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**No. 3611**

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## Mitsubishi Electric Achieves World's First Wideband Operation of 4G, 5G and Beyond 5G/6G Systems with Single GaN Power Amplifier

*Will help to realize radio-unit sharing and power-efficient base stations*

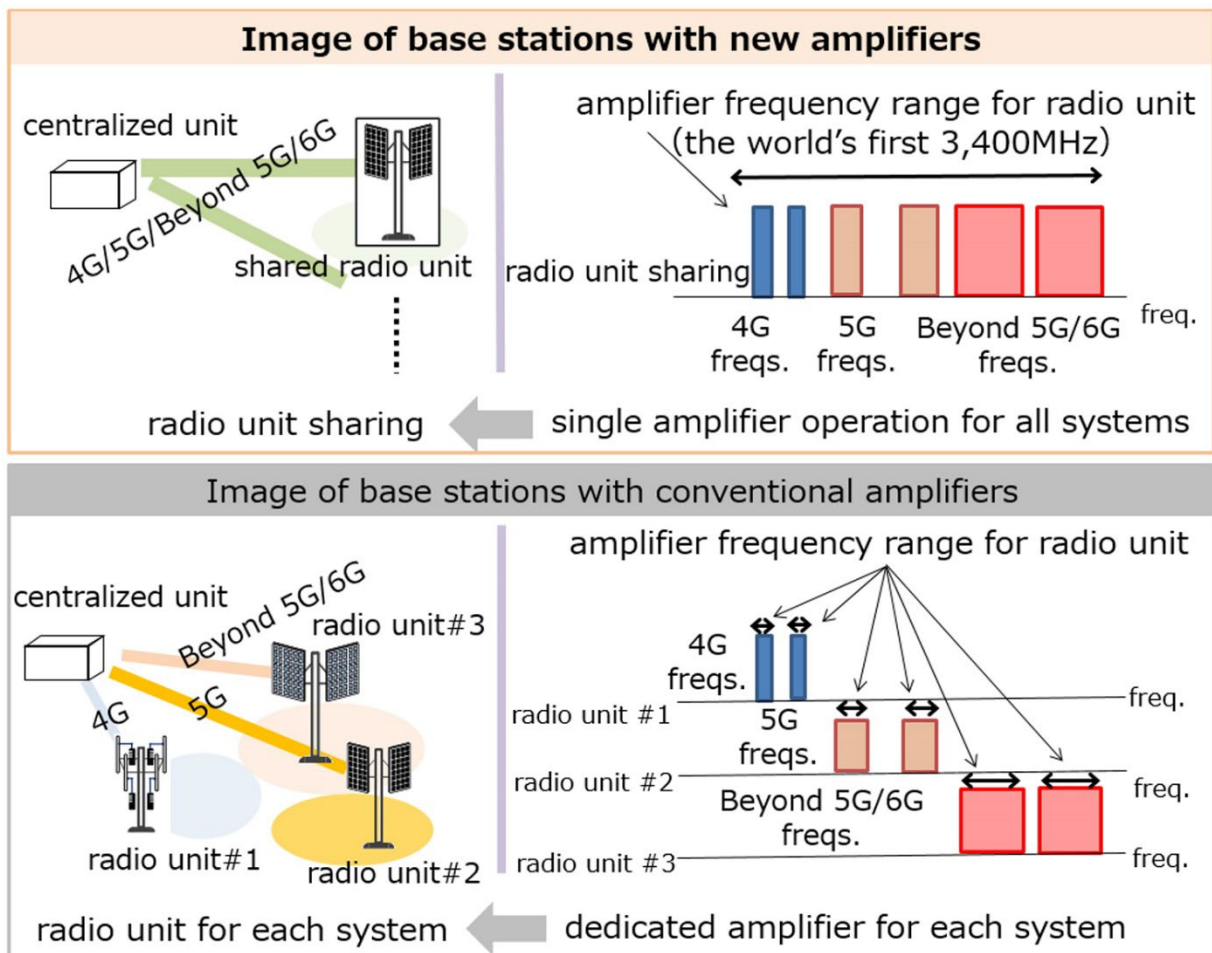


Image of the base-stations with before/after amplifiers

**TOKYO, June 8, 2023** – [Mitsubishi Electric Corporation](https://www.mitsubishielectric.com) (TOKYO: 6503) announced today it has developed what is believed to be the world's first\* gallium nitride (GaN) power amplifier that achieves a frequency range of 3,400MHz using a single power amplifier, which the company has demonstrated can be used for 4G, 5G and Beyond 5G/6G communication systems operating at different frequencies in a single base station. The

\* According to Mitsubishi Electric research as of June 8, 2023

amplifier is expected to enable the radio unit (transceiver) to be shared for different communication systems and lead to more power-efficient base stations. Technical details will be presented at the IEEE International Microwave Symposium 2023 this month.

