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

GB/T 42968.4-2024

**Integrated circuits - Measurement of electromagnetic immunity
- Part 4: Direct RF power injection method
(English Translation)**

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Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 General	
4.1 Measurement principle	
4.2 Single-pin direct power injection method	
4.3 Multi-pin direct power injection method	
5 Test conditions	
6 Test equipment	
6.1 General	
6.2 RF Power Source	
6.3 RF Power Meter and Directional Coupler	
7 Experimental Arrangement	
7.1 Overview	
7.2 Power injection arrangement	
7.3 Breadboard	
7.4 Characteristics of power injection arrangements	
7.5 Decoupling Network	
8 Test procedures	
8.1 General	
8.2 Specific test procedures	
9 Test Report	
Appendix A (informative) Examples of immunity levels in automotive applications	
Appendix B (Informative) Installation tips for optimal RF test arrangement	
Appendix C (informative) Description of constant peak test level	
Reference	

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.

This document is Part 4 of GB/T 42968. GB/T 42968 has been published in the following parts.

- Part 1: General conditions and definitions;
- Part 2: Radiated immunity measurement TEM cell and broadband TEM cell method;
- Part 4: Radio frequency power direct injection method;
- Part 8: Radiated immunity measurement IC stripline method.

This document is equivalent to IEC 62132-4:2006 "Integrated Circuit Electromagnetic Immunity Measurement 150kHz~1GHz Part 4: Radio Frequency Immunity Test" Direct Frequency Power Injection Method.

The following minimal editorial changes were made to this document.

- In order to coordinate with the existing standards, the name of the standard is changed to "Measurement of electromagnetic immunity of integrated circuits Part 4: Direct radio frequency power Injection Method.

Introduction

To standardize the electromagnetic immunity measurement of integrated circuits and provide different electromagnetic immunity measurement methods for integrated circuit manufacturers and testing agencies GB/T 42968 specifies the general conditions, definitions, test procedures and test methods for electromagnetic immunity measurement of integrated circuits.

The test requirements are planned to consist of 7 parts.

- Part 1: General conditions and definitions. The purpose is to specify the general conditions and definitions for the measurement of electromagnetic immunity of integrated circuits.
- Part 2: Radiated immunity measurement TEM cell and broadband TEM cell method. The purpose is to specify the TEM cell and broadband Test procedure and test requirements with TEM chamber method.
- Part 3: Bulk current injection (BCI) method. The purpose is to specify the test procedures and test requirements for the bulk current injection method.

--- Part 4: Radio frequency power direct injection method. The purpose is to specify the test procedures and test requirements for the radio frequency power direct injection method.

--- Part 5: Bench Faraday cage method. The purpose is to specify the test procedures and test requirements for the bench Faraday cage method.

--- Part 8: Radiated immunity measurement IC stripline method. The purpose is to specify the test procedures and test requirements of the stripline method.

--- Part 9: Radiated immunity measurement surface scanning method. The purpose is to specify the test procedures and test requirements of the surface scanning method.

Integrated Circuit Electromagnetic Immunity Measurement Part 4: Radio frequency power direct injection method

1 Scope

This document specifies the method for measuring the immunity of integrated circuits (ICs) in the presence of conducted radio frequency (RF) disturbances, e.g. caused by radiated Conducted RF disturbances caused by RF disturbances. This method ensures high repeatability and correlation of immunity measurements.

This document establishes a common basis for the evaluation of semiconductor devices in equipment when operating in the presence of unwanted RF electromagnetic waves.

2 Normative references

The contents of the following documents constitute 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.

IEC 61967-4 Integrated circuit electromagnetic emission measurement Part 4: Conducted emission measurement 1ohm/150ohm direct coupling method (In-Note. GB/T 44937.4-2024 Integrated circuit electromagnetic emission measurement Part 4: Conducted emission measurement 1ohm/150ohm direct coupling method (IEC 61967-4:2021, IDT) IEC 62132-1 Integrated circuits electromagnetic immunity measurement Part 1: General conditions and definitions (Integratedcircuits-Note. GB/T 42968.1-2023 Integrated Circuit Electromagnetic Immunity Measurement Part 1: General Conditions and Definitions (IEC 62132-1:2015, IDT)

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in IEC 62132-1 apply.

4.1 Measurement principle

The minimum electromagnetic immunity level required for an IC depends on the maximum RF disturbance level that can be emitted by the electronic system.

Determined by the specific parameters of the system and actual application. In order to determine the IC's immunity performance and ensure high repeatability, a measurement procedure is required the following are the basic requirements for this test.

The largest geometry found in ICs is the lead frame. The lead frame size is in the range of a few centimeters or less.

The structural size is even two orders of magnitude smaller than that of the lead frame. For the frequency range below 1 GHz, this lead frame and chip the structure does not constitute an effective antenna for receiving unwanted RF signals. What constitutes an effective antenna is the cable bundle and/or printed circuit board (PCB) the IC receives unwanted RF energy through the pins connected to these cables. Therefore, the IC's electromagnetic immunity can be reduced by RF conducted disturbances.

The RF signal is characterized by the interference (i.e. RF forward power) instead of the field parameters usually used in module and/or system testing.

For module and system testing, the forward power provided to the circuit by a cable bundle or printed circuit board trace acting as an antenna can be measured or estimated.

Regardless of whether this power is reflected or absorbed, it is considered forward power supplied to the circuit.