

MEMS TUNABLE OPTICAL FILTER

With Control Board

OVERVIEW

sercalo's Tunable Optical Filter is based on MEMS technology and is designed for ITU C and L band with a FWHM bandwidth of 0.6 nm. It can be independently controlled by an UART interface or an I²C/SMBus serial bus and features a user-programmable channel grid. The highly reliable tuning mechanism uses an integrated micro-mirror with switching time below 50 ms and insertion loss below 3 dB. The component is designed to conform to Telcordia 1221 reliability standards.

FEATURES

- *45 x 23 x 10 mm³ size*
- *User-programmable channel grid*
- *UART and I²C/SMBus interface*

APPLICATIONS

- *Reconfigurable Optical Add/Drop Multiplexers*
- *Optical power monitors*
- *Optical sensor interrogators*
- *Low cost spectrometer*
- *Low cost tunable laser*

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DESCRIPTION

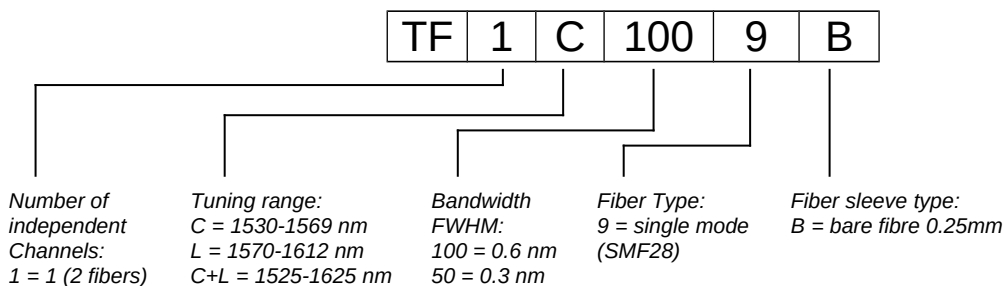
The tunable Filter is composed of an optical system and an electrical driver interface with a size of only 45 x 23 x 10 mm³. Light from the input fiber is collimated onto a fused silica grating. The grating diffracts the incoming light into its spectrum with a distinct angle for each wavelength. A MEMS mirror reflects the light onto the output collimator, which only couples a small fraction of the spectrum into the output fiber. By modifying the mirror tilt angle user can chose the wavelength of the filter.

