BROADCOM®

SELECTION GUIDE

Industrial Fiber Optic Components, Cabling and Accessories

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Fiber Optic Components for Industrial, Automation, Power Generation/ Distribution, Transportation, Gaming and Medical Applications

Broadcom is the world's leading provider of fiber optic transmitters, receivers, and transceivers. Broadcom offers unmatched quality with high-volume, cost-effective manufacturing techniques. Industry leaders and small firms alike turn to Broadcom for their fiber optic needs.
The SFH-series (Connectorless) has 650nm fiber-optic components with the capability to work with unconnectorized POF (plastic optical fiber) for ease of installation. The Versatile Link Package contains 650nm discrete components that feature snap-in connector parts. The SMA/ST Package is an extremely robust industrial-grade family with SMA or ST ports suitable for use in Fieldbus applications. The Miniature Link family which provides greater link-lengths, is available with 820nm and 1300nm technology. These are discrete components that can use SMA, ST, SC, or FC connectors.

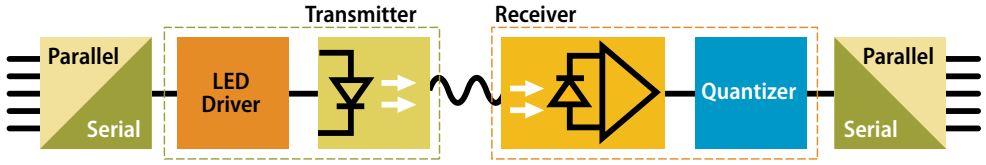
Fundamentals of Digital Fiber Optic Links

Optical transmitters from these families include an LED. Transmitters are available with and without driver circuitry. Cost effective driver ICs are available from many suppliers, and we offer application notes that will demonstrate easy integration of these ICs into a transmitter circuit. The optical receivers from DC up to 50 MBd include a photodiode, preamp, and quantizer circuit (shown in the block diagram below). These receivers have TTL outputs (dc coupled) and can be used with arbitrary timing (no duty factor restriction). Typical applications are RS232, RS485, SERCOS, INTERBUS-S and PROFIBUS protocols.
The receivers for data rates from 1 MBd to 160 MBd include a photodiode, pre-amp and analog outputs. They have to be ac coupled to a comparator or quantizer circuitry to provide digital logic levels (i.e. ECL, TTL). The ac coupling requires encoding of the serial data (i.e. Manchester, 4B/5B, scrambled coding), but provide better sensitivity than DC coupled receivers.

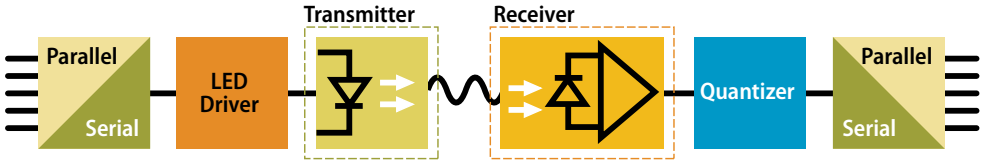
Plastic Optical Fiber (POF) Components

Broadcom is committed to the advancement of fiber optics technologies and recognizes the importance of optical data transmission for today's growing data networking needs. Plastic Optic Fiber (POF) enables low-cost, high voltage applications providing safe galvanic isolation with the advantages of optical data transmission; suitable for automotive, industrial and consumer markets.

Typical link block diagram from DC to 50 MBd.



Typical link block diagram from 1 MBd to 160 MBd.



Industrial Fiber Optic Transceiver

Providing a comprehensive line of high-performance fiber optic transceivers, Broadcom's products reliably support a wide range of industrial data networking standards and speeds.

