



# Test and Measurement Business



## Contributing to the New Innovation Frontier Opened by 5G

- Supporting Network Evolution and Creating New Growth Drivers in 5G Utilizing Fields -

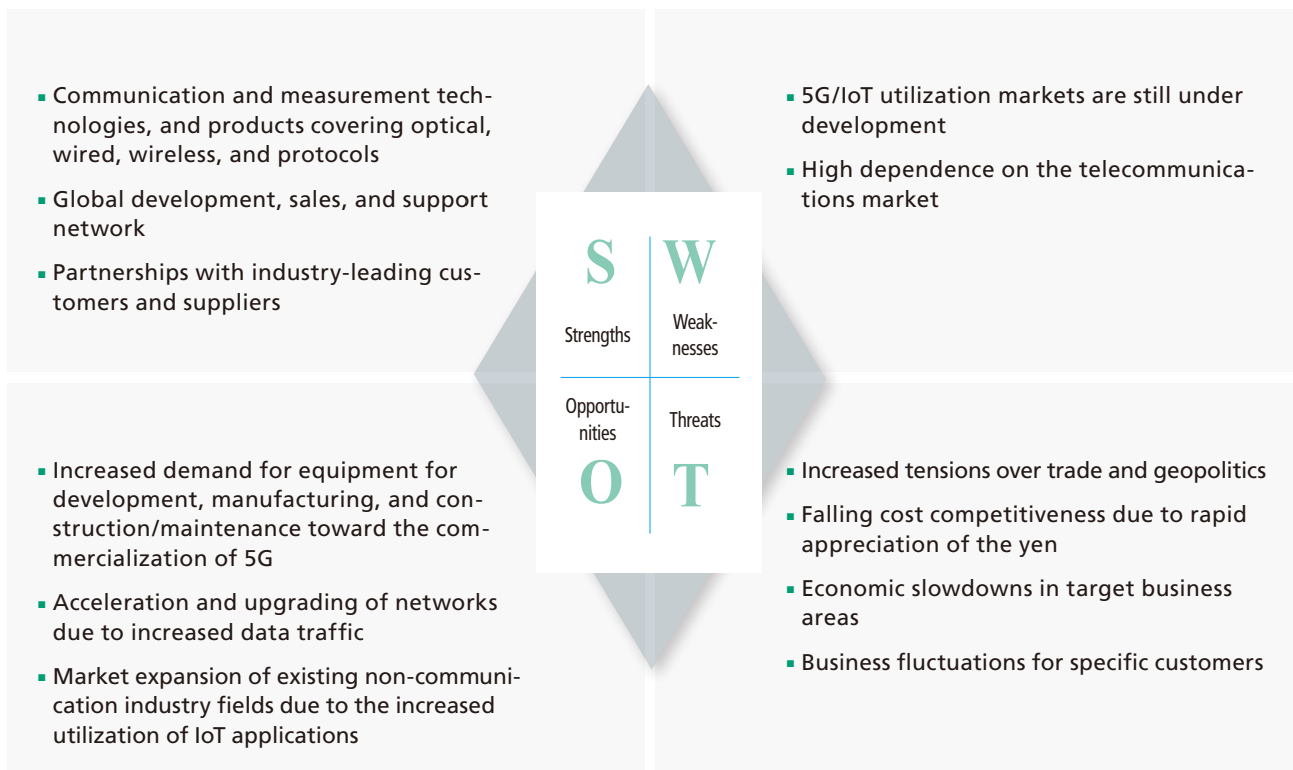
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Since the digitalization of communication began in the 1980s, advancements including an explosive increase in mobile phone subscribers, the rapid development of the Internet, and the spread of mobile broadband driven by smartphones have brought great changes to both our lives and business. 5G, which carries high expectations as a communication platform for an advanced IoT society, is now poised to enter practical use.

Anritsu's Measurement Business provides the global market with measuring instruments and test systems, which are essential tools for the establishment and spread of communication technologies. In addition to supporting the commercialization and development of 5G, from networks to terminals, we will contribute to the creation of new use cases and the solution of social issues, through the use of 5G in various industrial fields.

