EMCORE is a leading provider of advanced optical chips, components, subsystems and systems that provide the foundation for today’s high-speed broadband and wireless communications networks. As one of the few suppliers offering truly vertically-integrated solutions, we have a long history of innovation and leadership in RF over fiber technology for broadband access networks. Our fiber optic transmission technology innovations have enabled MSOs to continually enhance bandwidth to meet growing demand for ultra high-speed Internet, 4K UHD, video on-demand, streaming, and other advanced services. With our expertise in Indium Phosphide (InP) wafer manufacturing, we develop chip level solutions for the Telecom market, FTTx and Data Center, and our latest products for Wireless support emerging 5G and Distributed Antenna Systems (DAS), enhancing bandwidth and linearity to enable delivery of reliable signals where traffic and interference is high, or signals are normally weak.
Indium Phosphide (InP) Wafer Fab
TELECOM & DATA CENTER CHIP LEVEL DEVICES, VERTICALLY-INTEGRATED MANUFACTURING

EMCORE owns and operates its world-class 7,000 square foot InP semiconductor wafer fabrication plant at our corporate headquarters in Alhambra, California. The plant supports development of best-in-class Telecom, Data Center and Wireless application devices, as well as EMCORE’s vertically-integrated manufacturing for its laser, transmitter and receiver products.

EMCORE’s semiconductor wafer fabrication facility supports 2” and 3” wafer process for InP-based devices including laser, APD & PIN photodetectors. The plant features MOCVD reactors for 3x3” or 6x2” wafers, plus stepper, wafer track, ICP, RIE, diffusion, metal and dielectric deposition, and cleaving/dicing. Our strong, highly-experienced technical team has expertise in device design, epitaxial growth, wafer processing, device characterization and COB/TO/OSA sub-assembly from development through manufacturing.

2.5G & 10G PON DFB Laser Chips
EMCORE’s G1033 series of GPON DFB laser diode chips are designed to provide the source laser for uncooled PON applications for triple-play voice, video and data applications. A variety of wavelengths are supported. They are designed to perform the E/O conversion in a PON system.

2.5G & 10G Avalanche Photodiode, Top & Bottom Illuminated Chips and COB
EMCORE’s latest series 10G APD chips are designed for high-speed, Next-Gen PON applications. They have high-responsivity, low-capacitance and low noise equivalent power. Bottom illuminated APDs are mounted on Chip-On-Block (COB) for ease of assembly into receiver modules. The G1013 series 2.5G APD top illuminated chip are designed for GPON ONU and 2.6 Gb/s applications and also have high-responsivity, low-capacitance. Both designs are ideally suited high-speed data communications.

12.5G 1310 nm Fabry-Perot Laser Chips
EMCORE’s G1033-201, 12.5G 1310 nm Fabry-Perot (FP) laser chip is designed for uncooled digital applications. This laser is ideally suited for low-cost, high-speed data communications and wireless designs.

Wafer Fab Highlights
- 7,000 square foot, class 1,000 clean room space
- MOCVD reactors
- 2” and 3” wafer process for InP-based devices
- Laser, APD & PIN photodetector chips
- High-power gain chips
- 2.5 Gbps to 25 Gbps devices
- CWDM wavelengths capable
- Strong, highly-experienced technical team
EMCORE designs and manufactures the most complete and advanced line of optical components, subsystems and systems for broadband access distribution networks. EMCORE’s CATV-HFC products support various network architectures and address the needs of transmitting and receiving signals in short- to long-haul, forward- and return-path, and headend-to-hub-to-node configurations over 1310 nm and 1550 nm wavelengths.

EMCORE, through its Ortel heritage, was the first to implement linear fiber optic transmission for cable TV and we continue to be a leader in RF over fiber products for HFC networks in the CATV industry. Our products enable increased data transmission distance, speed and bandwidth, with lower noise and power consumption. This empowers cable service operators to meet the growing demand for ultra high-speed Internet, 4K UHD, video-on-demand, streaming and other advanced services. EMCORE’s product portfolio includes forward and return-path analog lasers, photodetectors and subassembly components, analog fiber optic transmitters, Quadrature Amplitude Modulation (QAM) transmitters, high-power EDFAs, R FoG ONU transceivers, lasers, photodiodes and optical receivers.

