Provider of unique all-fiber solutions for mode control in optical communications and fiber sensors

KSPhotonics

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Fiber Mode Control Innovation

KSPhotonics

Contents

KS photonics provides unique devices based on all-fiber technologies for optical communications and fiber sensors

KS Photonics Inc. was established in 2012 and develops, manufactures, and sells optical fiber devices and instruments for R&D in optical communications and sensors fields.

The functions provided by the devices are unique and in most cases not available by other means. Initial focus of the company is on the mode control in single and few mode optical fibers for mode division multiplexed systems and interferometric systems.

The products are based on all-fiber technologies providing negligible optical loss with high efficiency.

KS Photonics products will be the enablers for innovations in the optical fiber communication systems and fiber sensors. The company is closely collaborating with universities and industrial and public R&D organizations for the development of future products.

Mode Division Multiplexers

Highly efficient all-fiber optic mode converting device

3-mode
(LP$_{01}$, LP$_{11(a,b)}$)

60(H)×160(W)×180(D)

4-mode
(LP$_{01}$, LP$_{11}$, LP$_{21}$, LP$_{02}$)

60(H)×160(W)×180(D)

6-mode
(LP$_{01}$, LP11$_{11(a,b)}$, LP$_{21(a,b)}$, LP$_{02}$)

50(H)×220(W)×250(D)

10-mode
(LP$_{01}$, LP$_{11(a,b)}$, LP$_{21(a,b)}$, LP$_{02}$, LP$_{31(a,b)}$, LP$_{12(a,b)}$)

50(H)×220(W)×250(D)

● Any design or specification can be changed without prior notice.

Mode Division Multiplexer/Demultiplexer Performance at 1550 nm

	LP$_{01}$	LP$_{11a}$	LP$_{11b}$	LP$_{21a}$	LP$_{21b}$	LP$_{02}$
Coupling efficiency (%)	84	86	82	82	70	81
Extinction ratio (dB)	16	21	20	16	18	16

Temperature : 25℃

*Due to the manual fabrications, coupling efficiency and extinction ratio can vary for individual units.

Features

● All-fiber optic construction

● Low loss mode mux/demux

● Broadband operation

● Available with or without connectors

Applications

● Mode division multiplexing for optical communications
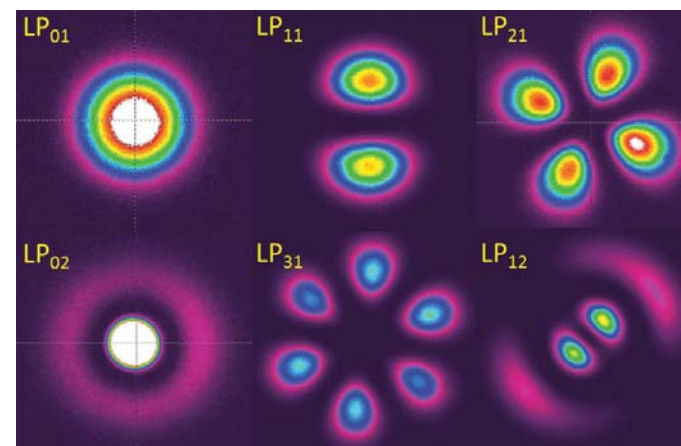
● Excitation of higher order modes

Mode Selective Couplers

Highly efficient all-fiber optic mode converting device

16(H)×62(W)×20(D)

Real image view from each mode selective coupler at 1550 nm

Features

- All-fiber optic construction
- Low loss mode coupling
- Broadband operation
- Available with or without connectors

Applications

- Mode division multiplexing for optical communications
- Excitation of higher order modes
  Optical fiber sensor

Mode Selective Coupler Performance at 1550 nm

Mode	LP_{11}	LP_{21}	LP_{02}	LP_{31}	LP_{12}
Coupled Power (dB)	-0.36	-0.47	-0.51	-0.76	-0.70

Tested by 1550 nm CW laser source, 0dBm input power at room temperature (25℃)

This data is an exampled and can vary.

Fiber Variable Ratio Couplers/
Tunable Directional Couplers

Compact directional coupler with tunable coupling ratio

Manual Type

25(H)×91(W)×91(D)

Manual Type with Display

50(H)×110(W)×110(D)

Specifications

Insertion loss (dB)	< 0.1 (bare type) <0.5 (adapter type)
Tuning range of coupling (%)	0 - 100
Operation wavelength (nm) (633, 830, 980, 1064, 1550)	Can be specified by customer
Polarization Extinction Ratio (dB)	> 20 (PMF, Manual type only)

● Any design or specification can be changed without prior notice.

Features

● Negligible loss
● Polished fiber coupler
● Tunable coupling ratio (0 -100%)
● Available with various fiber types (SMF and PMF)
● Available at customer specified wavelength
● Coupling ratio displaying (Display type only)

Applications

● Optical system testing
● Interferometry
● General laboratory experiments
● Optics education kits

PM Fiber Couplers

Compact fixed ratio coupler with polarization maintaining fiber and other specialty fibers

16(H)×20(W)×62(D)

Features

- Customized coupling ratio (0-99%)
- Excellent temperature stability
- 2 X 2 or 1 X 2 available
- High polarization extinction ratio

Specifications (PMF)

Insertion loss (dB)	< 0.35 (1550 nm)
Coupling (%)	Can be specified by customer 0-99
Operation wavelength (nm)	Can be specified by customer 633, 830, 980, 1064, 1310, 1550
Polarization Extinction Ratio (dB)	> 20 (adaptor type) > 25 (bare type) (1550 nm)

- Any design or specification can be changed without prior notice.

