

**Solutions for OCT Systems**

# **OZ Optics Limited**

**September 2024**



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- **OZ Optics Canada**
- **OZ Optics Türkiye**
- **OZ Optics China**

# Company Background



- **Founded in 1985**
- **Corporate Headquarter Located in Ottawa, Canada**
- **Manufacturing Facility in Ottawa / Canada, Izmir / Türkiye and Jiaxing / China**
- **Ten Product Groups:**
  - Laser-to-Fiber Delivery Systems
  - High Power Fiber Optic Components
  - Polarization Maintaining Products
  - Attenuators
  - Opto-Electronic Packaging
  - Fiber Optic Test Equipment
  - Fiber Optic Sensor Systems
  - Fiber Optics Components for Gyroscope
  - OCT
  - BioPhotonics
  - Quantum
- **Sales Offices in Canada, USA, Europe, Türkiye and China**

## ➤ Ottawa, Canada



## ➤ Izmir, Türkiye



## ➤ Jiaxing, China



# Corporate Statements and Quality Policy



## Our Vision

- ✓ Capture and expand market share
- ✓ Be the preferred supplier of choice
- ✓ Maximize shareholder value

## Our Mission

To become the leading provider of innovative optical products to telecom and non-telecom sectors

## Our Core Values

- ✓ Leadership
- ✓ Teamwork
- ✓ Boldness
- ✓ Commitments
- ✓ Innovation
- ✓ Rewards

## Our Quality Policy

Provide our Customers with a competitive advantage, leveraging performance, price and delivery, through a continuous process of Quality advancement in all areas of our Company.

Communicate effectively to our Customers, Suppliers and Shareholders our commitment to Quality, continuous improvement and to abide by any applicable requirements.

Promote opportunities of professional development for all members of our company through education, training and personal challenge.



# Company Profile

Over 467 employees worldwide

OZ Canada



**243+**  
Employees

OZ China



**87+**  
Employees

OZ Türkiye



**137+**  
Employees

# Company Profile



**Advanced Proprietary Processing Technology**



**Canada  
Certificate: FM 63463**



**China  
Certificate: FM 577647**



**Turkey  
Certificate: FM 601414**

**ISO9001:2015 Certified**



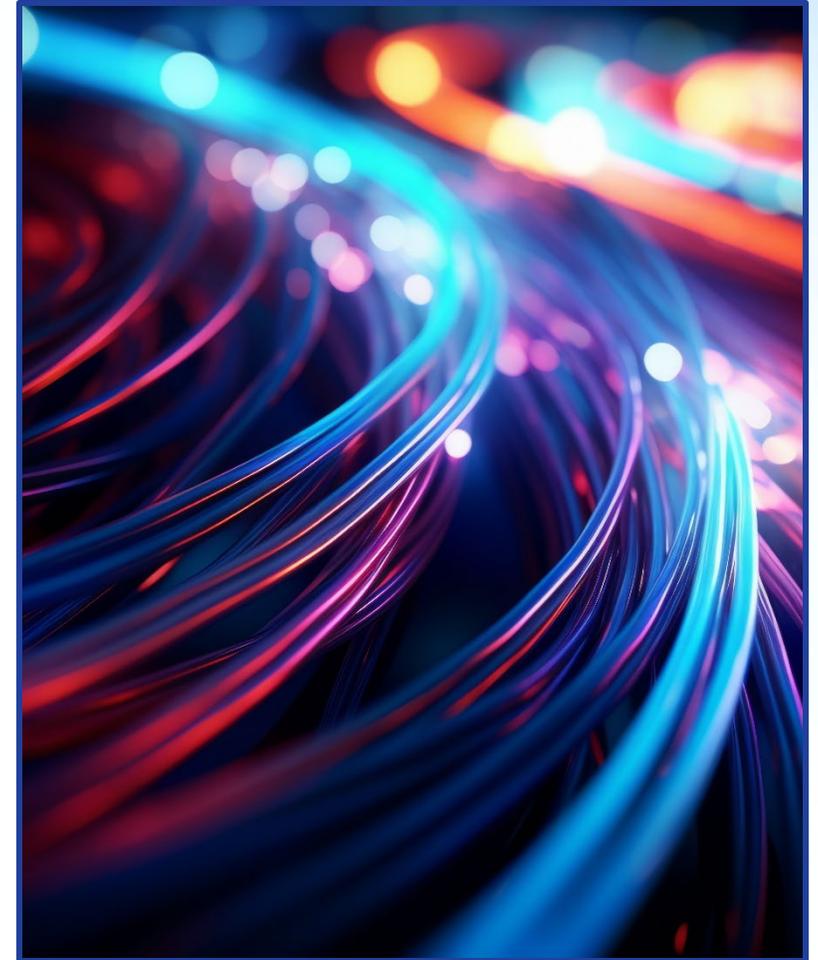
**Broad Patent Portfolio**



# Company Profile

## OZ Optics is Lead by an Experienced Team:

- **Ömür Sezerman, Chairman, President & CEO**
  - Founder and CEO since inception (40 years)
- **Zahide Sezerman, VP of Human Resources**
  - With OZ Optics since inception (40 years)
- **Garland Best, VP of Components Division**
  - 33 years at OZ Optics
- **Gordon Youle, VP of Test Equipment Division**
  - 26 years at OZ Optics
- **Saeed Pilevar, Senior VP of Business Development**
  - 3 months at OZ Optics
- **Onur Koca, General Manager of OZ Türkiye**
  - 3 year at OZ Optics
- **Bing Li, General Manager of OZ Optics China**
  - 21 years at OZ Optics



