# INIC-1618
# USB to SATA Bridge
# Specification

**Datasheet**
**Version 1.06**
**Dec. 22, 2010**

# Revision History

| Revision | Date | Comments |
|---|---|---|
| V1.00 | 11/12/2009 | Initial Release |
| V1.01 | 12/22/2009 | 1. Correct 3.3V to 1.2V LDO voltage value.<br>2. Correct ROM and buffer size in block diagram. |
| V1.02 | 02/19/2010 | 1. Support QFN 40pin<br>2. Update DC characteristic |
| V1.03 | 06/04/2010 | Remove Punch type package. |
| V1.04 | 07/02/2010 | Correct pin description for P3.4, P1.7 and P1.3. |
| V1.05 | 12/7/2010 | Correct block diagram. |
| V1.06 | 12/22/2010 | Correct GPIO description |

# Table of Contents


1 Introduction ..... 4
1.1 Feature Summary ..... 4
1.2 Firmware/Software Support ..... 5
1.3 Devices Support ..... 5
2 INIC-1618 Block Diagram ..... 6
3 Pin-Out Diagram ..... 7
3.1 LQFP 48-Pin ..... 7
3.2 QFN 40-Pin ..... 8
4 Pin Signal Description: ..... 9
4.1 48-Pin LQFP Package ..... 9
4.1.1 USB Interface ..... 9
4.1.2 SATA Interface (Analog pins) ..... 9
4.1.3 System Interface ..... 9
4.1.4 NVRAM Interface ..... 9
4.1.5 GPIO Interface ..... 10
4.1.6 Power Regulator pins ..... 10
4.1.7 Power/GND ..... 10
4.2 40-Pin QFN Package ..... 11
4.2.1 USB Interface ..... 11
4.2.2 SATA Interface (Analog pins) ..... 11
4.2.3 System Interface ..... 11
4.2.4 NVRAM Interface ..... 11
4.2.5 GPIO Interface ..... 12
4.2.6 Power Regulator pins ..... 12
4.2.7 Power/GND ..... 12
5 Electrical Information: ..... 13
5.1 Absolute Maximum Ratings ..... 13
5.2 Recommended Operating Conditions ..... 13
5.3 General DC Characteristics ..... 13
5.4 DC Electrical Characteristics for 3.3V Operation ..... 13
5.5 DC Specification for LDO 5V to 3.3V Regulator ..... 14
5.6 DC Electrical Specification for 3.3V to 1.2V Regulator ..... 14
6 Power on Reset Timing Requirement ..... 15
7 Crystal/Oscillator Specification ..... 15
8 Packaging Specification ..... 16

# 1 Introduction

The INIC-1618 provides an advanced solution to connect SATA devices to USB Host with integrated CPU and embedded SRAM/ROM. To provide high performance and cost effective solution, the INIC-1618 integrates USB-PHY, Mass Storage Class Bulk-Only USB function, SATA link/PHY core and microprocessor into a single ASIC. The INIC-1618 provides the data transfer rate of up to 60 MB/sec connecting to a 1.5G SATA interface.

## 1.1 Feature Summary

- Integrates USB2.0 PHY IP core.
- Data transfer rate of up to 60 MB/sec.
- Integrated internal Turbo 8051 uP with 16KB embedded ROM and 4KB SRAM.
- External NVRAM supported.
- Support HID.
- Up to 11 GPIO pins.
- Only one external crystal.
- Supports SATA (bridged SATA) Hard Disk drives, CD-RW devices, DVDs, Removable media devices, BD (Blu-Ray Disc) drive
- USB 1.1 and USB 2.0 compliant.
- USB Mass Storage Class Bulk-Only Transport Specification Compliant.
- SATA specification 1.0, SATA II Compliant (Hot Plug is supported).
- Support ATA/ATAPI device DMA and PIO mode.
- Support SATA BIST through USB and SATA bus
- 4k bytes of data buffer for data transfer.
- Support tri-state on SATA Tx/Rx ports
- On-Chip 3.3V to 1.2V regulator and 5V to 3.3V regulator.
- 48 pin LQFP or 40 pin QFN package

### 1.2 Firmware/Software Support

- USB Mass Storage Class Bulk-Only Transport support
- Provide software utilities for NVRAM upgraded.

