FUJIKURA NEWS

2020 No.472 12

Fujikura Modern history -8

Completion of Fourth Plant and Expansion to Western Japan

While the Japanese economy was changing for the worse due to the end of the economic boom of the late 1960s called Izanagi Keiki and the Nixon shock, Fujikura continued expanding facilities. To meet the rapid increase in demands for electric wires since the economic boom, following Sakura Plant, No.4 plant was completed in Suzuka City, Mie Prefecture in 1970. The expansion of the production facility into the Chukyo and Kinki region raised expectations of the company's future development. The facility was an ideal space with few pillars, well-structured for saving power, and nonpolluting with almost no noise, vibration, or water contamination. So the employment of local workers went well, receiving a favorable reception from the community.

Inside of the Suzuka Plant

R&D

Fujikura joins MIT.nano Consortium

Fujikura Ltd. (President & CEO: Masahiko Ito) has announced that it has joined the MIT.nano Consortium.
2nd from the left, Managing Director Fujikura Wada, 4th Professor MIT Bulović, 5th Director Fujikura Yamada
MIT.nano is an advanced facility for nanoscience and nanoengineering at MIT. Located in the heart of the MIT campus, the facility provides shared equipment, specialized environments, and support from highly qualified technical staff to any faculty member, researcher, student, or qualified partner who needs these resources to advance their investigations.
Fujikura's principal relationship with MIT.nano will be with the Advanced Research Core (ARC), a new unit established at Fujikura in 2019 to conduct advanced basic research.
"Right now, we live in a very exciting time surrounded by digital transformation. To enable our researchers to envision the next era, the Advanced Research Core (ARC) works to develop cutting-edge technologies, covering both basic and applied areas. On behalf of ARC, I look forward to exploring with MIT.nano the unlimited potential of nanotechnology to enrich the world," said Yumi Yamada, Fujikura's General Manager of ARC.
"For more than a century, Fujikura has been in the business of making connections. This spirit is a perfect match for MIT's culture of innovation through collaboration," said Vladimir Bulović, the founding faculty director of MIT.nano and the Fariborz Maseeh (1990) Professor of Emerging Technology. "We look forward to connecting our new colleagues from Fujikura to the MIT community and the members of the MIT.nano Consortium."
In MIT.nano's quarterly industry Consortium meetings, Fujikura will provide advice alongside 12 other Consortium companies to help guide and advance nanoscale innovations at MIT.

About MIT.nano

MIT.nano is a comprehensive facility for research on nano-scale and was built in the heart of the university's Cambridge Campus in 2018. The four-story facility with a total floor area of 20 thousand square feet supports research in the fields of energy, hygiene, life science, quantum chemistry, electronic engineering, and manufacturing.
For more information, visit mitnano.mit.edu.

Advanced Research Core wwwadmin@jp.fujikura.com

Power & Telecom

Fujikura Receives the Society of Iodine Science Award 2020 for Commercialization of Dye-sensitized Solar Cells

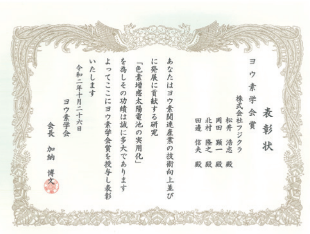
Fujikura has received the Society of Iodine Science (SIS) Award 2020 for our achievements of commercializing dye-sensitized solar cells (DSSCs). In the ceremony held on October 26, the company received a testimonial from the Chairman of SIS (professor, graduate school of science, Chiba University). This award commends those who significantly contributed to the development in the fields of basic research and applied research on iodine and in the iodine industry. Fujikura's DSSC electrolyte uses iodine. Iodine-based electrolytes function well in charges transport. On the other hand, there were technological barriers to the practical use of the electrolytes because of high reactivity of iodine and difficulties in sealing the devices so as not to let the electrolytes volatilize for a long time.

For our receipt of the award, SIS commended Fujikura's achievements of technological development of DSSC modules with viewing to overcoming these challenges and of putting the modules to practical use as energy-harvesting power supply to be mounted on IoT sensor network terminals. We have sold DSSC products since 2015. This summer, we started to provide a new model with one half thickness of the previous model, simplifying the design for installing the device into the enclosure to allow the device to be widely used. In addition, to help our customers reduce design and development costs when they turn to energy harvesting, we have launched different design tools necessary for using DSSCs as power supply.

Our Website (https://dsc.fujikura.jp/) provides the simulator for energy balance calculation, and the circuit diagrams and parts lists of the power module, which can be used for designing devices.