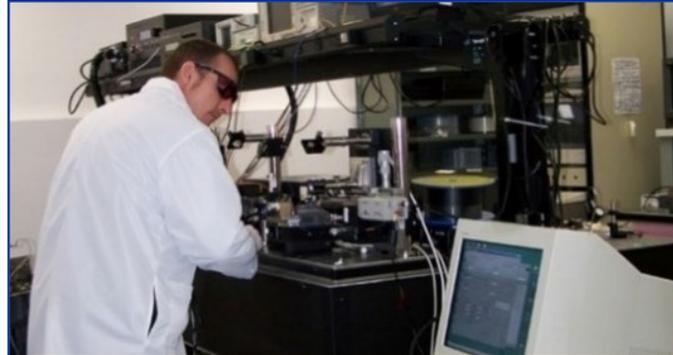
# Company Profile

**Experienced and Well-Trained Staff in Following Fields:  
Optical, Mechanical, Electronics & Software**

## ➤ CNC Machine Shop



## ➤ Femto-Second Laser Lab



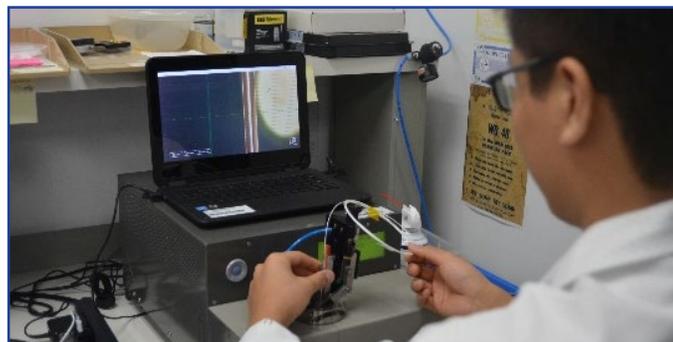
## ➤ AR Coating



## ➤ Clean Room



## ➤ Laser Conditioning / Cleaving





# Core Competencies



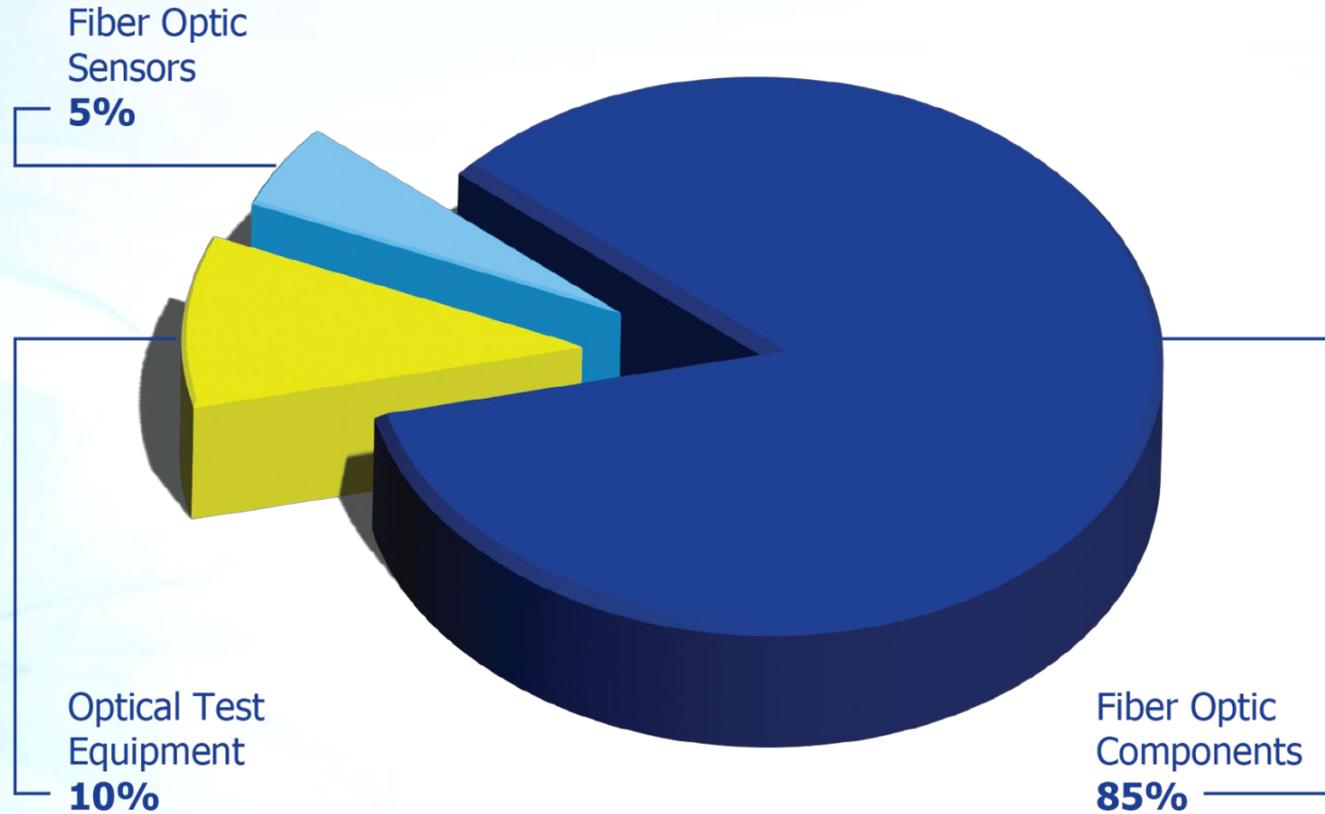
- **Pioneer in Polarization Maintaining (PM) Components & Custom Test Equipment, Including Polarization Test Equipment and FTTH Equipment**
- **Leader in Wavelength Flattened, High Power & Low PDL Components**
- **Leader in High Power Fiber Optic Delivery Systems**
- **Widest Range in Attenuator Product Offering**
- **Fiber Optic Distributed Strain and Temperature Sensors**
- **Complete product line for OCT, Gyroscope & BioPhotonics applications & 2 Micron**
- **Now available: Spectrometers and Quantum Light Sources**



# Leading Technology



➤ **Three Product Groups** ➤ **Over 1,000 Products** ➤ **Leading Edge R&D**





# Leading Technology

## Featured Products

### World's Largest Online Fiber Optic Catalog

Most Products are in Stock



Quantum Light Sources



Fiber Optic Products for Biophotonics Applications



Fiber Optic Products for Gyroscopes



Polarization Maintaining Components



Delivery Systems



High Power Components



Test Equipment



High and Low Power Patchcords

### Polarization Maintaining Fiber Optic Components

Patent Numbers: USA 7058275, 7095931, 7295731, China 1672073



Polarization Maintaining Connectors and Patchcords



Polarization Maintaining and Polarizing Splitters / Combiners / Fused Couplers / Switches



All Fiber Manual and Electrically Driven Polarization Controllers / Seramblers



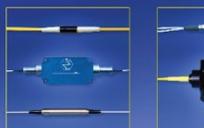
Polarization Dependent Loss Emulators



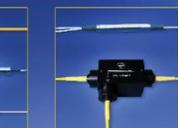
Fiber Pigtailed Polarizers



PM Fiber Directional Taps and PLC Splitters



Isolators



PM Fiber Pigtailed Circulators

### Laser and Laser Diode to Fiber Delivery Systems



Laser to Fiber Couplers



Pigtail, Receptacle Style Collimators and Focusers



Bulkhead Receptacles



Bare Fiber Adaptors with Magnetic Clips



Wavelength Division Multiplexers(WDMs) and R&B Combiners



OCT Modules and 2 micron Components



Evanesence Based Variable Split Ratio Fiber Splitter/Coupler



OEM Laser Diode to Fiber Couplers

### High Power Fiber Optic Components

Patent Numbers: Canada 2494133, USA 7058275, 7095931, 7295731, China 1672073



High Power, High Temperature Connectors and Patchcords



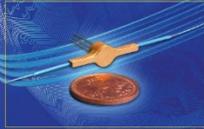
OZPEN™ CO-2 Fiber Optics Cleaning Unit for High Power Components



High Power Laser to Fiber Couplers, Collimators and Focusers



High Power Mode Field Adapters



High Power Optical Taps and Power Monitors



High Power Isolators



High Power Splitters and Wavelength Division Multiplexers (WDMs)



Shutters, Receptacles and Sleeve Thru Adapters with Sensors



# Leading Technology

## Featured Products

### Fiber Optic Attenuators

Polarization Maintaining, Single Mode and Multi-Mode Fibers



Benchtop Digital

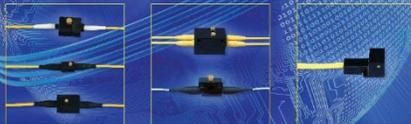
Variable Attenuators



Digital Variable Attenuators

Electrically Controlled Variable Attenuators

MEMS Variable Attenuators



PM, SM and MM Fibers Pigtailed Inline Variable Attenuators

Single and Multi Channel Miniature Variable Attenuators

Reflective Style Variable Attenuators



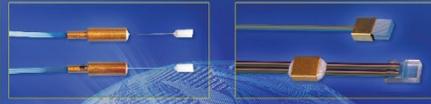
Air Gap Variable Attenuators

Plug Type Fixed Attenuators

Attenuating Fiber Patchcords

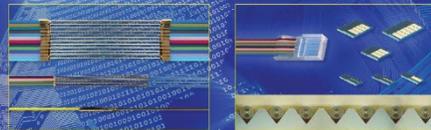
### Fiber Optic Components for Optoelectronic Packaging

Hermetically Sealable Patchcords with Glass or Metal Solder



Single Channel

Multi Channel



Metalized Fibers

PM, SM and MM Fiber Pigtailed V-Groove Arrays



Polarization Measurement System for V-Grooves

Tapered, Lensed Fiber, Polished and Laser Shaped



Precision Collimator and Focuser Array

Fused Fiber Collimator

### Fiber Optic Test Equipment



Quantum Entangled Photons Sources

High-Resolution Optical Spectrometers



Optical Fiber Length Meters

Back Reflection Meters

High-Speed Polarization Controller-Scrambler



Handheld and Benchtop Extinction Ratio Measurement Systems

Multichannel, Benchtop and Handheld Digital Variable Attenuators

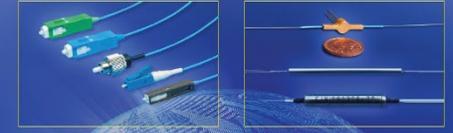


High Power Visual Fault Locators

Powermeters with Smart Detector Heads

Laser Diode Stable Sources

### Fiber Optic Components for 2 Micron Wavelengths



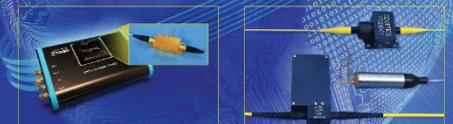
Fiber Optic Patchcords

Fused Couplers, Taps, Beam Splitters and Combiners



Fiber Pigtailed Laser Diode Sources

Pigtailed, Rectangular Style Collimators and Focusers



High Speed Electro-Optic Polarization Controllers and Scramblers

Manual and Electrically Controlled Variable Attenuators



Polarizers

Isolators



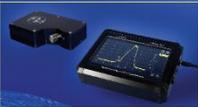
# Leading Technology

## Featured Products

### New Fiber Optic Products



Polarization Entangled Photon Sources



High-Resolution Optical Spectrometers



High Speed Electro-Optic Polarization Controllers and Scramblers



Polarization Entanglement Tomography Analyzers



Fiber Optic Coils For Gyroscopes



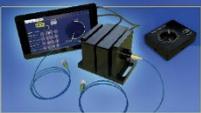
Universal Optical DNA Band Detection Systems for Pathogens



