Voltage-Controlled Optical Filters

VCF Series

Key Features

- 50 and 100 GHz tunable filters for C or L band
- High adjacent and non-adjacent channel rejection
- Good wavelength setting accuracy
- Low insertion loss
- Low chromatic dispersion
- Wide tuning range
- Low tuning voltage
- Pins extruding from side of the package
- Mountable on PCB with small footprint

Applications

- ASE suppression for optical fiber amplifiers (OFAs) and tunable lasers or receivers
- Signal demultiplexers for wavelength division multiplexers (WDMs) or 1xN splitters
- Dynamic wavelength selection associated with WDM systems using optical add/drops and flexible wavelength conversion

The JDSU Agile Optical Components family includes modulators, switches, attenuators and tunable filters. These products provide the basis for spectrally efficient DWDM transmission utilizing dispersion tolerant modulation, channel monitoring, wavelength switching, remote power control and dynamic channel selection. They support a wide range of flexible functionalities at lower operational expenses for the Agile Optical Network. In addition, we have a complete line of tunable lasers assemblies and sub-assemblies in our Agile Transmission Module family.

The JDSU VCF series is a voltage-controlled tunable band pass filters* that can be used for amplified spontaneous emission (ASE) suppression of optical signals and for single-channel demultiplexing from a multichannel dense wavelength division multiplexing (DWDM) optical signal stream. The VCF can also be used in flexible and dynamic wavelength optical add/drop applications. The VCF uses hermetic sealing for increased resistance to environmental extremes. The VCF series offers excellent optical performance in either C or L band.

The center wavelength selection is precisely tuned using a stepper motor driven by an external integrated circuit controller. The driver moves the filter up and down in uniform steps in the center wavelength, to provide high resolution. The VCF is compact in size and can easily be mounted on a printed circuit board (PCB).

The transmission spectrum of the VCF is optimized for low insertion loss, high rejection, and low chromatic dispersion.

* Patent pending.

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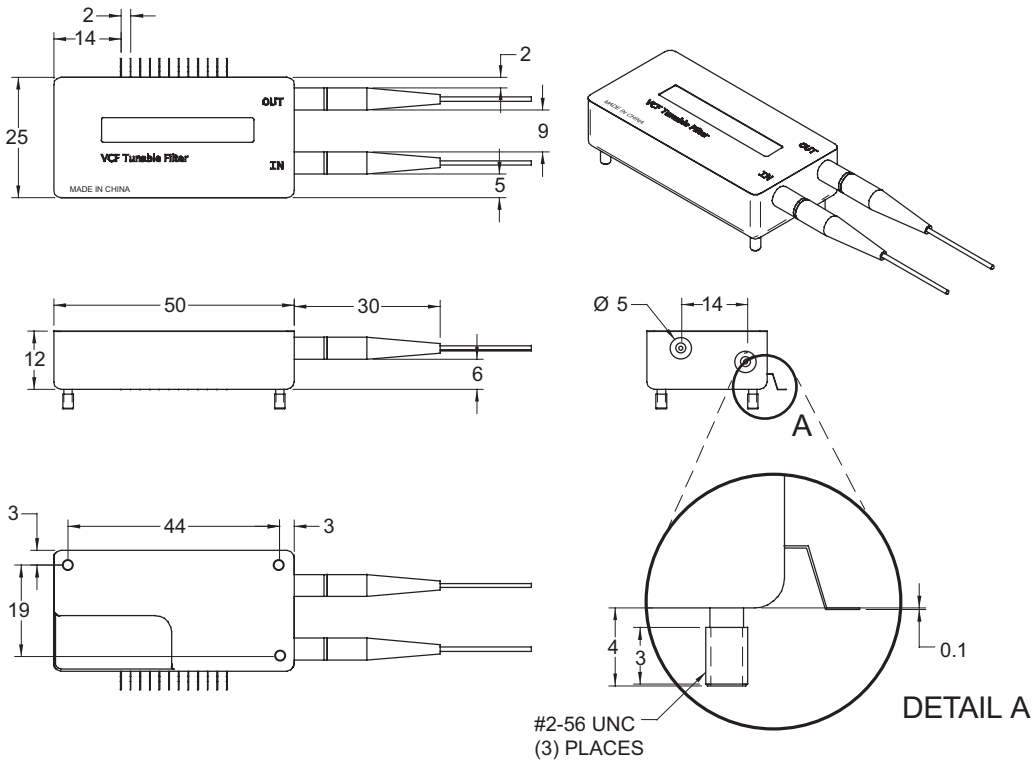
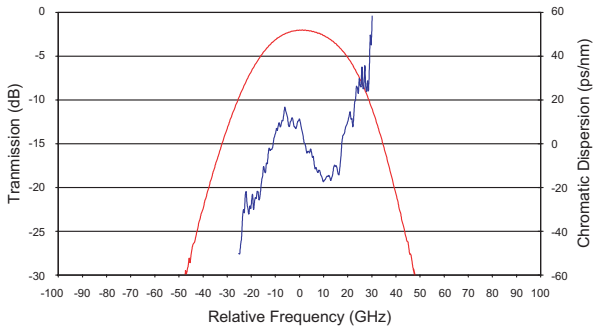
Dimensions Diagram

