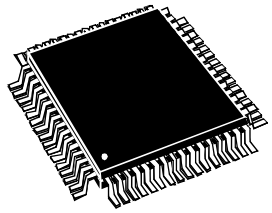
ST7HUB

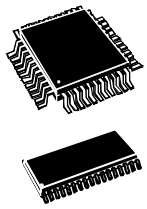
USB 1.1 HUB WITH 2 DOWNSTREAMS, FULL SPEED FUNCTION, 8-BIT MCU, 10-BIT ADC, 3 TIMERS, 2 PWMs

DATA BRIEFING

- **Memories**
  - 32K High Density Flash (HD-Flash) program memory with read/write protection or 16K ROM
  - In-Application Programming (IAP) via USB and In-Circuit programming (ICP) for Flash device
  - 768 bytes RAM memory including up to 176 bytes for USB buffers and up to 256 bytes stack
- **Clock, Reset and Supply Management**
  - Enhanced Reset System (Power On Reset) and Low Voltage Detector (LVD) on some devices
  - PLL for generating 48 MHz USB clock using a 4 MHz crystal
  - Up to 12 MHz internal frequency on ROM device
  - Up to 8 MHz internal frequency on Flash device
  - Clock-out capability
  - 2 Power saving modes
- **USB HUB Function**
  - 3 bus-powered downstream ports (1 connected internally to embedded function)
  - Individual downstream Power Switching
  - Overcurrent Protection for each downstream
  - Supports all USB Standard and HUB commands
  - Integrated 3.3V voltage regulator and transceivers
- **USB Full Speed Function**
  - 7 USB Endpoints:
    - One 8-byte Bidirectional Control Endpoint
    - One 64-byte In Endpoint (Interrupt or Bulk)
    - One 64-byte Out Endpoint (Interrupt or Bulk)
    - Four 8-byte In Endpoints (Interrupt)
  - DMA for Full speed applications compliant with USB specification (v 2.0)
  - Suspend and Resume operations
- **35 I/O Ports**
  - 35 multifunctional bidirectional I/O lines
  - 23 individually selectable external interrupts (3 vectors) with per port programmable sensitivity
  - Pull up resistors in input individually selectable by software



TQFP64 10x10



Subsets in TQFP44 10x10 and SO34

  - 3 ports (20 I/Os) can be individually configured to open drain pull up configuration for PS/2 and keyboard function.
  - 7 high sink outputs (8 mA@0.4 V/ 20 mA@1.3 V)
- **3 Timers**
  - Configurable watchdog timer (8 to 500 ms timeout)
  - 8 bit Time Base Unit (TBU) for generating periodic interrupts, cascadable with ART
  - 8 bit Auto-Reload Timer (ART) with 2 Input Captures, 2 PWM outputs and External Clock Input
- **Analog Peripheral**
  - 10-bit A/D Converter with V_{REF+} and V_{REF-} reference pins
    - 4 high impedance high accuracy channels
    - 12 standard channels
- **1 Communication Interface**
  - Serial Peripheral Interface (SPI)
- **Instruction Set**
  - 8-bit data manipulation
  - 63 basic instructions
  - 17 main addressing modes
  - Nested Interrupts
  - 8 x 8 unsigned multiply instruction
  - True bit manipulation
- **Development Tools**
  - Full hardware/software development package
- **Operating Conditions**
  - 4.0 to 5.25V power supply
  - 0 to 70°C temperature range

Rev. 1.0

1 INTRODUCTION

The ST7HUB is a USB microcontroller based on ST7 core, which is an enhanced industry-standard architecture. The USB module of the ST7HUB is a compound device, consisting of a 3-port HUB and an attached embedded function. To the USB host, the embedded function appears as an attached port of the HUB with its own device address and endpoints.

In addition to the peripherals for USB full speed data transfer and to the HUB, the ST7HUB includes all the necessary features for a gaming peripheral or a multimedia keyboard application.

