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

GB/T 20870.3-2026

**Semiconductor devices - Part 16-3: Microwave integrated
circuits - Frequency converters**

半导体器件 第16-3部分：微波集成电路 变频器

(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 3 of GB/T 20870 "Semiconductor Devices". GB/T 20870 has the following parts published.

- Part 16-1.Microwave Integrated Circuit Amplifiers;
- Part 16-2.Microwave Integrated Circuit Prescalers;
- Part 16-3.Microwave Integrated Circuit Frequency Converters;
- Part 16-4.Microwave Integrated Circuit Switches;
- Part 16-5.Microwave Integrated Circuit Oscillators;
- Part 16-6.Microwave Integrated Circuit Frequency Multipliers;
- Part 16-7.Microwave Integrated Circuit Attenuators;
- Parts 16-10.Monolithic Microwave Integrated Circuit Technology and Receiving Procedures.

This document is equivalent to IEC 60747-16-3:2017 Semiconductor devices - Part 16-3.Microwave integrated circuit frequency converters.

The following minimal editorial changes have been made to this document.

- Added table numbering and a mention of the table number.

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 Integrated Circuit Standardization Technical Committee (SAC/TC599).

Introduction

Semiconductor devices are general-purpose basic products in the electronics industry chain and are the most basic units in electronic systems. GB/T 20870 "Semiconductor Devices" "Conductor Devices" is a series of standards for microwave integrated circuit products, serving as a fundamental and universal standard for the research, development, production, and testing of microwave integrated circuits.

The accuracy is crucial for evaluating and assessing the quality and reliability of microwave integrated circuits, and is proposed to consist of 11 parts.

---Part 16-1.Microwave Integrated Circuit Amplifiers. The purpose is to define the terminology and basic ratings of microwave integrated circuit amplifiers.

Values, characteristics, and testing methods.

Symbols, basic ratings, characteristics, and test methods.

---Part 16-3.Microwave Integrated Circuit Frequency Converters. The purpose is to define the terminology and basic ratings of microwave integrated circuit frequency converters.

Values, characteristics, and testing methods.

---Part 16-4.Microwave Integrated Circuit Switches. The purpose is to define the terminology, basic ratings, and characteristics of microwave integrated circuit switches.

Sex and testing methods.

---Part 16-5.Microwave Integrated Circuit Oscillators. The purpose is to define the terminology and basic ratings of microwave integrated circuit oscillators.

Values, characteristics, and testing methods.

---Part 16-6.Microwave Integrated Circuit Frequency Multipliers. The purpose is to define the terminology and basic ratings of microwave integrated circuit frequency multipliers.

Values, characteristics, and testing methods.

---Part 16-7.Microwave Integrated Circuit Attenuators. The purpose is to define the terminology and basic ratings of microwave integrated circuit attenuators.

Values, characteristics, and testing methods.

---Part 16-8.Microwave Integrated Circuit Limiters. The purpose is to define the terminology and basic ratings of microwave integrated circuit limiters.

Values, characteristics, and testing methods.

---Part 16-9.Microwave Integrated Circuit Phase Shifters. The purpose is to define the terminology and basic ratings of microwave integrated circuit phase shifters.

Values, characteristics, and testing methods.

---Part 16-10.Monolithic Microwave Integrated Circuit Technology and Receiver Procedures. The purpose is to specify the design, implementation, and procedures for monolithic microwave integrated circuits.

Manufacturing and delivery terms, definitions, symbols, quality systems, testing, evaluation, verification methods, and other requirements.

---Parts 16-11.Microwave Integrated Circuit Power Detectors. The purpose is to define the terminology for microwave integrated circuit power detectors.

Basic ratings, characteristics, and test methods.

The research, production, testing, and application of integrated circuits are of great significance, and they also supplement and improve the semiconductor integrated circuit standard system, providing a foundation for microwave integrated circuits.

It plays a guiding role in the development of the road industry.

semiconductor devices Part 16-3.Microwave Integrated Circuit Frequency Converters

1 Scope

This document specifies the basic ratings and characteristics of microwave integrated circuit frequency converters and describes the test methods.

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.

GB/T 17573-2026 General Rules for Semiconductor Devices (IEC 60747-1:2006, IDT)
Note. GB/T 17574-1998 Semiconductor devices - Integrated circuits - Part 2: Digital integrated circuits (IEC 748-2:1985, IDT) Note. GB/T 17940-2000 Semiconductor devices - Integrated circuits - Part 3: Analog integrated circuits (IEC 748-3:1986, IDT) IEC 61340-5-1 Electrostatics - Part 5-1.General requirements for electrostatic protection of electronic devices.

Note: GB/T 37977.51-2023 Electrostatics Part 5-1.General requirements for electrostatic protection of electronic devices (IEC 61340-5-1:2016, IDT) IEC TR61340-5-2 Electrostatics - Part 5-2.User Guide for Electrostatic Protection of Electronic Devices

3 Terms and Definitions

The following terms and definitions apply to this document.

The ratio of the desired output power to the input power obtained through frequency conversion.

Note: Variable frequency gain is usually expressed in decibels (dB).

deltaGC

The difference between the maximum and minimum values of the frequency converter gain