

## Ultra-high fiber-count optical cable with connectors: 160- $\mu$ m fiber type

Data traffic has been growing rapidly in recent years due to the expansion of video distribution, cloud services, and AI-powered web services. As a result, data centers have grown in size, and the construction of efficient and economical communication networks has become an important issue. Fujikura has already put on the market Wrapping Tube Cable® (WTC®), ultra-high 3,456- fibers and 6,912- fibers optical cables that can handle large-capacity, high-speed data communications.

On the other hand, due to the significant increase of the number of cores of optical cables used, high-density wiring and improvement of efficiency of connection work are becoming issues. We have so far developed a 3,456 fiber-count WTC with connectors for

4-inch piping. It is terminated a multi-fiber push on connectors (MPO) and can be connected to the equipment immediately after installation. Some data center operators have already introduced or considered using the cable.

This 160- $\mu$ m fiber type of ultra-high fiber-count optical cable with connectors has a compact design using smaller diameter fiber than the conventional product, and the end part of MPO connectors are housed in a pulling hose with an outer diameter of  $\phi$ 40mm. (Conventional SWR/WTC 250 $\mu$ m has a  $\phi$ 50mm towing hose) This makes it possible to pass through very thin piping of 50mm or less, which is thinner than the conventional piping of 100mm diameter.

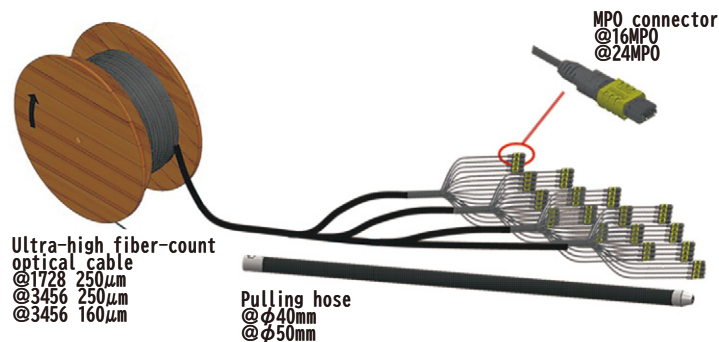
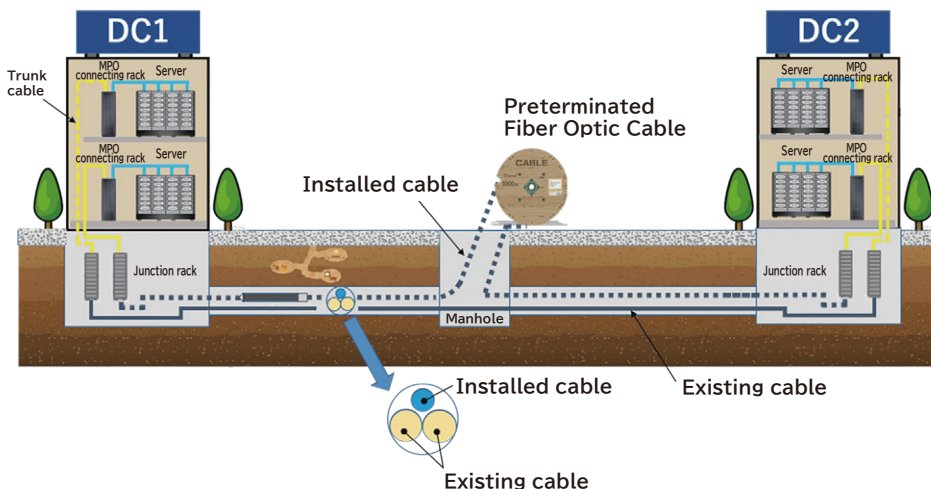


Table 1 Specification of Ultra-high fiber-count optical cable with connectors

Number of fiber cores	3,456 cores	
Cladding diameter/Fiber diameter( $\mu$ m)	125/250	80/160
Cable diameter(mm)	26.5	21
Applicable connector	24-fiber MPO	
Pulling hose diameter(mm)	$\phi$ 50	$\phi$ 40
Pulling hose length(m)	4	5

