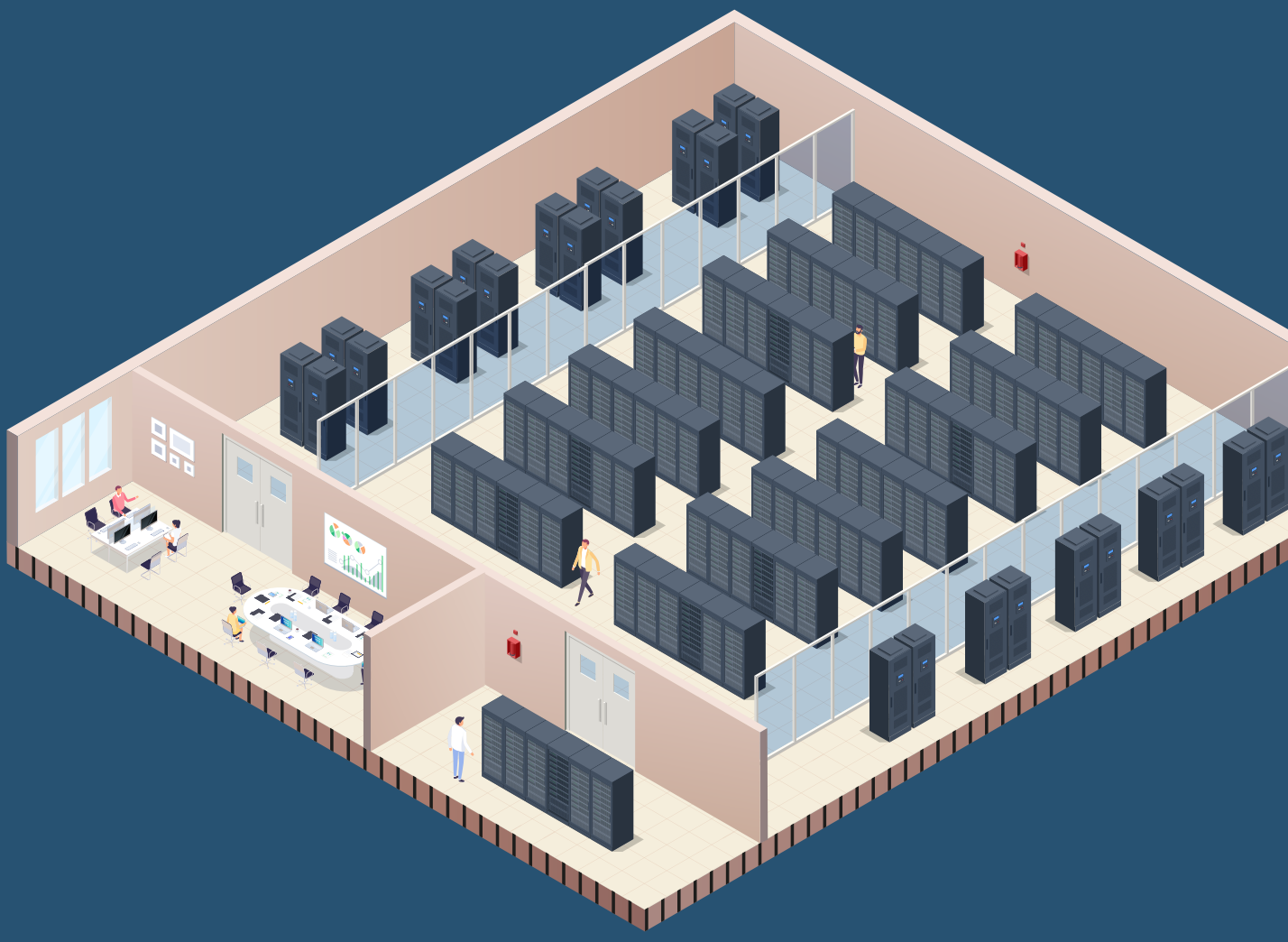
RADIO FREQUENCY SYSTEMS

Data Center Connectivity

Edition 1 / 09.2025



RFS DATA CENTER SOLUTIONS

With data centers experiencing an exponential surge in bandwidth demands, driven by immense data growth, the requirements of in-data center infrastructure are shifting. The AI boom is at the epicenter of skyrocketing demand for data center compute power with McKinsey anticipating that by 2030, data centers are projected to require $6.7 trillion worldwide to keep pace with the demand for compute power.

To meet the demand, whether upgrading existing data centers or expanding across new sites, two of the key considerations of any data center infrastructure investment are:

- **Keeping pace with capacity requirements**
- **Optimizing power consumption**

RADIO FREQUENCY SYSTEMS

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ADDRESSING **DATA CENTER CHALLENGES**

THE DATA EXPLOSION

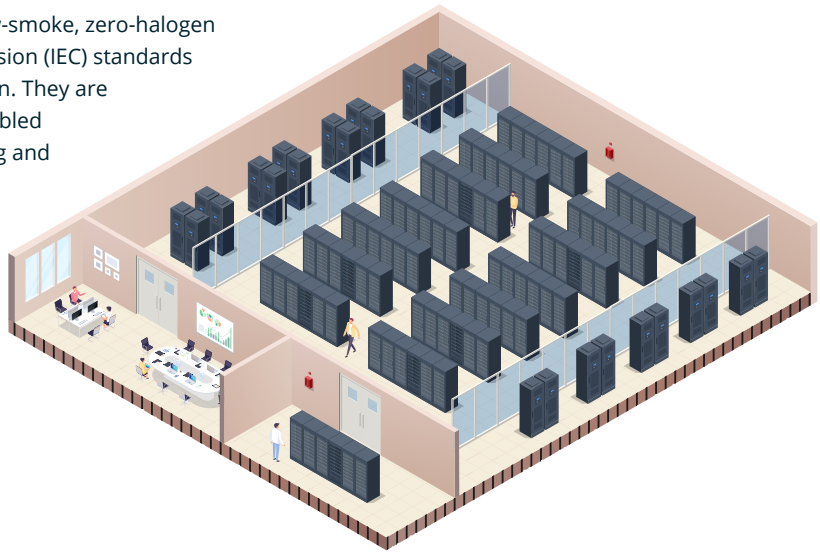
Bandwidth requirements have transformed dramatically over the past decade. A data center today is no longer satisfied with 10G interfaces; instead, they now demand a minimum of 100G connectivity, with cutting-edge facilities implementing 400G, 800G and even 1.6T solutions. This massive bandwidth expansion is not just about speed and capacity, but about supporting increasingly complex computational workloads across financial trading, cloud computing, artificial intelligence, and big data analytics making low-latency just as important.

POWER CONSUMPTION OPTIMIZATION

The exponential increase in bandwidth comes with a corresponding surge in power consumption, creating a critical challenge for data center operators. The IEA anticipates that energy demands from AI data centers will quadruple by 2030, and there are question marks over whether it is possible to service this demand for power. While it is inevitable that equipment dealing with greater data loads will consume more power, the key is to minimize the power consumption per Gigabit (GB) to achieve power optimization.

