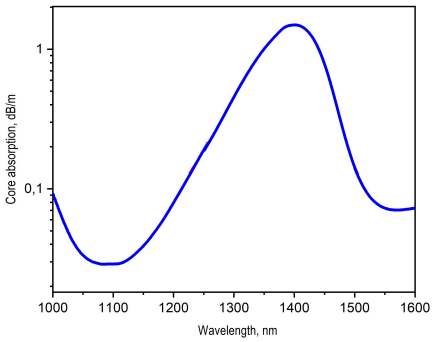
BISMUTH-DOPED FIBERS MODULES

ARTICLE OFM-BAC-SI-1370-1490



Bismuth-doped fibers modules OFM-BAC-SI-1370-1490 include four variants. In the first three types (OFM-BAC-SI-1370-1490, OFM-BAC-SI-1370-1490-HC, and OFM-BAC-SI-1370-1490 -XC), the active absorption at 1400 nm increases sequentially by approximately 80–100%: 0.75 / 1.35 / 2.75 dB/m.

The gain increases accordingly. All fibers modules are specifically designed for use in fiber amplifiers, lasers, and superluminescent fiber sources operating in the 1370–1490 nm wavelength range.

Bismuth-doped fibers modules OFM-BAC-SI-1370-1490 has the highest ratio of active absorption to unsaturable losses, enabling the lowest noise figure in amplifiers. It is recommended when achieving the minimum noise figure is the main priority in amplifier design or when maximum laser efficiency (>65%) is required.

Bismuth-doped fibers modules OFM-BAC-SI-1370-1490-HC and OFM-BAC-SI-1370-1490-XC allow the length of a laser or amplifier to be reduced by approximately 2 and 4 times, respectively, compared to the OFM-BAC-SI-1370-1490 fibers modules. They are well suited for applications where minimizing device length is a priority.

Bismuth-doped fibers modules OFM-BAC-SI-1370-1490-PM has a PANDA-type structure and therefore supports polarization. The presence of a noticeable polarization-dependent gain effect can be useful for achieving lasing in a single polarization.

FIBER SPECIFICATIONS	OFM-BAC-SI-1370-1490	OFM-BAC-SI-1370-1490-HC	OFM-BAC-SI-1370-1490-XC	OFM-BAC-SI-1370-1490-PM
Wavelength range, nm	1370 ÷ 1490	1370 ÷ 1490	1370 ÷ 1490	1370 ÷ 1490
Core diameter, μm	6.5 ± 0.6	6.5 ± 0.6	1370 ÷ 1490	6.5 ± 0.6
Clad diameter, μm	125 ± 5	125 ± 5	1370 ÷ 1490	125 ± 5
Coating diameter, μm	230 ± 20	230 ± 20	1370 ÷ 1490	230 ± 20
Coating material type	silicon rubber or acrylate	silicon rubber or acrylate	1370 ÷ 1490	acrylate
Core NA	0.14 ± 0.02	0.14 ± 0.02	1370 ÷ 1490	0.14 ± 0.02
Cutoff wavelength, μm	1.15 ± 0.1	1.15 ± 0.1	1370 ÷ 1490	1.15 ± 0.1
Amplification range (-3dB), nm	1410 ÷ 1450	1410 ÷ 1450	1370 ÷ 1490	1410 ÷ 1450
Core absorption (1350 nm), dB/m	0.3 ± 0.06	0.53 ± 0.1	1370 ÷ 1490	1.1 ± 0.25
Typ. peak gain (@1430 nm), dB/m	> 0.3 (Pp ~ 200mW at 1310nm)	> 0.53 (Pp ~ 200mW at 1310nm)	1370 ÷ 1490	> 1.1 (Pp ~ 200mW at 1310nm)
Typ. gain (@1410 ÷ 1450 nm), dB/m	> 0.2 (Pp ~ 200mW at 1310nm)	> 0.33 (Pp ~ 200mW at 1310nm)	1370 ÷ 1490	> 0.65 (Pp ~ 200mW at 1310nm)
Approximate fiber length required to achieve amplification of a weak signal of 25 dB @ 1430 nm, m	100	60	1370 ÷ 1490	30
Typical laser eff-cy (@1440nm), %	> 50% (vs pump power at 1310nm)	> 50% (vs pump power at 1310nm)	1370 ÷ 1490	> 50% (vs pump power at 1310nm)
Splice loss with SMF28 (1310 nm), dB	~ 0.2	~ 0.2	1370 ÷ 1490	~ 0.2

Possible applications:

- Wideband and ultrabroadband fiber telecom systems with wavelength division multiplexing (including dense and course) where bismuth-doped fiber amplifiers (BDFA) help to increase fiber reach and capacity in several times;
- Widely tunable lasers for various applications including spectroscopy, sensing, metrology etc;
- Wideband and ultrawideband superfluorescent fiber sources for OCT, telecom etc.
- Short and Ultrashort pulse fiber lasers in sub-ps, -ps and -ns ranges in diapason 1.1-1.8 um for variety of applications including spectroscopy, metrology, sensing etc.

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