### SWOT Analysis



## Business Areas

Over the 120 years of our history, Anritsu has exhibited its DNA as a pioneer who has opened up the future of information and communication, and supported the evolution and development of communication technology at the cutting edge. Our Test and Measurement Business provides the global market with a variety of measuring instruments and test systems that are essential for the functional and performance testing and quality assurance of communication facilities, equipment, and networks.

- Providing test solutions for all phases such as chipset development, device development, conformance testing, and manufacturing inspection in the mobile communications market, as represented by smartphones.
- Providing measuring instruments for performance evaluations for network interfaces and bus interfaces, which are becoming ever faster due to the spread of cloud computing, as well as measuring instruments for optical module inspections.
- Providing measuring instruments for startup tests and maintenance/repair of IP networks that support the Internet, and measuring instruments for manufacturing and construction/maintenance of mobile communication base stations. In addition, providing a set of measuring instruments necessary for the construction/maintenance of optical fiber cables that extend throughout the world, from the overseas to homes.
- Providing measuring instruments and test systems required for evaluation and assurance of the connectivity quality required for the spread of connected cars and the introduc-

tion of IoT into home appliances and industrial equipment.

- Providing monitoring solutions that contribute to network failure analysis and improvements in customer experience by visualizing the network operational status of telecommunications carriers.

## Market Environment and Business Opportunities

### ■ Start of 5G Commercial Service

The introduction of 5G, which carries high expectations as a communication platform for IoT in various industries, will start in 2019. In addition to chipset development, where demand for testing has been strong since the communication standards were established, there will be expanding 5G business opportunities for the development of commercial devices, conformance testing, carrier acceptance testing, and calibration inspections in production lines. The introduction of 5G is also expected to increase the demand for measuring instruments required for construction and maintenance across networks, such as the upgrading of communication equipment to realize high speed and low latency, and the introduction of base station equipment that supports high frequencies.

### ■ Data Center Expansion and Network Evolution

Data traffic is steadily increasing due to services such as SNS and video sharing. In the future, this trend is expected to strengthen further due to AR/VR applications and utilization of AI, among other factors. This situation is expected to promote increases in the scale of data centers as well as

