Optical Fiber Patch Cables | FIPAC

RoHS

A full lineup of optical fiber patch cables, designed for use with visible light through to infrared light.

Single-mode Optical Fiber Patch Cable | FC/PC-FC/PC

- With FC/PC connector
- ϕ3mm protective tube
- Return loss: Typ.50 dB or more

Specifications

Part Number	Length [m]	Operating Wavelength*1 [nm]	Cutoff Wavelength [nm]	MFD*2 [µm]	Cladding Diameter [µm]	NA	Fiber
FIPAC-SM-405-3-FPFP-2M	2	400 – 550	370±30	3.5±0.5 @532nm	125	0.13	SPF405
FIPAC-SM-450-3-FPFP-2M	2	450 – 600	430±30	3.5±0.5 @532nm	125	0.13	SPF450
FIPAC-SM-600-3-FPFP-2M	2	600 – 800	570±30	4.0±0.5 @633nm	125	0.13	SPF600
FIPAC-SM-750-3-FPFP-2M	2	750 – 970	730±40	5.0±0.5 @850nm	125	0.13	SPF750
FIPAC-SM-1060-3-FPFP-2M	2	980 – 1600	920±40	6.5±0.5 @1060nm	125	0.13	SPF1060
FIPAC-SM-1550-3-FPFP-2M	2	1260 – 1620	1260±30	9.2±0.5 @1310nm	125	0.13	SMF-28e

*1 The operating wavelength range is a reference value, and is not a guaranteed value.
*2 The MFD is a nominally calculated value for the operating wavelength.

Single-mode Optical Fiber Patch Cable | FC/APC-FC/APC

- With FC/APC connector
- ϕ3mm protective tube
- Return loss: Typ.50 dB or more

Specifications

Part Number	Length [m]	Operating Wavelength*1 [nm]	Cutoff Wavelength [nm]	MFD*2 [µm]	Cladding Diameter [µm]	NA	Fiber
FIPAC-SM-405-3-FAFA-2M	2	400 – 550	370±30	3.5±0.5 @532nm	125	0.13	SPF405
FIPAC-SM-450-3-FAFA-2M	2	450 – 600	430±30	3.5±0.5 @532nm	125	0.13	SPF450
FIPAC-SM-600-3-FAFA-2M	2	600 – 800	570±30	4.0±0.5 @633nm	125	0.13	SPF600
FIPAC-SM-750-3-FAFA-2M	2	750 – 970	730±40	5.0±0.5 @850nm	125	0.13	SPF750
FIPAC-SM-1060-3-FAFA-2M	2	980 – 1600	920±40	6.5±0.5 @1060nm	125	0.13	SPF1060
FIPAC-SM-1550-3-FAFA-2M	2	1260 – 1620	1260±30	9.2±0.5 @1310nm	125	0.13	SMF-28e

*1 The operating wavelength range is a reference value, and is not a guaranteed value.
*2 The MFD is a nominally calculated value for the operating wavelength.

Single-mode Optical Fiber Patch Cable | FC/PC-FC/APC

- With FC/PC-FC/APC connector
- ϕ3mm protective tube
- Return loss: Typ.50 dB or more

Specifications

Part Number	Length [m]	Operating Wavelength*1 [nm]	Cutoff Wavelength [nm]	MFD*2 [µm]	Cladding Diameter [µm]	NA	Fiber
FIPAC-SM-1550-3-FPFA-2M	2	1260 – 1620	1260±30	9.2±0.5 @1310nm	125	0.13	SMF-28e

*1 The operating wavelength range is a reference value, and is not a guaranteed value.
*2 The MFD is a nominally calculated value for the operating wavelength.

