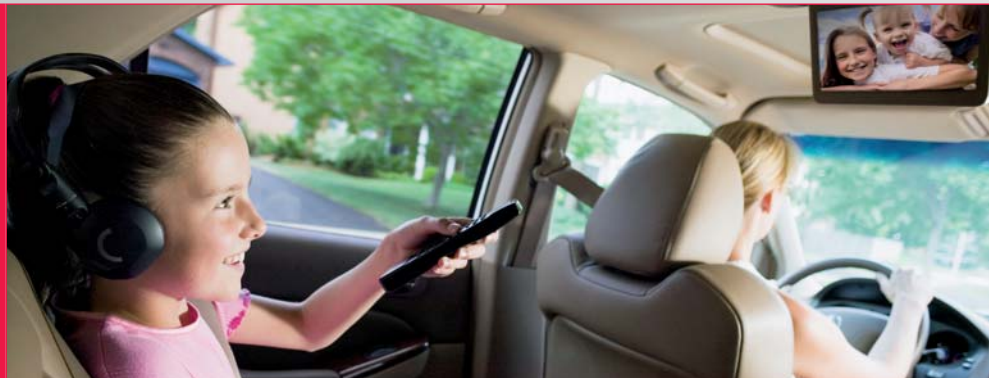


MOST Informative



MOST Highlights 2

MOST is celebrating its 10th Anniversary, presenting an automotive success story: The third generation of the infotainment backbone is now available with faster data rates of 150 Mbps and optimized robustness, quality and efficiency.

MOST Technology 10

Pushing the Boundaries – The world is turning digital but analog requirements still remain to interface with real-world components such as LEDs and photodiodes within FOTs.

MOST News 12

Latest news of various companies as Alps, Altera, Condalo, Dension, Firecomms, Fujitsu, GÖPEL electronic, Hamamatsu Photonics, Hosiden, Lineas, Melexis, Nanotech Semiconductors, NAV-TV, NEC, RUETZ SYSTEM SOLUTIONS, SMSC, TRS-STAR and Vector contributing to MOST Technology.

MOST Cooperation 19

The MOST Cooperation is delighted to announce the first Asian car models implementing MOST Technology. MOST networking technology has been selected as part of the infotainment system of more than 55 car models.

MOST Outlook 20

Upcoming conferences and events worldwide where the MOST Cooperation will show its latest highlights and achievements



Dear Readers,



The MOST Cooperation is celebrating its 10th Anniversary: During these first ten years of operation the technology has seen widespread acceptance for networking infotainment systems and its success has been steadily growing. Today more than 55 car models run their infotainment systems over a MOST network. The rapid pace of technological and economic achievements culminated into milestones that were introduced over the last months.

At the 13th International Conference “Electronic Systems in Vehicles” in Baden-Baden recently the MOST Cooperation presented latest technology highlights as MOST150, the future infotainment backbone with data rates of up to 150 Mbps. Furthermore live demonstrations at the conference showed MOST networks running at 50 Mbps over Unshielded Twisted Pair (UTP) wires and real-time video. The very positive feedback we received in discussions with participants in the event indicates that the MOST Technology is well positioned for the future. Further underlining the importance of MOST is the recently published MOST Book that provides a comprehensive introduction to the technology and applications.

Taking a look ahead into 2008 we see some exciting events, starting with the

annual All Members Meeting in March, going to the Convergence Show in October in Detroit and ending with the 2008 Asia Interconnectivity Conference in November in Seoul, Korea. Also please look out for the first industry event on MOST that will take place in Europe this fall. We will publish timely announcements and invitations to these events.

We are proud to present this edition of MOST Informative filled with exciting technology highlights from the MOST Cooperation and its member companies. Please enjoy reading and we are looking forward to receiving your feedback about MOST.



Dr. Christian Thiel
Administrator of the MOST Cooperation

An Automotive Success Story

MOST Cooperation Celebrates 10th Anniversary



Over 10 years ago the carmakers BMW and Daimler together with Harman (today Harman/Becker) and OASIS SiliconSystems (today SMSC) started

cooperating on defining and designing the Media Oriented Systems Transport Technology. With their clear vision the companies saw the need for a common infotainment network standard instead of proprietary solutions. The activities around MOST aim at concrete and measurable results for volume production rather than only defining a theoretical standard. In 1998 the companies founded the MOST Cooperation with Audi joining shortly thereafter. They quickly developed the first specification since they had to meet deadlines for mass production. Within only 3 years BMW introduced the 7 series as the

first MOST car in 2001. The following year 13 more models implemented the MOST infotainment backbone. Today MOST is integrated in over 55 car models of most of the 16 carmaker members, including the first Asian models from Toyota and Hyundai/Kia. The MOST Cooperation's 10th Anniversary is highlighted with more than 90 members presenting an automotive success story: The third generation of the infotainment backbone with faster data rates of 150 Mbps is being standardized and robustness, quality and efficiency have been optimized.

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Comprehensive MOST Standard Work

MOST Book Provides an Introduction to the Basics and Applications of the Leading Infotainment Technology



Complete information compiled on the subject of MOST is now available as a standard work: Comprehensive and easy to understand, the reference "MOST Book" provides an introduction to the technology and applications of the multimedia standard MOST. Not intended to replace the official MOST specifications, it nevertheless gives a comprehensive overview introducing these specifications. This qualified compendium is published in the series Electronics & Electrical Technology library of the Franzis Verlag. The authors are a team of 16 specialists from member companies and competence partners of the MOST Cooperation, representing a broad spectrum of the entire MOST know-

how. The editor, Prof. Dr. Ing. Andreas Grzempa, and his team of authors describe all the relevant aspects of this technology, from the presentation of the communications architecture and a variety of development tools to the installation and commissioning of a simple MOST system. The MOST experts conclude by demonstrating the basic structure of MOST gateways, describing the handling of MOST components and their use in standard vehicles. This reference book offers a comprehensive overview of MOST and provides an easy introduction to the communications architecture. It is aimed at both electronics development engineers and designers with sections relevant to project managers and executives who are concerned with the transmission of multimedia data.

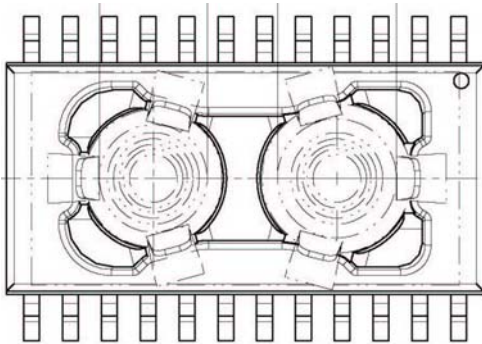
MOST Standard and Application

After an introductory description of the MOST Cooperation and its structure the reader is given an overview of all network architectures in vehicles to facilitate a better understanding of the use cases for MOST. The subsequent introduction to the MOST Technology is an overview of the system architecture, the application framework and the protocols. The next chapter on physical layers starts with an introduction and the basics of the layer structure followed by a system description and concludes with further developments and alternative trans-

mission media. Various MOST interface controllers and network services are listed and explained. The authors then go on to describe the MOST system design. Two important subjects include the testing of MOST based infotainment systems and the compliance processes. Finalizing the first part of the compilation, the reader is given an overview of the almost 4000 pages of MOST specifications. The second part of the book is dedicated to the practical use cases of MOST: Beginning with an introduction of the diverse development tools of various providers, the structure of a simple MOST system with three communication participants is described. The examples used are a CD changer, an amplifier and a control interface. The connection of external devices via gateways illustrating the versatility of the architecture follows. Production and processing of MOST components as well as MOST in series production conclude the work. The appendix provides an overview of different communications systems and explains the abbreviations and special terminology used.

