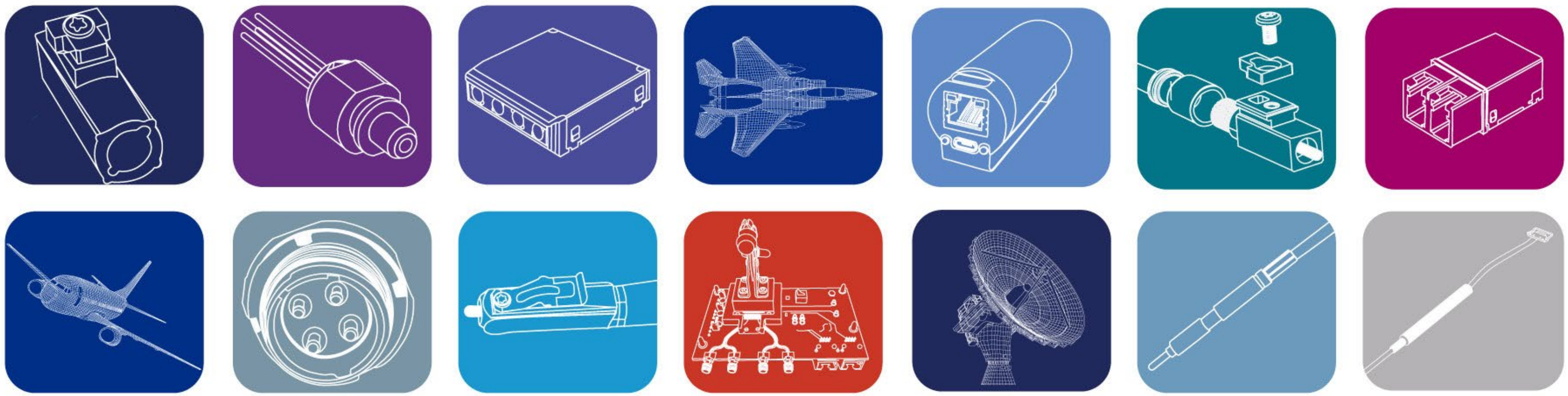
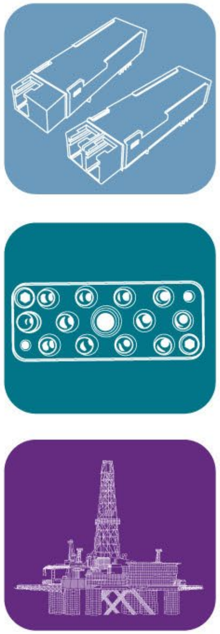


COTSWORKS®

Rugged Optical Network Component Solutions



www.cotsworks.com

About COTSWORKS

COTSWORKS, INC. is an innovative manufacturer of rugged optical components and subsystems for harsh environment networking and sensing applications.

Commercial OR Custom-Off-The-Shelf components are integrated across multiple engineering disciplines to WORK in the most consistent, highest quality, performance, and cost-effective process and configurations.

Optical Transceivers, Simplex and Complex Cables, and Test Equipment are designed for Commercial and Military Aerospace, Military Tactical, Industrial & Energy, Rugged Networking and Sensor markets.

AS9100, ISO 9001, and ATEX certified, founded in 2006, with 100+ employees in North America, Europe, and representatives in Asia and Middle East. Privately funded with investment from Industry leaders.

