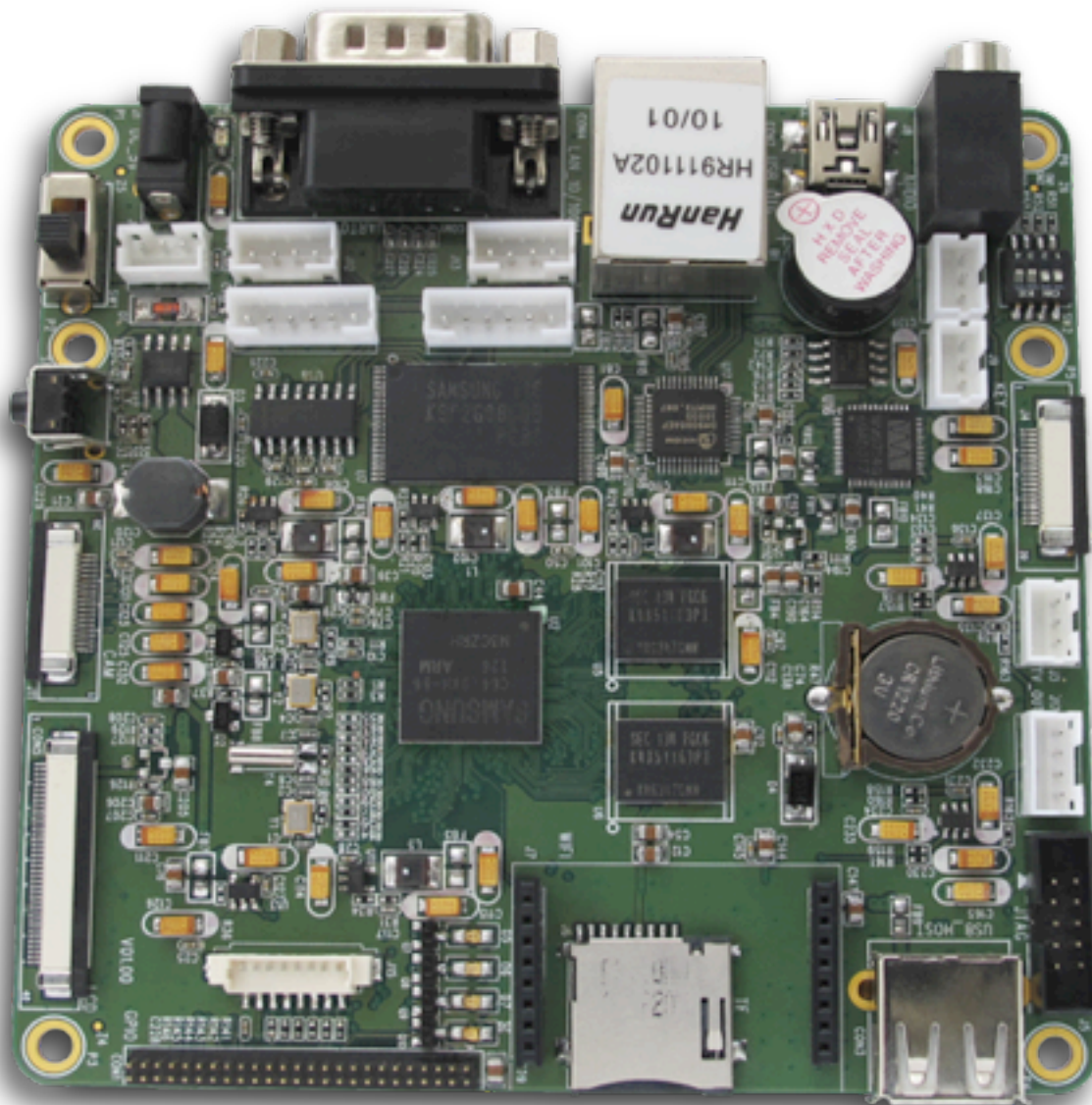




## Introduction to the TenByTen6410



*Illustration shows a pre-production unit, appearance might be slightly different on final product.*



## Introduction

The TenByTen6410 is a high performance ARM11 single board computer, specially designed for consumer electronics, hand-held devices, industrial control equipments, vehicle navigation devices, etc. It features exactly the same dimensions as the popular MINI2440V2 from Hiteg Ltd. and can therefore be used as a drop-in replacement.

