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

GB/T 47240.4-2026

**Semiconductor devices - Semiconductor interface for human
body communication - Part 4: Capsule endoscope**

半导体器件 人体通信半导体接口 第4部分：胶囊内窥镜

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 4 of GB/T 47240 "Semiconductor Devices - Semiconductor Interfaces for Human Body Communication". GB/T 47240 has been published.

The following section.

---Part 1: General Provisions;

---Part 4: Capsule Endoscopy this document is equivalent to IEC 62779-4:2020 "Semiconductor devices - Semiconductor interfaces for human body communication - Part 4: Capsule endoscopes".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no 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 Semiconductor Device Standardization Technical Committee (SAC/TC78).

Introduction

Human body communication technology is a transmission technology that uses the human body as a transmission medium to transmit signals. It has the advantages of low signal leakage, high security, and low latency.

Signal attenuation - characterized by low transmission power and low carrier frequency, resulting in low interference, high security, suitable transmission range, and potential for further improvements.

High degree of miniaturization. Human body communication technology has already been used in several products for medical applications, such as using endoscopic capsules to monitor the digestive system and for testing.

Transmits heart rate and blood oxygen saturation, transmits electrocardiogram signals, monitors muscle contraction or relaxation, fluid hydration and dehydration, and assists in the diagnosis and treatment of fluid disorders.

Disorders, etc.

GB/T 47240 "Semiconductor Devices - Human Body Communication Semiconductor Interface" is proposed to consist of the following four parts.

---Part 1: General Provisions. The purpose is to specify the general requirements for semiconductor interfaces used in human body communication, including the functional requirements of the interface.

Find the limit value and the working condition requirements.

---Part 2: Performance Characteristics. The purpose is to specify the measurement methods for the electrical performance of electrodes used in human body communication (HBC) semiconductor interfaces.

The method includes the general requirements and functional requirements of the measurement method.

---Part 3: Functional Classification and Operating Conditions. The purpose is to define the functional categories of semiconductor interfaces for Human Body Communication (HBC).

The classification of HBC interfaces includes categorizing them based on contact conditions and defining performance parameters for each type of interface.

---Part 4: Capsule Endoscopes. The purpose is to specify the semiconductor interface for capsule endoscopes using electrically coupled human body communication.

General requirements for electrical performance.

The capsule endoscope's channel transmission uses current coupling, requiring the definition of a common interface for communication with the human body via the capsule endoscope.

Ensure communication compatibility between various capsule endoscopy devices and receiving devices implemented on or inside the human body.

Semiconductor devices, human body communication, semiconductor interfaces Part 4: Capsule Endoscopy

1 Scope

This document specifies the general requirements for the electrical performance of semiconductor interfaces for capsule endoscopes using current-coupled human body communication, including the interface itself.

General and functional requirements. This document covers semiconductor interfaces used in capsule endoscopes and external receiving devices within the human body.

An interface between communication modems for processing or transmitting electrical signals.

Note: See Appendix A for further information on the use of the Human Communication Capsule Endoscope.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

3 Terms, Definitions and Symbols

The following terms, definitions and symbols apply to this document.

3.1 General Terminology

3.1.1

A gold-plated physical structure that is typically located inside the human body and attached to the inner wall of the digestive tract, transmitting electronic signals from the capsule endoscope to the human body.

Note: The transmitting electrode transmits electrical signals to the non-metallic transmission

channel (human body).

3.1.2

capsule endoscope

A small, cylindrical device comprising a light-emitting diode (LED) module, a lens module, a sensor PCB, a battery, and a power module.

3.1.3

Image sensor

A semiconductor device that converts a light image in front of a sensor into an electrical signal.

3.1.4

driver

Semiconductor devices that transmit image data to the human body in the form of electrical signals.

Note: The driver is located before the transmitting electrode and outputs electrical signals for pre-limited current and pre-limited voltage.

3.1.5

A receiver with two electrodes installed inside or on the surface of the human body senses the electrical current induced by the transmitter through a specific part of the body.