We Manufacture Reliable Optical Products

Vision of B&A: Specialist on Photon Technology

B&A Technology

Shanghai B&A Technology Co., Ltd

CONTENTS

B&A Technology

Who is B&A?

CHAPTER 1

COMPANY INTRODUCTION

B&A Technology

Other High light :

- ✓ Product Qualified by True of Thailand, Telefonica, Claro and some biggest CATV operators
- ✓ 30 million RMB credit line of Bank of Nanjing

2004.9.28
Founded in Shanghai
By Dr. Topson

2007.3
The 1st commercialized EYDFA in FTTH in China

2013
EDFA qualified by Oplink & ZTE

2017
The Largest supplier of FTTX EYDFA in China

2018
Improved subsystem product line

2020
Improved OCT components and Lidar components product line

17 years of operation

17 years of manufacturing

17 years of independent R&D

Market Segments

B&A Technology

The Engine of Fiber

Communication

Industrial Solution Providers

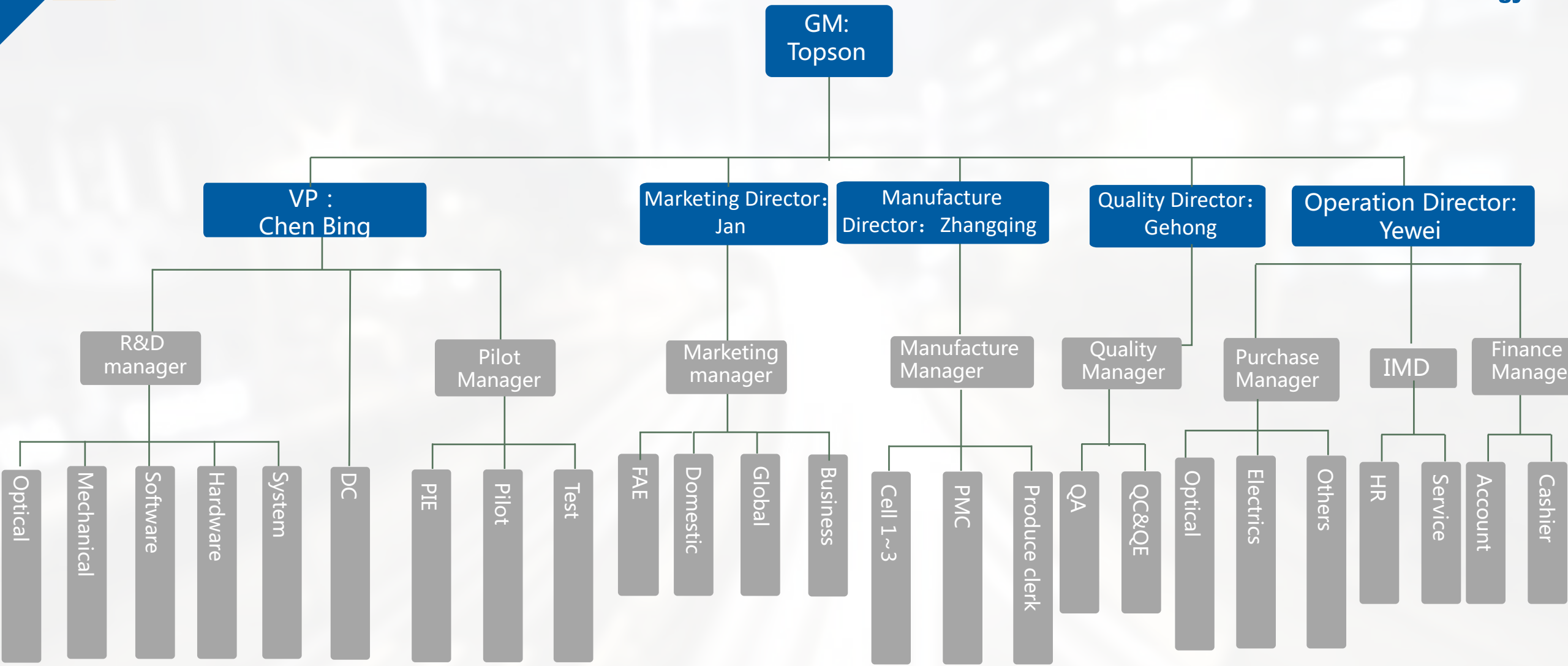
Customization On Demand

Telecommunication Solution Providers

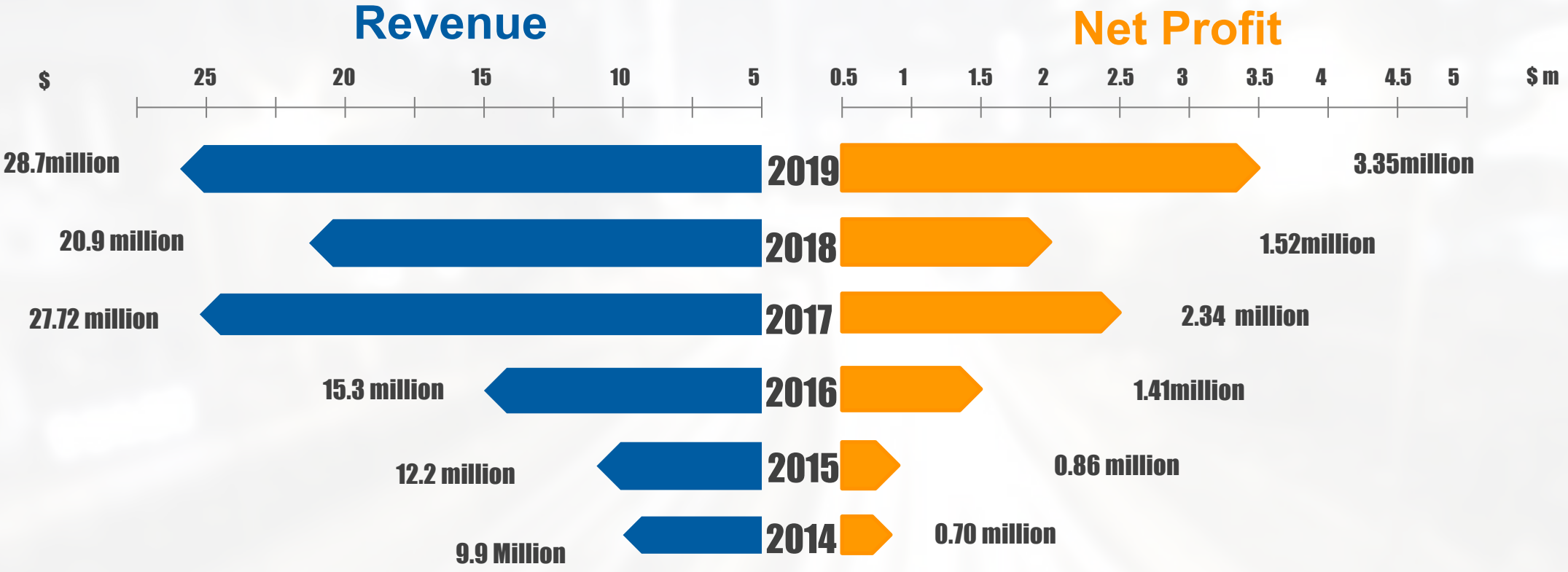
Fiber Sensor & OCT & Lidar application

Research Institutes and Others

COMPANY O-Chart

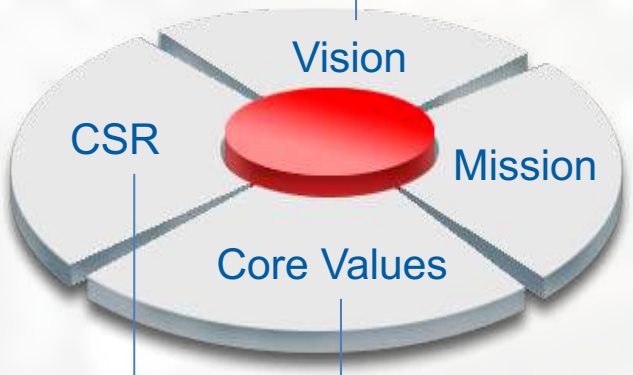


Finance


Revenue
Net Profit
$
25
20
15
10
5
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
$ m
28.7million
2019
3.35million
20.9 million
2018
1.52million
27.72 million
2017
2.34 million
15.3 million
2016
1.41million
12.2 million
2015
0.86 million
9.9 Million
2014
0.70 million