Applications

- Polarization maintaining fiber laser
- Fiber Gyroscope
- Fiber sensor
- Interferometry

Polarization controllers

All-new fiber-optic polarization controllers

Single Paddle Type

60(H)×83.5(W)×24(D)

59(H)×113.7(W)×31(D

Stackable Three Dial Type

18(H)×155(W)×22(D)

25(H)×160(W)×35(D

● Any design or specification can be changed without prior notice.

Specifications

Insertion loss (dB)	< 0.4
Polarization Extinction Ratio (dB)	> 30
Polarization dependent loss (dB)	< 0.03 (typical)
Operation range (nm)	1260 - 1625

Features

● No squeezing fiber
● Short fiber length
● High extinction ratio (> 30dB)
● Available with or without connectors

Applications

● Optical communication
● Fiber optic sensors
● Component testing
● Fiber laser
● PDL measurement

Single Paddle Type

● Compact new single paddle design
● Wavelength insensitive
● Easy to use (intuitive control)

Stackable Three Dial Type

● Multiple PCs stackable in a small volume

Tunable Long Period Gratings

Compact tunable inter-modal mechanical converter

82(H)×100(W)×77(D)

Specifications

| Tunable beatlength range (μm)	300-1100

● Any design or specification can be changed without prior notice.

Features

- ● Works for wide range of beatlengths
- ● Works for many modes
- ● Wavelength independent
- ● Adjustable coupling ratio
- ● Low loss and back reflection

Applications

- ● Mode division multiplexing
- ● Fiber sensors
- ● Wavelength filter
- ● Modal interferometry
- ● General laboratory experiments
- ● Optics education kits
- ● Characterization of fiber modes
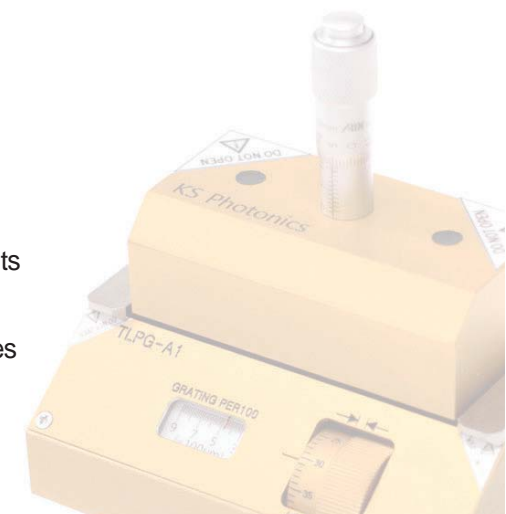
All-Fiber AOTF

Highly efficient all-fiber acousto-optic tunable filter

15(H)×190(W)×20(D)

Specifications

Wavelength range (nm)	Customized
Notch Depth (dB)	> 10

Features
- High efficiency notch filtering
- All-fiber optic construction
- Low optical loss
- Custom operation wavelength range
- Electronically control of center wavelength and notch depth

Applications
- Spectral notch filter
- Frequency shifter
- Spectral shaper

- Any design or specification can be changed without prior notice.

Fiber Long Period Gratings

Highly efficient all-fiber Long Period Gratings

3(Φ)×50(W)

Specifications

Wavelength range (nm)	Customized
Notch Depth (dB)	> 10

Features
- High efficiency notch filtering
- Permanent gratings
- All-fiber optic construction
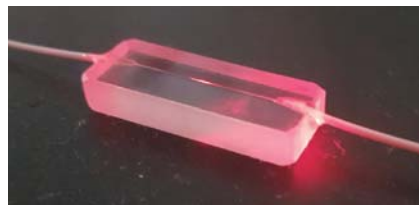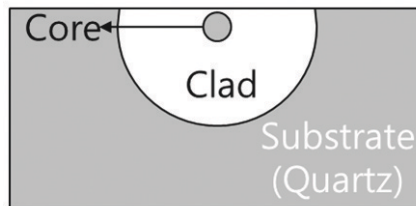- Custom operation wavelength range

Applications
- Spectral notch filter
- Spectral shaper
- Environmental sensor
- Gain flattening filter

- Any design or specification can be changed without prior notice.

Side Polished Couplers

Low loss half Couplers

5 (H)×10(W)×27(D)

Features

- Negligible loss
- Various substrate (quartz) dimension
- Available with various fiber types including SMF, MMF and PMF
- Available at customer specified polishing depth

Applications

- Optical communication
- Fiber optic sensors
- Fiber laser

Polishing depth (dB)	1-60, Using index matching liquid
Operation wavelength (nm)	Can be specified by customer
Insertion loss (dB)	<0.1

Location

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