Hichips-Parrot Board Hardware

User Manual

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Revision History

Revision Number	Author	Date	Description
V0.1	Lee	2018.11.11	Initial Draft

Contents

1. Introduction

Hichips-Parrot Board(Allwinner SoC-Only 3-Mic Far-Field Dev Kit) for Amazon AVS with allwnner R18 chip design.

Allwinner SoC-Only 3-Mic Far-Field Dev Kit is Allwinner's official development board targeting at audio recognition field, which is certified by Amazon.Powered by Allwinner R18 Quad-core CortexTM-A53, Its rich features and cost-effectiveness make audio intelligence further close to our daily life.


Overview

2. Key Features

- Integrates all AVS features on a single SoC
- Supports for either Linux or Android
- High performance with low power consumption
- Reserves application headroom for non-AVS applications
- Built-in battery-operated designs
- Supports 3 MICs both-side placement

3. Hardware

The AVS Developer Kit is a qualified device enables Alexa Voice Service (AVS) that allows developer to interact with Alexa Voice Service hands-free. It includes a 3-mic array and one base board that provides various peripheral interfaces. Services to play music, ask questions, set alarms, play iHeartRadio, news, sports updates, weather and more are available on this kit. With Gmems's front end algorithm, the developer kit is equipped with most advanced beamforming, noise reduction and echo cancellation technology so that your commands can be easily picked up even under noisy environment or during music is playing.
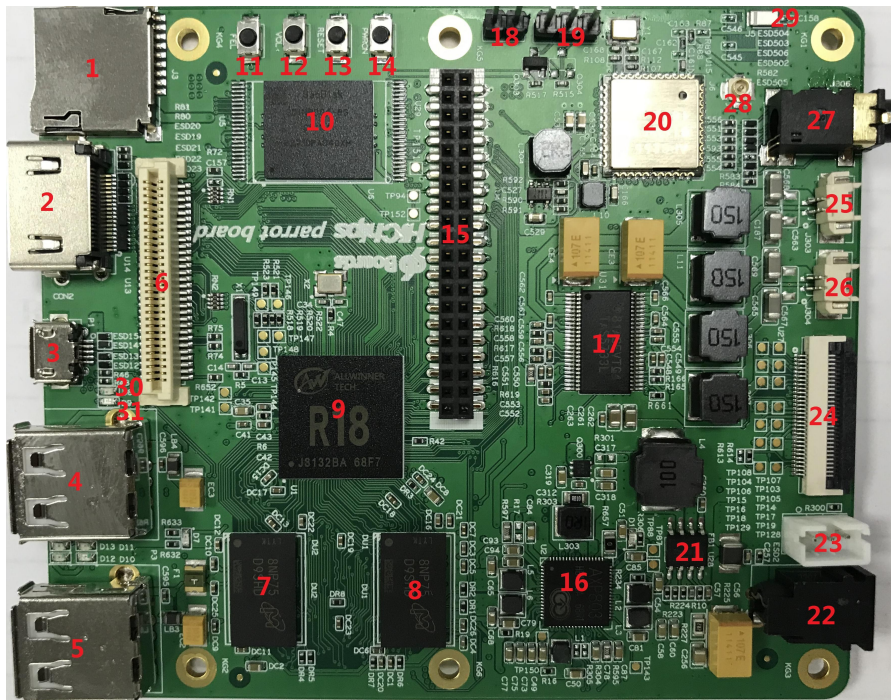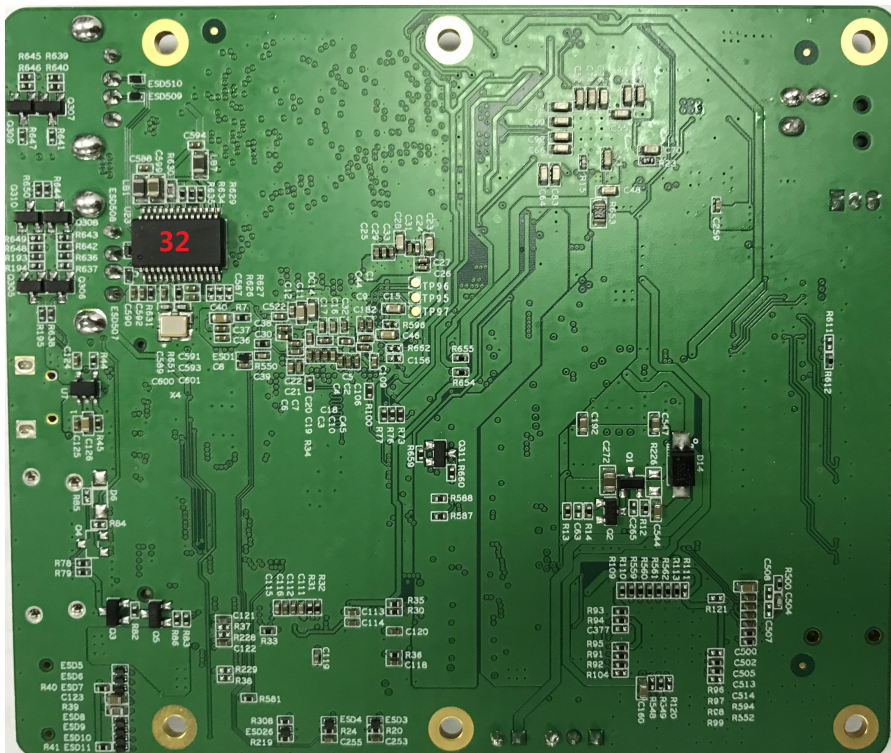
1	J3	Micro SD Card Socket
2	CON2	HDMI Type A Port
3	P1	USB Type C, UART debug port
4	P4	USB Type A
5	P3	USB Type A
6	U30	60PIN High Speed Expansion Connector
7	DU2	DDR3*16
8	DU1	DDR3*16
9	U1	R18
10	U5	EMMC Flash
11	SW5	FEL
12	SW1	VOL+
13	SW7	RESET
14	SW6	PWRON
15	U29	40PIN Low Speed Expansion Connector
16	U2	AXP803
17	U31	Audio Power Amplifier
18	J308	12V-OUT
19	J307	UART Debug
20	U15	WLAN/Bluetooth module
21	U28	12V-5V DCDC
22	J2	Power Jack
23	J301	BAT
24	U27	MIC ARRAY
25	J304	External speaker Jack
26	J303	External speaker Jack
27	J306	HeadPhone Jack