FIND CPR-COMPLIANT CABLES FOR ANY APPLICATION

All RFS CPR-compliant cables are also designated as low-smoke, zero-halogen (LSZH) and meet International Electrotechnical Commission (IEC) standards for flame spread, smoke acidity and low smoke emission. They are compatible with existing RFS connectors, factory-assembled jumpers, grounding kits and clamps, as well as trimming and preparation tools.



Problem solving

RFS has a full portfolio of fiber, power, and RF solutions ideally placed to improve performance where it matters – allowing better fiber management, increased capacity, over longer distances with lower power consumption per GB.

RFS FIBER OPTIC PERFORMANCE MATRIX

There is no one-size-fits-all fiber solution for data centers. But, for virtually every data center application, RFS has a combination of products that make a full solution to address the key needs of the scenario. Our team can work to identify the best complete solution for each scenario based on application capacity need, transmission distance, and minimizing the power cost per GB.

The table opposite gives a non-exhaustive look at how our systems can combine to achieve **power per GB as low as 0.02W, capacity up to 1.6 TB, and reach of 40,000m** to suit multiple requirements. →

								Fiber Options			
Band-width (Gb/s)	Application	Lane Speed (Gb/s)	Transmis-sion	No. of fibers	TRx Con Interface	Trans-ceiver	Power per Gb (W)	OM4 Reach (m)	OM5 Reach (m)	QSMT Reach (m)	OS1 &OS2 Reach (m)
10	10GBase-SR	10G	Full Duplex	2	LCD	SFP+	0,1	550	550		
10	10GBase-LRM	10G	Full Duplex	2	LCD	SFP+	0,1				
10	10GBase-LX4	2.5G	Full Duplex	2	LCD	SFP+	0,1				
10	10GBase-LRM	10G	Full Duplex	2	LCD	SFP+	0,1				10000
10	10GBase-LR	10G	Full Duplex	2	LCD	SFP+	0,1				10000
10	10GBase-ER	10G	Full Duplex	2	LCD	SFP+	0,15				40000
40	40GBase-SWDM4	10G	Full Duplex	2	LCD	QSFP28	0,0875	350	440		
40	40GBase-SR4	10G	Full Duplex	8	MTP08/12	QSFP	0,0375	150	150		
40	40GBase-LR4	10G	Full Duplex	2	LCD	QSFP	0,0875				10000
100	100GBase-SWDM4	25G	Full Duplex	2	LCD	QSFP28	0,035	100	150		
100	100GBase-SR4	25G	Full Duplex	8	MTP08/12	QSFP	0,035	100	100	350	
100	100GBase-SR10	10G	Full Duplex	20	MTP24	QSFP	0,07	150	150		
100	100GBase-PSM4	25G	Full Duplex	8	MTP08/12	QSFP28				10000	500
100	100GBase-CWDM4	25G	Full Duplex	2	LCD	QSFP	0,035			10000	2000
100	100GBase-LR4	25G	Full Duplex	2	LCD	QSFP	0,045				10000
100	100GBase-ER4	25G	Full Duplex	2	LCD	QSFP	0,045				40000
400	400GBase-VR4	100G	Full Duplex	8	MTP08/12	QSFP	0,0225	50	50		
400	400GBase-SR4	100G	Full Duplex	8	MTP08/12	QSFP	0,02	100	100		
400	400GBase-SR4.2	100G	BiDi	8	MTP08/12	QSFP	0,03	100	150		
400	400GBase-SR8	50G	Full Duplex	16	MTP16	QSFP-DD	0,025	100	100		
400	400GBase-SR16	25G	Full Duplex	32	2 x MTP16	QSFP-DD		100	100		
400	400G-DR4	100G	Full Duplex	8	MTP08/12	QSFP	0,03				500
400	400G-DR4-2	100G	Full Duplex	8	MTP08/12	QSFP	0,03				2000
400	400G-FR4	100G	Full Duplex	2	LCD	QSFP	0,0225				2000
400	400G-LR4-10	100G	Full Duplex	2	LCD	QSFP	0,025				10000
800	800G-VR4.2	100G	BiDi	8	MTP08/12	OSFP	0,02	50	70		
800	800G-VR8	100G	Full Duplex	16	2 x MTP08/MTP16	QSFP	0,02	50	50		
800	800G-SR4.2	100G	BiDi	8	MTP08/12	OSFP		70	100		
800	800G-SR8	100G	Full Duplex	16	2 x MTP08/MTP16	OSFP	0,02	100	100		
800	800G-DR8	100G	Full Duplex	16	2 x MTP08/MTP16	QSFP	0,020625				500
800	800G-DR4	200G	Full Duplex	8	MTP08/12	OSFP	0,0225				500
800	800G-DR8-2	100G	Full Duplex	16	2 x MTP08/MTP16						2000
800	800G-DR4-2	200G	Full Duplex	8	MTP08/12						2000
800	800G-FR4	200G	Full Duplex	2	LCD						2000
800	800G-LR4	200G	Full Duplex	2	LCD						10000
1600	1.6T-VR8.2	100G	BiDi	16	MTP16			50	70		
1600	1.6T-SR8.2	100G	BiDi	16	MTP16			70	100		
1600	1.6T-DR8	200G		16	MTP16						500
1600	1.6T-DR8-2	200G		16	MTP16						2000

ADVANCED **CABLE TECHNOLOGIES**

EXTENDING FIBER PERFORMANCE

Not all fiber is created equal, and different fiber optic technologies have different roles to play in the modern data center setup. The fiber optic solution selected matters, and at RFS, we offer a comprehensive range of advanced fiber optic solutions to help customers balance cost, speed, latency, distance covered, and power consumption for the full range of data center applications.

In this brochure, we highlight some of the key innovative solutions within the RFS fiber optic portfolio that specifically tackle the challenges outlined in the introduction. We will look at how we can enhance performance against three main criteria:

- **Gigabits per Second**
- **Power Consumption per GB**
- **Transmission Distance Capabilities**

OM4+ FIBER

In addition to legacy OM4+ fiber options that are suitable for 10 Gigabit Ethernet over 550 meters and 40/100 Gigabit Ethernet up to 150 meters, we offer two advanced OM4 options for enhanced performance.

OM4+ Pro Bending Intensive Multi-Mode Fiber

RFS OM4+ Pro Bending Intensive Multimode Fiber is designed for 100G/lane technology, offering high bandwidth in the wavelength range of 850 nm – 870 nm.

OM4+ Ultra Bending Intensive Multi-Mode Fiber

RFS OM4+ Ultra Bending Intensive Multi-Mode Fiber works in the same wavelength range of 850 nm – 870 nm, as well as 910 nm to support 100G/lane and Terabit BiDi technology

Both compensate for signal degradation caused by the center wavelength shift of 100G/lane transceivers, ensuring smooth upgrades to 400G, 800G, and higher data rates for data centers, and are fully backward compatible with legacy OM4 and OM5.