COTSWORKS®

Markets and Product Application

COMMERCIAL AEROSPACE

MILITARY AEROSPACE

TACTICAL VEHICLES

SUB SEA

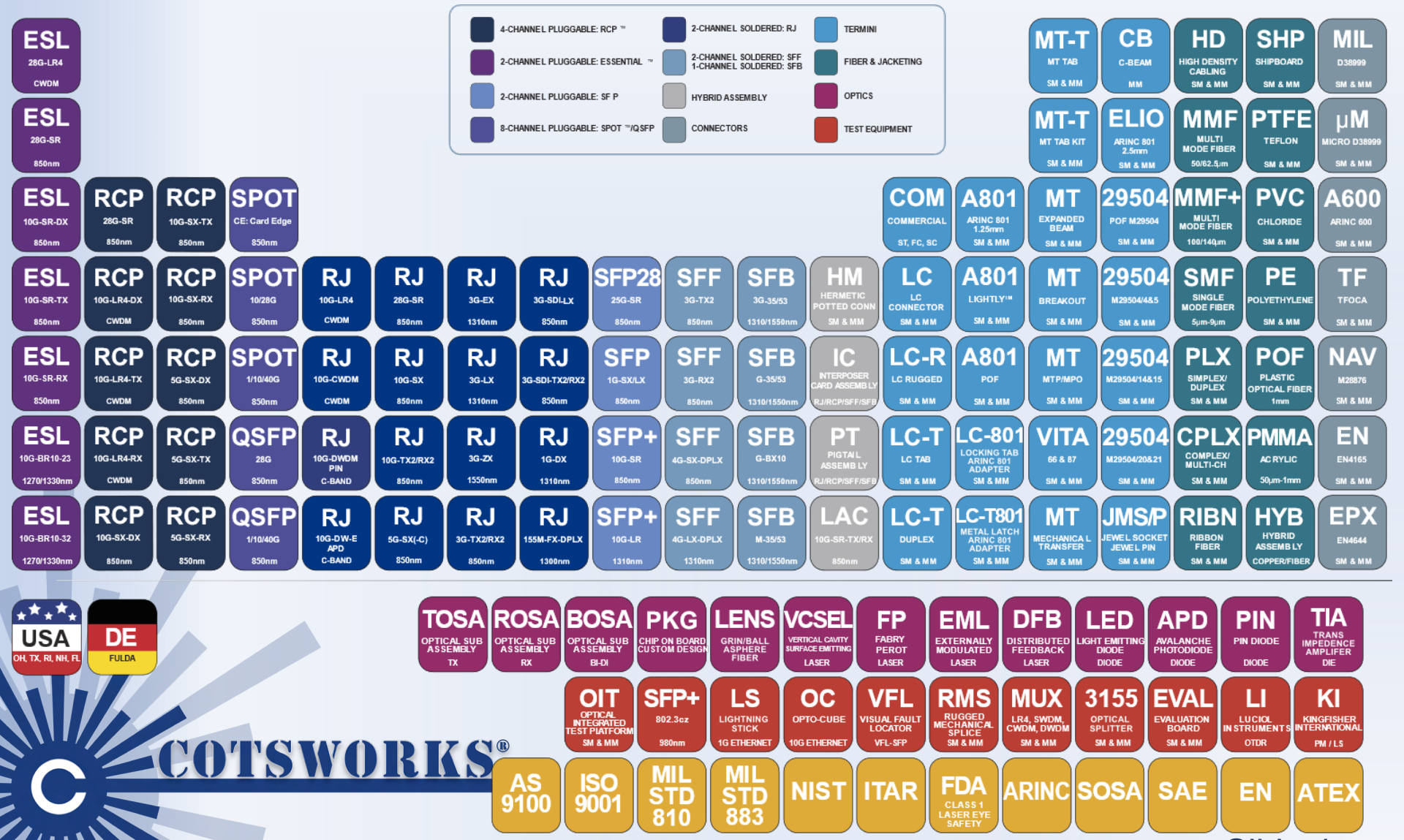
APPLICATIONS

Flight Deck Displays | In-Flight Entertainment and Cabin Crew Interfaces | Electronic Warfare | Radar Systems | Flight Recorders | Heads Up and Down Displays | Storage Devices | Cameras | Towed Array Networking