28	J6	External Antenna IPEX
29	J5	BT,WIFI Antenna
30	U23	WIFI LED
31	D8	BT LED
32	D9	USB HUB

5. Specification

Work conditions：

- ❖ Temperature：0℃～40℃；

- ❖ Humidity：5％～90％

- ❖ Storage temperature： -40~ 90 ℃

- ❖ Temperature changing rate：±15℃/hours

- ❖ Power supply 4V-16V(DC JACK)/5V（USB）

Operation voltage: 3.3V/3V/1.8V/1.5V/1.2V/1.1V

Location hole diameter:2mm

6. Key parameters

Items	Descriptions
CPU	Quad-core Cortex-A53 @ 1.15GHz
GPU	Mali400MP2 GPU,Supports OpenGL ES 2.0 , Open VG1.1
Memory	1G Byte DDR3
Storage	8G Byte eMMC
WIFI	Dual band. 2.4GHz, 5GHz
BT	BT 4.0
MIC	3 MIC, 2 AEC
HW Interfaces	HDMI, USBA, USB-OTG, HEADPHONE OUT
OS	Tina Linux
Algorithm Provider	GMEMS

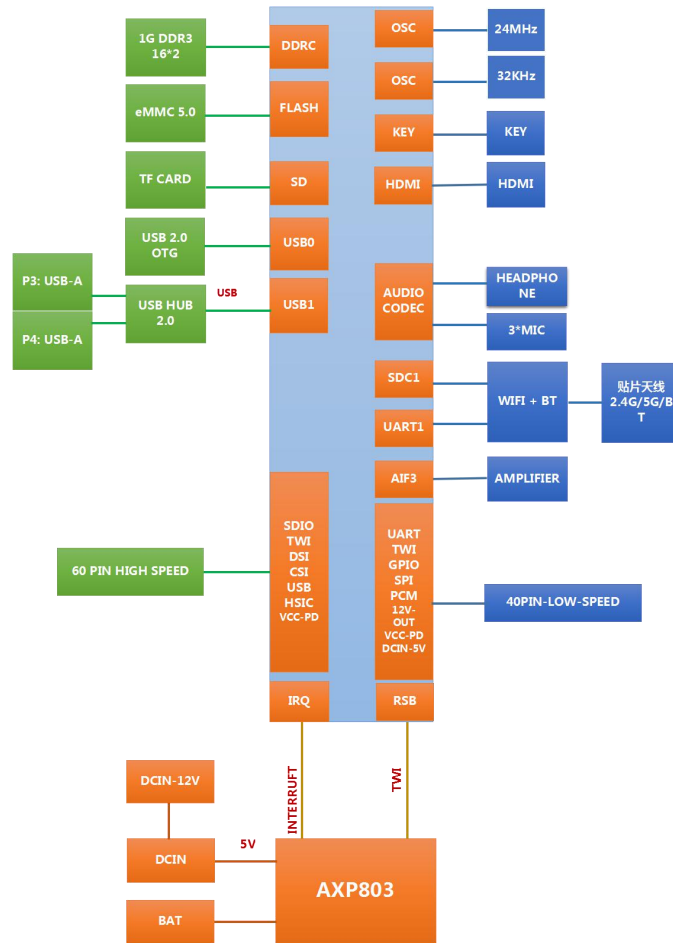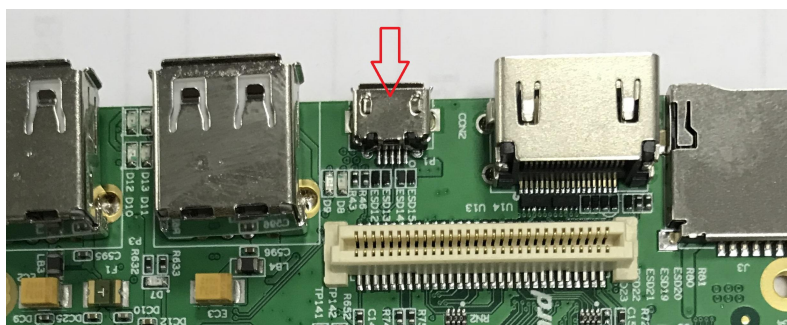| Power input	12V DC
MIC Board Size	104*90mm
Mainboard Size	100*85mm

