

# LVDS SERDES Transmitter/Receiver (ALTLVDS\_TX and ALTLVDS\_RX) Megafunctions

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You can configure the features of the low-voltage differential signaling serializer or deserializer (LVDS SERDES) megafunctions—ALTLVDS\_TX and ALTLVDS\_RX through the MegaWizard™ Plug-In Manager in the Quartus® II software. The ALTLVDS\_TX and ALTLVDS\_RX megafunctions implement the LVDS SERDES interfaces to transmit and receive high-speed differential data.

## Features

The following table lists the features of the ALTLVDS\_TX and ALTLVDS\_RX megafunctions.

Table 1: ALTLVDS\_TX and ALTLVDS\_RX Features

Feature	Supported devices
<b>ALTLVDS_TX and ALTLVDS_RX</b>	
Parameterizable data channel widths	All devices stated in the <a href="#">Device Support</a> section.
Parameterizable serializer/deserializer (SERDES) factors	All devices stated in the <a href="#">Device Support</a> section.
Registered input and output ports	All devices stated in the <a href="#">Device Support</a> section.
Support for external phase-locked loops (PLL)	All devices stated in the <a href="#">Device Support</a> section.
PLLs sharing between transmitters and receivers	All devices stated in the <a href="#">Device Support</a> section.
PLL control signals	All devices stated in the <a href="#">Device Support</a> section.
Choice to implement the LVDS interface in dedicated circuitry or logic cells	All devices stated in the <a href="#">Device Support</a> section excluding Arria® V, Arria V GX, Cyclone® series, and Stratix® V.
<b>ALTLVDS_RX Only</b>	
Dynamic phase alignment (DPA) mode support	All devices stated in the <a href="#">Device Support</a> section excluding Cyclone series.
DPA PLL calibration support	All devices stated in the <a href="#">Device Support</a> section excluding Arria II GX, Cyclone series, HardCopy® III, Stratix, Stratix GX, Stratix II, and Stratix II GX.
Soft clock data recovery (CDR) mode support	Arria II GX, Arria II GX, Arria V, Arria V GX, HardCopy III, HardCopy IV, Stratix III, Stratix IV, and Stratix V devices.

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# Megafunction User Guide

**Findlay Shearer**

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## Megafunction User Guide:

### Implementation of a CAN Bus based Measurement System on an FPGA Development Kit Yu Zhu,2010-07-05

Inhaltsangabe Abstract The Controller Area Network CAN is a serial field bus protocol which was originally used in road vehicles Most people still use Microcontrollers MCU to control the CAN bus The development of Field programmable Gate Array FPGA is very advanced and compared to the MCU the FPGA has many advantages For this reason this thesis uses an Altera FPGA development kit to design a CAN bus based measurement system During the work four Direct Digital Synthesizers DDS were simulated for four wave channels in the FPGA All signals of the channels were transmitted from the FPGA to a CAN bus Between the CAN bus and FPGA an Atmel CAN MCU which contains both serial and CAN ports was used as the third party Whereby the data output from the FPGA were first transmitted to the serial port of the CAN MCU and then shifted to the CAN port of the CAN MCU The CAN bus device NI CAN USB 8473 which was used in this thesis has a CAN port to connect to the CAN port of the CAN MCU and a USB 2.0 port to connect to a PC Finally the data of the CAN bus was monitored on the PC with the LabVIEW platform With this platform the data could also be transmitted to the CAN bus and then to the FPGA to change the tuning word of DDS In order to achieve the speed limit of the complete measurement system the communication rates of FPGA CAN bus and CAN MCU were programmed to be the maximum Inhaltsverzeichnis Table of Contents 1 Introduction 4 1.1 Background 4 1.2 Objective 4 1.3 Outline 6 2 CAN Introduction 7 2.1 Background 7 2.2 Architecture Layers 8 2.2.1 Physical Layer 8 2.2.2 Data Link Layer 10 2.2.3 Higher Layer 10 2.3 Frame Structure 11 2.3.1 Data Frame 11 2.3.2 Remote Frame 14 2.3.3 Error Frame 15 2.3.4 Overload Frame 16 2.3.5 Interframe Space 16 2.4 Frame Coding 17 2.5 Error Detecting and Handling 18 2.6 Fault Confinement 19 3 CAN and MCU Serial Port Effective Data Study 22 3.1 CAN Effective Data Study 22 3.2 MCU Serial Port Study 25 3.2.1 General 8051 MCU 25 3.2.2 Using Timer 227 3.2.3 X2 Mode 28 3.3 CAN vs MCU Serial Port 29 4 Experiment Components and Setup 32 4.1 Stratix III FPGA Development Kit 32 4.2 CAN MCU AT89C51CC0335 4.35 3.3 V Voltage Level Transistor 38 4.4 NI CAN USB 8473 40 4.5 PC with NI CAN Driver 42 4.6 Setup 42