Ultra-high fiber-count optical cable with connectors : 160- $\mu$ m fiber type



- Installation of fiber cable with passing the pulling hose through the manhole.
- Remove the pulling hose reaching the data center and connect the MPO to the rack

Installation of Ultra-high Fiber-count Cable between data centers

### Points relevant to the 17 SDGs

We will contribute to the building and development of infrastructure in response to the increasing capacity of communications. We also contribute to energy saving by reducing weight, space, and labor.



## Fujikura Releases the New Optical Cable “IF-WBZ” for Metro Networks

Fujikura announces the release of innovative optical fiber cable which is termed as IF-WBZ to the NTT, a leading company in the telecommunication business.

The new cable is used for underground installation in metro networks where long-haul and high-capacity transmissions are required.

Fujikura has been supporting NTT’s efforts by cooperating in the development of many types of optical cables for long time.

For example, High-density optical fiber cable technology to reduce the total deployment cost is one of the innovative contributions that Fujikura has made.

Features of the high-density optical fiber cable family are;

- Cables with a small diameter reduces the material usage in a cable.
- High fiber density in a cable contributes effective and economic use of cabling space
- Many techniques are engineered in the cable design to provide easy handling during installation.

Fujikura continues to support NTT’s work to expand this cable family into wider applications. IF-WBZ

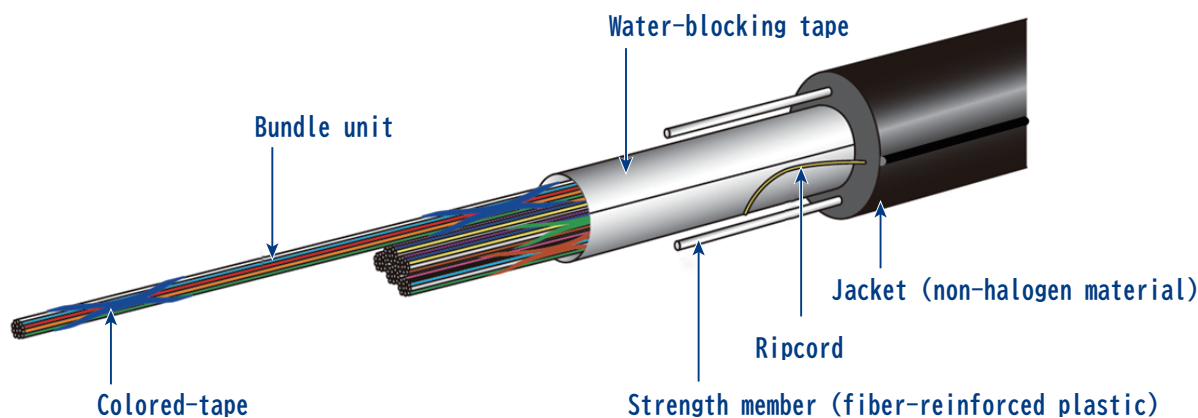
released this time has been developed in order to deploy the cable family in metro networks at underground area.

At first, the long-haul transmission is to be considered for the metro networks. During the long-haul installation, there are some locations that require dielectric materials in the cabling pathway. Therefore, steel wires that are used in the conventional cable design as strength members have been replaced with fiber reinforced plastic rods.

Secondly, high speed networks (e.g. 400Gbps) with larger traffic capacity in near future needs to be taken into account when building a new ICT infrastructure. IF-WBZ cable has a capability to support “beyond 400Gps” because the cable is designed to achieve the requirements for the high-performance transmission.