Applications

- Factory automation at Fast Ethernet speeds
- Fast Ethernet networking
- IPTV connection high-speed gateway to set-top box
- Home networking
- Industrial applications
- Real Time Fast Ethernet networks
- Gigabit Ethernet over POF

Industrial Fiber Optic Transceiver

Connector Configuration		Data Rate	Reach	Fiber	Supply Voltage	Part Numbers	DMI	Evaluation Board
	SFF/LC	Fast Ethernet (10/100 Mbps)	2000m	Multi-mode	3.3V	HFBR-5963LZ	No	HFBR-0562
						AFBR-59E4APZ		HFBR-0572
						AFBR-59E4APZC		
						AFBR-59E4APZ-HT		
						AFBR-59E4APZ-LH		
	SFF/MT-RJ	Fast Ethernet (10/100 Mbps)	2000m	Multi-mode	3.3V	AFBR-5903AZ	No	
	SFP/LC	Fast Ethernet (10/100 Mbps)	2000m	Multi-mode	3.3V	HFBR-57E0APZ	No	HFBR-0570
						AFBR-57E6APZ	Yes	
						AFBR-57E6APZC		
						AFBR-57E6APZ-HT		
	SFP/LC	DC-50 MBd	2000m	Multi-mode	3.3V	AFBR-57B4APZ	Yes	
	1x9/SC	Fast Ethernet (10/100 Mbps)	2000m	Multi-mode	3.3V/5V	AFBR-5803ATQZ	No	HFBR-0535
	1x9/ST	Fast Ethernet (10/100 Mbps)	2000m	Multi-mode	3.3V/5V	AFBR-5803ATQZ	No	HFBR-0535
	SC-RJ Profinet®	Fast Ethernet (10/100 Mbps)	50/100m	POF/HCS®	3.3V	AFBR-5978Z	Yes	AFBR-0978Z
	Versatile Link	Fast Ethernet (10/100 Mbps)	50m	POF	3.3V	AFBR-5972Z	No	AFBR-0544Z
	Versatile Link	250 MBd	50m	POF	3.3V	AFBR-5972EZ (black) AFBR-5972BZ (blue)	No	

Transceiver with Bare Fiber Locking System		Data Rate	Reach	Fiber	Supply Voltage	Part Numbers	Monitor Output (MON)
		125 MBd	70m	POF	3.3V	AFBR-59F1Z	Digital SD
		250 MBd	40m			AFBR-59F2Z	Analog
		1 Gbps Multilevel Coded	50m			AFBR-59F3Z	

650nm Industrial Fiber Optic Components

Components listed here are compatible with both plastic (1 mm core diameter) and HCS® (hard clad silica) optical fibers. Plastic fiber (1mm core diameter), often specified in cost-effective solutions, will see implementations in frequency conversion, power electronics control and industrial fieldbuses. HCS is typically used for higher data rates and link length. Connectorization schemes include Connectorless, ST, SMA and Versatile Link.

Applications

- Factory automation
- Industrial networking and fieldbuses
- Audio visual links and datalinks, up to 160 Mbd
- High-voltage conversion
- IGBT, GTO, IGCT power electronics
- High-voltage galvanic isolation
- Gaming equipment
- Human machine interfaces

