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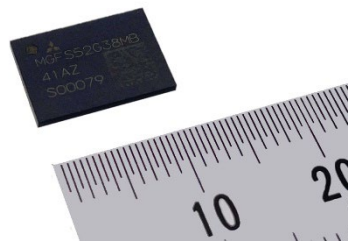
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## **Mitsubishi Electric to Ship Samples of 16W GaN Power Amplifier Module for 5G Massive MIMO Base Stations**

*Deployment in 32T32 massive MIMO antennas will lower production costs  
and reduce base station power consumption*



16W GaN PAM for 5G massive MIMO base stations (MGFS52G38MB)

**TOKYO, June 4, 2024** – [Mitsubishi Electric Corporation](https://www.mitsubishielectric.com) (TOKYO: 6503) announced today that it will begin shipping samples of a new 16W-average-power gallium nitride (GaN) power amplifier module (PAM) for 5G massive MIMO<sup>1</sup> (mMIMO) base stations on June 11. PAMs, which can be used in 32T32R mMIMO antennas<sup>2</sup> to reduce the manufacturing cost and power consumption of 5G mMIMO base stations, are expected to be increasingly deployed as 5G networks expand from urban centers to regional areas. Mitsubishi Electric will exhibit its new 16W GaN PAM in the USA at IEEE MTT-S International Microwave Symposium (IMS) 2024 in Washington, DC, from June 18-20.

In September 2023, Mitsubishi Electric began providing samples of a GaN PAM that achieves an average output power of 8W (39dBm) over a wide frequency range from 3.4 to 3.8GHz, suitable for 64T64R mMIMO antennas<sup>3</sup> of 5G base stations. The 16W (42dBm) GaN PAM announced today achieves even higher average output power over a wide frequency range from 3.3 to 3.8GHz and is suitable for 32T32R mMIMO antennas, extending the communication range of 5G mMIMO base stations and lowering their manufacturing cost by reducing the required number of PAMs.

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<sup>1</sup> Wireless technology using multiple antennas in both transmitter and receiver to improve communication speed and quality

<sup>2</sup> Massive MIMO antenna consisting of 32 transmitters and receivers

<sup>3</sup> Massive MIMO antenna consisting of 64 transmitters and receivers

## **Product Features**

### **1) *Reduces number of power amplifier modules and extends range of 5G mMIMO base stations***

- Compared to an existing 8W GaN PAM, the new 16W GaN PAM enables a 32T32R mMIMO antenna to use half the normal number of power amplifiers while achieving the communication range of a 64T64R mMIMO antenna, thus reducing the manufacturing cost of 5G mMIMO base stations.
- The 16W GaN PAM doubles the power of a 64T64R mMIMO antenna compared to existing 8W products, extending the communication range of 5G mMIMO base stations.

### **2) *High efficiency of 40% in 500MHz band reduces 5G mMIMO base station power consumption***

- GaN high-electron-mobility transistors (HEMTs) with an epitaxial growth layer structure<sup>4</sup> achieve high efficiency and low distortion characteristics in 5G environments.
- Mitsubishi Electric's proprietary wideband Doherty circuit,<sup>5</sup> which mitigates bandwidth limitations caused by the output parasitic capacitance of GaN HEMTs, achieves 40% power-added efficiency in the 500MHz band to reduce power consumption in 5G mMIMO base stations.

### **3) *Modularization reduces circuit-design burden and manufacturing cost of 5G mMIMO base stations***

- Mitsubishi Electric's proprietary high-density packaging technology realizes a Doherty-circuit PAM that is indispensable to 5G base station power amplifiers.
- Deployment of the new PAM will reduce the number of components required in 5G mMIMO base stations, thereby simplifying circuit design and lowering manufacturing costs.

## **Main Specifications**

Model	MGFS52G38MB
Frequency	3.3-3.8GHz
Average output power	16W (42dBm)
Saturated output power	125W (51dBm) min.
Gain	28dB min.
Power-added efficiency	40% typ.
Dimensions	11.5×8.0×1.4mm
Shipment date	June 11, 2024

The use of mMIMO base stations to achieve high-speed, high-capacity communications is progressing mainly in urban areas. To further reduce power consumption and manufacturing costs, there is a growing demand for power amplifiers that offer higher efficiency and modularity. PAMs achieve 3GPP-compliant low-distortion characteristics<sup>6</sup> over a wide frequency range for broad compatibility with mobile networks in different countries. As 5G networks expand from urban centers to regional areas in the future, mMIMO base stations will be required to offer longer communication ranges and lower costs, in part by using power amplifiers capable of extra-high performance.

## **Environmental Awareness**

This product is compliant with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive 2011/65/EU and (EU) 2015/863.

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<sup>4</sup> Thin-film crystal growth layer formed by growing a crystalline thin film on a crystalline substrate

<sup>5</sup> High-efficiency circuit technique for power amplifiers proposed by W.H. Doherty in 1936

<sup>6</sup> 5G in-band and out-of-band distortion characteristics are regulated by the Third Generation Partnership Project (3GPP)

## **Website**

For more about high-frequency devices, visit [www.MitsubishiElectric.com/semiconductors/hf/](http://www.MitsubishiElectric.com/semiconductors/hf/)

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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 5,257.9 billion yen (U.S.\$ 34.8 billion\*) in the fiscal year ended March 31, 2024. For more information, please visit [www.MitsubishiElectric.com](http://www.MitsubishiElectric.com)

\*U.S. dollar amounts are translated from yen at the rate of ¥151=U.S.\$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2024