Lightvision

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★ High stability
★ Wide tuning range
★ Finesse up to 6000
★ Cost competitive

Tunable Filters

Alpha High-speed Tunable Filters
Linear Thin-film Variable Filters
Angular Thin-film Filters

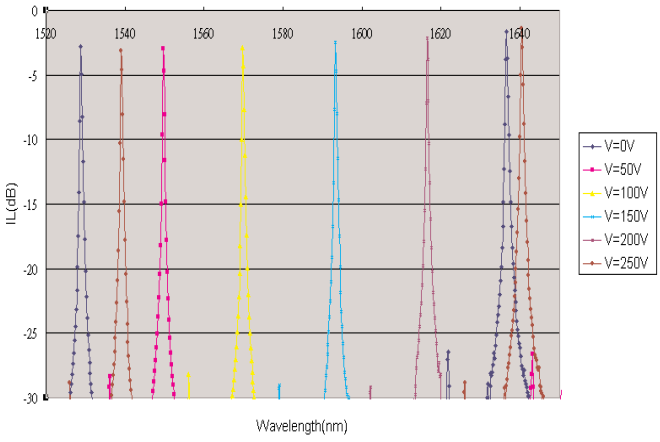

Fig 1: Typical Tuning Curve for Alpha Tunable Filter

Thin-film based tunable filter is an ideal candidate for telecom application, especially for DWDM system, on account of its low insertion loss, flat-top transmission spectrum, and excellent thermal stability. Lightwaves2020 is the pioneer in the tunable filter field. In May 2009, Lightwaves2020 released Alpha tunable filter, with Fabry-Perot transmission spectrum (see Fig 1), for high-speed (see Fig 2) and narrow bandwidth (see Fig 3) tuning applications. Currently, Alpha tunable filter is in the mass production stage. The products with the following specifications are available upon request:

(i) Free Spectrum Range: 20-150nm

(ii) Insertion Loss: <2.0dB (depend on Finesse)

(iii) Finesse: up to 6000

(iv) 3dB Bandwidth: down to 0.02nm

(v) Scanning Speed: up to 10kHz

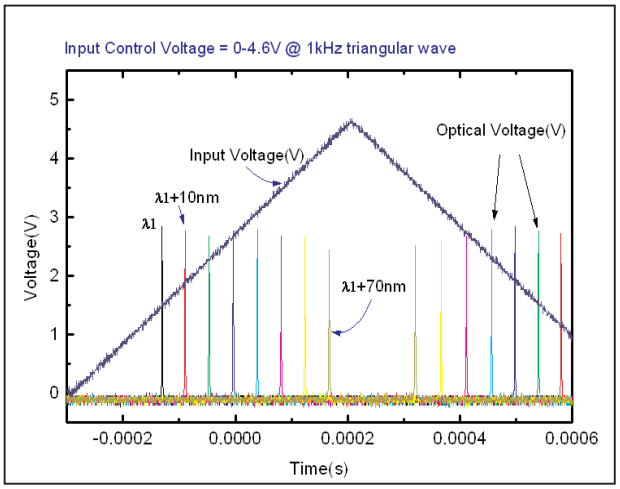

Fig 2: Scan Speed Performance for Alpha Tunable Filter

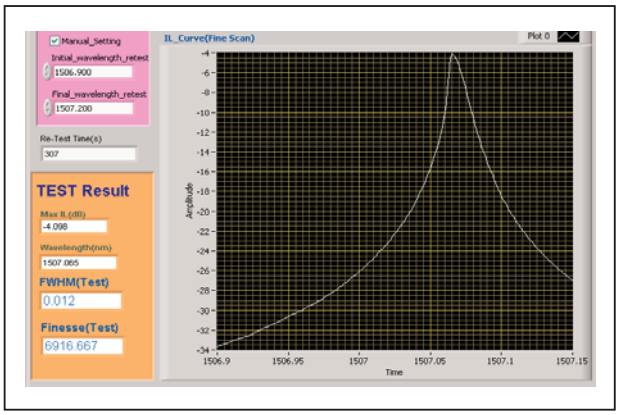

Fig 3: High Finesse Alpha Tunable Filter

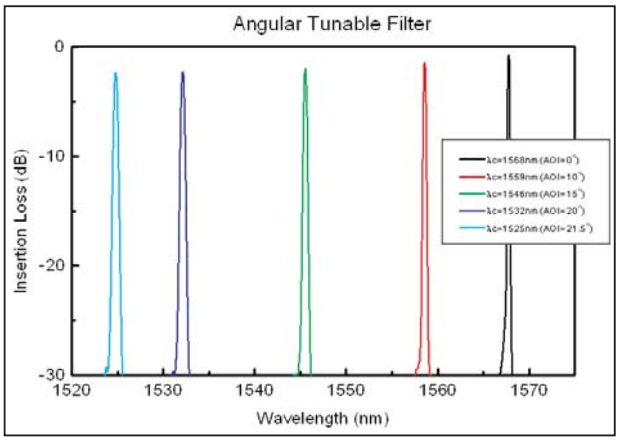

Fig 4: Tuning Curve for Angular Tunable Filter

Tunable Filters

In order to fulfill the wider passband requirement for telecom application, Lightwaves2020 focused on the thin-film based tunable filter development in 2009. With innovative coating methods and optical monitoring techniques, in Jan, 2010, Lightwaves2020 released step motor controlled 50GHz thin-film based tunable filters.