FIBER NETWORK ADVANTAGES

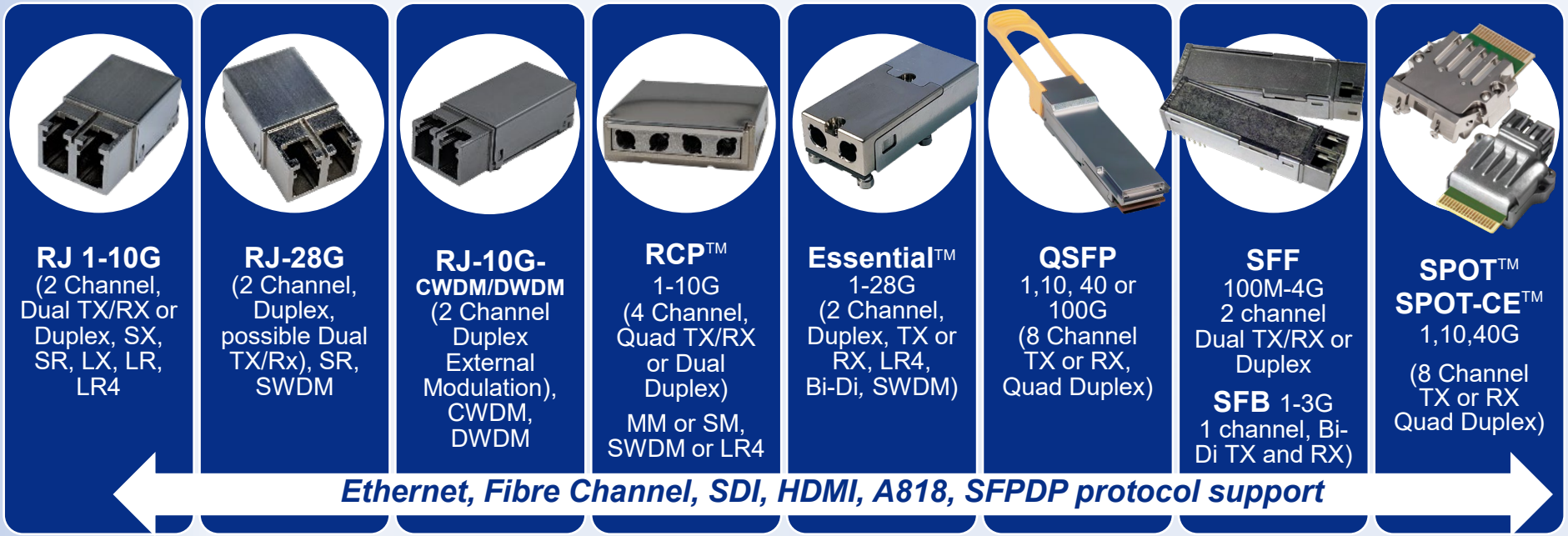
- Reduces data wire weight by up to 70%
- Increase network bandwidth and enables multiple protocols on one fiber
- Enables powerful edge computing network architectures
- Reduces EMI concerns in composite airframes Vs copper wire

Elemental Product Platforms



COTSWORKS®

Opto-Electronic Platform



COTSWORKS ships 100,000 channels/year into Boeing and Airbus commercial aircraft and many USA and EMEA warfighters, transports, rotorcraft, and radar/sonar systems worldwide.

Interconnect Platform

LC-T™

All metal body, robust metal clip, no tools needed, high pull force.

LC-R™

1.25 mm ferrule with metal screw based latching system.

Comes with locking termini & screw kits.

Lightly™

ARINC 801 innovation to simplify installation. No FOD risks: Built-in insertion/removal tool on back-end.

POF M29504

Plastic Optical Fiber terminus designed to accept single core 1000µm plastic fiber. MIL-PRF-29504 style.

C-Beam™

Pin and socket style optical terminus pair with replaceable hood and lens feature.

LC-T801™

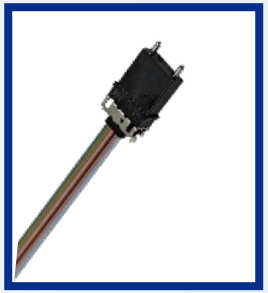
LC-801™

Converts LC receptacles to ARINC 801 receptacles.

COTSWORKS develops its own rugged termini for use with our transceivers or in-line networks in vehicles

- COTSWORKS manufactures simplex and complex fiber optic cable assemblies using the highest quality materials and processes available.
- Terminated, rugged fiber cables with Military or Commercial Aerospace grade termini and connectors are made to meet and exceed industry certifications.

