



ATIS-0600015.09.2020

**Methodology for Measurement and Reporting of Base
Station Metrics for Telecommunication Equipment:
Power Consumption & Energy Performance**

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ATIS-0600015.09.2020, Methodology for Measurement and Reporting of Base Station Metrics for Telecommunication Equipment: Power Consumption & Energy Performance

Is an American National Standard developed by the ATIS **Telecommunications Energy Efficiency (TEE)** Subcommittee under the **ATIS Sustainability in Telecom: Energy and Protection Committee (STEP)**.

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American National Standard for Telecommunications

**Methodology for Measurement and Reporting of Base
Station Metrics for Telecommunication Equipment:
Power Consumption & Energy Performance**

Alliance for Telecommunications Industry Solutions

Approved July 16, 2020

American National Standards Institute, Inc.

Abstract

This document defines the methodology to be used by vendors and third-party test laboratories in the determination of base station input power and energy efficiency.

Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

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ANSI guidelines specify two categories of requirements: mandatory and recommendation. The mandatory requirements are designated by the word SHALL and recommendations by the word SHOULD. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, STEP, 1200 G Street NW, Suite 500, Washington, DC 20005.

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American National Standard for Telecommunications on –

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1 Scope, Purpose, & Application

1.1 Scope

This document defines the methodology to be used by vendors and third-party test laboratories for the determination of base station input power and energy efficiency metrics.

The Base Station Input Power Metric is reported in Watts and is based on radio resource usage. The metric is obtained with the base station placed in a static operating state and does not take into account changing environmental conditions such as mobility, fading, and traffic demands.

The Base Station Energy Performance metric is based on the base station performance. The metric is obtained with the base station placed in a dynamic state in which the energy consumption of the base station changes due to mobility, channel behavior and the traffic demands. In this state the base station responds to the requests from UEs in the test setup in form of data packet transferring.

The current revision of this standard covers both the method to determine the Base Station Input Power Metric and the method to determine the Base Station Energy Performance Metric.

This standard is restricted to the base station, and it does not apply to the base station site. The methodologies described in this document are suitable for the following radio access technologies:

- LTE (FDD and TDD).
- UMTS (including WCDMA and HSPA) (only static measurement method).
- GSM (including EDGE and GPRS) (only static measurement method).

Energy consumption of terminal (end-user) equipment is outside the scope of the present document; however, how a user equipment (UE) affects a base station energy efficiency will be considered for further study.

The scope of the present document is not to define target values for the power consumption nor the energy performance of equipment.

1.2 Purpose

The purpose of this standard is to define a consistent method of measuring and reporting base station input power and energy performance metrics.

1.3 Application

This standard is intended to compare the input power and the energy performance of functionally similar base stations.

Comparisons should occur between base stations of the same rated output power class as per 3GPP TS 36.104 [Ref. 3] (e.g., Macro-to-Macro, Micro-to-Micro). Compared base stations should also serve the same number of sectors and have identical rated RF output powers and antenna configurations. For example, a three-sector base station configured for 2x2 MIMO and 40 Watt RF output power should be compared to another three-sector 2x2 MIMO 40 Watt base station.

This standard is not intended to compare the input power and/or the energy performance of base stations serving different radio access technologies (e.g., a UMTS base station should not be compared with an LTE base station).