



# ISP1763A

## Hi-Speed USB OTG controller

Rev. 02 — 31 March 2010

Data brief

## 1. General description

The ISP1763A is a single-chip Hi-Speed Universal Serial Bus (USB) On-The-Go (OTG) controller integrated with the advanced ST-Ericsson's slave host controller and the ST-Ericsson's ISP1582 peripheral controller.

The Hi-Speed USB host controller and peripheral controller comply with *Universal Serial Bus Specification Rev. 2.0* and support data transfer speeds of up to 480 Mbit/s. The Enhanced Host Controller Interface (EHCI) core implemented in the host controller is adapted from *Enhanced Host Controller Interface Specification for Universal Serial Bus Rev. 1.0*. The OTG controller complies with *On-The-Go Supplement to the USB Specification Rev. 1.3*.

The ISP1763A has two USB ports. Port 1 can be configured to function as a downstream port, an upstream port, or as an OTG port; port 2 is always configured as a downstream port. Port 2 supports Session Request Protocol (SRP) detection from the B-device. The OTG port supports Host Negotiation Protocol (HNP) and SRP as specified in *On-The-Go Supplement to the USB Specification Rev. 1.3*.

The ISP1763A support multiple bus interfaces with 8-bit or 16-bit bus. The ISP1763A can interface to processors with digital I/O voltages of 1.8 V or 3.3 V.

## 2. Features

- Compliant with:
  - ◆ *Universal Serial Bus Specification Rev. 2.0*
  - ◆ *On-The-Go Supplement to the USB Specification Rev. 1.3*
- Small form-factor for portable applications; available in VFQFPN64 and TFBGA64
- Restriction of Hazardous Substances (RoHS) compliant, halogen-free and lead-free packages
- Low power consumption for portable applications
- Host supports data transfer at high-speed (480 Mbit/s), full-speed (12 Mbit/s), and low-speed (1.5 Mbit/s); supports disabling of high-speed mode on each port
- Peripheral supports data transfer at high-speed (480 Mbit/s) and full-speed (12 Mbit/s)
- Integrated Transaction Translator (TT) for Original USB (full-speed and low-speed) support
- Two USB ports:
  - ◆ Port 1: OTG, host, or peripheral port
  - ◆ Port 2: Host port only (supports SRP detection)
- Supports OTG HNP and SRP
- Supports 8-bit or 16-bit CPU bus interface
- Flexibility to interface with various types of processors:

- ◆ NOR Flash interface (multiplexed mode)
- ◆ NAND Flash interface (multiplexed mode)
- ◆ General multiplex interface
- ◆ SRAM interface
- Single configurable interrupt (INT) line for the host controller, peripheral controller, and OTG controller
- Integrated Phase-Locked Loop (PLL) supports external 12 MHz, 19.2 MHz, and 24 MHz crystal, and direct clock source
- Supports remote wake-up from deep sleep mode
- Supports interfacing I/O voltage of 1.8 V or 3.3 V; separate I/O voltage supply pins minimize crosstalk
- Internal voltage regulator supplies 1.2 V to the digital core
- 3.0 V to 3.6 V supply voltage input range for the internal USB transceiver
- Supports hybrid power mode;  $V_{CC}$  is not present,  $V_{CC(I/O)}$  is powered
- Host controller-specific features:
  - ◆ EHCI core is adapted from *Enhanced Host Controller Interface Specification for Universal Serial Bus Rev. 1.0*
  - ◆ Integrated TT for Original USB device support on both the ports
  - ◆ Integrated 24 kB high-speed memory
  - ◆ Power switching and overcurrent reporting on per-port basis
- Peripheral controller-specific features:
  - ◆ Complies with *Universal Serial Bus Specification Rev. 2.0*
  - ◆ Integrated 4 kB memory to support 7 IN endpoints, 7 OUT endpoints, and 1 fixed control IN/OUT endpoint
  - ◆  $V_{BUS}$  detection in deep sleep mode
- OTG controller-specific features:
  - ◆ Supports OTG HNP and SRP using status and control registers for the software implementation in OTG dual-role devices
  - ◆ Integrated  $V_{BUS}$  voltage comparators
  - ◆ Integrated cable (ID) detector
  - ◆ Programmable timers with high resolution (0.01 ms to 80 ms)

## 3. Applications

The ISP1763A can be used to implement a dual-role USB device in any application, USB host, or USB peripheral, depending on the cable connection. If the dual-role device is connected to a USB peripheral, it behaves like a USB host. The dual-role device can also be connected to a PC or any other USB host and behave like a USB peripheral.