Motor Driven Polarization Dependent Loss Emulators



Detector Heads and Optical Power Monitors



### Fiber Optic Products for Gyroscopes



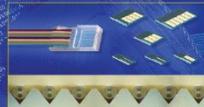
Fiber Optic Coils for Gyroscopes



ASE Sources



Wavelength Division Multiplexers



PM, SM and MM Fiber Pigtailed V-Groove Arrays



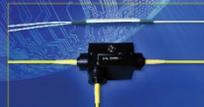
Fused Couplers, Taps, Beam Splitters and Combiners



Fiber Optic Polarizers



Fiber Optic Patchcords



SM and PM Fiber Pigtailed Circulators



Isolators

### Quantum Entangled Photons Sources



Hyper-Entangled Photon Source Broadband Telecom



Polarization-Entangled Photon Source Broadband Telecom



Bright Polarization-Entangled Photon Source Broadband Telecom



Bright Polarization-Entangled Photon Source Narrowband Telecom



Correlated Photon Pair Sources



Polarization-Entangled Photon Source Narrowband at 610 nm



Polarization Entanglement Tomography Analyzer

### Fiber Optic Products for OCT Applications



OCT Modules



Manual and Electrically Controlled Broadband Variable Attenuators



Manual and Electrically Controlled Fiber Optic Delay Lines



Manual and Electrically Controlled Polarization Controllers / Scramblers



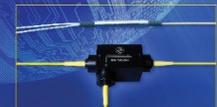
Fiber Pigtailed Broadband SLED Sources



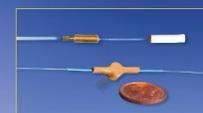
Fiber Collimators / Focusers



Broadband Fused Couplers



SM and PM Fiber Pigtailed Circulators





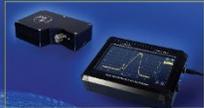
# Leading Technology

## Featured Products

### Fiber Optic Products for Biophotonics Applications



Universal Optical DNA Rapid Detection Systems for Pathogens



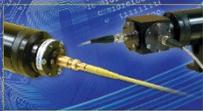
High-Resolution Optical Spectrometers



Fiber to Photodiode Couplers with Removable Filters



High and Low Power Patchcords



High Power Laser to Fiber Couplers



Pigtails, Rectenable Style Collimators and Focusers



Fiber Optic U-Bracket Assemblies



Wavelength Division Multiplexers and Beam Splitters



Turnkey, Ultra Stable Laser Modules



Pocket Optical Power Meter and Detectors

### Universal Optical DNA Rapid Detection System

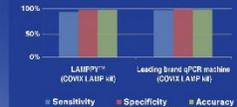
For Pathogens Including:  
COVID-19, SARS, EBOLA, CHOLERA, SALMONELLA, ETC.



#### Features:

- Use to detect viral, fungal, and bacterial DNA/RNA
- Rapid DNA/RNA detection (as little as 20 minutes)
- Highly sensitive and specific detection of low viral levels
- Intuitive software displays real time data during testing
- Melt analysis available with the included software
- Lid heater prevents evaporation and condensation
- Compact modular design allows for easy cleaning and maintenance
- Pair with an external battery for a portable and field-deployable system
- Test up to 8 samples simultaneously (higher throughput systems with up to 96 samples available upon request)
- Wireless communication with dual-band Wi-Fi and Bluetooth connectivity
- A fraction of the cost of qPCR based systems
- OZ Optics also offers private labelling for volume OEM applications

Clinical trial: LAMP-PPY™ vs. Leading brand qPCR machine

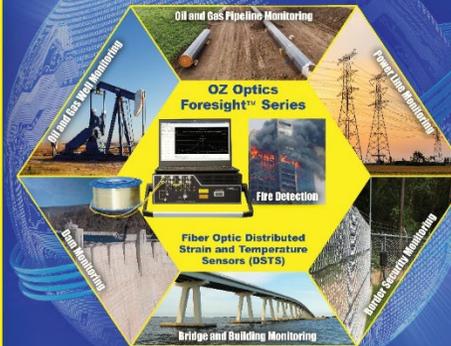


In a lab study done at Acibadem University using saliva samples taken from patients at the Acibadem Hospitals, LAMP-PPY was compared to a well-known conventional qPCR machine in performance and speed. The comparison study was carried out with a sample size of 262 using the COVID LAMP-based kit on both instruments and then verified with the KrosQuant SARS-COV-2 (2019 nCoV) Real Time PCR Diagnostic Kit on a leading brand conventional qPCR machine.

### Fiber Optic Distributed Strain and Temperature Sensors

USA Patent Numbers: 7499151, 7599047, and 9568307

- BOTDA only, BOTDR only, or both BOTDA and BOTDR modules in one unit
- Simultaneous measurement of strain and temperature
- Fast, dynamic measurement of strain and/or temperature up to 200 km sensing range
- Uses standard telecommunications fibers to minimize costs



### Fiber Optic Sensors for Pipeline Monitoring

USA Patent Numbers: 7499151, 7599047, and 9568307

- Pipeline leakage detection
- Sensitive detection of corrosion / erosion, cracks and buckling
- BOTDA only, BOTDR only, or both BOTDA and BOTDR modules in one unit
- Simultaneous measurement of strain and temperature
- Fast, dynamic measurement of strain and/or temperature up to 200 km sensing range
- Uses standard telecommunication fiber to minimize costs





# Leading Technology

## Featured Products



### Fiber Optic Sensors for Fire Detection

USA Patent Numbers: 7499151, 7599047, and 9568307

- BOTDA only, BOTDR only, or both BOTDA and BOTDR modules in one unit
- Simultaneous measurement of strain and temperature
- Fast, dynamic measurement of strain and/or temperature up to 200 km sensing range
- Uses standard telecommunications fiber to minimize costs



### Fiber Optic Sensors for Bridges, Dams and Buildings

USA Patent Numbers: 7499151, 7599047, and 9568307

- BOTDA only, BOTDR only, or both BOTDA and BOTDR modules in one unit
- Simultaneous measurement of strain and temperature
- Fast, dynamic measurement of strain and/or temperature up to 200 km sensing range
- Uses standard telecommunications fibers to minimize costs



Bridge Monitoring



Dam Monitoring



Building Fire Detection

### Fiber Optic Sensors for Power Line and Smart Power Generator Monitoring

USA Patent Numbers: 7499151, 7599047, and 9568307

- BOTDA only, BOTDR only, or both BOTDA and BOTDR modules in one unit
- Simultaneous measurement of strain and temperature
- Fast, dynamic measurement of strain and/or temperature up to 200 km sensing range
- Uses standard telecommunication fiber to minimize costs



Underground Power Line Monitoring



Power Line Monitoring



Optical Ground Wire (OPGW)



Construction of OPGW



Gas Generator Monitoring

### Fiber Optic Sensors for Security Monitoring

USA Patent Numbers: 7499151, 7599047, and 9568307

- BOTDA only, BOTDR only, or both BOTDA and BOTDR modules in one unit
- Simultaneous measurement of strain and temperature
- Fast, dynamic measurement of strain and/or temperature up to 200 km sensing range
- Uses standard telecommunication fiber to minimize costs



Border Security Monitoring



Highway Health Monitoring



# Industry Standards

**All Products Manufactured are in Strict Accordance with International Industry Standards:**

- **ISO 9001:2015 Certified (Canada, China and Türkiye)**
- **REACH Compliance**
- **RoHS Compliance**
- **CE Compliance**
- **Telecordia Compliance**
- **Controlled Goods Directorate Registered**
- **Critical Supplier for F35 and F18 Project**
- **TSCA (Toxic Substance Control Act) Compliance**
- **CHEMSHERPA Compliance**
- **IEC 61010 Compliance**



# Marketing Strategy

## Application Market

Using our strong direct sales and distributors, we address the following markets:

- **Energy – Oil and Gas**
- **Military and Homeland Security**
- **Educational**
- **Industrial**
- **Telecom / Datacom**
- **Medical & Pharmaceutical**





# Marketing Strategy

## Application Market

By leveraging the technology and expertise gained since its inception, OZ Optics has attracted a broad range of customers in the telecom / datacom, medical, military, security, industrial, construction, aerospace, power utilities, petrochemical and educational sectors.





