Fujitsu Radio Unit
Fujitsu has over 15 years of radio unit (RU) expertise. Over 600K RUs have been delivered since 2004.

- **2004**: First world shipment of Fujitsu RUs
- **2014**: Fujitsu begins supplying dual and triple band RUs
- **2019**: World’s first commercial O-RAN compliant 5G deployment
- **2020**: O-RAN trials in Europe
- **2021**: First O-RAN compliant radios delivered to N. America
- **2022**: Massive MIMO RU has been commercialized in Japan Market

**O-RAN commitment and leadership**
Driving Open RAN ecosystem and technology
Fujitsu O-RU benefits

**Performance**
- High efficiency
- Contact and light weight
- Wide band
- High output power

**Proven Reliability**
- High MTBF
- Very low return rate
- Natural cooling
- FMEA applied

**Flexibility**
- LTE & NR RAT
- Dynamic Spectrum Sharing
- Hybrid M-Plane

**Industry Compliance**
- ORAN 7-2x
- 3GPP
- SSHv2 & TLS security compliance
- FCC / ISED / CE / Telcordia
RU Technologies
Key differentiators for RU

1. Power saving
   - High-efficient Power Amplifier by Multi-Chip-Module (MCM)
   - Power saving in operation by advanced sleep control

2. Achieving High Throughput
   - In house BFIC supporting multi-beam multiplexing for mmWave
   - High-capacity RU with small size

3. Technology toward 6G
   - Enabling 6G with developing in house wafer technology to operate at high power in Sub THz (100-300GHz) range

CO2 emission of total system to be 1/2 of today’s amount by FY2025
Fujitsu can provide lower power consumption solutions based on Systems, Products, and Module & Devices. Power consumption can be reduced by 30~50%.

- PA (power amp.) miniaturization achieves lower loss elements in module.
- Linearized techniques (DPD) for GaN save energy dissipation from power source.

**Advanced PA on/off control with DPD**

**Conventional transmitter (1ch)**

**MCM (Multi-Chip-Module)**
FUJITSU has mmWave devices, antenna in packaging (AiP), and multi-beam radio technologies. High performance (>10Gbps) and small size (<1/2) RU is realized by those technologies.

**mmWave device technology**

CMOS beam-forming IC

**Multi-beam antenna technology**

- Multi-panel multi-beam antenna (Conventional)
- Single-panel multi-beam antenna (Proposed)

**Multi-beam Radio Unit**

28GHz 8ch TRX beam-forming IC

Throughput $2.5\text{Gbps} \times 4 = 10\text{Gbps}$

Inter-beam interference suppression

This material is based on results obtained from the project, "Research and Development Project of the Enhanced infrastructures for Post-5G Information and Communication Systems" (JPNP20017), by the New Energy and Industrial Technology Development Organization (NEDO).
Technology toward 6G

To establish leading position in the market by developing the sub-THz array antennas and the world No1 high-power and high-efficient power amplifiers for 100/300GHz

1. Array antennas for beam forming
   - Element pitch: 0.7mm (0.7λ)
   - Developed array antennas (1×4 array)

2. High-power amplifiers (PAs)
   - Output power
   - Efficiency
   - Target: 100GHz 10mW, 300GHz 100mW

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6G joint trials press release

Current FJ-PA (World record)
Thank you