Quantum Network Test Applications with MAP-300 Platform

VIAVI Solutions

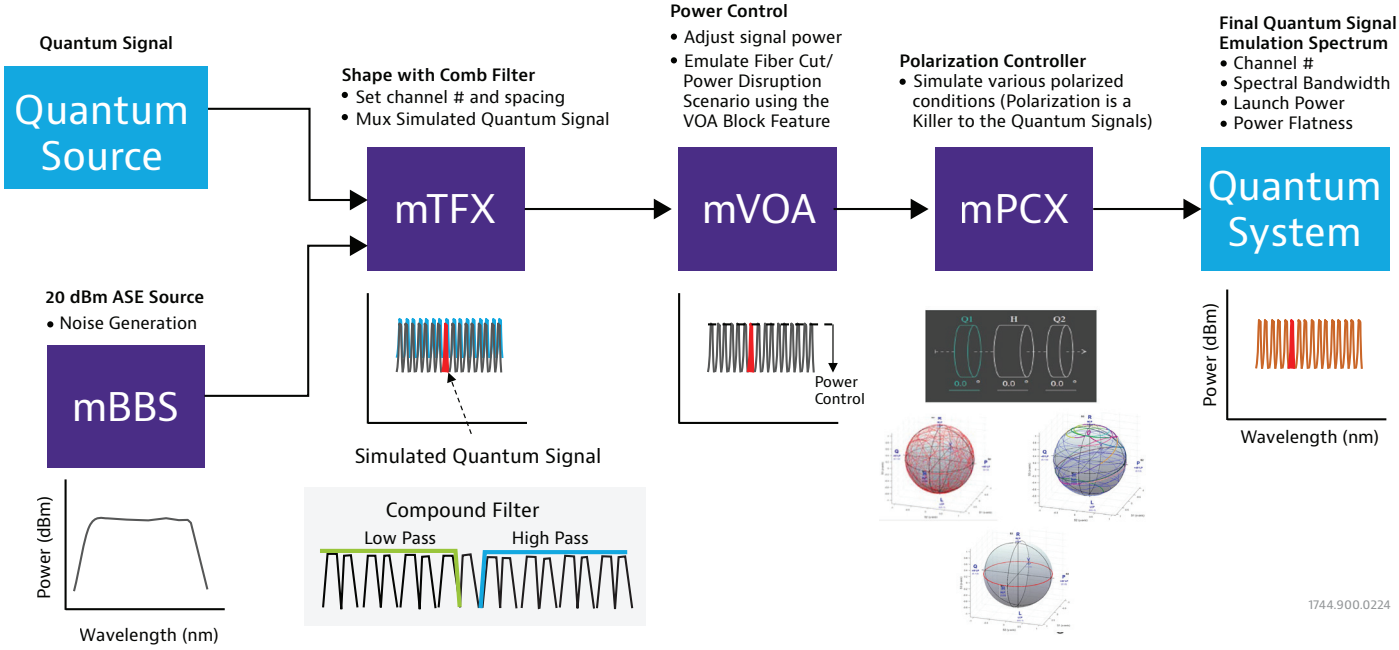
Quantum Testing requires test beds that are comprised of switches, wavelength management tools, EDFAs, attenuators to manage various quantum experimental conditions. These labs will build networks for quantum techniques trials/evaluations.

VIAVI MAP-300 is a modular, dense, and easily reconfigurable Optical Test Platform with remote and automatable capability through Ethernet. It effectively explores the limits of quantum in computing, networking, encryption, and cryptography.

