



## NEC and Analog Devices Collaborate to Provide 5G O-RAN Massive MIMO Radio for Rakuten Mobile

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TOKYO & NORWOOD, Mass.--(BUSINESS WIRE)--Oct. 22, 2020-- [NEC Corporation](#) (NEC; TSE: 6701) and [Analog Devices, Inc.](#) (Nasdaq: ADI) announced today that they have teamed up to design a 5G Network Massive MIMO Antenna Radio Unit for Rakuten Mobile. The radio unit adopts ADI's fourth-generation wideband RF transceiver solution to achieve high precision Massive MIMO and possesses a 5G open vRAN (virtual RAN) interface corresponding to Rakuten Mobile's end-to-end fully virtualized cloud-native mobile network. It delivers large capacity transmission with high efficiency by using 3.7GHz frequency Massive MIMO\*<sup>1</sup> and digital beamforming technology.\*<sup>2</sup> The cloud-native virtual network heralds a major shift in how communications providers can offer high-speed internet access worldwide, at significantly lower costs, made possible without the maintenance, upkeep, repair and labor costs associated with the physical infrastructure that hinders conventional networks. NEC has already started shipping the 5G Network Massive MIMO Antenna Radio Unit to Rakuten Mobile.

ADI's fourth-generation wideband RF transceiver integrates quad channel transmitters, receivers and Digital Pre-Distortion (DPD) in a single chip. The radio is fully software reconfigurable and covers all sub-6GHz 5G frequency bands, simplifying radio designs.

"ADI's RF transceiver is expertly designed to support wireless applications such as Massive MIMO and small cell systems, simplifying system design, reducing size and weight, and minimizing power consumption," said Nozomu Watanabe, Senior Vice President at NEC. "Virtualization is a dependable and cost-efficient approach, and the world's leading telecom providers are pursuing it as the next evolution of communications. ADI's RF equipment allows us to provide the connectivity required to build an architecture that supports 5G full-spectrum systems."

NEC's 5G equipment utilizes highly accurate digital beamforming for efficient high-capacity transmission. The system also features seamless installation, achieved through circuit integration.

"The new wave of 5G-based network connectivity is defined by flexibility," said Greg Henderson, Senior Vice President at Analog Devices. "By working with NEC to drive the first Massive MIMO installation for Rakuten Mobile, we're laying the groundwork to propel 5G connectivity forward. The ecosystem is incredibly intricate and complex, but the primary goal is for all parties to work seamlessly together to inspire efficiencies across the board: cost, time and capital equipment. These are the pieces that will help us move to the next step of a truly virtualized network."

### About NEC Corporation

NEC Corporation has established itself as a leader in the integration of IT and network technologies while promoting the brand statement of "Orchestrating a brighter world." NEC enables businesses and communities to adapt to rapid changes taking place in both society and the market as it provides for the social values of safety, security, fairness and efficiency to promote a more sustainable world where everyone has the chance to reach their full potential. For more information, visit NEC at <http://www.nec.com>.

### About Analog Devices, Inc.

Analog Devices (Nasdaq: ADI) is a leading global high-performance analog technology company dedicated to solving the toughest engineering challenges. We enable our customers to interpret the world around us by intelligently bridging the physical and digital with unmatched technologies that sense, measure, power, connect and interpret. Visit <http://www.analog.com>.

\*1 Massive MIMO--Massive multiple-input, multiple-output, or massive MIMO, is an extension of MIMO, which essentially groups together antennas at the transmitter and receiver to provide better throughput and better spectrum efficiency.

\*2 Digital Beamforming--Technology to precisely manipulate the gain and phase of multiple antenna signals. Able to form intensively to a specific direction and to deliver stable radio waves over longer distances.

*This release may be deemed to contain forward-looking statements intended to qualify for the safe harbor from liability established by the Private Securities Litigation Reform Act of 1995. These forward-looking statements include, among other things, our statements regarding the expected opportunities, benefits, cost savings, product and service offerings and developments associated with the collaboration between Analog Devices, Inc. and NEC Corporation relating to the 5G Network Massive MIMO Antenna Radio Unit and virtual implementation of a 5G network, that are based on current expectations, beliefs, assumptions, estimates, forecasts, and projections about the industry and markets in which the companies operate. The statements contained in this release are not guarantees of future performance, are inherently uncertain, involve certain risks, uncertainties, and assumptions that are difficult to predict. Therefore, actual outcomes and results may differ materially from what is expressed in such forward-looking statements, and such statements should not be relied upon as representing Analog Devices' expectations or beliefs as of any date subsequent to the date of this press release. Important factors that could cause actual results to differ materially from the results described, implied or projected in any forward-looking statements include difficulty or delay in our design, development, production and marketing of products, technologies and solutions, including those associated with the collaboration between Analog Devices and NEC, the course, impacts and uncertainty of the COVID-19 global pandemic, and other risk factors described in the most recent filings of Analog Devices with the Securities and Exchange Commission. Analog Devices does not undertake any obligation to update forward-looking statements made by us.*

(ADI-Web)

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