Product Features

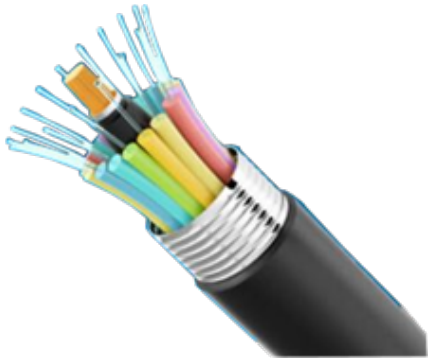
- Optimized for 100G/lane transmission system
- High effective modal bandwidth in the wavelength range of 850 – 870 nm and 910 nm for OM4 Ultra bending Intensive
- Low attenuation and high bandwidth
- Low differential mode delay (DMD)
- Very low macro bending sensitivity
- Stable performance over a wide range of environmental conditions

Applications

- 10, 40, 100, 400, 800 Gb/s and 1.6 Tb/s Ethernet

MULTI-MODE OM5

OM5 fiber is an advanced multimode optical fiber designed to extend traditional OM4 performance across a broader wavelength range (850–953 nm). It enables support for four-wavelength shortwave wavelength division multiplexing (SWDM4) which allows four wavelengths to transmit simultaneously over one fiber, increasing capacity fourfold while remaining fully backward compatible.



Developed specifically to meet rising data center demands, OM5 is optimized for high-speed ethernet applications above 100 Gb/s and supports modulation formats like PAM4, a signal modulation technique used to transmit data by encoding two bits of information into each signal level.

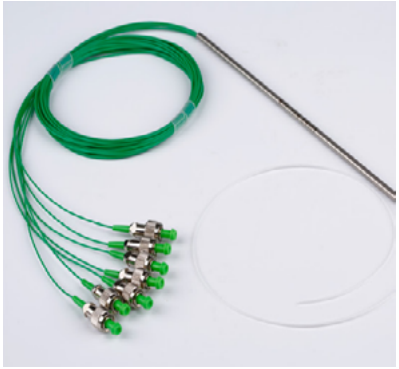
OM5's compatibility with SWDM and BiDi transceivers reduces the fiber volume needed and supports cost-effective, future-ready upgrades. With benefits like low power consumption and scalability, OM5 is one of the most promising technologies for the future of data center infrastructure.

Product Features

- Supports single-wavelength and multi-wavelength transmission systems from 40 Gb/s to 400 Gb/s
- High bandwidth in the wavelength range of 850 – 950 nm
- Superior geometry uniformity for low attenuation and signal loss
- Low differential mode delay (DMD)
- Very low macro bending sensitivity
- Stable performance over a wide range of environmental conditions
- Backward compatibility with legacy OM4 fiber
- Applications
- Supports WDM and PAM4 to increase data center capacity
- Underpins the computing and storage capacities needed by 5G
- Data center links up to 150m

FLAGSHIP TECHNOLOGIES

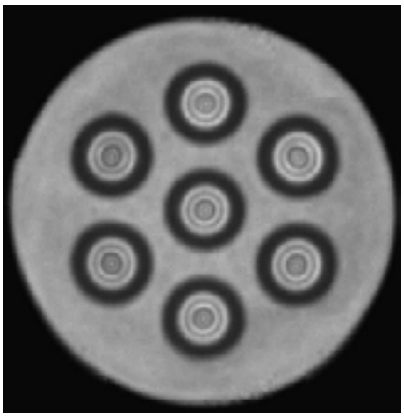
Multi-Core Fiber (MCF)



Multi-core fiber (MCF) is a new type of fiber solution that can combine seven fiber cores into the same cladding without increasing the overall diameter of the cable.

Based on the concept of space division multiplexing (SDM), multi-core fiber can transmit several light signals through different channels within the same fiber cable, to significantly increase capacity over a single-mode fiber.

RFS MFC has a seven-core structure and F-doped cladding to ensure low inter-crosstalk in long SDM optical transmission, making it a strong option for future high-capacity optical networks.



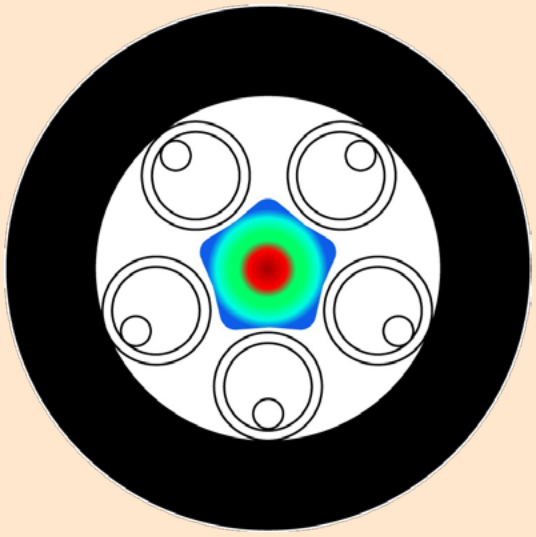
Product Features

- Single fiber with multiple separate channels
- Ultra-low crosstalk between cores
- Excellent fiber geometric consistency for easy patching
- Low fiber loss

Applications

- Extremely high-capacity transmission system
- Large-capacity multi-task access
- Distributed fiber sensors

Hollow Core Fiber



Hollow Core Fiber (HCF) is an advanced optical fiber technology designed to meet the growing demand for efficient, high-speed data transmission. HCF's unique hollow core design allows light to travel through air. This significantly minimizes signal loss as air has much lower attenuation compared to glass. Additionally, this enables its ultra-low dispersion capabilities, allowing HCF deployments to maintain integrity over long distances.

To address the need to reduce nonlinear distortions and ensure signal clarity, instead of relying on conventional refractive index contrasts HCF uses advanced waveguide mechanisms. This design allows HCF to maximize performance, even under high-power conditions.

Product Features

- **Ultra-Low Attenuation**: Exceptional light transmission efficiency with minimal loss.
- **Low Latency**: Ensures ultra-fast data transmission
- **Low Nonlinear Effects**: Minimizes signal distortion even at high power levels.
- **Low Dispersion**: Maintains signal integrity over long distances.

	Solid Core Fiber	Hollow Core Fiber	Improvement
Lower Attenuation	≈ 0.14dB/km	<0.1dB/km	~ 50%
Lower Latency	4.911 microseconds/km	**3.356 microseconds/km**	**~ 31%**
Reduced Nonlinear Effects	~ 2.6 x 10^{-20} m^2/W	~ 1.1 x 10^{-23} m^2/W	~ 1000 times
Lower Dispersion	~ 17 picoseconds/nm/km	2~3 picoseconds/nm/km	~ 8 times

As a new fiber optic technology with only two manufacturers globally, the applications for HCF are still emerging. In a data center setting, HCF can serve three key use cases depending on the link reach needed:

Applications

Data Center Interconnect or Medium-Distance Coverage (2-20 km)
In the 10-20 km range, hollow-core fiber's low latency advantage can expand the geographical coverage of data centers (increasing coverage by about 70%) or provide greater flexibility in data center location selection.