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Systems Changyi Gu,2016-05-26 Develop the software and hardware you never think about We're talking about the nitty gritty behind the buttons on your microwave inside your thermostat inside the keyboard used to type this description and even running the monitor on which you are reading it now Such stuff is termed embedded systems and this book shows how to design and develop embedded systems at a professional level Because yes many people quietly make a successful career doing just that Building embedded systems can be both fun and intimidating Putting together an embedded system requires skill sets from multiple engineering disciplines from software and hardware in particular Building Embedded Systems is a book about helping you do things in the right way from the beginning of your first project Programmers who know software

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Chu,2011-08-29 The book is divided into four major parts Part I covers HDL constructs and synthesis of basic digital circuits Part II provides an overview of embedded software development with the emphasis on low level I O access and drivers Part III demonstrates the design and development of hardware and software for several complex I O peripherals including PS2 keyboard and mouse a graphic video controller an audio codec and an SD secure digital card Part IV provides three case studies of the integration of hardware accelerators including a custom GCD greatest common divisor circuit a Mandelbrot set fractal circuit and an audio synthesizer based on DDFS direct digital frequency synthesis methodology The book utilizes FPGA devices Nios II soft core processor and development platform from Altera Co which is one of the two main FPGA manufactures Altera has a generous university program that provides free software and discounted prototyping boards for educational institutions details at [www.altera.com/university](http://www.altera.com/university) The two main educational prototyping boards are known as DE1 99 and DE2 269 All experiments can be implemented and tested with these boards A board combined with this book becomes a turn key solution for the SoPC design experiments and projects Most HDL and C codes in the book are device independent and can be adapted by other prototyping boards as long as a board has similar I O configuration

**EDN ,2009** **Digital Signal Processing with Field Programmable Gate Arrays** Uwe Meyer-Baese,2004 Field Programmable Gate Arrays FPGAs are revolutionizing digital signal processing as novel FPGA families are replacing ASICs and PDSPs for front end digital signal processing algorithms So the efficient implementation of these algorithms is critical and is the main goal of this book It starts with an overview of today s FPGA technology devices and tools for designing state of the art DSP systems A

case study in the first chapter is the basis for more than 30 design examples throughout The following chapters deal with computer arithmetic concepts theory and the implementation of FIR and IIR filters multirate digital signal processing systems DFT and FFT algorithms and advanced algorithms with high future potential Each chapter contains exercises The VERILOG source code and a glossary are given in the appendices while the accompanying CD ROM contains the examples in VHDL and Verilog code as well as the newest Altera Baseline software This edition has a new chapter on adaptive filters new sections on division and floating point arithmetics an up date to the current Altera software and some new exercises