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 configuration



■ Table 1 Cable structure

Item		40-fiber	100-fiber	200-fiber	400-fiber	1000-fiber
Nominal outer diameter (mm)		12.5	14.0	17.0	19.5	23.0
Approximate weight (kg/m)	General	0.11	0.13	0.16	0.28	0.40
	Flame-retardant	0.14	0.16	0.22	0.33	0.50

### ■ Points relevant to the 17 SDGs

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



## New cable antenna for 920 MHz band RFID communication Introduction of CXPA1.5D-9i

Fujikura Dia Cable Ltd. has developed the CXPA1.5D-9i cable antenna for radio frequency identification (RFID) communications in the 920 MHz band and started shipping samples.

The newly developed CXPA1.5D-9i is a product that has improved the radio wave radiation characteristics of the CXPA1.5D-9 (conventional type), which was launched in 2021.

The advantages of the CXPA1.5D-9i are its improved antenna gain and reduced VSWR variation even when it is placed close to metal body compared to the conventional type.

In addition, as with the conventional type, the cable-type antenna (Table 1, Photo 1) with a small diameter can be flexibly bent, so it enables management of narrow and long areas, which is a

characteristic of cable-type antennas.

With these features, the CXPA1.5D-9i can be wired along the shelves, including metal shelves, and can read RFID tag information.

The radio wave radiation is uniform in the circumferential direction near the antenna, and the RFID tag can be read with satisfactory sensitivity. The reading direction (antenna direction) of the RFID tag is perpendicular to the cable axis (Figure 1).

It is expected to be used in areas such as the management of items on metal shelves, which are often used in stores, warehouses, and offices, where conventional cable antennas cannot be used. We will continue to contribute to the wider use of RFID technology.

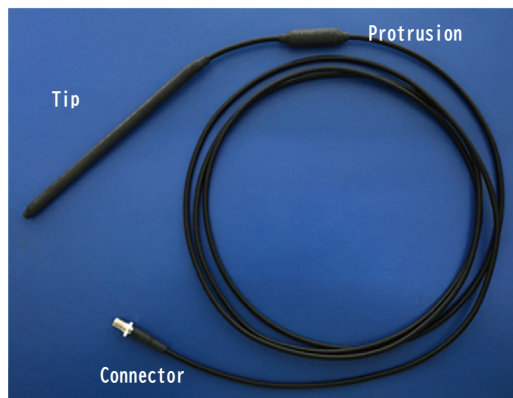
■ Table1 CXPA1.5D-9i characteristics table  
(Connectors can be chosen according to the installation location)

Product name	CXPA1.5D-9i
Cable/Protrusion/Tip outer diameter [mm]	Approx. 3/9.2/6.5
Tip length [mm] (incl. protrusion)	Approx. 130 <sup>*2</sup> (approx. 210)
Total length	0.5-2.0 (typ. 1.0)
Applicable frequency [MHz]	915-930
VSWR	1.92 or less (915.9-923.5 MHz)
Maximum antenna gain [dBi] <sup>*1</sup>	1.17
Polarization	Linear polarization
Nominal impedance [ $\Omega$ ]	50
Connector shape	SMA-type jack or SMA-type plug

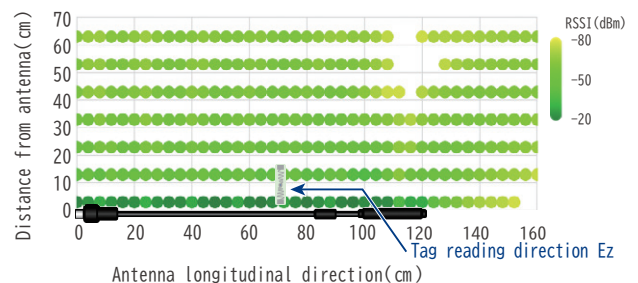
<sup>\*1</sup> Reference values for tests conducted by the test method set forth in the Ministry of Internal Affairs and Communications Notification No. 88 based on the provisions of 1(3) of Appended Table 1 of the Ordinance on Technical Standards Conformity Certification of Specified Radio Equipment or by a method equivalent thereto or higher. The measurement frequency is 915.9 MHz.