Versatile Link Package/Connector

Connector Configuration	Data Rate	Reach		Supply Voltage	Transmitter		Receiver		Temperature Range	Evaluation Board
		POF	HCS		Part Number	Interface	Part Number	Interface		
Horizontal 	DC-40kBd	110m		5V	HFBR-1523Z	Pin-diode	HFBR-2523Z	Open collector	0 to 70°C	HFBR-0503Z
	DC-1MBd	10m		5V	HFBR-1524Z	Pin-diode	HFBR-2524Z	Open collector	0 to 70°C	
		45m		5V	HFBR-1522Z	Pin-diode	HFBR-2522Z	Open collector	0 to 70°C	HFBR-0502Z
		45m		5V	HFBR-1522ETZ	Pin-diode	HFBR-2522ETZ	Open collector	-40 to +85°C	
	DC-5MBd	20m	500m	3.3V/5V	HFBR-1521Z	Pin-diode	HFBR-2521Z	Open collector	0 to 70°C	HFBR-0501Z
		20m	500m	3.3V/5V	HFBR-1521Z	Pin-diode	HFBR-2521ETZ	Open collector	-40 to +85°C	
		58m	500m	3.3V/5V	AFBR-1521CZ	Pin-diode	AFBR-2521CZ	TTL	-40 to +95°C	
	DC-10MBd	58m	500m		AFBR-1528CZ	Pin-diode	AFBR-2528CZ	TTL	-40 to +95°C	
		40m	200m	3.3V/5V	AFBR-1529Z	Pin-diode	AFBR-2529Z	TTL	-40 to +85°C	
	DC-50MBd	50m	120m	3.3V/5V	AFBR-1624Z	TTL	AFBR-2624Z	TTL	-40 to +85°C	AFBR-0546Z AFBR-0548Z
		50m	120m	3.3V/5V	AFBR-1629Z	TTL	AFBR-2529Z	TTL	-40 to +85°C	AFBR-0547Z
		50m	120m	3.3V/5V	AFBR-1629Z	TTL	AFBR-2529SIZ	TTL + RSSI	-40 to +85°C	AFBR-0553Z
	125MBd	30m	100m	5V	HFBR-1527Z	Pin-diode	HFBR-2526Z	Open collector	0 to 70°C	HFBR-0527xZ
		30m	100m	5V	HFBR-1527ETZ	Pin-diode	HFBR-2526ETZ	Open collector	-40 to +85°C	
	160MBd	50m	50m	5V	HFBR-1527Z	Pin-diode	HFBR-2526Z	Open collector	0 to 70°C	
		50m	50m	5V	HFBR-1527ETZ	Pin-diode	HFBR-2526ETZ	Open collector	-40 to +85°C	
Vertical 	DC-40kBd	110m		5V	HFBR-1533Z	Pin-diode	HFBR-2533Z	Open collector	AN1035	HFBR-0503Z
	DC-1MBd	10m		5V	HFBR-1534Z	Pin-diode	HFBR-2534Z	Open collector	AN5374	
		45m		5V	HFBR-1532Z	Pin-diode	HFBR-2532Z	Open collector	AN1035	HFBR-0502Z
	DC-5MBd	20m		5V	HFBR-1531Z	Pin-diode	HFBR-2531Z	Open collector	AN1035	HFBR-0501Z
		20m		5V	HFBR-1531ETZ	Pin-diode	HFBR-2531ETZ	Open collector	AN1035	
		50m	500m	3.3V/5V	AFBR-1639Z	TTL	AFBR-2531CZ	TTL	-40 to +85°C	
		58m	500m	3.3V/5V	AFBR-1531CZ	Pin-diode	AFBR-2531CZ	TTL	-40 to +95°C	
	DC-10MBd	40m	200m	3.3V/5V	AFBR-1539Z	Pin-diode	AFBR-2539Z	TTL	-40 to +85°C	
	DC-50MBd	50m	120m	3.3V/5V	AFBR-1634Z	TTL	AFBR-2634Z	TTL	-40 to +85°C	
		50m	120m	3.3V/5V	AFBR-1639Z	TTL	AFBR-2539Z	TTL	-40 to +85°C	
	125MBd	30m	100m	5V	HFBR-1537Z	Pin-diode	HFBR-2536Z	Open collector	0 to 70°C	HFBR-0527xZ
	160MBd	50m	50m	5V	HFBR-1537Z	Pin-diode	HFBR-2536Z	Open collector	0 to 70°C	
Tilted 	DC-1MBd	45m		5V	HFBR-1542ETZ	Pin-diode	HFBR-2542ETZ	Open collector	-40 to +85°C	HFBR-0502Z
	DC-5MBd	20m		5V	HFBR-1541ETZ	Pin-diode	HFBR-2541ETZ	Open collector	-40 to +85°C	HFBR-0501Z
		50m	500m	3.3V/5V	AFBR-1649Z	TTL	AFBR-2541CZ	TTL	-40 to +85°C	
		58m	500m	3.3V/5V	AFBR-1541CZ	Pin-diode	AFBR-2541CZ	TTL	-40 to +95°C	
	DC-50MBd	50m	120m	3.3V/5V	AFBR-1644Z	TTL	AFBR-2644Z	TTL	-40 to +85°C	AFBR-0546Z AFBR-0548Z

