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GB/T 29239-2024

Energy efficiency metrics and measurement method for mobile communication equipment - Base station

移动通信设备节能参数和测试方法 基站

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Standardization Administration of the PRC

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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. This document replaces GB/T 29239-2020 "Mobile communication equipment energy saving parameters and test methods base station" and GB/T 29239- Compared with 2020, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

a) Added the content applicable to 5G (5G TDD and 5G FDD) standards in the scope (see Chapter 1);

b) The definition of full load has been changed (see 3.1.9,

3.1.9 of the 2020 edition);

c) Added the description and power consumption definition of distributed three-level architecture base stations (see 4.2);

d) Changed the LTE full load model (see 5.5.2,

5.5.2 of the 2020 version);

e) Added reference base station configuration and reference traffic load model for 5G (5G TDD and 5G FDD) base stations (see 5.6);

f) The ambient temperature test parameters have been changed (see 6.1,

6.1 of the 2020 edition);

g) Added description of 5G energy-saving parameter test system and test reference points (see 6.3);

h) Added the output power error range for 5G base station top output power (see 6.4);

i) Added test steps for 5G base station types (see 6.6). 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 Communications Standardization Technical Committee (SAC/TC 485). This document was drafted by: Shanghai Nokia Bell Co., Ltd., China Academy of Information and Communications Technology, China Telecom Corporation Limited, China United Network Communications Group Co., Ltd., China Mobile Communications Group Co., Ltd., ZTE Corporation, Huawei Technologies Co., Ltd. Company, Ericsson (China) Communications Co., Ltd., China Information and Communications Technology Group Co., Ltd., China Electronics Technology Putian Technology Co., Ltd., Jiangsu Electronic Information Product Quality Supervision and Inspection Institute (Jiangsu Information Security Evaluation Center). The main drafters of this document are. He Jing, Sun Jingyuan, Zhang Ruiyan, Xu Fei, Xu Sen, Cao Gen, Tang Chunmei, Ma Zhifeng, Su Ling, Quan Haiyang, Li Xing, Xu Xiayan, Wang Lijun, Cheng Min, Zhu Zhangrui, Lin Yingchao, Zhang Sheng, Bi Cheng, Xiong Shangkun, Lin Henghua, Wu Jinlian, Li Fuchang, Lü Ting, Fan Bin, Ding Zhenghu, Ma Zijiang, Xu Hao, Xiao Rufeng, Lu Jie. The previous versions of this document and the documents it replaces are as follows: --First published in.2012 as GB/T 29239-2012 and first revised in 2020; --This is the second revision.

1 Scope

GB/T 29239-2024 defines the energy efficiency parameters of mobile network base stations and the methods for measuring them. China operates more base stations than the rest of the world combined, and they consume a substantial share of national electricity, so how their efficiency is defined has real consequences: a figure quoted as watts per site says nothing, because it depends on the traffic carried, the number of carriers and sectors configured and the sleep modes in use. The standard therefore fixes the parameters first, the base station power consumption, the output power, the load definitions and the efficiency metrics derived from them, and then the measurement method: the test configuration, the traffic models representing low, medium and busy hour loading, the measurement duration and averaging, the conditions under which energy saving features may be active, and the calculation and reporting of results. It applies to the base station types current in Chinese networks. It took effect on 23 August 2024, and for an equipment vendor or an operator comparing equipment it is the basis of every efficiency claim.

This document describes the energy-saving parameters, reference test models and measurement methods for mobile communication base station equipment. Requirements on test environment, power supply, test reference points, instruments, measurement errors, test data recording, etc. This document applies to GSM, TD-SCDMA, WCDMA, CDMA, LTE (TD-LTE and LTE FDD) and 5G (5G Energy saving test of TDD and 5G FDD) standard base station equipment.

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 28519-2012 General rules for energy consumption test methods for communication products YD/T 883-2009 900/1 800 MHz TDMA digital cellular mobile communication network base station subsystem equipment technical requirements and Wireless index test method YD/T 1553-2009 2 GHz WCDMA digital cellular mobile communication network wireless access subsystem equipment test method (Part 1) Three stages) YD/T 1573-2013 800 MHz/2 GHz cdma2000 digital cellular mobile communication network equipment test methods base station subsystem YD/T 1678-2013 800 MHz/2 GHz cdma2000 digital cellular mobile communication network equipment test methods High speed packet data Data (HRPD) (Phase II) Access Network (AN) YD/T 1850-2015 2 GHz TD-SCDMA digital cellular mobile communication network High Speed Uplink Packet Access (HSUPA) Line access subsystem equipment test method YD/T 2572-2015 TD-LTE digital cellular mobile

communication network base station equipment test method (Phase I) YD/T 2574-2017 LTE FDD digital cellular mobile communication network base station equipment test method (Phase I) YD/T 3929-2021 Technical requirements for base station equipment in the frequency band below 6 GHz for 5G digital cellular mobile communication networks (Phase I) YD/T 3930-2021 5G digital cellular mobile communication network 6 GHz frequency band base station equipment test method (first phase)

3 Terms, definitions and abbreviations

3.1 Terms and Definitions The following terms and definitions apply to this document.

3.1.1 Power consumption The input power of a communication product for normal operation under specified conditions.

3.1.2 Energy efficiency metrology The basis for energy-saving classification of communication products.