Long-Distance Backbone (100 km+)
Hollow-core fiber can support three times the transmission capacity of conventional G.652 fiber (approximately twice that of G.654). This makes it well suited for backbone connectivity across computing grids and power grids.

Intra-Data Center (20-500 m)
HCF can extend the reach of intra-data center connections, without compromising latency that would in turn limit applications requiring ultra-low latency. Replacing conventional fiber with hollow-core fiber in an unchanged network architecture can improve computational efficiency by at least 10%.

ADVANCED **CONNECTIVITY TECHNOLOGIES**

Seeing how the technologies combine to achieve different levels of performance, we can now look in detail at some of our advanced solutions and the benefits they offer for different data center applications.

OPTICAL TRANSCEIVERS

Optical transceivers are essential for high-speed communication between servers and network devices, and the capabilities and performance of each module dictate both **capacity** and **power consumption**.

TRANSCEIVERS

RFS offers a wide selection of high-density, low-power transceivers with a range of specifications to suit every data center application while balancing speed and capacity, reach, and power consumption to Gb for a cost-effective solution.

Examples of how some of our commonly used data center transceivers perform can be found in the performance matrix on page 5 for a more complete look at the overall performance, including potential reach with compatible cable types.

All Transceiver Products features:

400G	200G	100G
• **Supports 4x 100G Breakout** • **Connector options LC, MPO-12, MPO-16** • **Max reach 10km** 	• **Connector options MPO-12** • **Max reach 100m** 	• **Connector options LC, MPO** • **Max reach 80km** • **Compliant QSFP28 MSA, IEEE 802.3bm 100GBASE-SR4/LR4/ER4,** • **4 channels full-duplex** • **Up to 28Gb/s per channel** • **Single 3.3V power supply** 

50G	40G	25G
• **Connector options LC** • **Max reach 40km** 	• **Connector options LC, MPO** • **Max reach 40km** • **Compliant QSFP MSA, IEEE 802.3.ba 40GBASE-SR4/LR4/ER4** • **4 channels full-duplex** • **Up to 11.2Gb/s per channel** • **Single 3.3V power supply** 	• **Connector options LC** • **Max reach 10km** • **Up to 28Gb/s bi-directional data links** • **Duplex LC connector** • **Single 3.3V power supply** 

10G SFP+

- **Connector options LC**
- **Max reach 80km**
- **Compliant SFP+ MSA, IEEE 802.3.ae 10G Base-ZR/ZW,**
- **10GBASE-ER/EW, 10GBASE-LR/LW, 10GBASE-SR/SW**
- **6~11.3Gb/s bi-directional data links**
- **Up to 80km on 9/125um SMF, 300m over OM3, 100m over OM2**
- **Single 3.3V power supply**

ACTIVE OPTICAL CABLE (AOC)

Within data centers, Active Optical Cables (AOCs) allow high-speed, long-distance data transmission to connect servers, switches, and storage systems. The advantages it offers over traditional copper cables include longer reach, higher bandwidth, and immunity to electromagnetic interference.

Product Features

- Contain 10Gbps/25Gbps/40Gbps and Breakout
- AOC/100Gbps and Breakout AOC
- Digital diagnostics functions
- Single 3.3V power supply
- Meet EMI, ESD
- RoHS compliant
- Class 1/1M Standard product, Compliant IEC60825-1
- Telcordia GR-468-CORE reliability compliant
- Operating temperature 0~70°C

Applications

- 10G/25G/40G/100G Ethernet
- Data Center Links

Remark	Package	Connector	Data Rate	Wavelength	Reach	Transmitter	Receiver
10G AOC	SFP+	AOC	10,3G	850 nm	1 - 100 m	VCSEL	PIN
25G AOC	SFP28	AOC	25,78G	850 nm	1 - 100 m	VCSEL	PIN
40G AOC	QSFP+	AOC	41,2G	850 nm	1 - 100 m	VCSEL	PIN
40G AOC Breakout	QSFP+ to 4x SFP+	AOC	4X10,3G	850 nm	1 - 100 m	VCSEL	PIN
100G AOC	QSFP28	AOC	100G	850 nm	1 - 100 m	VCSEL	PIN
100G AOC Breakout	QSFP28 to 4X SFP28	AOC	4X25,78G	850 nm	1 - 100 m	VCSEL	PIN

PASSIVE & ACTIVE COPPER CABLE

Alongside fiber optic solutions, copper cable solutions remain an essential component of data center infrastructure, offering cost-effective, low-latency performance for short-distance connections such as server-to-switch and switch-to-switch links.

However, modern, advanced copper solutions offer significantly enhanced performance to support data-intensive applications while maintaining ease of installation, scalability, and cost effectiveness.

Cat.6 UTP Patch Cord

Cat.6 UTP Patch Cord is mainly applied to the connections between information modules, distribution frames, switches and equipment, it supports 1000 Base-T and is backward compatible.

Upgrading to a Cat.6 cable system (including Cat6.a) can ensure transmission speed and sustained performance for processing requirements. Especially for data centers, investing in a higher-quality system increases the capacity and performance of the network.

Direct Attach Cable (Copper)

RFS's Direct Attach Copper (DAC) cable is a twinax copper cable with pre-terminated transmission modules that enable it to connect directly into the ports (or line cards) within active equipment, such as switches, routers, servers or data storage devices, in a data network.

Product Features

- Data rates: 10G~800G
- Compliant with SFF8472/SFF8636/CMIS
- Compliant with IEEE 802.3bj/cd/ck
- Form Factors: SFP/DSFP/QSFP/QSFP-DD/OSFP/OSFP-RHS
- Cable Gauge: 26AWG, 28AWG, 30AWG
- Reach: up to 3m (112G/lane@awg26)
- Customization available

PRODUCT	LENGTH (M)	AWG	POWER DISSIPATION (/END)
800G OSFP to 800G OSFP DAC	≤1.0 ≤1.5 ≤3.0	30 28 26	<0.07W
800G OSFP to 2x400G OSFP-RHS DAC			
800G OSFP to 2x400G QSFP112 DAC			
800G QSFP-DD to 800G QSFP-DD DAC	≤1.0 ≤1.5 ≤2.0	30 28 26	<0.01W
800G QSFP-DD to 2x400G OSFP-RHS DAC			
800G QSFP-DD to 2x400G QSFP112 DAC			
400G QSFP112 to 400G QSFP112 DAC	≤1.0 ≤1.5 ≤3.0	30 28 26	<0.01W
400G QSFP112 to 2x200G QSFP112 DAC			
400G OSFP to 400G OSFP DAC	≤1.5 ≤2.5 ≤3.0	30 28 26	<0.01W
400G OSFP to 2*200G QSFP56 DAC			
400G QSFP-DD to 400G QSFP-DD DAC			
400G QSFP-DD to 2x200G QSFP56 DAC			
200G QSFP56 to 200G QSFP56 DAC			
200G QSFP56 to 2x100G QSFP56 DAC			
100G QSFP28 to 100G QSFP28 DAC	≤2.5 ≤3.5 ≤5.0	30 28 26	<0.01W
100G DSFP to 100G DSFP DAC	≤1.5 ≤2.5 ≤3.0	30 28 26	<0.01W

Active Copper Cable (Direct Attach Cable + Linear Equalizer)

By incorporating a linear equalizer with DAC cable, RFS can offer an Active Copper Cable solution. This enables an improved transmission distance.