# Marketing Strategy

## Global Sales Network

OZ Optics has resellers and distributors in over 30 Countries and Regions with over 10,000 customers worldwide:



Austria



Germany



Luxembourg



Sweden



Belgium



Greece



Netherlands



Switzerland



Brazil



Hong Kong



Norway



Taiwan



Canada



India



Poland



Thailand



China



Ireland



Portugal



Türkiye



Denmark



Italy



Singapore



United Kingdom



France



Japan



South Korea

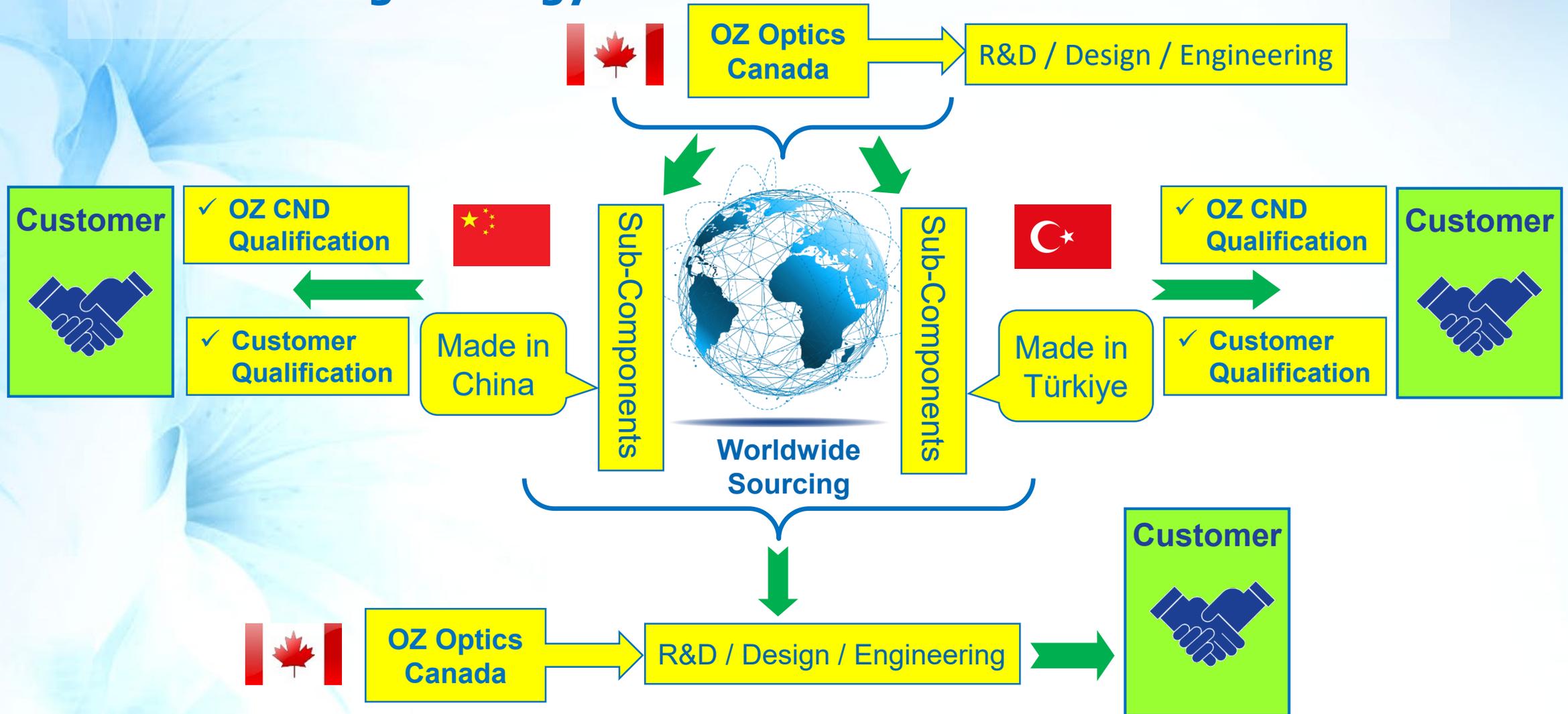


United States



# Operation Strategy

## Manufacturing Strategy



# Marketing & Operation Strategy

## Competitive Advantage

- Superior Technology  
Innovative Engineering
- Competitive Pricing
- Global Presence
- Extensive Experience  
In Fiber Optics Manufacturing
- Exceptional Quality and Service



# Branch Network





# Branch Network

## Facility - Ottawa Headquarters

- 60,000 sq ft. - Manufacturing and R&D Facilities
- 15,000 sq ft. - Admin, Sales and Marketing
- 15,000 sq ft. - Training and Fitness Facilities





# Branch Network

## Facility - Ottawa Headquarters



**Production Area**



**Training Centre Building**



**Meeting Room**



**Swimming Pool**



# Branch Network

## Facility - Türkiye Factory (Izmir, Türkiye)

- Operational Since 2000
- 33,000 sq ft. Manufacturing Facility
- Located in Free Trade Zone
- Low Tax Rates
- Sub Component Parts Manufacturing
- High Quality Labor
- AR Coating Machine & Clean Room onsite





# Branch Network

## Facility - China Factory (Jiaxing, China)

- Operational Since June 2010
- Wholly Foreign Owned Enterprise
- Cost Effective Manufacturing
- High Quality Labor
- Supply Chain Integration





# Branch Network

## Facility - China Factory (Jiaxing, China)

- Located in Economic Development Zone
- 4000+ sq meters - Total Area
  - 500 sq meters – Administration, Sales and Marketing
  - 3500 sq meters – Manufacturing Area
    - ✓ 500 sq meter – Class 10,000 Clean Room
    - ✓ 300 sq meter – ESD Working Area





# OZ Optics China

## Zhejiang OZ Optics Technologies Co., Ltd

- Operational since June 2010
- Wholly Foreign Owned Enterprise
- NPI & Production Line Setup
- On-site Training by OZ CND
- Began Mass Production in September 2010
- Completed Main Facility Expansion in 2019





# Optical Coherence Tomography Components



- **OZ Optics provides high quality, competitively priced fiber optic products based for OCT applications.**
- **Broadband, passive, products allow for miniaturization and stable operation.**



# Fused Splitters For Visible and Near IR Applications

**DTS0033: Fused Couplers – Fiber Optic**

**DTS0092: Polarization Maintaining Fused Fiber Couplers/Splitters**

- Operating wavelengths available from 488 nm to 2000 nm
- Multimode, single mode and PM fiber versions
- Wavelength flattened versions
- Low loss (typically less than 0.3 dB)
- Wavelength dependence typically  $\pm 0.25$  dB over operating range
- Low PDR, typically  $< 0.1$  dB
- Miniature and ruggedized package options