TECHNICAL SPECIFICATIONS

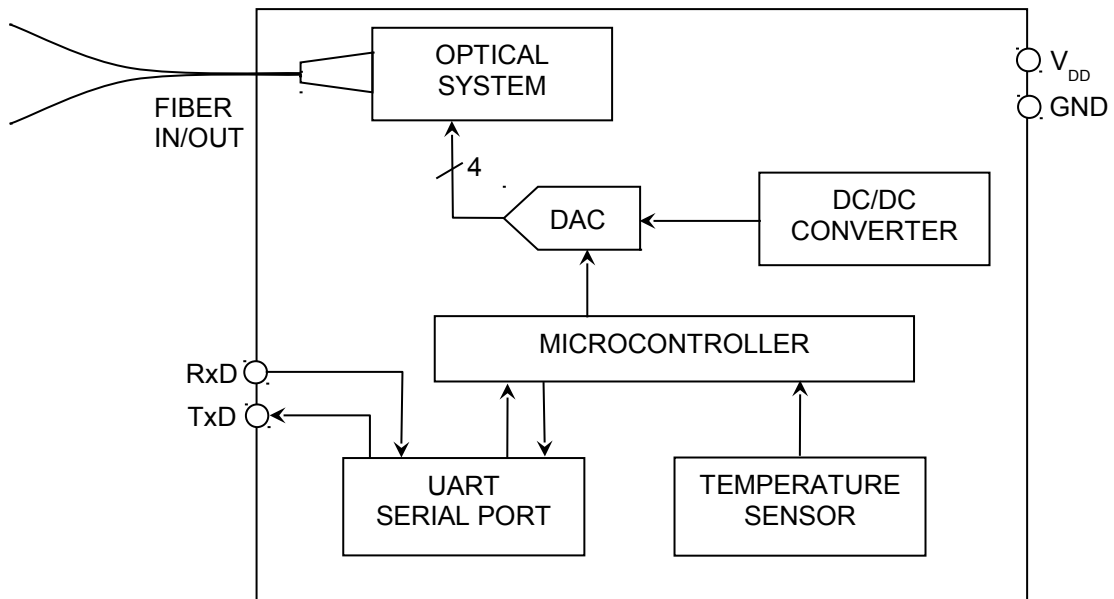
	Unit	Min	Typ	Max
Optical Filter				
Tuning range (span)	nm	1530		1569
Central wavelength			1539	
Insertion loss ¹	dB		1.5	3.0
Bandwidth @ 0.5 dB	nm		0.20	
Bandwidth @ 3 dB	nm		0.45	
Bandwidth @ 20 dB	nm		1.2	
Return loss	dB	30		
Wavelength repeatability	nm		0.01	
Wavelength temperature dependence	pm/K		1	5
Switching time	ms		10	50
PDL	dB		0.3	
Durability	cycles	No wear		
Side Mode Suppression Ratio (SMSR)	dB	25		
Integrated Driver				
Supply voltage (Vdd)	V	4.75	5	5.25
Power consumption (idle)	W		0.2	
Power consumption (operating)	W		1	
UART speed	baud	9600		115200
SMBus/I ² C bus speed	kHz			400
Logic level low	V		0	0.6
Logic level high	V	2.8	5	
Reset inactive voltage ²	V	2.4	5	
Reset active voltage	V		0	0.9
Reset pulse duration	µs	15		
Package				
Operation temperature	°C	0		70
Storage temperature	°C	-40		70
Size (including control board)	mm	45 x 23 x 10		
Size (only optical engine)	mm	16 x 11.2 x 9.2		
Weight	g	75		

¹Value @ 25 °C, without connectors. ²Through onboard pull-up resistor.

