Filter Components

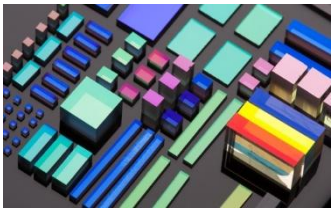
PowerLocker™ VBG Wavelength Stabilization Gratings

Volume Bragg Gratings (VBG / VHG) for stable, narrowband wavelength locking of laser diodes

PowerLocker™ wavelength stabilization gratings are Volume Bragg Gratings (VBGs) that lock the emission of a laser diode into a narrowed optical spectrum, increasing spectral brightness and ensuring highly stable optical performance over extended temperature ranges. PowerLocker™ gratings enable compact external cavity designs that deliver superior mode selection and wavelength stability without compromising power output.

PowerLocker™ VBGs are holographically recorded throughout the volume of glass. They are stable over a wide range of operating conditions, optical intensities, and do not degrade over time.

Using proprietary materials, precision manufacturing processes and industry leading test techniques, Coherent delivers world-class consistency, reproducibility, and data traceability on every VBG, every time.





FEATURES

- Increase spectral brightness
- Reduce thermal dependence
- Filter unwanted spectral components
- Narrow spectral bandwidth
- Low loss, Low power penalty
- Environmentally stable at high temperature and humidity, with over 12,000 hours of testing at 150°C
- No degradation under high optical intensities

USES

- External Cavity wavelength stabilization
- Targeting absorption band of a pump medium - maximize efficiency / reduce overall power consumption
- Wavelength Tuning
- Spectral Filtering
- Spatial Filtering
- Wavelength-selective Output Coupler
- Spectral Beam Combining

APPLICATIONS

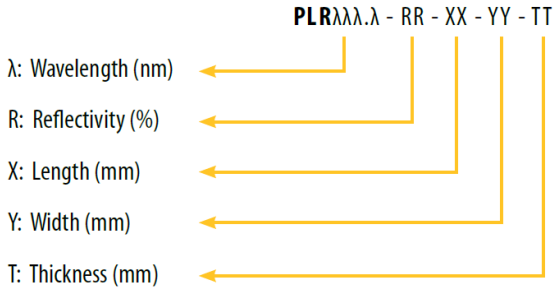
- Optical Pumping for Fiber & Slab Laser
- Direct Diode Material Processing
- Diode Pumped Alkali Vapor Laser (DPAL)
- Laser Spin Exchange Optical Pumping (SEOP)
- Pr3+ Doped Crystals Pumping
- Diode Pumped Solid State (DPSS) Laser
- Raman Spectroscopy
- RGB Sources
- Quantum Computing, Entangled Photon Source
- Frequency Doubling
- Gas Sensing
- Bioinstrumentation
- Particle Counting
- Lung Imaging
- LIDAR
- Skincare, Tattoo Removal, Acne Treatment
- Metrology, Holography
- Graphic Arts (Printing & Digital Imaging)
- Photodynamic Therapy

ONDAX

Specifications[5]	Unit	Min	Typical	Max
Center Wavelength[1]	nm	375	405, 633, 658, 780, 785, 794.7, 808, 885, 888, 940, 976, 981, 1064, O-Band, C-Band, 1725, 2100	2700+
Wavelength Tolerance[2]	nm		+/-0.5	
Wavelength Variation (within filter)	nm			0.2
Bandwidth[3] (FWHM)	nm	0.03	0.1	1
Temperature Dependence	nm/°C		0.01	
Diffraction Efficiency [Bragg Mirror Reflectivity]	%	3	5 - 98	99
Diffraction Efficiency [Reflectivity] Tolerance[2]	%		+/-5	
Grating Slant Angle[4]	°		<1	
AR Coating Reflectivity (per surface)[2]	%			0.5
Insertion Loss (scatter + absorption)	%		<1	
Laser Induced Damage Threshold (@ 1064nm, 20ns pulse width)	J/cm^2		15	
Dimensions	mm	0.5		25
Thickness	mm	0.5		30

[1] Custom wavelength available
[2] Tighter tolerances available on request
[3] Grating bandwidth is a function of wavelength and thickness
[4] Custom slant angles available on request
[5] Not all Max/Min specifications are available in all items