Single-mode Optical Fiber Patch Cable | SC connector

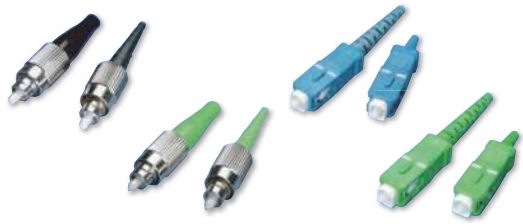
- With SC connector
- ϕ3mm protective tube
- Return loss: Typ.50 dB or more

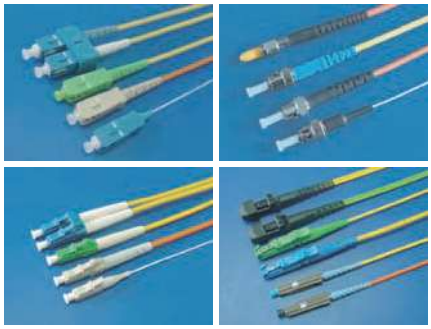
Specifications

Part Number	Length [m]	Connector A	Connector B	Fiber Diameter [mm]	Operating Wavelength*1 [nm]	Fiber
FIPAC-SM-1550-3-SPSP-2M	2	SC/PC	SC/PC	ϕ3	1260 – 1620	SMF-28e
FIPAC-SM-1550-3-SPSA-2M	2	SC/PC	SC/APC	ϕ3		
FIPAC-SM-1550-3-SASA-2M	2	SC/APC	SC/APC	ϕ3		

*1 The operating wavelength range is a reference value, and is not a guaranteed value.

Custom-design/Optical fiber patch cables are also available.





Specifying Part Numbers

FIPAC- □□ - □□□ - □ - □□ - □□

Type	
SM:	Single-Mode
PM:	Polaization-maintaining
MM:	Multi-Mode

Fiber Type	
405:	SFP405
450:	SFP450
600:	SFP600
780:	SFP780
1060:	SFP1060
1550:	SMF-28e
Custom	
1060XP:	1060XP(Nufern)
50/125:	MMF 50/125µm
etc.	

Fiber Diameter	
0.25:	ϕ250µm
0.4:	ϕ400µm
0.9:	ϕ900µm
2:	ϕ2mm
3:	ϕ3mm

Connector Type	
FP:	FC/PC
FA:	FC/APC
SP:	SC/PC
SA:	SC/APC
LC:	LC
SMA:	SMA

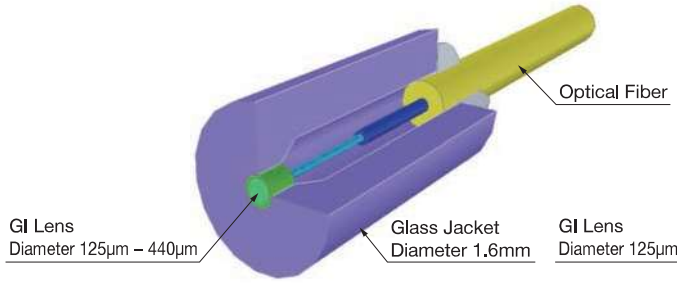
Fiber Length	
1.5M:	1.5m
2M:	2m
etc.0.5 – 10m	

Optical Fiber Collimator | SFC1/MFC1

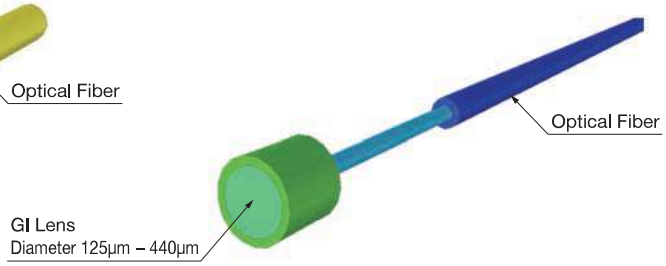
RoHS Catalog Code W2049

Single-core optical fiber collimator <jacket type/bare type>

- Single-mode/Multi-mode
- Can be adapted to high heat-resistant structures
- Disconnection prevention and protection structure
- Rigid type for outstanding handling
- Compact
- Excellent versatility



Jacket Type



Bare Type

Specifications					
Type	Single-mode: SFC1			Multi-mode: MFC1	
Beam waist diameter	50µm	80µm	170µm	90µm	165µm
Beam waist position	0.5mm	2.5mm	7.0mm	0.3mm	1.0mm
Lens Diameter	125µm	240µm	440µm	240µm	420µm
Termination Type	Jacket type, bare type			Jacket type, bare type	
Insertion loss	≦0.5dB			≦0.5dB	
Lens End Face Angle	Flat-polished			Flat-polished	
Wavelength Used	1310nm or 1550nm			850nm, 1310nm, 1550nm	
Optical Fiber	SMF, PMF (strand diameter 250µm)			MMF GI50 50/125µm, NA0.2 (strand diameter 250µm)	
Connector	FC, SC, SMA			FC, SC, SMA	

Note: The beam waist diameter and beam waist position are design values, and may not meet the specifications that have been specified. Specifications other than the above can also be custom-designed. Please contact our International Sales Division for more information.

