

LMH0341, LMH0041, LMH0071, LMH0051 3G, HD, SD, DVB-ASI SDI Deserializer with Loophrough and LVDS Interface

General Description

The LMH0041 family of products provide a very simple 1:5 deserializer and receiver function. The device is intended to be paired with an FPGA host which will receive the raw 5 bit data words and will decode the data appropriately such that a SMPTE standard signal may be recovered. The devices are designed to receive data compliant with DVB-ASI, SMPTE 259M, SMPTE 292M and/or SMPTE 424M. The interface between the LMH0041 and the FPGA consists of a 5 bit wide LVDS bus, an LVDS clock and an SMBus interface. All devices except for the LMH0051 includes a reclocked feedthrough output with a SMPTE compliant cable driver. The LMH0341 includes support for SMPTE424M, and the LMH0071 is a Standard Definition (SD) only variant. The product is packaged in a physically small 48 pin LLP package.

Key Specifications

- Output compliant with SMPTE 259M-C, SMPTE 292M, SMPTE 424M and DVB-ASI
- Typical power dissipation: 410 mW (loophrough disabled)
- 0.6 UI Input Jitter Tolerance

Features

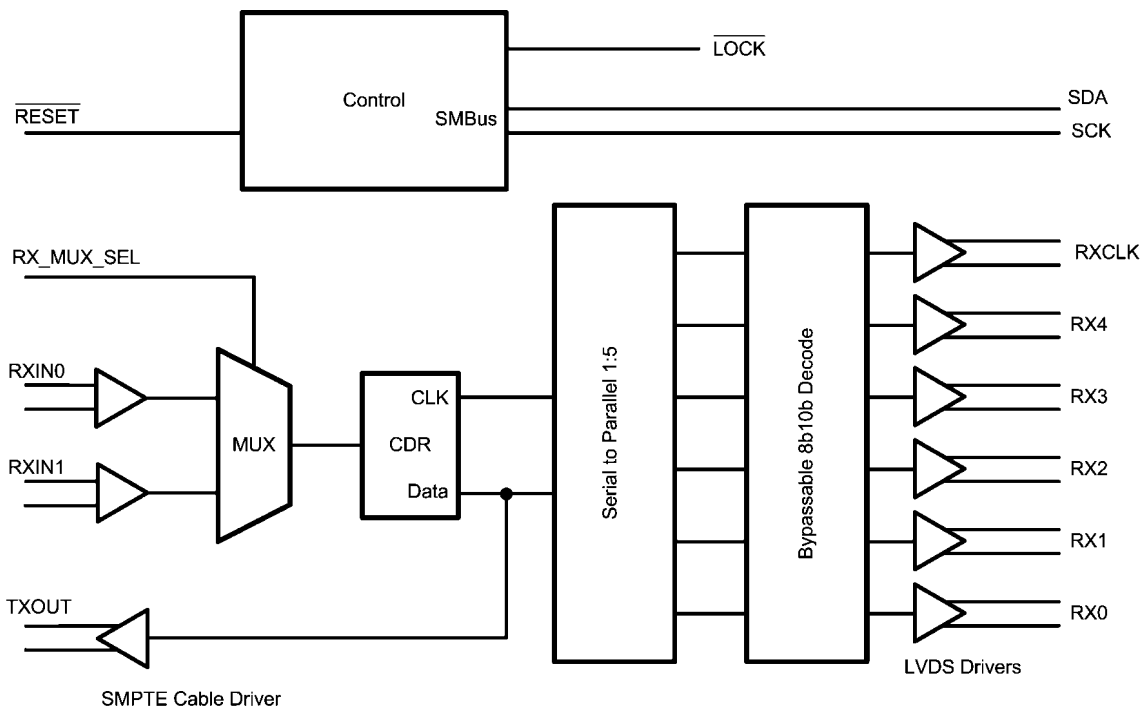
- LVDS Interface
- Dual multiplexed inputs
- No external VCO or clock required
- Loophrough with Cable Driver
- SMBus configuration interface
- 48 pin LLP package

Applications

- SDI interfaces for:
 - Video Cameras
 - DVRs
 - Video Switchers
 - Video Editing Systems

LMH0341, LMH0041, LMH0071, LMH0051 3G, HD, SD, DVB-ASI SDI Deserializer with Loophrough and LVDS Interface

Block Diagram



30017201

TABLE 1. Feature Table

| Device | SMPTE 424M Support | SMPTE 292M Support | SMPTE 259M Support | DVB-ASI Support | Active Loopthrough |
|---------|--------------------|--------------------|--------------------|-----------------|--------------------|
| LMH0341 | x | x | x | x | x |
| LMH0041 | | x | x | x | x |
| LMH0071 | | | x | x | x |
| LMH0051 | | x | x | x | |