– 10-bit Analog-to-Digital converter (ADC) with 16 multiplexed analog inputs and external references. 4 of the channels have optimized layout so that external source can have up to 50kΩ impedance
– 8-bit Auto-Reload Timer with 2 input capture functions, 2 PWM outputs and external clock input
– Serial Peripheral Interface
– Low voltage reset ensuring proper power-on or power-off of the device (selectable by option)
– Digital Watchdog

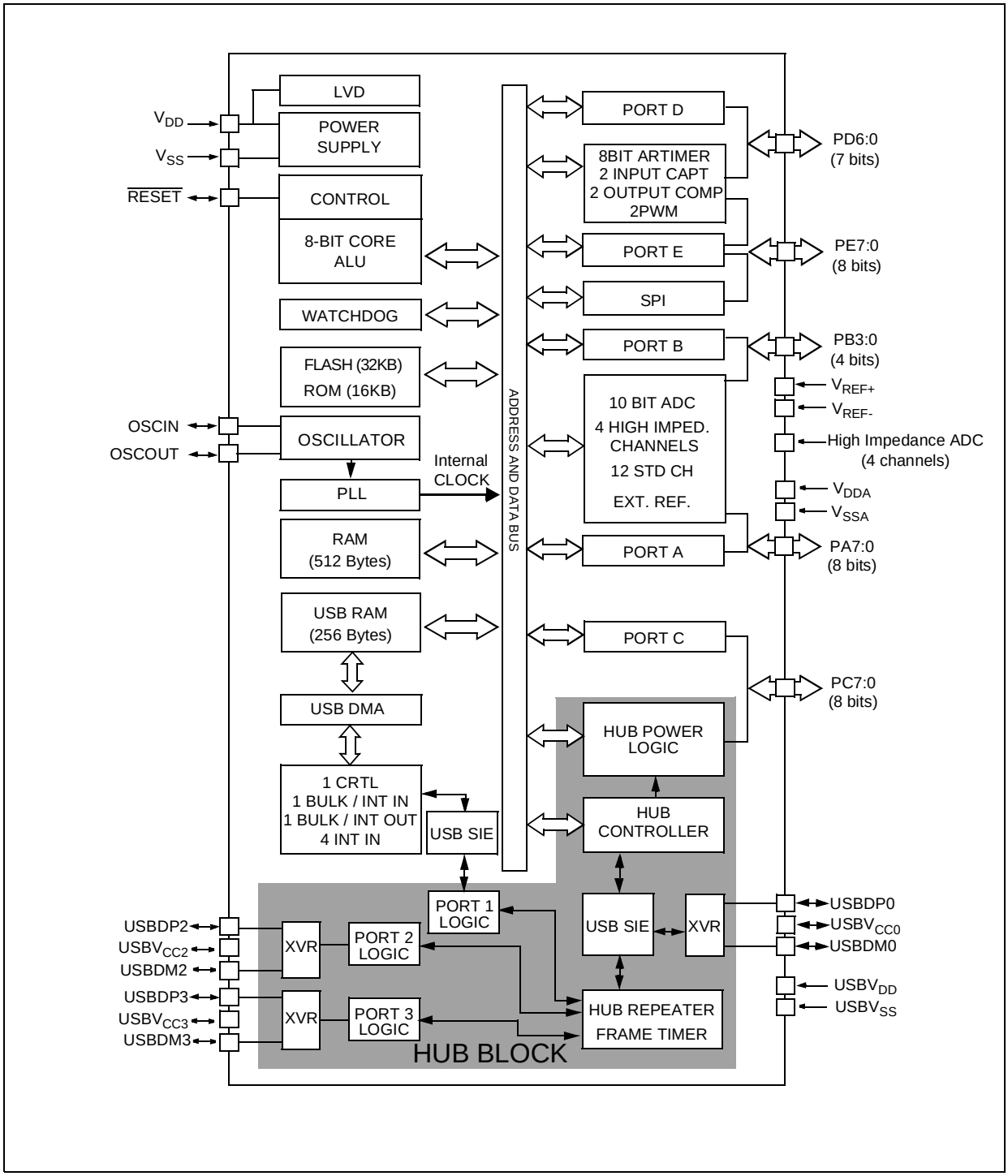
The ST72FHUB devices are the Flash versions of the ST7HUB in a TQFP64 10x10 package.