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News from the Working Group Physical Layer Specification for MOST150



Based on lessons-learned of today's MOST25 networking generation, a working group consisting of car, device and component makers has developed a new Physical Layer Specification for MOST150. The specification is available to members of the MOST Cooperation as part of the MOST 3.0 specification set and can be used for implementation into products. An integral approach

was used to define the electrical and optical signal parameters for MOST150 as well as cost optimized standardized packages together with pin-out descriptions for optoelectronic converters. The specification addresses the challenges of soldering processes, changeability of fiber optic elements with alternative replacements, as well as new opportunities to organize supply chains of components. Unambiguous signal definitions for operational states, power supply ramp-up and ramp-down scenarios, together with the use of established eye diagram testing methods, well known from the data and telecom industry, safeguard an easy and robust

development process. MOST150 uses the well-known and established MOST25 1mm step index POF polymer fiber. The mechanical interface at the wire harness connector stays the same, only the optoelectronics are adapted to the new speed grade. By design, most of the elements of this new MOST150 specification can be carried over to future, cost optimized MOST25 generations. Later in 2008, the working group will define the updated compliance process to test products for conformance to these requirements. This process will be carried over from MOST25 and will be enhanced with reliability testing methods.

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MOST Quality at High Efficiency

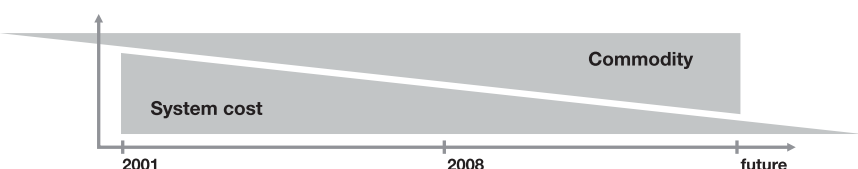
MOST Cooperation Enhances Robustness and Ease-of-use Coupled With Cost Down Strategy

The MOST Cooperation has overhauled its specifications and implemented an integrated compliance verification process to enhance the quality while reducing the cost at the same time. To reduce costs, for example, the supply chain for optical connectors has been shortened by means of a new design and new ICs with more implemented functions for MOST nodes have been introduced. To further optimize robustness and user friendliness, the specifications have been refined to remove ambiguities and add clarity. Since its first volume implementation, the MOST specifications have continuously been amended and extended in order

to reduce the possibility of different interpretations by implementers. The specification is further complemented through standard driver stacks (Network Services) that are available from several sources. Another example is that the MOST Cooperation has added descriptions of the dynamic behavior of functional entities such as various APIs. Also the necessary master functions to manage a MOST network like Network Master, Power Master etc have been described with

Message Sequence Charts. These specifications have been implemented in software that is available as standard code. These important functions, that usually sit in a head unit and control the whole MOST network, no longer need to be developed over and over by each Tier 1 supplier. Furthermore, MOST Cooperation has launched the development of a broad environment of infrastructure for MOST.

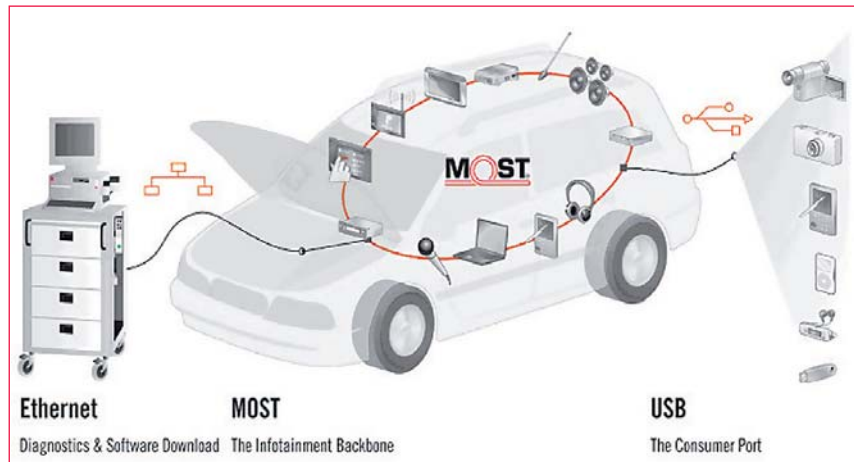
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MOST Cooperation Introduces the Next Generation Infotainment Backbone

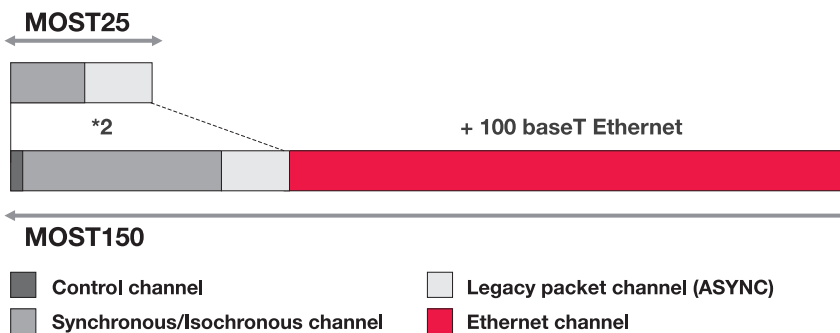
MOST150 Enables Efficient Transport of Video Streams and IP-Based Packet Data

The MOST Cooperation presents MOST150 offering a bandwidth of 150 Mbps. In addition to higher bandwidth, MOST150 features an isochronous transport mechanism to support video applications, as well as an Ethernet channel for efficient transport of IP-based packet data. With MOST, audio and video signals can be transported efficiently using the bandwidth and without any overhead for addressing, collision detection/recovery or broadcast. Thus, MOST150 offers capacity that packet-switched networks can only



– but in addition it offers two new channels: an Ethernet channel and an isochronous channel. The Ethernet channel can transport unmodified Ethernet frames. This permits software stacks and applications from the

streams generally use variable bit-rate. This new MOST feature enables many video applications. MOST150 also adds significant enhancements to the control channel (which is used for real-time control of devices) by doubling the bandwidth in comparison to MOST25.



achieve with much higher gross bandwidth. Multiple high-definition (HD) video streams and multi-channel surround sound with premium quality of service can be transmitted, while simultaneously moving high loads of packet data around.