Specifying Part Numbers

For single-mode

SFC1- □□ - □□ - □□ - □□□□ - □□

Termination Type		Beam waist diameter		Beam waist position		Fiber Type		Connector Type	
01:	Jacket type (adhesive-free)	50:	50µm	0.5:	0.5mm	SMF2:	SMF, 2m	FC:	FC connector
02:	Jacket type (adhesive)	80:	80µm	2.5:	2.5mm	PMF1:	PMF, 1m	SC:	SC connector
00:	Bare type	170:	170µm	7.0:	7.0mm			SMA:	SMA connector
								0:	No connector

For multi-mode

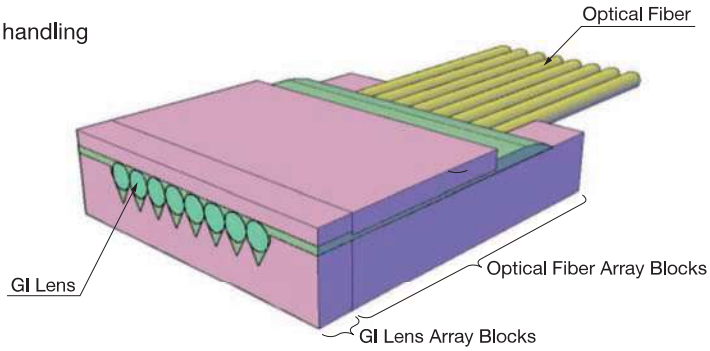
MFC1- □□ - □□ - □□ - □□ - □□

Termination Type		Beam waist diameter		Beam waist position		Fiber Length		Connector Type	
01:	Jacket type (adhesive-free)	90:	90µm	0.3:	0.3mm	01:	1m	FC:	FC connector
02:	Jacket type (adhesive)	165:	165µm	1.0:	1.0mm	10:	10m	SC:	SC connector
00:	Bare type							SMA:	SMA connector
								0:	No connector

A fiber collimator array capable of 100ch or more

A GI lens mounted at the fiber tip ensures parallel output light as a quality collimator.

- Capable of arrays of 100ch or more
- Single-mode/Multi-mode
- Can be adapted to high heat-resistant structures
- Disconnection prevention and protection structure
- Rigid type for outstanding handling
- Compact
- Excellent versatility



Specifications

Type	Single-mode: SFC			Multi-mode: MFC	
Array Pitch	127μm	250μm	500μm	250μm	500μm
Number of Fiber Strands	1 – 48	1 – 48	1 – 48	1 – 48	1 – 48
Beam waist position	0.5mm	2.5mm	7.0mm	0.3mm	1.0mm
Beam waist diameter	50μm	80μm	170μm	90μm	165μm
Insertion loss	≦0.5dB			≦0.5dB	
Return loss	25dB or more (with AR coating), 45dB or more (angle-polished)				
Lens End Face Angle	Flat-polished, angle-polished (hexagonal packing, octagonal packing)				
Wavelength Used	1310nm, 1550nm			850nm, 1310nm, 1550nm	
Optical Fiber	SMF, PMF (strand diameter 250μm)			MMF GI50 50/125μm, NA0.2 (strand diameter 250μm)	
Connector	FC, SC, ST, MU, LC				

Note: The beam waist diameter and beam waist position are design values, and may not meet the specifications that have been specified. Specifications other than the above can also be custom-designed. Please contact our International Sales Division for more information.

