

## Delivery of a rare-earth-based high temperature superconducting tape for the world's first fusion demonstration reactor, expanding production capacity

We at Fujikura announced that we had delivered a rare-earth-based high-temperature superconducting tape to Commonwealth Fusion Systems (CFS) working on a demonstration of the world's first fusion reactor in order to promote the future production capacity expansion.

Founded in 2018 as a spin-off company of Massachusetts Institute of Technology, CFS is a high-profile cutting-edge company working to realize the world's first commercial fusion reactor.

Compared to conventional power generation, fusion power generation does not emit carbon dioxide, and its resources are inexhaustible in seawater. It is excellent in safety and expected to be a technology that will fundamentally solve energy and environmental problems.

It will make it possible to make superconducting magnets necessary for fusion power generation smaller than conventional ones by using the rare-earth-based high temperature superconducting tape realizing

ultra-high magnetic fields developed by Fujikura.

Fujikura has continued world-leading research and development on high temperature superconductivity, and currently provides high-performance, uniform rare-earth-based high temperature superconducting tapes both in Japan and overseas, which have been highly evaluated by users.

The demonstration of fusion reactor using high temperature superconductivity, which CFS intends to realize, requires both high critical current performance and high strength in an ultra-high magnetic field. We have established mass production technology to meet these requirements by further enhancing our existing manufacturing technology.

Taking this delivery as an opportunity, we will expand our production capacity of the high temperature superconducting tape, enhance our presence, and contribute to the realization of a carbon-neutral society through our contribution to various future superconducting devices.



Rare-earth-based high temperature superconducting tape

### Points relevant to the 17 SDGs

Fujikura will contribute to the realization of a carbon-neutral society through various next-generation superconducting devices.



## Introduction of ultra-slim, high-density 6912 fiber count optical fiber cable. Further reduction in diameter and weight of optical cable with the world's highest fiber-count.

Fujikura introduces an ultra-slim, high-density 6912 fiber count cable. This is a renewed version of the cable with the same concept released in 2018 but with a great improvement in the size and its fiber density.

With the progress of 5G, the volume of data, such as video distribution and cloud services, has increased dramatically, and the construction of data centers is underway to handle large volumes of data communication and storage.

Building high-capacity network for connecting data centers requires huge number of optical fibers in a limited installation space or in the existing facilities.

Fujikura contributes to the expansion of high-capacity network by releasing 6912 fiber-count SWR/WTC, which utilizes 200um dia. 12F intermittent bonded ribbon fibers.

In preparation for further capacity increase for data communication in the future, we see a growing demand for smaller diameter, higher density, and lower installation costs of optical fiber cables. To meet this requirement, we will offer a lineup of ultra-slim, high-density 6912 fiber count SWR®/WTC® optical fiber cables.

■ Table 1: Features of ultra-slim 6912F SWR®/WTC® optical fiber cable

	Conventional product	Ultra-slim 6912F SWR®/WTC®
Number of fibers	6912F	6912F
Number of fibers	6912F	6912F
Fiber diameter	200μm	200μm
Outer diameter	35.0mm	29.8mm <b>15% smaller compared to conventional product</b>
Mass	750 kg/km	640kg/km <b>15% lighter compared to conventional product</b>
Maximum length/drum	10,000ft (3,048m)	15,000ft (4,572m) <b>1.5 times larger compared to conventional product</b>

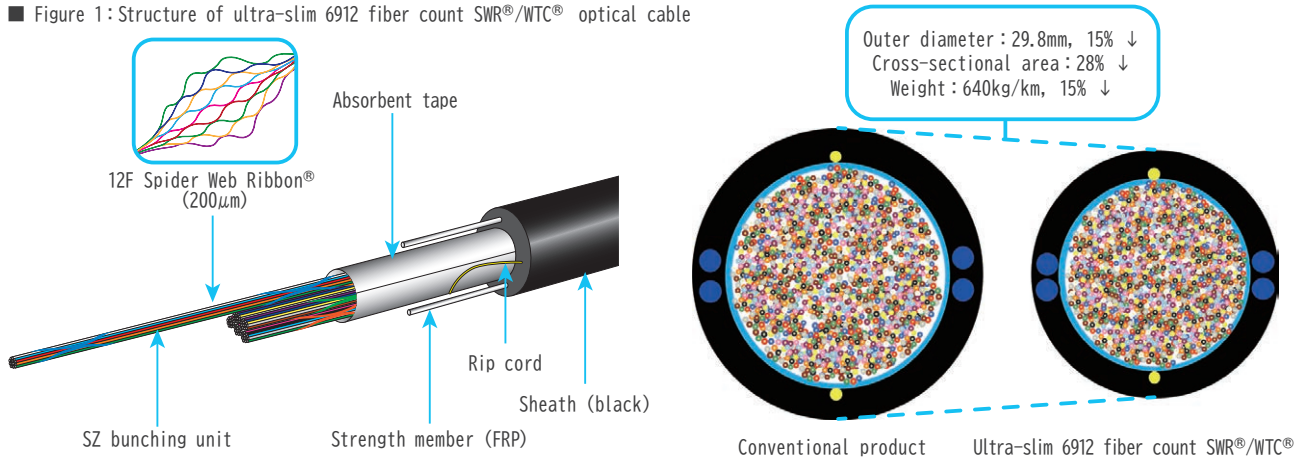
While achieving a 15% smaller diameter than conventional products, we ensure the same mechanical properties as conventional products and increases the length per drum, thereby reducing the number of connection points during cable laying and contributing to shorter installation time.