7. Dimensions
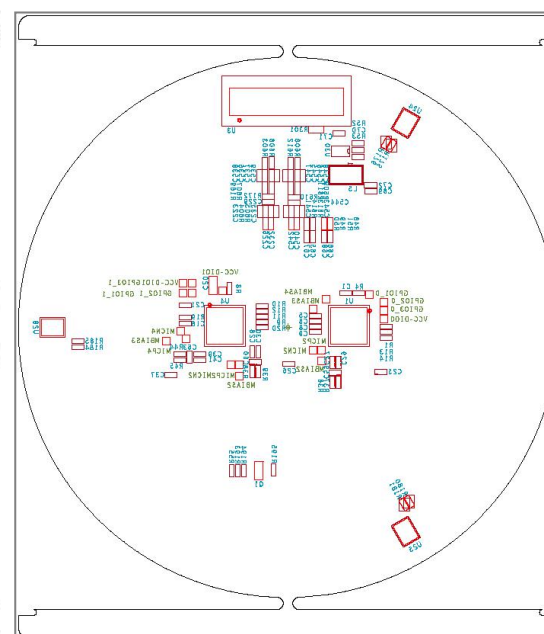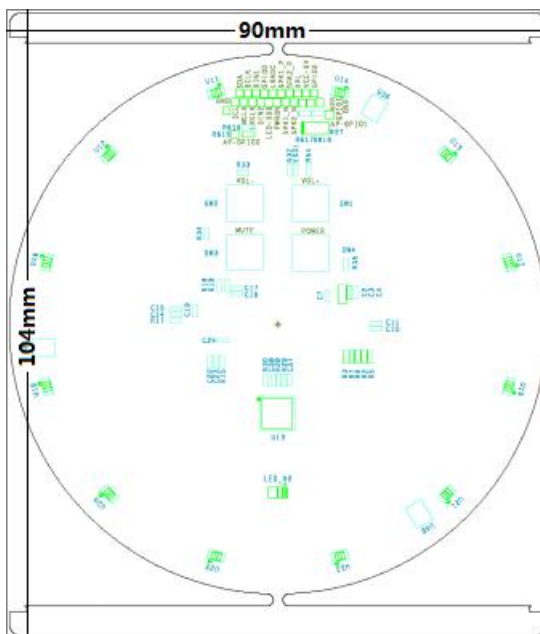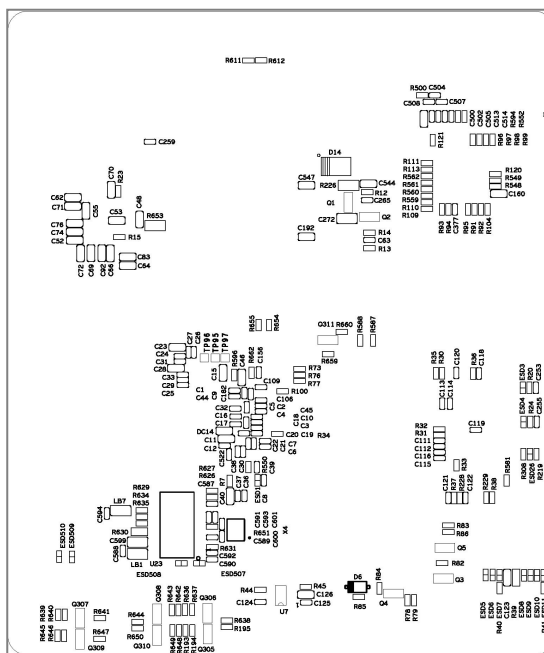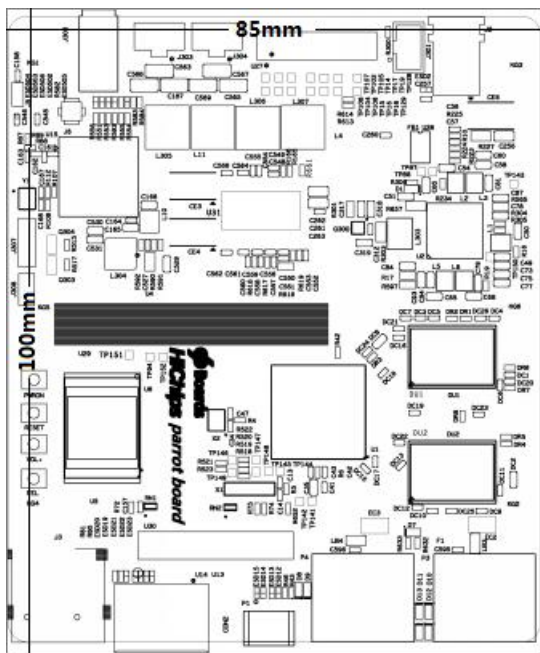
8. Functional description

8.1 Block diagram

8.2 Hardwares interface

Micro-usb for adb and power supply：

Uart debugger:

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8.3 Button

The button PWRON can be used to power cycle the board.

The button RESET can be used to reset the system.

The button FEL can be used to burn the software.

The button VOL+ can be used to adjust the volume, and other configuration.

8.4 DC in jack

DC power is provided via the DC JACK of J2. This is a CUI PJ-041H connector with a center pin diameter of 1.65mm conffigured with positive plolarity. An 12V power supply at a minimum of 2A rateing can be used to provide sufficient board power for on system requirements as well as external devices.