Product Features

- Compliant with SFF8472/SFF8636/CMIS
- Compliant with IEEE 802.3bj/cd/ck
- Data rates: 10G~800G
- Form Factors: SFP/QSFP/QSFP-DD/OSFP/OSFP-RHS
- Cable Gauge: 28AWG, 30AWG
- Linear Equalizer up to~16dB @ 26.56GHz
- Reach: up to 3.5m (112G/lane@awg28)
- Customization available

PRODUCT	LENGTH (M)	AWG	POWER CONSUMPTION (/END)
800G OSFP to 800G OSFP ACC	≤2.5 ≤3.5	30 28	<1.5W
800G OSFP to 2x400G OSFP-RHS ACC			
800G OSFP to 2x400G QSFP112 ACC			
400G QSFP112 to 400G QSFP112 ACC	≤2.5 ≤3.5	30 28	<0.7W
400G QSFP112 to 2x200G QSFP112 ACC			
400G QSFP-DD to 400G QSFP-DD ACC	≤4.0 ≤5.0	30 28	<1.5W
400G QSFP-DD to 2x200G QSFP56 ACC			
200G QSFP56 to 200G QSFP56 ACC	≤4.0 ≤5.0	30 28	<0.7W
200G QSFP56 to 2x100G QSFP56 ACC			
100G QSFP28 to 100G QSFP28 ACC	≤5.0 ≤7.0	30 28	<0.7W
100G QSFP28 to 4x25G SFP28 ACC			
40G QSFP+ to 40G QSFP+ ACC	≤5.5 ≤9.0	30 28	<0.7W
40G QSFP+ to 4x10G SFP+ ACC			
25G SFP28 to 25G SFP28 ACC	≤5.0 ≤7.0	30 28	<0.25W
10G SFP+ to 10G SFP+ ACC	≤5.5 ≤9.0	30 28	<0.25W

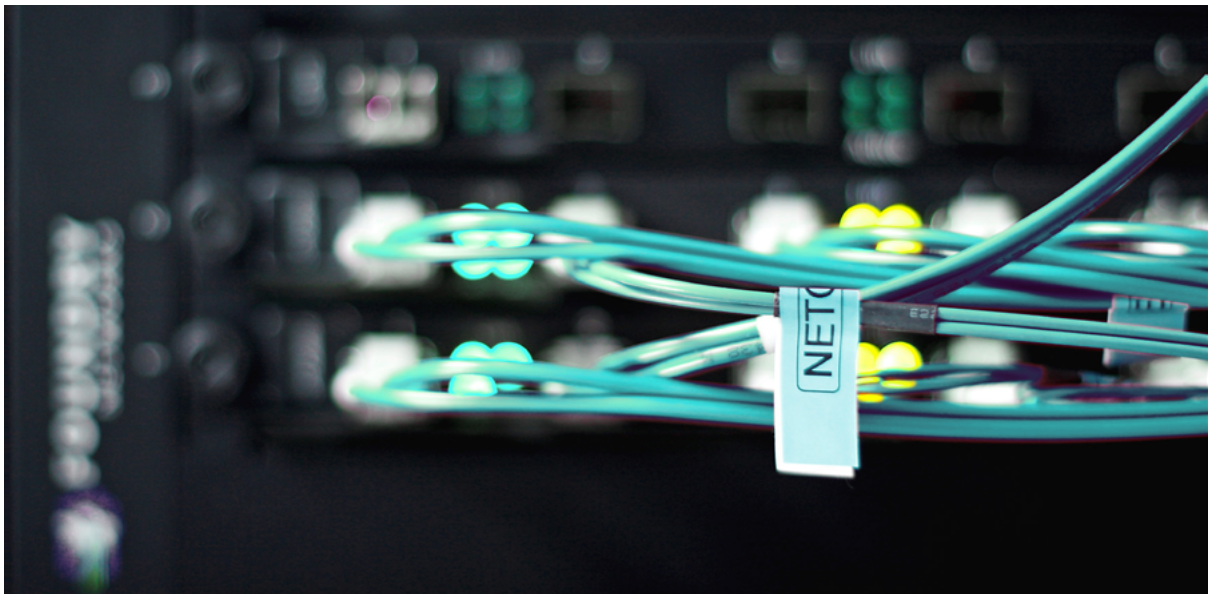
Active Electrical Cable (Direct Attach Cable + Re-timer IC)

Active Electrical Cables (AECs) combine the benefits of Direct Attach Cables (DACs) with re-timer ICs to extend signal reach and improve signal integrity in high-speed data transmission.

Product Features

- Compliant with CMIS 5.2
- IEEE-compliant auto negotiation and link training
- Data rates: 400G~800G
- Form Factors: QSFP112 /QSFP-DD/OSFP/OSFP-RHS
- Cable Gauge: 28AWG, 30AWG, 32AWG
- Pre-FEC BER<1E-7
- >40 dB loss on both the line and host interfaces
- Reach: up to 5.5m (112G/lane@awg28)
- Customization available

PRODUCT	LENGTH (M)	AWG	POWER CONSUMPTION (/END)
800G OSFP to 800G OSFP AEC	≤3.5 ≤4.5 ≤5.5	32 30 28	<12W
800G OSFP to 2x400G OSFP-RHS AEC			
800G OSFP to 2x400G QSFP112 AEC			
800G QSFP-DD to 800G QSFP-DD AEC	≤3.0 ≤4.0 ≤5.0	32 30 28	<12W
800G QSFP-DD to 2x400G OSFP-RHS AEC			
800G QSFP-DD to 2x400G QSFP112 AEC			
400G QSFP112 to 400G QSFP112 AEC	≤3.5 ≤4.5 ≤5.5	32 30 28	<6.5W
400G OSFP to 400G OSFP AEC			



IMPROVING **FIBER MANAGEMENT**

To manage the bandwidth explosion, approaches that improve fiber management are essential. At an infrastructure level, we can address this in two ways:

- **Increasing fiber density**
- **Improved cable management in installation**

INCREASING FIBER CAPACITY

To meet the demand for increased bandwidth, alongside high-capacity fiber, data centers need infrastructure that can increase fiber density. Our range of patch panels and main distribution frames is specifically designed to offer data centers the highest fiber density solutions on the market.