Ethernet and Isochronous Channel Added to Multi-Channel Network

Like MOST25 and MOST50, MOST150 offers the well known channels for synchronous, packet and control data

consumer and IT domain, where the speed of innovation is much faster, to be seamlessly migrated into the car. TCP/IP stacks or protocols utilizing TCP/IP can communicate via MOST150 without any modification. MOST150 provides the automotive-ready physical layer for Ethernet in the car. In addition, MOST150 offers an isochronous channel to support streams which are not synchronized to the MOST frame rate. A typical use case is the transport of MPEG streams over a MOST network since MPEG

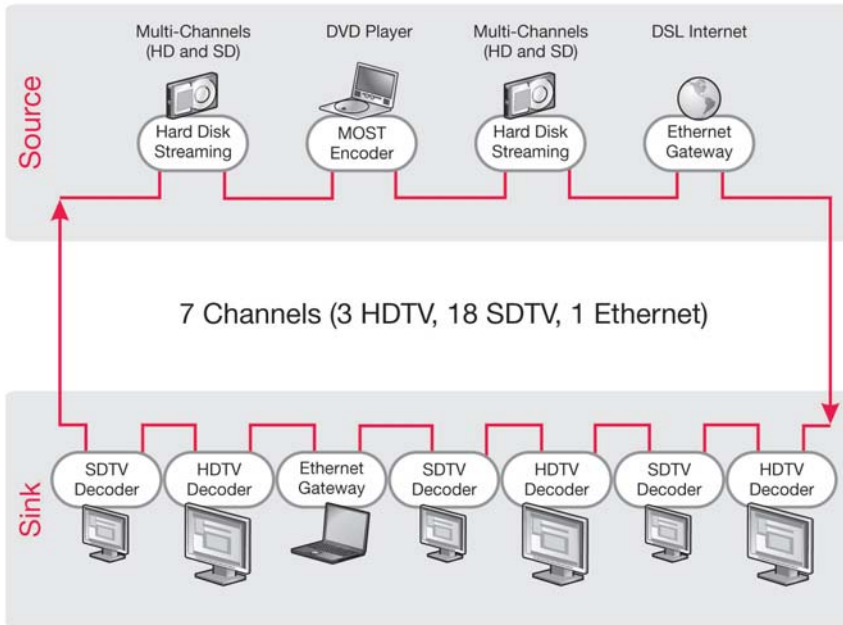
Physical Layer

MOST150 allows carmakers to continue to use POF and LEDs as light sources. They can continue to use their established optical wire harness and assembly processes which make the transition to higher bandwidth networking with MOST150 a smooth evolution.

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First Live Presentation of the MOST150 Multimedia Demonstration

MOST Highlights at 13th International Conference “Electronic Systems for Vehicles” in Baden-Baden



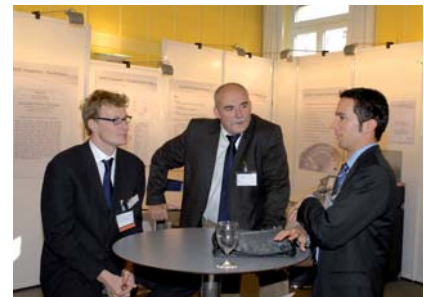
processes while in parallel advancing the technology to meet the needs of tomorrow's infotainment systems."

Many of the 1500 delegates stopped by the booth or came to the show room to see the continuing progress of the MOST Technology. The impressive multimedia demonstration included 18 standard definition and 3 high definition video stream showing MOST at 150 Mbps bandwidth with high-speed Ethernet packet transport, multi-channel video streaming from HDD as well as isochronous streaming of HDTV and SDTV. Video sources and sinks were gluelessly interfaced to the INIC to achieve low system cost. The cooperation also showed MOST50 and the electrical Physical Layer which has just been implemented by a leading Asian carmaker. Further demonstrations included Real-Time Video over MOST, a MOST25 / MOST50 Bridge, and Bandwidth for Video Quality.

The MOST Cooperation showed its latest achievements and roadmap at the 13th International Conference “Electronic Systems for Vehicles” on October 10th and 11th, 2007, in Baden-Baden, Germany. The Congress was an ideal venue to present to the automotive public the latest designs and developments of the MOST Cooperation and its members. “We had live demonstrations of MOST networks

running at 50 Mbps over Unshielded Twisted Pair (UTP) wires and the new MOST150 speed grade running at 150 Mbps over optical fiber”, states Dr. Wolfgang Bott, Technical Coordinator of the MOST Cooperation. “The demonstrations held at booth 25a and in show room 2 highlighted the success of our efforts to reduce cost and concurrently increase quality by concentrating on compliance

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8th MOST Interconnectivity Conference

Latest MOST Technology Shown in Tokyo, Japan



Directly following the Interconnectivity Conference the MOST Cooperation Press Conference took place to which the cooperation invited Japanese automotive and electronics media and presented the highlights and achievements of MOST Technology.

The MOST Cooperation held the eighth MOST Japan Interconnectivity Conference on November 7th, 2007, in Tokyo at the Hotel Laforet. During the one-day convention Asian carmakers and their suppliers received an update on recent achievements and on the MOST roadmap. Throughout the morning session, members of the Steering Committee gave an overview further explained with presentations of various members in the afternoon.



The members Avago, BMW, Daimler, Firecomms, Harman/Becker Automotive Systems, RUETZ SYSTEM SOLUTIONS, SMSC and Vector Japan Co., Ltd. introduced the latest MOST achievements.

The presentations covered MOST50 and the electrical Physical Layer which has just been put on the road by a major Japanese carmaker as well as the work on the latest generation of MOST, MOST150. MOST150 was demonstrated publicly for the first time in October 2007 and the MOST Cooperation is working on different aspects of the corresponding standard specifications. More than 120 attendees joined the presentations and visited the live demonstrations of MOST150 and Video over MOST.

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MOST Cooperation Steering Committee Welcomes Commitment of Harman/Becker and SMSC to Open Data Link Layer of MOST

The Steering Committee of MOST Cooperation, whose membership consists of Audi, BMW, Daimler, Harman/Becker and SMSC, has announced that it welcomes and embraces the decision by Harman/Becker Automotive Systems and SMSC to open the details of their proprietary Data Link Layer for new and current generations of the MOST multimedia network. SMSC and Harman/Becker announced their intention to make their detailed Data Link Layer technology for existing and future generations of MOST available via a royalty bearing license in a step-wise process linked to market growth. They also announced that a detailed Data Link Layer specification for the first generation, MOST25, has already been made available and can be requested on SMSC's website by members of the MOST Cooperation. A license agreement to the related patents of both companies can be requested via the same webpage.

The carmaker members of the Steering Committee, Audi, BMW and Daimler, endorse the opening of the MOST Data Link Layer. "We believe that MOST is an exceptionally useful technology to Audi and should be propagated widely throughout the auto industry," said Dr. Willibert Schleuter, head of electronics at Audi. "We are in favor of any steps that will make complementary technologies more widely available as we see this as essential in helping to spread the adoption of MOST. There-

fore Audi welcomes Harman/Becker's and SMSC's decision to license their Data Link Layer intellectual property to other semiconductor manufacturers. Due to this opening step the semi-conductor industry has the chance to design optimized products enabling more competition."

"Standards bodies have taken different approaches in determining how to develop a standard that suits a particular industry," said Dr. Christoph Grote, head of BMW's Infotainment division. "From the beginning, the philosophy of the MOST Cooperation has been to base its standard on particular elements of existing technology to rapidly create a reliable and stable infotainment networking standard. Like other standardization groups, the eventual goal of the MOST Cooperation is for all its members to be enabled to make MOST compatible parts and systems. We recognize, however, that in order for the MOST Technology to develop, SMSC and Harman/Becker need to receive a fair return for the intellectual property investment that they have developed outside of the MOST Cooperation as an incentive for innovation. BMW endorses the licensing model proposed by SMSC and Harman/Becker because it will encourage a necessary competition and will allow the market for MOST compatible parts to develop while respecting the effort and intellectual property of those companies that have developed it."