Our Vision: Specialist on Photon Technology

B&A Technology



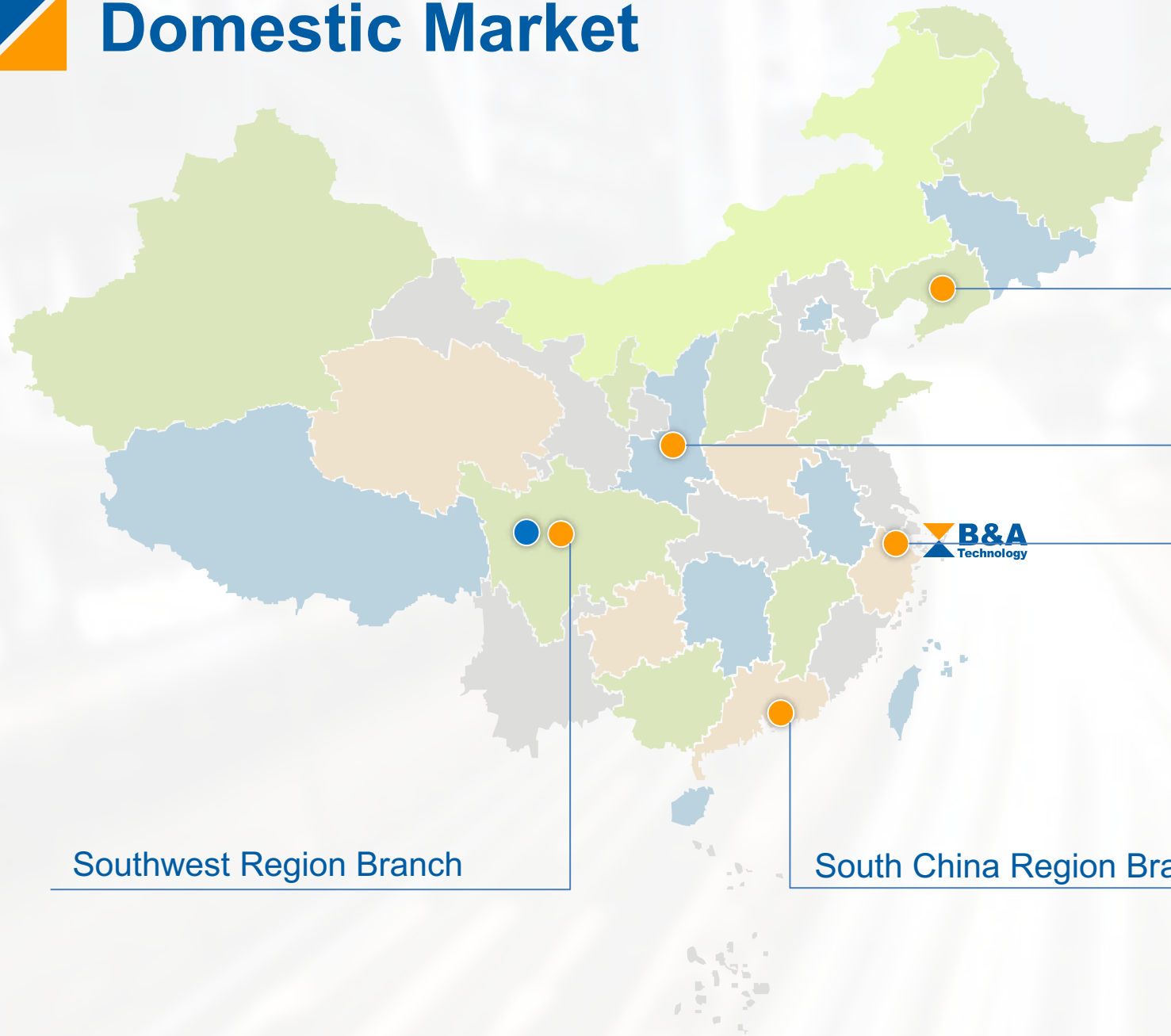
- **Continue and insist on Photon technology, concentrate our efforts and invests to technology breakthroughs, to be a respectful specialist on photon technology!**

- Create values for Customers
- Create opportunities for Partners
- Create base of health and happiness for Employees
- Create wealth and prestige for Investors
- Create development for Suppliers

- Customer-Centric
- Persevering
- Integrity
- Self-perfection

- To inspire technical innovation
- To keep green and environmental-friendly
- To ensure heathy and safe
- To repay to the community and society
- To respect and comply traditions, rules and laws

Domestic Market



Northeast Region Branch

Northwest Region Branch

East China Region Branch

- 1st Commercial EYDFA
- 2 R&D Centers : Shanghai,Chengdu
- 5 Region Branches
- 20+ Provinces business coverage
- 200+ Partners including: China Mobile, China Telecom, China Unicom, China State Grid, True, Viettel etc.
- 500,000 sets Commercially deployed

Southwest Region Branch

South China Region Branch

International Market: Success of Partners First

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1000,000 sets + Commercially Deployed with OEM brands

Honors and Patents

B&A Technology

- B&A keep investments on R&D, insist on strict quality control and follow ISO9001:2015 quality Standards, continue to provide products with high stability, leading technical innovation.

- Total 45 patents in the EDFA, High Power EDFA, Communication system, Sensor field and others, including 20 invention patents.

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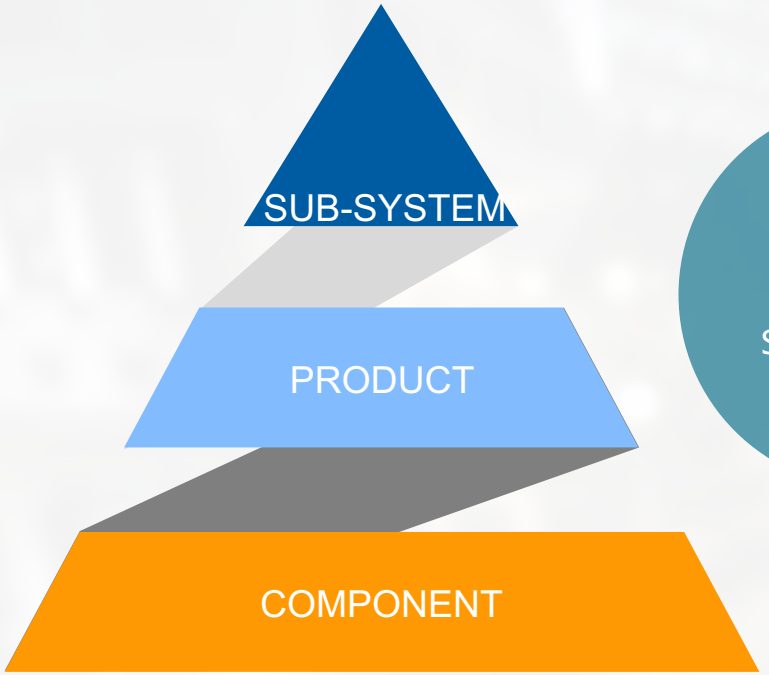
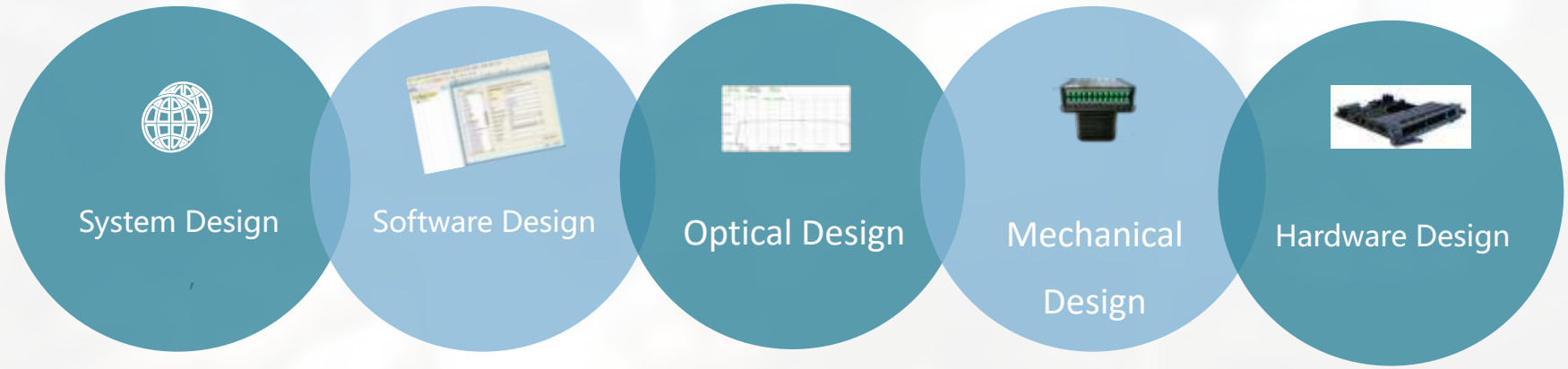
What B&A Can Do?

CHAPTER 2

From Requirements to Products

B&A Technology





Passion Team, Capability of Rapid Design & Mass Production

CATV HFC

OPTICAL TRANSMISSION

PON ACCESS

INDUSTRIAL FIBER LASER

LIDAR AND FIBER SENSING

Optical Design and Development

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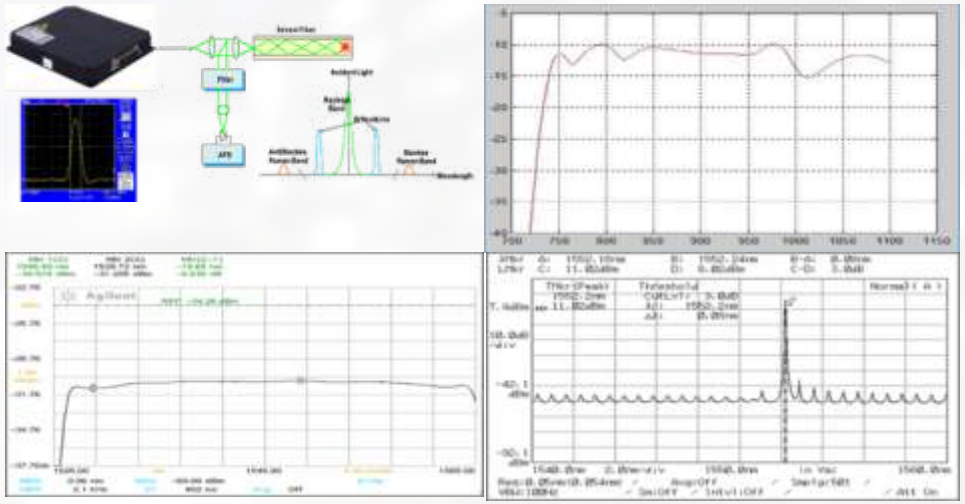
Optical Design

- Optical design and simulation software Optisystem, Oasix.
- Unique active fiber processing patent
- Bellcore 1312, GR468, GR1221, ITU-T G.977 and other standards of reliability design



CATV / Telecom / Utility Optical System

High-speed Digital/Analog Signal high-power Amplifier

Industrial Fiber Laser/Optical Sensor

Kilo-watt High Power Pulse Laser
Lidar Supporting Optical System
Optical Fiber Sensing System

Aerospace Grade Reliability

Participated China Shen Zhou Spaceship and Tian Gong Space Station Projects

Submarine Optical Experience

Submarine Optical Amplifier Communication Experience

Mechanical Design & Development

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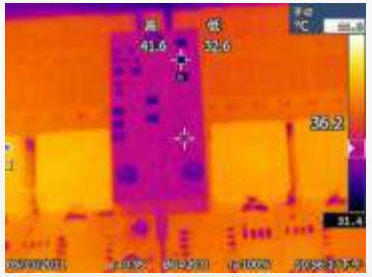
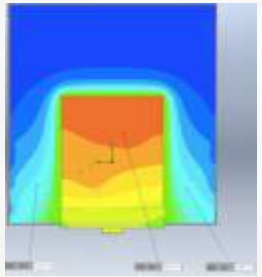
Mechanical Structural Design and Analysis Based on ProE, AutoCAD, Solidworks

Mechanical Reliability Design Based on IEC60068 / GJB150





High Complexity, High Precision Design Capability

Thermal Design Capacity of multi-layer Thermal Analysis and Simulation Based on FLOTHERM

Hardware Design & Development

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Hardware Design

Based on XILINX Zynq 7000 platform,TI C67xx Series circuit processing platform design and algorithm processing.
Based on TCP / IP with UDP network application development capabilities.