PATCH PANELS

The table below shows the range of patch panels offered and the fiber capacity they have, from 96-core in 1U of space right through to 432-core per 1U to meet virtually any data center application.

G4

The G4 series is our selection of high-density, high-quality patch panels. They are flexible, easy to install, and support 96-cores. The compact nature of the G4 patch panels allows double-sided installation of the cabinet to maximize cabinet capacity.

UDF

The UDF series is a range of ultra-high-density fiber optic patch panels. They use a modular design which can be configured with different capacities according to customers' specific needs. It can reach 144-core (UDF), 192-core (UDF Plus) and 432-core (UDF pro) cabling density **in 1U of space – significantly higher than the industry standard.** The flexibility of the patch panels also allows smooth and seamless upgrades at any point. With extremely high-density, patch cord management is of the utmost importance, hence the availability of intelligent RFID patching solutions.

Version	Patch Interface	Capacity (1U)	Capacity (2U)	Capacity (4U)	Comments	Application
G4/S	LC	96 fibers		384 fibers	12 or 24 fiber modules	Base 8 & 12
G4/S	MTP	48 adapters		192 adapters		Base 8, 12 & 16
UDF	LC	144 fibers		576 fibers	12 or 24 fiber modules	Base 8 & 12
UDF	MTP	72 adapters		288 adapters		Base 8, 12 &r 16
UDF Plus	LC	192 fibers	384 fibers	768 fibers	24 fiber modules	Base 8, 12 & 16
UDF Plus	MTP	96 adapters	192 adapters	384 adapters		Base 8, 12 & 16
UDF Pro	MDC	432 fibers	864 fibers	1728 fibers	72 fiber modules	Base 8, 12 & 16
UDF Pro	SN	288 fibers	576 fibers	1152 fibers	48 fiber modules	Base 8, 12 & 16
UDF Pro	CS	240 fibers	480 fibers	960 fibers	40 fiber modules	Base 8, 12 & 16

CABINETS

RFS patch panels can be housed in a wide range of cabinet options to suit any configuration, whether a new data center deployment or replacing existing equipment.

G-Series Network Cabinet

- Available in a full range of commonly required dimensions.
- Hexagonal mesh front and rear door for adequate ventilation
- Aluminized zinc square-hole strips and mounting beam, automatically aligned upon installation.
- Trapezoid mounting beam compliant with mechanical principles for increased load-bearing capacity.
- Multiple ingress holes in upper frame allows flexible cabling, maintaining separation between low and high-current cabling.
- Ingress holes sufficient for 1,000 Cat.6 cable.
- Multiple front and rear door solutions for flexible, easy access
- Detachable packages; 1/2-2/3 packing volume reduction.
- Equipped with two fan modules as standard

K-Series Server Cabinets

- Range of dimensions to suit data center applications
- Hexagonal mesh front and rear door for adequate ventilation
- Three-sectioned side door and bottom plate; for easy, fast access
- Multiple ingress holes in upper cover for flexible cabling and maintaining separation between weak and strong electricity cabling.
- Cable ports sufficient for 1,000 Cat.6 cable.
- Rolled 9-fold material with load-bearing capacity in excess of 1,000 kg.
- Equipped with two fan modules as standard

P-Series Wall Mounted

- Integrated welded structure, stable and rigid.
- Modular design, all parts are interchangeable for products in the same type series.
- Fast-opening side door, easy operation and maintenance.
- Knock-out holes in top, bottom, and back sides, convenient for cable passing through.
- Suitable to wall and floor mounting, optional accessories for floor mounting.
- Standard 19” rack.

Main Distribution Frame

As part of our portfolio of solutions to increase fiber density and improve fiber management, alongside the full range of Patch Panels, we offer plug-and-play Main Distribution Frames to suit different strategic priorities. This includes increasing fiber density, flexibility for system reconfiguration, easy circuit identification, and future proofing.

Well-suited to data center applications, the **GPX28UGF-ZR Series Main Distribution Frame** is a high-capacity optical fiber distribution frame.

Product Features

- Open structure with a functional partition layout for clear maintenance management.
- Unified cable entry from top or bottom; supports both ribbon and non-ribbon optical fiber cables.
- Supports parallel installation of multiple frames.
- Equipment side features multiple horizontal cable troughs for organized jumper separation.
- No patch cord route crossing; maintains minimum fiber bending radius of 30 mm.
- 96-core rotatable (90°) terminal unit for convenient operation and maintenance.
- W-shaped, no-winding jumper route for easy jumper identification.
- Dual cable troughs separate intra-frame and inter-frame jumpers for simplified maintenance.

EASY INSTALL PLUG AND PLAY SOLUTIONS

One of the real strengths RFS offers, alongside industry-leading technologies, is its real-world-centric design. We have thousands of conversations with installers every year, and this feeds back to the R&D teams to ensure that the solutions we design and manufacture not only achieve high performance but are easy and practical to install.

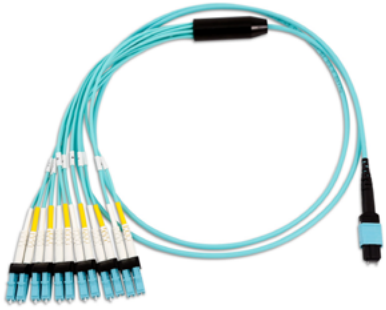
The limited space within data centers makes it critical to have a smooth and efficient installation process.

Fiber Assemblies and Trunk Assemblies

Although fusion-spliced connections are essential for wider data center network links, connecting active equipment, such as switches, routers, servers or data storage devices, in a data network, requires pre-terminated, plug and play solutions.

Fiber Assemblies

The starting point for fiber assemblies is the choices made about transceivers, fiber types, and overall architecture. Assemblies need to be fully compatible to enable the maximum performance of the equipment they connect.



Selecting Fiber Assemblies

As end-to-end manufacturers of our cable solutions, we have maximum flexibility for the fiber assemblies available to customers. We offer standard and custom fiber assemblies designed for full compatibility with relevant application protocols, and to meet deployment density requirements for optimized transceiver operation across all supported speeds and reaches. All assemblies offer low insertion loss, high return loss, and excellent reliability and stability characteristics for fast, convenient, and quality connectivity.

