aXenic

# aXenic and the SASER Project

aXenic Project Highlights

CELTIC-NEXT Proposers Day,

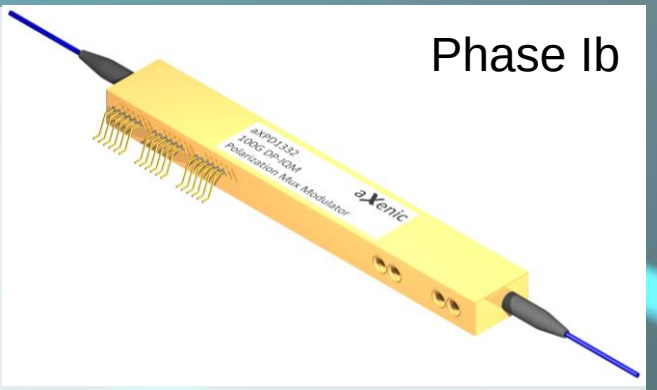
5th February 2019, London

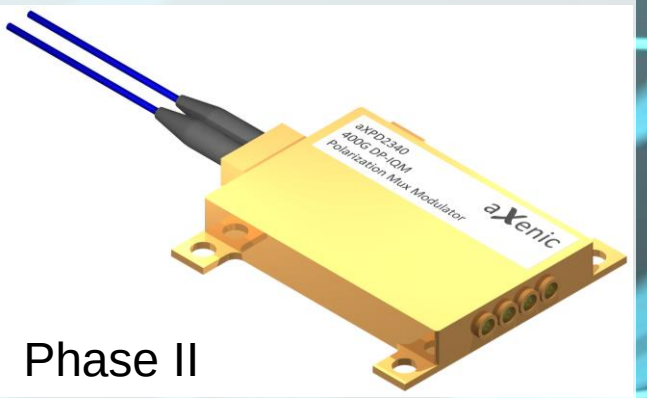
# Safe and Secure European Routing

- SASER project 2012 – 2015
- Objective to produce higher quality modulators
  - 28/56 G-baud MZ-modulators
  - Optical modulators put signal on to fibre
- Early outcomes showed limitations
- More radical design addressed shortcomings
- Led to new opportunities exploited by aXenic

# GaAs DP-QPSK Modulators: Highlights

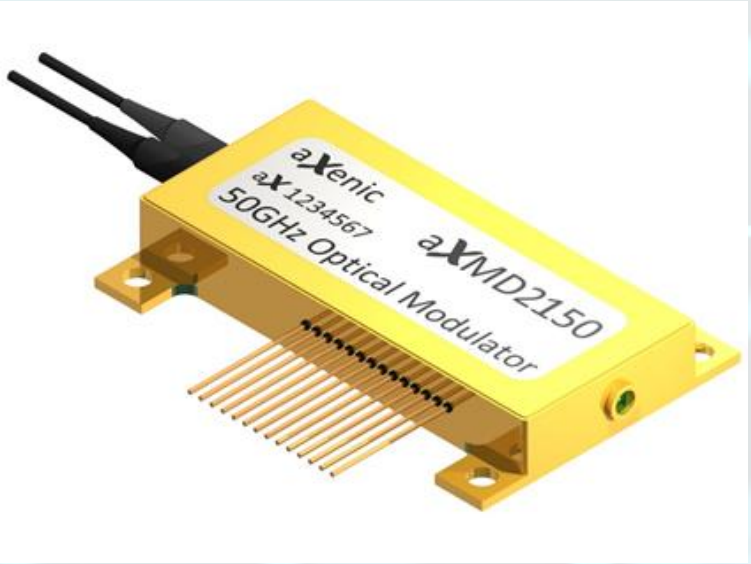
- Towards 56GBd: Phase-I(b) Modulator
  - Retained the OIF footprint:
    - RF side-entry and long, convoluted RF lead-in route
  - RF improvements to chip, ceramic and package
  - Revised epitaxy and chip layout
  - Achieved: Lower Vπ, improved bandwidth balance
    - But: Minimal change in bandwidth
- Phase-II Modulator Design and Fabrication
  - Radical configuration overhaul
    - Short, straight RF path and Single-ended optical in/output.
  - Shorter active length using a second epitaxy revision
    - Flattens the frequency response by reducing RF attenuation
  - D.C. chip-test complete and look good:
    - improved stability, extinction and loss
    - packaging in-progress
- Spin out of aXenic to develop and exploit the devices