1. High-speed digital and analog circuit designs
2. Laser driving circuit and temperature control Patents
3. EMC Design following IEC61000 \GJBGJB151A152A
4. The high-speed circuit design capabilities based on single chip,ARM, multi-core,FPGA,DSP etc
5. Product Safety Design following CE,UL,RoHS
6. Low power consumption and high electro-optical efficiency

Software Design & Development

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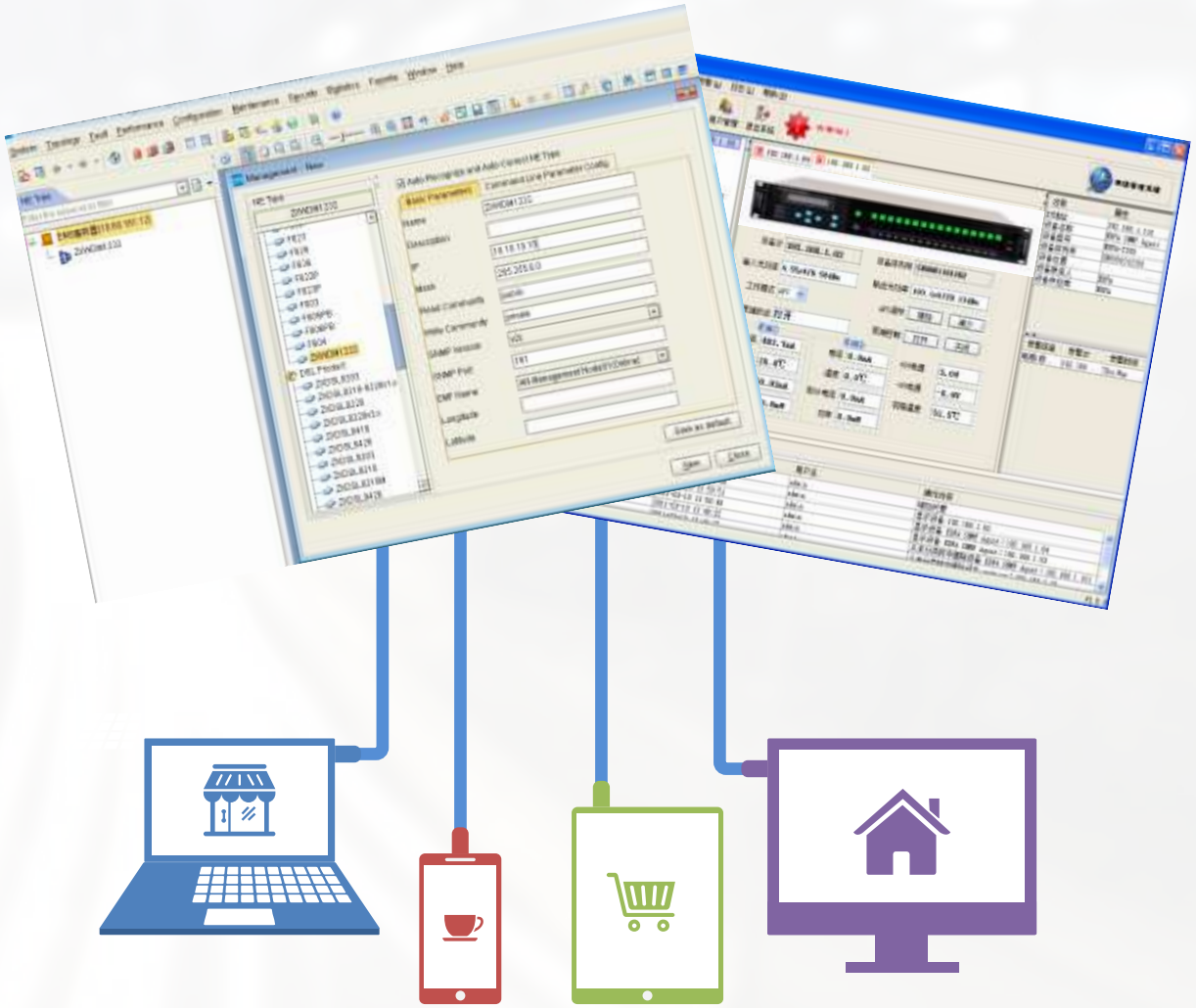
- Embedded operating systems and software
- TCP / IP & UDP network protocol stack process
- 10G Policy Routing software design
- Design network management software
- Database and application software



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What B&A Offer Now?

CHAPTER 3

Optical Amplifier Modules

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General EDFA

CATV EDFA

Constant output power
Max 24dBm

FGA & Raman Module

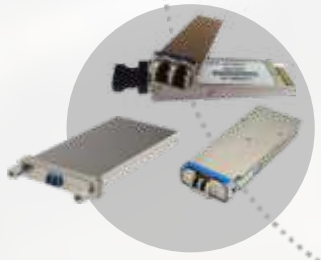
150*125*20mm
Max 24dBm

VGA & ASE Source

MSA module

Supermini EDFA

Subsystem Equipment

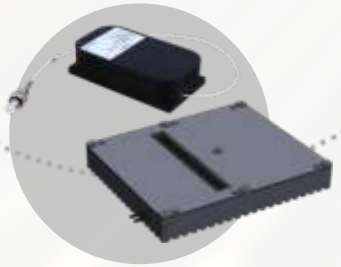


XFP、CFP2、CFP Module

Pluggable EDFA

MSA EYDFA: MAX30dBm
HA Module:MAX40dBm

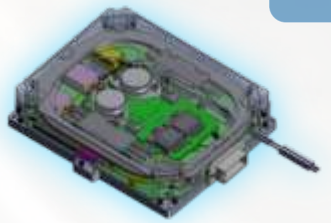
EYDFA Module

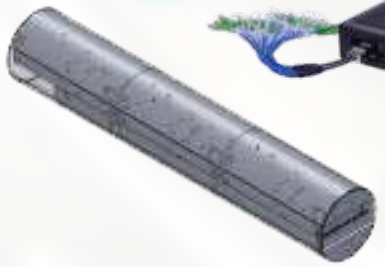


Mini EDFA & Gain block

Special EDFA

- Pulse EDFA
- C+L EDFA
- C+L Raman Amplifier
- PM EDFA
- Aerospace EDFA
- Submarine EDFA
- EDFA Array





Rackmount Products

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CATV EDFA

1.Support CATV distribution system
2.Max. output power 24dBm
3.Support mid-stage small signal amplification

Telecome EDFA

1. Support SDH system
2. Support DWDM system
3. Support BIDI system

Raman

1. Support long distance transmission system
2. Min receiver sensitivity -40dBm
3.Max gain 20dB

1RU FTTX EYDFA

1.Support Max.16 PON access system
2.Max. output power 33dBm
3.Optical switch is optional

2RU FTTX EYDFA

1.Support Max.64 PON access system
2.Max. output power 43dBm
3. Optical switch is optional

CATV Transmitter

1.Direct modulation and external modulation are optional
2.Max to 1.2Ghz
3.SBS max to 19dBm

DCM

1.Fiber/FBG/TDM is optional

FEC

1.Support:STM-1/4/16/64
2.Gain:5dB/8dB

OLP

1.Support 1+1,1:1,1-1 OLP system

Multi-Functional Platform Products

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Multi Functional Platform

ISAP 5200

ISAP 2200

ISAP 1200

	ISAP 5200	ISAP 2200	ISAP 1200
Height(U)	5	2	1
Slot of Service Board	16 Max	7 Max	3 Max
Power Input	DC -48V /AC 90~260V 1+1 Redundant design DC/AC hybrid		
Power Consumption	600W(Ref)	200W(Ref)	100W(Ref)

All boards are compatible and hot swappable

Multi-Functional Platform for Telecom(2)

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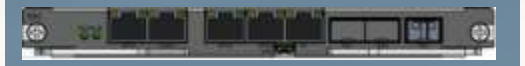
Services Boards— Diversified and Compact