TenByTen6410 SBC is based on the Samsung S3C6410 ARM11 micro controller, which provides the TenByTen6410 with abundant internal resources and powerful video processing capacity with 667MHz peak frequency. Beside the powerful processor, the TenByTen6410 is also equipped with 128/256MB mobileDDR RAM, 256MB NAND Flash, as well as some common external interfaces like USB, UART, SD, LCD, Camera, audio, ethernet, etc., which make the TenByTen6410 a full featured and easy to use SBC. With the vigorous internal resources and excellent capacity of 3D video processing, the TenByTen6410 is fully competent for various kinds of hand-held devices, consumer electronics, industrial controllers, Mobile Internet Device, Notebooks, etc.

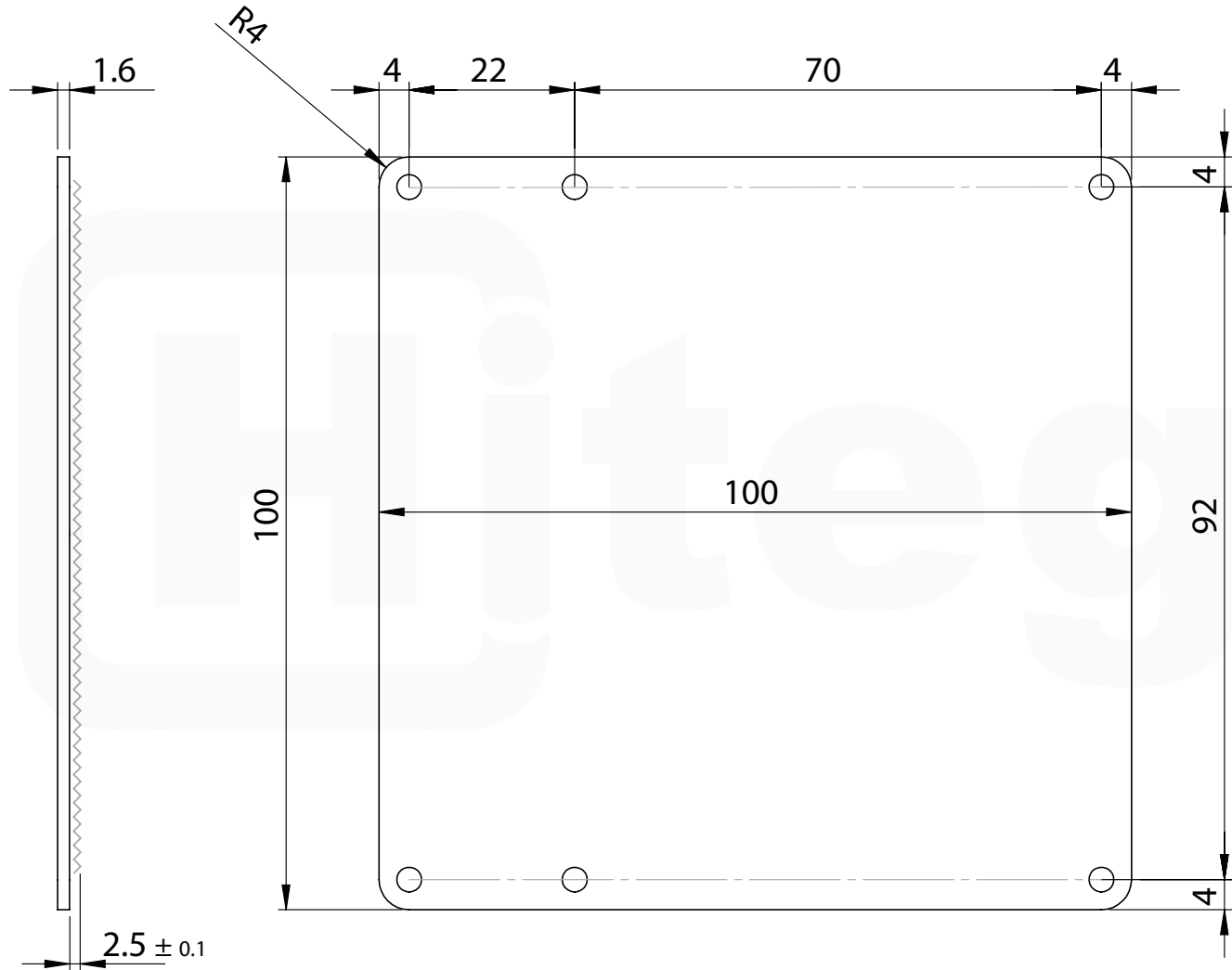
TenByTen6410 uses a reliable 8-layer PCB measured 100x100mm, it is designed and produced in strict accordance with UL and CE standard, with full consideration to the signal integrity, electrostatic protection, electromagnetic compatibility to assure that the TenByTen6410 is capable of working in various environments. Hiteg Ltd. provides an Industrial Temperature Range version of the TenByTen6410.