In addition, the smaller diameter and lighter weight

of the cable reduces CO<sub>2</sub> emissions generated during manufacturing, transportation, and installation, contributing to reduction in the environmental load.

Fujikura will continue to support the further growth of advanced information society by creating new technologies to meet customer needs and continuous development of innovative products.

■ Figure 1: Structure of ultra-slim 6912 fiber count SWR®/WTC® optical cable



### ■ Points relevant to the 17 SDGs

Our ultra high fiber count cable, which utilizes our proprietary innovative technologies, enables high-density and efficient optical fiber distribution even in limited installation spaces, and supports the development of an even more advanced information-communication society, including the advancement of 5G and the accompanying high-capacity data communications.



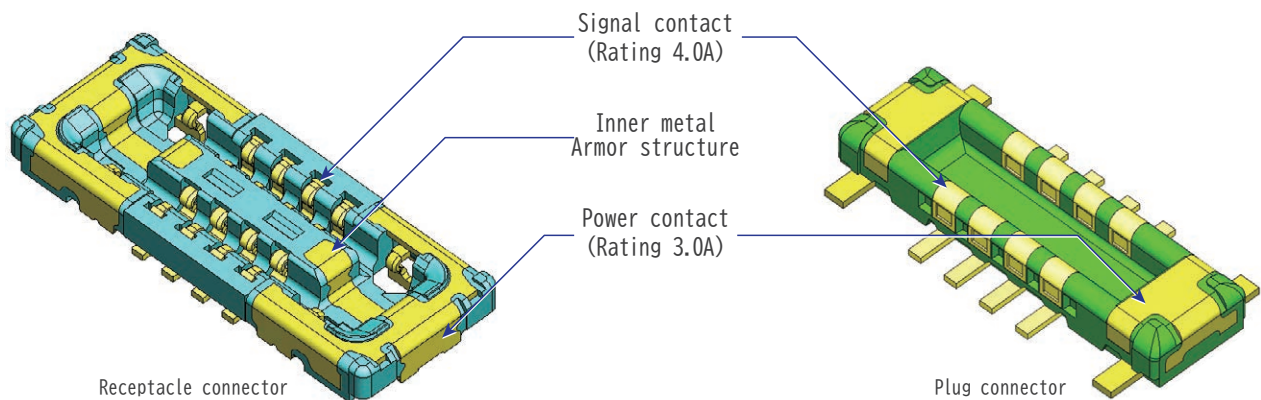
## Introduction of FB35AT5 Series, board-to-board connector for smartphones

As smartphones and other mobile devices that are now essential to our lives become increasingly multifunctional, the number of modules installed is also increasing. As a result, it has become essential to increase the density inside such devices, and connectors are required to be even smaller and lighter. With this market need in mind, we have developed an ultra-compact board-to-board connector with a fitting height of 0.5mm in pursuit of miniaturization. In addition to the signal contact with a rated current

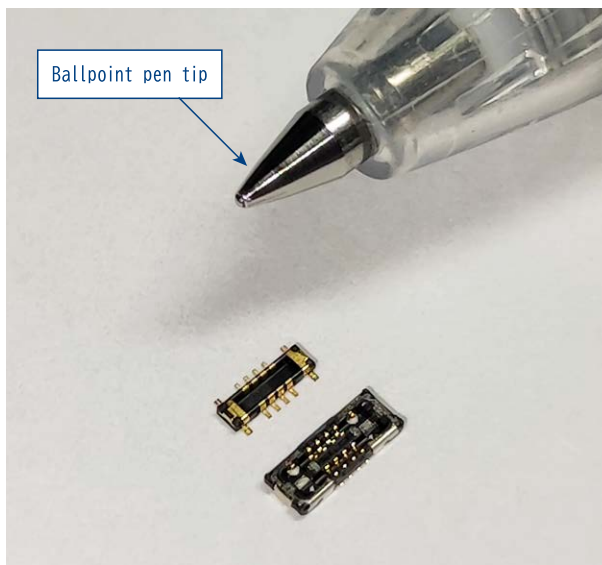
of 0.4A, two power contacts with a rated current of 3 A are arranged (Figure 1). The power contacts not only support high current, but also serve to reinforce the connectors and prevent damage during mating. In addition, an “inner metal armor structure\*” is adopted to further increase the connector strength.