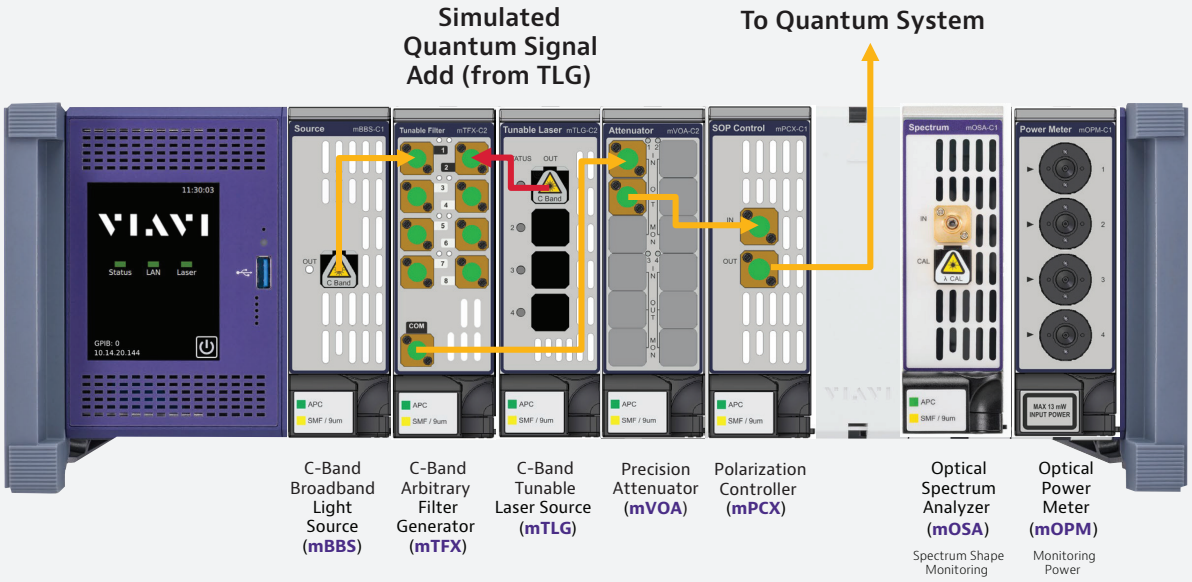
MAP-330 (3 Slots Chassis)

MAP-380 (8 Slots Chassis)

MAP-300 Quantum Signal Emulation Block Diagram



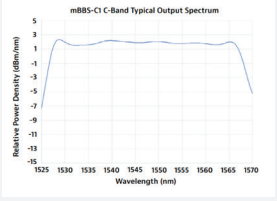
MAP-300 Configuration for Quantum Signal Emulation



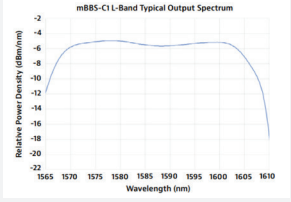
MAP-300 Modules for Quantum Signal Emulation

Broadband Source (mBBS)

- Provide a stable source to **generate DWDM Spectrum** which represents live spectrum signal in the line
- With 20 dBm High Output Power



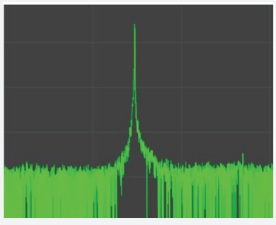
C-Band: 1525 nm – 1568 nm



L-Band: 1565nm – 1610nm

Tunable Laser Source (mTLG)

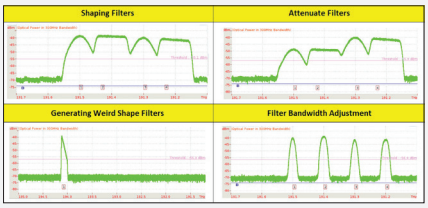
- Simulate a quantum signal with a **low linewidth signal** (<200 kHz)
- Having C-Band (1525 nm – 1572 nm) or L-Band (1570 nm – 1608 nm) Options



Tunable Filter (mTFX)

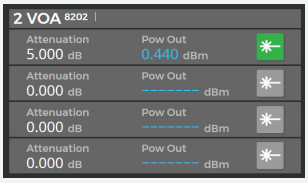
- Generate DWDM Spectrum
- Quantum Signal Injection up to 8 ports
- Create simulated empty data carriers

Wave Shaping Methods with mTFX



Variable Optical Attenuator (mVOA)

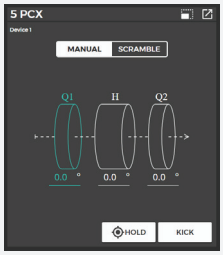
- Control Signal Spectrum Power
- **70 dB** dynamic range with Beam Block Function
- Low zero loss
- Simulate Fast Power Cut Condition with the Beam Block Function