On the software part, the TenByTen6410 supports various kinds of operating systems, such as Android, WinCE and some other Linux distributions, together with the TenByTen6410 we provide full featured BSPs for Android, WinCE6.0, Ubuntu, and Linux, the BSPs provide device drivers for all the low-level interfaces.



### Dimensions

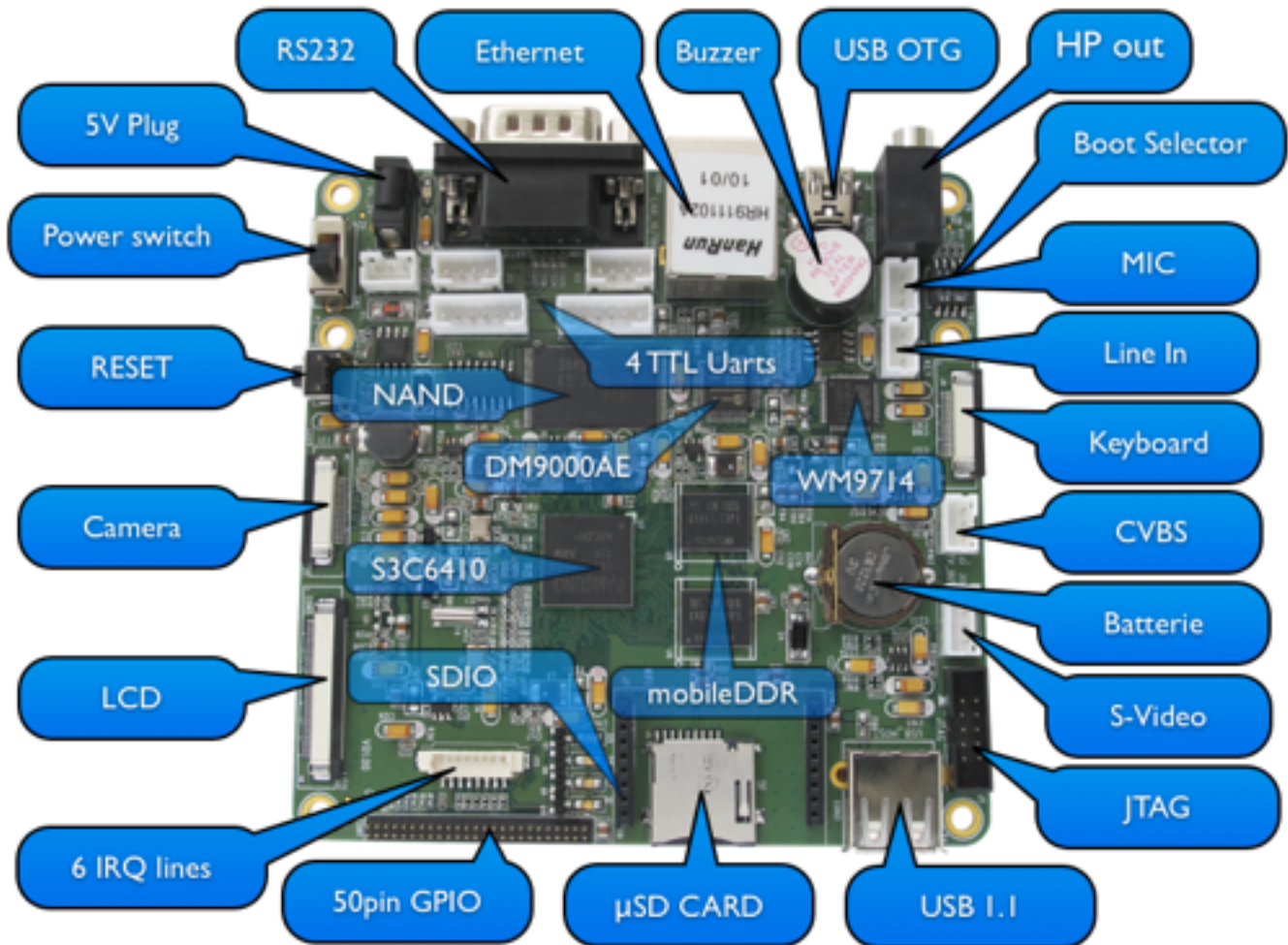
All dimensions are given in *mm*.



