Panoramic view of Fukagawa plant before the Great Kanto Earthquake

FUJIKURA HISTORY

Significant Damage in the Great Kanto Earthquake：The Great Kanto Earthquake struck Tokyo in September 1923 after the production had already been relocated to Fukagawa. The subsequent fire burnt 25,000 m2 of Fukagawa Plant, but early evacuation to Sendagaya Plant and other places saved the lives of all the employees and their families. With a party heading for Fukagawa to help the remaining employees, Fujikura rose from the ashes for rapid recovery.

Power and Telecommunication

Launch of Sales of New-type Single-core Optical Fiber Cleaver

Fujikura is pleased to announce the development and launch of sales of a "New-type Single-core Optical Fiber Cleaver," a tool used to cleave optical fiber core wires for communication and featuring improved operability and maintainability over conventional models. The new model will be launched in the first half of this fiscal year.

The new model allows the operator to replace the cleaving blade and the resin fiber holder, and is expected to realize major reductions in maintenance time and costs.

Moreover, in the past, when part of the disk-type cleaving blade became worn due to repeated optical fiber cleaving, the disk lock had to be disengaged using a wrench and then re-engaged using a wrench again after rotating the disk to a position where the blade had not been worn down. The new model features a dial that can be turned to change the position of the disk-type cleaving blade without the need for tools such as wrenches.

In addition, the opening angle of the lever positioned on the top surface of the cleaver has been expanded to 90 degrees or more, facilitating the setting of optical fiber in the cleaving unit. An interlock mechanism has been adopted that reciprocates the disk-type cleaving blade by opening and closing the lever to enable completion of cleaving in a single operation. The new cleaver offers greatly improved work efficiency compared to conventional models.

● **Example of Product Specifications**

Model Name	CT08
Applicable optical fiber core count	Single core
Applicable cladding diameter	125 μ m
Applicable sheath outer diameter	Single core: Sheath diameter: μ 160 - 900 μ m
External dimensions	110mm(W)×95mm(D)×45mm(H)
Weight	185 g

Precision Equipment Division　info-splicer@jp.fujikura.com

WEB dedicated for Fusion Splicer　https://www.fusionsplicer.fujikura.com/jp
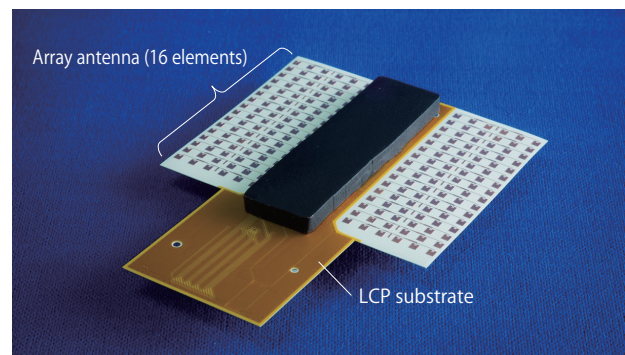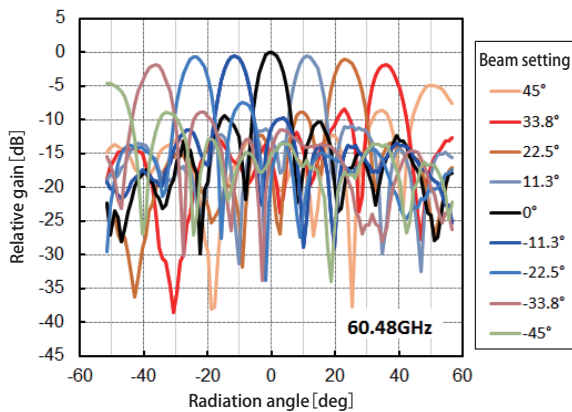
2018 2

R & D

60 GHz Millimeter-wave RF Module with High-gain Phased Array

Fujikura has been developing a built-in-type radio communication module that enables high-speed long-distance transmission at 60 GHz. This module has a feature that it can control the direction of a high-gain narrow beam over a wide range using a phased array for beamforming.

We built a prototype of the high-frequency circuit portion (millimeter-wave RF module) mainly consisting of the phased array, and experimentally verified its beamforming ability. The new millimeter-wave RF module is composed of a flexible low-loss multilayer liquid crystal polymer (LCP) and a high-gain array antenna with 16 elements each for transmission and receipt. The antenna is designed to be mounted to the LCP substrate and driven by a high-power phased array IC. The test results proved that the module can direct a narrow antenna beam of approximately an angle of 7.5° at any angle between plus and minus 45°.

● **Beam pattern evaluation results**

Beam setting: 45°, 33.8°, 22.5°, 11.3°, 0°, -11.3°, -22.5°, -33.8°, -45°

60.48GHz

Array antenna (16 elements)

LCP substrate

✉ Advanced Technology Laboratory ▶ fjk.efdept@jp.fujikura.com

---

Power and Telecommunication

Fujikura Receives Testimonial from BICSI Japan

Fujikura has received a testimonial for our services from BICSI* (Building Industry Consulting Service International) Japan, the professional association that provides education in the design and installation of generic cabling. BICSI aims to improve the skills of network design and installation professionals, and Fujikura supports BICSI's activity for a long time.

Fujikura will support further progress of society of information communications technology by producing better quality products and installing correct wiring.

* BICSI(Building Industry Consulting Service International)was established in the U.S. in 1974 as a non-profit association that provides certification, information, and education regarding the design and installation and wiring standards of wired and wireless network systems. The association has more than 24,000 members in about 100 countries.