Specifying Part Numbers

□□□ - □□ - □□□ - □□ - □□ - □ - □□ - □□

Type

SFC:	Single-mode
MFC:	Multi-mode

Number of Fiber Strands

01:	1
04:	4
08:	8
16:	16
32:	32
48:	48

Pitch

127:	127μm(SMF)
250:	250μm
500:	500μm

Beam waist diameter

50:	50μm(SFC)
80:	80μm(SFC)
90:	90μm(MFC)
165:	165μm(MFC)
170:	170μm(SFC)

Beam waist position

0.3:	0.3mm(MFC)
0.5:	0.5mm(SFC)
1.0:	1.0mm(MFC)
2.5:	2.5mm(SFC)
7.0:	7.0mm(SFC)

Polished Angle

0:	Flat
6:	Flat-polished, angle-polished (hexagonal packing)
8:	Angle-polished (octagonal packing)

Fiber Type

SMF2:	SMF, 2m (SFC)
PMF1:	PMF, 1m (SFC)
02:	2m(MFC)
10:	10m(MFC)

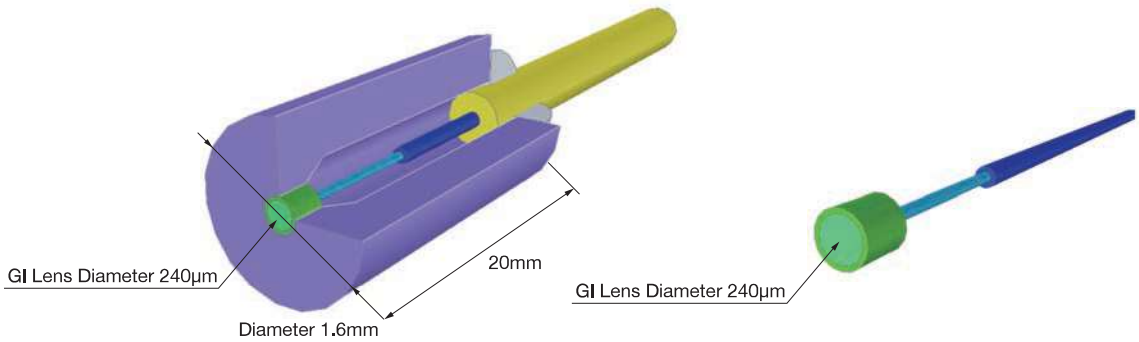
Connector Type

FC:	FC connector
SC:	SC connector
ST:	ST connector
MU:	MU connector
LC:	LC connector
0:	No connector

Fiber Focuser | FF1/FFF1

RoHS Catalog Code W2051

Fiber focusers consist of a GI lens with a base material machined to the desired diameter and length, mated to a single-mode optical fiber. They output more focused light than a GI lens.



Specifications		
Type	**Single-core fiber focuser: FF1**	**Single-core fiber fine focuser: FFF1**
Beam waist position	≦2mm	≦50µm
Beam waist diameter	≦50µm	≦8µm
Lens Diameter	240µm	
Termination Type	Jacket type, bare type	
Insertion loss	≦0.5dB	
Lens End Face Angle	Flat-polished	
Wavelength Used	1310nm ,1550nm	
Optical Fiber	SMF, PMF (strand diameter 250µm)	
Connector	FC, SC, SMA	

Note: The beam waist diameter and beam waist position are design values, and may not meet the specifications that have been specified. Specifications other than the above can also be custom-designed. Please contact our International Sales Division for more information.

Specifying Part Numbers

For single-core fiber focusers

FF1- □□ - 50 - 2.0 - □□□ - □□

Termination Type	
01:	Jacket type (adhesive-free)
02:	Jacket type (adhesive)
00:	Bare type

Beam waist diameter	
50:	50µm

Beam waist position	
2.0:	≦2mm

Fiber Type and Fiber Diameter	
SMF2:	SMF, 2m
PMF1:	PMF, 1m

Connector Type	
FC:	FC connector
SC:	SC connector
SMA:	SMA connector
0:	No connector

For single-core fiber fine focusers

FFF1- □□ - 8 - 50 - □□□ - □□

Termination Type	
01:	Jacket type (adhesive-free)
02:	Jacket type (adhesive)
00:	Bare type