The TenByTen6410 is carefully designed to fit seamlessly into any enclosure made for the MINI2440V2. Hiteg Ltd. offers two plastic enclosures (5inch and 7inch) to use for the TenByTen6410 and the MINI2440v2 boards alike to demonstrate and assure correctness.



## Hardware Resources



- Processor: Samsung S3C6410XH-66, ARM1176JZF-S kernel, 667MHz main frequency
- 128/256MB mobileDDR RAM, 32bit data bus. Two Samsung K4X51163PC chips
- 256M Bytes NAND Flash (up to 16GB), Samsung K9F2G08 chip
- 10/100Mbps ethernet, DM9000AE, RJ45 interface
- USB Host 1.1 interface
- USB OTG Interface (mini-USB AB)
- AC97 audio interfaces, consist of WM9714, one audio output, one MIC input, one LINE IN input using 2.0mm pitch 3pin connector.



- High Speed SD card (MMC) interface
- SDIO WiFi supporting IEEE802.11b/g
- Two 4-wire serial ports, two 2-wire serial ports. Can be used as three 4-wire serial ports
- LCD interface, containing all the LCD\_controller signals and 4-wire resistive touch screen
- CVBS Out
- S-VIDEO Out
- camera interface, (20 pin Hirose FH12-20H-0.5S, supporting ITU-R 601/656 8bit mode)
- 8x8 matrix keyboard interface, can be uses as IRQ/GPIO 20pins on Hirose FH12-20H-0.5S
- 50pin GPIO connector 25x2 1.27mm pitch
- JTAG interface
- 4 User LEDs
- Power indicator LED
- Buzzer (5V)
- Connector for 6 User buttons
- RTC-backup battery
- Reset button for system reset, using MAX811T reset chip
- Power Switch
- 5V Power Plug



## Software Features

Four popular operating system are provided together with the TenByTen6410:

- WindowsCE 6R3,
- Linux,
- Android-2.23
- Ubuntu-9.04

Boot loaders and kernels are provided as source code.

## WindowsCE Features

### 1. Version

- Windows CE 6R3

### 2. Device Drivers

- 128/256M mobileDDR driver
- 256M NAND FLASH driver SLC and special version for MLC
- LCD driver (supporting 3.5" 240x320, 4.3" 480x272, 7" 800x480, LVDS)
- Audio driver (supporting ear phone, audio recording, Line in)
- USB Host driver (supporting USB devices such as USB keyboard, mouse, U-disk)
- USB OTG driver (for data synchronizing with PC)
- DM9000AE ethernet driver (10/100M auto-adaptive ethernet interface)
- 4 serial ports driver (1 debugging serial port and 3 users serial ports)
- I2C bus driver
- SPI driver
- Touch screen driver
- SD/MMC driver
- JPEG hardware decoding driver
- MFC multi-media codec driver
- CVBS/S-VIDEO OUT driver
- RTC driver
- Button driver (Up, Down, Left, Right, Enter, Return)



- Camera driver (Supporting OV3640 3Mpixels Auto Focus camera, supporting photo, video capture and replay)
- WIFI driver