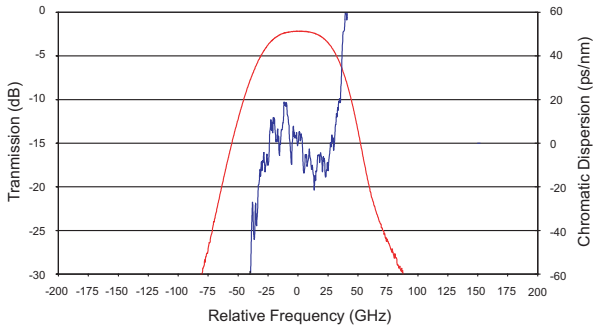
(Specifications in mm unless otherwise noted.)



Filter Performance: VCF050



Filter Performance: VCF100



Specifications[1]

Parameter		VCF050	VCF100
Optimized tuning range		1525 to 1570 nm (C band) or 1565 to 1610 nm (L band)	
Bandwidth (BW at -0.5 dB)	Typical	15 GHz	25 GHz
Bandwidth (BW at -1 dB)	Minimum	20 GHz	30 GHz
Bandwidth (BW at -3 dB)	Typical	35 GHz	70 GHz
Bandwidth (BW at -20 dB)	Maximum	84 GHz	160 GHz
Non-adjacent rejection	Minimum	-40 dB	-40 dB
-1 dB bandwidth variation over tuning range	Typical	±5%	±5%
Insertion loss	Maximum	3.0 dB	3.0 dB
Insertion loss variation over tuning range	Typical	0.5 dB	0.5 dB
Frequency setting accuracy[2]	Typical	±3 GHz	±3 GHz
	Maximum	±4 GHz	±5 GHz
Potentiometer frequency backlash	Typical	2 GHz	2 GHz
	Maximum	8 GHz	8 GHz
Stepper motor frequency backlash	Typical	3 GHz	3 GHz
	Maximum	9.5 GHz	9.5 GHz
Stepper motor frequency repeatability (unidirectional)	Typical	±0.5 GHz	±0.5 GHz
Polarization dependent loss[3]	Maximum	0.30 dB	0.20 dB
Polarization mode dispersion[3]		0.2 ps	0.2 ps
Group delay dispersion[2]		±50 ps/nm	±20 ps/nm
Return loss	Minimum	40 dB	
Settling time	Maximum	30 ms	
Tuning speed	Maximum	5000 ms	
Wear	Maximum	1.2 x 10^6 nm	
Fiber type		SMF-28 with 900 µm buffered jacket or 250 µm bare fiber	
Maximum optical power (single-channel)	Maximum	10 dBm	
Maximum optical power (all channels)	Maximum	23 dBm	
Dimensions (W x H x D)[4] side pinout		25 x 12 x 50 mm	
Operating temperature		-5 to 70 °C	
Storage temperature		-40 to 85 °C	

1. All specifications are excluding connectors, over operating temperature range -5 to 70°C, wavelength range 1525 to 1570 nm or 1565 to 1610 nm, and all polarization states.
2. Using insertion loss feedback.
3. Within specified bandwidth over ±12 GHz from filter center.
4. Excluding strain relief and connector pins.

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Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Sample: VCF100+3CANCE1.5

VCF □□□ +3 □ A □□ □ □ □

Code	Filter Option
050	50 GHz
100	100 GHz

Code	Tuning Range
C	1525 to 1570 nm
L	1565 to 1610 nm

Code	Connector
NC	no connector
FP	FC/HPC[1]
FA	FC/APC[1]
SC	SC/HPC[1]
SU	SC/APC[1]
SP	ST/HPC[1]

Code	Pigtail Type
C	250 µm bare fiber
E	900 µm tight buffer

Code	Pitail Length
1.0	1.0 meter
1.5	1.5 meters

1. Not available for 250 µm bare fiber option.