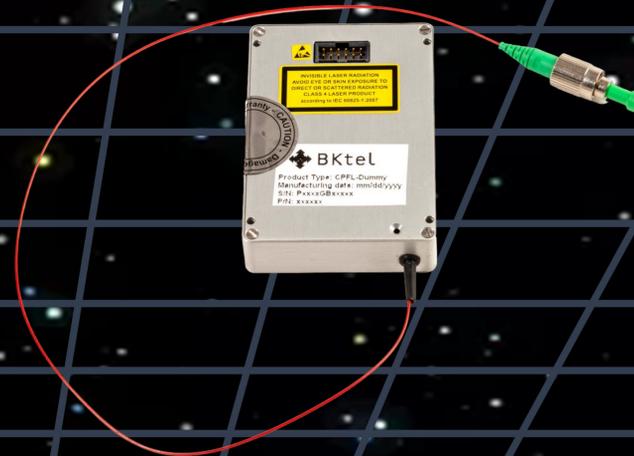




**BKtel**  
photonics

## CPFLS Series Flying Modules Telemetry in Space



- Space grade optical pulsed fiber laser for LIDAR application and satellite positioning
- Output Power up to 1W
- Pulse Width: 1ns to 10ns
- Pulse Repetition Rate: 10kHz to 3MHz
- High Pulse Energy
- Linear Polarization
- T-VAC and Radiation test performed

[www.bktel-photonics.com](http://www.bktel-photonics.com)

**HUBER+SUHNER**



**BKtel**  
photonics

# GOAS & CGOAS Series Flying Modules Intra-Satellites Communications



○ Space grade optical amplifier for sat2sat communications



**CGOA2S**

**CGOA3S**

**GOAS**

Wavelength

1535-1565nm

1535-1565nm

1535-1565nm

Input Power

0 to 5dBm

0 to 5dBm

0 to 5dBm

Output Power

Up to 32dBm

Up to 33dBm

Up to 32dBm

Noise Figure

< 6dB

< 7dB

< 7dB

Dimensions

50 x 80 x 12mm

50 x 80 x 12mm

70 x 90 x 15mm

○ Random Polarization

○ APC Mode

○ T-VAC and Radiation test performed

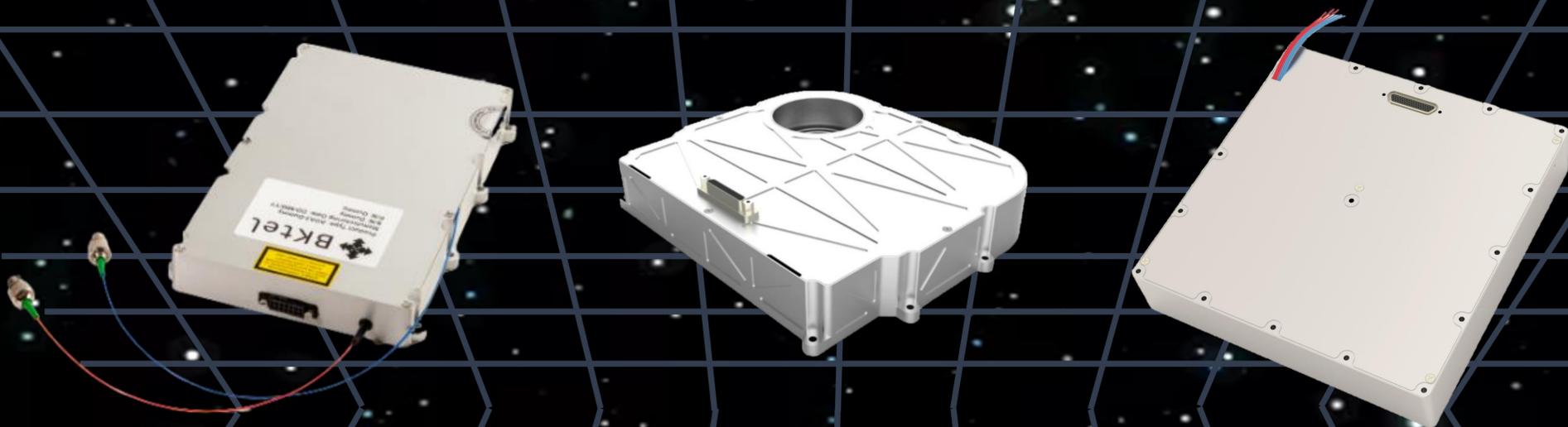
[www.bktel-photonics.com](http://www.bktel-photonics.com)

