



SolarTech Power Solutions

Huawei base station power efficiency



Overview

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A joint innovation between China Tower and Huawei, 5G Power is a key advancement that will promote the maturity of the 5G power industry by introducing a new approach to the power model for 5G sites. In 2019, the 5G Power solution won ITU's Global Industry Award for Sustainable Impact. For.

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.

By improving base station energy efficiency, the green antennas can lower down the power requirement by 2 dB while keeping the same coverage. The average site-wide energy savings can reach 20%. This brings operators the benefits of greater energy efficiency in their 5G networks while also.

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Enhancing the performance evaluation metrics of base station antennas based on efficiency will enable manufacturers to improve antennas and also help operators select antennas that allow for the highest possible network energy efficiency. It is necessary that the antenna industry quickly draws.

The two figures above show the actual power consumption test results of 5G base stations from different manufacturers, ZTE and HUAWEI, in Guangzhou and Shenzhen, by an anonymous operator. While there is a lot of talk about 5G's advantages in speed, performance and bandwidth, there are also concerns. Can high RF efficiency reduce the power consumption of a base station?

From the perspective of energy saving, antennas with high RF efficiency can be used to reduce the power consumption of the base station by reducing the transmit power of the radio unit while maintaining the same coverage quality. The following describes the details from the two perspectives.

How does a high RF efficiency antenna affect a base station?

This indicates that an antenna with a higher RF efficiency will help reduce the power provided by the radio unit, enabling the base station to consume less energy. Here is an example. In scenario A, the radio unit's total transmit power is 200 W and antenna A has an RF efficiency of 70%. The power radiated from the antenna is 140 W ($200\text{ W} \times 70\%$).

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.

How much power does a 5G station use?

The power consumption of a single 5G station is 2.5 to 3.5 times higher than that of a single 4G station. The main factor behind this increase in 5G power consumption is the high power usage of the active antenna unit (AAU). Under a full workload, a single station uses nearly 3700W.

How much power does a base station use?

For a base station with typical configurations, the transmit power can be reduced by 36%, that is, 288 W.

Are cellular base stations a future-proof power model?

Debaillie, C. Dessel, and F. Louagie, "A flexible and future-proof power model for cellular base stations," in IEEE 81st Vehicular Technology Conference (VTC

Spring), 2015, pp. 1-7. S.

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