**DTS0033 – Fused Couplers – Fiber Optic**



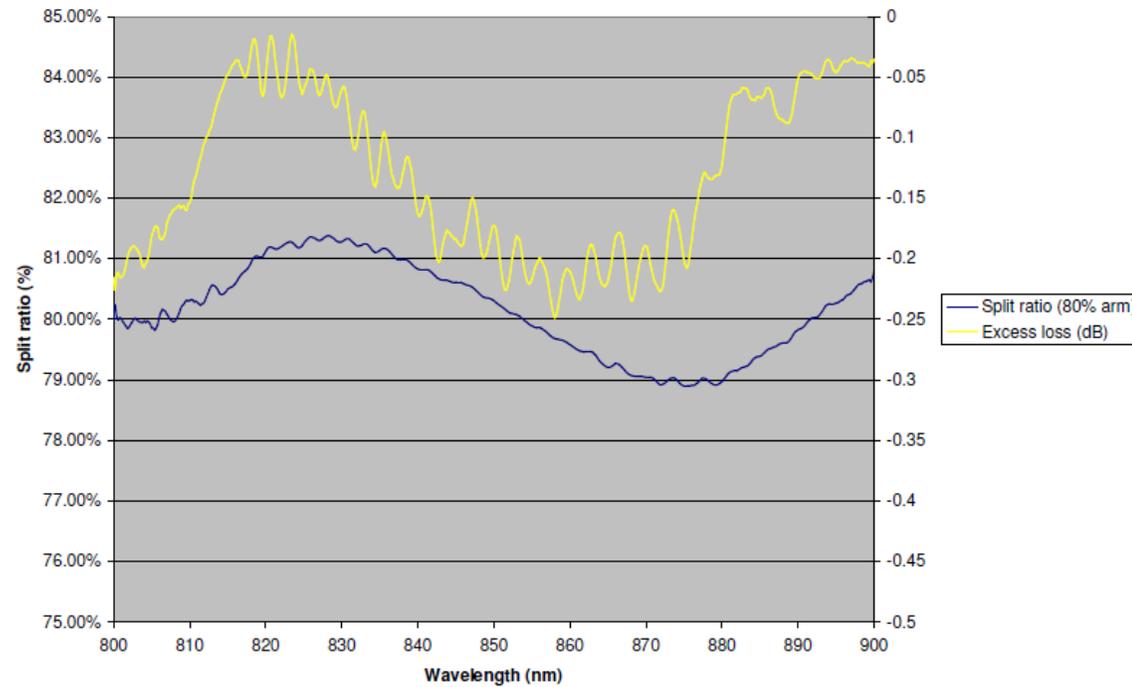
**DTS0092 – Polarization Maintaining Fused Fiber Couplers/Splitter**



# 840 nm Broadband Splitters



Split ratio and insertion loss variation of 2X2 80/20 splitter

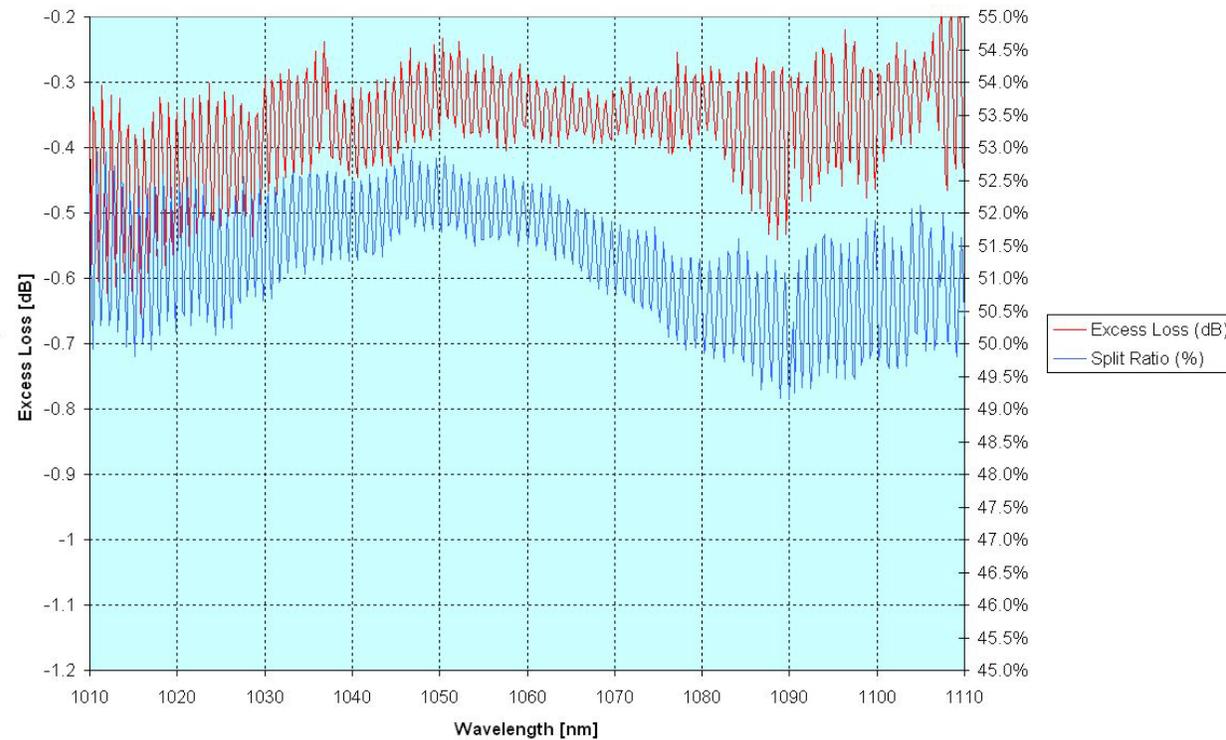




# 1060 nm Broadband Splitters



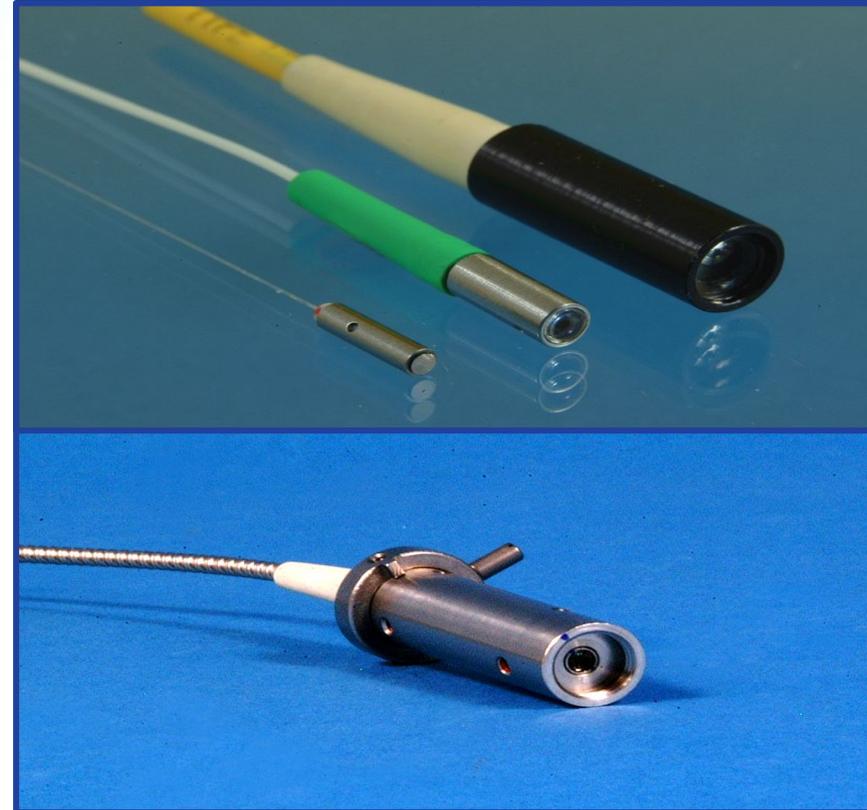
Insertion Loss and Split Ratio versus Wavelength for Fused splitter Sample #1



# Fiber Optic Collimators and Focusers

## DTS0060: Collimators and Focusers - Pigtail Style

- Variety of Collimator Sizes
- Aspheric or achromatic lenses for superior beam quality
- Infrared achromats for superior wavelength independence
- AR coated optics for maximum transmission, low return losses
- Variety of beam sizes
- Centration better than 1 mrad with respect to mechanical axis