Two different kinds of tuning mechanism exist for thin-film based tunable filters: angular-tuning mechanism and linear-tuning mechanism. Angular tunable filter is a better choice for competitive cost and compact size if the tuning range requirement is relatively smaller (i.e. <20nm). Lightwaves2020's R&D team developed innovative coating structure to increase the fabrication tolerance at larger AOI and new optical scheme to minimize PDL issue. Below are the typical filter performance and some curves. (see Table 1 & Fig 4)

Tuning Range	20nm	40nm
IL	< 2.5dB	< 4.0dB
PDL	< 0.3dB	< 0.4dB
-0.5dB Bandwidth	> 0.15nm	> 0.12nm
-20dB Bandwidth	< 0.80nm	< 1.10nm

Table 1: Product specifications for 50GHz Angular tunable filter

For the linear-tuning type filter, Lightwaves2020 designs a new mask and optical monitor system to control the coating uniformity during the whole process to achieve the best tuning quality. Below are the typical filter performance and some curves. (see Table 2 and Fig 5)

Excellent thin-film filter quality aside, the vibration-free package and electronics control circuit is also provided. The wavelength setting repeatability is <±50pm. Undoubtedly, Lightwaves2020's thin-film based tunable filter family is best solution for DWDM system application.

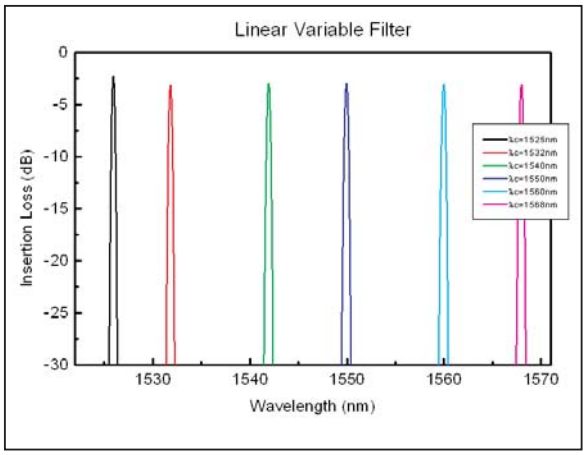

Fig 5: Tuning Curve for Linear Variable Filter

Tuning Range	40nm
IL	< 3.5dB
PDL	< 0.20dB
-0.5dB Bandwidth	> 0.15nm
-20dB Bandwidth	< 0.85nm

Table 2: Product specifications for 50GHz Linear variable filter

Lightvision

Lightvision is a publication of Lightwaves2020 as a service to customers and sales associates.

Editor **Vivian Wang**
Art Designer **Roger Kuo**

High Dynamics Range

Variable Gain EDFA

Variable gain EDFAs are the standard in amplification for metro, regional, and long-haul WDM network in the near future. It is used to compensate discrete loss due to DCMs, ROADMs, and other devices. To provide system customer best products available, in December, 2009, Lightwaves2020 released one compact variable gain EDFA module with low noise figure.

With Lightwaves2020's proprietary Liquid-crystal Variable Optical Attenuator and Thin-film based Gain Flattening Filter, the variable gain ranges from 10dB to 25dB within wide input power range. This makes the module suitable for pre-amplifier, inline, and booster applications. Our standard products achieve gain deviation < ±1dB & noise figure < 7dB. We also provide custom made products.

Compact in the package size of 120mm(L) x 90mm(W) x 17mm(H), this full-function EDFA module covers all automatic control modes for constant gain, power, and current. The control interface is a TTL level RS232 driven by 5V power supply. Monitoring of input, output, and reflected signal levels as well as temperature and signal levels alarms are provided.

Lightwaves2020 Variable Gain EDFA features compact size and is capable for mass production now. Definitely, it is the best solution

NEWSWIRE

We have some exciting news to share with all our readers:

Jewel Chang has been promoted to Acting COO for her distinguished performance in coordinating among the sales team, engineering team, and the production team.

Meanwhile, we warm-heartedly welcome the new force that just joined our team, Paisley Lin (Public Relations Specialist), Wendy Wu (Buyer), and Rita Chang (Administrative Assistant).

We also have the following exciting news to announce:

- *Submitting Multi-Fiber Section Tunable Optical Filter Patent Application.*
- *An exhibitor at 2010 OFC/NFOEC. Welcome to visit our booth at 2010 OFC/NFOEC during March 23 – 25 in San Diego!*

Lightwaves2020

1323 Great Mall Drive, Milpitas, CA 95035-8037
Tel.408.503.8888 Fax. 408.503.8988
www.lightwaves2020.com
sales@lightwaves2020.com