

# photonics

To develop modern communication networks, we need technologies that can significantly increase the volume and security of transmitted information.

## Integrated optical elements

### Main advantages:

- Immunity to electromagnetic interference
- Operational safety in the environment of combustible substances (fuel)
- Security related to radio interception or eavesdropping
- Minimum transmission loss
- Increased bandwidth
- Large bandwidth (multiplexing capability)

### Problem solved:

- Information is protected during data transmission. Data transmission over optical networks does not allow contactless reading, because does not generate any radiation
- Parallel data transmission
- 10-100 times increase in data transmission capacity
- Low power consumption. AWG technology does not require energy consumption, because the elements are passive
- Interference-resistant communication. Electromagnetic pulses do not affect optical signal transmission

## Applications



Telecom equipment and communication systems



DSC and storage servers



Airborne equipment

*DWDM (Dense Wavelength Division Multiplexing) is a modern technology for transmitting a large number of optical channels over a single fiber, which is the basis of a new generation of network technologies.*



Prototype chip of optical waveguide AWG multiplexer/demultiplexer for WDM systems based on SiO<sub>2</sub> technology platform

*The developed modules have no domestic analogues based on domestically manufactured optical chips.*

## Optical AWG multiplexer for WDM systems

Parameter	Spanish 1	Spanish 2
Network type	<b>DWDM</b>	
Spectral range	ITU grid, C-band (1530...1565nm)	
Device formula (DEMUX/MUX)	NxN	1xN/Nx1
Number of channels (N)	16	44
Grid spacing, GHz	100	
Bandwidth at level - 1 dB, GHz	45 (0.36nm)	
Insertion loss, dB	5 (max)	
Uniformity, dB	1	
Polarization-dependent loss, dB	0.5	
Operating temperature, °C	-5...+65	
Used optical fiber	single mode 9/125 μm G.652 (SMF-28e or equivalent)	
Optical connectors	Single mode (FC, SC, LC)	

*Operating characteristics of products correspond to foreign analogues.*

*Zelenograd nanotechnology center is a multifunctional microelectronic complex for the full cycle of development and contract manufacturing of microelectronics and microsystems products with a set of CMOS, MEMS, MOSFET / IGBT technologies, which provides the necessary conditions for the manufacture of a wide range of civil and special-purpose products.*

## Our advantages:

There is the on-site manufacture of a full cycle with modern equipment

Our qualified personnel have scientific degrees and extensive experience in ICs manufacture

We have developed CMOS technologies from design to manufacture

We established partnerships with DWDM multiplexers manufacturers

We received letters of support from leading multiplexer consumer companies in Russia

We are the first in Russia who are developing domestic multiplexers

We have already manufactured the first samples of crystals of the optical waveguide DWDM multiplexer