**Hacker's Guide to Project Management** Andrew Johnston, 2004-02-18 Managing a software development project is a complex process There are lots of deliverables to produce standards and procedures to observe plans and budgets to meet and different people to manage Project management doesn't just start and end with designing and building the system Once you've specified designed and built or bought the system it still needs to be properly tested documented and settled into the live environment This can seem like a maze to the inexperienced project manager or even to the experienced project manager unused to a particular environment A Hacker's Guide to Project Management acts as a guide through this maze It's aimed specifically at those managing a project or leading a team for the first time but it will also help more experienced managers who are either new to software development or dealing with a new part of the software life cycle This book describes the process of software development how projects can fail and how to avoid those failures outlines the key skills of a good project manager and provides practical advice on how to gain and deploy those skills takes the reader step by step through the main stages of the project explaining what must be done and what must be avoided at each stage suggests what to do if things start to go wrong The book will also be useful to designers and architects describing important design techniques and discussing the important discipline of Software Architecture This new edition has been fully revised and updated to reflect current best practices in software development includes a range of different life cycle models and new design techniques now uses the Unified Modelling Language throughout

**OpenGL Programming Guide** Dave Shreiner, Graham Sellers, John Kessenich, Bill Licea-Kane, 2013-03-19 Includes Complete Coverage of the OpenGL Shading Language Today's OpenGL software interface enables programmers to produce extraordinarily high quality computer generated images and interactive applications using 2D and 3D objects color images and programmable shaders OpenGL Programming Guide The Official Guide to Learning OpenGL Version 4.3 Eighth Edition has been almost completely rewritten and provides definitive comprehensive information on OpenGL and the OpenGL Shading Language This edition of the best selling Red Book describes the features through OpenGL version 4.3 It also includes updated information and techniques formerly covered in OpenGL Shading Language the Orange Book For the first time this guide completely integrates shader techniques alongside classic functioncentric techniques Extensive new text and code are presented demonstrating the latest in OpenGL programming techniques OpenGL Programming Guide Eighth Edition provides clear explanations of OpenGL

functionality and techniques including processing geometric objects with vertex tessellation and geometry shaders using geometric transformations and viewing matrices working with pixels and texture maps through fragment shaders and advanced data techniques using framebuffer objects and compute shaders New OpenGL features covered in this edition include Best practices and sample code for taking full advantage of shaders and the entire shading pipeline including geometry and tessellation shaders Integration of general computation into the rendering pipeline via compute shaders Techniques for binding multiple shader programs at once during application execution Latest GLSL features for doing advanced shading techniques Additional new techniques for optimizing graphics program performance

*Selected Papers of the International Workshop on Smalltalk Technologies* Michael Haupt, 2010 The goal of the IWST workshop series is to create and foster a forum around advancements of or experience in Smalltalk The workshop welcomes contributions to all aspects theoretical as well as practical of Smalltalk related topics

*A Hacker's Guide to Project Management* Andrew K. Johnston, 1995 This practical guide for all project managers is packed with examples hints and tips It will enable managers to manage and build better systems on time and within budget The book contains many Q A sessions which indicate common questions and answers found by experienced project managers

**A Designer's Guide to VHDL Synthesis** Douglas E. Ott, Thomas J. Wilderotter, 2013-12-19 A Designer's Guide to VHDL Synthesis is intended for both design engineers who want to use VHDL based logic synthesis ASICs and for managers who need to gain a practical understanding of the issues involved in using this technology The emphasis is placed more on practical applications of VHDL and synthesis based on actual experiences rather than on a more theoretical approach to the language VHDL and logic synthesis tools provide very powerful capabilities for ASIC design but are also very complex and represent a radical departure from traditional design methods This situation has made it difficult to get started in using this technology for both designers and management since a major learning effort and culture change is required A Designer's Guide to VHDL Synthesis has been written to help design engineers and other professionals successfully make the transition to a design methodology based on VHDL and logic synthesis instead of the more traditional schematic based approach While there are a number of texts on the VHDL language and its use in simulation little has been written from a designer's viewpoint on how to use VHDL and logic synthesis to design real ASIC systems The material in this book is based on experience gained in successfully using these techniques for ASIC design and relies heavily on realistic examples to demonstrate the principles involved