Additional current rating may be required for mezzanine boards or modules. DC power can also be supplied via the SYS_DCIN pins on the low speed expansion of U29.

8.5 40PIN Low speed expansion connector

The Hichips-Parrot Board features one expansion connector. This connector is a low-profile 40 pin femal 2mm receptacle(20*2) of a specified height of 4.5mm height.

The low speed expansion brings out 1.8V level SOC signals such as UART2 and UART3, TWI0 and TWI1, GPIO signals as well as SPI, Audio, Reset, 1.8V and Ground. The complete list of signals is shown as below:

GND	PIN1	GND	PIN2
UART3_CTS	PIN3	PWRON	PIN4
UART3_TxD	PIN5	AP-RESET#	PIN6
UART3_RxD	PIN7	SPI1_CLK	PIN8
UART3_RTS	PIN9	SPI1_MISO	PIN10
UART2_TxD	PIN11	SPI1_CS	PIN12
UART2_RxD	PIN13	SPI1_MOSI	PIN14
TWI0_SCK	PIN15	AP-PCM_SYNC	PIN16
TWI0_SDA	PIN17	AP-PCM_BCLK	PIN18
TWI1_SCK	PIN19	AP-PCM_DOUT	PIN20
TWI1_SDA	PIN21	AP-PCM_DIN	PIN22