ARINC 801



MT

LC

M29504

Jewel

CONNECTORS

- D38999
- Micro D38999
- EN4165
- EN4694
- GPRB/EPXB
- ARINC 600
- TFOCA
- M28876
- M83526
- MPO
- SMA
- Expanded Beam

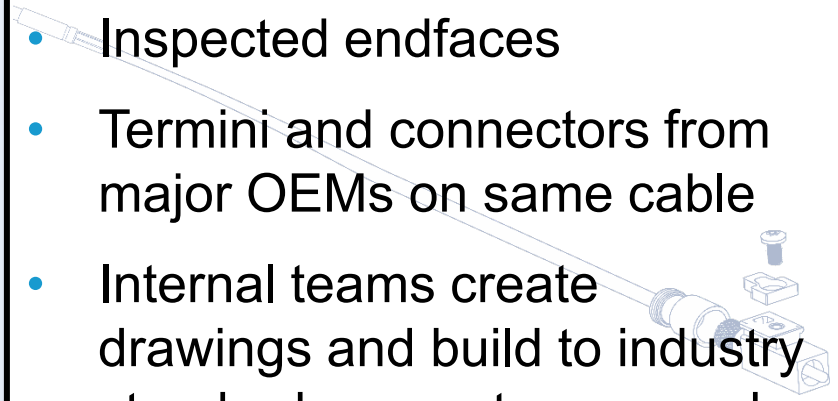
Product Platform Benefits

Optical Transceivers

- Better Tx, Rx values
- Wide temperature operation
- Meet Mil/Aero environmental
- Vertically integrated supply of transmitters and receivers
- COTSWORKS' Firmware: Better control, features, security across platform

Optical Fiber Cables

- Better IL and RL
- Inspected endfaces
- Termini and connectors from major OEMs on same cable
- Internal teams create drawings and build to industry standards or customer needs
- COTSWORKS' termini adds value in features, usability



COTSWORKS®

Transceivers and cables can be tested with COTSWORKS' automated test equipment

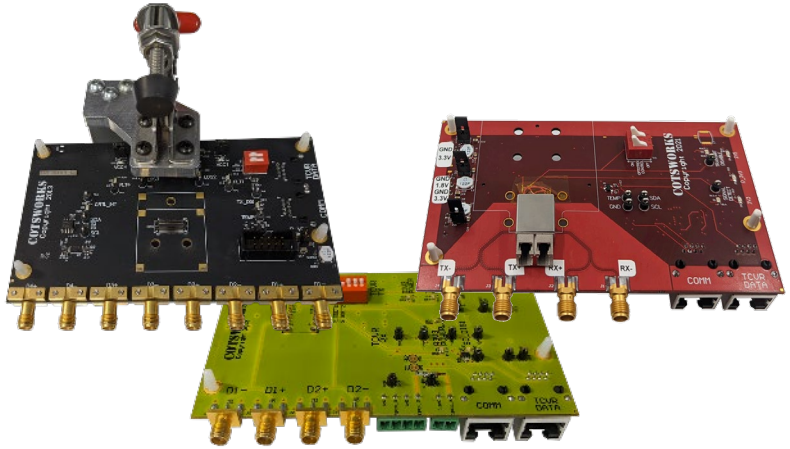
Optical Test Platform

Optical Integrated Test (OIT) Platform

The (OIT) Platform can be integrated into a production line to test and validate the performance of the optical link while under data or environmental stress testing

- 2, 4, 12, or 36 port configurations in standard 19” rack
- User specified port operation, function and performance
- Modular internal design allows reduces cost, support time
- Built-in cable calibration tool reduces optical fiber referencing
- API commands for Python and other scripting
- Dedicated interface port for PC monitor and control
- Web server enables software control of hardware functions

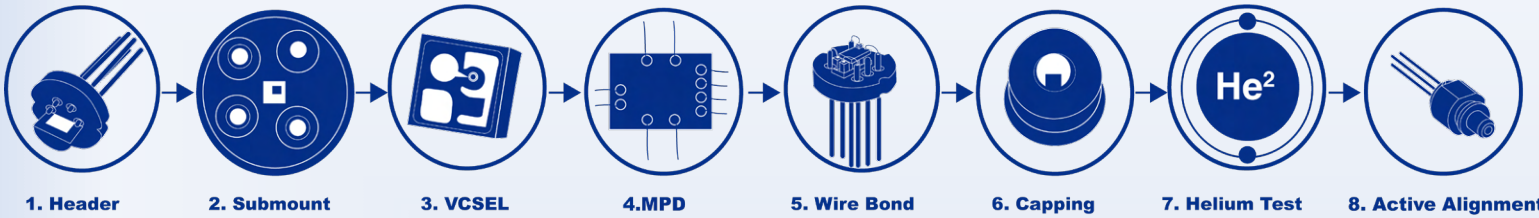
Test Boards/ Interposer Boards



COTSWORKS test boards are ideal for testing and troubleshooting optical transceivers. They can be modified into Interposer Boards routing the electrical signals from COTSWORKS’ transceivers to an existing PCB.

