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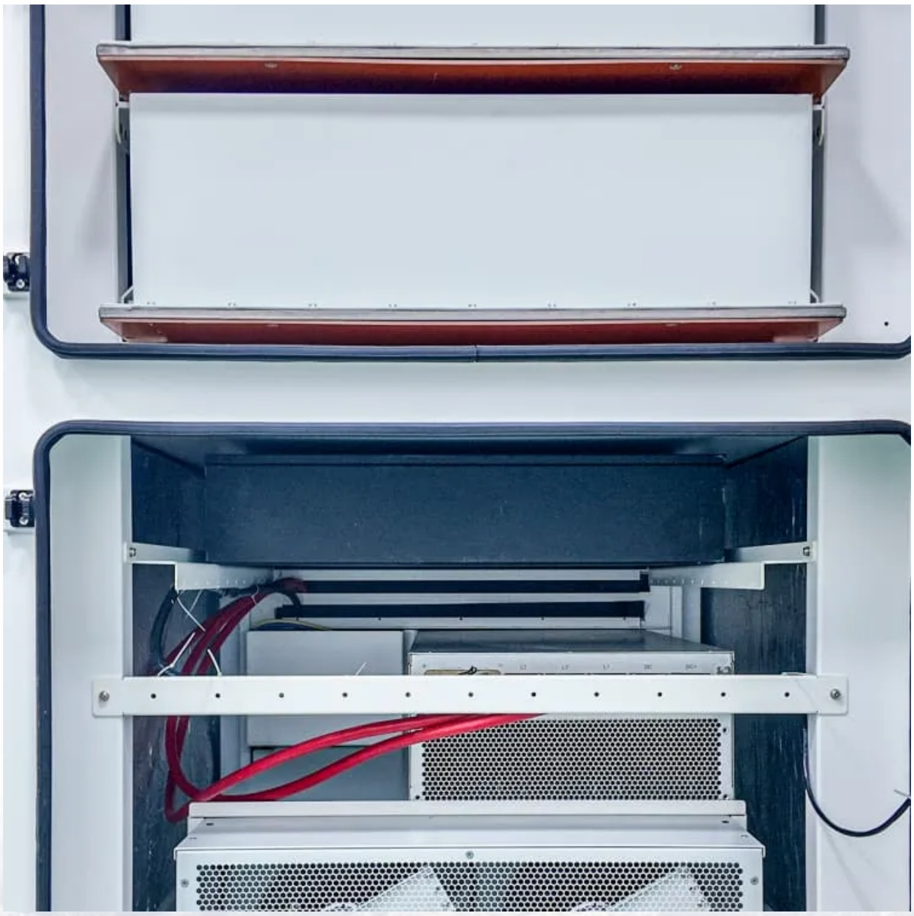
Mobile communication green base station transmission frequency



Overview

Are green base stations a problem?

As society grows increasingly more aware of green energy sources, governments also start modifying their power rules to support them. As a result, problems with green base stations became the focus of a significant amount of recent ICT research efforts .

Are baseband transceiver components suitable for the 3GPP NR system?

Concerns about sustainability have arisen as a result of the substantial rise in energy usage in wireless communications brought about by the quick development of 5G and 6G networks . To address this, the authors of this study developed baseband transceiver components for the 3GPP NR system.

How much power does a 5G base station use?

By 2025, the worldwide 5G base station number is anticipated to be 65 million. Table 1 shows the power consumption of typical 4G and 5G macro base stations at 2.6 GHz, as measured by China Mobile in 2019. The total power of a base station includes the power consumption for baseband processing and the power of the remote radio unit (RRU).

How much power does a 4G base station use?

A 4G base station has a transmission power of 40 W for a bandwidth of 20 MHz for each sector (there are typically three sectors) and uses eight transmission and eight reception antennas. In contrast, a 5G base station has a transmission power of 240 W for a bandwidth of 100 MHz and uses 64 transmission and 64 reception antennas.

How can cellular network operators shift towards green practices?

The green communication initiative focuses primarily on improving EE, reducing costs such as CAPEX and OPEX, and eliminating extra BSs’ emissions to ensure their future evolution. Therefore, the cellular network operators use

the following main approaches a try to shift toward green practices as shown in Fig. 4.

How can mobile network architecture contribute to green networking?

The representation of the mobile network architecture along with the expanded view of the 5G base station has been depicted in Fig. 5. Improving hardware components can contribute toward green networking. It entails reducing BS’s energy consumption by using energy-efficient hardware.

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