Transponder Board

C/DWDM Board

EDFA Board

FEC Board



OSC Board

Transmission

Support all the optical transmission System

EYDFA Board

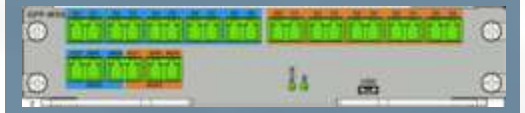
Transmitter Board

Video Combiner

PON Repeater Board

ACCESS

Support FTTX end to end solution



WSS Board

OCM/OPM

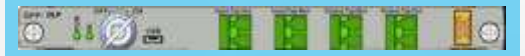
PS Board

EDFA Array

Open ROADM

Support part of ROADM system

TDM Board



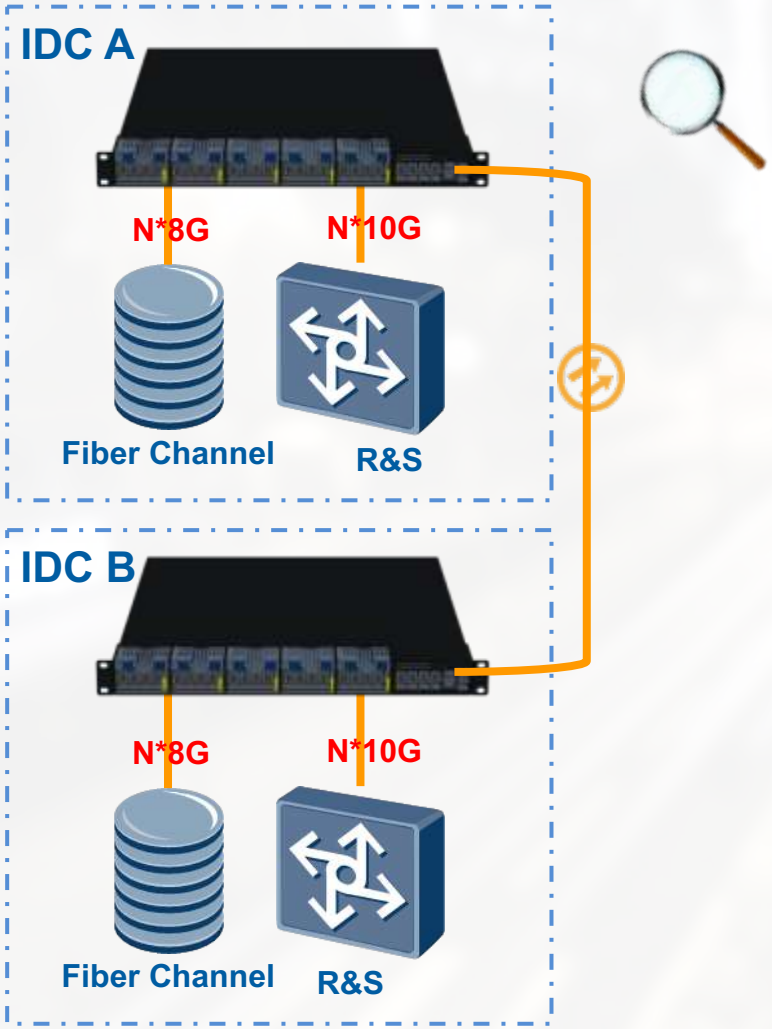
OLP Board

OTDR Board

Others

Support custom development

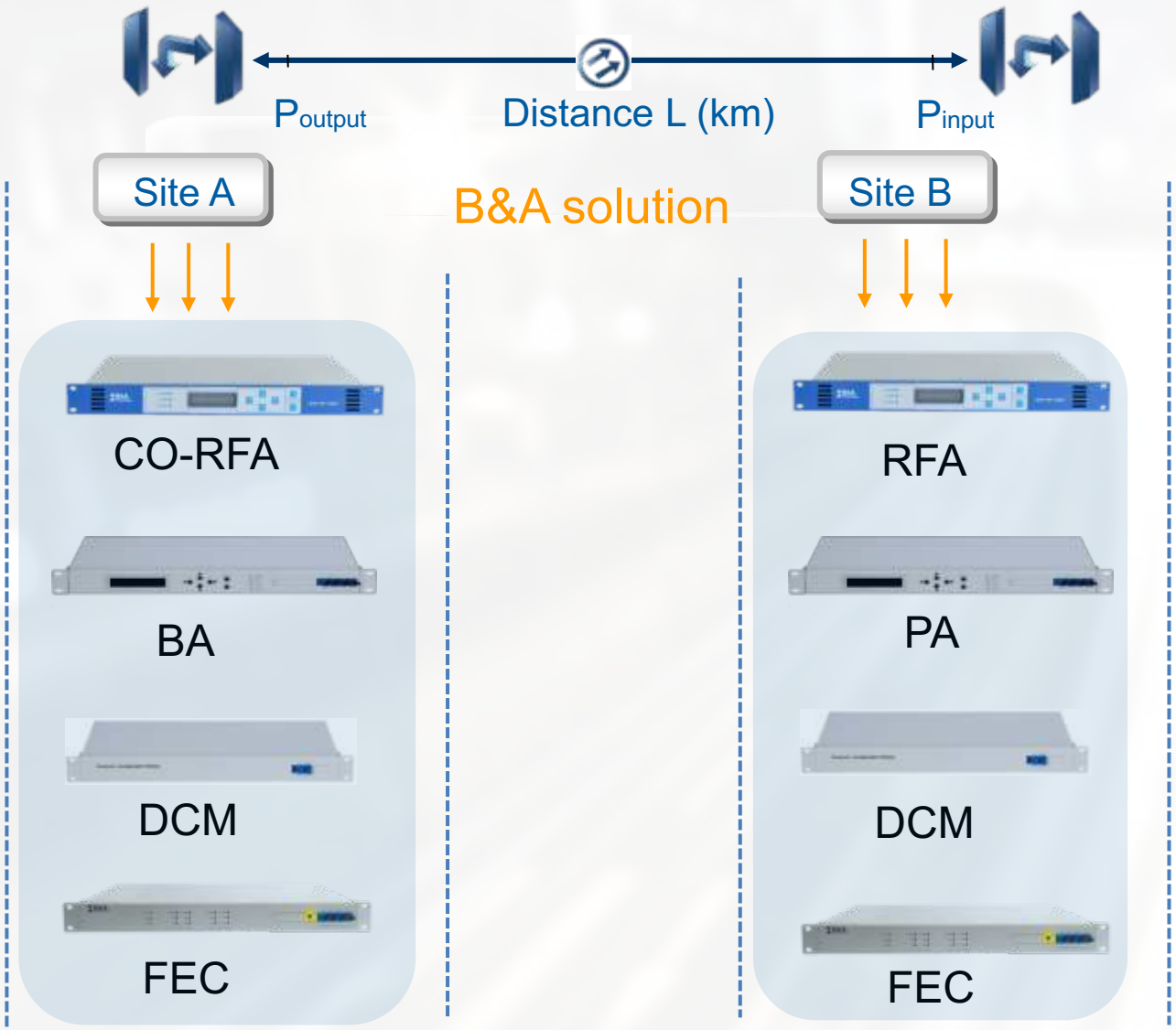
IDC Solution Introduction



Compatible OLS2200

- Support plug and play
- Combine OTU, Mux/DeMux, EDFA, OLP, OSC etc. in one unit
- Capacity:80G, 160G, 240G, 400G
- Support FE/GE/10GE LAN, 10GE WAN, stm-1 ~64, etc
- 8*10G board card can be inserted and unplugged
- Support maximum 80km, and OLA can extend the distance
- OLP 1+1 (optional)
- Support dual power supply

Ultra-Long SPAN Solution



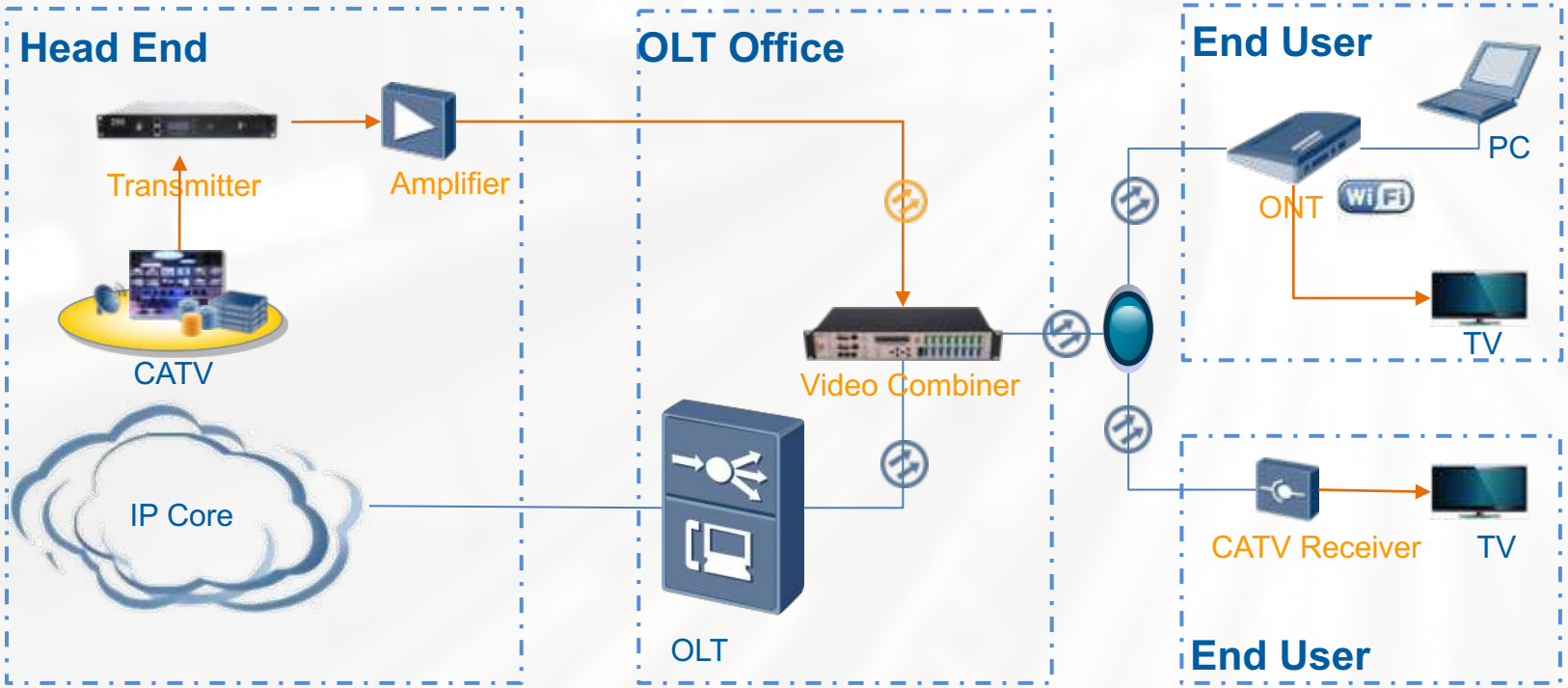
In some ultra-long occasions, deploying physical sites or REG in the middle is not a right cost-effective choice.