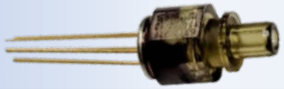
- SMA electrical interfaces
- Clampdown feature available on all boards
- Spring header receptacles for fast and easy transceiver mounting
- Convenient test points for DDMI interface
- Easy to read LED indicators for visual function verification
- Easy access signal detect test points
- Easy access TX Disable D.I.P. switches

Optical Sub-Assembly Platform



- **ISO 7, Class 10,000 Cleanroom** houses optical alignment, encapsulation, test equipment capable of producing **OSAs** operating at 100M to 28Gbps
- **Process Capabilities**: Burn-in, active alignment and capping, curing, performance testing, harsh-environment reliability testing, visual and optical inspection
- **Next Generation Process Capabilities**: Die attach, fiber metallization, micro-welding, wire bonding, TO-can welding, mechanical test, and hermeticity test
- **Design Engineering:** Optical paths including lens creation, selection, forming, silicon bench, chip on board taking light from a solid-state semiconductor to precise fiber coupling.

TOSA
Transmitter Optical Sub-Assembly



980nm, SWDM, CWDM4, LR4, CWDM, DWDM

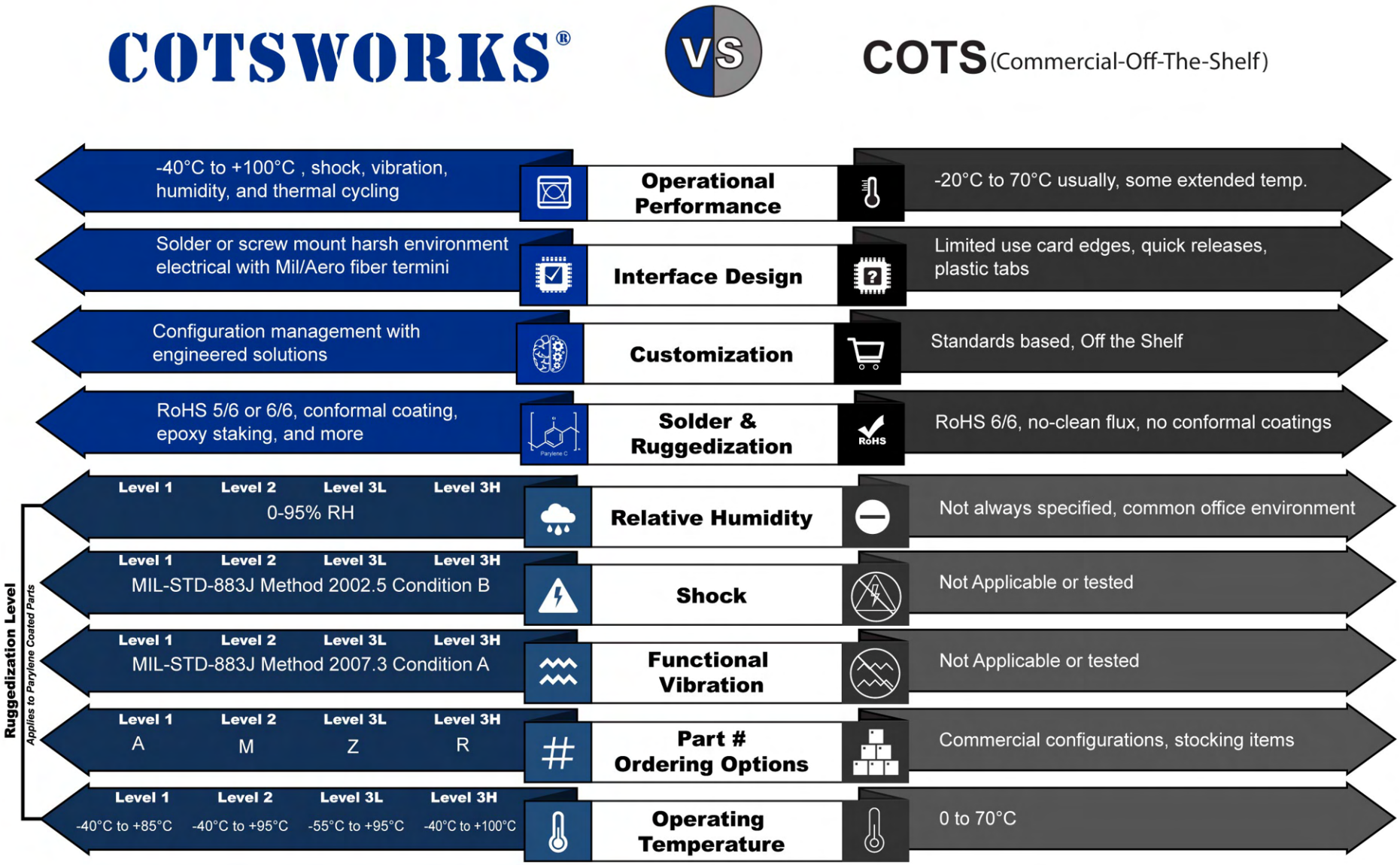
ROSA
Receiver Optical Sub-Assembly

980nm, SWDM, CWDM4, LR4, CWDM, DWDM

BOSA
Bi-Directional Optical Sub-Assembly

1310nm/1310nm, 1270nm, 1310nm, 1330nm, 1490nm, 1550nm

Product Features