Fieldbus (SMA/ST Connector)

Connector Configuration		Data Rate	Reach		Supply Voltage	Part Numbers		Application Notes	Evaluation Board
			POF	HCS®		Transmitter	Receiver		
	SMA	DC-2MBd	50m	400m	5V	HFBR-1505CZ	HFBR-2505CZ		HFBR-0538Z
			50m	300m	5V	HFBR-1505CFZ	HFBR-2505CFZ		
			20m		5V	HFBR-1602Z	HFBR-2602Z		
			20m		5V	HFBR-1604Z	HFBR-2602Z		
		DC-10MBd	40m	200m	5V	HFBR-1505AZ	HFBR-2505AZ	AN1080	HFBR-0540Z
			40m	100m	5V	HFBR-1505AFZ	HFBR-2505AFZ		
		DC-16MBd	45m	200m	5V	HFBR-1506AMZ	HFBR-2506AMZ	AN5006	HFBR-0541Z
			45m	100m	5V	HFBR-1506AFZ	HFBR-2506AFZ		
		2MBd - 16MBd	45m		3.3V/5V	HFBR-1506AFZ	HFBR-2555AFZ		
			45m	100m	3.3V/5V	AFBR-1555ARZ	AFBR-2555ARZ		
	ST	DC-10MBd	40m	200m	5V	HFBR-1515BZ	HFBR-2515BZ	AN1080	HFBR-0539Z
			40m	100m	5V	HFBR-1515BFZ	HFBR-2515BFZ		

Connectorless

Connector Configuration		Data Rate	Reach		Supply Voltage	Part Numbers		Application Notes	Evaluation Board
			POF	HCS®		Transmitter	Receiver		
	V-Housing	DC-5MBd	20m		5V	SFH757V	SFH551/1-1V	AN5341 AN5342	
		100MBd	20m		5V	SFH757V	SFH250V		
	LL-Housing	DC-5MBd	20m		5V	SFH757	SFH551/1-1	AN5341 AN5342	
		100MBd	20m		5V	SFH757	SFH250		

High Galvanic Isolation Link

Connector Configuration	Data Rate	Creepage & Clearance Distance	Supply Voltage	Part Number	Application Notes
 Certified to IEC 60747-5-5:2007	DC-5MBd	25mm	3.3V/5V	AFBR-390525RZ	AFBR-39xxyyRZ-AN100
		50.4mm		AFBR-390550RZ	
		75.8mm		AFBR-390575RZ	
		101.2mm		AFBR-390500RZ	
	DC-50MBd	25mm	3.3V/5V	AFBR-395025RZ	AFBR-39xxyyRZ-AN100
		50.4mm		AFBR-395050RZ	
		75.8mm		AFBR-395075RZ	
		101.2mm		AFBR-395000RZ	

*As per IEC-60664-1 @2000m above sea level and pollution degree 2, inhomogeneous field conditions may lead to partial discharge through air for these voltages.

Miniature Link 820nm/850nm/1300nm Industrial Fiber Optic Components

These cost-effective components with long link-length capabilities can be used to build high-performance ethernet transceivers. Typical applications include FDDI, Token Ring, FOIRL, 10Base-FL and 100Base-SX. Glass fiber specified in this selection guide are multimode fiber both 62.5/125 µm and 50/125 µm multi-mode glass fiber can be used.