The ST7HUB devices are the ROM versions in a TQFP64 10x10 package.

The device is also available in TQFP44 and SO34 packages without HUB function.

INTRODUCTION (Cont'd)

Figure 1. General Block Diagram



2 PIN DESCRIPTION

Figure 2. 64-Pin TQFP Package Pinout

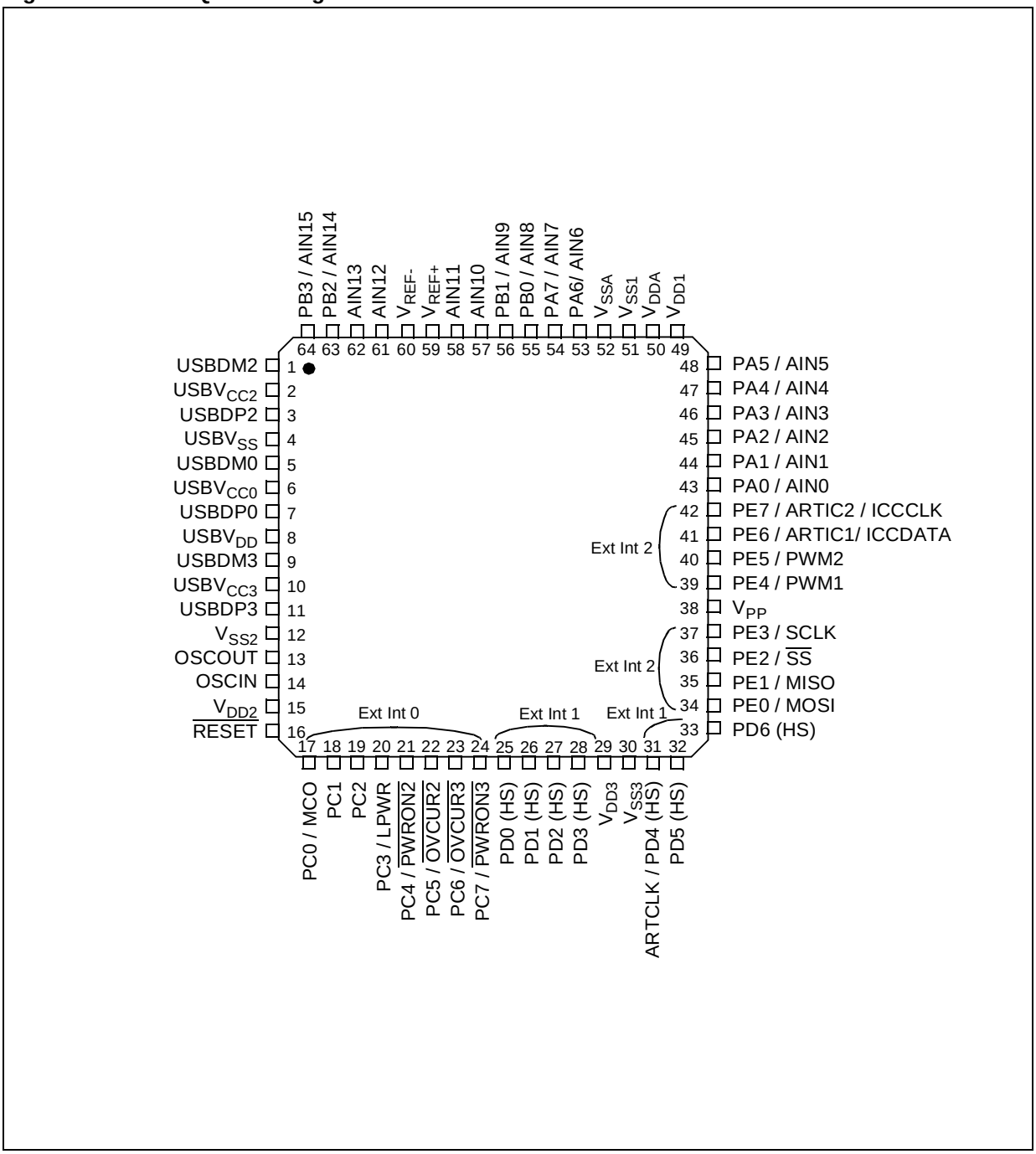
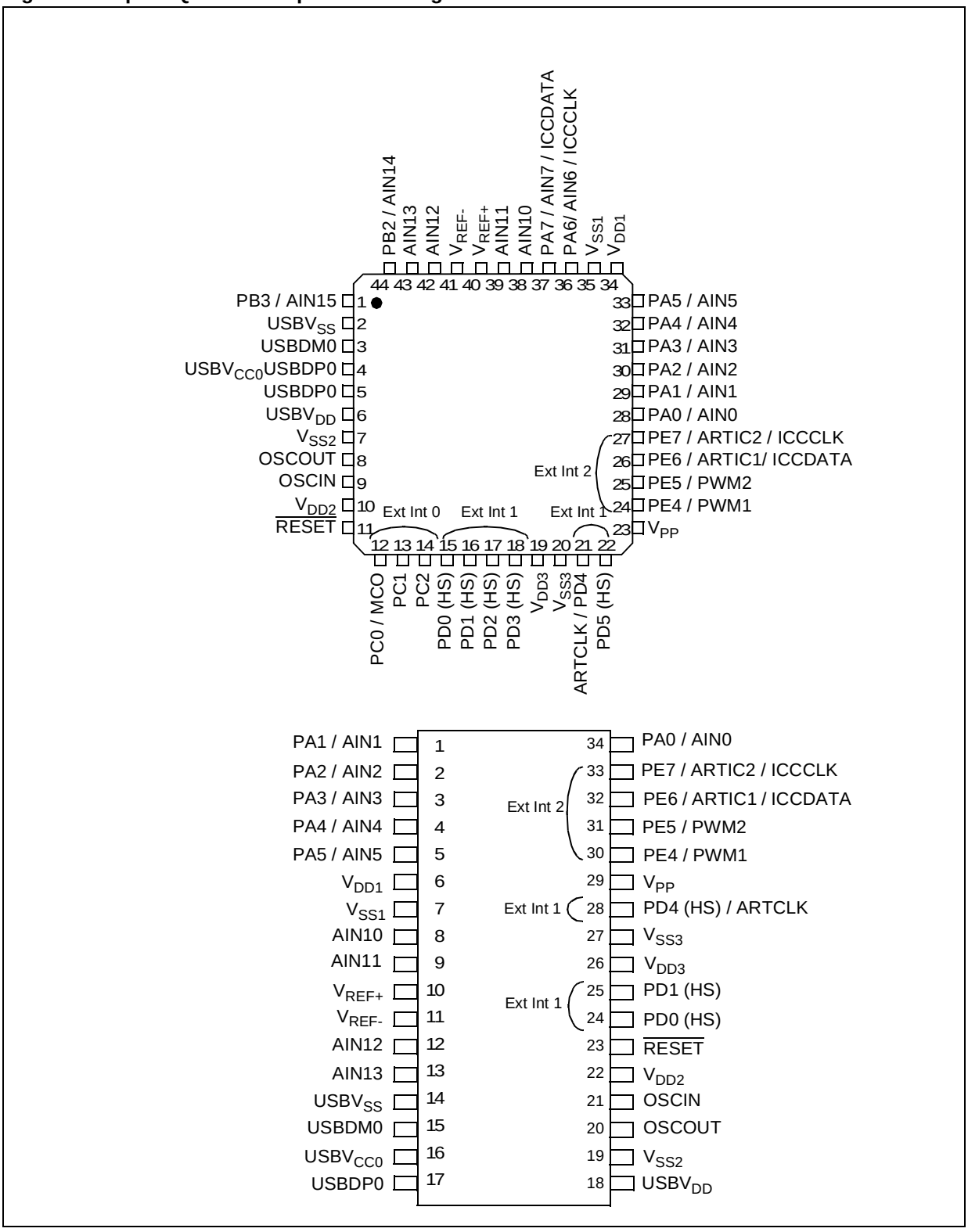


Figure 3. 44-pin TQFP and 34-pin SO Package Pinout



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