- Based on restricted factors of real network, B&A provide comprehensive long SPAN solution including BA/LA/PA, RAMAN,FEC,DCM,ROPA etc.
- Unified management system
- High compatibility: SDH/PTN/WDM network of various providers
- Widely commercially deployed in Telcom Operators, TV Operators and Utility companies in China

Solution	Traffic with Single Wavelength	Lab Test Result(Max)
BA | PA+DCM	2.5G	260km
	10G	200km
FEC+BA | PA+DCM+FEC	2.5G	330km
	10G	280km
FEC+BA | RFA+PA+DCM+FEC	2.5G	390km
	10G	340km

CATV Overlay Sub System

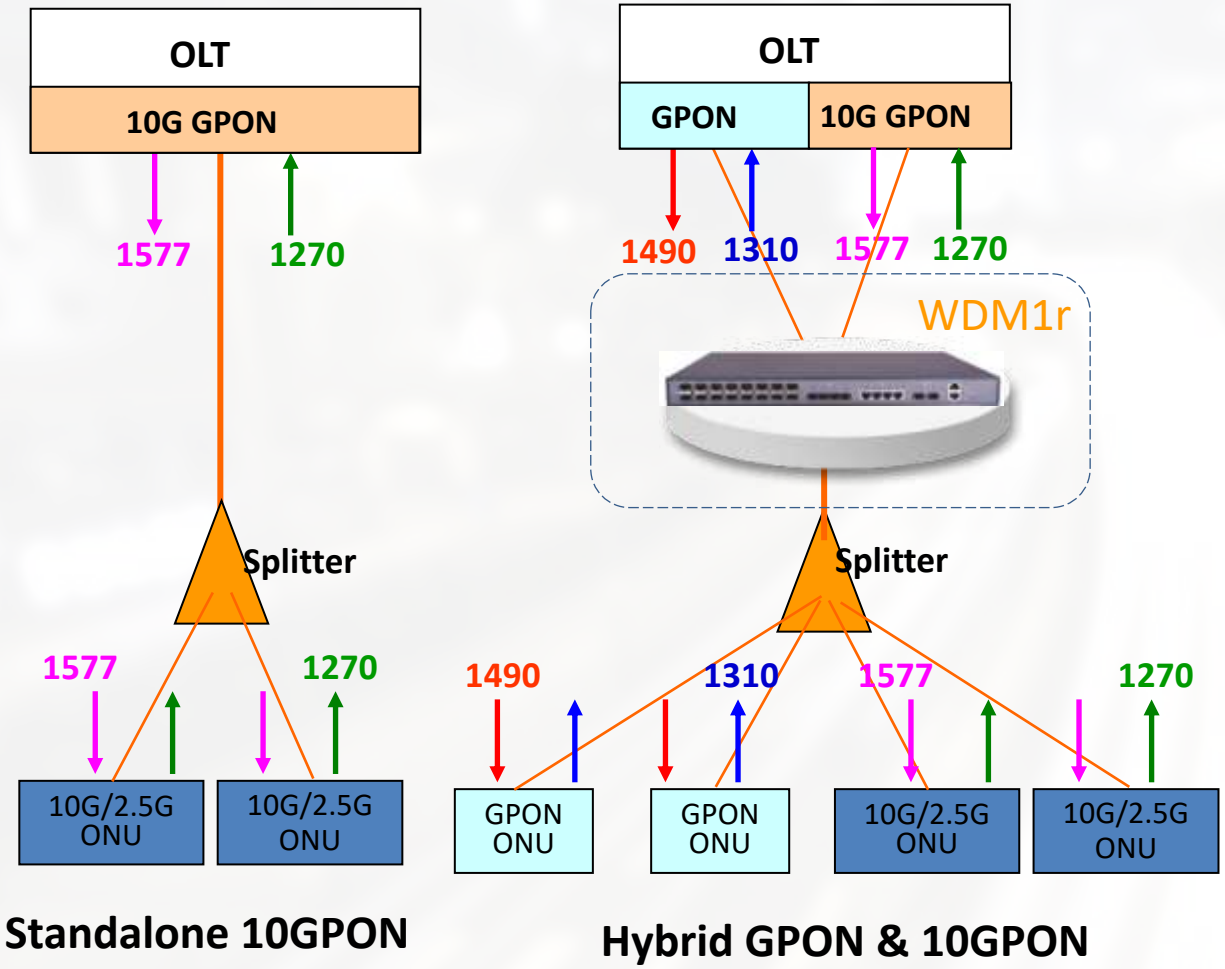
- MSO Operators merging with Telecom Operators
- CATV Overlay solution helping the merging smoothly.



B&A CATV Overlay :

- Fully compatible with GPON/EPON/XGPON/XGSPON OLT of mainstream providers
- Unified NMS
- Embedded high power amplifier to support 1000 users(Splitter 1:32) in single set
- Support 1+1 CATV signal input backup

Era of Co-existing of GPON and XGPON



- With the soaring of high bandwidth traffic, such as OTT video, 4kTV, 8kTV, AR,VR, 10GPON is coming
- Long-term co-existing of GPON and XGPON will be the market trend. Standalone WDM1r will be widely deployed in the co-existing networks.
- B&A provide standard WDM1r with high port-density (max 64 ports in 1U) and high wavelength isolation to guarantee high reliability for TELECOM operators.

Optical Protection Solution

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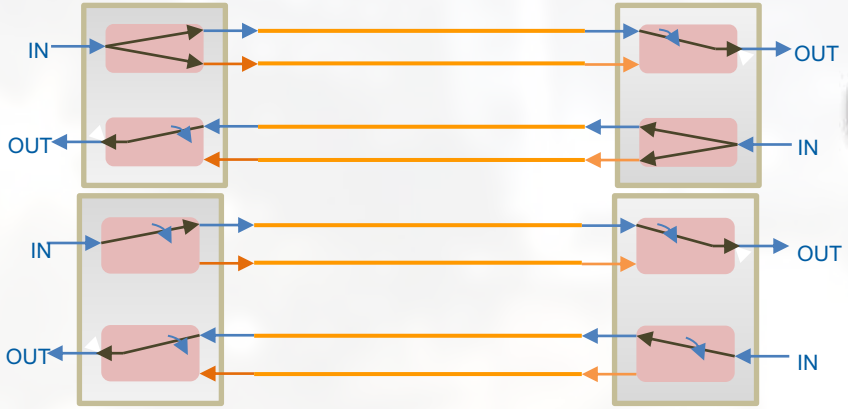
B&A OLP –Sufficient Optical Fiber Resources