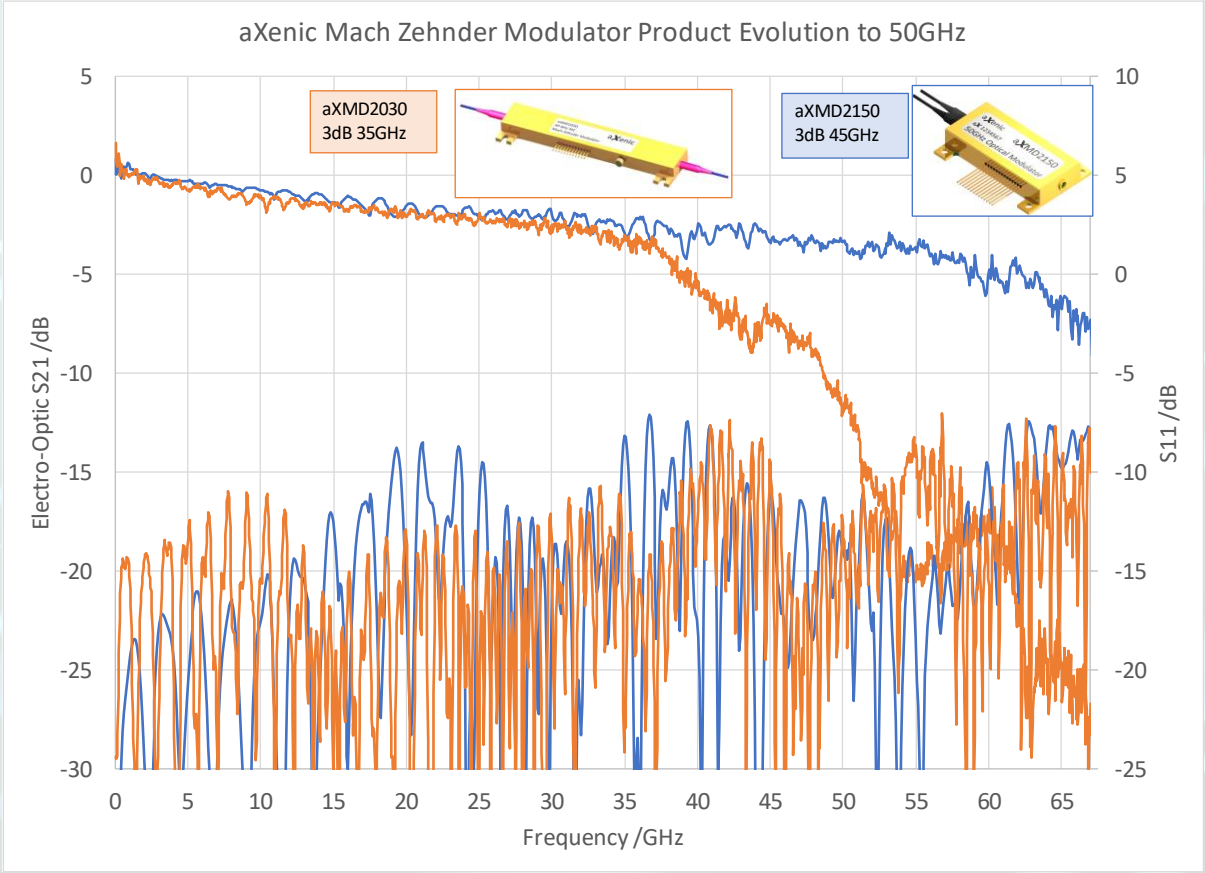
# Format Benefits

- The aXenic offering exploits folded format devices:
  - Halves the fibre handling space required
  - Very high bandwidth capability
  - Simplifies RF connections
  - Allows arrays of devices to be managed in parallel without loss of performance



# aXMD2150 50GHz MZM

- Compact folded optic design
- Useable bandwidth improved from <40GHz to >60GHz



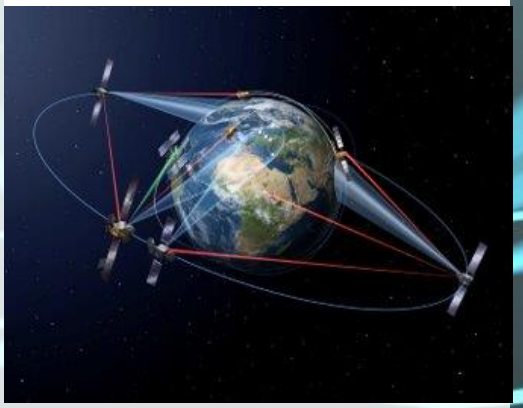
# The Problem

- Data requirements for linking between and within satellites growing as part of global demand
- Existing methods not capable of extending because weight too prohibitive
- Launch cost increases by £25k/kg

Credit: ESA

# The Solution

- For applications where electronic transmission is too bulky and heavy for high speed transmission, optical transmission is becoming adopted
- For these applications aXenic offer an optical modulator :
  - **Half the size** of competitive devices
  - Folded format **halves the space** occupied by fibre handling
  - **Highest bandwidth** available for space applications
- Added to this, the same package format is compatible with an array of four devices to meet future integration requirements for digital and analogue aerospace applications

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