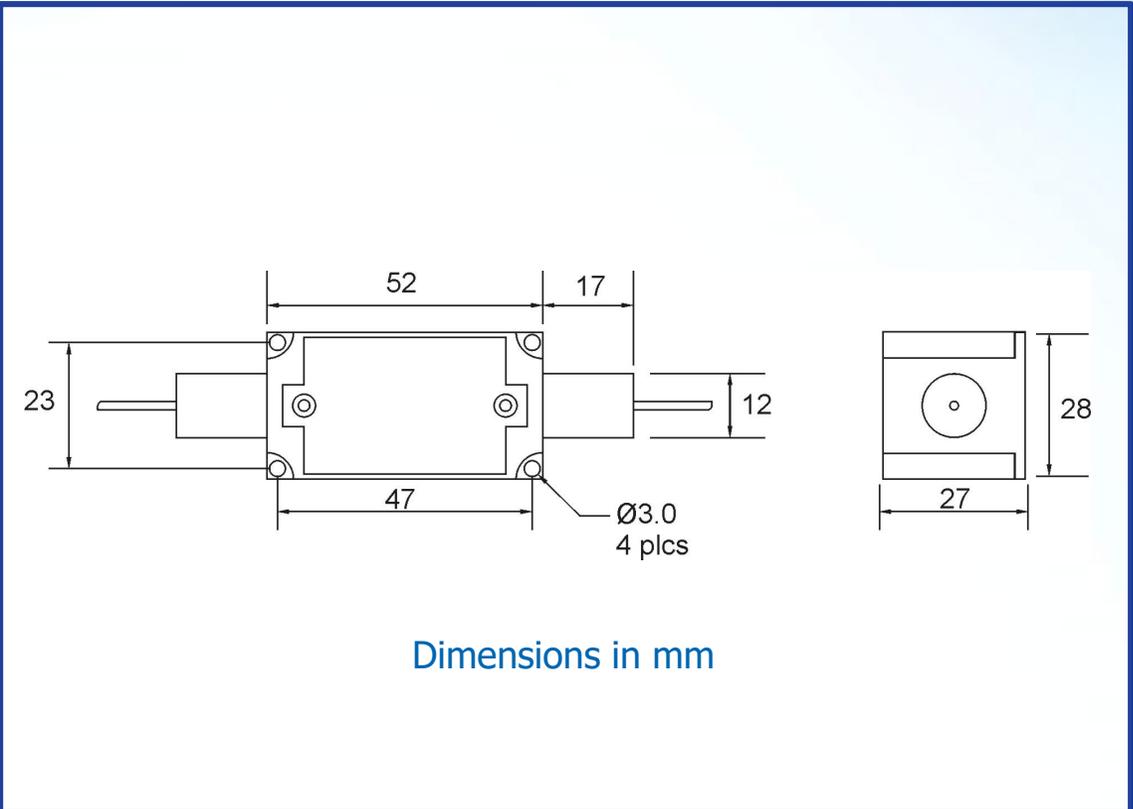
DTS0060 – Collimators and Focusers - Pigtail Style



# Optical Isolators

## DTS0016: Fiber Optic Isolators

- **Broadband wavelength operation, more than  $\pm 40$  nm**
- **High isolation over wavelength and temperature**
- **Low insertion loss over wavelength and temperature**
- **Compact Size**



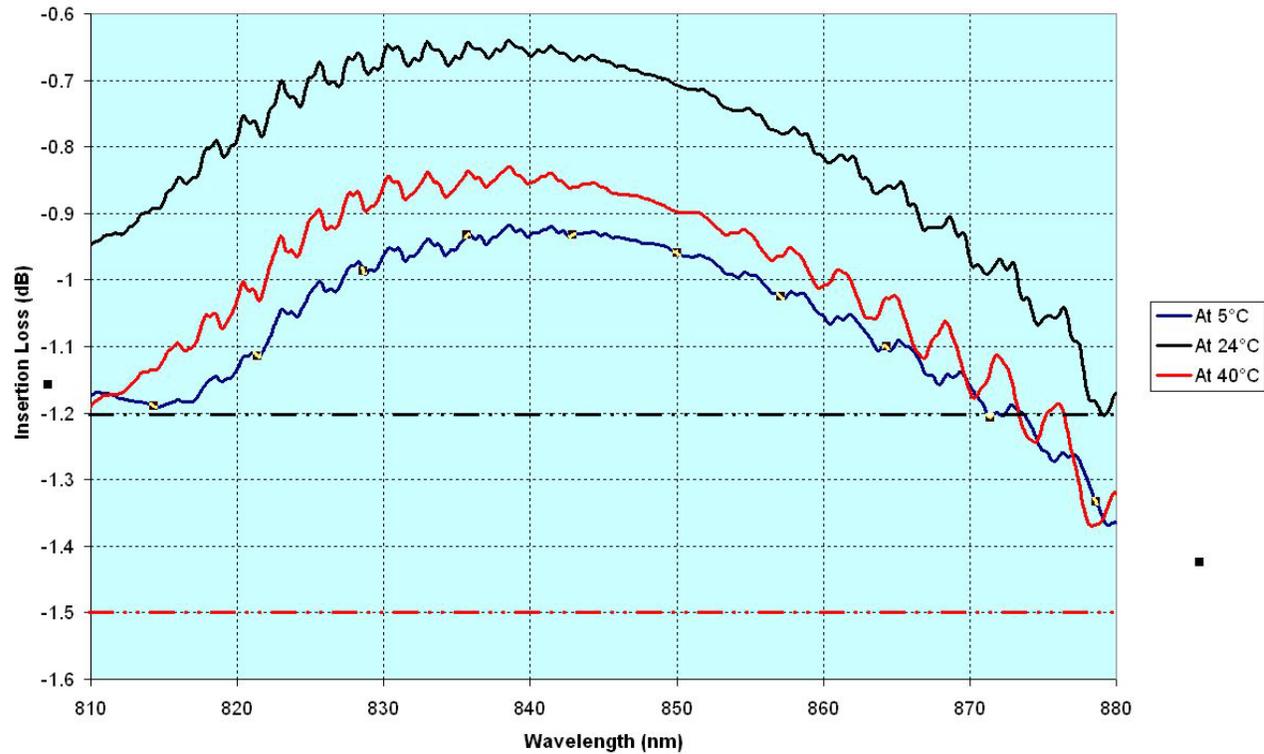
DTS0016 – Fiber Optic Isolators



# 840 nm Isolator Insertion Loss



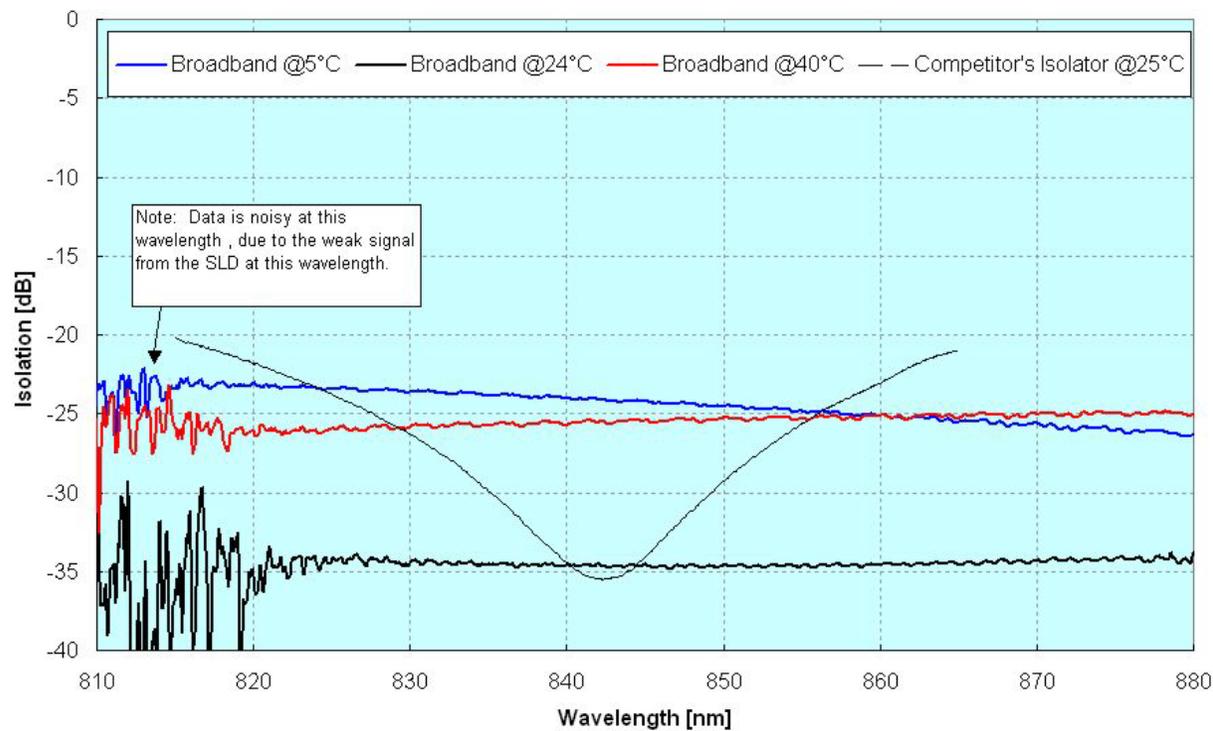
Isolator Insertion Loss Versus Wavelength and Temperature