"SMSC's and Harman's program to license their Data Link Layer on a commercially reasonable basis should help spread the MOST Technology and allow for additional innovation and competition," said Peter Haeussermann, head of the Mercedes-Benz telematics division at Daimler. "In order to spread new generations of MOST Technology, it is essential that we increase the number of companies that can manufacture MOST compatible parts. Harman/Becker and SMSC have now defined clear conditions for opening their proprietary technologies related to MOST now and for new generations of MOST products, which we expect will lead to greater diversity of supply."

www.mostcooperation.com

MOST Cooperation Endorses First International MOST Conference

The world's first industry event on MOST based infotainment technology is approaching: In September 2008 the international MOST Conference invites to a one day congress with numerous specialists presenting latest and future technologies and applications on MOST. As premium partner the MOST Cooperation accompanies the forum not only to guarantee highest overall quality of the conference but also as exhibitor and moderator opening the presentation sessions. Media partners will support the event with public promotion and in addition provide know-how as part of the se-

lection committee to ensure highest possible quality of the speeches. At the accompanying exhibition various companies inform about latest products and services. The MOST Conference will bring together top professionals from the automotive electronics industry and academia to exchange information and results of recent business and work on systems, circuits, technologies, processes and applications. The conference will provide a forum for a broad audience reaching from researchers, designers, engineers, system developers via purchasers and journalists to the

managers of the involved industries. The event establishes an ideal forum to share ideas, experiences and to discuss latest news on the emerging technology. To assure a broad field of topics and a high quality conference all interested presenters are invited to submit paper proposals. Suggested MOST topics for submission include networking and system architecture, application framework, physical layer, network management, interface controller, testing and compliance, application tools, and gateways.

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DTCP over MOST

Secure Transmission of DVD Audio, DVD Video, HD-DVD and Blu-ray Content

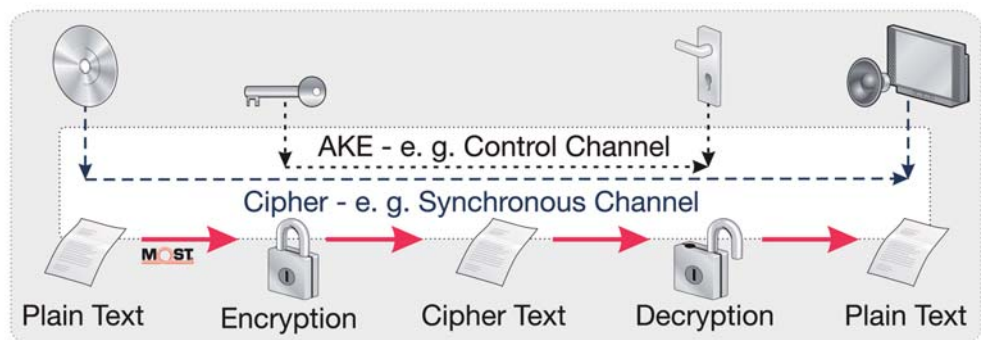
The MOST network is optimized for high quality audio and video streaming – MOST150 enables direct isochronous transport of, for example, MPEG video streams without bit-stuffing or transcoding. The MOST standard supports approved content

protection schemes and therefore enables digital transmission of DVD Audio, DVD Video, HD-DVD and Blu-ray content. With the integration of DVD Audio and DVD Video into digital networks, the requirement for content protection comes into place. DVD content on a digital network must be DTCP (Digital Transmission Content Protection) protected. MOST was the first network to be fully approved by the DVD Copy Control Association (DVD CCA) to carry DTCP protected content. This was made

possible by adapting DTCP to the MOST standard. By doing so, also HD-DVD and Blu-ray content on MOST is supported since AACS (Advanced Access Content System) licensing allows digital outputs which are protected using DTCP. DTCP requires source and sink devices to authenticate each other. In addition, there is a need to encrypt multimedia streaming data before sending it over a digital network. A sink device therefore has to be able to decrypt protected digital content. DTCP over MOST

also supports point-to-multipoint connections. With MOST150, the integration of DVD applications into vehicles is no longer an issue – even when streaming the full-quality bandwidth. DTCP solutions for MOST are available in hardware as well as in software from various suppliers.

www.mostcooperation.com

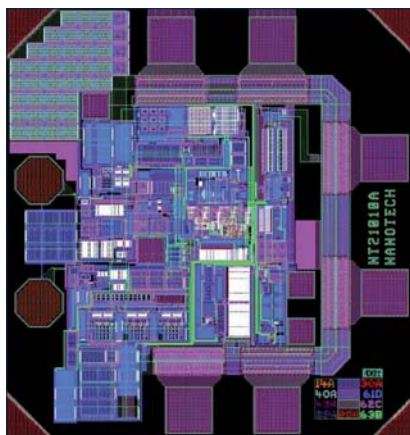


Pushing the Boundaries

For more than 30 years, constantly shrinking process technologies for manufacturing Integrated Circuits ('ICs') have enabled the integration of a growing number of transistors on a single chip with lower and lower costs. This economic revolution has meant that a number of functions traditionally integrated in the analog domain can now be implemented with less cost and less power in the digital domain. Although the electronic world is turning digital, analog requirements will remain as the interface to real-world components such as microphones, loudspeakers and the LEDs and photodiodes within FOTs (Fiber Optic Transceivers). Let us take a look at the improvements in link budget performance, power dissipation and cost which are achievable by adopting new techniques, following the major trends in the IC industry.

Analog Wire Harness versus Digital Net

The digital revolution although not at all a recent development is still affect-



ing areas which until recently have been analog. Even the MOST Technology is facing an ever increasing digital influence and far beyond the ways one would expect. One of the first steps of MOST25 was the adoption of the digital domain. No matter which systems we look at – be it a large home entertainment system or a head-unit in a car – the traditional approach of connecting the speakers to the amplifier has been by the use of analog copper cables. MOST25 challenged this approach and not only introduced the use of Polymer Optical Fiber (POF) but also the concept of linking the head-unit to each speaker using digital signalling. With this approach the overall system implementation cost has been reduced significantly even though single component costs might have become higher. The introduction of the MOST Technology into complex infotainment systems has led to replacing heavy copper wire harnesses by a single POF ring.

Digital Technology for Analog Functionality

When taking an even closer look at MOST systems it is easily seen that additional fundamental changes are driven by the success of digital technologies. Within the FOTs silicon ICs are responsible for controlling the brightness and speed of the LED on the transmitter side, and to amplify the received signal on the receiver side. Until recently such ICs have generally been designed on special yet expen-

CMOS Technology (relative to e.g. SiGe/BiCMOS)
<p>Challenges</p> <ul style="list-style-type: none"> • Longer design time • Specialist skill set required • Different design techniques required (for example special mismatch techniques) <p>Benefits</p> <ul style="list-style-type: none"> • Low die size, hence low cost • Larger wafers, yet low wafer fabrication cost, hence lowest overall cost • Low power consumption • Mixed signal analog and digital circuits on the same chip ICs

sive analog processes such as Silicon Bipolar transistors resulting in very high unit costs. Now, with the virtuous-circle of success of Complementary Metal-Oxide-Silicon (CMOS) processes in the digital world CMOS has replaced these original processes and offers better value in terms of cost and performance. In fiber optics, 10 years ago there was a migration from Gallium Arsenide (GaAs) technology to Silicon Germanium/Bipolar-CMOS (SiGe/BiCMOS) and then to CMOS. Today, the first technology approach usually taken is CMOS ICs.