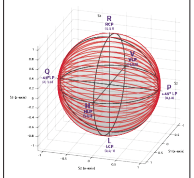
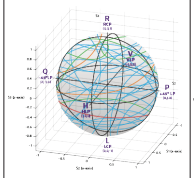
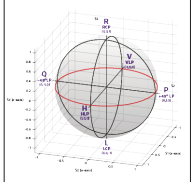
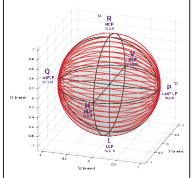
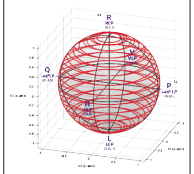
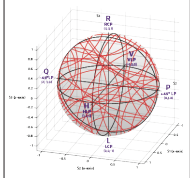
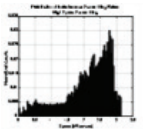
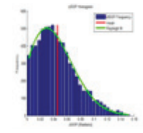
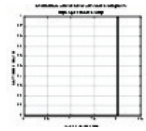
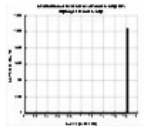
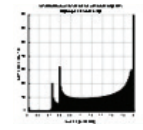
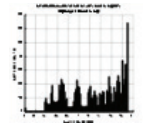


MAP-300 Modules for Quantum Signal Emulation continued

Polarization Controller (mPCX)

- Fast scrambler with diagnostics modes
- Simulate Various Polarization Condition
- Simulate polarization events with hold and kick functions

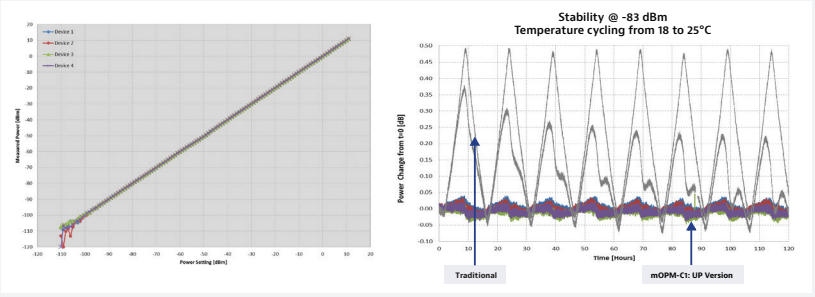


Scrambling Mode	Random Scrambling	Rayleigh	Ring Mode	Polar Mode	Oscillating Ring	Random Ring
Poincare View						
ΔSOP/s Histogram						

MAP-300 Modules for Signal Monitoring

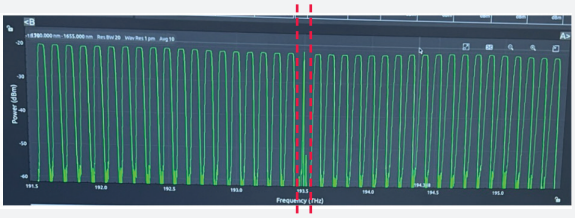
Optical Power Meter (mOPM)

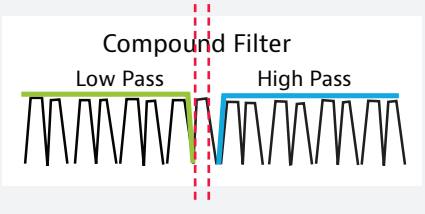
- Monitor power level to as low as **-100 dBm** which is suitable for quantum photons detection experiments
- Sensor Calibration
- **Stable Dark** real time monitoring and adjustment of dark current levels without disruption to measurement



Optical Spectrum Analyzer (mOSA)

- Compact High Speed OSA C+L Band Single Slot module design
- Monitor the spectrum with **20 pm** resolution BW





Optical Switches

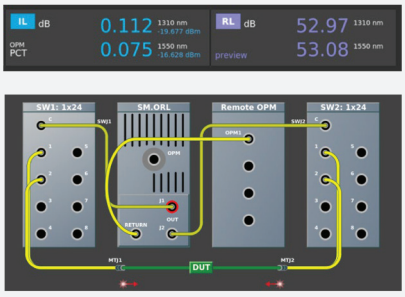
Optical Switch (mOSW)

- High Performance Low Loss Optical Switches to provide flexibility and optimization in test setup configurations

Optical Cable IL and RL Qualification Test

PCT Insertion Loss (IL) and Return Loss (RL) Test (mORL)

- Quantum Photon signals are very sensitive to any degradation or condition of the optical cable
- Testing **IL** and **RL** are highly recommended to qualify the cable/patch cord conditions before using it in the Quantum System Test



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