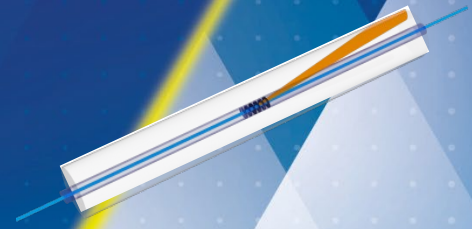


RSS Raman Scattering Suppressor



The RSS is an all-fiber, Fiber Bragg-grating (FBG)-based filter that eliminates Stimulated Raman Scattering (SRS) while transmitting the laser signal in high-power fiber lasers.

Now compatible with large core fibers for MOPA configurations.

Significantly increase laser **stability**, fiber **length** and **beam quality** by preventing the onset of SRS with this simple all-fiber component.

Using TeraXion's exclusive tilted FBG filter technology ^{(1), (2)}, the RSS cleverly guides SRS through the cladding of the fiber where it can finally be safely extracted out of the laser, making power amplifiers

Applications include multi-kW industrial lasers for metal cutting and welding, additive manufacturing and defence systems for Directed Energy (DE).

Top 5 Features

- **Value:** Enables otherwise unachievable levels of output power consistency and beam quality stability. It also enables the use of much longer fibers, which are becoming essential to manufacture larger workpieces, and to give design flexibility for modular designs of multi-kilowatt systems.
- **Reliability:** Patented design enabling unmatched handling of deleterious SRS. With very consistent performances and quality, long-term stable operation is ensured.
- **Power scaling:** Suitable for fiber laser oscillators and MOPA up to 5 kW, creating a protection for power amplifiers. Eliminating SRS also means more margin to manage Transverse Mode Instabilities (TMI).
- **High efficiency:** Minimizes energy down-conversion to the Stokes wave, with very low insertion loss.
- **Adaptability:** Every laser design is different, and the RSS can be tailored to perfectly match the specific requirements of the system.

(1) Patents granted: US10393955, US10663654, US11215749, US11681094, CA2971601 CA3156196

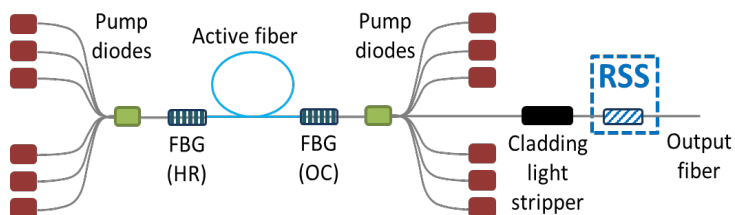
(2) Patents pending: CA3175294

General Specifications

Optical Parameters	Specification	Units
Passband center wavelength (CWL _{pass}) at room temperature ^{(1),(2),(3)}	1010 to 1090	nm
Insertion loss @ CWL _{pass} ⁽¹⁾	≤ 0.15	dB
Stopband center wavelength (CWL _{stop}) at room temperature ^{(1),(2),(3)}	-13.6 THz shift with respect to CWL _{pass}	
SRS attenuation bandwidth (stopband centered on CWL _{stop})	≥ 20	nm
SRS attenuation level (over the specified SRS attenuation bandwidth) ⁽¹⁾	≥ 20	dB
Power handling ^{(4),(5)}		
Maximum cladding power	Up to 2000	W
Maximum signal power	Up to 5000	W
Mechanical parameters		
Pigtails length	Standard: 1	m
Package type	Low index recoat, 100 mm long ⁽⁶⁾	
Proof test	50	kpsi
Standard fiber parameters ⁽⁷⁾		
Core diameter	10 to 35	um
Core NA	0.06 to 0.11	
Cladding diameter	125 to 600	um
Cladding NA	≥ 0.42	
Product compliance		
RoHS compliant	Yes	

- (1) LP₀₁ mode
- (2) Room temperature = 20 °C to 23 °C
- (3) Custom wavelengths can also be offered.
- (4) Power handling depends on fiber type. In general, the maximum cladding power handling depends on the maximal signal power handling and vice versa. Several grades and combinations are available, contact TeraXion for details.
- (5) With proper cooling on a water-cooled cold plate to ensure that the RSS temperature is kept below 70 °C in operation.
- (6) The recoat diameter depends on the fiber parameters in general.
- (7) Several (but not all) combinations of core diameter, core NA and cladding diameter are available. Contact TeraXion for details.

High-power fiber laser oscillators with RSS filter



Ordering information

For orders, questions, specific requirements or to learn more about TeraXion's products, contact us at info@teraxion.com

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