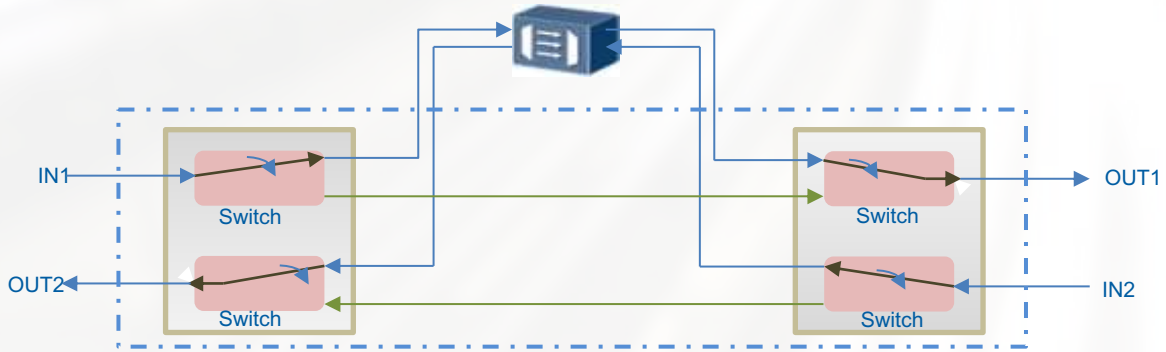


BA-OLP1000

- Low insert loss: ≤5dB
- Low handover time: ≤25ms

- Low insert loss: ≤3dB
- Low handover time: ≤50ms

B&A OBP—Single Point of Failure

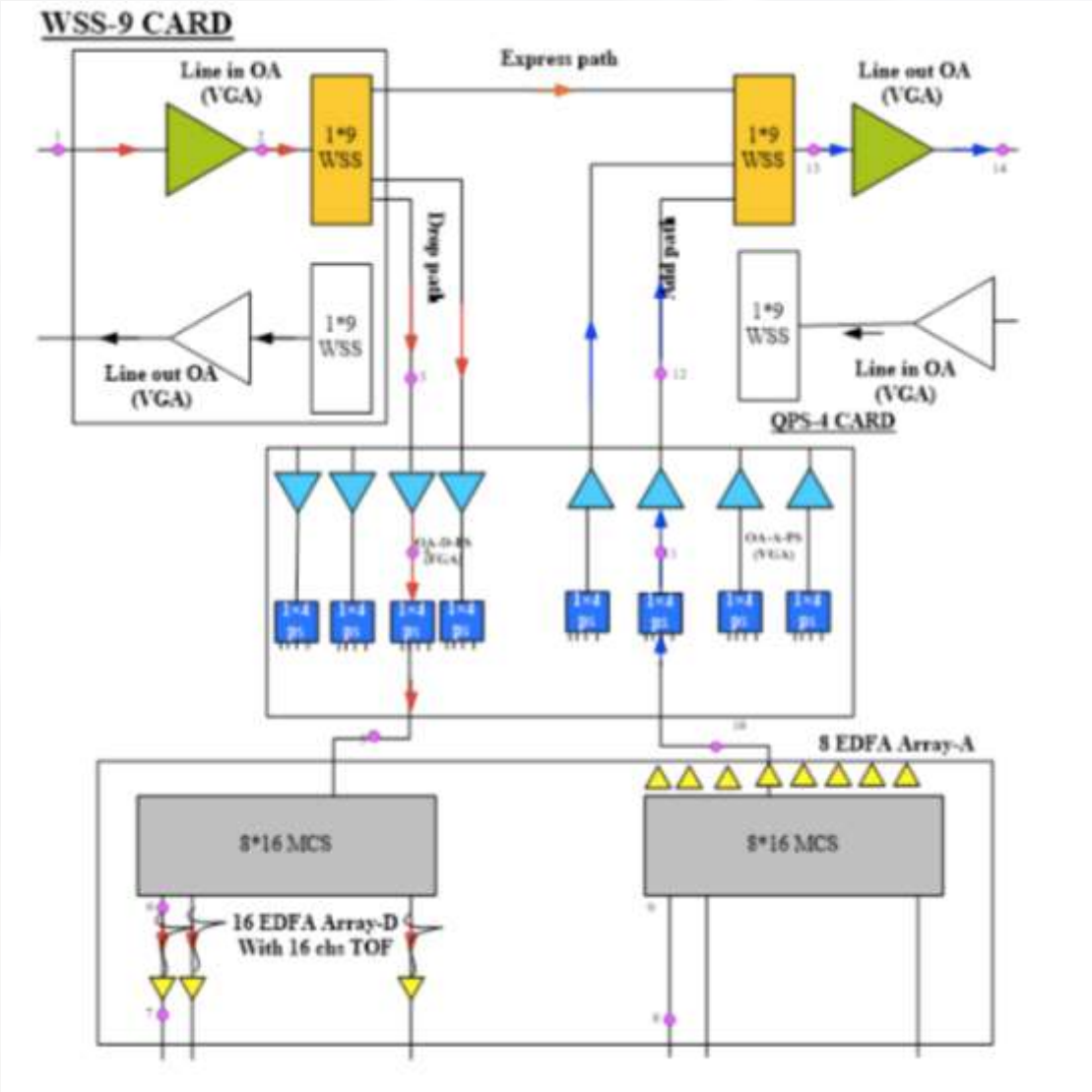


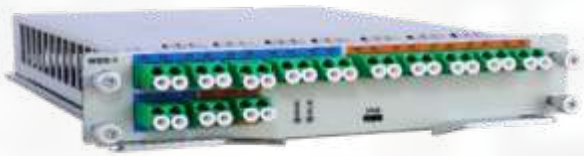
BA-OBP1000

- Low insert loss ≤1.5dB
- Low handover time ≤15ms

Uninterrupted: When site off power, the traffic service no interruption

Open ROADM Introduction





WSS card

- ROADM allows for remote configuration and reconfiguration
- Support max 9 dimension

OCM card

- Supervise every optical channel power

Compact Integrated Pulse-Source for LiDAR

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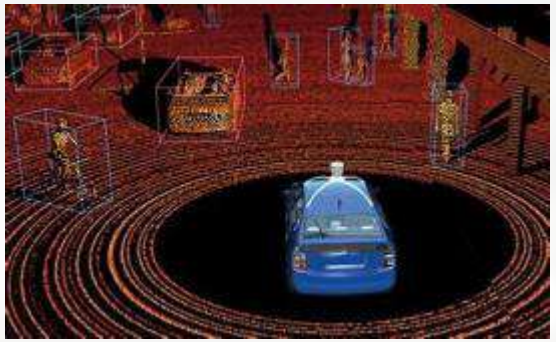
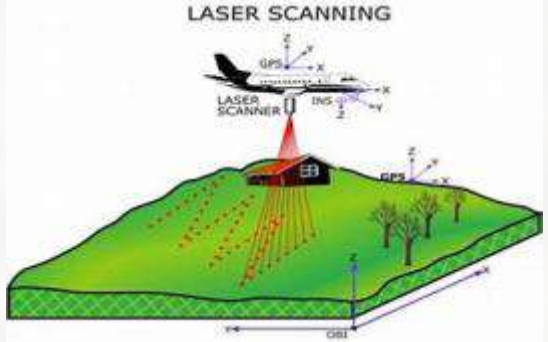
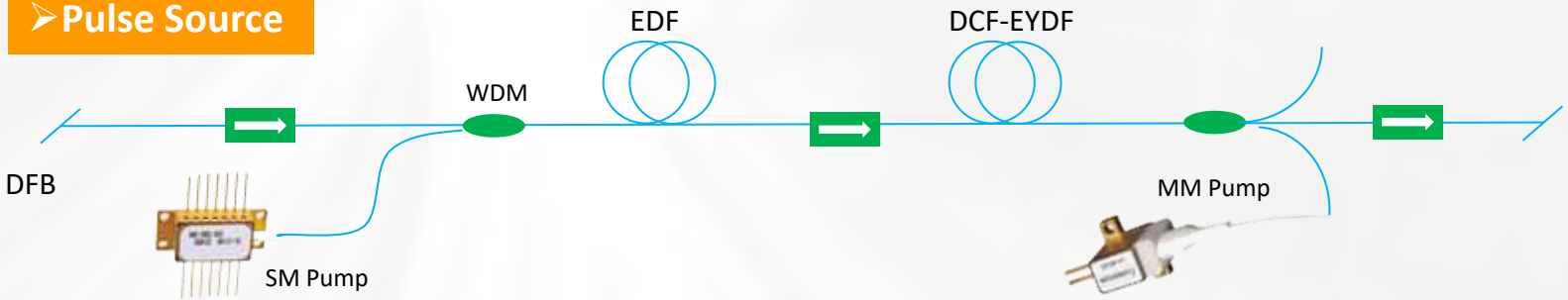
Light Detection and Ranging





Precise detection and ranging technology is widely used, including Autonomous vehicles, Mapping, Home/Industrial Robots etc.
B&A provide compact laser source and high power amplifier solution for LiDAR suppliers.

➢**Pulse Source**



Dimension: 80*45*20mm
Power Consumption:8W
Peak Power Output: 10KW+

Swept source for OCT

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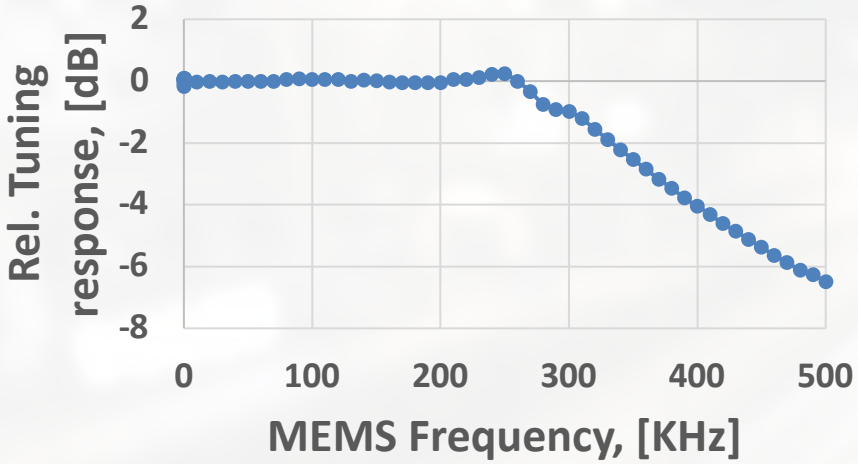
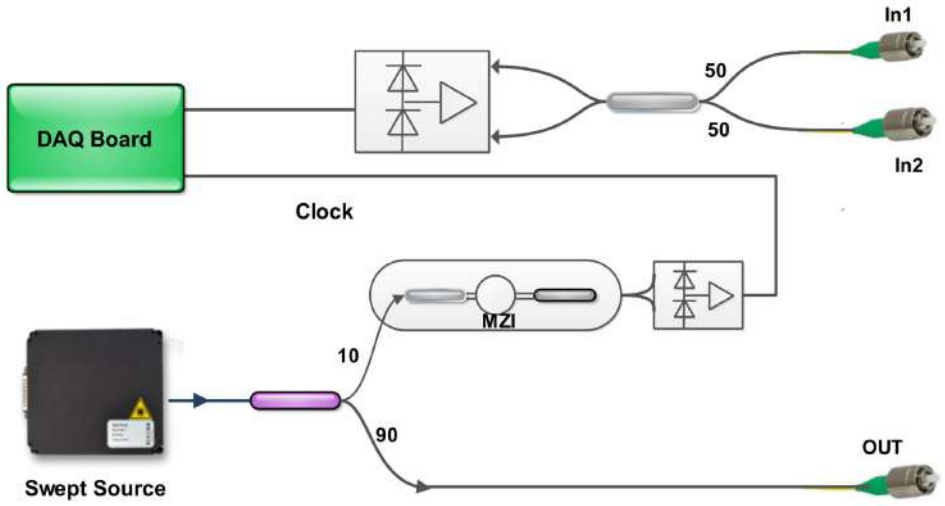
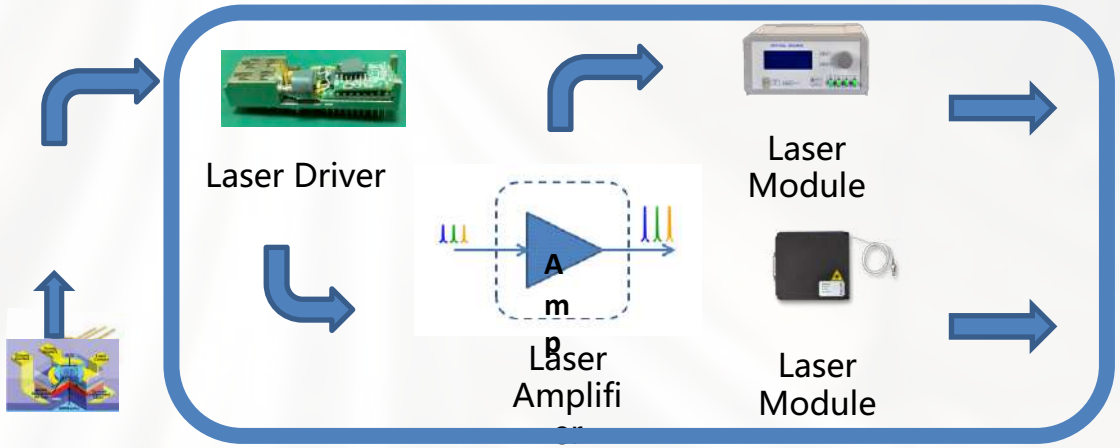
OCT Application:

The products uses MEMS-VCSEL to achieve continuous wavelength tuning with single-mode optical spectrum and narrow Linewidths at MHz scan rate.







