconductor integrated circuits - Measuring methods for RF
transmitters and receivers**

半导体集成电路 射频发射器接收器测试方法

Issued on: December 31, 2024

Implemented on: April 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1	Scope
2	Normative references
3	Terms and definitions
4.1	General Principles
4.2	Environmental Requirements
4.3	Test conditions
5	Detailed requirements
5.1	Dynamic power consumption P_a (mW)
5.2	Power gain GP (dB)
5.6	Output power P_o (dBm)
5.7	Burnout resistance power PKSH (dBm)
5.10	Image rejection ratio RIMJ (dBc)
5.11	Harmonic suppression ratio RHR (dBc)
5.12	Local Oscillator Rejection Ratio RLO (dBc)
5.13	Sideband suppression ratio RSB (dBc)
5.16	Output second-order intermodulation cutoff point OIP2 (dBm)
5.19	Input third-order intermodulation cutoff point IIP3 (dBm)
5.22	Transmitting and receiving switching time t_{TR}

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting is required. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China. This document is under the jurisdiction of the National Technical Committee for Integrated Circuit Standardization (SAC/TC 599). This document was drafted by: China Electronics Technology Group Corporation No.

24 Research Institute, Chongqing Southwest Integrated Circuit Design Co., Ltd., The 14th Research Institute of China Electronics Technology Group Corporation, the 38th Research Institute of China Electronics Technology Group Corporation, Chengdu Zhenxin Technology

Co., Ltd. Limited company, Shenzhen Jingfeng Crystal Technology Co., Ltd. The main drafters of this document are. Su Liangyong, Wang Lu, Tang Jinglei, Yang Run, Qi Yuan, Liu Dan, Xu Juan, Su Qiao, Chen Xiang, Liu Xiaozheng, Fan Chao, Gao Qing. Semiconductor integrated circuits RF Transmitter/Receiver Test Methods

1 Scope

GB/T 44924-2024 specifies how RF transmitter and receiver integrated circuits are measured. Every RF datasheet quotes the same handful of figures, output power, error vector magnitude, adjacent channel leakage, noise figure, sensitivity, blocking, phase noise, and every one of them depends on a measurement set-up that the datasheet rarely states in full; two parts that look identical on paper can differ by several decibels in the same application. This document fixes the set-ups and the procedures: the test conditions and the reference circuits, the measurement of transmitter output power, gain and gain flatness, spectral mask and adjacent channel leakage, modulation accuracy and EVM, harmonics and spurious emissions, and of receiver sensitivity, selectivity, blocking, intermodulation, noise figure and dynamic range, together with the local oscillator and phase noise measurements, the calibration and the uncertainty. For a chip maker, a module builder or a laboratory qualifying an RF part in China, this is the basis on which the numbers are comparable.

This document specifies the basic principles of the electrical characteristics test methods for semiconductor integrated circuit radio frequency transmitters and receivers (hereinafter referred to as devices). and testing procedures. This document is applicable to single frequency conversion RF transmitters/receivers with receiving function, transmitting function, and integrated transmitting and receiving function. Other types The transmitter and receiver can be used for reference.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 4937.1-2006 Mechanical and climatic test methods for semiconductor devices Part

3 Terms and definitions

The terms and definitions defined in GB/T 9178 and the following apply to this document.

3.1 dynamic power consumption The total power consumed when there is an excitation signal at the input of the device and a load at the output.

3.2 Power gain The ratio of output power to input power when the device operates under specified input/output power conditions.

3.3 Power gain flatness gain flatness The difference between the maximum power gain and the minimum power gain of a device within the specified frequency range and under specified input/output power conditions.

3.4 Linear power gain The device operates in an area where the output power change is the same as the input power change, and the ratio of the output power to the input power.

3.5 Linear power gain flatness linear gain flatness The maximum linear power gain of the device within the specified frequency range, in the area where the output power change and input power change are the same The difference from the minimum linear power gain.

3.6 Output power The output power of a device is measured under specified input power conditions.