### 3. Other features

- Eboot supporting SD card boot.
- Eboot and NK images can be updated via either USB or SD card
- registry savable
- system suspend/wake up supported
- supporting 2D/3D hardware acceleration, OpenGL ES test program provided as source code
- Multimedia hardware Codec, supporting H264/H263/MPEG4/WMV9 hardware decoding. Driver and test programs source code provided
- JPEG hardware codec, supporting JPEG, JPG hardware codec, driver and test programs source code provided
- media player: supporting various video format decoding
- TCP/IP Player, supporting H264/H263/MPEG4/WMV9 video hardware decoding

### 4. IDE

- Full sources for SLC version of BSP. For MLC version a NDA is required.

## Linux Features

### 1. bootloader

- u-boot-1.1.6

### 2. Kernel

- Linux-2.6.3x

### 3. Drivers

- 128/256MM mobileDDR driver
- NAND Flash driver
- LCD driver supporting 320x240, 480x272, 800x480
- resistive touch screen driver



- audio driver
- USB Host driver
- 10/100MBit Ethernet driver
- SD/MMC driver, supporting up to 8GB SD/MMC card
- UART driver, one debug port and three user serial ports
- camera driver, for OV3640 3M Autofocus camera module

#### 4. Filesystem

- JFFS2, YAFFS2

#### 5. GUI

- QT

#### 6. Other Features:

- u-boot supporting SD card boot
- kernel and filesystem images can be downloaded via USB

#### 7. Cross Compiler

- avail able

#### 8. Debugging tool

- DNW

## **Android Features**

#### 1. Boot loader

- u-boot-1.1.6

#### 2. Kernel

- Linux-2.6.3x-android

#### 3. Drivers

- 128/256M mobileDDR driver
- NAND Flash driver
- LCD driver supporting 320x240,480x272, 800x480
- resistive touch screen driver
- SD/MMC driver, supporting up to 8GB SD/MMC card





- UART driver, one debug port and three user serial ports
- button driver

#### 4. Filesystem

- yaffs2 (Androidfs-sdk-m5-rc15)

#### 5. GUI

- Android

#### 6. Other Features:

- u-boot supporting SD card boot
- kernel and filesystem images can be downloaded via USB

#### 7. Cross Compiler

- Arm-none-linux-gnueabi

#### 8. Debugging tool

- DNW
- MovinAND\_Fusing\_Tool.exe

## **Ubuntu-9.04 Features**

#### 1. Boot loader

- u-boot-1.1.6

#### 2. Kernel

- Linux-2.6.29

#### 3. Drivers

- 128/256MB mobileDDR driver
- 256M Nand Flash driver
- LCD driver supporting 320x240, 480x272, 800x480
- resistive touch screen driver
- SD/MMC driver, supporting up to 8GB SD/MMC card
- UART driver, one debug port and three user serial ports
- button driver

#### 4. Filesystem



- Ext3

#### 5. GUI

- Lxde-ubuntu

#### 6. Other Features:

- u-boot supporting SD card boot
- kernel and filesystem images can be downloaded via USB

#### 7. Cross Compiler

- Arm-none-linux-gnueabi

#### 8. Debugging tool

- DNW
- MovinAND\_Fusing\_Tool.exe

### III. Add-ons

- 3.5 inch TFT LCD
- 4.3 inch TFT Display
- 5.0 inch TFT Display
- 7 inch TFT LCD
- LVDS
- Camera module
- Housing for TenByTen6410 and 7 inch Display
- Housing for TenByTen6410 and 5 inch Display

### IV. Package List

- TenByTen6410 board
- serial port cable(cross-over)
- USB cable (AB type)
- ethernet cable(cross-over)
- 5V/2A DC power adapter



- DVD
- GPIO connector 50pin 1.27mm pitch to 25X2 2.0mmpitch and 25x2 2.54mm pitch
- two adapter TTL 3.3V to RS232
- CVBS and S\_VIDEO adapter
- six button board

### **Contact**

Postal Address:

#### **Hiteg Ltd.**

Villa B9B , Fengrun Garden,  
Renming Rd.,  
Longhua,Bao'An  
518109 Shenzhen,  
China

**T** +86 755 28125870

**F** +86 755 28125870