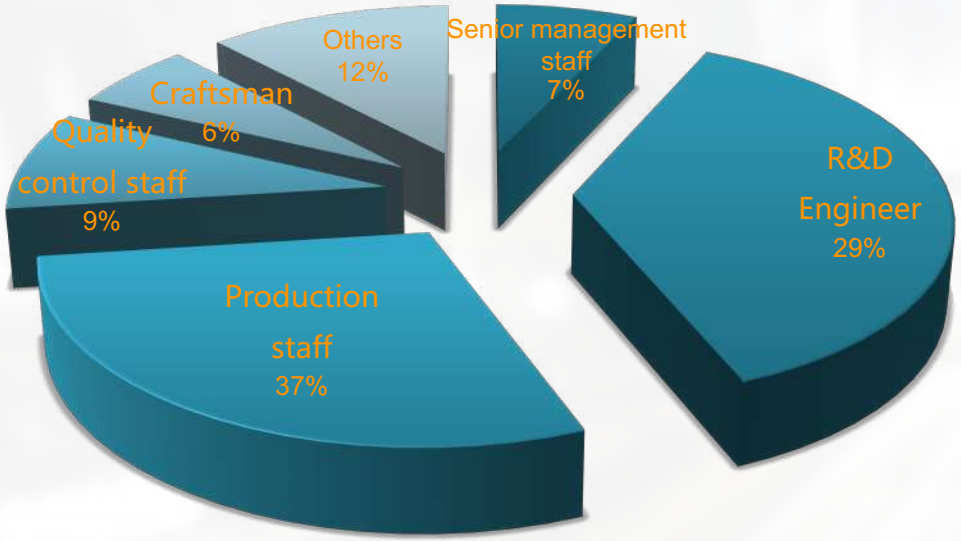
Parameters	符号	最小值	典型值	最大值	单位
Center wavelength	λp	1035	1050	1065	nm
Scan Range	R	50	---	80	nm
Outputpower	Po	10	20	40	mw
Swept rate*BIDI	F	------	100	300	Khz
Model	VCSEL				

B&A Technology

Why B&A?

CHAPTER 4

Number of employees



- R&D: Total 35 employees
- Production: Total 45 employees
- Quality: Total 11 employees

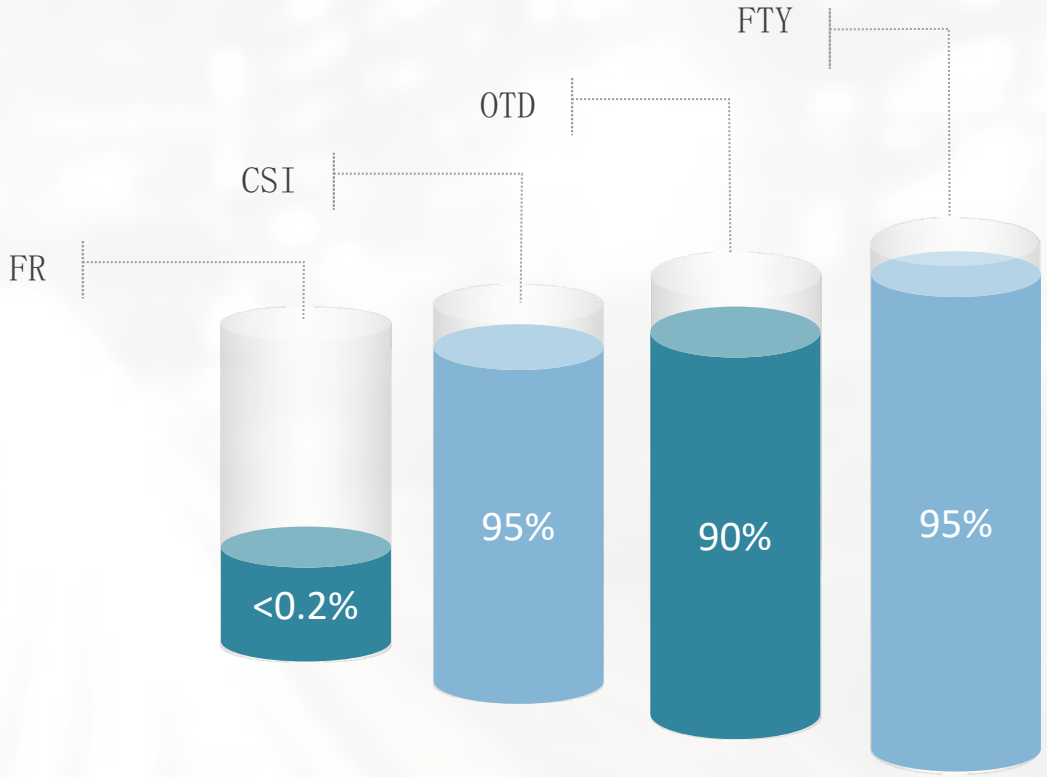
Young, Passion, Customer-Centric

Total 120 employees
Average age is less than 35 years old

Manufacturing and Quality

Quality Policy and Quality Objective ：

Quality first,
Technology leading,
Market oriented,
Continuous improvement



Manufacturing Address: Shanghai, Chengdu

Product Area: Total 4000 m^2

Production capacity: +2000pcs module and +1000 Rackmount device per month

Delivery cycle: 4~6 weeks

High Reliability Design

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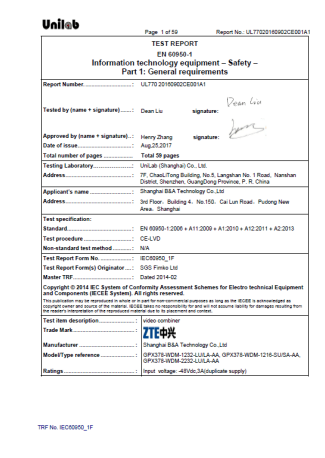
1. Bellcore GR1312 Generic Requirements for Optical Fiber Amplifier
2. IEC60068-2-1 Environmental testing of Electrotechnical Products
3. ETSI EN 300 019 Environmental Conditions and Environmental Tests for Telecommunications Equipment
4. IEC61000-4 Electromagnetic Compatibility Testing and Measurement
5. IEC/EN 60950 60825 Information technology equipment - Safety
6. GR-468-CORE GR-1221-CORE GR-326-CORE Reliability Assurance for Optoelectronic Devices



Stable Supplier Partnerships

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LUMENTUM

II-VI

Laser

AOF

Supply Chain

Well-known suppliers, Quality Control, Low

Passive Modules

Flange Jumper

ofs A Furukawa Company

CarActive

无限光通讯(深圳)有限公司 ADF Fibercom Limited

LIGHTCOMM

-CX 上海中科创欧通讯设备有限公司

SEIKOH GIKEN

SENKO Advanced Components

Long-term win-win partnership with suppliers, more than 10 years, grow up together, face the challenges together.

Concentration, Customization, Specialization

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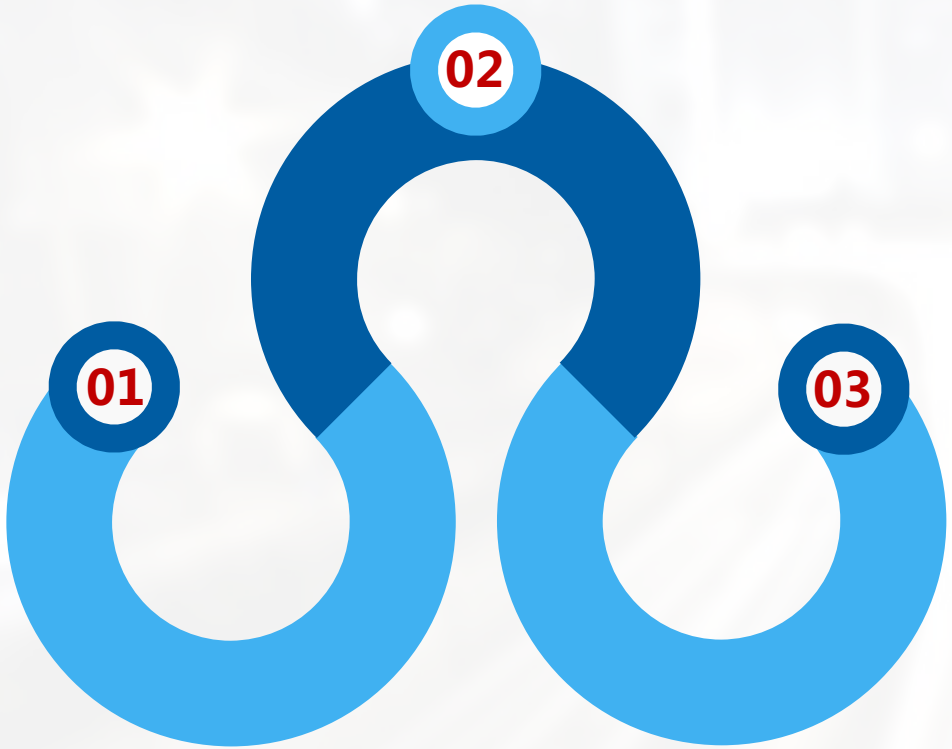


1. No.1 high power EYDFA manufacturer in PON
2. 40% market share of OLP sub-system in China
3. Tier-1 Optical Components Manufacturer

