

# Voltage-Controlled Optical Filters

## VCF Series

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### 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.

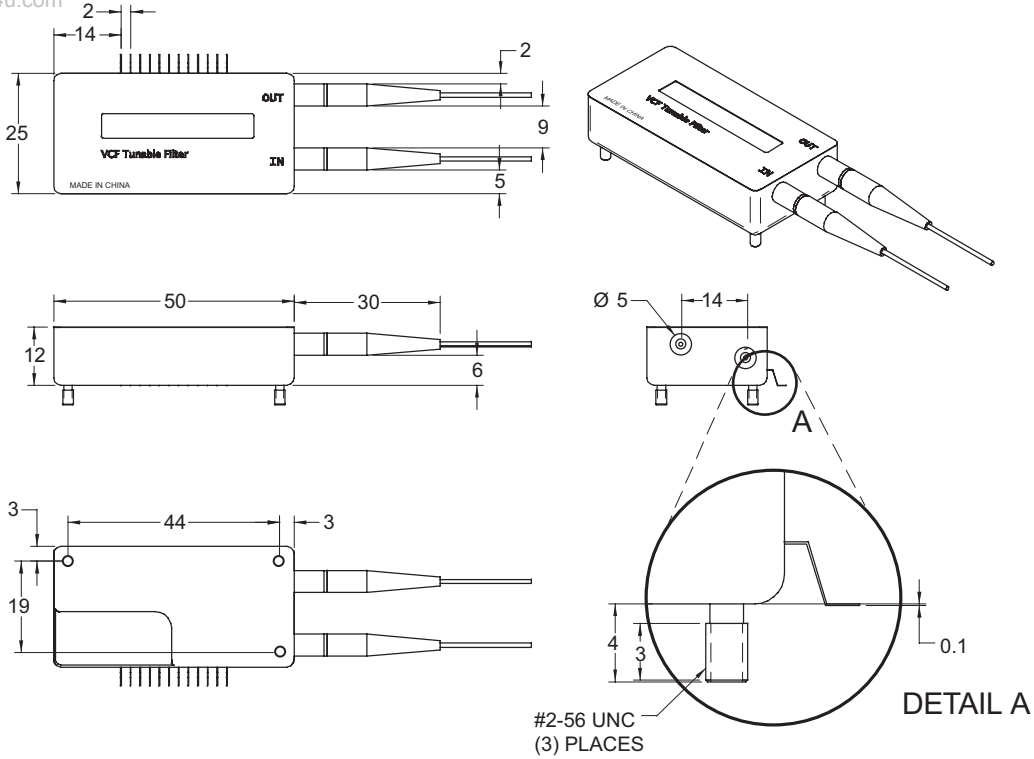
\* Patent pending.

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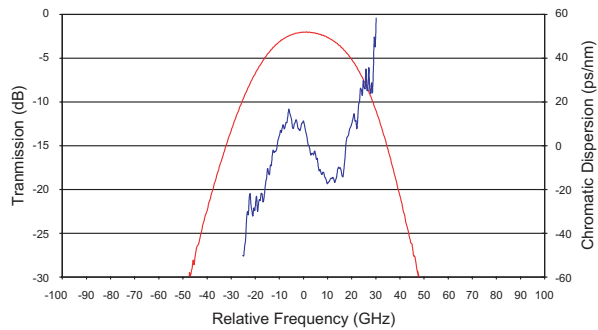
Dimensions Diagram

(Specifications in mm unless otherwise noted.)

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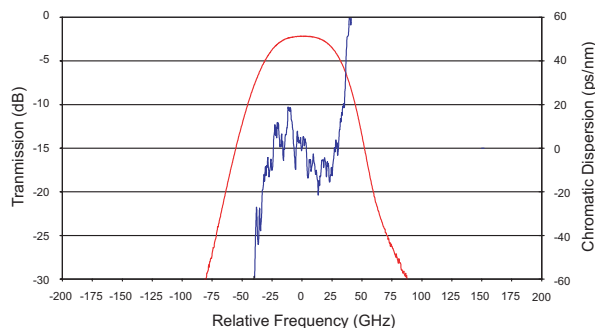
Filter Performance: VCF050



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## Filter Performance: VCF100

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Specifications<sup>1</sup>

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 <sup>2</sup>	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 <sup>3</sup>	Maximum	0.30 dB	0.20 dB
Polarization mode dispersion <sup>3</sup>		0.2 ps	0.2 ps
Group delay dispersion <sup>2</sup>		±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 <sup>6</sup> 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) <sup>4</sup> 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.

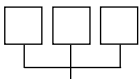



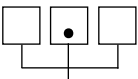
3. Within specified bandwidth over ±12 GHz from filter center.

4. Excluding strain relief and connector pins.

**Ordering Information**
[www.datasheet4u.com](http://www.datasheet4u.com)

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](mailto:customer.service@jdsu.com).

**Sample: VCF100+3CANCE1.5**

<b>VCF</b>		<b>+3</b>		<b>A</b>					
<b>Code</b>	<b>Filter Option</b>	<b>Code</b>	<b>Tuning Range</b>	<b>Code</b>	<b>Connector</b>	<b>Code</b>	<b>Pigtail Type</b>	<b>Code</b>	<b>Pigtail Length</b>
050	50 GHz	C	1525 to 1570 nm	NC	no connector	C	250 μm bare fiber	1.0	1.0 meter
100	100 GHz	L	1565 to 1610 nm	FP	FC/HPC <sup>1</sup>	E	900 μm tight buffer	1.5	1.5 meters
				FA	FC/APC <sup>1</sup>				
				SC	SC/HPC <sup>1</sup>				
				SU	SC/APC <sup>1</sup>				
				SP	ST/HPC <sup>1</sup>				

1. Not available for 250 μm bare fiber option.

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