Broadband Access Highlights
- Most complete line of RF over fiber products for CATV networks
- Revolutionary Linear Externally Modulated Laser (L-EML™) technology
- Vertically-integrated solutions
- High-quality volume manufacturing
- CWDM and DWDM wavelengths
- DOCSIS 3.1 compliant

EMCORE designs and manufactures the most complete line of RF over fiber products for CATV networks. EMCORE’s CATV-HFC products support various network architectures and address the needs of transmitting and receiving signals in short- to long-haul, forward- and return-path, and headend-to-hub-to-node configurations over 1310 nm and 1550 nm wavelengths.

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The MEDALLION 6000 series is a family of state-of-the-art, high-performance 1550 nm externally-modulated CATV transmitters that leverage a breakthrough optical device innovation at their core. The Linear Externally Modulated Laser (L-EML™), invented, developed and manufactured exclusively at EMCORE. The L-EML™ device consists of a high power, low-noise, narrow linewidth laser combined with a proprietary highly-linearized modulator in a monolithic assembly. It enables long distance optical link performance approaching traditional lithium niobate-based externally-modulated transmitters.

The 6000 series couples high optical output powers, up to 12.0 dBm, with low optical linewidth resulting in unmatched performance. The unique EMCORE optical modulator, combined with proprietary predistortion circuitry, provides superior CTB and CSO performance with SBS suppression levels of greater than 21 dBm.

**MEDALLION 8100 Series DOCSIS 3.1 L-EML™ Externally-Modulated CATV Transmitters**

**C-Type/J-Type/F-Type/S-Type Transmitters**

The MEDALLION 8100 series is a family of state-of-the-art, high-performance DOCSIS 3.1 compliant 1550 nm externally-modulated CATV transmitters that leverage a breakthrough optical device innovation at their core. The Linear Externally Modulated Laser (L-EML™), invented, developed and manufactured exclusively at EMCORE. The L-EML™ device consists of a high power, low-noise, narrow linewidth laser combined with a proprietary highly-linearized modulator in a monolithic assembly. It enables long distance optical link performance approaching traditional lithium niobate-based externally-modulated transmitters.

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**MEDALLION 6000 Series Externally-Modulated CATV Transmitters**

**L-Type/D-Type/S-Type/F-Type Transmitters**

The MEDALLION 6000 series is a family of state-of-the-art high-performance 1550 nm externally-modulated CATV fiber optic transmitters optimized for varying network applications. Packaged in a convenient 1 RU housing, this line of optical transmitters couples high optical output power, up to 11.0 dBm, with low optical linewidth resulting in unmatched performance. The optical modulator, combined with proprietary pre-distortion circuitry, provides superior CTB and CSO performance with SBS suppression levels of greater than 21 dBm through 40 km of fiber. Advanced features such as built-in field adjustable SBS control allow these transmitters to be quickly optimized in the field for any link or application without the need to procure specifically tuned transmitters.

**J-Type and I-Type Transmitters for Japanese & International Markets**

Providing all the core capabilities of the MEDALLION 6000 series, J-Type MEDALLION transmitters are specially optimized to support fiber optic links of up to 150 km for the Japanese market place and other markets with similar requirements. The J-Type series is designed as a high-performance solution for CATV applications, or where the simultaneous transport of CATV and SAT-IF FM signals is required. The SAT-IF signals can be applied anywhere in the 950 to 2800 MHz band.

I-Type MEDALLION transmitters are optimized for international network applications that employ an 85 MHz forward / reverse path split frequency. This line of optical transmitters couples high optical output power, up to two ports 10.0 dBm, with low optical linewidth resulting in unmatched performance. I-Type transmitters are specially designed and optimized to support fiber optic links of up to 150 km for the international marketplace.
3644 Mini-Tx 1.2 GHz, 1550 nm DOCSIS 3.1 L-EML™
CATV Transmitter Subassembly

EMCORE's Model 3644 mini-transmitter card is a linear externally-modulated 1550 nm transmitter subassembly optimized for the 190CW channel plan with an operation bandwidth to 1.2 GHz. The source laser utilizes EMCORE's industry-leading 1550 nm, high-power, low-noise, narrow linewidth Linear Externally Modulated Laser (L-EML™). The 3644 is designed to support traditional HFC, multi-wavelength node splitting, RFoG and RF overlay for FTTP applications.

The platform supports RF loads of analog, QAM and OFDM to 1218 MHz. Integrated within the design is EMCORE's patented predistortion technology to provide outstanding noise and distortion performance. The 3644 Mini-Tx achieves an exceptional MER of 44 dB across the entire operating band under full QAM load conditions. There is an RF test port on-board with monitor and control via an RS-232 interface.