Beam waist diameter	
8:	8µm

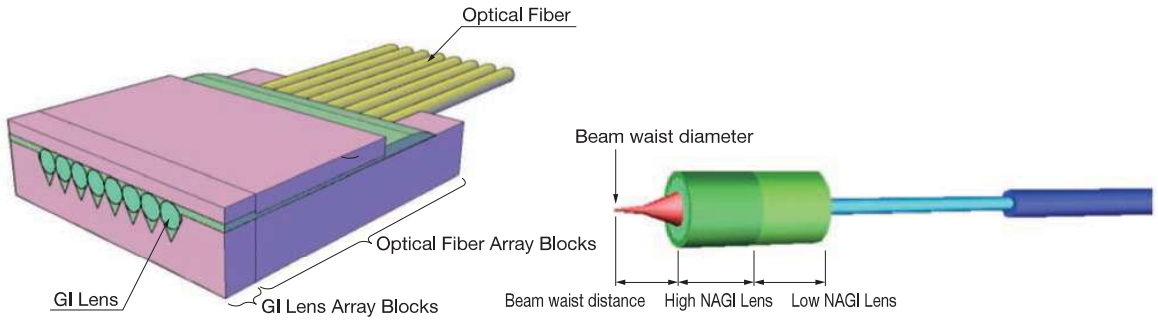
Beam waist position	
50:	50µm

Fiber Type and Fiber Diameter	
SMF2:	SMF, 2m
PMF1:	PMF, 1m

Connector Type	
FC:	FC connector
SC:	SC connector
SMA:	SMA connector
0:	No connector

A fiber focuser array capable of 100ch or more.

Fine focusers consist of a low NAGI lens and high NAGI lens in a stepped structure to achieve an ultra-fine spot diameter. Also available as an array for a high-precision layout of ultra-small light beams.



Specifications					
Type	Fiber focuser array: FF or Fiber fine focuser array: FFF				
Number of fiber strands	1	4	8	16	32
Array Pitch	250μm				
Beam waist position	≦2.0mm or ≦50μm				
Beam waist diameter	≦50μm or ≦8μm				
Insertion loss	≦0.5dB				
Return loss	25dB or more (with AR coating *The AR coating is the center wavelength ±50 to 100nm as standard), 45dB or more (angle-polished)				
Lens End Face Angle	Flat-polished, angle-polished (hexagonal packing, octagonal packing)				
Wavelength Used	1310nm, 1550nm				
Optical Fiber	SMF, PMF (strand diameter 250μm)				
Connector	FC, SC, ST, MU, LC				
Lens standard size (WxLxH)	2×12×3	2×12×3	3×12×3	6×12×3	10×12×3

Note: The beam waist diameter and beam waist position are design values, and may not meet the specifications that have been specified.
Specifications other than the above can also be custom-designed. Please contact our International Sales Division for more information.

Specifying Part Numbers

□□□ - □□ - 250 - □□ - □□ - □ - □□□□ - □□

Type

FF:	Fiber Focuser Array
FFF:	Fiber Fine Focuser Array

Pitch

250:	250μm

Beam waist diameter

50:	50μm(FF)
8:	8μm(FFF)

Fiber Type

SMF2:	SMF, 2m
PMF1:	PMF, 1m

Number of fiber strands

01:	1
04:	4
08:	8
16:	16
32:	32

Beam waist position

2.0:	2.0mm(FF)
50:	50μm(FFF)

Polished Angle

0:	Flat
6:	Flat-polished, angle-polished (hexagonal packing)
8:	Angle-polished (octagonal packing)

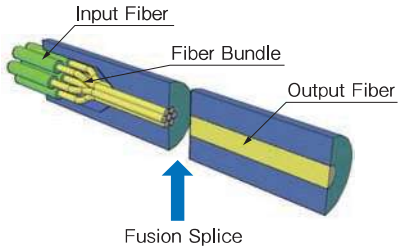
Connector Type

FC:	FC connector
SC:	SC connector
ST:	ST connector
MU:	MU connector
LC:	LC connector
0:	No connector

Optical Power Combiner | OPC

RoHS Catalog Code W2053

A component for combining optical fibers, featuring an adhesive-free structure using glass fusing technology to allow multiple optical fibers to be bundled together and joined efficiently to a large diameter core optical fiber. Can be used to bundle up to 61ch optical fibers to deliver high output light required for next-generation optical fibers or LED lights. Available in two mounting types: high power type and low power type.