Assembly Types

- Patch Cables
- Breakout Cables
- Trunks

Supports speeds

- 10G to 1.6 terabit

Connector Interface Options

- LC Duplex: Lower speed applications
- MPO-12: 40G SR4, 100 gig applications
- MPO-16: Higher density applications
- MPO-24: Ultra-high bandwidth applications

Advanced Connector Types:

- SN/CS Connectors: Miniature LC versions, double the density (288 fibers per 1U)
- MDC Connectors: Ultra-high density (432 fibers per 1U)

Density Optimization:

- Fiber assemblies must match the density capabilities of distribution frames
- 96-fiber trunks align with 1U/96-fiber patch panels
- 144-fiber trunks maximize LC connector density
- 288-fiber trunks optimize for SN connector systems

Trunk Assemblies

Trunk assemblies are our highest-density fiber assemblies for data center connectivity. As with all assemblies, by combining multiple fiber connections into single high-density cables, we streamline fiber management, reduce cable complexity, and simplify installation with a single cable pull vs. multiple individual cables

Space Advantages:

- Significant space savings in cable routing
- 50% space saving using 144-fiber trunk cable (17.5mm diameter) vs. twelve 12-fiber cables (36mm total)

Trunk Cable Configurations

Protocol	No. of fibers	Connectors	Diameter	Fiber type(s)
40G SR4, 100G, SR4, 200G SR4, 400G SR4.2	12	MTP12(f) to MTP12(f)	3mm	OM3, OM4, OM5
40G & 100G PSM4, 200G & 400G DR4	12	MTP12/APC(f) to MTP12/APC(f)	3mm	G657A2
40G SR4, 100G, SR4, 200G SR4, 400G SR4.2	24	2 x MTP12(f) to 2 x MTP12(f)	3mm	OM3, OM4, OM5
40G & 100G PSM4, 200G & 400G DR4	24	2 x MTP12/APC(f) to 2 x MTP12/APC(f)	3mm	G657A2
40 & 100G Base8 SR4	24	3 x MTP12(f) to 3 x MTP12(f)	3mm	OM3, OM4, OM5
40 & 100G Base8 LR4	24	3 x MTP12/APC(f) to 3 x MTP12/APC(f)	3mm	G657A2
40G SR4, 100G, SR4, 200G SR4, 400G SR4.2	48	4 x MTP12(f) to 4 x MTP12(f)	9mm	OM3, OM4, OM5
40G & 100G PSM4, 200G & 400G DR4	48	4 x MTP12/APC(f) to 4 x MTP12/APC(f)	9mm	G657A2
40G SR4, 100G, SR4, 200G SR4, 400G SR4.2	72	6 x MTP12(f) to 6 x MTP12(f)	11.2mm	OM3, OM4, OM5
40G & 100G PSM4, 200G & 400G DR4	72	6 x MTP12/APC(f) to 6 x MTP12/APC(f)	11.2mm	G657A2
40G SR4, 100G, SR4, 200G SR4, 400G SR4.2	96	8 x MTP12(f) to 8 x MTP12(f)	13.5mm	OM3, OM4, OM5
40G & 100G PSM4, 200G & 400G DR4	96	8 x MTP12/APC(f) to 8 x MTP12/APC(f)	13.5mm	G657A2
40G SR4, 100G, SR4, 200G SR4, 400G SR4.2	144	12 x MTP12(f) to 12 x MTP12(f)	17.5mm	OM3, OM4, OM5

*All available in lengths 10-40m

ADDRESSING THE **WIRELESS LAYER**

COMPLETE INDOOR COVERAGE

Alongside connectivity for data center infrastructure, Data centers also need to be flooded with wireless connectivity for both mission-critical applications and to support applications like IoT environment monitoring and security. RFS has a long heritage in the innovation and deployment of best-in-class wireless solutions which include data center specific solutions for a range of use cases.

CELLFLEX

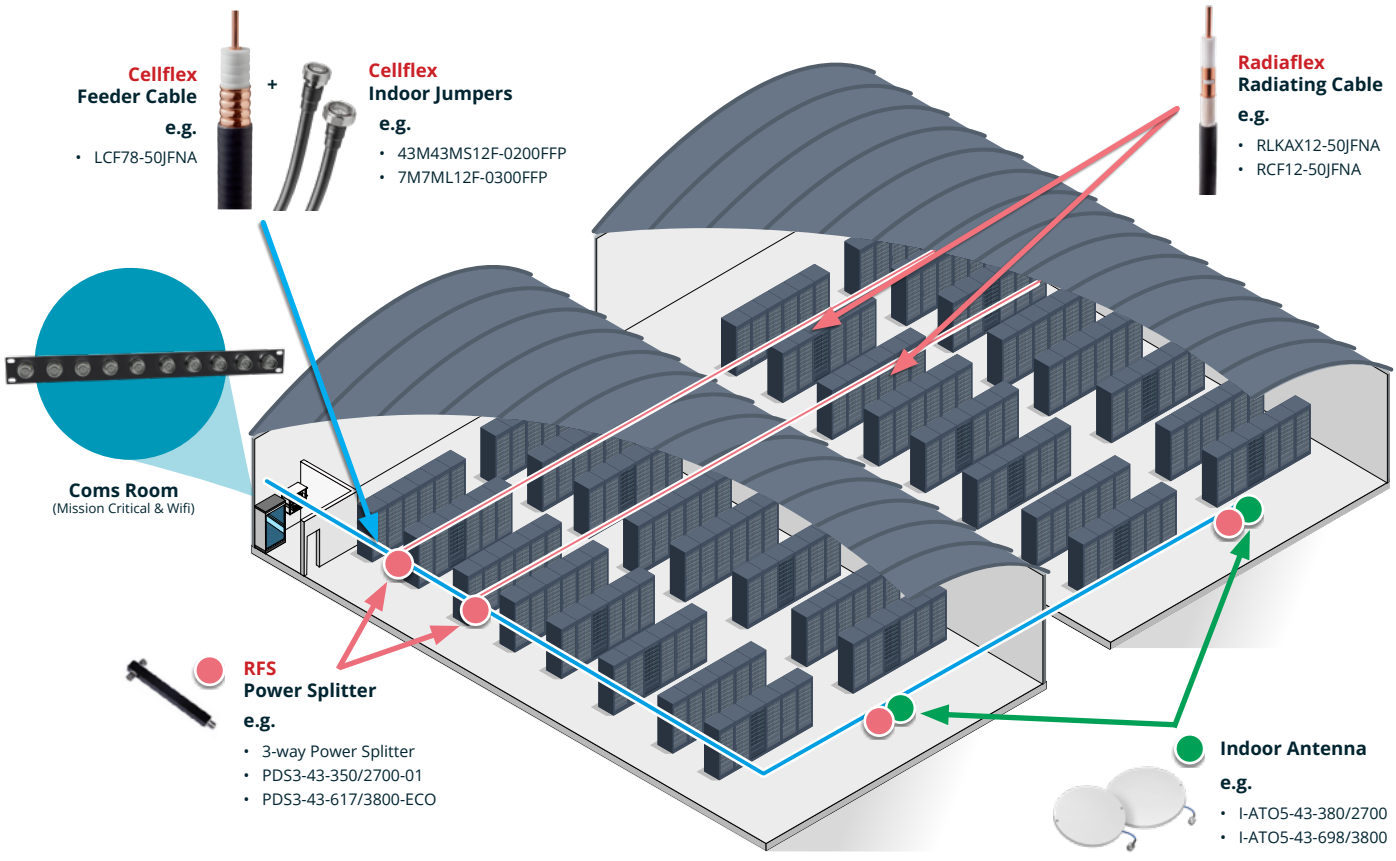
CELLFLEX cables combine flexibility and performance to make the industry's largest portfolio of corrugated transmission lines. Ideal for sustaining high-quality wireless connections across indoor environments, the CELLFLEX family includes the ¼" super flexible coaxial cable suited explicitly to data center applications. CELLFLEX meets the highest level of CPR to meet regulatory requirements for indoor installation, and is renowned for reliable high performance with:

- Low attenuation & broad bandwidth
- High power rating
- Excellent shielding & low PIM
- Fire-safety compliance (CPR)

Complete Indoor system

Using CELLFLEX as the backbone, RFS offers a full range of compatible components and accessories for a complete indoor system, including:

- **Patch Panels** with different interfaces and form factors for 19" rack installation to connect coaxial RF cable
- **Small-form-factor, field-installable ¼" coaxial cable connectors** available with multiple interfaces to meet diverse data center requirements
- **Super-flexible low-loss jumper cables** for easy installation
- **Passive indoor antennas** to support 350MHz to 6000MHz and all wireless standards and technologies including 2G/3G/4G/5G cellular services, analog and digital mission-critical radio, and WIFI/WLAN networks



SITE-WIDE MISSION-CRITICAL COVERAGE

The materials and density of data center infrastructure result in an extremely 'wireless unfriendly' environment. This can make traditional DAS systems inefficient in some data center settings; to address this, the wireless setup can also include specific solutions that facilitate comprehensive, reliable connectivity. Alongside offering the solutions, the RFS team is able to design complete wireless systems, considering all RF barriers to ensure the comprehensive coverage needed for business and mission-critical applications.

RADIAFLEX

RFS RADIAFLEX® radiating cable is the world's leading "leaky feeder" or "radiating cable" solution. It is designed to deliver contoured indoor RF coverage with signal emitted across the entire length of the cable to overcome the limitations associated with antenna and repeater DAS systems. Supporting all services up to 7.2GHz, it can be used for 4G, 5G and mission-critical use cases.

HYBRIFLEX

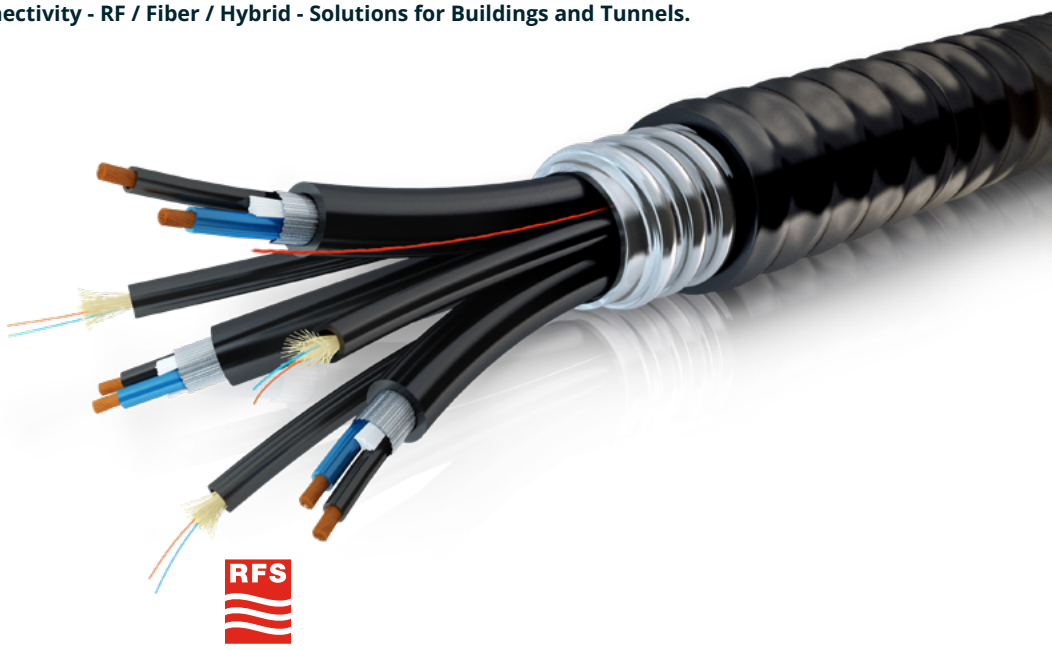
HYBRIFLEX hybrid cables have been developed for Distributed Radio Systems (DRS) and combine fiber connectivity with power for mission-critical applications. This includes allowing devices like CCTV, to be connected with an uninterruptible power supply (UPS) for resilient connectivity.

Improving Data Center Management with Wireless

Alongside the mission-critical use cases outlined, RF can play a key role in enhancing data center management capabilities and supporting a fully functional, smart Building Management System (BMS).

- **Asset Tracking:** Use RFID to monitor and manage every component within a data center to provide complete visibility across the facility.
- **Intelligent Patching:** Enable faster, easier installation with RFID-enabled fiber patching for accuracy and efficiency.
- **IoT Sensing:** Deploy wireless IoT sensors for temperature, humidity, and environmental monitoring, enabling predictive maintenance and proactive problem-solving.
- **CCTV Connectivity:** Ensure uninterrupted, secure surveillance with resilient, always-on wireless connectivity for high-security environments

For more details on our complete range of wireless solutions suitable for indoor deployments, including data centers, look at our Indoor Connectivity Brochure: **Indoor Connectivity - RF / Fiber / Hybrid - Solutions for Buildings and Tunnels.**



RFS AS A PARTNER FOR **CONNECTIVITY**

CONNECTIVITY SOLUTIONS TAILORED TO YOUR INDUSTRY

For over 125 years, RFS has been at the forefront of cable innovation, with best-in-class solutions for RF, fiber, and power connectivity. Evolving with every new generation of telecommunications and technology standards, RFS designs and manufactures solutions that are built for longevity with futureproofing in mind.

At RFS, we work collaboratively with customers across a range of vertical markets, including data centers, transportation, energy, warehousing, and manufacturing. Taking a solution-focused approach, we deliver complete solutions, tailored to achieve the specific connectivity goals of each customer. Regardless of industry, the RFS team has specialists who take into consideration unique pain points, regulatory concerns, and required outcomes, working as more than an equipment supplier but a consultant and expert partner.

Find out more about our sector-specific expertise by visiting our interactive landscape:

CONNECTIVITY LANDSCAPE

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- Backhauling
- Broadcast Cable Connectivity
- Campus
- City Solutions
- Data Center
- Manufacturing
- Mines
- Oil Platform
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- Rail Tunnel
- Ship
- Smart Road
- Stadium
- Suburban Areas
- Warehouse
- Wind Turbine

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LIFETIME RFS CONNECTIVITY

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RADIO FREQUENCY SYSTEMS

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