### 3.1 Host or peripheral roles

- TV/TV box:
  - ◆ Play, upload, or download media file from or to USB memory disk
- DVD player:
  - ◆ Play, upload, or download media file from or to USB memory disk
- Mobile phone to or from:

- ◆ Mobile phone: exchange contents
- ◆ Digital still camera: e-mail pictures or upload pictures to the web
- ◆ MP3 player: upload or download/broadcast music
- ◆ Mass storage: upload or download files
- ◆ Scanner: scan business cards
- Printer
- Netbook
- Set-top box

## 4. Ordering information

**Table 1. Ordering information**

| Commercial product code | Package description                            | Packing                            | Minimum sellable quantity |
|-------------------------|--|------------------------------------|---------------------------|
| ISP1763AETTM            | TFBGA64; 64 balls; body<br>4 × 4 × 0.8 mm      | 13 inch tape and reel non-dry pack | 4000 pieces               |
| ISP1763AHNUM            | VFQFPN64; 64 terminals;<br>body 9 × 9 × 1.0 mm | 13 inch tape and reel dry pack     | 1000 pieces               |

## 5. Marking

**Table 2. Marking codes**

| Commercial product code | Marking code <sup>[1]</sup> |
|-------------------------|-----------------------------|
| ISP1763AETTM            | 1763A                       |
| ISP1763AHNUM            | 1763A                       |

[1] The package marking is the first line of text on the IC package and can be used for IC identification.

## 6. Package outline

**VFQFPN64: plastic thermal enhanced very thin quad flat package; no leads; 64 terminals; body 9 x 9 x 1.0 mm**

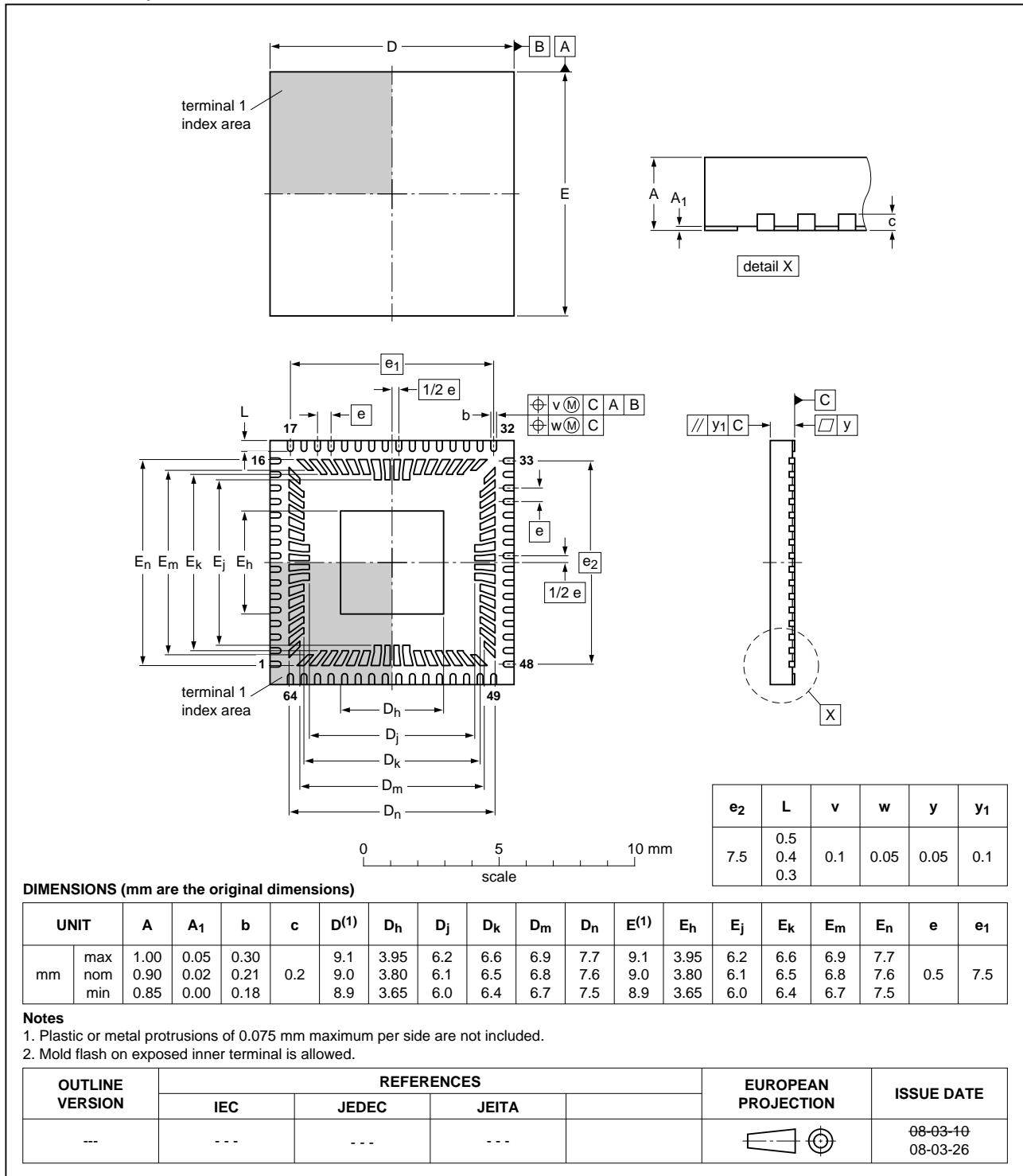


Fig 1. Package outline VFQFPN64

TFBGA64: plastic thin fine-pitch ball grid array package; 64 balls; body 4 x 4 x 0.8 mm