Package Type

●High power type

High-resistant design used to achieve a high output structure.

●Low power type

A simple parts layout means lower costs.

Specifications

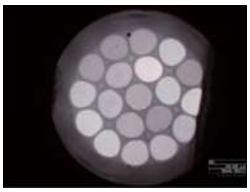
Type							
Number of input fiber strands	2	3	4	7	19	37	61
Input Fiber NA	0.12, 0.15, 0.22						
Input Fiber Core Diameter	105μm						
Input Fiber Cladding Diameter	125μm						
Output Fiber NA	– 0.48						
Output Fiber Core Diameter	200, 400, 600μm						
Operating Wavelength	400 – 1600nm						
Transmittance (coupling efficiency)	≧90%						
Light resistance	– 1W/ch						
Connector	SMA, FC, SC						
Cooling Method	Air-cooling						
Package Size (high power type)	9.5×60×15	9.5×60×15	9.5×60×15	9.5×60×15	9.5×80×15	9.5×80×15	9.5×80×15
Package Size (low power type)	ϕ5×60						

Note: If the optical fiber NA, core and cladding diameter to be bundled, the bundled number of fibers, jacket tube material, outer diameter and others are specified they can be custom-designed. Standard bundled strands are from 2 to 61 fibers. Please contact our International Sales Division if there will be more than 62 optical fibers, or if specifying the type of fibers being used. General purpose fibers packed with adhesive are also available.

Bundled end face by ch

No. of ch: 4ch

No. of ch: 7ch



No. of ch: 19ch

No. of ch: 61ch

Specifying Part Numbers

OPC- □□ - □□□ - □□□ - □□□ - □□□ - □ - □□

Number of fiber strands	
02:	2
03:	3
04:	4
07:	7
19:	19
37:	37
61:	61

Input Fiber NA	
120:	0.12
150:	0.15
220:	0.22

Output Fiber NA	
480:	0.48

Output Fiber Core Diameter	
200:	200μm
400:	400μm
600:	600μm

Package Shape	
H:	High power type
L:	Low power type

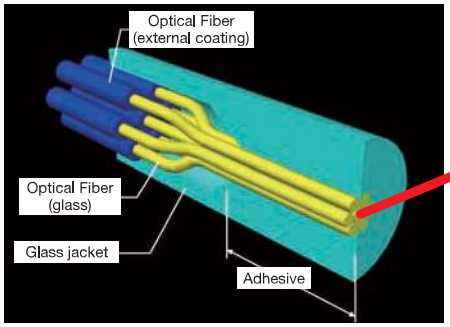
Input/Output Fiber Diameter	
200:	200μm
400:	400μm
600:	600μm

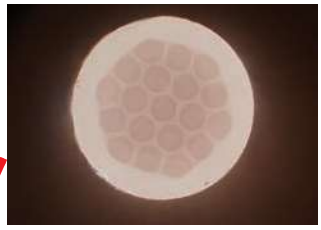
Connector Type	
SMA0:	SMA0 Input End No SMA Output End
OFC:	No Input End Output End FC

Fused Bundle Fiber | FBF

RoHS Catalog Code W2054

A fused bundle fiber that uses jacketing technology to bundle multiple optical fibers without the use of adhesive.
The heat source that is used when constructing fused bundle fiber is the same as jacketing technology: discharge, resistive-heating furnace, or microtorch. The heat source used for bundling differs to suit the outer dimensions. This technology does not use adhesive, and with excellent heat-resistance characteristics suited to high-temperature environments. Optical fibers can also be bundled in any desired layout.





Bundled end face

- In addition to a hexagonal packed layout, optical fibers can be arranged in any desired layout using dummy rods
- Adjacent optical fibers are kept in place using hot-melt without the use of adhesive, giving it a high level of heat-resistance and reliability
- AR (non-reflective) and other coatings can be applied to the optical fiber ends

Specifications

Type							
Nch Fiber Strands	2	3	4	7	19	37	61
Fiber NA	0.12, 0.15, 0.22						
Fiber core diameter	105µm, 200µm, 300µm, 400µm						
Operating Wavelength	400 – 1700nm						
Fiber Shape	SUS flexible tube, strand, 0.9mm cable, 3.0mm cable						
Nch Fiber Connector Type	SUS pipe termination, SMA, FC						
Bundle End Connector Type	SUS pipe termination						

Note: If the optical fiber NA, core and cladding diameter to be bundled, the bundled number of fibers, jacket tube material, outer diameter and others are specified they can be custom-designed. Standard bundled strands are from 2 to 61 fibers. Please contact our International Sales Division if there will be more than 62 optical fibers, or if specifying the type of fibers being used. General purpose fibers packed with adhesive are also available.