# 840 nm Isolator Isolation



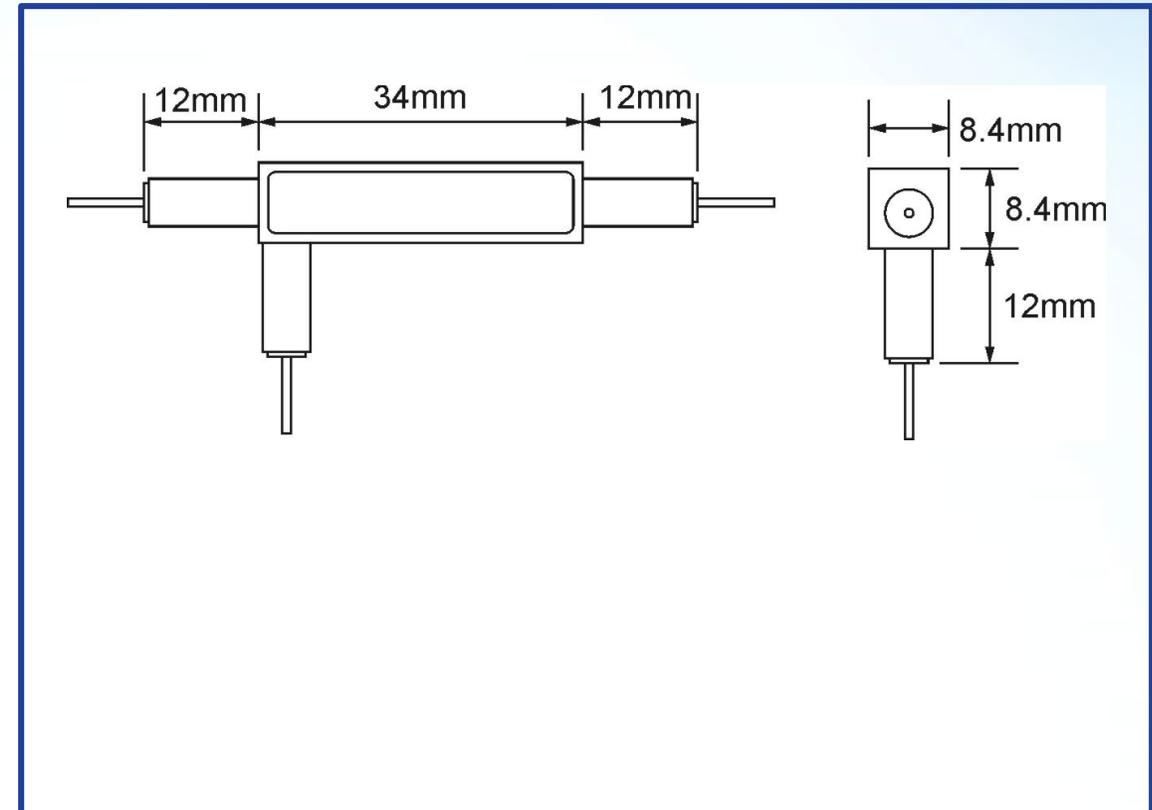
**Temperature and wavelength dependence of Broadband Isolator**  
(Typical isolation of a competitor's conventional isolator is also shown as a reference)



# Optical Circulator For 1064 nm

## DTS0070: Fiber Optic Circulators

- Exceptionally small size
- Better than 20 dB Isolation over 100 nm range
- <3 dB Insertion Loss at 1060 nm
- Better than -50 dB crosstalk