Left: Katsuji Furuichi, BICSI Japan District Chair
asayuki Inamura, Fujikura Data Center Business Department Head

✉ Data Center Business Department ▶ wwwadmin@jp.fujikura.com

Automotive Products

Fujikura to Establish Joint Venture of High-voltage Wire Harness
Design and Development with Hengtong Group

Fujikura has concluded a contract with Hengtong Optic-Electric Co., Ltd. (hereafter Hengtong), a Chinese leading electric wire company and member of Hengtong Group, to establish a joint venture for the design and development of high-voltage wire harnesses and related products.

In recent years, the required level of reductions in CO_2 emissions from vehicles has become stricter. This will accelerate the spread of new energy vehicles (NEVs) represented by electric vehicles (EVs) and plug-in vehicles (PHVs) at home and abroad. In addition, the Chinese government has set a goal of mandatory raise of quotas on EVs and PHVs in the country from 2019 under regulations regarding EVs. This measure will result in an increased production of NEVs over the medium- and long-term.

Under the contract, Fujikura will enter into a joint venture (Stake: Fujikura 51%, Hongtong 49%) in Shanghai, China within the 2017 fiscal year. We will be committed to strengthening the development of high-voltage wire harnesses and related products for the Chinese market.

● **Overview of joint venture**

Name	Fujikura Shanghai Hongtong Prosperous New Energy R&D Co., Ltd.
Company representative	Juichi Konishi, President

✉ Automotive Products Company ▷ automotive@jp.fujikura.com

Information

Fujikura Volunteers in Disaster Relief in Fukushima Again This year

More than six and a half years have passed since the Great East Japan Earthquake and the subsequent Fukushima Daiichi nuclear power plant accident occurred on March 11, 2011. In current years, a decrease in the number of volunteers visiting devastated areas has raised concerns about the recovery in Fukushima losing momentum.

The Fujikura Group has been involved in volunteer activities in Fukushima annually since 2014. This year marks our third volunteering activity, which took place on December 16 and 17, 2017 with 13 participants. In cooperation with an NPO, Minamisoma City Volunteer Work Center, we ripped away an abandoned bamboo thicket. A bamboo thicket requires regular trimming. If left as it is, it can overgrow and break the roofs of neighboring houses or spread to nearby fields to affect farming. Although our volunteering may be just a small step in reconstructing Fukushima, we will continue supporting the stricken areas to live up to people's expectations for a quick recovery.

✉ CSR Promotion Team ▷ fjk.csr@jp.fujikura.com

R & D

GTC Japan 2017
Fujikura Presents Current Status of Research in AI (Deep Learning)

Fujikura made a presentation at GTC Japan 2017 (hosted by NVIDIA, supported by the Ministry of Education, Culture, Sports, Science and Technology) held at Hilton Tokyo Odaiba on December 12 and 13, 2017. The title of the presentation was "Fujikura's Research in AI (deep learning) and Its Application to Visual Inspection of Wafers of High Power Semiconductor Laser."

Fujikura develops a high-power semiconductor laser wafer inspection system jointly with Optoenergy Inc. to improve the quality of semiconductor lasers, specifically, the core part of fiber lasers. The main function of the system is high-precision automatic judgement of pass or fail and abnormalities of chips by type using deep learning. The data obtained by the system is converted into heat map images so that an operator can verify that the defects have been recognized appropriately by deep learning.
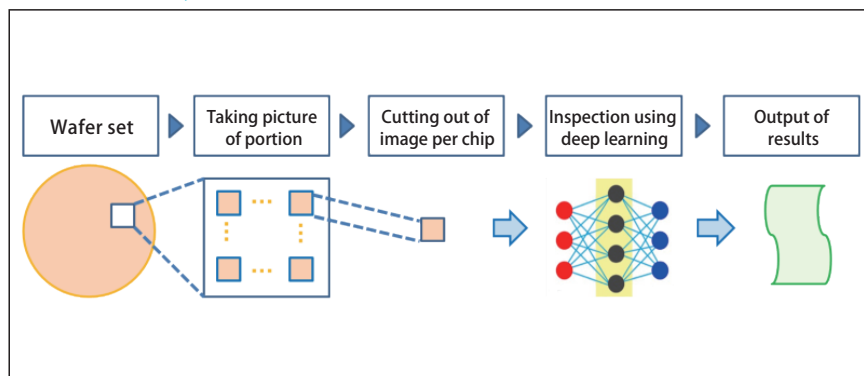
Deep learning has achieved a correct response rate of 98% exceeding 95% of those of technicians. The use of deep learning enables high-precision classification and recognition and early mounting of the system because deep learning does not require programing.
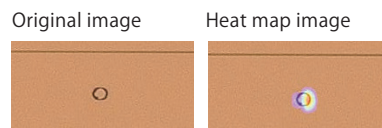
We will continue to introduce AI and IoT and expand our research in these areas as part of our manufacturing innovation.

GTC: It stands for GPU Technology Conference. This international conference centers high-performance computing, which is essential to AI (deep learning), and is held in seven cities worldwide. AI (deep learning) computing of the company NVIDIA, which hosts the conference, has become the de facto standard.

● **Overview of system**

Wafer set ▶ Taking picture of portion ▶ Cutting out of image per chip ▶ Inspection using deep learning ▶ Output of results

● **Status of image recognition**

Original image | Heat map image

● **Accuracy of image recognition**

Judgement	Precision
Pass or fail	98%
Type of defect	95%

✉ G-FPS Promotion Center ▶ wwwadmin@jp.fujikura.com