Applications

- LAN applications, such as 10Base-FL
- FDDI, Token Ring, 100base-SX
- Audio video links and industrial datalinks
- Wind turbine control system and farm networking
- Hydro and solar power generation plants
- Media and fiber converters
- Railway control systems
- Locomotive in-car and car-to-car communications
- Motorway infrastructures

820nm/850nm/1300nm Industrial Fiber Optic Components

Connector Configuration	Data Rate	Reach	Voltage	Part Number		Evaluation Board
				Transmitter	Receiver	
ST, SMA, FC	DC-5 MBd	1500m	5V	HFBR-14X2PXZ	HFBR-24X2XZ	HFBR-0410Z
ST, SC, SMA	20 MBd	2700m	5V	HFBR-14X4PXZ	HFBR-24X6XZ	HFBR-0416Z
	32 MBd	2200m				
	55 MBd	1400m				
	125 MBd	700m				
	155 MBd	600m				
	160 MBd	500m				
	DC-20 MBd	3000m	3.3V/5V	HFBR-14X4PXZ	AFBR-24X8XZ	AFBR-0549Z
	DC-32 MBd	2200m				
	DC-40 MBd	1500m				
	DC-50 MBd	1000m				
	20 MBd	3000m	3.3V/5V	HFBR-14X4PXZ	AFBR-24X9XZ	AFBR-0550Z
	32 MBd	2200m				
	40 MBd	1500m				
	50 MBd	1000m				
ST	20 MBd	5000m	5V	HFBR-1312TZ	HFBR-2316TZ	HFBR-0310Z
	32 MBd	3200m				
	55 MBd	3200m				
	125 MBd	2800m				
	155 MBd	2700m				
	160 MBd	2000m				
ST, SC, SMA	50 MBd	2000m	3.3V/5V	HFBR-14X4XZ	HFBR-24X8XZ	AFBR-0549Z

A/HFBR-□4□□□□Z — RoHS Compliant

1 - Transmitter
2 - Receiver

4 - 820 nm Transmitter and Receiver products

0 - SMA, Housed
1 - ST, Housed
2 - FC, Housed
E - SC, Housed

P - Protection improved option
T - Threaded port option
C - Conductive port receiver option
M - Metal port option

2 - TX, standard power
4 - TX, high power
2 - RX,5 MBaud, TTL output
5 - TX, high light output power
6 - RX, 125 MHZ, analog output
8 - RX, DC to 50 MBaud, digital output
9 - RX, 100 KBaud to 50 MBaud, digital output

Optical Arc Flash Detection

Arc flash accidents in electrical power distribution networks are a constant threat to both network infrastructure and human life. Optical systems are increasingly used to detect and prevent such events with high success.

Broadcom's components for optical arc flash detection help the system engineer to build an efficient and reliable arc flash protection system. The sensor transceiver is very compact, robust, low light sensitive and with inbuilt selftest functionality. The POF sensor fiber shows high sensitivity to the arc flash light and is equiped with a robust transparent jacket. Both form a perfect system together with Broadcom's simplex and duplex VL connectors and mating connectors. An evaluation kit and supporting literature is available for support.

Sensor Receiver/Transceiver

	Configuration	Part Number	Description	Connector Type	Rx Responsitivity	Tx Optical Power	Voltage	Remark
	Sensor Transceiver	AFBR-S10TR001Z	Compact TRx with integrated LED for heartbeat and with ASIC for PD and TIA functionality	Duplex VL AFBR-4526Z	45V/mW @650nm	-1dBm @30mA, 650nm	5V	
	Sensor Receiver (horizontal connector)	AFBR-S10RX021Z	Versatile Link based RX with ASIC for PD and TIA functionality	Simplex VL	45V/mW @650nm	NA	5V	To be used with transmitter: AFBR-1539Z or AFBR-1639Z (integrated LED driver)
	Sensor Receiver (vertical connector)	AFBR-S10RX031Z	Versatile Link based RX with ASIC for PD and TIA functionality	Simplex VL	45V/mW @650nm	NA	5V	To be used with transmitter: AFBR-1539Z or AFBR-1639Z (integrated LED driver)