### Business areas of the Test and Measurement Business



Mobile communication 2G, 3G, 4G & 5G



Automotive IoT connectivity



High-speed buses for cloud computing



Network Construction/Maintenance



RF & micro/mmWave devices/components

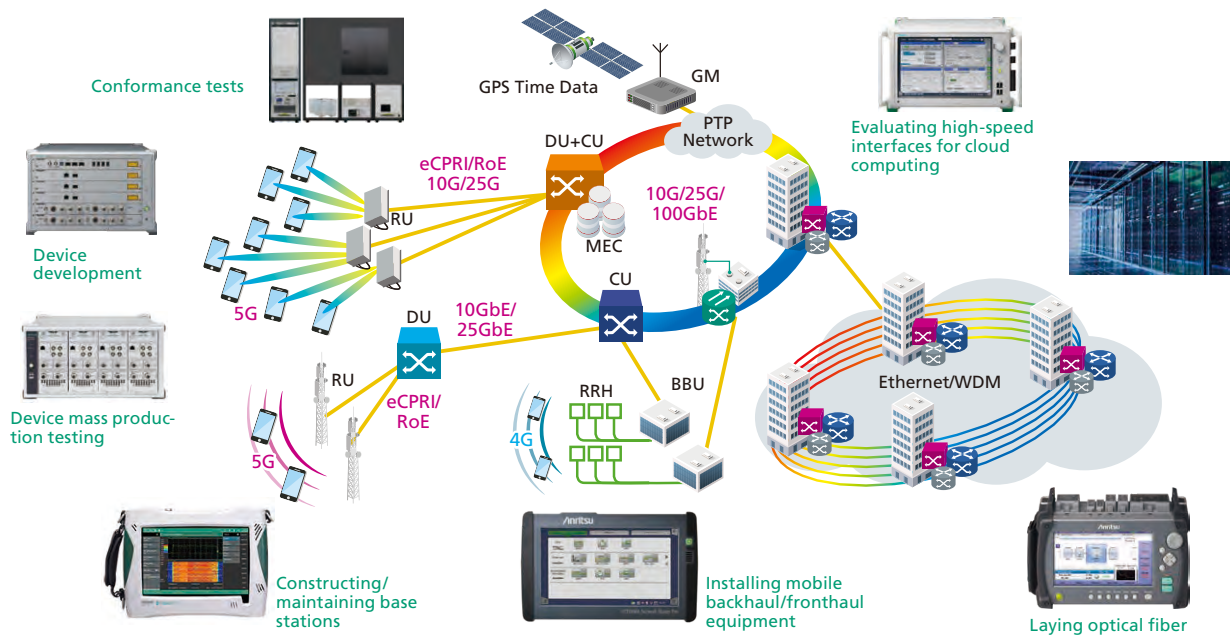


Telecom network monitoring



## Test and Measurement Business

### Anritsu solutions that support 5G networks



increased network speeds, and an increase in the introduction of 100G Ethernet equipment, which is already in widespread use. In 2019, 400G Ethernet employing a new optical transceiver technology called "PAM4" is about to be introduced, which is expected to create more new business opportunities.

### Expanding Use Cases for IoT

The expansion of the market for IoT, where devices and services are connected to a network, offers new growth opportunities for Anritsu. Test technologies cultivated in the mobile market has been leveraged for verification of connected cars, and demand is increasing as the market expands. Anritsu has a large variety of connectivity quality evaluation solutions required by IoT applications, such as 4G, 5G, wireless LAN, Bluetooth, and Cellular IoT, and we will continue to make proposals for various industry segments.

## Growth Strategy

### GLP2020 Core Policy

Under our Mid-Term Business Plan GLP2020, we have identified the three areas such as (1) 5G, LTE-Advanced, (2) IoT/Automotive, Connectivity, and (3) IP Data Traffic, Cloud Service, as growth drivers for realizing sustainable growth with profits. Among these, the 5G business plays the central role in our growth strategy. To establish a position as a leading company in the global market, we are working to enhance our solution lineups, establish an efficient development framework, and strengthen our support systems.

