



# Dense Wavelength Division Multiplexing

Research Centre for Microtechnology

*tiny structures for big ideas*

## Information Sheet



**DWDM (Dense Wavelength Division Multiplexing)** is the process by which multiple wavelengths are simultaneously combined in a single optical fiber, and then separated again at the receiving end of the fiber. With conventional electric data transfer, only one electric signal could be transmitted per cable. Using optical data transfer it is possible to send several optical signals simultaneously in one glass fiber without them interfering with one another. More wavelengths mean more data transferred.

Passive optical components like multiplexers / demultiplexers based on **Arrayed Waveguide Gratings (AWG)** play a key role in DWDM systems.

### Services

Design of passive optical components:  
DWDM / VHDWDM / CWDM AWGs  
Splitters (based on MMI & Y-branching)  
Tapers, waveguides, others

### AWG types

Number of output channels: *up to 256*  
Channel spacing: *200 GHz, 100 GHz, 50 GHz, 25 GHz, 12.5 GHz, 10 GHz*  
Output signal shape: *Gaussian, flat-top, semi-flat*  
Refractive index-contrast: *low & high*  
Colourless AWG  
Other designs on request

### Key AWG features

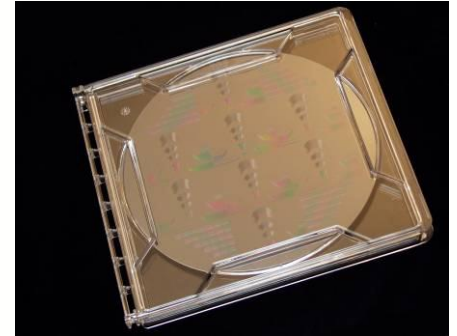
Low insertion loss  
Low channel crosstalk  
Very low background crosstalk  
Low non-uniformity

### Fields of application

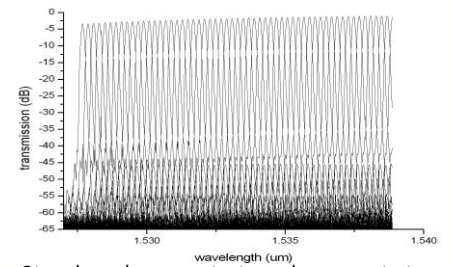
DWDM transmission  
Optical Add/Drop multiplexing  
Optical coding/decoding

### Contact

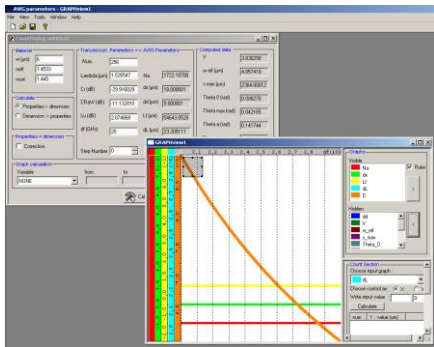
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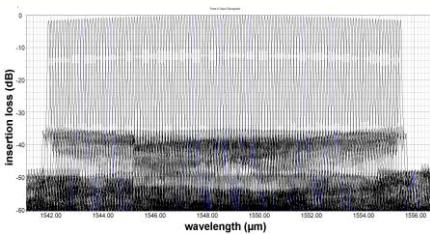
8 inch wafer with various AWG designs



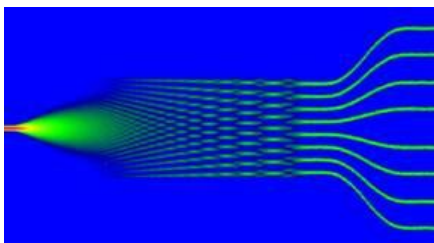
Simulated transmission characteristics of 256-channel, 25 GHz AWG



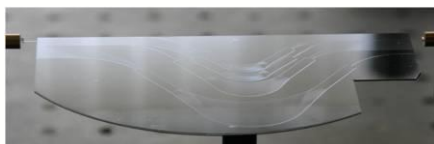
In-house software tool used to calculate AWG design parameters



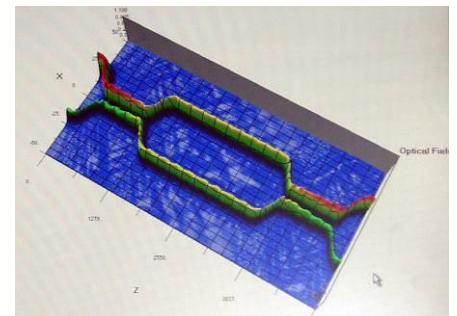
Simulation of narrow channel spacing 128-channel, 10 GHz AWG



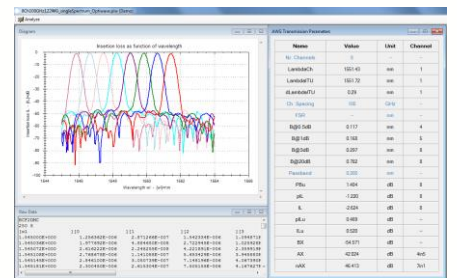
Design and simulation of 8 channel optical splitter



Measurement of the AWG transmission characteristics



Design and simulation of passive optical components



In-house software tool used to calculate AWG transmission parameters