Evaluation Kit

	Configuration	Part Number	Description	Connector Type
	Eval Kit for Sensor Transceiver	AFBR-S10EB001Z	Including PCB with sensor transceiver, sensor fiber, set of connectors, power supply	AV02-4913EN

Line Sensor

	Configuration	Part Number	Description	Operating temperature	Fiber Material	Fiber Diameter	N/A	Attenuation
	**Line Sensor**	AFBR-TUS500Z	Simplex SI POF with transparent jacket to be used as line sensor, 500m spool. Captures light that meets the fiber and guides it along the fiber	-40 to +85 °C	Core: PMMA Jacket: PE, transparent	Core and Cladding: 1mm Jacket: 2.2mm	0.48	0.21 dB/m

Point Sensor

	Configuration	Part Number	Description	Operating temperature	Appnote	Remark
	**Sensor head**	AFBR-S10PS010Z	To be mounted to the construction near to the place of the expected arc flash. Does not contain a fiber pigtail but can be connected to a fiber via the sensor connector AFBR-S10PS011Z	-40 to +85 °C	AFBR-S10PS01XZ-AN101	
	Sensor Connector	AFBR-S10PS011Z	Black crimpless non-latching connector. Is used to connect the sensor head AFBR-S10PS010Z to a duplex POF with 1mm/2.2mm fiber dimensions	-40 to +85 °C	AFBR-S10PS01XZ-AN101	Recommended fiber AFBR-HUD500Z
	Sensor connector kit for field installation	AFBR-S10PS012Z	A compilation of sensor connectors AFBR-S10PS011Z and special polishing tools and polishing paper. (3 polishing kits per 50 connectors)	-40 to +85 °C	AFBR-S10PS01XZ-AN101	When placing an order for AFBR-S10PS012Z, the quantity-value must relate to the number of connectors, not to the number of package

Optical Power Components

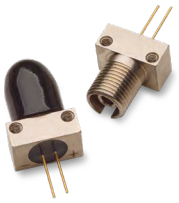
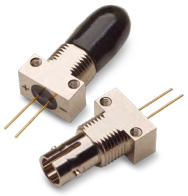
Optical Power Components

Broadcom`s optical power components are designed to supply electrically isolated power for remote sensors and actuators in industrial applications. With high efficiency across a wide industrial operating temperature range, the optical power components permit system integrators optimal cost efficiency. An Optical Power Converter is a photovoltaic device generating electrical power when illuminated by light from a laser or LED. The typical optical power converter delivers 10mW to 600mW of continuous power, depending on the light input, most often delivered over an optical fiber. With a choice of voltage outputs of 3.7V and 5.6V, most common electronic circuitry, sensors and data communications links can be powered while ensuring 100 percent galvanic isolation.

Applications

Optical power converters can power devices, such as:

- High voltage current sensors and transducers
- E-field and H-field probes
- MRI/RF imaging coils and patient monitoring equipment
- Power conditioning circuitry
- Wireless transmitters
- Aircraft sensors and transducers

Connector Configuration		Part Number	Fiber Type	Output Voltage	Optical Wavelength	Max. Output Power	Operating Temperature
	FC	AFBR-POC204L	Multimode Glass	3.7 V	800nm - 850nm	600 mW	-40 to +85 °C
	FC	AFBR-POC206L	Multimode Glass	5.6 V	800nm - 850nm	600 mW	-40 to +85 °C
	ST	AFBR-POC404L	Multimode Glass	3.7 V	800nm - 850nm	600 mW	-40 to +85 °C
	ST	AFBR-POC406L	Multimode Glass	5.6 V	800nm - 850nm	600 mW	-40 to +85 °C

Plastic Optical Fiber Cables

The HFBR-E/RXXYYZ series of plastic fiber optic cables are constructed of a single step index fiber, sheathed in a black polyethylene jacket. The duplex fiber consists of two simplex fibers joined with a zipcord web. Standard attenuation and extra low loss POF cables are identical except for attenuation specifications. Polyethylene jackets on all plastic fiber cables comply with ULVW-1 flame retardant specification (UL file #E89328). Cables are available in unconnectorized or connectorized options.