**HUBER+SUHNER**



**BKtel**  
photonics

# AOAS Series Optical Amplifier for LEO Satellites



○ Dual amplifier with Booster and Preamplifier



**Preamplifier**

**Booster**

Wavelength

1535-1565nm

1540-1560nm

Input Power

-45dBm

-7dBm - +10dBm

Output Power

Up to 0dBm

Up to 36dBm

Noise Figure

< 5dB

< 7dB

Gain

> 45dB

> 25dB



Random Polarization



Compact housing with low power consumption



Designed for a lifetime of 7 years (~ 61khours)



T-VAC and Radiation test performed

[www.bktel-photonics.com](http://www.bktel-photonics.com)

**HUBER+SUHNER**



**BKtel**  
photonics

# Free-Space Optical Communication (FSOC)

Based on Optical Telecom Industry compatibility  
enabling the breakthrough for Sat-Com



- More concentrated communication power at the receiver
- Lower required transmitted power
- Lower size, weight and power requirement for emitting and receiving the signal
- Almost no spatial overlap among various users
- FSOC is at present unregulated but it follows the laser safety recommendations

[www.bktel-photonics.com](http://www.bktel-photonics.com)

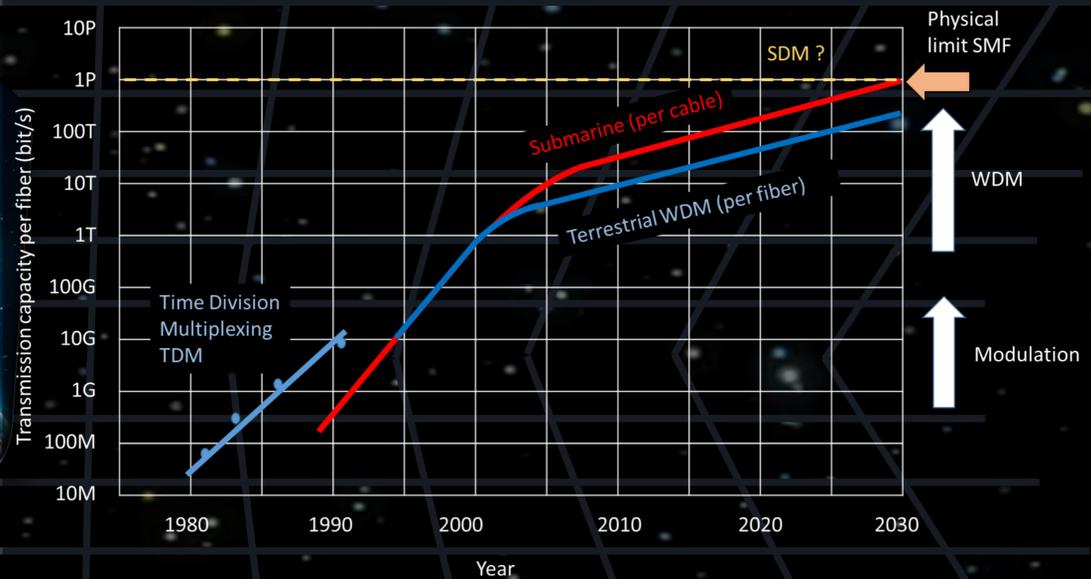
**HUBER+SUHNER**



**BKtel**  
photonics

# Why Free-Space Optical Communication ?

Terrestrial fiber optic networks are reaching their saturation point



○ Space is the new massive telecommunication infrastructure deployment

○ Satellite Constellations are now a reality

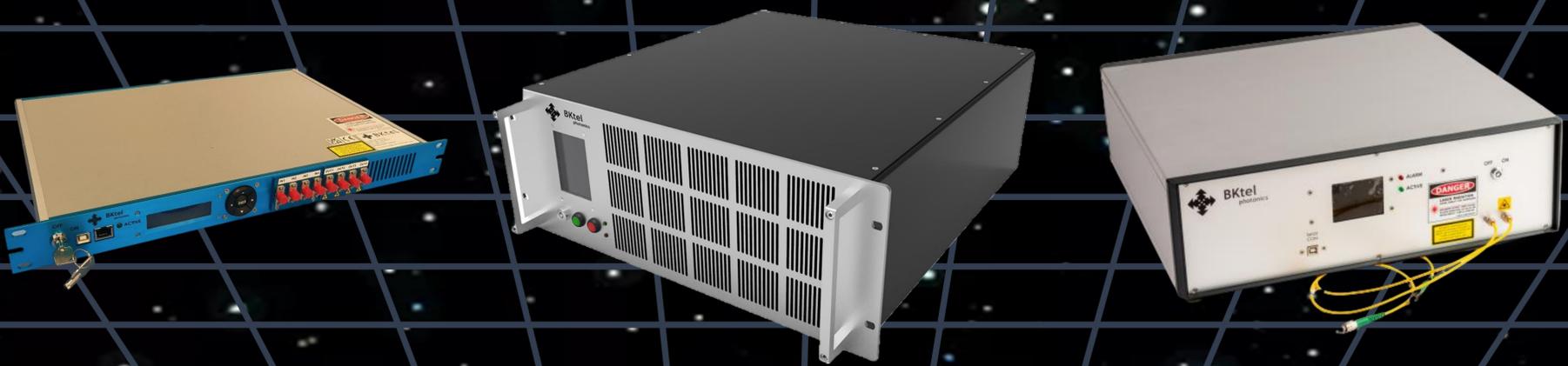