IEEE Workshop on Signal Processing Systems, 1997

*Rapid Prototyping of Digital Systems* James O. Hamblen, Michael D. Furman, 2007-05-08 Rapid Prototyping of Digital Systems Second Edition provides an exciting and challenging laboratory component for an undergraduate digital logic design class The more advanced topics and exercises are also appropriate for consideration at schools that have an upper level course in digital logic or programmable logic Design engineers working in industry will also want to consider this book for a rapid introduction to FPLD technology and logic synthesis using commercial CAD tools especially if they have not

had previous experience with the new and rapidly evolving technology Two tutorials on the Altera CAD tool environment an overview of programmable logic and a design library with several easy to use input and output functions were developed for this book to help the reader get started quickly Early design examples use schematic capture and library components VHDL is used for more complex designs after a short introduction to VHDL based synthesis A coupon is included with the text for purchase of the new UP 1X board The additional logic and memory in the UP 1X s FLEX 10K70 is useful on larger design projects such as computers and video games The second edition includes an update chapter on programmable logic new robot sensors and projects optional Verilog examples and a meta assembler which can be used to develop assemble language programs for the computer designs in Chapters 8 and 13 [Complete Guide to RS232 and Parallel Connections](#) Martin D. Seyer, 1988 Computer Systems Organization Computer Communication Networks **Failure Analysis** Marius Bazu, Titu Bajanescu, 2011-03-08 Failure analysis is the preferred method to investigate product or process reliability and to ensure optimum performance of electrical components and systems The physics of failure approach is the only internationally accepted solution for continuously improving the reliability of materials devices and processes The models have been developed from the physical and chemical phenomena that are responsible for degradation or failure of electronic components and materials and now replace popular distribution models for failure mechanisms such as Weibull or lognormal Reliability engineers need practical orientation around the complex procedures involved in failure analysis This guide acts as a tool for all advanced techniques their benefits and vital aspects of their use in a reliability programme Using twelve complex case studies the authors explain why failure analysis should be used with electronic components when implementation is appropriate and methods for its successful use Inside you will find detailed coverage on a synergistic approach to failure modes and mechanisms along with reliability physics and the failure analysis of materials emphasizing the vital importance of cooperation between a product development team involved the reasons why failure analysis is an important tool for improving yield and reliability by corrective actions the design stage highlighting the concurrent engineering approach and DfR Design for Reliability failure analysis during fabrication covering reliability monitoring process monitors and package reliability reliability resting after fabrication including reliability assessment at this stage and corrective actions a large variety of methods such as electrical methods thermal methods optical methods electron microscopy mechanical methods X Ray methods spectroscopic acoustical and laser methods new challenges in reliability testing such as its use in microsystems and nanostructures This practical yet comprehensive reference is useful for manufacturers and engineers involved in the design fabrication and testing of electronic components devices ICs and electronic systems as well as for users of components in complex systems wanting to discover the roots of the reliability flaws for their products *PC Mag*, 1985-12-24 PCMag com is a leading authority on technology delivering Labs based independent reviews of the latest products and services Our expert industry analysis and practical solutions help you make

better buying decisions and get more from technology      *Motorboating* - ND ,1983-07      PC Magazine ,1986      **PC** ,1986

**Power Management in Mobile Devices** Findlay Shearer,2011-04-01 Sealed Lead Acid Nickel Cadmium Lithium Ion  
How do you balance battery life with performance and cost This book shows you how Now that mobile has become the standard the consumer not only expects mobility but demands power longevity in wireless devices As more and more features computing power and memory are packed into mobile devices such as iPods cell phones and cameras there is a large and growing gap between what devices can do and the amount of energy engineers can deliver In fact the main limiting factor in many portable designs is not hardware or software but instead how much power can be delivered to the device This book describes various design approaches to reduce the amount of power a circuit consumes and techniques to effectively manage the available power Power Management Advice On Low Power Packaging Techniques Power and Clock Gating Energy Efficient Compilers Various Display Technologies Linear vs Switched Regulators Software Techniques and Intelligent Algorithms Addresses power versus performance that each newly developed mobile device faces Robust case studies drawn from the author s 30 plus years of extensive real world experience are included Both hardware and software are discussed concerning their roles in power      *Motorboating* - ND ,1984-01



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