MAFA Series EDFA Gain Modules

EMCORE's MAFA series EDFA gain modules are designed to meet the most demanding noise performance requirements and perform all the functions required of an optical amplifier for system integration. MAFA series EDFA gain modules provide input and output optical isolation for stable, low noise operation. The input and output optical signal power levels are detected for monitoring and control. The input optical signal is amplified with active gain control for a constant output power level, or with active output power control for constant gain mode operation.

The MAFA series features booster amplifiers with up to 24.5 dBm output power, and low noise pre-amplifiers with up to 17 dBm output power for very low power input signal applications. The companion MEB5200 evaluation board allows rapid lab evaluation and greatly simplifies system integration design.

EDFA Power Output Options

<table>
<thead>
<tr>
<th>Model</th>
<th>Output Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAFA 5000</td>
<td>14 – 24.5 dBm</td>
</tr>
<tr>
<td>MAFA 5000-PA Preamplifier</td>
<td>14 – 17 dBm</td>
</tr>
</tbody>
</table>
EMCORE is a leading provider of fiber optic components for the transmission of analog video, voice and data signals over high-speed fiber optics. Our products, including CWDM and DWDM DFB lasers, DOCSIS 3.1 lasers and low noise optical receivers, support a wide variety of broadband, wireless, satellite and optical sensing applications.

EMCORE lasers utilize Genuine Ortel Technology which has symbolized the highest quality in linear high-speed photonics. EMCORE leverages our vertically-integrated infrastructure and high-volume manufacturing to deliver the highest quality fiber optic components available today.

DOCSIS 3.1 1550 & 1310 nm Laser Modules
EMCORE’s 1752A, 1550 nm and 1616A, 1310 nm 1.2 GHz lasers are designed specifically for CATV applications and are compliant with the DOCSIS 3.1 standard. These lasers support operational bandwidth up to 1.2 GHz and feature low adiabatic chirp to maximize signal quality in short long lengths of fiber. The lasers operate over an industrial temperature range with excellent inherent linearity to minimize degradation of broadcast signals.

1900 Series Coaxial TO-56 DFB Lasers
EMCORE’s 1933, 1935 and 1955 coaxial TO-56 DFB lasers offer a low cost solution for linear fiber optic links. They can be cooled with external thermo-electric coolers for high stability, or run without TEC’s to reduce power consumption. These DFB lasers are packaged in a compact, hermetic assembly with monitor photodiode and isolator for flexible integration into various transmitter designs.

1600 Series 1310 nm 14-pin Butterfly DFB Lasers
EMCORE’s 1612, 1615 and 1622, 1310 nm forward path DFB laser modules are designed for both broadcast and narrowcast analog applications. These highly linear devices feature optical output power options up to 31 mW with superior distortion performance over an enhanced temperature range of -40°C to +85°C.

1700 Series 1550 nm DWDM 14-pin Butterfly DFB Lasers
EMCORE’s 1751, 1754 and 1782, 1550 nm laser modules feature a distributed feedback chip that has been designed specifically for RF QAM and CATV applications. They feature low adiabatic chirp to maximize signal quality in short long lengths of fiber. The laser’s excellent inherent linearity minimizes degradation of broadcast signals caused by QAM channels.

7840A DOCSIS 3.1 Low Noise Optical Receiver
The 7840A DOCSIS 3.1 Low Noise Optical Receiver is a best-in-class single-mode fiber pigtailed module featuring a low noise, impedance-matched broadband photodiode and RF amplification. The device receives optical analog and/or digital signals for a range of video broadcast options and delivers the corresponding RF electrical output. The wide bandwidth supports the delivery of any combination of analog and digital channels up to 1.2 GHz of spectrum.
With the rollout of 5G, dependence on wireless networks continues at ever increasing levels. Deployment of integrated wireless Distributed Antenna Systems (DAS) and Small Cells in stadiums and other venues is growing rapidly to provide customers better connectivity. EMCORE’s linear DFB Lasers, Optical Receivers and Fiber Optic Links integrate extremely well into these systems, enhancing bandwidth and linearity to enable the delivery of consistent, reliable signals in areas where interference is high, or signals are weak.

### 1997 6 GHz Uncooled Coaxial DFB Laser Module

EMCORE’s 1997 1310 nm and 1550 nm CWDM, 6 GHz uncooled DFB laser module is an ultra-linear, coaxial model optimized for 5G wireless, DAS and small cell applications. It is designed to enhance bandwidth and signal integrity for delivery of consistent, reliable wireless signals in temperature-controlled environments.

