

Leading Optical Component Manufacturers Release Multi-Source Agreement Specifications for 40 Gbit/s Serial Solution Based on XLMD2 Miniature Optical Device for Pluggable Transceivers

San Jose, CA—March 13, 2013—Five leading optical component manufacturers including LAPIS Semiconductor Co. Ltd., Mitsubishi Electric Corporation, Oclaro, Inc., Renesas Electronics Corporation and Sumitomo Electric Industries, Ltd., today announced the release of new common specifications for transmitter optical sub-assemblies (TOSAs) and receiver optical sub-assemblies (ROSAs). These specifications are based on the 40 Gbit/s serial Multi-Source Agreement (XLMD2-MSA^{*1}) for 40 Gbit/s pluggable transceiver modules such as the CFP MSA^{*2}.

The transmission speed of 40 Gbit/s is the highest commercially-available rate that uses the simple light on/off keying or serial transmission scheme. CFP transceivers and 300-pin MSA^{*3} transceivers are widely available for the 40 Gbit/s serial application.

In addition to ITU-T 40G serial transmission standards, VSR2000-3R2 for 2 km and P111-3D1 for 10 km^{*4}, the IEEE defined a 40 Gbit/s serial interface for 2 km (40GBASE-FR)^{*5}. The demand for 40G serial transmission is growing in the fields of telecommunications as well as data and IP communications.

In today's 300-pin MSA and CFP transceiver module market, XLMD-MSA^{*6} TOSAs and ROSAs are widely adopted. With the introduction of the CFP2/4^{*2} MSA, thin, miniature TOSAs and ROSAs are essential for downsizing the pluggable transceiver modules.

The XLMD2-MSA aims to establish compatible sources of 40 Gbit/s miniature optical transmitter and receiver devices embedded into the compact 40 Gbit/s serial pluggable optical transceiver modules. Companies adopting the XLMD2-MSA will promote MSA-compliant products in order to meet customer demand and expand the market.

The XLMD2-MSA specifications include mechanical dimensions, interfaces with a common printed circuit board (PCB) design, pin assignment and electrical characteristics for the following compatible optical devices:

- (1) Cooled EMwL^{*7} TOSA with built-in driver IC;
- (2) Cooled EMwL TOSA;
- (3) Cooled DML^{*8} TOSA;
- (4) Uncooled DML TOSA; and
- (5) PIN-TIA^{*9} ROSA.

These specifications are now available at the XLMD-MSA web site:

URL: <http://www.xlmdmsa.org/>

Notes:

- (*1) XLMD2-MSA: TOSA and ROSA MSA for use in the 40 Gbit/s serial small form factor transceivers, effective from July 2011. For more information, please visit <http://www.xlmdmsa.org>
- (*2) CFP: Pluggable transceiver MSA for 100 Gbit/s and 40 Gbit/s applications. For more information, please visit <http://www.cfp-msa.org>
- (*3) 300-pin MSA: First and widely used transceiver MSA. For more information, please visit <http://www.300pinmsa.org>

- (*4) ITU-T: ITU is the leading United Nations agency for information and communication technology. ITU-T is the ITU's Telecommunication Standardization Sector. For more information, please visit <http://www.itu.int>
- (*5) 40GBASE-FR: 40Gbit/s Ethernet: Ethernet standard defined by IEEE. For more information, please visit <http://grouper.ieee.org/groups/802/3/bg/index.html>
- (*6) XLMD-MSA: Fiber pig-tail TOSA and ROSA MSA for use in the 40 Gbit/s serial transceivers. For more information, please visit <http://www.xlmdmsa.org>
- (*7) EMwL: External modulator with laser diode
- (*8) DML: Direct modulation laser diode
- (*9) PIN-TIA: PIN photodiode with a trans-impedance amplifier

About LAPIS Semiconductor Co., Ltd.

LAPIS Semiconductor is a leading total-silicon solutions provider in the ever-expanding digital communications market. LAPIS Semiconductor has the expertise and experience in technology development and products manufacturing to support a wide array of customers and a multiplicity of customer demands. As the result of a highly synergetic union with the ROHM Co. Ltd. in 2008, LAPIS Semiconductor continues to support the new digital future by developing and providing innovative products to the market. For more information, please visit www.lapis-semi.com.

About Mitsubishi Electric Corporation

With over 90 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of 3,639.4 billion yen (US\$ 44.4 billion*) in the fiscal year ended March 31, 2012. For more information, visit www.MitsubishiElectric.com.

*At an exchange rate of 82 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2012.

About Oclaro, Inc.

Oclaro, Inc. (NASDAQ: OCLR) is one of the largest providers of lasers and optical components, modules and subsystems for the optical communications, industrial, and consumer laser markets. The company is a global leader dedicated to photonics innovation, with cutting-edge research and development (R&D) and chip fabrication facilities in the U.S., U.K., Italy, Switzerland, Israel, Korea and Japan. It has in-house and contract manufacturing sites in China, Malaysia and Thailand, with design, sales and service organizations in most of the major regions around the world. For more information, visit <http://www.oclaro.com>.

About Renesas Electronics Corporation

Renesas Electronics Corporation (TSE: 6723), the world's number one supplier of microcontrollers, is a premier supplier of advanced semiconductor solutions including microcontrollers, SoC solutions and a broad-range of analog and power devices. Business operations began as Renesas Electronics in April 2010 through the integration of NEC Electronics Corporation (TSE:6723) and Renesas Technology Corp., with operations spanning research, development, design and manufacturing for a wide range of applications. Headquartered in Japan, Renesas Electronics has subsidiaries in 20 countries worldwide. More information can be found at www.renesas.com.

About Sumitomo Electric Industries, Ltd.

Sumitomo Electric Industries, Ltd. produces a wide range of products from optical fibers, cables and components to electronic devices and automotive parts. Through effective research and diversification, Sumitomo Electric has become one of the world's leading companies in information and communications technology. The Company operates in more than 30 countries, employing 190,000 people. Sumitomo Electric reported group net sales of \$25 billion for the fiscal year ended March 2012. For more information, visit <http://global-sei.com>

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