○ Spatial Communications need a disruptive technology to meet the increase in demand

○ Free-Space Optical Communication based on Optical Telecom Industry compatibility enables the breakthrough for Sat Com



**BKtel**  
photonics

## The Ground Booster Amplifiers THPOA, TUHPAO, ROA Series



- High Power Ground Booster designed for Earth to Satellites communications
- Wavelength: 1540-1560nm
- Output Power up to 40W
- Input Power: +7dBm - +15dBm
- Gain Level > 25dB
- Noise Figure < 7dB
- Linear Polarization
- Ruggedized for mechanical shock and vibration
- Designed for a lifetime of 5 years (~ 45khours)

[www.bktel-photonics.com](http://www.bktel-photonics.com)

**HUBER+SUHNER**

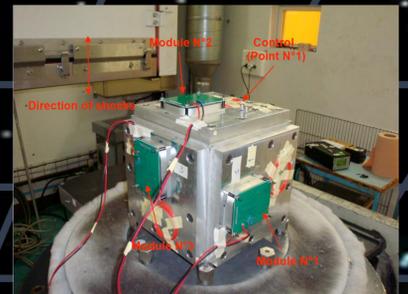


**BKtel**  
photonics

# Qualifications for Space Optics

## ○ Mechanical Shock and Vibration

*GR-468 Issue 2, Section 3.3.1.1.1, Table 4-3*



## ○ Temperature cycling

*GR-1312 Issue 3, Section 10.3.1, Table 10-3*

## ○ Low and High temperature storage

*GR-468 Issue 2, 3.3.2.1, Table 4-4*

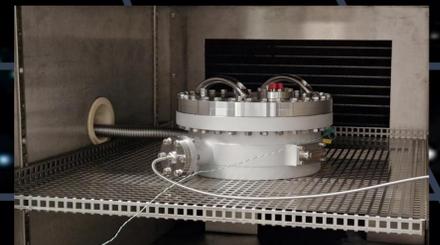


## ○ High Temperature Operating Life

*GR-468 Issue 2, Section 3.3.3.1, Table 4-5*

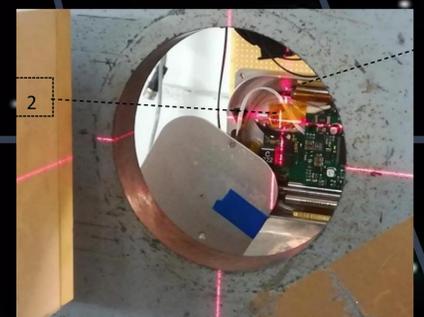
## ○ Temperature under vacuum cycling

*According to ECSS-E-10-03A Radiation tests*



## ○ Gamma rays and protons bombing

*According to ECSS-E-10-03A  
Radiation tests*



[www.bktel-photonics.com](http://www.bktel-photonics.com)

**HUBER+SUHNER**