



## Tri-Edge™ Contributes To a greener planet

Tri-Edge is an innovative analog semiconductor technology developed at Semtech. Its purpose is to provide reliable transmission of high speed data from point A to point B in an optical communications network, and do so in a way that reduces cost, latency and power consumption. Target markets include modern high-speed data centers and 5G wireless networks. These markets employ high-capacity PAM4 coding and Tri-Edge was specifically designed for this modern PAM4 standard.



200 Flynn Road, Camarillo, California 93012 | 805-498-2111 | [semtech.com](http://semtech.com)

Semtech Corporation is a leading global supplier of high performance analog and mixed-signal semiconductors and advanced algorithms for infrastructure, high-end consumer and industrial equipment. Products are designed to benefit the engineering community as well as the global community. The Company is dedicated to reducing the impact it, and its products, have on the environment. Internal green programs seek to reduce waste through material and manufacturing control, use of green technology and designing for resource reduction. Publicly traded since 1967, Semtech is listed on the NASDAQ Global Select Market under the symbol SMTC. For more information, visit [semtech.com](http://semtech.com).

## BACKGROUND



In the last decade (2010 to 2020), the number of global internet users doubled to 4.5 billion and internet traffic rose fifteen fold<sup>1</sup>. Traffic surged further in 2020 due to increased video streaming, video conferencing, gaming, and social networking related to the COVID pandemic. Internet traffic is expected to accelerate with new applications such as artificial intelligence, Internet of Things(IoT), autonomous vehicles, blockchain, virtual reality, remote working, and others. More users and new applications are placing sustained pressure on the capacity of the modern data center that processes and stores the information, and the wired and wireless networks that communicate with the users.

The majority of the world's internet traffic goes through data centers, therefore it is critical they be highly energy efficient. In 2020, it was estimated that data centers utilized roughly 1% of the world's electricity consumption (250TWh) and the wired and wireless networks feeding them utilized 1.4% (340TWh)<sup>2</sup>. This is 2.4% of the world's total, equating to 225 million metric tons of CO<sub>2</sub>.

Despite the remarkable internet traffic growth over the past decade, a continuous stream of impressive energy saving innovations largely offset this traffic growth. These innovations included efficient data center architectures, lower power consuming servers, storage devices, optical interconnects, and cooling systems as well as advanced server virtualization software, among others. This trend of energy saving innovations (combined with increasing use of renewable energy) must continue in the current decade to minimize CO<sub>2</sub> emissions as internet traffic soars. Tri-Edge™ is one such innovation.

For optical interconnects in data centers and 5G wireless networks (i.e., connecting point A to point B using fiber optic cables), Tri-Edge can offer power consumption savings of up to 20% per link versus the incumbent digital signal processor (DSP) technology. This is because Tri-Edge uses analog technology as opposed to digital technology. DSP simply requires more power hungry steps to do the job, especially the analog to digital conversion step, which isn't required at all for analog technology.

## CONCLUSION

# Tri-Edge™

By using industry forecasts of the number of optical links required in data centers and 5G wireless systems by 2027<sup>3</sup>, it is estimated that Tri-Edge deployment (versus DSP) could save up to 1TWh of energy annually. This is the equivalent of powering 100,000 homes, or emissions of 385,000 metric tons of CO<sub>2</sub>.

Gary Beauchamp

*Executive Vice President & General Manager, Semtech Signal Integrity Products Group*



<sup>1</sup> <https://www.iea.org/reports/data-centres-and-data-transmission-networks>

<sup>2</sup> <https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.html>

<sup>3</sup> <https://www.internetworldstats.com/emarketing.htm>