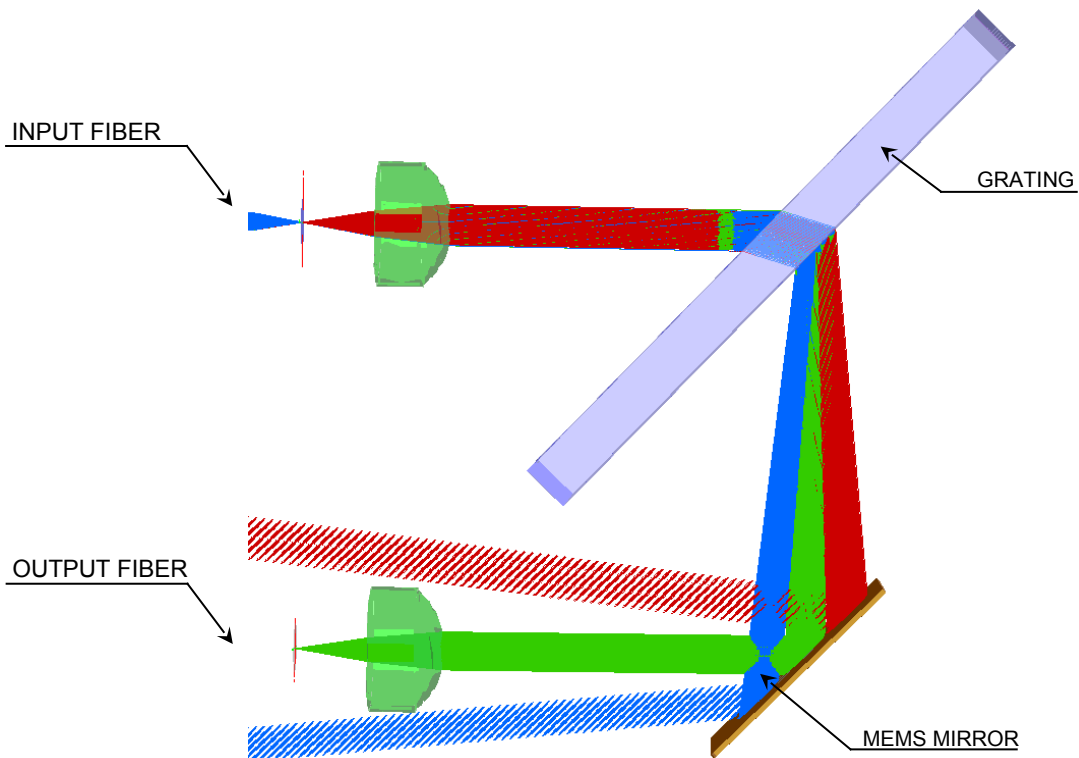
ORDERING INFORMATION



FUNCTIONAL BLOCK DIAGRAM



TUNABLE FILTER OPERATING PRINCIPLE



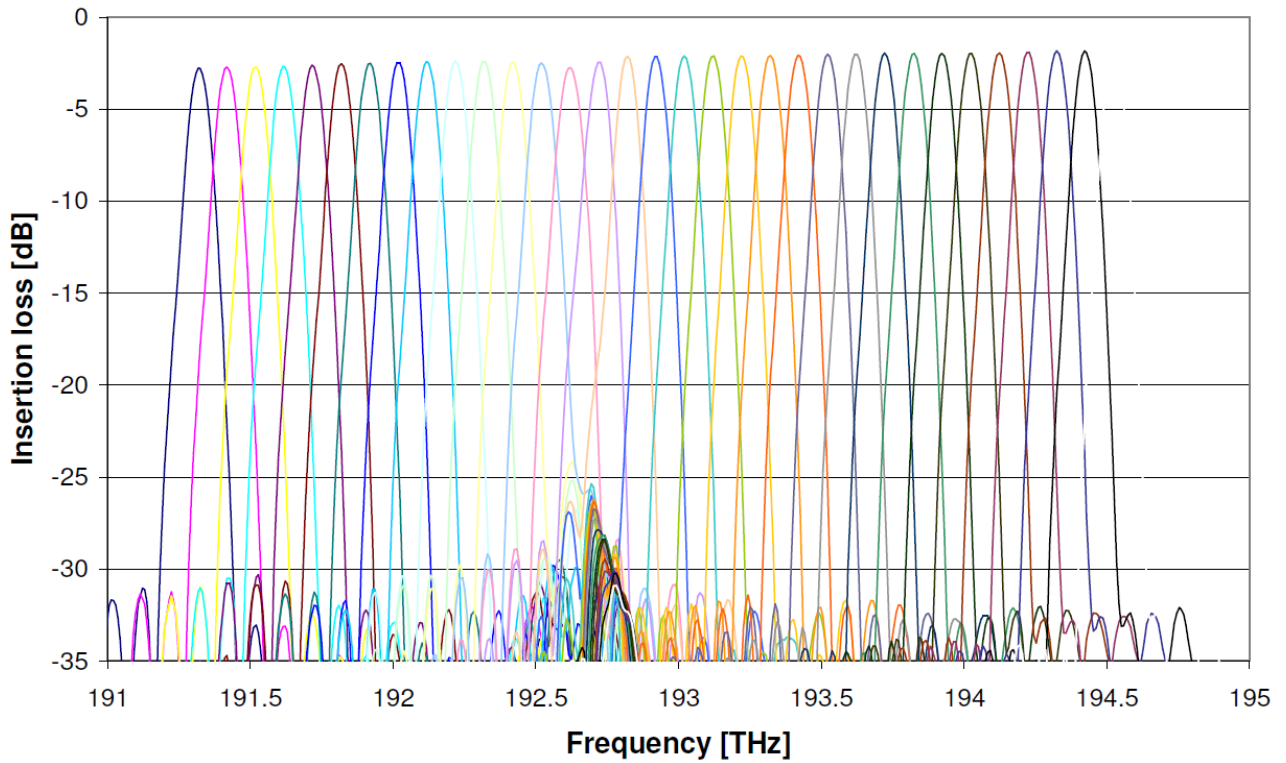