Ordering Information



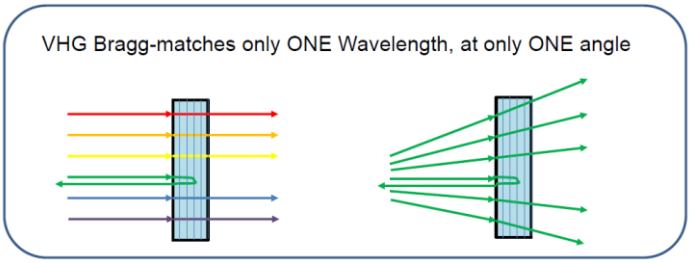
- Bandwidth is a function of WL and thickness, and goes inverse linear with thickness
- Wavelength is specified at 25 °C, vacuum referenced by default. Please note if air referenced.

Options Available

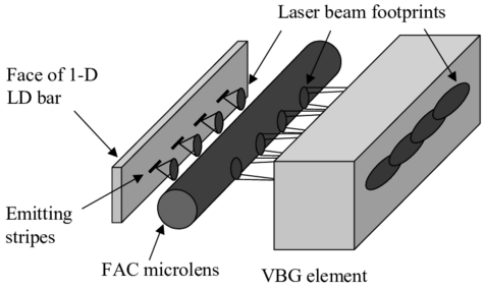
- VBG assembled in 1" diameter or ½" diameter round mount
- Transverse-chirped wavelength (linear wavelength gradient)
- Custom wavelength and tighter tolerances available
- Custom slant angles available.

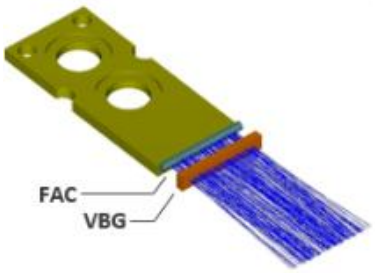
Principle of Operation

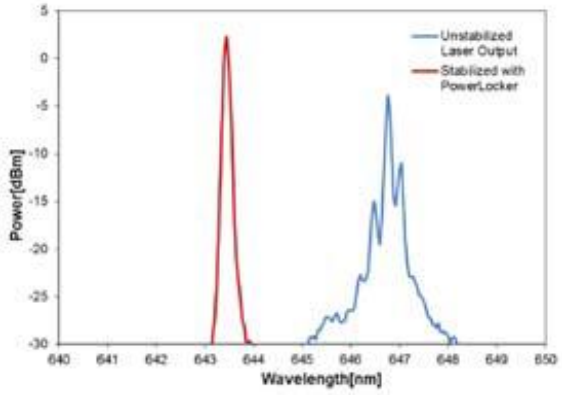
A Volume Bragg Grating (VBG) acts as a partially reflective, WL-selective mirror. When well-aligned to a laser source, the VBG creates an external cavity, and retro-reflects a well-defined percentage of the input beam at the design wavelength. This stabilizes the output, locks the wavelength, and increase the power in the desired mode.

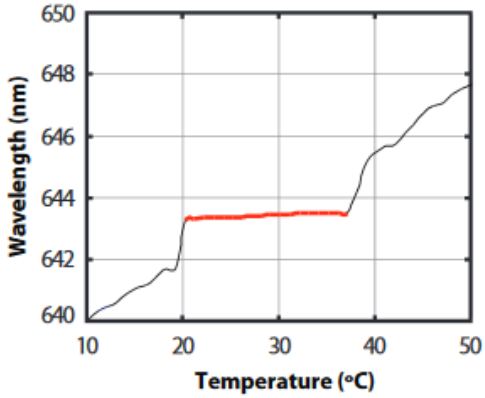


For a well-collimated, well-aligned beam, the retro-reflected light is not lost – it is coupled back into the laser cavity and further amplified.









Handling

Shipping: VBG's are shipped in low-VOC Gel-Paks, with vacuum release. Custom packaging options are available.

Storage Temperature: VBG storage temperature: -20 to +250 °C; Gel-Pak storage temperature: -10 to +75 °C

UV Exposure: Avoid exposure to UV wavelengths below 350 nm. If bonding VBG's with a UV-cure epoxy use preferably a filtered LED source above 350 nm.

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