

ContainerPower Energy Solutions

Power consumption of each mobile base station device



Overview

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While the radio access network (RAN) equipment is generally considered the main contributor of the sector in terms of energy consumption, the 8.5 billion mobile devices actually add up to a bigger overall impact [2]. Second, with UE generally battery-powered, a certain minimum energy autonomy is.

However, there is still a need to understand the power consumption behavior of state-of-the-art base station architectures, such as multi-carrier active antenna units (AAUs), as well as the impact of different network parameters. In this paper, we present a power consumption model for 5G AAUs based.

Energy efficiency of any deployment is impacted by the power consumption of each individual network element and the dependency of transmit power and load. In this paper we developed such power models for macro and micro base stations relying on data sheets of several GSM and UMTS base stations with.

Base stations represent the main contributor to the energy consumption of a mobile cellular network. Since traffic load in mobile networks significantly varies during a working or weekend day, it is important to quantify the influence of these variations on the base station power consumption. How do base stations affect mobile cellular network power consumption?

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How much energy does a 5G base station consume?

Because it is estimated that in 5G, the base station's density is expected to exceed 40-50 BSs/ Km². The energy consumption of the 5G network is driving attention and many world-leading network operators have launched alerts about the increased power consumption of the 5G mobile infrastructure.

What is a base station power consumption model?

In recent years, many models for base station power consumption have been proposed in the literature. The work in proposed a widely used power consumption model, which explicitly shows the linear relationship between the power transmitted by the BS and its consumed power.

What parameters are used to evaluate cellular base station Power model?

Parameters used for the evaluations with this cellular base station power model. The 5G NR standard has been designed based on the knowledge of the typical traffic activity in radio networks as well as the need to support sleep states in radio network equipment.

What is the largest energy consumer in a base station?

The largest energy consumer in the BS is the power amplifier, which has a share of around 65% of the total energy consumption. Of the other base station elements, significant energy consumers are: air conditioning (17.5%), digital signal processing (10%) and AC/DC conversion elements (7.5%).

Is there a direct relationship between base station traffic load and power consumption?

The real data in terms of the power consumption and traffic load have been obtained from continuous measurements performed on a fully operated base station site. Measurements show the existence of a direct relationship between base station traffic load and power consumption.

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