

Base station power supply estimation

What are base station models?

The base station models vary in their approaches and potential use cases. Hereafter, the models are grouped according to these aspects. Main component models only model the power consumption of the main base station components (power amplifier, analog frontend, baseband unit, active cooling, power supply) separately.

Can a base station Power model be combined?

As the main components are common to most of the models, they can be easily combined to form a new model. Most of the base station power models are based on measurements of LTE (4G) hardware or theoretical assumptions. For the more recent models, based on measurements of 5G hardware, the parameter values are not publicly available.

What are the main components of a base station Power model?

The main components are the baseband processing unit, analog frontend, power amplifier, and power supply as well as active cooling. As the main components are common to most of the models, they can be easily combined to form a new model. Most of the base station power models are based on measurements of LTE (4G) hardware or theoretical assumptions.

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.

Do base stations dominate the energy consumption of the radio access network?

Furthermore, the base stations dominate the energy consumption of the radio access network. Therefore, it is reasonable to focus on the power consumption of the base stations first, while other aspects such as virtualization of compute in the 5G core or the energy consumption of user equipment should be considered at a later stage.

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%).

These tools simplify the task of selecting the right power management solutions for these devices and, thereby, provide an optimal power solution for 5G base stations components.

Measurements show the existence of a direct relationship between base station traffic load and power



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consumption. According to this relationship, we develop a linear power consumption ...

Abstract: A new power estimation method is proposed for base station (BS) in this paper. Based on this method, a software platform for power estimation is developed.

From the above calculation, it can be seen that after adding a set of 5g equipment in the original station, the capacity expansion shall be considered from the storage battery, switching power ...

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Building better power supplies for 5G base stations Authored by: Alessandro Pevere, and Francesco Di Domenico, both at Infineon Technologies Infineon Technologies - Technical ...

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Based on this utility function, an aggregated control method is proposed, including real-time available power estimation and model predictive control (MPC) for the gNBs-cluster, ...

In this paper, we present a regression-based power consumption estimation method based on voice and data traffic provided by base stations with 2G and 3G capabilities.

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Infrastructure OEMs and their suppliers see "pulse power" as a potential solution. This technique reduces opex

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by putting a base station into a ...

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This study develops a mathematical model and investigates an optimization approach for optimal sizing and deployment of solar photovoltaic (PV), battery bank storage ...

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Infrastructure OEMs and their suppliers see "pulse power" as a potential solution. This technique reduces opex by putting a base station into a "sleep mode," with only the ...

The 5G base station is composed of a power supply system and communication equipment [4], in addition to some auxiliary equipment such as air ...

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Power consumption models for base stations are briefly discussed as part of the development of a model for life cycle assessment. An overview of relevant base station power ...

1# Base Station Power Supply Monitoring Robert Liao 34 subscribers 148 views 2 years ago

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