Designing a high speed analog IC is faster on dedicated technologies such as SiGe/BiCMOS. To give an example let us take a look at the phenomenon of mismatch. If a transistor structure in a design has to be used twice or more it is usually desirable for the

structures to behave in the same way. However, in reality, there will often be a mismatch between the transistors. Various physical causes are related to mismatches however a discussion goes beyond the scope of this article. The effect of mismatch is, at minimum, one order of magnitude bigger with CMOS compared to bipolar technologies. Mismatch effects can be compensated by dedicated techniques in order to avoid unwanted behavior of the architecture.

Mixed Signal – Digital and Analog in Perfect Harmony

Transistor type changes however reflect only one small aspect of the technological innovations implemented in ICs for usage in MOST networks. Techniques like Mixed-Signal (i.e. the integration of analog and digital signal processing realized in one piece of silicon) have already been standard to a broad variety of other applications and are now being inte-

grated into MOST. The MOST25 Receiver (NT21010) from Nanotech Semiconductor may function as an example of the integration of leading technologies and techniques. The device usually used in the Rx FOT converts the low-level photo currents from the photodiode to a full TTL logic level. Performance improvements for multiple parameters along with no negative impacts related to the usage of state-of-the-art technologies can be demonstrated easily. Examples of the changes are: industry leading edge sensitivity allowing for several additional meters of network fiber between each node, more in-line connectors, removal of all external components, lowest current consumption, smallest silicon area and lowest cost on the market. This MOST25 receiver is manufactured in standard ‘logic’ CMOS technology.

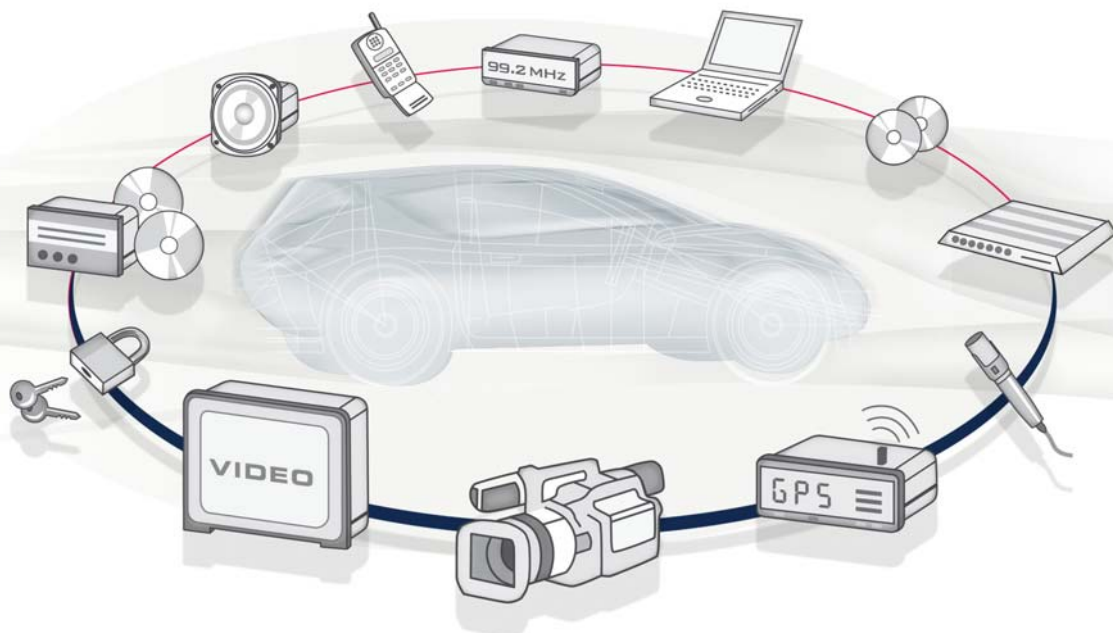
In the future further increased speed of the data transmission is to be expected due to growing bandwidth-

hungry applications like video and flash updates. And there is more to come with the expected penetration of MOST into the consumer market. POF and CMOS technologies will be able to cope with requirements far beyond speeds realized in MOST150 – Production-grade ICs supporting 250 Mbps are already available from Nanotech. The realization of speeds higher than 500 Mbps have already been demonstrated and a minimum of at least 1.25 Gbps will be attainable once the market is ready for it.

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www.nanosemi.co.uk



Graphics Controller SoC for Seamless Integration into MOST Based Infotainment Systems



Fujitsu Microelectronics Europe and SMSC announce the successful implementation of SMSC's Media Local Bus (MediaLB™) technology in Fujitsu's latest graphics controller, the MB86R01, known as 'Jade'. Markus

Mierse, Senior Manager Graphics Solutions at FME comments, "With MediaLB we further extend our portfolio of in-car networking protocols, which already covers all current industry standards. As such Fujitsu is able to offer customers a multiple-choice of solutions to their particular problem." MediaLB is an inter-chip communication technology. It allows one or more applications to access the MOST network. MediaLB is also designed to support future MOST networks, thereby providing a simple migration path from existing MOST network architectures to next-generation platforms. 'Jade' is the first device

in a new family of graphics controllers from Fujitsu, and it is the first Fujitsu System-on-Chip (SoC) to integrate the 32-bit ARM926EJ-S™ CPU core with the company's graphics processor 'Coral PA'. The device is targeted at high-end embedded automotive and industrial graphics applications including on-board and mobile navigation systems, graphical dashboard systems, HUD (head up display) units, rear seat entertainment, and industrial point-of-sale terminals and control panels.

www.fujitsu.com

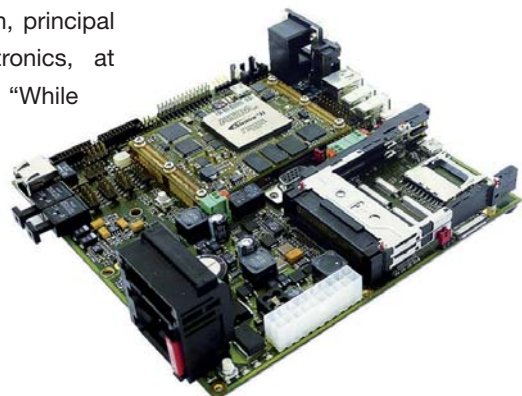
PARIS Platform for Incorporating Intellectual Property Into Car Multimedia Systems

With PARIS development platform Altera Corporation and TRS-STAR GmbH provide the industry's first fully scalable infotainment platform for the automotive market. The flexible solution targets automotive multimedia systems used in next-generation car infotainment and telematics systems. Supporting CAN, MOST, USB, Ethernet and SDHC interfaces the PARIS platform features a scalable automotive graphics system with multiple video-in and video-out functionalities, an audio processing module, and an application processor. The PARIS platform, with an FPGA at its core, offers automotive infotainment designers a single, fully