\*Inner metal armor structure: Metal in the center of the receptacle connector

■ Figure 1: Appearance of of connector



■ Figure 2 : Appearance



■ Table 1 : Specifications

	Current products	New products
Series	FB35AT6	FB35AT5
Mating height	0.6mm	0.5mm
Pitch	0.35mm	
Width	1.65mm	
Rated voltage	AC 30V (r.m.s.)/DC 30V	
Rated current	Signal contact : 0.4A/contact Power contact : 3.0A/pin	
Voltage resistance	AC 200V (r.m.s.)/minute	
Insulation resistance	100M $\Omega$ (r.m.s.) min. at DC 200V	
Contact Resistance	Signal contact : 30m $\Omega$ max. Power contact : 20m $\Omega$ max.	
Operating temperature range	-45°C ~ +85°C	
Number of contacts	Signal contact : 8, 10, 18	Signal contact : 8
	Power contact : 2	

### ■ Points relevant to the 17 SDGs

We contribute to the development of mobile devices such as smartphones, which are becoming more multifunctional every year, by developing smaller and lighter connectors.





## Started delivery of 40SM-DZ 「-」 and 40SM-DZ-ANS to NTT

Fujikura has started to deliver 40SM-DZ 「-」 and 40SM-DZ-ANS cables to NTT, which have realized the same external diameter as the conventional 24SM-DZ 「-」 and 24SM-DZ-ANS cables.

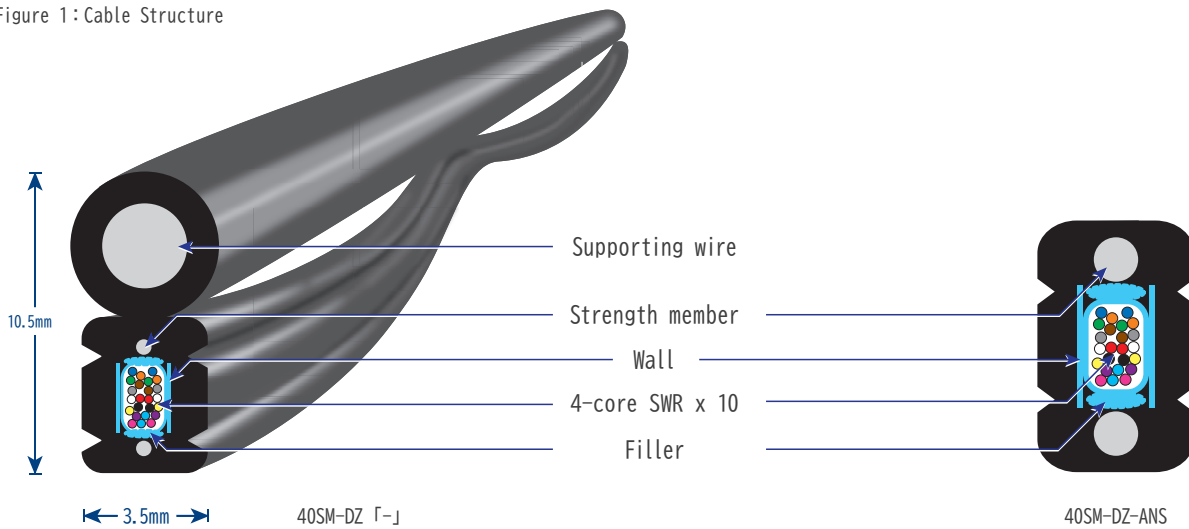
In recent years, with the spread of cloud services, there is growing need for efficient installation of optical fiber cables, easy branching and connecting workability in order to accommodate 5G and IoT. Under these circumstances, 24SM-DZ 「-」 and 24SM-DZ-ANS, which use SWR have been widely installed throughout Japan because they

are extremely thin, lightweight, easy branching and connecting workability.

The introduction of 40SM-DZ 「-」 and 40SM-DZ-ANS for NTT will enable more efficient deployment of optical wiring than ever before.

Fujikura will continue to support the further development of an even more advanced information society by creating new technologies to meet customer needs and continuously developing innovative products.

■ Figure 1: Cable Structure



■ Table 1: Cable structure

Item	DZ 「-」		DZ-ANS	
	Number of cores	24	40	24
Cable dimensions (mm)	Approx. 4.0 × 10.5 Cable dimension (without supporting wire) : Approx. 3.3 × 5.5		Approx. 3.5 × 5.5	
Cable weight (g/m)	Approx. 70		Approx. 20	

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✉ Solution Sales Engineering Department : [telcon@jp.fujikura.com](mailto:telcon@jp.fujikura.com)