Figure 1 – Example of custom grid: 100GHz spacing, 32 channels

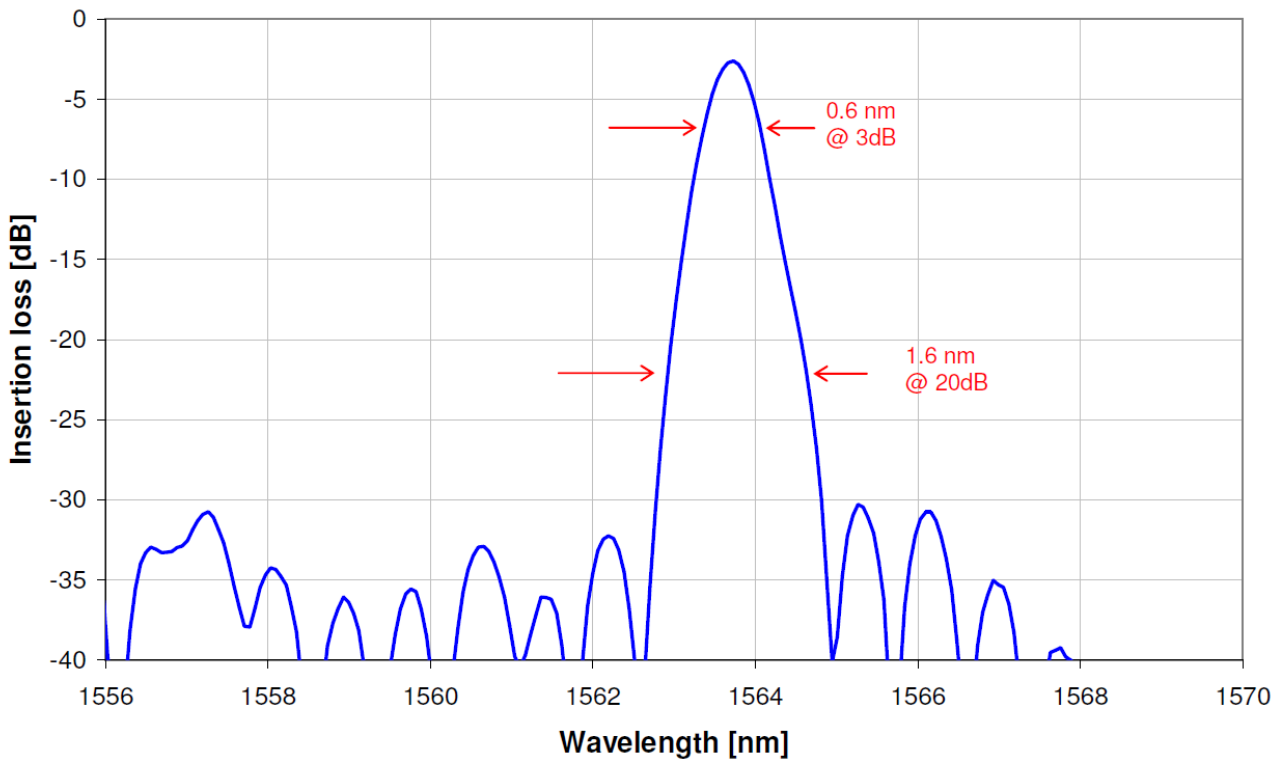


Figure 2 – Typical filter shape