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Laser power converter products with Eff>60% based on the vertical epitaxial heterostructure architecture (VEHSA) design

In 2017, Broadcom acquired Azastra Opto Inc. and L2W Inc. and released its new laser power converter product line. It is based on the patented Vertical Epitaxial HeteroStructure Architecture (VEHSA design) and it has been deployed in various applications. These photo transducer products have the highest ever optical to electrical power conversion efficiency, as will be shown in this presentation with the product performance distributions of several thousand devices. Fibered semiconductor lasers are commonly available, nowadays with a few watts of power and can be used to optically power such VEHSA devices. This allows for the safe delivery of watts of isolated electrical power with high galvanic isolation as the optical fiber is immune to EMI and RF noises. The devices are perfect for applications requiring complete electrical isolation in highly demanding industrial environments. The product can be used for powering electronic circuitry where electrical wired solutions are not feasible due to high voltage, electromagnetic inductance or strong magnetic fields. In this presentation, an update on the latest developments will also be given, including examples of applications requiring several watts of converted power or operating under various conditions. Applications in the field also include:

-Sensor applications: Provide isolated power for various sensors
-Electric Power Utilities: Provide a fully isolated power to protect sensor devices
-Lightning: Protection of key circuits
-Biomedical and Neuro-stimulation: Provide safe and tailored voltage and current sources
-RF Power electronics circuits: Interference and ringing reduction
-Oil & Gas Industry: Eliminate the risk of sparks from metal
-Chemical Plants: Use power over fiber in corrosive areas where metal wires can be attacked
-Avionics: Use Power over fiber instead of metal wires to reduce weight and EMI
-Medical instrumentation: Resonance Magnetic Imaging (RMI)
-Security: Trigger and power sources unaffected by EMI-RFI.

Biography

Simon Fafard is currently a Hardware specialist at Broadcom Semiconductor ULC, Canada. Broadcom is a large public company that acquired Azastra in 2017. He has been focused on the design, epitaxy and characterization of optoelectronic devices, including most recently at uSherbrooke, Azastra and Broadcom. He received the 2017 CAP Medal for Outstanding Achievement in Industrial and Applied Physics. He has a Google Scholar h-index of 52, with about 250 publications, with over 11,000 citations and he is the inventor of over 30 patents. He raised over $20M of private and venture capital funding and also obtained numerous research grants. He led Cyrium to become a manufacturer of one of the highest performance multijunction III-V solar cells and led Azastra to manufacture the highest performance photo transducer products. As an entrepreneur he cumulates over 25 years of experience in Optoelectronics and Photonics while developing and commercializing numerous devices and products in the industry at Azastra, Aton, Cyrium, Alcatel Optronics, Kymata and also in research labs as a Professor at uSherbrooke, as a Senior Research Officer at National Research Council, as an Adjunct Professor in Physics at uOttawa and at UCSB.

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