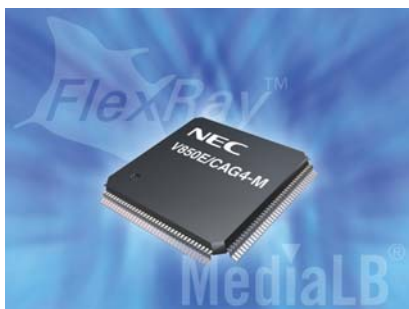
scalable system platform featuring hardware, software and IP. This approach provides designers the ease and flexibility of choosing the IP they need for individual systems, significantly reducing design time and development costs. According to the market research firm iSuppli, the total automotive infotainment market is expected to be more than \$50 billion by 2012. Richard Robinson, principal analyst, automotive electronics, at iSuppli Corporation, stated, "While automobile production is experiencing a steady three-percent compound annual growth rate, the

automotive infotainment segment is expanding much more rapidly. We forecast the automotive infotainment market, which remains largely untapped today, to experience an eight percent CAGR from 2006 to 2013."

www.altera.com



Gateway Controller for Adoption to MOST Infotainment Networks



NEC Electronics Europe is introducing a new family member of NEC Electronics' powerful 32-bit RISC microcontroller family for automotive gateway and body applications. Offering high performance, large memory size and fully-fledged communication interfaces, it is ideal for high-end gateway and

body applications in the automotive field. The V850E/CAG4-M takes the popular V850 family into the high-performance bracket and supports emerging standards in automotive communication interfaces. The V850E/CAG4-M utilizes MediaLB™ technology to efficiently transport multimedia data (Control, Packet, Synchronous and Asynchronous) through SMSC's intelligent network interface controllers (INICs) onto the MOST network. MediaLB is an inter-chip communication technology developed by SMSC. The embedded interface opens a new way to connect to the MOST world for very high data

throughput especially for asynchronous data transfer. The integrated macro supports the 3-pin MediaLB connection with up to 512FS and interfaces to all MOST speed grades. Advantages are real-time clock and power-saving mode support. The 16-bit parallel external bus interface allows the V850E/CAG4-M to connect to external components like RAM, while the FPU and 80 MHz RISC performance covers new fields of diagnostics and high-end server concepts.

www.nec.com

MOST PCI Tool Kit Offers Flexibility for MOST Device and System Development



MOST PCI Tool Kit from SMSC is a new solution designed to address most phases of a typical development process for a MOST system or a MOST device. The MOST PCI Tool Kit is capable of realizing the following setups with the same hardware: MOST NetServices application pro-

gramming platform, MOST device simulation environment, test and verification setup for MOST systems or MOST devices, and end-of-line test center. The MOST PCI Tool Kit is a combination of PC interfaces (hardware) accompanied by a software bundle. Additionally, various software extensions are available to provide additional specific features and functionalities. The MOST Tool Kit's software is uniform and supports all speed grades including MOST25, MOST50 and MOST150. It consists of the MOST driver stack, which supports the various MOST PCI Interfaces and the MOST Tool Foundation, containing the services and modules for the MOST NetServices API and software extensions. The MOST driver

stack includes extension devices for standard network, sound or video devices on the Windows PC. The advantage of the variety in drivers is to offer different setup options for test and verification by using established Windows APIs like sockets (TCP/IP, UDP), WDM sound streaming and DirectX interfaces for sound and/or video applications. The MOST Tool Foundation allows two different ways to use the MOST control channel for device simulation and test applications: Full MOST NetServices API (requires MOST NetServices license) and SOCKET MBI (Message Based Interface).

www.smsc-ais.com

MOST Datalogging Provides Powerful Test and Validation Environment



For test and validation of infotainment systems, it is most important to record messages from all bus systems involved. This results in a huge amount of trace data (MOST, CAN, serial, GPIO...), which needs to be tracked, processed and filed. These valuable trace files will become worthless if the boundary conditions are lost. To

analyze or reproduce test, and/or fault conditions, a detailed parameter set needs to be filed including information such as the ring position of the MOST sniffer and involved ECU's, setup parameters of bus systems as well as version information and software release information of the firmware of every device included. In addition data of marker management, time and date stamp conditions, car identification and driver-id or author-id are sensible information to be tracked. LINEAS Test and Validation environment stores all the necessary information related to a trace file in a central data store. This database can be shared between

the component supplier and OEM to enable problems reported by the OEM to be solved at the supplier's lab. A powerful GUI and interconnection framework – which has been optimized with the support of a German OEM – rounds off the system concept. Recording is managed via a modular, industrial PC based multi bus data logger, which can be equipped with different interface cards exactly according to the test situation. The LINEAS Environment automatically identifies connected recorders and its customizable interface board setup.

www.lineas.de

MOST Datalogging with OptoLyzer G2 30xx

The MOST Datalogger extension of the OptoLyzer®G2 30xx family, the comprehensive network analysis platform for both MOST25 and MOST50 networks, has been enhanced: The

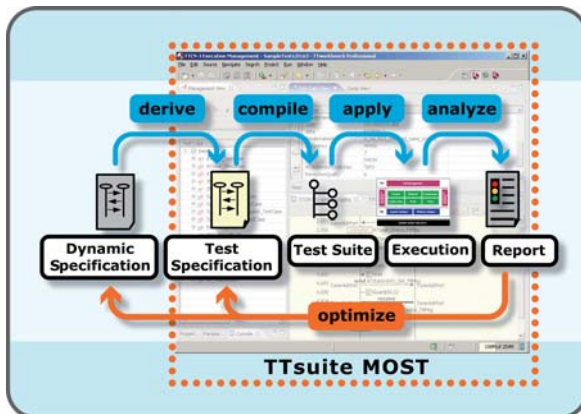


Datalogger extension for OptoLyzer G2 and OptoLyzer PowerPack, in conjunction with the OptoLyzer G2 30xx, offers an optimized set of network analysis tools to log all MOST traffic to any USB storage device that is connected to the OptoLyzer OL30xx. Users simply connect the USB stick and the WLAN transceiver (both part of the Datalogger Extension for OptoLyzer G2) to the OptoLyzer OL30xx and install the software on a Laptop/PocketPC with WLAN connectivity. This software provides the capability to start/stop logging, set a marker in the log file and make various setting adjustments, such as log file size, prefilters, etc. The OptoLyzer PowerPack is an uninterruptible

power supply for any device that needs a 12/5/3.3 V power supply. It enables reliable operation of the connected device (e.g. OptoLyzer OL30xx) for a certain period of time in case of voltage drop down or shut-down of the power supply. Thus, operation of test and verification setups in the vehicle, where such incidents might occur, is secured. Since the OptoLyzer PowerPack is completely automotive qualified, it is proven to be operational in the harsh car environment and also provides special features such as protection against over-voltage, load-dump and cranking.

www.smcs-ais.com

Standardized Application Testing for MOST50



TTsuite MOST is now able to provide application test functionality for all available MOST physical layers: MOST25 oPhy and MOST50. TTsuite MOST is based on the test description language TTCN-3. For definition,

implementation as well as documentation of tests this language uses easily readable graphic formats that are well compatible with MSC (Message Sequence Chart) specifications. The Support of MOST High Protocol is a further new feature. Users can now, for the

first time, test and simulate processes using the asynchronous channel in relation to the control channel. To support MOST50 in the best possible way, RUETZ SYSTEM SOLUTIONS now uses Optolyzer G2 3050 as a