Specifying Part Numbers

FBF- □□ - □□□ - □□□ - □ - □□ - □□□

Number of fiber strands	
02:	2
03:	3
04:	4
07:	7
19:	19
37:	37
61:	61

Fiber NA	
120:	0.12
150:	0.15
220:	0.22

Fiber core diameter	
105:	105µm
200:	200µm
300:	300µm
400:	400µm

Fiber Shape	
SUS:	SUS tube
0:	Strand
1:	0.9mm cable
2:	3.0mm cable

Fiber Length	
10:	10m
05:	5m

Connector Type	
FC:	FC connector
SUS:	SUS pipe termination
SMA:	SMA connector
0:	No connector

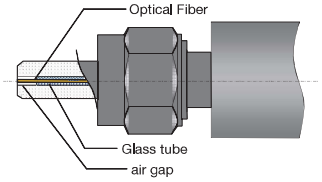
High-Power Connector Cable | HPC

RoHS Catalog Code W2055

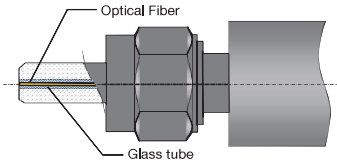
An adhesive-free optical connector made using glass fusing technology for flexibility with high power applications consisting of different fiber diameters. Connector shapes are compatible with SMA905 and FC, available with connector end structures using and tip air gap (TYPE1) or tip glass jacket (TYPE2).
If higher power is required, the optical fiber end can be terminated with an end cap to reduce the input and output energy density.

Connector Type

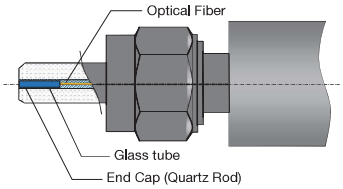
●TYPE1
Structures using and tip air gap



●TYPE2
Tip Glass Jacket (Fusion Splice)



●End Cap (ECF)
Fiber structure with end cap



Specifications

Fiber Diameter	125μm	240μm	360μm	480μm	600μm	1000μm
Fiber core diameter	105μm	200μm	300μm	400μm	550μm	910μm
Fiber NA	0.12, 0.15, 0.22				0.22	
Operating Wavelength	400 – 1700nm					
Connector Shape	SMA, FC					
Connector Type	TYPE1 or TYPE2 or end cap fiber (ECF)					
Fiber Shape	SUS flexible tube, strand, 0.9mm cable, 3.0mm cable					
Light resistance	≦40W					
Cooling Method	Air-cooling					

Note: Contact our International Sales Division for specifications other than those listed above.

Specifying Part Numbers

HPC- □□□ - □□□ - □□□ - □□□ - □ - □

Fiber Diameter	
125:	125μm
240:	240μm
360:	360μm
480:	480μm
600:	600μm
100:	1000μm

Fiber core diameter	
105:	105μm
200:	200μm
300:	300μm
400:	400μm
550:	550μm
910:	910μm

