

# High Efficiency Telecom Transmission Gratings T-966C 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 966 grooves/mm Telecom Transmission Grating for Cband.*

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Optical			
Description	Value		Units
	T-966C-[size]-94	T-966C-[size]-92	
Line Density	966.2		Lines/mm
Line Density Uniformity	± 0.001		Lines/mm
Angle of Incidence (AOI) <sup>1</sup>	48.3 ±1		°
Wavelength Range	1526 to 1566		nm
Optimal polarization <sup>2</sup>	Any		
Diffraction Efficiency <sup>3,4</sup>	≥ 94	≥ 92	%
Polarization Dependent Loss <sup>3,4</sup>	≤ 0.20	≤ 0.25	dB
Spectral Non-Uniformity <sup>3,4</sup>	≤ 0.25		dB
Spatial PDL Non-Uniformity <sup>3,4</sup>	≤ 0.1		dB
Insertion Loss Ripple <sup>4,5</sup>	≤ 0.1	≤ 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	±0.2 for grating size and width
Substrate Thickness	0.675 ± 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-966C-1610-94	16.0	10.0	15.0	9.0
T-966C-2710-94	27.0	10.0	26.0	9.0
T-966C-2710-92	27.0	10.0	26.0	9.0
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.