### 1.3 Devices Support

- Hard disk drives
- CD-RW devices
- DVDs
- Removable media devices
- Blu-Ray Disk driver

## 2 INIC-1618 Block Diagram

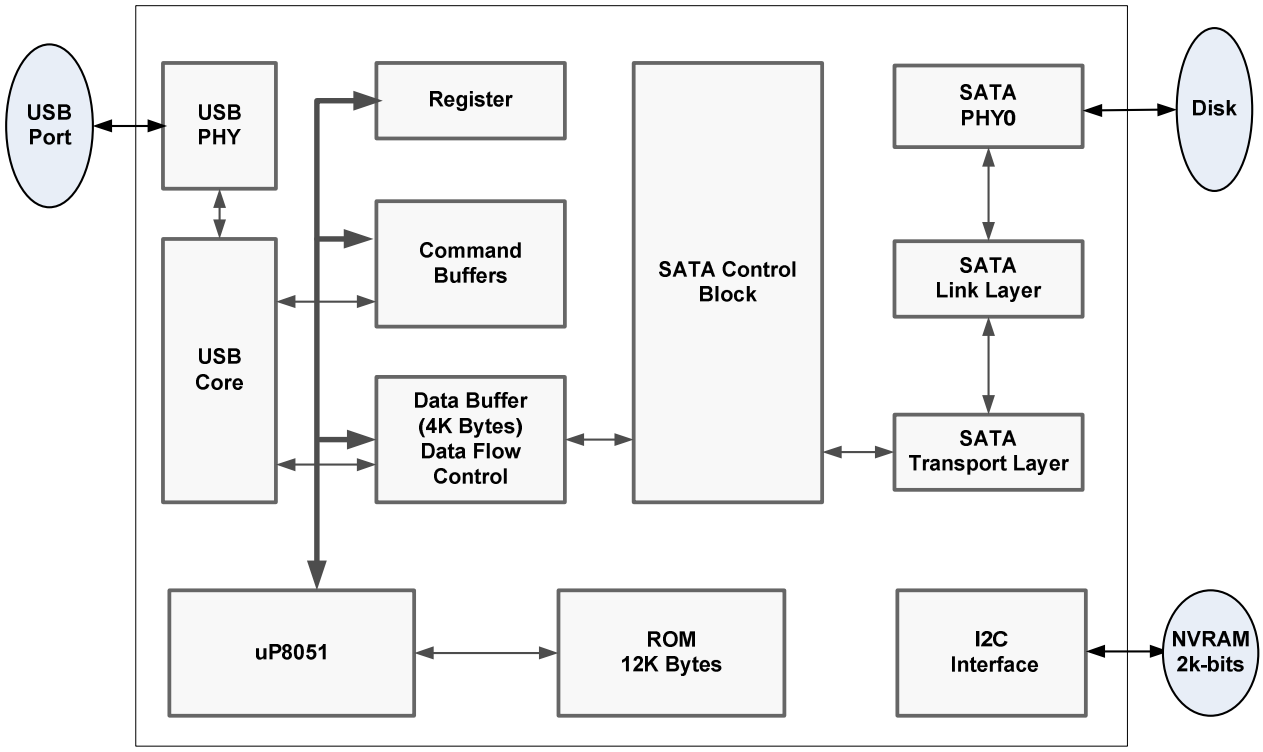
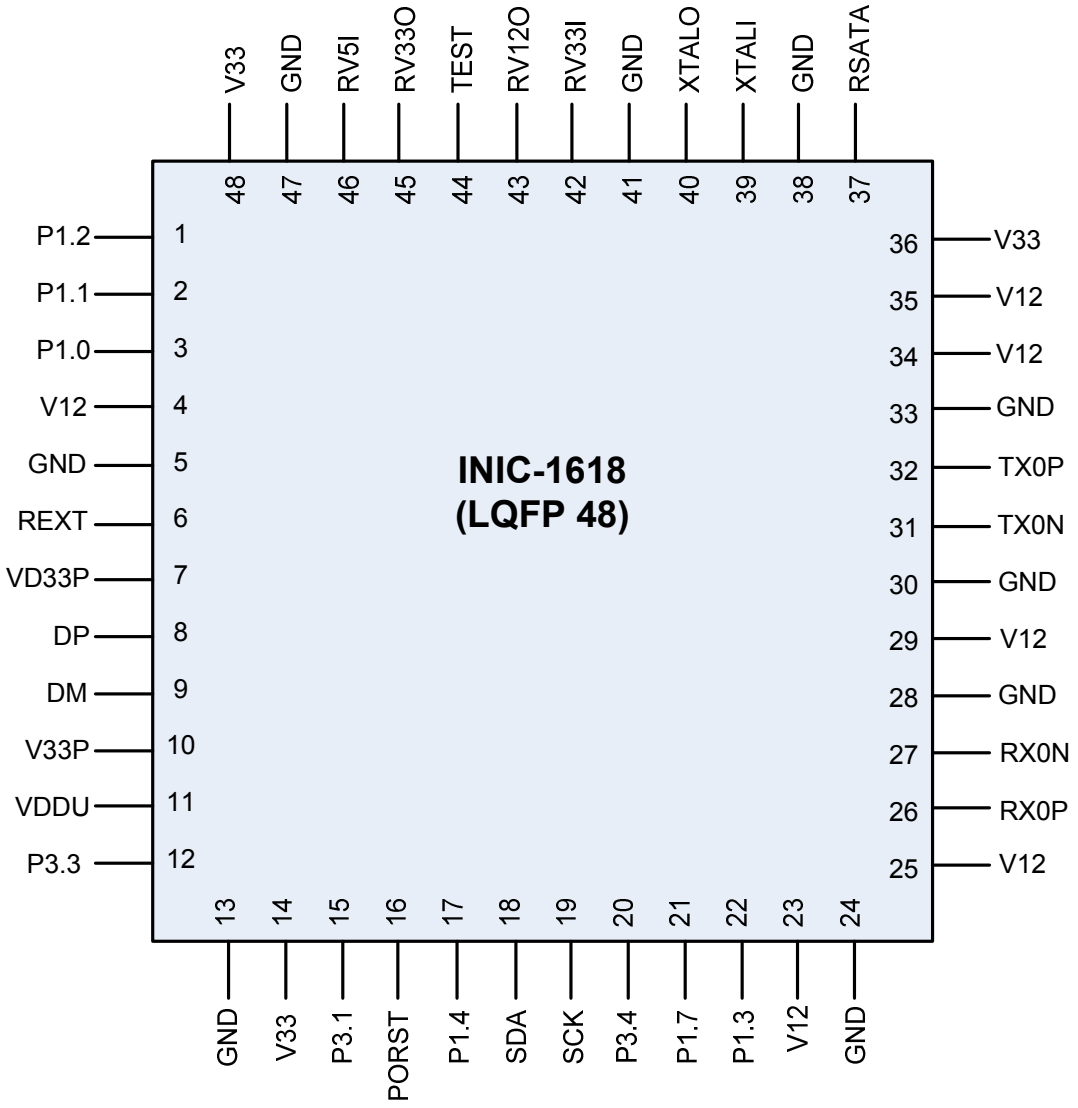