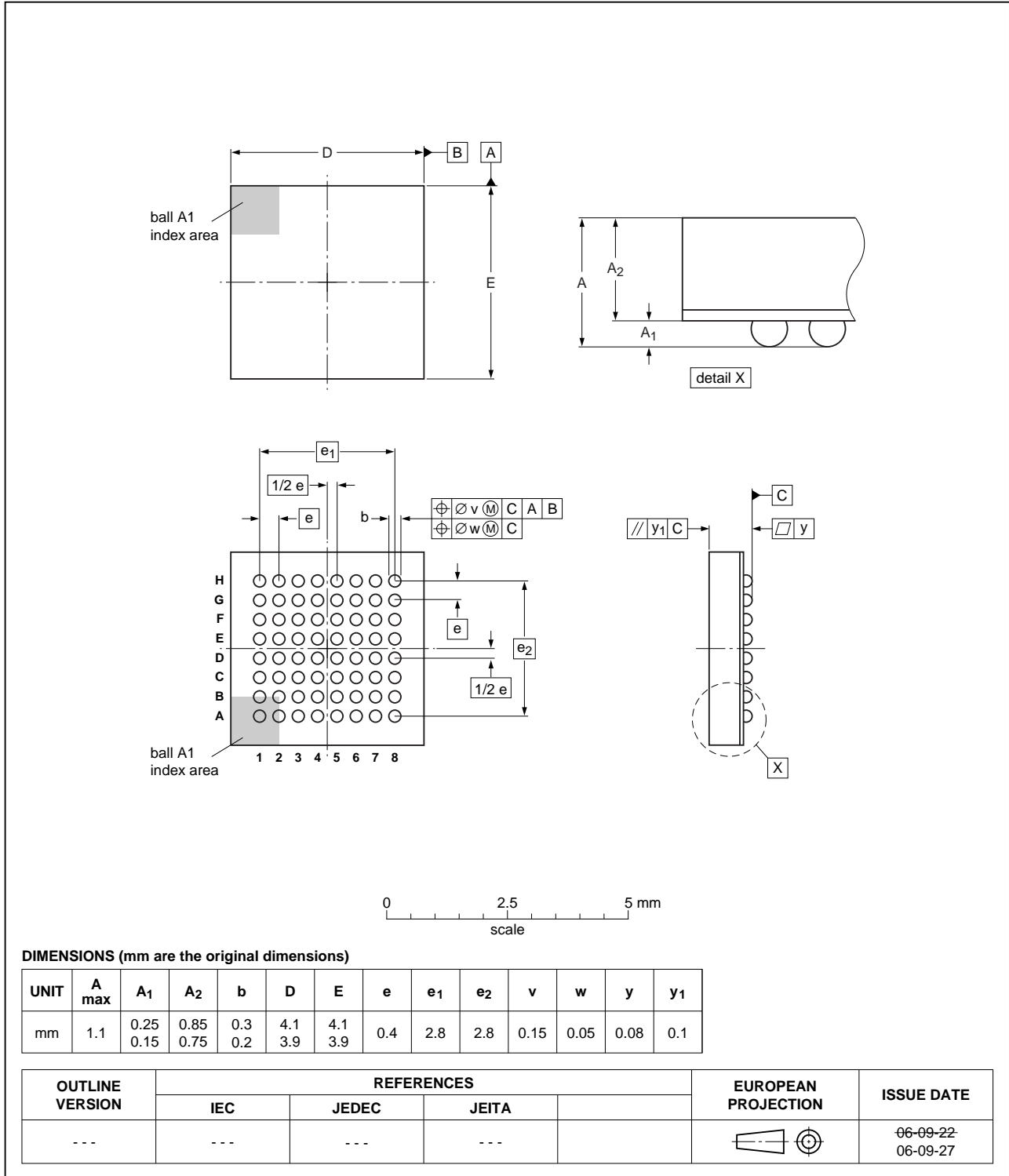


Fig 2. Package outline TFBGA64

## 7. Revision history

**Table 3. Revision history**

| Revision | Release date | Comments   |
|----------|--------------|--|
| 2        | 20100331     | <ul style="list-style-type: none"> <li>• Globally changed package from HVQFN64 to VFQFPN64.</li> <li>• <a href="#">Section 2 “Features”</a>: updated.</li> <li>• <a href="#">Section 3 “Applications”</a>: added set-top box.</li> <li>• <a href="#">Section 4 “Ordering information”</a>: updated.</li> <li>• <a href="#">Section 5 “Marking”</a>: updated.</li> <li>• <a href="#">Section 6 “Package outline”</a>: added.</li> </ul> |
| 1        | 20090916     | First release.   |

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