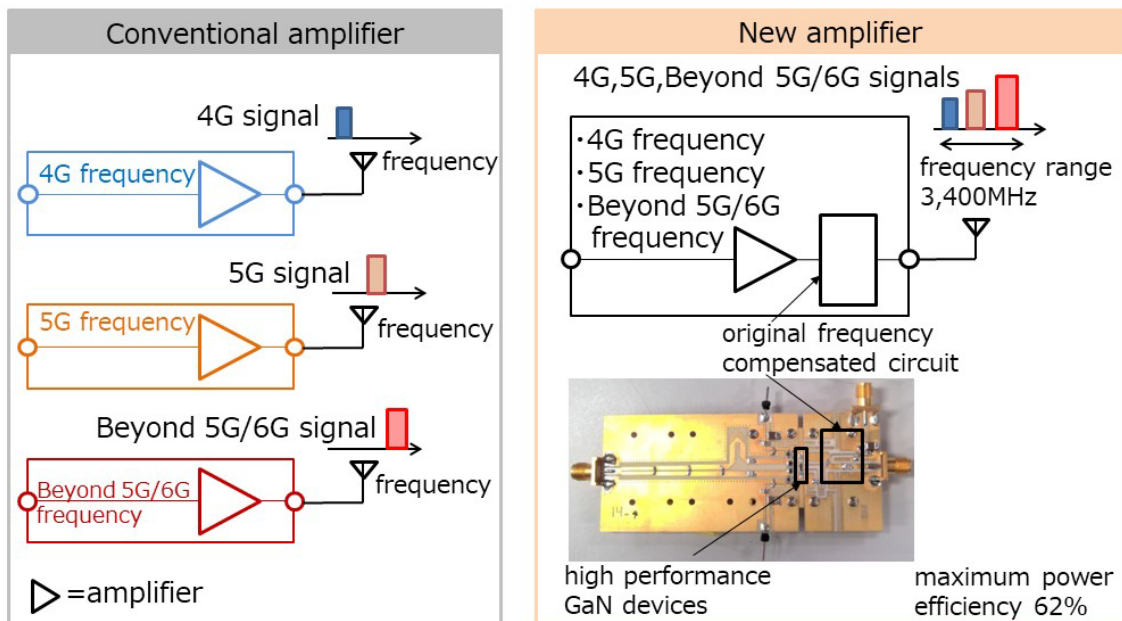
## **Features**

### **1) Novel frequency-compensated circuit achieves world's first wideband operation**

- Frequency range expanded to 3,400MHz, six times that of a power amplifier released by the company on January 12, 2017, thanks to a novel frequency-compensated circuit for switching communication modes according to the frequency
- World's first successful deployment of a single amplifier for 4G, 5G and Beyond 5G/6G communication systems operating at different frequencies
- Expanded bandwidth covering diverse frequencies is expected to enable the base station's radio unit (transceiver) to be shared for multiple communication systems.

### **2) New amplifier using high-performance GaN reduces base-station power consumption**

- Amplifier uses high-performance GaN devices that achieve industry-leading power efficiency
- Maximum power efficiency of 62% in the frequency range of 3,400 MHz exceeds the level required for Beyond 5G/6G to realize power-efficient base stations



Comparison of conventional amplifier and new amplifier

In order to advance wireless communications, 5G was launched in 2020 and the transition to Beyond 5G/6G is anticipated to start in around 2030. To enable a smooth transition to Beyond 5G/6G, base stations must be capable of supporting new communications infrastructure. Currently, power amplifiers are developed individually for specific frequency bands handled by each type of base station. For envisioned base stations, however, radio units will be shared to save space and lower maintenance/operation costs as well to accommodate ultra-wide bandwidth covering various frequency bands. In addition, Beyond 5G/6G requires

the highly dense arrangement of mMIMO antennas to enable massive simultaneous connections. Consequently, it is necessary to use components that are very small and power amplifiers that are very efficient in order to avoid problems with heat dissipation.

### **Future Development**

Research and development will be conducted for practical use of Beyond 5G/6G base stations.

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### **About Mitsubishi Electric Corporation**

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its “Changes for the Better.” The company recorded a revenue of 5,003.6 billion yen (U.S.\$ 37.3 billion\*) in the fiscal year ended March 31, 2023. For more information, please visit [www.MitsubishiElectric.com](http://www.MitsubishiElectric.com)

\*U.S. dollar amounts are translated from yen at the rate of ¥134=U.S.\$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2023