<sup>\*2</sup> Tip part and projection part are not bent.

■ Photo 1 Appearance of CXPA1.5D-9i



■ Figure 1 Distribution of tag received signal strength indicator (RSSI) value in longitudinal direction of antenna (Shades indicate the degree of strength)



### ■ Points relevant to the 17 SDGs

The new cable-type antenna makes it easier to manage RFID items on metal shelves, etc., and contributes to the utilization and development of RFID technology in a wide range of areas, including stores, warehouses, factories and offices.



## Introduction of smartphone battery connector FPB3 series

As smartphones and other mobile devices that are now essential to our lives become increasingly multifunctional, the need for larger capacity batteries and fast charging is increasing. Accordingly, the design of charging connectors is required to be compact and capable of handling large currents.

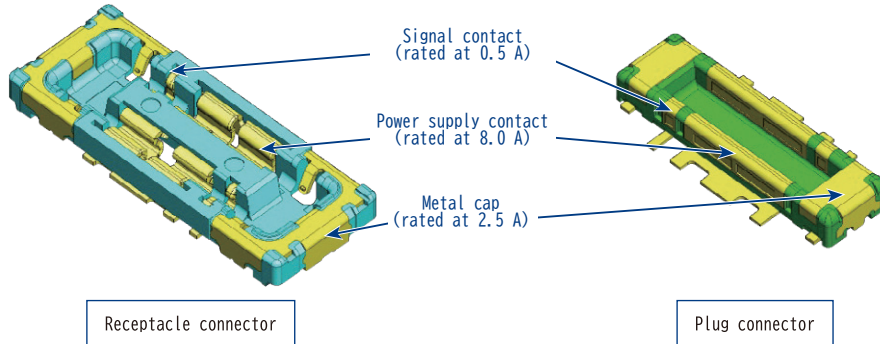
In response to these market needs, we have developed a small connector for large-current applications with a fitting height of 0.6 mm, a length of 5.0 mm and a width of 1.95 mm, which accommodates, in addition to signal contacts with a rated current of 0.5 A, two 2.5 A metal

cap terminals and two 8 A power supply contact terminals (Figure 1).

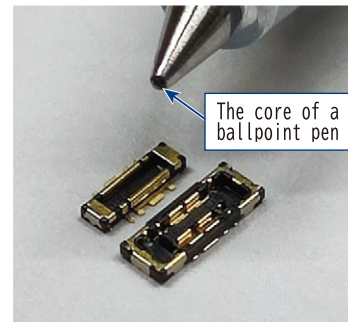
The metal cap not only supports large current of 2.5 A, but also serves to reinforce the connector and prevent damage during fitting.

We will contribute to the development of mobile technology by developing connectors that are more compact than conventional connectors and capable of handling large currents, and by providing effective solutions to the challenges of increasing multifunctionality and battery capacity.

■ Figure 1 Appearance of connector



■ Photo 1 Appearance



■ Table 1 Specifications

	Current product	New product
Series	BTK	FPB3
Fitting height	0.7mm	0.6mm
Width	2.20mm	1.95mm
Rated voltage	AC30V(r.m.s.)/DC30V	
Rated current	Signal contact: 0.5 A/pin Power supply contact: 6.0 A/pin	Signal contact: 0.5 A/pin Power supply contact: 8.0 A/pin Metal cap: 2.5 A/pin
Withstand voltage	200 VAC (r.m.s.)/min.	
Insulation resistance	200 VDC 100 MΩ or more	
Contact resistance	Signal contact: 20 mΩ or less Power supply contact: 10 mΩ or less	Signal contact: 30 mΩ or less Power supply contact: 5 mΩ or less Metal cap: 20 mΩ or less
Operating temperature range	-40°C ~ +85°C	
Number of poles	Signal contact: 4 Power supply contact: 2	Signal contact: 2 Power supply contact: 2 Metal cap: 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.



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