Fujikura promotes the proliferation of various EH devices, especially in the IoT field, by supplying DSSCs and these tools. It leads to reduce the costs for replacing batteries and the number of wasted batteries, and we will contribute to the realization of a comfortable and environmentally-friendly society.

● Award ceremony
(Left: Chairman of SIS, Professor Hirofumi Kanoh)



表彰状

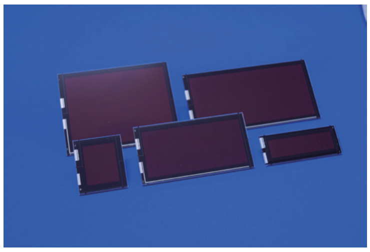
ヨウ素学会賞

株式会社フジクラ
松井 浩志 殿
岡田 顕一 殿
北村 隆之 殿
田邉 信夫 殿

あなたはヨウ素関連産業の技術向上並びに発展に貢献する研究
「色素増感太陽電池の実用化」
を為しその功績は誠に多大であります
よってここにヨウ素学会賞を授与し表彰いたします

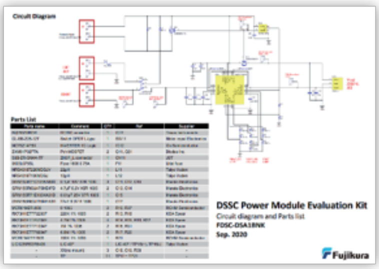
令和二年十月二十六日
ヨウ素学会
会長 加納 博文

● Fujikura's DSSC module panels



● Published circuit diagram and parts list (left), Screens of energy balance calculation simulator (center, right)

Circuit diagram and parts list



Input screen

Calculation results

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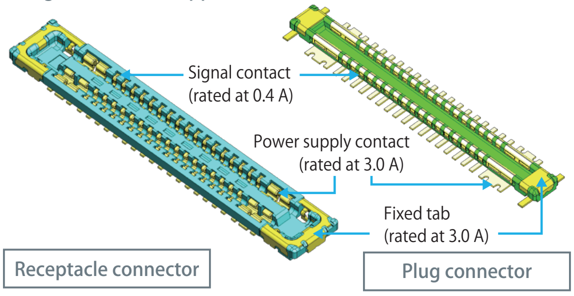
Electronics

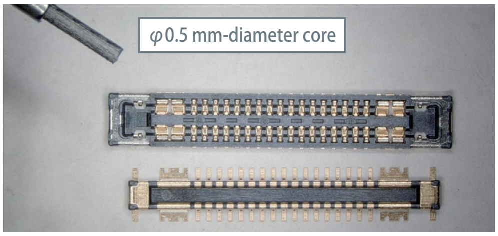
Board-to-Board Connector, FB35AF Series, for Smartphones

Smartphones and mobile devices have become highly functional, and connectors are required to have a high current capacity, smaller size and weight. To respond to these requirements, Fujikura has commercialized board to board connectors with fixing tabs on both ends, the FB35 series, which are well received by customers.
Pursuing a higher current capacity and compactness, we have developed a small-size board-to-board connector with a high current capacity, a mated height of 0.5 mm and a width of 1.8 mm. In addition to a signal contact rated at 0.4 A, the connector houses two 3 A fixed tab electrodes and four 3 A power supply contacts (Fig. 1). Furthermore, the fixed tab not only handles high currents but also supports the connector to prevent breakage that can occur at the time of fitting.

● Fig. 1 Connector appearance



● Fig. 2 Appearance



● Specifications

	Existing product	New product
Series	FB35AB	FB35AF
Mating height	0.6 mm	0.5 mm
Pitch	0.35 mm	
Width	1.8 mm	
Rated voltage	AC 30 V (r.m.s.)／DC 30 V	
Rated current	0.4 A/pin Signal contact: 0.4 A/pin 3.0 A/pin Power supply contact: 3.0 A/pin Fixed tab: 3.0 A/pin	
Withstanding voltage	AC 200 V(r.m.s.)/minute	
Insulation resistance	DC 200 V 100 MΩ min.	
Contact resistance	Signal contact: 30 mΩ max. Power supply contact: 20 mΩ max. Fixing tab: 20 mΩ max.	
Operating temperature range	-40 ℃～+85 ℃	
Number of contacts	Signal contact: 16	Signal contact: 34
	Power supply contact: 4 Fixed tab : 2	

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Power & Telecom

PANDA Fiber for usage under small Bending Radius at 1310nm wavelength region

A PANDA*1 fiber (BIR5-13-PX-U25D) for miniaturized optical transmission devices has been developed. The most important characteristic of this fiber is to maintain the polarization crosstalk under the small bending radius as 5 mm.
The design of this fiber was optimized to achieve the maintaining polarization crosstalk at 1310nm wavelength region under the small bending radius.
Fujikura is continuing to develop products that contribute to society, taking advantage of our speciality fiber technology.