Device Operation

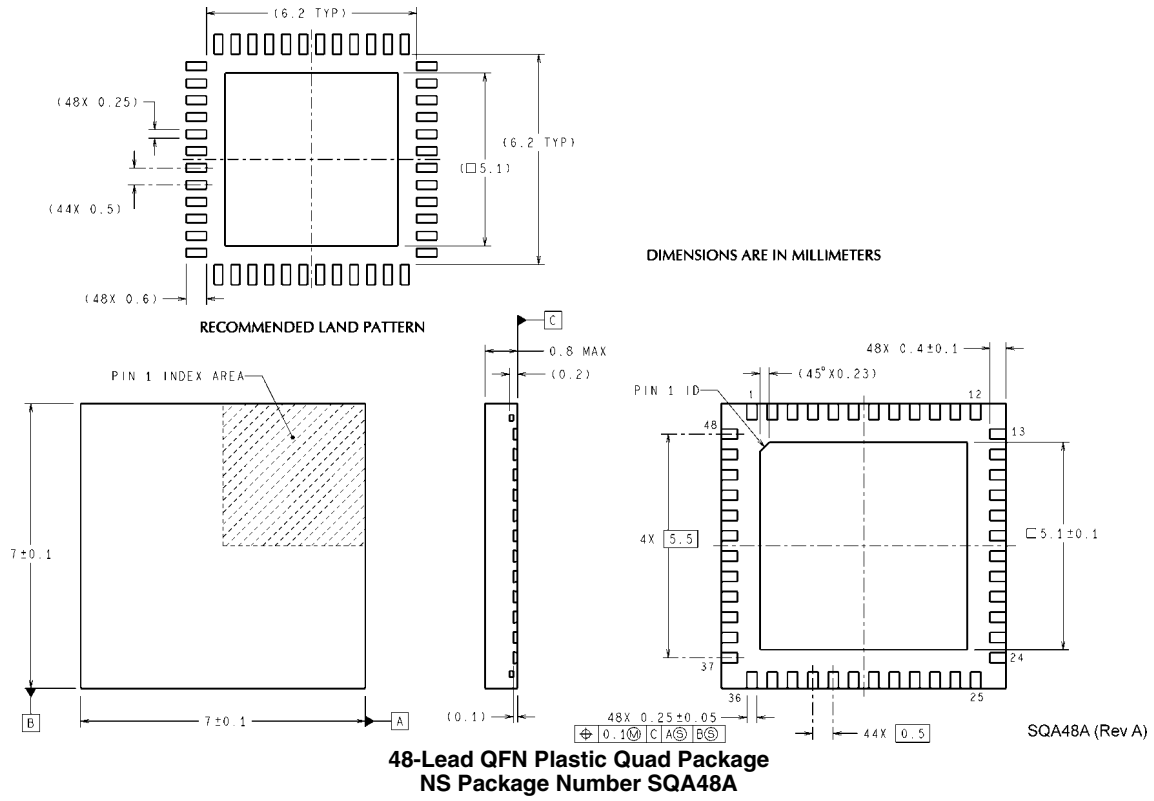
The LMH0041 deserializer is used in digital video signal origination equipment. It is intended to be operated in conjunction with an FPGA host which processes the received data to recover the original parallel data from the five bit wide datapath that comes from the LMH0041. The LMH0041 requires the use of an external equalizer such as the LMH0044, which can be directly connected to the LMH0041.

ternal framer and 8b10b decoder is engaged such that the data appearing on RX0-RX3 will represent a nibble of the decoded 8b10b data. RX4 is an Idle character detect and can be used as an enable to allow the receiver to not write data into a FIFO. RX4 is high if the data being presented on RX0-RX3 represents the idle character. The Most Significant Nibble of data is presented on the rising edge of RXCLK, and the least significant on the falling edge of RXCLK.

DVB-ASI Mode

DVB-ASI mode is enabled when the DVB-ASI pin is brought to a high state. When the DVB-ASI mode is enabled, an in-

Physical Dimensions inches (millimeters) unless otherwise noted



Notes

THE CONTENTS OF THIS DOCUMENT ARE PROVIDED IN CONNECTION WITH NATIONAL SEMICONDUCTOR CORPORATION ("NATIONAL") PRODUCTS. NATIONAL MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS PUBLICATION AND RESERVES THE RIGHT TO MAKE CHANGES TO SPECIFICATIONS AND PRODUCT DESCRIPTIONS AT ANY TIME WITHOUT NOTICE. NO LICENSE, WHETHER EXPRESS, IMPLIED, ARISING BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT.

TESTING AND OTHER QUALITY CONTROLS ARE USED TO THE EXTENT NATIONAL DEEMS NECESSARY TO SUPPORT NATIONAL'S PRODUCT WARRANTY. EXCEPT WHERE MANDATED BY GOVERNMENT REQUIREMENTS, TESTING OF ALL PARAMETERS OF EACH PRODUCT IS NOT NECESSARILY PERFORMED. NATIONAL ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR BUYER PRODUCT DESIGN. BUYERS ARE RESPONSIBLE FOR THEIR PRODUCTS AND APPLICATIONS USING NATIONAL COMPONENTS. PRIOR TO USING OR DISTRIBUTING ANY PRODUCTS THAT INCLUDE NATIONAL COMPONENTS, BUYERS SHOULD PROVIDE ADEQUATE DESIGN, TESTING AND OPERATING SAFEGUARDS.

EXCEPT AS PROVIDED IN NATIONAL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, NATIONAL ASSUMES NO LIABILITY WHATSOEVER, AND NATIONAL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY RELATING TO THE SALE AND/OR USE OF NATIONAL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE CHIEF EXECUTIVE OFFICER AND GENERAL COUNSEL OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

National Semiconductor and the National Semiconductor logo are registered trademarks of National Semiconductor Corporation. All other brand or product names may be trademarks or registered trademarks of their respective holders.

Copyright© 2007 National Semiconductor Corporation

For the most current product information visit us at www.national.com



National Semiconductor Americas Customer Support Center
Email: new.feedback@nsc.com
Tel: 1-800-272-9959

National Semiconductor Europe Customer Support Center
Fax: +49 (0) 180-530-85-86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 69 9508 6208
English Tel: +49 (0) 870 24 0 2171
Français Tel: +33 (0) 1 41 91 8790

National Semiconductor Asia Pacific Customer Support Center
Email: ap.support@nsc.com

National Semiconductor Japan Customer Support Center
Fax: 81-3-5639-7507
Email: jpn.feedback@nsc.com
Tel: 81-3-5639-7560