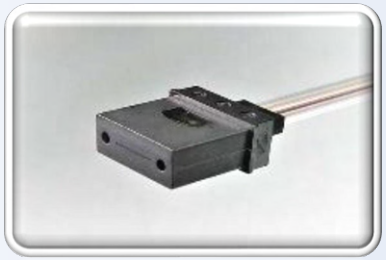


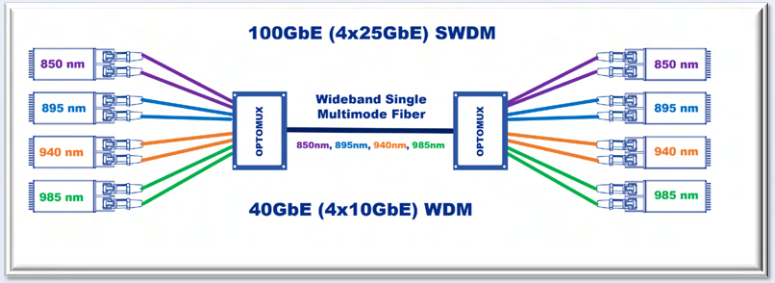
Company vs. Industry Standards

COTSWORKS®	VS	COTS (Commercial-Off-The-Shelf)
Tight opto- and electromechanical parameters	**Design Goals**	Industry standards, wide tolerances
3-5 year design cycle with longer term support	**Platform Lifecycle**	18-36 month use and short EOL term
Highly controlled geographical supply chain with vendor reviews	**Market Focus**	Commercial use and data/telecom standards based
Comprehensive literature with more parameters than standard	**Datasheet Detail**	Industry Standard high level without all OE interfaces and timing defined
Email, advanced web, phone, on-site engineering interaction	**Customer Support**	Automated responses, references to constantly changing MSAs
ITAR compliant with advanced cybersecurity compliance	**Export Requirements**	Open market use, unrestricted/reviewed firmware

Road to 100Gbps and Beyond

Reliable lasers at 25Gbps or 50Gbps over temp. to get to 100 or 200Gbps means parallel architecture or **W**ave **D**ivision **M**ultiplexing





Parallel

- ☑ 4, 8, or 12 channels, one controller chip, Multimode only, complex structures
- ☑ MT Connector, ribbon fiber, IEC commercial standardized
- ☑ Higher aggregate data rates with potentially lower link budget
- ☑ Smaller packages than pluggables and high-density electrical interconnect