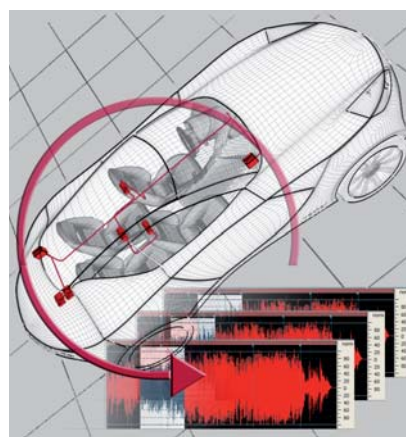
MOST Interface on the SMSC tool platform, a consistent technology both at present and in the future. For the first time, TTsuite MOST provides the new generation of MOST Technology with a reliable high-performance test and simulation system which is available right from the start.

www.ruetz-system-solutions.com

Expanded Access to All Data on MOST

CANoe.MOST 7.0 is the first development and test tool which offers access to all MOST channels, including the full bandwidth of the synchronous channels. This simplifies multi channel audio analysis and the generation of test signals on the PC. MOST users gain access to the synchronous channels with the latest version of CANoe.MOST and the standard USB interface VN2610. This enables the analysis of state of the art 5.1 and 7.1 audio streams and the evaluation of CODEC algorithms. Furthermore, low level tests on the complete streaming data may be performed. Automated long term tests can be performed by generating test signals and verifying correct transmission through the

MOST ring within a single test tool. CANoe.MOST allows recording and



replaying of all synchronous data and offers a framework for the easy integration of user specific algorithms. All well-known functionalities e.g. the

access to the control and asynchronous channel as well as the execution of test sequences can be used at the same time. The provided run time environment including the network master facilitates single device tests. The combination of these functionalities with the new streaming functionality gives the user a comprehensive test tool, which also supports system tests optimally. Additionally the current CANoe.MOST version provides many further enhancements for the usability, the function catalog support and especially the programming of test sequences.

www.vector-worldwide.com/MOST

Optical SMD Transceiver for MOST150 Concept



Hamamatsu Photonics will be ready to supply SMD FOT (fiber optics transceiver) for MOST150 to meet the requirements of a high speed car net-

work. This device is not only stable transmitting 150 Mbps, but also employs a new package concept. In this new package the emitter and receiver are combined into one module. The new package leads to high reliability, high reflow soldering capability and high shielding characteristic. Furthermore this package is adapted for a direct connection to the fiber without any additional parts. To enhance the transmission speed, it

employs a RC LED and a high speed photo IC, which has several new features including an operating temperature range from -40°C to $+95^{\circ}\text{C}$, a 3.3V operating voltage and a self-diagnosis function. Hamamatsu Photonics is now securing to meet the release date in spring 2009.

www.hamamatsu.de

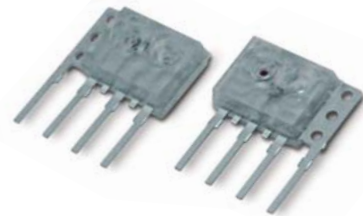
Low Power 3.3V MOST25 FOT

Hamamatsu Photonics FOT products for MOST25 have demonstrated good quality in large volume production. Based on the request for a device that will operate in low voltage environments, Hamamatsu Photonics is to-date developing a MOST25 FOT which operates at 3.3V. The device employs a high heat tolerance resin so

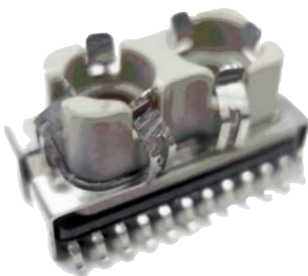
that it can be operated at 105°C . The transmitter device contains an internal RC LED which has a superior response speed. Thus, a more stable high light output waveform can be achieved. In respect to the receiver device a current consumption of $I_{\text{cco}} = 16\text{mA}$ in operation mode and $I_{\text{ccs}} = 5\mu\text{A}$ in sleep mode have been achieved.

Hamamatsu Photonics has scheduled the release date to May 2008.

www.hamamatsu.de



Fiber Optic MOST Transceiver Transmits 150 Mbps



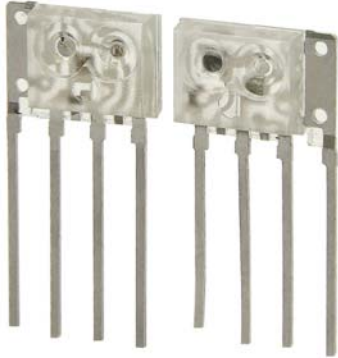
The MLX75605 of Melexis is a single package solution for a fiber optics transceiver (FOT), dedicated for MOST protocol network. Compliant to the MOST150 Mbps physical layer specification under development, MLX75605 embeds a 650nm light source, driver IC, and monolithic

receiver IC. The driver IC includes on chip calibration circuitry to achieve optimal performance by compensating each transceiver's LED and process variations. The receiver part consists of a PIN Photo Diode, TIA and End Amplifiers integrated into a single die. This monolithic receiver IC enabling best in class immunity against electromagnetic disturbances. The MLX75605 is packaged in a 24 pin SOIC package and Melexis innovative package technology developed for automotive optoelectronic ICs. It integrates the ferrule receptacles of both receiver and transmitter pigtailed and achieves

optimal coupling efficiency. The monolithic receiver IC (MLX75603) as well as the (RC)LED driver IC (MLX75604) are also available in die form. The fully optical tested FOT operates at 3.3V providing a wavelength of 650nm. Integrated features include a sleep mode function, low voltage differential signal I/Os (LVDS), integrated test mode for emitted power adjustment, integrated memory for on-chip parameter trimming and embedded ferrule clamping for plug and play integration.

www.melexis.com

MOST FOT 48 kHz Compliance



FCM110, Firecomms' Automotive MOST transmitter and receiver FOT pair, has received certification that it is compliant with the MOST 1.1 physical layer at 48KHz. These devices have been available and certified for operation at 44.1KHz since early 2006. Certification at 48KHz now means

that developers of systems based on the increasingly popular 48KHz sample frequency can also be assured of full compliance with every parameter in the compliance test matrix. Firecomms' FCM110R transmitter and FCM110D receiver are state-of-the-art four-pin, low-cost plastic packaged components. Digital input/output data conforms to TTL switching levels. The transmitter uses a novel high-speed resonant cavity light emitting diode (RCLED) source with an integrated lens designed to maximize coupling efficiency. Because RCLEDs are five times faster and more efficient than traditional LEDs, the company can demonstrate high-speed future proofing for the automotive industry up to 300

Mbps. The receiver uses an optimized low-cost CMOS design that achieves an industry best minimum sensitivity of -28 dBm. The components, which operate over a temperature range of -40°C to 95°C, will enter into a low power "sleep mode" in the absence of any optical data and exit "sleep mode" with the presence of an optical signal on the fiber network. With an optical budget of 8dB over the MOST specification, Firecomms' MOST FOT can be targeted to higher temperature performance. This enables Firecomms' customers to use extra inline connectors and develop more efficient car harnesses.

www.firecomms.com

MOST Optical Connector with 3.3 Voltage Operation

Hosiden has developed a MOST optical connector that operates with low voltage, 3.3 Volts compared to existing 5 Volts operation type. The current consumption at sleep mode is only 7.5 microamperes or less. Furthermore, the original light guide result in low loss and very stable optical characteristics. The micro pigtailed contain original light guides formed by injection molding in order to achieve high optical stability. Moreover, optimized spherical ends of the light guides provide low optical loss. In addition to the 2+0 normal type, 2+0 shutter type and 2+4 type are available. The 2+0 shutter type has a shutter mechanism in the opening face so that the usual dust cap is eliminated. Consequently dust is avoided and total production costs are reduced by



simplifying examination processes with quick plugging and no caps getting lost. The wastes are reduced as the cap does not need to be disposed after the product is placed. Furthermore, Hosiden has developed the industry's first micro pigtail of 2+4 type providing a very small PC board occupation. In adopting the same light guide similar superior optical characteristics as 2+0 types are achieved. 2+12 and 2+20 types can be developed correspondingly. All of the above products are provided as