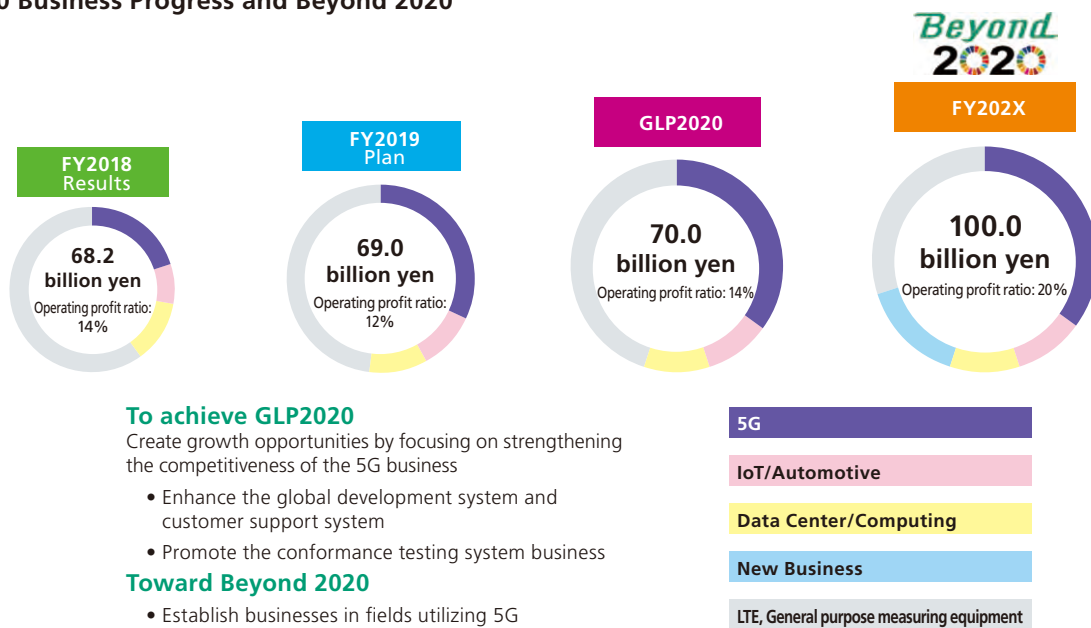
### GLP2020 First Year Results

In FY2018, the first year of GLP2020, by capturing the rise in 5G initial development demand, we greatly exceeded our initial targets of 60.0 billion yen in sales and an operating profit ratio of 6%, achieving sales of 68.2 billion yen and an operating profit ratio of 14%, which represents a strong start toward the realization of GLP2020. We have expanded our lineup of 5G products, from development to manufacturing and maintenance, in readiness for the commercialization of 5G. Although the market for LTE has contracted, as expected, we have maintained our customer base and improved profitability by managing investment with a conscious focus on effectiveness. Our automotive and IoT-related businesses are continuously working to develop new customers, as businesses that will grow gradually over the long term. In 2018, the trend toward an expanded use of IoT has become more prominent, such as mandatory eCall in Europe and the successive launch of Cellular IoT services by the operators of various countries.

### Toward Achievement of the GLP2020 targets

To achieve revenue of 70.0 billion yen and an operating margin ratio of 14%, those are the goals for GL2020, we are accelerating our shift in attention to growing segments in FY2019, and work to expand our customer base. Due to the earlier-than-anticipated commercialization of 5G, we expect demand for testing to continue to switch from 4G to 5G. In addition to increasing the competitiveness of confor-

## GLP2020 Business Progress and Beyond 2020



mance testing systems, which will enjoy increased demand with 5G commercialization, we are aggressively making strategic investments to meet an increase in testing requests, due to many operators starting 5G operations. We will also work on the development of network equipment that will evolve with cloud computing, such as 400G Ethernet, and enhance our products in anticipation of manufacturing demand for optical communication modules.

### Toward Beyond 2020

The introduction of new services that exploit the ultra high-speed and high capacity communication of 5G allowing the use of high-definition video distribution and VR/AR. The new features of ultra-low latency and multiple simultaneous connections are also expected to create use cases in a variety of fields, including industry, agriculture, construction, and healthcare, as well as automobiles. Various experiments and demonstrations are already being actively conducted. By leveraging Anritsu's competencies of "connecting" and "measuring" technologies, we will consider collaborating with companies with a strong presence in various fields, and strengthening our portfolio through M&As, as some of our options for establishing businesses in 5G utilizing fields, in new industries that lie beyond a projection of our existing mobile business. We are also working on creating a system to support further growth. For example, we are strengthening the management of our globally expanding development centers, working to achieve a deeper cooperation with leading customers, and developing sales channels. In terms of improving profitability, we will promote

thorough profitability evaluations of development investment projects, and promote product design and kaizen activities that consider cost control. Through these initiatives, we will achieve concrete results, aiming for sales of 100.0 billion yen and an operating profit ratio of 20%, which are the Beyond 2020 targets for the Test and Measurement Business.

### Solutions for Society (SDG Initiatives)

IoT, which connects all kinds of devices, carries high expectations for solving various social issues toward realization of the sustainability targets listed as the SDGs. In order to create a safe, secure, and comfortable IoT society, the development of a robust network infrastructure is essential. Our Test and Measurement Business contributes to the realization and maintenance of communication quality through various solutions for the communication network development, manufacturing, construction and maintenance, and operation stages. Measuring instruments and test systems that utilize wireless communication technologies, such as WLAN, Bluetooth, Cellular IoT, 4G, and 5G, IP communication, and protocol testing technologies, are not limited to smartphones, and are starting to be introduced in advanced companies in fields including automobiles, home appliances, construction machinery, smart meters, and sensing. We believe that more fields will emerge in which Anritsu has something to offer, and we will continue contributing to the promotion of innovation in various industries, toward the creation of a sustainable society.