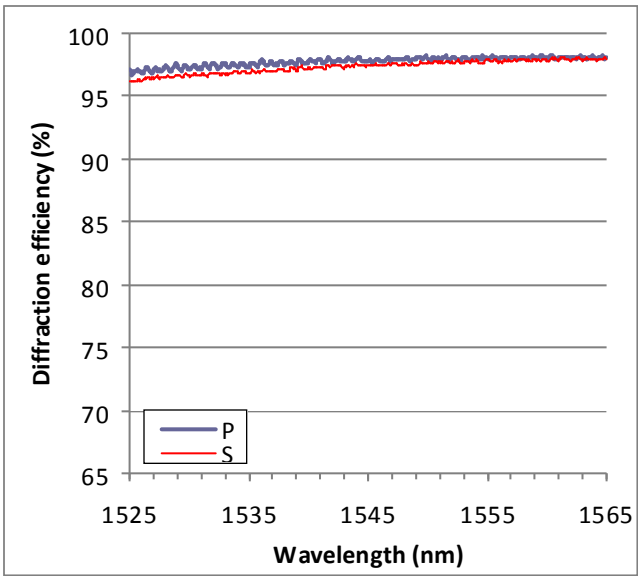
Specification for High Efficiency Telecom Transmission Grating, T-940C series

Crafting light for the Information Age



LightSmyth Technologies' transmission gratings are fabricated on fused silica substrates and robust dielectric films by state-of-the-art projection photolithography and reactive ion etch. These high fidelity semiconductor fabrication methods enable precise realization of sophisticated proprietary grating designs that provide diffraction efficiency close to 100% and line spacing control to 1 part per million.
No other grating technology is capable of achieving this degree of performance combined with the cost effectiveness and reproducibility afforded by semiconductor volume fabrication technology.

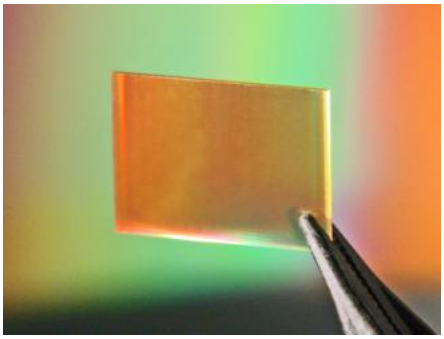
Left: Typical absolute diffraction efficiency of 940 grooves/mm Telecom Transmission Grating for C-band.

Features:

- Ultra-High Diffraction Efficiency.
- Very Low Polarization Sensitivity.
- Excellent Feature Fidelity and Groove Uniformity.
- Only fused Silica and robust dielectrics are used, no polymers.
- Extreme environmental stability. Telcordia qualified.
- Each grating is a master: low light scatter, no ghosting.
- Very competitive pricing.
- Strict quality control. LightSmyth is ISO 9001:2008 certified.

Applications

- Optical telecommunications (ROADM, WSS, WDM MUX/DEMUX)
- Pulse compression
- Spectral beam combining
- Remote optical sensors and spectroscopy



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Optical			
Description	Value		Units
	T-940C-[size]-94	T-940C-[size]-92	
Line Density	940.07		Lines/mm
Line Density Uniformity	± 0.001		Lines/mm
Angle of Incidence (AOI) [1]	46.5 ± 1		°
Wavelength Range	1526 to 1566		nm
Optimal polarization [2]	Any		
Diffraction Efficiency [3, 4]	≥ 94	≥ 92	%
Polarization Dependent Loss [3, 4]	≤ 0.2	≤ 0.25	
Spectral Non-Uniformity [3, 4]	≤ 0.2		dB
Spatial PDL Non-Uniformity [3, 4]	≤ 0.1		
Insertion Loss Ripple [4, 5]	≤ 0.1	≤ 0.15	dB

[1] Optical grating performance will remain substantially similar over a 5 ° variation in angle of incidence.
[2] p-polarization: electric field vector is perpendicular to the grating lines; s-polarization is orthogonal to p.
[3] Determined from parabolic fit of efficiency as a function of wavelength for s- and p- polarization.
[4] Worst case in the operational wavelength range.
[5] Determined by Fast Fourier Transform method.

Mechanical	
Dimension tolerances	±0.2 for grating size and width
Substrate Thickness	0.675 ± 0.050 mm
Material	Fused silica, dielectric layers
Scratch/Dig [6]	60/40 standard, 40/20 and 20/10 custom

[6] as per MIL-PRF-1380B in the clear aperture; no requirements outside of the clear aperture.

Substrate dimension options				
Part number	Substrate width, mm [7]	Substrate height, mm [7]	Clear aperture width, mm [8]	Clear aperture height, mm [8]
T-940C-2409-94	24.0	9.0	23.0	8.0
T-940C-2414-94	24.0	14.0	23.0	13.0
T-940C-2414-92	24.0	14.0	23.0	13.0
Custom dimensions	Any rectangle fitting within 135 mm diameter circle (e.g. 130 x 20 mm)			

[7] Width is perpendicular to grating grooves, height is along the grating grooves.
[8] Clear aperture is centered on the substrate.

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