Compatible with our Versatile Link family of connectors and fiber optic components, we offer 1mm diameter (outer diameter 2.2 mm) POF in two grades: Standard POF with 0.22 dB/m typical attenuation or High Performance Extra Low Loss POF with 0.19 dB/m typical attenuation.

The Broadcom AFBR-HUX500Z is a halogen-free, robust plastic optical fiber (POF) cable. The cable comes in a single spool of 500m POF consisting of a step-index fiber sheathed in a black polyethylene jacket with an outer diameter of 2.2 mm (simplex dimension, duplex: 2x2.2 mm). The jacket has a blue marking. The POF inside the covering jacket has a diameter of 1 mm.

The cable complies with UL VW-1 flame retardant specification (UL file #E116331 / Style #5538).

Applications

- Industrial data links for factory automation and plant control
- Intra-system links: board-to-board or rack-to-rack
- Telecommunications switching systems
- Computer-to-peripheral data links, PC bus extension
- Proprietary LANs
- Digitized video
- Medical instruments
- Reduction of lightning and voltage transient susceptibility
- High-voltage galvanic isolation
- Power electronics
- Gaming equipment
- Data communications

Plastic Optical Fiber Specifications: A/HFBR-E/R/HXXYYZ

Parameter		Symbol	Min.	Typ.	Max	Unit	Condition
Cable Attenuation Source: 660nm LED, 0.5 NA (HFBR-15xxZ) Length: 50m	Standard cable type “R”	α^{o}	0.15	0.22	0.27	dB/m	TA=-40°C to +85°C
	Extra low loss type “E”		0.15	0.19	0.23		
	Halogen-free type “H”		0.15	0.19	0.23		
Reference Attenuation Source: 650nm, 0.5 NA (monochrometer) Length: 50m	Standard cable type “R”	α^{R}	0.12	0.19	0.24	dB/m	TA=-40°C to +85°C
	Extra low loss type “E”		0.12	0.16	0.19		
	Halogen-free type “H”		0.15	0.19	0.23		
Numerical Aperture		NA	0.46	0.47	0.50		>2meters
Diameter, Core and Cladding			0.94	1.00	1.06	mm	

A/HFBR- □ □ □ □□□ Z

Cable Code
R - Standard Attenuation POF
E - Extra Low Loss POF
H - Halogen-free

Connector Code
U - Unconnectorized
N - Standard Simplex Connectors
L - Latching Simplex Connectors
M - Standard Duplex Connectors
T - Latching Duplex Connectors

RoHS Compliant

Length Code
(measured from tip of connector to tip of connector)
Maximum 500 meters (not in 1 meter increments.)
e.g. 015 = 15 meters

Channel Code
S - Simplex Cable
D - Duplex Zipcord Cable

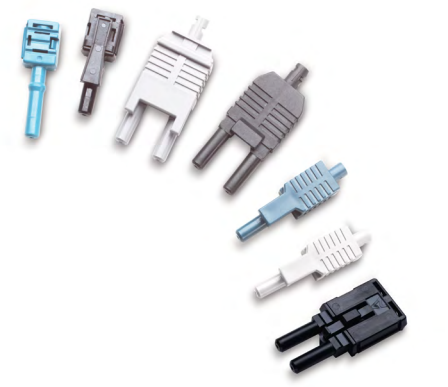
POF Connectors and Accessories

Crimp Style

The HFBR-4501Z, HFBR-4503Z and HFBR-4506Z connector styles are available for termination of plastic optical fiber: simplex, simplex latching, duplex and duplex latching. All connectors provide a snap-in action when mated to Versatile Link components. Simplex connectors are color coded to facilitate identification of transmitter and receiver connections. Duplex connectors are keyed so that proper orientation is ensured during insertion. The connectors are made of a flame retardant VALOX UL94 V-0 material (UL file # E121562).