＊1 ANDA (Polarization-maintaining AND Absorption-reducing) type is a typical structure of polarization maintaining optical fibers. Polarization-maintaining fibers have a feature that polarization of transmitted light is stable against the outer disturbance.

● Characteristics of new product and conventional products

	Conventional products	New product
Minimum bending radius (mm) *2	20	5
Bending polarization crosstalk (dB)	—	Less than or equal to -30 (at R 5 mm ×10 turns)
MFD (Mode Field Diameter)	9.0±0.5	7.8±0.5
Cladding diameter (major diameter) μm	125±1	125±1

1310 nm frequency band *2 Only optical characteristics are guaranteed

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Electronics

Development of PEDOT Transparent Touch Sensor

Capacitance touch sensors are increasingly being employed because of their good design and operability. Specifically, since flexible transparent touch sensors feature a high degree of freedom in the design and space saving, they can be placed in a curved enclosure. This allows the products to be incorporated in the control panels of home appliances and vehicles as slim illuminating switch with a backlight.

In recent years, according to the expansion of their applications, transparent touch sensors have been needed to be even more transparent and reliable than the existing products. To meet these demands, we have developed a PEDOT* transparent touch sensor with almost invisible electrode in addition to our lineup of products with fine mesh electrodes formed by gravure offset print technology.

Generally, while the conductive polymer, PEDOT, provides a high degree of transparency, its challenges are environmental reliability. Thus, the material has had difficulty to be commercialized as touch sensor without improvement.

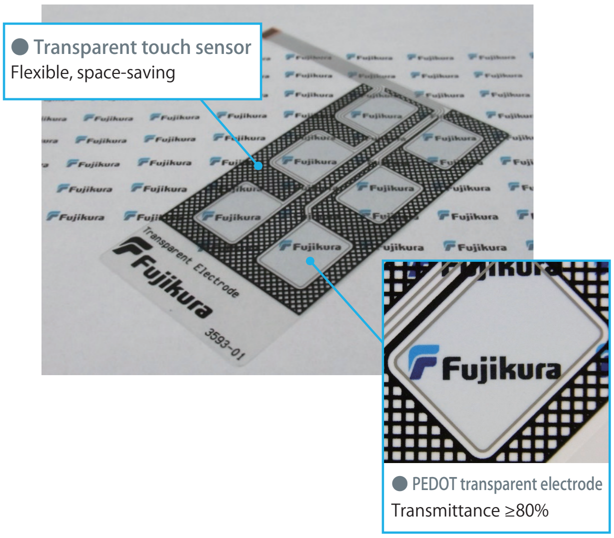
Consequently, we handled the challenge, and the product has achieved a transmittance of 80% and a resistance increase rate of 20% in a harsh testing of high-temperature exposure at 105°C for 1000 hours.

This new product exhibits high reliability in terms of light resistance and high-temperature high-humidity resistance and thus can be used for different applications including in-car application.

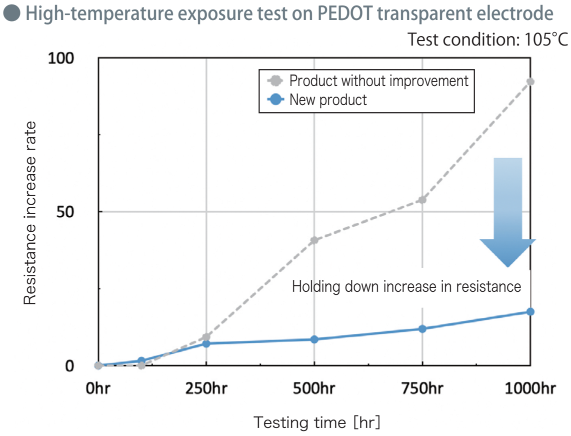
In the future, Fujikura will be committed to improving customers' product value by providing proposals of our new product along with fine mesh electrodes that are in volume production according to the customers' applications and requirements.

*PEDOT: Poly (3,4-ethylenedioxythiophene)

● PEDOT transparent touch sensor



● High-temperature exposure test on PEDOT transparent electrode



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Issue :December 2020, No. 472 Editor in Chief : Tomoharu Morimoto
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