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PL11	PIN23	PD10	PIN24
PD5	PIN25	PD11	PIN26
PD6	PIN27	PD12	PIN28
PD7	PIN29	PD13	PIN30
PD8	PIN31	PD14	PIN32
PD9	PIN33	PD4	PIN34
+1V8	PIN35	DCIN-12V	PIN36
+5V	PIN37	DCIN-12V	PIN38
GND	PIN39	GND	PIN40

8.6 60PIN High Speed Expansion Connector

The HS Expansion connector is a board to board low profile 60 pin receptacle TE part.

SDC0-D0	PIN1	CSI-PCLK	PIN2
SDC0-D1	PIN3	CSI-MCLK	PIN4
SDC0-D2	PIN5	GND	PIN6
SDC0-D3	PIN7	CSI-HSYC	PIN8
SDC0-CLK	PIN9	CSI-VSYC	PIN10
SDC0-CMD	PIN11	GND	PIN12
GND	PIN13	R-D0	PIN14
×	PIN15	R-D1	PIN16
×	PIN17	GND	PIN18
GND	PIN19	R-D2	PIN20
DSI-CKP	PIN21	R-D3	PIN22
DSI-CKN	PIN23	GND	PIN24
GND	PIN25	R-D4	PIN26
DSI-D0P	PIN27	R-D5	PIN28
DSI-D0N	PIN29	GND	PIN30
GND	PIN31	TWI2-SCK	PIN32
DSI-D1P	PIN33	TWI2-SDA	PIN34
DSI-D1N	PIN35	CSI-SCK	PIN36
GND	PIN37	CSI-SDA	PIN38
DSI-D2P	PIN39	GND	PIN40
DSI-D2N	PIN41	R-D6	PIN42
GND	PIN43	R-D7	PIN44
DSI-D3P	PIN45	GND	PIN46
DSI-D3N	PIN47	CSI-RST	PIN48
GND	PIN49	CSI-STBY	PIN50

HUB-USB3-DP	PIN51	GND	PIN52
HUB-USB3-DN	PIN53	×	PIN54
GND	PIN55	×	PIN56
HSIC-STR	PIN57	GND	PIN58
HSIC-DAT	PIN59	PD21	PIN60

8.7 Antenna

The Hichips-Parrot Board is equipped with a AMPAK AP6255 WIFI and bluetooth Module, WIFI for Dual band. 2.4GHz, 5GHz and BT for BT 4.0. A PCB chip antenna is available on board by default. In addition, an external antenna by IPEX Jack can be configured

8.8 USB interfaces

There are total 4 USB ports on the Hichips-Parrot Board. Two type A USB3.0 host ports at P3 and P4, one micro USB slave port at P1 and one USB host port available on the High Speed Expansion bus, as UART debug port.
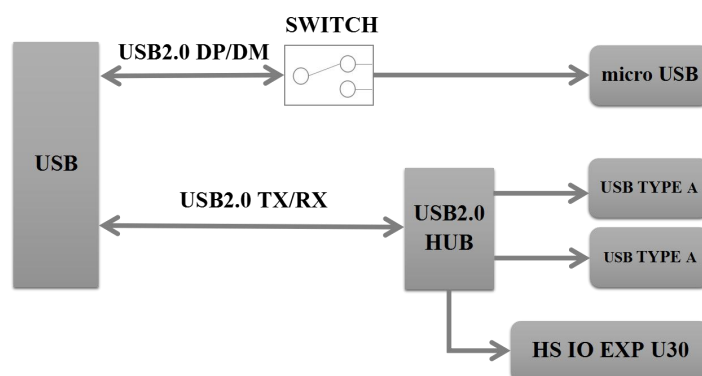
8.9 System and user LEDs

There are one status LED and four User LEDs on the Hichips-Parrot Board. The user LEDs can be programmed by the SoC directly.

● D1 and D7 power LED

This is a red type surface mount 0603 LED

● D8 WIFI LED

The WiFi activity LED is a yellow type surface mount 0603 LED

● D9 BT LED

The BT activity LED is a blue type surface mount 0603 LED

● D10-D13 USER LEDs

The four user LEDs are surface mount green type 0603 LED