

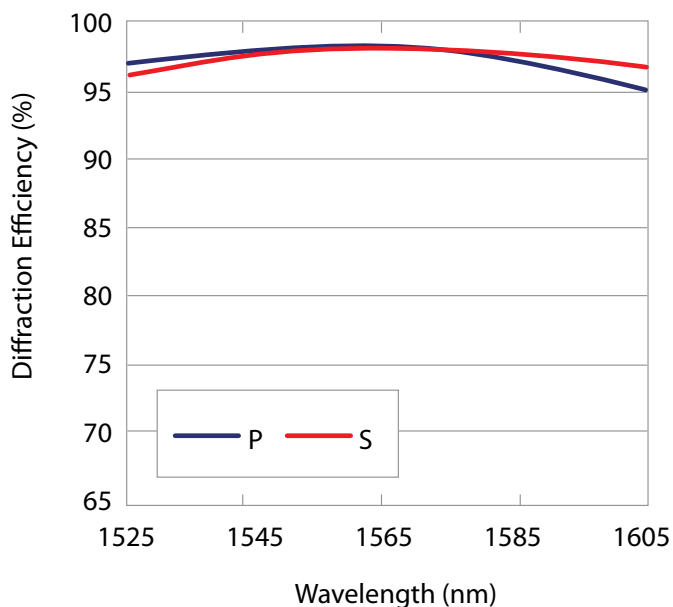
## High Efficiency Telecom Transmission Gratings T-940CL Series

### 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



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 and L band.*

# High Efficiency Telecom Transmission Gratings

## T-940CL Series

Optical		
Description	Value	Units
Line Density	940.07	Lines/mm
Line Density Uniformity	$\pm 0.001$	Lines/mm
Angle of Incidence (AOI) <sup>1</sup>	$47.5 \pm 1$	°
Wavelength Range	1526 to 1610	nm
Optimal polarization <sup>2</sup>	Any	
Diffraction Efficiency <sup>3,4</sup>	$\geq 92$	%
Polarization Dependent Loss <sup>3,4</sup>	$\leq 0.25$	dB
Spectral Non-Uniformity <sup>3,4</sup>	$\leq 0.25$	dB
Spatial PDL Non-Uniformity <sup>3,4</sup>	$\leq 0.1$	dB
Insertion Loss Ripple <sup>4,5</sup>	$\leq 0.15$	dB

Notes: <sup>1</sup> Optical grating performance will remain substantially similar over a 5° variation in angle of incidence.

<sup>2</sup> p-polarization: electric field vector is perpendicular to the grating lines; s-polarization is orthogonal to p.

<sup>3</sup> Determined from parabolic fit of efficiency as a function of wavelength for s- and p- polarization.

<sup>4</sup> Worst case in the operational wavelength range.

<sup>5</sup> Determined by Fast Fourier Transform method.

Mechanical	
Dimension tolerances	$\pm 0.2$ for grating size and width
Substrate Thickness	$0.675 \pm 0.050$ mm
Material	Fused silica, dielectric layers
Scratch/Dig <sup>6</sup>	60/40 standard, 40/20 and 20/10 custom

Note: <sup>6</sup> As per MIL-PRF-1380B in the clear aperture; no requirements outside of the clear aperture.

Substrate dimension options				
Part Number	Substrate width, mm <sup>7</sup>	Substrate height, mm <sup>7</sup>	Clear aperture width, mm <sup>8</sup>	Clear aperture height, mm <sup>8</sup>
T-940CL-2710-92	27.45	10.0	26.45	9.0
T-940CL-2418-92	24.0	18.0	23.0	17.0
Custom dimensions	Any rectangle fitting within 135 mm diameter circle (e.g. 130x20 mm)			

Notes: <sup>7</sup> Width is perpendicular to grating grooves, height is along the grating grooves.

<sup>8</sup> Clear aperture is centered on the substrate.