SPECIFICATION
MODEL:XPI-3566-ZERO
Confirmation

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<th>APPROVED BY GENIATECH</th>
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Website: www.geniatech.com
Address: Room 02-04, 10/F, Block A, Building 8, Shenzhen International Innovation Valley, Dashi Road, Nanshan District, Shenzhen, Guangdong, China
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Revision History

<table>
<thead>
<tr>
<th>VERSION</th>
<th>DATE</th>
<th>BOARD ID</th>
<th>PAGE</th>
<th>DESCRIPTION</th>
<th>AUTHOR</th>
</tr>
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<tbody>
<tr>
<td>V1.0</td>
<td>20230325</td>
<td>Initial Version</td>
<td></td>
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1. GENERAL DESCRIPTION

The XPI-3566-ZERO is a microcomputer product developed by Geniatech based on the Rock-Chip 3566 platform, and XPI-3566-ZERO has the same form factor of Raspberry Pi Zero & Zero 2 W. According to the definition of Raspberry Pi Zero, this is suitable for the field of smart home applications, programming education for teenagers and other IoT projects.

This product's key features including a Rock-Chip RK3566 high-performance and low power 64-bit quad-core processor, HDMI display support at resolutions up to 4KP60, hardware video decode at up to 4KP60, hardware video encode at up to 1080P60, 512MB LPDDR, up to 8GB, Type-C for USB OTG, Bluetooth 5.0, dual-band 2.4/5 GHz wireless LAN.

Below is the detailed specification
(I) 65mm*30mm, less than the half size of a bank card
(II) Rockchip RK3566 with Quad-core Cortex-A55 up to 1.8GHz
(III) 512MB LPDDR RAM( up to 8GB), 8GB eMMC flash (up to 128GB)
(IV) 1 *Type-C for USB Host with 5VDC input, 1 *Type-C for USB OTG, 1*MIPI-CSI, 1* Extension GPIO interface
(V) Support Android 11.0, Linux (Debian 10) or Raspberry PI OS.
(VI) 2.4GHz&5GHz Wi-Fi WLAN & Blue tooth 5.0
2. PRODUCT OVERVIEW

Below picture is for reference only, please prevail in kind.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>RK3566 SOC</td>
<td>*1</td>
</tr>
<tr>
<td>2</td>
<td>40 Pin GPIO header</td>
<td>*1</td>
</tr>
<tr>
<td>3</td>
<td>LPDDR4</td>
<td>*1</td>
</tr>
<tr>
<td>4</td>
<td>eMMC Flash</td>
<td>*1</td>
</tr>
<tr>
<td>5</td>
<td>HDMI Connector</td>
<td>*1 Mini HDMI</td>
</tr>
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3. BOARD DIMENSIONS

![Board Dimensions Diagram]

4. SPECIFICATIONS

<table>
<thead>
<tr>
<th>CHIPSET</th>
<th>RK 3566</th>
</tr>
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<tbody>
<tr>
<td>MARKET AREA</td>
<td>Global</td>
</tr>
<tr>
<td>Processor OS</td>
<td>Android 11/Debian 10 /Raspberry PI OS</td>
</tr>
<tr>
<td>CPU</td>
<td>Quad-core ARM Cortex-A55 CPU up to 1.8GHz</td>
</tr>
<tr>
<td>GPU</td>
<td>ARM G52 2EE GPU: Supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1 Embedded high-performance 2D acceleration hardware</td>
</tr>
<tr>
<td>NPU</td>
<td>Integrated RKNN NPU AI accelerator, 1Tops@INT8 Supports one-click switching of Caffe/TensorFlow/TFLite/ONNX/PyTorch/Keras/Darknet</td>
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5. Connectors Definition

5.1 40 Pin GPIO header (J1)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Definition</th>
<th>Pin</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC3V3_IO</td>
<td>2</td>
<td>VCC5V0_SYS</td>
</tr>
<tr>
<td>3</td>
<td>I2C1_SDA/GPIO8_A4</td>
<td>4</td>
<td>VCC5V0_SYS</td>
</tr>
<tr>
<td>5</td>
<td>I2C1_SCL/GPIO8_A5</td>
<td>6</td>
<td>GND</td>
</tr>
<tr>
<td>7</td>
<td>GPIO0C1_CLKOUT</td>
<td>8</td>
<td>UART1_TX/ GPIO5_B1</td>
</tr>
<tr>
<td>9</td>
<td>GND</td>
<td>10</td>
<td>UART1_RX/ GPIO5_B0</td>
</tr>
<tr>
<td>11</td>
<td>UART4_CTSN/GPIO5_B4_SPI0CLK</td>
<td>12</td>
<td>I2S_CLK/GPIO6_A0_PCM</td>
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<tr>
<td>13</td>
<td>UART4_TX/GPIO5_B6_SPI0_TXD</td>
<td>14</td>
<td>GND</td>
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### 5.2 MIPI CSI Connector