Fiber NA	
120:	0.12
150:	0.15
220:	0.22

Connector Shape	
FC:	FC connector
SMA:	SMA connector

Connector Type	
1:	TYPE1
2:	TYPE2
3:	End cap fiber

Fiber Shape	
0:	Strand
2:	SUS tube
3:	0.9mm loose tube
4:	3.0mm cable

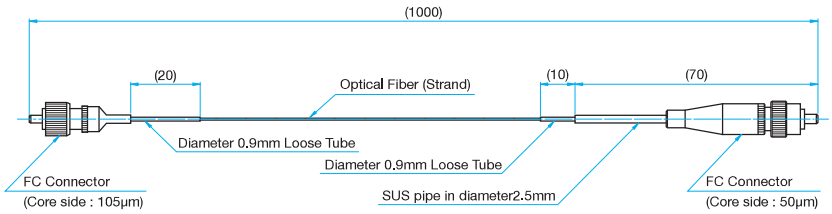
Tapered Optical Fiber | TOF

RoHS Catalog Code W2056

Tapered optical fibers use optical fibers shaped with a large input diameter and small output diameter, to deliver a spot size that cannot be achieved by focusing with a lens. Optical fibers are constructed by melting and stretching them using heaters or torches, and can be made into any desired fiber diameter to suit requests. (*The core/cladding ratio is fixed, so the outer diameter differs on the input side and output side)

Termination Shape

The standard termination shape of tapered optical fibers is similar to the shape that general patch cable is terminated (refer to image below). The tapered section can be terminated with SUS pipe to reduce fluctuations in optical power caused by bending and other factors.



Specifications					
Input Side Core Diameter	125μm	240μm	360μm	600μm	1000μm
Output Side Core Diameter	10μm	50μm	105μm	105μm	105μm
Fiber NA	0.29 (GI), 0.22 (GI)				
Operating Wavelength	≦8dB	≦3dB	≦3dB	≦6dB	≦7dB
Insertion Loss (at 633nm)	GI (recommended), SI				
Taper Length	≦80mm				
Fiber Length	1m				
Jacketing	0.9mm loose tube, 3.0mm cable				
Connector	SMA, FC, SC				

Note: Contact us for specifications other than those listed above.
* Fiber diameters and special connector shapes other than standard specifications are also available.

Specifying Part Numbers

TOF- □□□ - □□□ - □□□ - □□ - 1 - □ - □□□□

Input Fiber Core Diameter

125:	125μm
240:	240μm
360:	360μm
600:	600μm
1000:	1000μm

Output Fiber Core Diameter

10:	10μm
50:	50μm
105:	105μm

Output Fiber NA

290:	0.29
220:	0.22

Refractive Index Distribution

GI:	GI
SI:	SI

Fiber Shape

0:	Strand
2:	0.9mm loose tube
3:	3.0mm cable

Connector Shape

SMA0:	Input Side SMA No Output End
0FC:	No Input End Output End FC

Optical Adapter

RoHS Catalog Code W2057

Adapter for optical fiber connections.

- Single-mode/Multi-mode
- FC, SC, LC connectors
- Available for angle-polished (APC) types
- Wide key type and narrow key type

Guide

▶Also available for single-mode optical fiber cables.

FC Adapter
SSFC131A4-SM
SSFC131A4-SM-APN

FC Adapter
SSFC132A2-SM

SC Adapter
SSSC131B-1A

SC/APC Adapter
SSSC131B-1A-AP

LC Adapter
SSLC-1ASRZR-BL-SM

FC-SC Conversion Adapter
SSSC133B-SCFC
SSSC133B-SCFC-AP1

Shutter for SC Adapter
SSSC-1SH-CL-LN

Specifications

Part Number	Connector Type	Details
SSFC131A4-SM	FC/PC-FC/PC Adapter	Square flange, wide key
SSFC131A4-SM-APN	FC/APC-FC/APC Adapter	Square flange, narrow key (2mm)
SSFC132A2-SM	FC/PC-FC/PC Adapter	Rectangle flange, wide key
SSSC131B-1A	SC/PC-SC/PC Adapter	Housing: resin, color: blue
SSSC131B-1A-AP	SC/APC-SC/APC Adapter	Housing: resin, color: green
SSSC133B-SCFC	FC/PC-SC/PC Conversion Adapter	Housing: metal, FC side wide key
SSSC133B-SCFC-AP1	FC/APC-SC/APC Conversion Adapter	Housing: metal, FC side narrow key (2mm)
SSLC-1ASRZR-BL-SM	LC-LC Adapter	Housing: resin, color: blue
SSSC-1SH-CL-LN	Shutter for SC Adapter	Housing: resin, color: clear

- Optical adapters other than those listed above are also available, so feel free to contact us.

Bare fiber adapter

Conversion plug

Dual adapter

Multi adapter

Fixed optical attenuator