R&D Capability | Support | Cost-Effective | Delivery

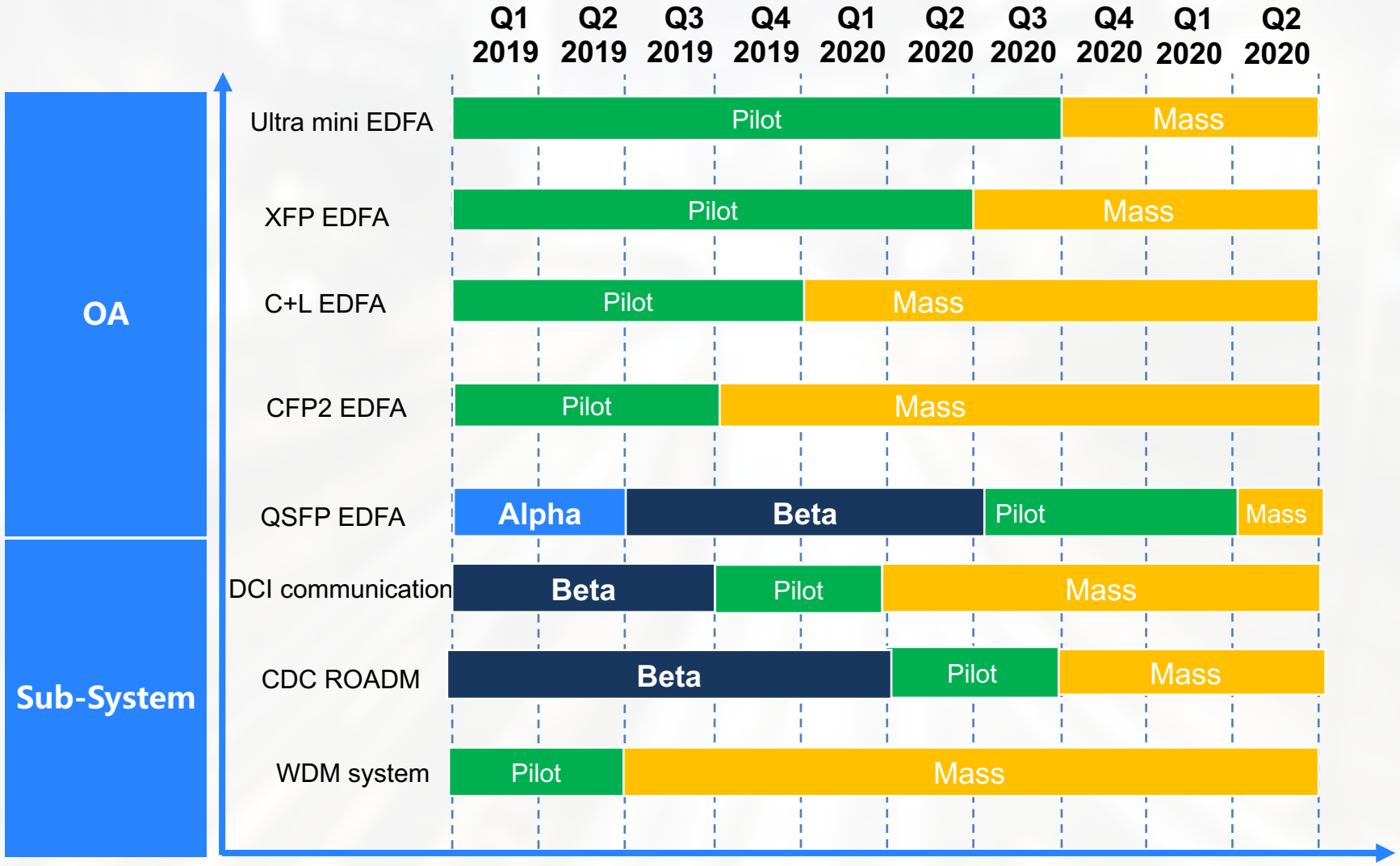
B&A Technology

Planning

CHAPTER 5

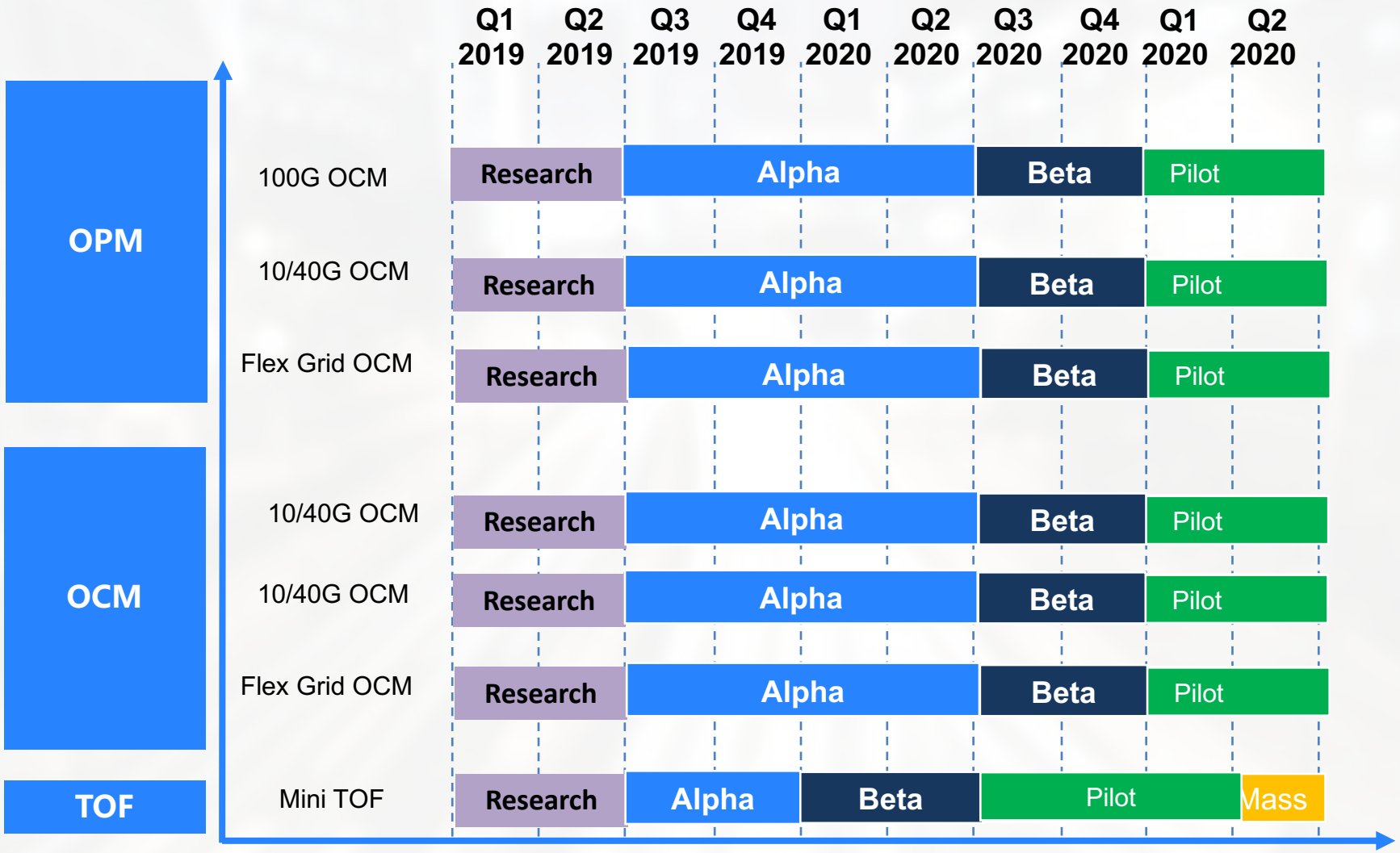
Planning

ROADMAP



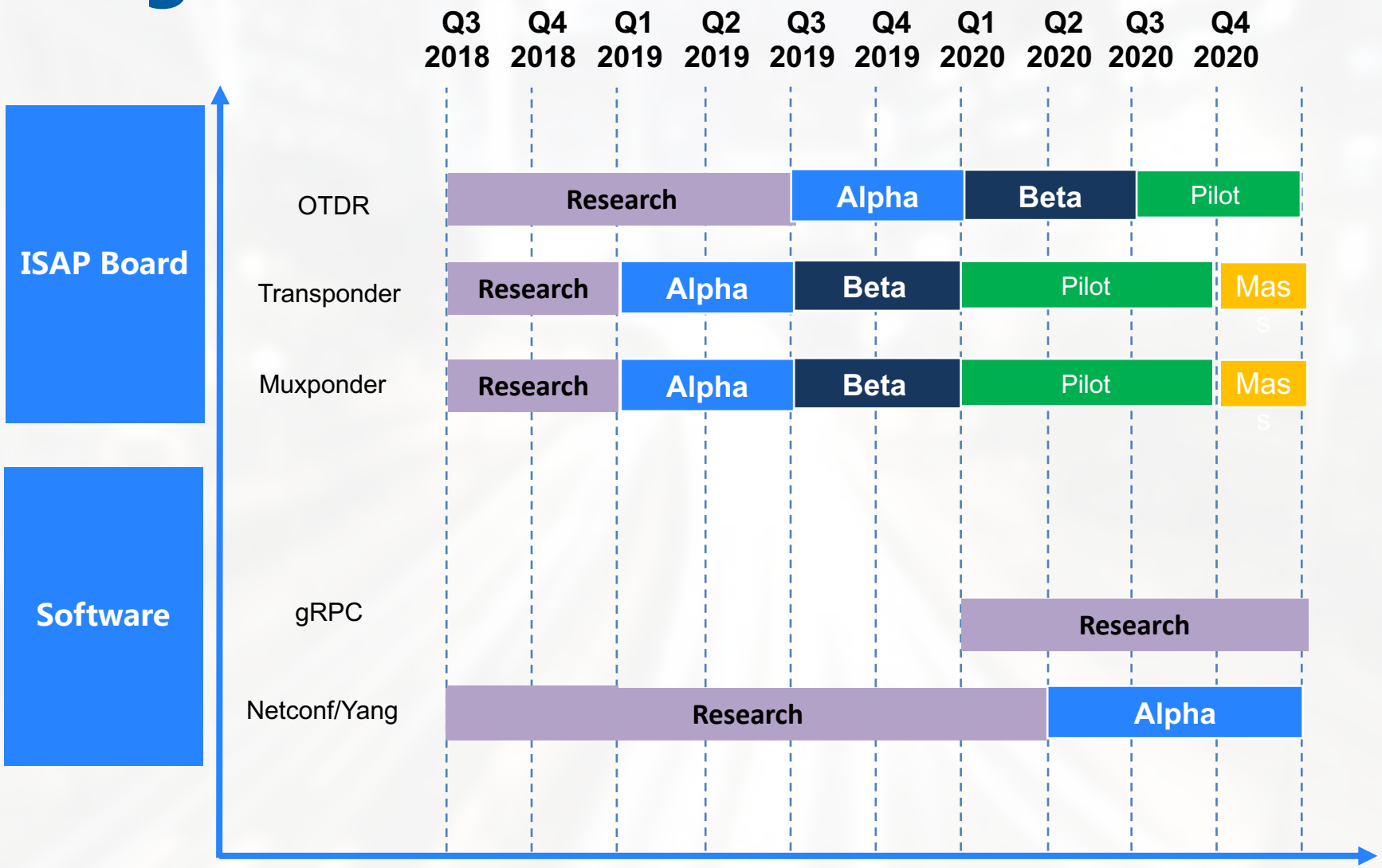
Planning

ROADMAP



Planning

ROADMAP



TECHNOLOGY

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THANKS

2021