<table>
<thead>
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<th>Pin</th>
<th>Definition</th>
<th>Pin</th>
<th>Definition</th>
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<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>2</td>
<td>MIPI_CSI_RX_D0N</td>
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<tr>
<td>3</td>
<td>MIPI_CSI_RX_D0P</td>
<td>4</td>
<td>GND</td>
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<tr>
<td>5</td>
<td>MIPI_CSI_RX_D1N</td>
<td>6</td>
<td>MIPI_CSI_RX_D1P</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
<td>8</td>
<td>MIPI_CSI_RX_CLK0N</td>
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<tr>
<td>9</td>
<td>MIPI_CSI_RX_CLK0P</td>
<td>10</td>
<td>GND</td>
</tr>
<tr>
<td>11</td>
<td>MIPI_CSI_RX_D2N</td>
<td>12</td>
<td>MIPI_CSI_RX_D2P</td>
</tr>
<tr>
<td>13</td>
<td>GND</td>
<td>14</td>
<td>MIPI_CSI_RX_D3N</td>
</tr>
<tr>
<td>15</td>
<td>MIPI_CSI_RX_D3P</td>
<td>16</td>
<td>GND</td>
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<tr>
<td>17</td>
<td>MIPI_CAM_PDN0_L_GPIO4_B2</td>
<td>18</td>
<td>MIPI_CAM_RST0_L_GPIO3_D5</td>
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6. HARDWARE BLOCK

XPI-3566 Block Diagram

7. SUPPORT FORMATS

Audio
- I2S0 with 8 channel
  - Up to 8 channels TX and 8 channels RX path
  - Audio resolution from 16bits to 32bits
  - Sample rate up to 192KHz
  - Provides master and slave work mode, software configurable
  - Support 3 I2S formats (normal, left-justified, right-justified)
  - Only for HDMI inside
- I2S1 with 8 channel
  - Up to 8 channels TX and 8 channels RX path
  - Audio resolution from 16bits to 32bits
- Sample rate up to 192KHz
- Provides master and slave work mode, software configurable
- Support 3 I2S formats (normal, left-justified, right-justified)
- Support 4 PCM formats (early, late1, late2, late3)
- I2S and PCM mode cannot be used at the same time

- I2S2/I2S3 with 2 channel
  - Up to 2 channels TX and 2 channels RX path
  - Audio resolution from 16bits to 32bits
  - Sample rate up to 192KHz
  - Provides master and slave work mode, software configurable
  - Support 3 I2S formats (normal, left-justified, right-justified)
  - Support 4 PCM formats (early, late1, late2, late3)
  - I2S and PCM mode cannot be used at the same time

- PDM
  - Up to 8 channels
  - Audio resolution from 16bits to 24bits
  - Sample rate up to 192KHz
  - Support PDM master receive mode

- TDM
  - supports up to 8 channels for TX and 8 channels RX path
  - Audio resolution from 16bits to 32bits
  - Sample rate up to 192KHz
  - Provides master and slave work mode, software configurable
  - Support 3 I2S formats (normal, left-justified, right-justified)
  - Support 4 PCM formats (early, late1, late2, late3)

- Voice Activity Detection (VAD)
  - Support read voice data from I2S/PDM
  - Support voice amplitude detection
  - Support Multi-Mic array data storing
  - Support a level combined interrupt

### Video Codec

- **Video Decoder**
  - H.265 HEVC/MVC Main10 Profile yuv420@L5.1 up to 4096x2304@60fps
  - H.264 AVC/MVC Main10 Profile yuv400/yuv420/yuv422/@L5.1 up to 4096x2304@60fps
  - VP9 Profile0/2 yuv420@L5.1 up to 4096x2304@60fps
  - VP8 version2, up to 1920x1088@60fps
  - VC1 Simple Profile@low, medium, high levels, Main Profile@low, medium, high levels, Advanced Profile@level0~3, up to 1920x1088@60fps
  - MPEG-4 Simple Profile@L0~6, Advanced Simple Profile@L0~5, up to 1920x1088@60fps
  - MPEG-2 Main Profile, low, medium and high levels, up to 1920x1088@60fps
  - MPEG-1 Main Profile, low, medium and high levels, up to 1920x1088@60fps
  - H.263 Profile0, levels 10-70, up to 720x576@60fps
Video Encoder

- H.264/AVC BP/MP/HP@level4.2, up to 1920x1080@60fps
- H.265/HEVC MP@level4.1, up to 1920x1080@60fps (4096x4096@10fps with TILE)
- Support YUV/RGB video source with rotation and mirror

JPEG CODEC

- JPEG decoder
  - Decoder size is from 48x48 to 65536x65536
  - Support YUV400/YUV411/YUV420/YUV422/YUV440/YUV444
  - Support 1920x1080@120fps
  - Support MJPEG

- JPEG encoder
  - Baseline Non-progressive
  - up to 8192x8192
  - up to 90 million pixels per second

8. PRECAUTIONS FOR USE

1. Relative humidity: 10% ~ 90%
2. Storage temperature: 0 ~ 85°C
3. Operation temperature: commercial (0 °C ~60 °C)
4. Do not squeeze, distort or disassemble the board.
5. Keep the board away from static electricity.
6. Keep the board away from water and other liquid.
7. Clean the board with soft and clean dry cloth when it's dirty.
8. Don't use long connect wires which may affect performance and image quality.