Crimpless Style

The HFBR-453XZ series connectors are an enhanced version of the HFBR-4501Z and HFBR-4503Z connectors for plastic optical fiber, compatible with Broadcom's Versatile Link series transmitters and receivers. This design uses a simple, snap-together concept, which eliminates the need for crimping. User labor and tool cost are reduced together with the yield loss due to installation error. The HFBR-453XZ series connectors are available in two-styles: latching and non-latching. For a duplex connector, two nonlatching simplex connectors can be snapped together. The connectors are made of a rugged, flame resistant plastic which is good for industrial and other harsh environments. The HFBR-453XZ series connectors are for use with plastic optical fiber only.



Plastic Optical Fiber Connectors

Part Number	Description
HFBR-4501Z/4511Z	Gray/blue simplex conector with crimp ring
HFBR-4503Z/4513Z	Gray/blue simplex latching conector with crimp ring
HFBR-4505Z/4515Z	Gray/blue mating adapter for two simplex non-latching POF connectors
HFBR-4506Z/4516Z	Parchment/gray duplex connector with crimp ring
HFBR-4531Z/4532Z	Black crimpless simplex non-latching/latching connector
HFBR-4533Z/4535Z	Blue/gray crimpless simplex non-latching connector
AFBR-4526Z/452BZ	Black/Blue crimpless duplex latching connector (mating transceivers: AFBR-5972xZ, AFBR-S10TR001Z)
AFBR4536EZ/4536BZ/4536DZ	Duplex Bulkhead Connector suitable For Duplex Connector AFBR-452xZ

Plastic Optical Fiber Accessories

Part Number	Description
HFBR-4522Z	500 HFBR-0500 products port plugs
HFBR-4525Z	1000 simplex crimp rings
HFBR-4526Z	500 duplex crimp rings
HFBR-4593Z	Polishing kit (one polishing tool, two pieces 600 grit abrasive paper and two pieces 3µm pink lapping film)
AFBR-4594Z	Polishing kit for AFBR-4526Z (One polishing tool, two pieces 600 grit abrasive paper, and two pieces 3um pink lapping film)
HFBR-4597Z	Crimping tool 4.5 - 5.5mm for simplex/duplex crimp rings
AFBR-4595Z	Simple Cutting Tool for Polymere Optical Fibre

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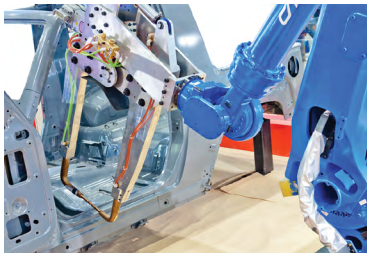
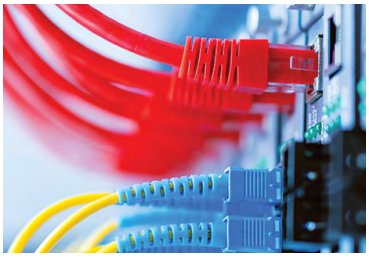

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Broadcom's extensive product portfolio serves multiple applications within four primary end markets: wired infrastructure, wireless communications, enterprise storage and industrial & others. Applications for our products in these end markets include: data center networking, home connectivity, broadband access, telecommunications equipment, smartphones and base stations, data center servers and storage, factory automation, power generation and alternative energy systems, and displays.

Broadcom combines global scale, engineering depth, broad product portfolio diversity and superior execution and operational focus to deliver category-leading connectivity products so its customers can build and grow successful businesses today and in the future.

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