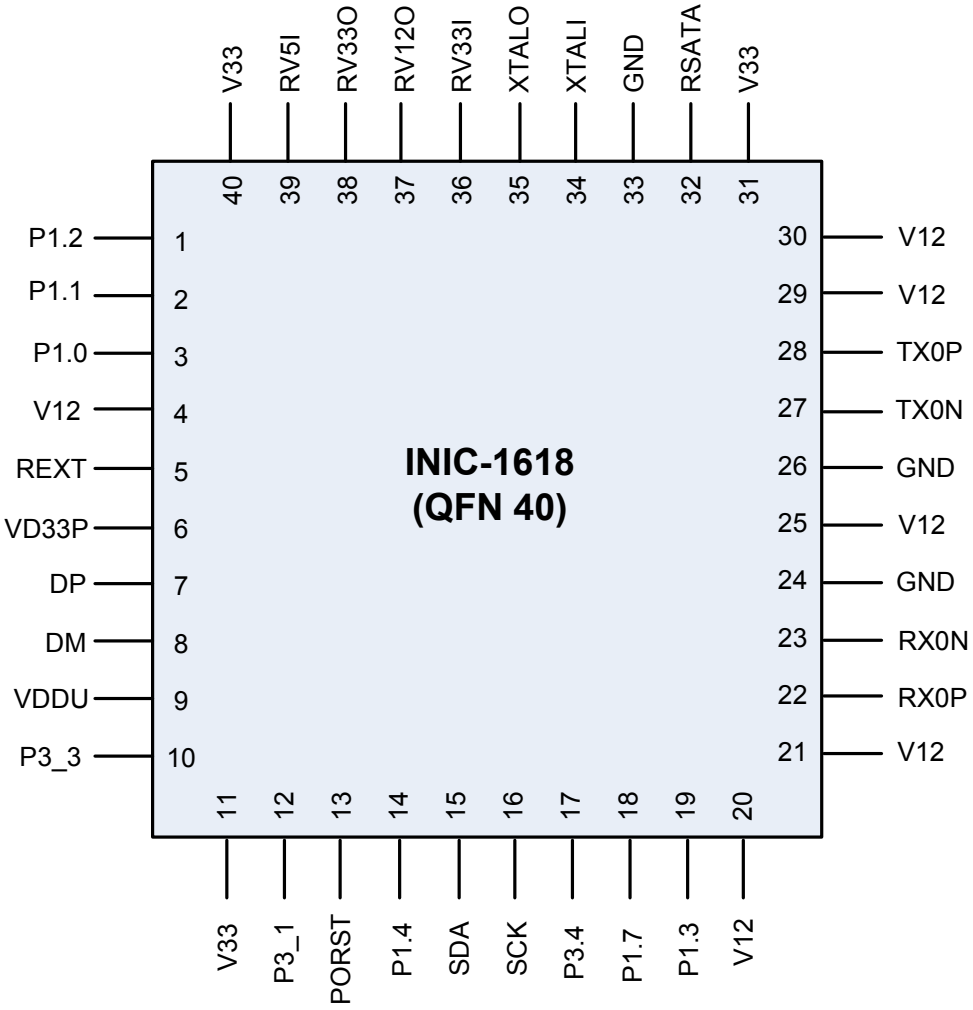

**Figure1: USB to SATA Bridge Block Diagram**

# 3 Pin-Out Diagram

## 3.1 LQFP 48-Pin



### 3.2 QFN 40-Pin


INIC-1618
(QFN 40)
1 P1.2
2 P1.1
3 P1.0
4 V12
5 REXT
6 VD33P
7 DP
8 DM
9 VDDU
10 P3_3
11 V33
12 P3_1
13 PORST
14 P1.4
15 SDA
16 SCK
17 P3.4
18 P1.7
19 P1.3
20 V12
21 V12
22 RX0P
23 RX0N
24 GND
25 V12
26 GND
27 TX0N
28 TX0P
29 V12
30 V12
31 V33
32 RSATA
33 GND
34 XTALI
35 XTALO
36 RV33I
37 RV12O
38 RV33O
39 RV5I
40 V33