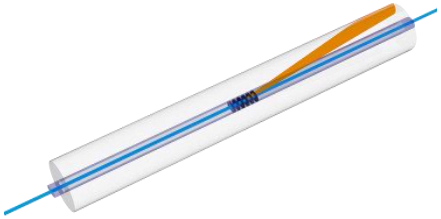
TeraXion

An indie Semiconductor Company

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.
TeraXion's RSS is the only cost-effective, patented solution that eliminates SRS at its source.

Manufacturers can now significantly increase the output power and the stability of their lasers by reducing SRS.

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.

Applications include multi-kW industrial lasers for metal cutting and welding and defence systems for Directed Energy Weapons (DEW).

(1) Patents granted: US10393955 and US10663654
(2) Patents pending: US20200333529 and CA2971601

Top 5 Features

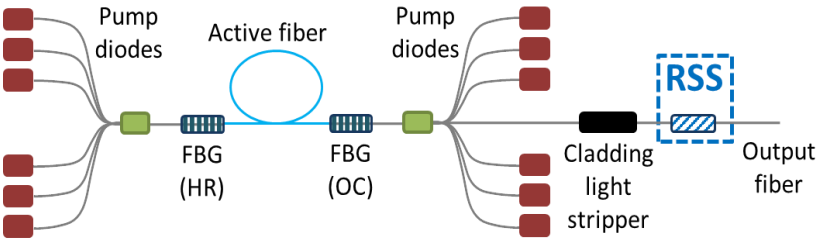
- **Value:** Allows the usable output power of fiber laser oscillators to be increased by up to 300%. Helps stabilize laser output power and beam profile for applications involving highly reflective targets, such as copper in battery welding processes. Allows the use of longer fibers, which is welcome in some laser architectures such as those that rely on tandem pumping.
- **Reliability:** Patented design enabling unmatched handling of deleterious SRS. With very consistent performances and quality, long-term stable operation is ensured for industrial and defence systems.
- **Power scaling:** Suitable for fiber lasers up to 5 kW. 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.
- **Partnership:** TeraXion will offer support through the entire product development process, from prototyping to mass production.

General Specifications

Optical Parameters	Specification	Units
Passband center wavelength (CWL_{pass}) at room temperature (1),(2),(3)	1064 to 1080	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})	≥ 15	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	20 to 25	um
Core NA	0.06 to 0.11	
Cladding diameter	125 to 600	um
Cladding NA	≥ 0.42	
Product compliance		
RoHS compliant	Yes	

(1) LP_{01} 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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