5V type and 3.3V type. Low power consumption (max 40 mA/operating mode, max 7.5 μ A/sleep mode) and wide operating temperature range (-40°C to 105°C) are featured.

www.hosiden.com

MOST Communication Modules on PXI and USB Basis



GOEPEL electronic introduces brand new MOST communication modules for ECUs in PXI and USB form factors with full compliance to the current MOST specification. The new modules

are the PXI card 3060 and a USB stand-alone controller named basicMOST 3060. PXI 3060 and basicMOST 3060 are designed for communication applications in general test and measurement technologies, in particular for vehicle control units. Based on the new MOST IC INIC OS81050 the modules are configurable as Master and Slave. The new controllers guarantee sending/receiving on the control channel and packet channel as well as the read-out of all data

(monitoring) in the MOST network. In addition to several specific functions, in particular on-board diagnostic plays an important part. Furthermore, the controller is able to send/receive application protocols, data packages and control messages. Trigger inputs and outputs are provided by means of the front connector. Additionally, PXI 3060 and basicMOST 3060 have analog inputs and outputs.

www.goepel.com

MOST Newsticker

Car Communication Observation via Datalogger CCO DLIII

The Condalo datalogger CCO DLIII with a MOST interface is available and has been designed to meet the specific conditions of the automotive world. The modular design of the datalogger allows to adjust the type and number of interfaces to the respective requirements. It is suitable for use in any phase of the development process up to the supervision of volume production. The device during the measurement losslessly and simultaneously stores all signals for later analysis and processing of data in order to execute the large number of necessary tests without changing the tools.

www.condalo.com

MOST Compliance Pre-Tests Free of Charge

Timely testing means more planning security for development projects. Now

customers can already get a good overview of the quality of their MOST control units at an early development stage with a Pre-test which RUETZ SYSTEM SOLUTION offers free of charge. This offer of a free Pre-Test is valid in conjunction with ordering an official MOST Compliance Tests.

www.ruetz-system-solutions.com

MOST Receptacle



Alps offers the MOST connector FLTM1G001A which meets the MOST standard 1.1. The micro pigtail receptacle of 2+0 type allows a frequency of 48 kHz and operates at 5 V.

www.alps.com

Gateway for iPod, AUX and USB

Dension listed a new version of the Gateway 500 iPod/USB/auxiliary audio interface that enables retention of



the OEM CD changer in a wide range of MOST vehicles (Audi, BMW, Mercedes Benz, Porsche, Saab). Dension Gateway 500 allows CE and IT device integration for advanced integration of e.g. email, IP telephony and mobile entertainment.

www.dension.com

MOST iPod Interface

The NAV-TV OPi - series iPod Interface connects, controls, charges, and plays an iPod through the factory stereo system of vehicles utilizing MOST fiber optic technology. It also adds optional auxiliary input to connect any standard portable stereo device plus iPod connection. Current supported vehicles are late model Mercedes, Porsche and Audi.

www.navtv.com

MOST Inside

Hyundai & Kia Select MOST Infotainment Network for First Vehicle Models



Hyundai Motor Company and Kia Motors Corporation have selected MOST infotainment networking solution for the Hyundai Genesis Sedan and Kia Mohave sports utility vehicle. It is expected that each of the Asian automotive partners will roll out



the technology in additional models next year. MOST has the potential to become a de facto industry standard for high bandwidth multimedia networking in the Asia region, as it has in the European automotive market.

MOST50 and Electrical Physical Layer Moving onto the Road in Japan – Shipment of MOST50 to Toyota Suppliers



Interface controllers for the 50 Mbps MOST network technology were shipped to Toyota Motor Corporation's suppliers. MOST50 uses a double density coding scheme to double the bandwidth over the first generation while maintaining the same physical transmission frequency. While MOST25 was optimized for signal transmission

over Polymer Optical Fiber (POF), the new generation also features an electrical Physical Layer. Signal transmission can be realized over Shielded Twisted Pair (STP) copper cables and even over unshielded Twisted Pair (UTP) copper cables in the harsh environment of a vehicle. The electrical Physical Layer has been verified by several carmakers. This represents a noteworthy achievement as typical car networks like CAN run up to 1 Mbps over copper cables, FlexRay recently launched a 10 Mbps solution and MOST runs 50 Mbps. The option to use MOST with copper cables allows carmakers to continue to use their conventional wire harness and established manufacturing processes.

MOST Networking Solution Adopted in Audi A4 Model



MOST network has been selected as part of the infotainment system by Audi for its A4 model. The MOST Technology is already the in-car network across the A8, A6, A5 and Audi Q7 vehicle lines.

Volvo V70 & C70 Platforms Implement MOST

MOST oPHY networking technology has been selected as part of the infotainment system by Volvo for its V70 and C70 platforms. Volvo being a



early adopter of the MOST Technology has now broadly implemented MOST across its portfolio.



About MOST Cooperation

MOST (Media Oriented Systems Transport) is a multimedia networking technology optimized for (but not restricted to) use in cars. It enables transport of high quality of service audio and video together with packet data and real-time control over a single transmission medium. MOST offers transmission over Plastic Optical Fiber and Unshielded Twisted Pair copper physical layers under automotive conditions. MOST to date is used in over 55 car models and represents the communication backbone for their information and entertainment equipment. The MOST Cooperation is the organization through which MOST Technology is standardized and refined so that it continues to stay abreast of the latest industry requirements. Today it consists of 16 international carmakers and more than 75 key component suppliers. The MOST Cooperation is prepared to embrace efforts to further develop and standardize the technology for other industries. The MOST Cooperation was founded in 1998 to standardize MOST Technology as a global standard for multimedia networking. Audi, BMW, Daimler, Harman/Becker and SMSC as core partners form its Steering Committee.

Upcoming Events

10th Annual All Members Meeting in Frankfurt on March 11th, 2008

The partners and members of the MOST Cooperation will meet in Frankfurt for the annual All Members Meeting on March 11th, 2008. As the collaboration established to standardize and further develop MOST Technology celebrates its tenth anniversary, representatives of the partners Audi, BMW, Daimler, Harman/Becker and SMSC and all other member companies will get together to take stock of the progress so far and to outline the roadmap for 2008.

First International MOST Conference in September 2008

At this public MOST congress the MOST Cooperation participates as knowledge partner to guarantee highest overall quality of the conference. In addition the cooperation will join as exhibitor and moderator opening the presentation and workshop sessions.

Convergence – Electronics Transportation Conference 2008 in Detroit, USA, on October 20th to 22nd, 2008

The MOST Cooperation will be showing its latest technology highlights and achievements at the Convergence Exhibition from October 20th to 22nd, 2008, in Detroit, Michigan (USA). Please visit us at Booth 913 at this important event of the international automotive and transportation electronics community.

2008 Asia Interconnectivity Conference in Korea in November 2008

The MOST Cooperation will be hosting the ninth Asia Interconnectivity Conference (formerly Japan Interconnectivity Conference) in Korea.

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