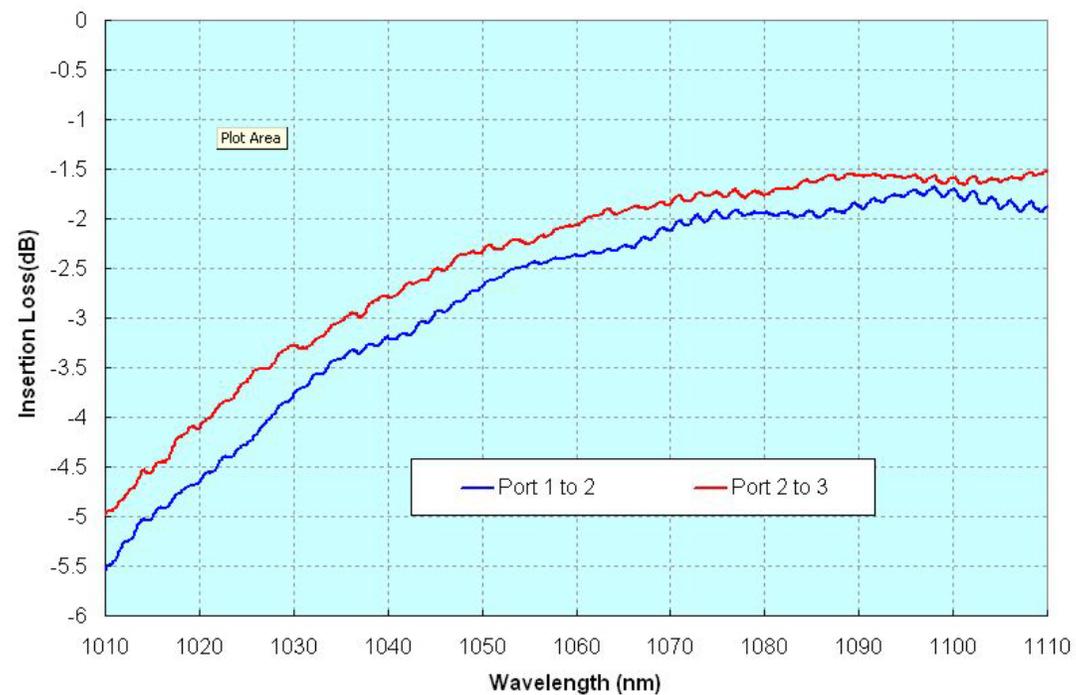


DTS0070 – Fiber Optic Circulators

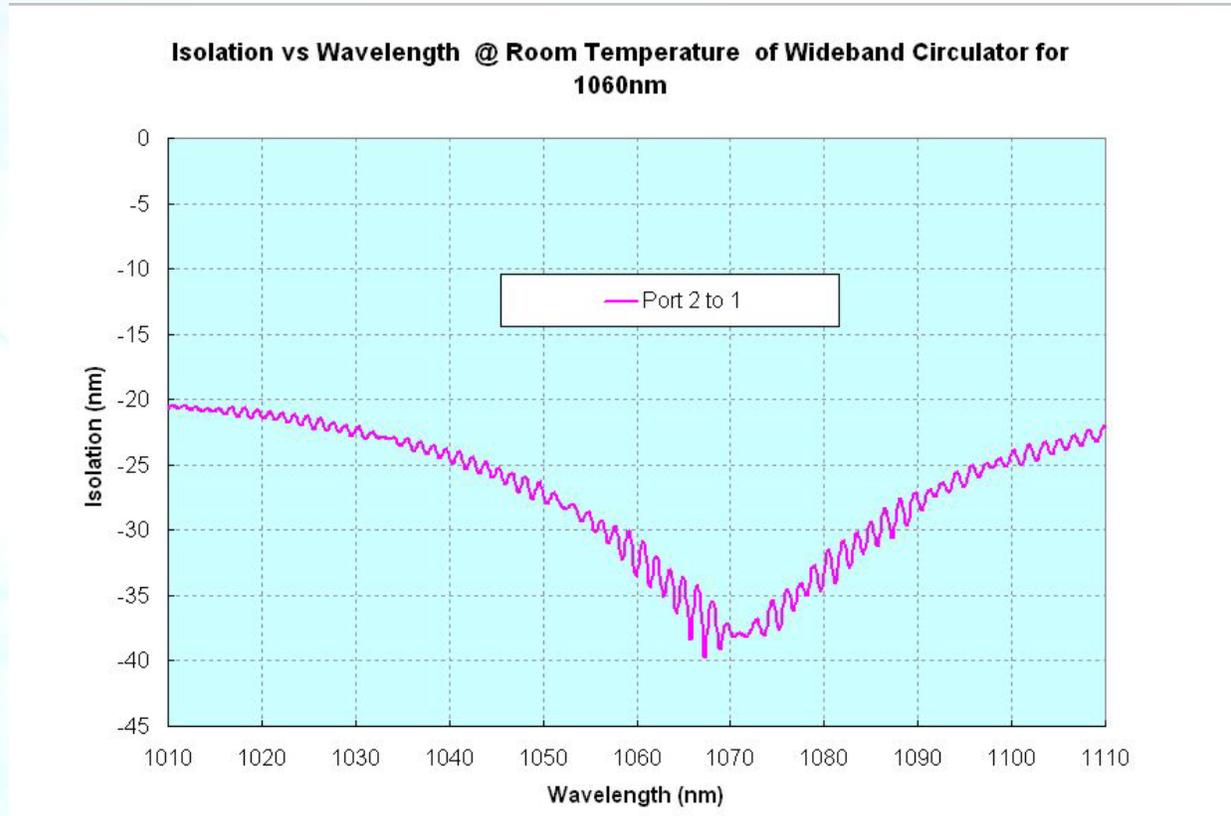
# Optical Circulator for 1064 nm Losses



Insertion Loss vs Wavelength @ Room Temperature of Wide Band Circulator for 1060nm.



# Optical Circulator for 1064 nm Isolation

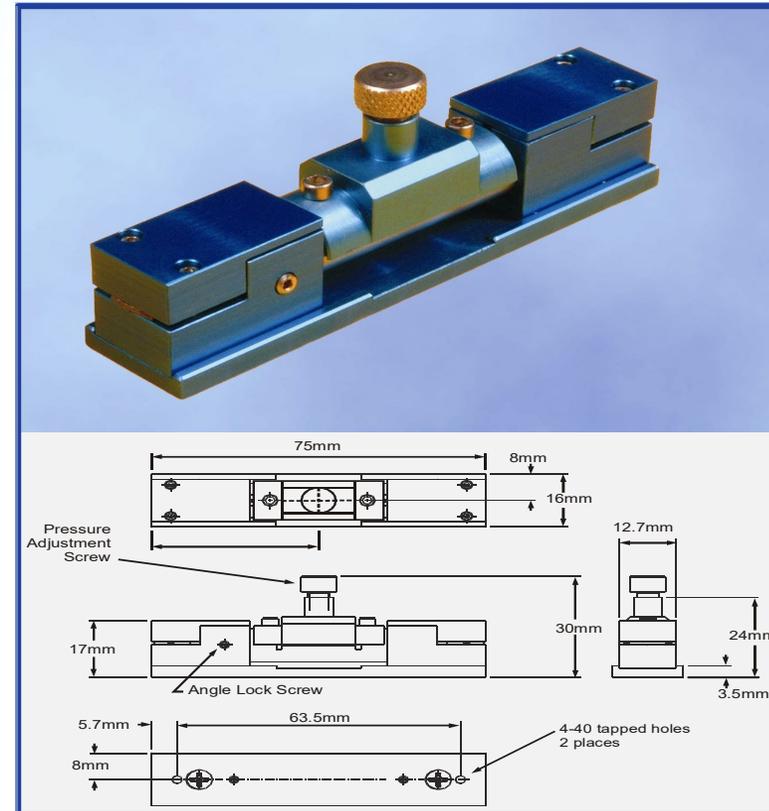




# Polarization Controllers

## DTS0001: All Fiber Polarization Controller

- No intrinsic loss
- No back reflection
- Miniature housing
- Easy to use
- Wavelength insensitive
- Low cost



DTS0001 – All Fiber Polarization Controller

# Optical Delay lines

## DTS0055: Optical Delay Lines

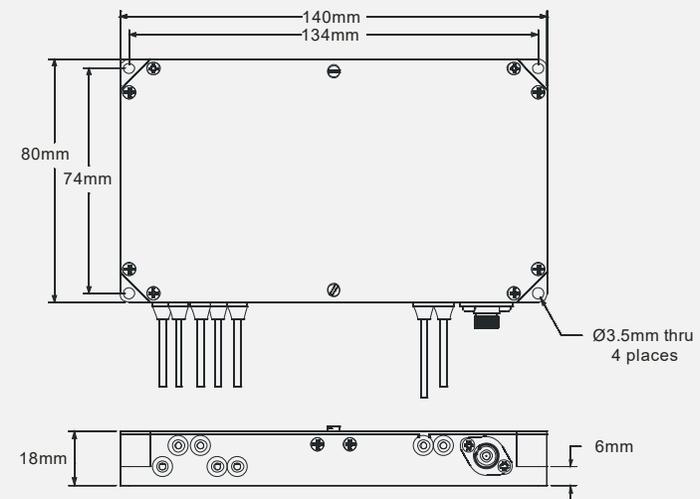
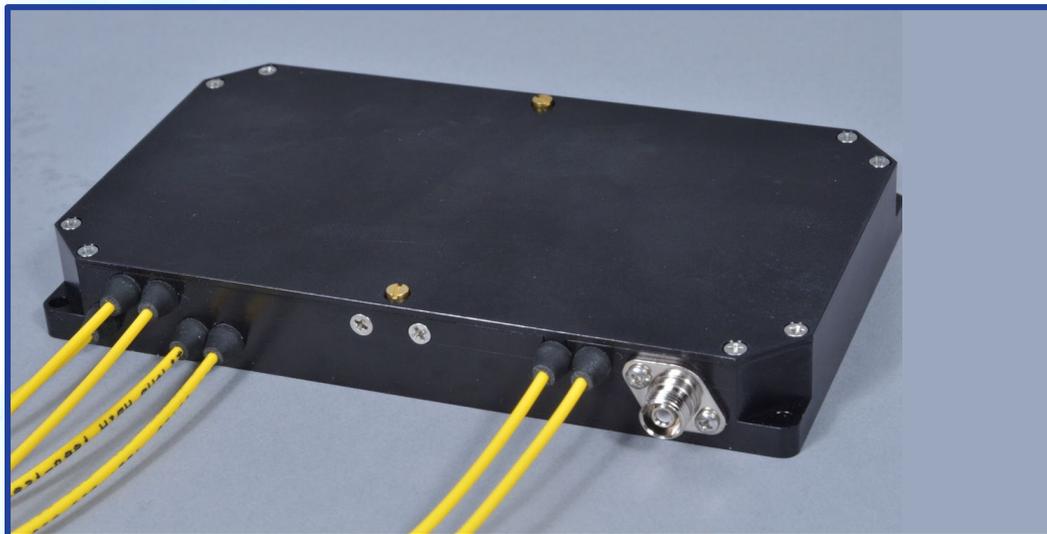
- Electrically controlled via RS232
- Over 300 ps delay range, < 1 dB typical IL
- 0.003 ps (0.8 micron) Resolution



DTS0055 – Optical Delay Lines

# OCT Interferometer Modules

- Combines splitters, attenuators, circulators into a single module
- Mach Zehnder and Michelson versions
- Custom built to customer specifications
- Single mode, and PM fiber versions
- 850 nm, 1060 nm, 1300 nm, and 1550 nm Versions





# Broadband SLD Stable Sources

**DTS0073: Polarized Fiber Optic Source**

**DTS0081: Fiber Pigtailed Ultra Stable Laser Module OZ-1000, OZ-2000 & OZ-3000 Series**

- **830 nm, 1060 nm, 1300 nm and 1550 nm versions**
- **50-100 nm linewidths**
- **Over 10 mW output power versions**
- **Single mode and PM fiber versions**



**DTS0073 – Polarized Fiber Optic Source**



**DTS0081 – Fiber Pigtailed Ultra Stable Laser Module OZ-1000, OZ-2000 & OZ-3000 Series**

# Thank You for Choosing OZ Optics

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