WDM

- ☑ Two channels on single fiber or up to 16 channels for single or duplex fiber runs
- ☑ M29504, ARINC 801, or LC, simplex or duplex, Military, Commercial standardized
- ☑ Very high link budget, Single or Multimode fiber with optical muxes
- ☑ Using Mil spec fiber also enables highspeed through slip rings

COTSWORKS®

2025 PRODUCT ROADMAP

Opto-Electronic | Interconnect | OSA | Test

Q1 2025

Opto-Electronic
- ESL-10G-SR
- ESL-BiDi-LR4
- RCP-LR4

Interconnect
- POF-M29504 *(update)*
- Lightly *(update)*
- Potted Connectors/QSFPs

Optical Sub-Assembly
- 1-10/14-28G MM ROSA
- 1-28G CWDM4 TOSA

Test
- SPOT Eval Boards

Q2 2025

Opto-Electronic
- SPOT 10G
- SPOT-CE 10G

Interconnect
- MT-T Connector
- Lensed MT Cable Assemblies

Optical Sub-Assembly
- 1-28G CWDM TOSA
- SM FP TOSA/ROSA

Test
- Custom OITs

Q3 2025

Opto-Electronic
- SFP28 SR, LR
- SPOT28
- SPOT28-CE

Interconnect
- MT-x Box Wall Mounts
- Rugged SM/MM Couplers

Optical Sub-Assembly
- 1310 Defocused FP TOSA
- 31/55 & 27/33 BOSA

Test
- OptoCube 10G Updates

Q4 2025

Opto-Electronic
- RJ-10G SR SWDM
- ESL-10G SR SWDM

Interconnect
- S/C/D/CWDM4-Multiplexers
- Rugged Singlemode /Multi-Ferrule Termini

Optical Sub-Assembly
- 1/10/40Gbps Optical Engine
- 10/28Gbps Optical Engine

Test
- FPGA Based Eval Boards

For more information about COTSWORKS products, please contact our sales support team.

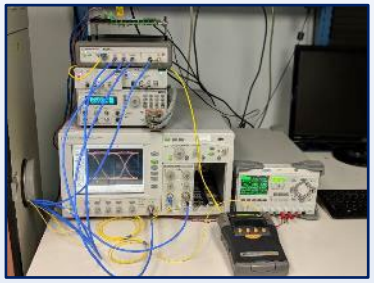
• Americas & Asia/Pacific | 440-446-8800 | sales@cotsworks.com

• EMEA | +49(0) 661 9786 9200 | EMEAsales@cotsworks.com

Facility

Facility Overview

- ISO 9001:2015, AS9100:D, JEDEC and IEC certified products
- State of the art with modern power and services for secure operation
- In-house failure analysis rework and repair capabilities
- Production test racks include automated BERTs, optical & electrical scopes, spectrum & protocol analyzers, power meters, light sources with NATA/NIST traceability, high resolution OTDRs, advanced imaging systems, mechanical property analysis, and more



Transceiver Production

- Opto-electronic assembly/test/rework stations: industry leading manufacturer equipment & custom-built stations
- All test data is recorded and readily retrievable by barcode
- All parts tracked by serial ID, lot #, technician, and linked to customer from PO to shipment
- Shipment specific test data and certificates of conformance provided with every delivery