### 1998 6 GHz Cooled Coaxial DFB Laser Module with Flex Circuit

EMCORE’s 1998 DWDM, 6 GHz cooled DFB coaxial laser offers a high-performance solution for signal distribution in 5G wireless, DAS and 5G low- and mid-band applications. The 1998 is internally cooled with thermo-electric coolers already installed for high-stability in demanding environments.

### 1615A 1310 nm 2.7 GHz DFB Laser

EMCORE’s 1615A 1310 nm DFB laser module is designed for both wireless and DAS applications. This highly-linear OC-48 pinout compatible device delivers superior distortion performance over an enhanced temperature range of -40 °C to +85 °C.

### 1764 1550 nm C-Band DWDM DFB Laser

EMCORE’s 1764 laser module is a DWDM laser for analog wireless and DAS applications. It features a DFB device designed specifically for RF and wireless applications. The 1764 laser has a wide temperature range for reliable performance in harsh node environments and narrow transmitter designs.

### 7830W 3 GHz Optical Receiver

EMCORE’s 7830W 3 GHz optical receiver is a singlemode fiber pig-tailed module featuring a low-noise, impedance-matched broadband photodiode and RF amplification. The device receives optical analog and/or digital signals for a range of video broadcast options, and delivers the corresponding RF electrical output.

### 5200 Series 3 GHz & 6.5 GHz High-Performance Fiber Optic Inter-Facility Links

EMCORE’S 5200 Series, 3 and 6.5 GHz Fiber Optic Inter-Facility Links (IFLs) are a high-performance, cost-effective alternative to coaxial cable for 50 MHz to 6500 MHz communications applications. They are a compact, weatherproof fiber optic transmitter and receiver pair for applications where high-performance under demanding conditions is critical. These IFLs eliminate the limitations of copper systems by enabling longer transmission distance with the highest level of signal quality.

### Wireless Highlights

- **DFB Lasers**
  - Standard ITU grid wavelengths
  - Advanced analog chip design
  - Wide industrial temperature range – stable even in harsh environments
  - Telcordia® 468 compliant
  - RoHS compliant

- **Optical Receivers**
  - Wide 40 MHz – 3000 MHz Bandwidth: Supports analog or a combination of analog and digital channels
  - Case temperature range from -30 °C to +85 °C
  - Excellent RF frequency and distortion characteristics for high linearity
  - Internal proprietary impedance matched circuitry

- **Fiber Optic Links**
  - 50 MHz – 3000 MHz (Model 5200 3 GHz)
  - 50 MHz – 6500 MHz (Model 5200 6.5 GHz)
  - IP66 rated
  - 50 Ohm SMA and 75 Ohm BNC options
  - LNB Power Options 13 v /18 v / 22 kHz
  - Variable RF gains

### Laser & Receiver Applications

- Wireless & 5G networks
- Distributed Antenna Systems (DAS)
- Small Cells
- Architectures using separate optical wavelengths to carry targeted services
- Long distances and high optical splits

### 5200 Fiber Optic Link Applications

- 4G LTE and WiMAX
- Distributed Antenna Systems (DAS)
- Cellular fronthaul
EMCORE’s Innovation & Technology Leadership

EMCORE is a vertically-integrated manufacturer that pioneered the MOCVD (Metal-Organic Chemical Vapor Deposition) process for both development and production of many of the compound semiconductor-based materials and devices in use today. EMCORE owns and operates a world-class 7,000 square foot Indium Phosphide (InP) semiconductor wafer fabrication plant at our corporate headquarters in Alhambra, California.

EMCORE’s vertical integration and highly-linear fiber optics capability based on Genuine Ortel Technology positions us for leadership in the development of enabling technologies for current and future high-speed, broadband access and wireless networks. EMCORE’s latest innovations are realized in our newest series of CATV transmitters and Wireless components that are ushering in a new era of broadband and wireless transmission technology. EMCORE’s transmitters leverage a breakthrough optical device innovation at their core, the Linear Externally Modulated Laser (L-EML™), invented, developed and manufactured exclusively at EMCORE. Our lasers components for high-speed wireless will deliver maximum signal integrity for emerging 5G, DAS and small cell networks. Our combination of semiconductor manufacturing expertise and advanced photonics design capability has enabled us to continue to achieve strong market presence in the CATV-HFC, FTTx, Telecom, Wireless and Satellite Communications markets.

Quality Management - ISO 9001 Certified

EMCORE’s various manufacturing processes involve extensive quality assurance systems and performance testing. Our manufacturing facilities have all acquired and maintain ISO 9001 certification.

How To Contact
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