Simplex & Complex Cabling

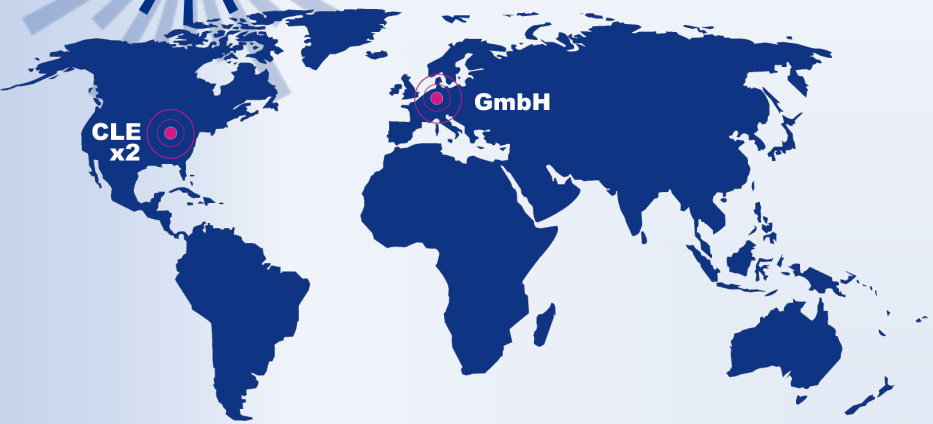
- SIMPLEX and COMPLEX cable design/fabrication/state of the art test of optical & hybrid assemblies
- Terminates/polishes to customer specified or industry standards: every cable/termini are inspected visually & with an interferometer ensuring they meet or exceed specifications
- IL test data provided with every cable. Screen shots of test measurements available upon request

FORCE

- Fiber Optic Research Center of Excellence (FORCE) packages optical ICs utilizing optical bench design, submounts, enclosures, fiber guides unique packages, optical filters and more
- Lens design, light path analysis, splitter/combiner, laser diode package, and fiber ferrule design

COTSWORKS®

Company History



100+ Employees

30,000 SQ FT high tech facility

***21% Annual Growth**

**Excluding Pandemic Years*

100,000+ Parts shipped annually

2006
- COTSWORKS founded in Cleveland, Ohio USA

2007
- WDM transceivers and passives ruggedized for Mil/Aero applications

2008
- COTSWORKS achieves ATEX certification for Oil & Gas product applications

2009
- COTSWORKS expands mfg facility with advanced ESD implementation

2010
- COTSWORKS achieves ISO 9001 certification for design and manufacturing of opto-electronic device

2011
- Enhanced RJ Transceiver released, supporting digital diagnostics, 5Gbps, and SM fiber

2012
- COTSWORKS achieves ISO 9001 certification for design and manufacturing

2013
- RCP is upgraded for new radar applications, offering 15 dB of link budget at 10Gbps

2014
- COTSWORKS named one of the top 100 fastest growing companies in Northeast Ohio

2015
- The RCP product platform is expanded to include quad Tx or Rx configurations in addition to standard duplex

2016
- New production and engineering areas added to support growth of complex cable assembly offerings

2017
- AS9100C certification achieved with production capacity exceeding 250,000 units/year

2018
- COTSWORKS creates GmbH in Fulda, Germany to support rapid growth of EMEA market

2019
- COTSWORKS receives R&D grant to build FORCE, a Fiber Optic Research Center of Excellence, in Ohio

2020
- Multi-year product development roadmaps released publically, demonstrating alignment with growing mil/aero market needs. AS9100:D certification achieved

2021
- COTSWORKS celebrates 15th anniversary with >$100M in generated revenue & 600,000+ units delivered across 20k shipments to customers around the world

2022
- COTSWORKS celebrates 5-years at its GmbH office in Fulda, Germany. Phase II Update of FORCE to include single-mode assemblies & DFB lasers

2023
- Rugged Mechanical Splice & POF termini released. COTSWORKS CEO accepts chair position at SAE AS-3 Fiber Optics & Applied Photonics Committee

2024
- New OSAs and Test equipment. New form factor parallel part: SPOT. New leadership in Sales/Marketing. New office supporting growth, and, Best financial results in the company's history

2025

Company Information

Quality System:

ISO 9001:2015 + AS9100:D CERT-0136100
ATEX Compliant, OP IS
S20.20 ESD program
J Standard electronic parts work
Compliant to FAR 52.204-2, DFARS 252:204-7012
NIST 800-171 Compliance in process

Aerospace and Electronics Industry Quality Standards

FDA/CDRH Laser Safety Test and Manufacturing Support

International Traffic in Arms Regulations

ESD handling and Facility Testing, Operation, and Certification

Harsh environments including Oil and Gas compliance

Foreign Object Debris Procedures, Auditing, and Training

Company Information:

EIN/Tax ID: 20-4055028
Vendor License: 18-90016
CAGE Code: 49T62
ECCN: EAR99
ITAR: M37737

USA

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COTSWORKS®