

## 深圳金亚太科技有限公司

Shenzhen Geniatech Co.,Ltd.

# SPECIFICATION

MODEL: RS-V2L100

MARKETING NAME: AKITIO

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Website: [www.geniatech.com](http://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

VERSION	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
1.0	2022-02-18				

# 1. GENERAL DESCRIPTION

The **Geniatech AKITIO RS-V2L100** Development Board are based on Renesas low power highly efficient powerful RZ/V2L SoC, which is jointly designed & manufactured in closed collaboration with Geniatech & Renesas.

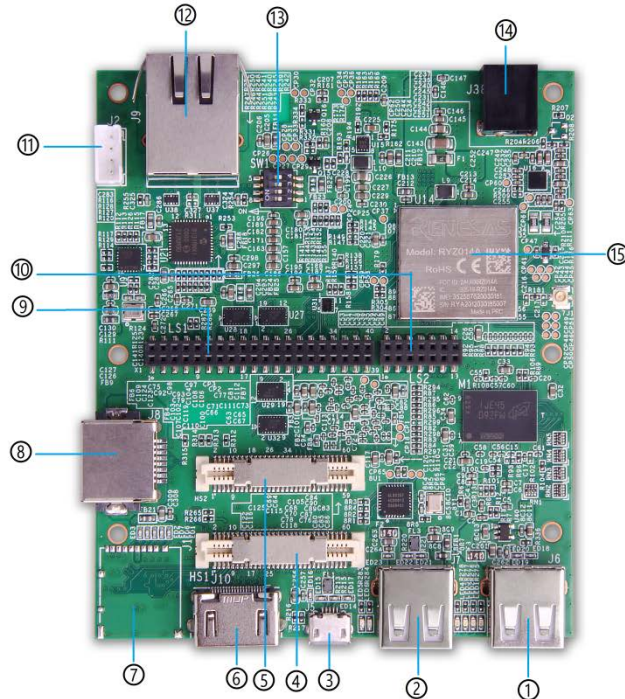
In general, **Geniatech AKITIO RS-V2L100** key features including a high-performance 64-bit Dual-core processor, HDMI out display support at resolutions up to 1080P, hardware video decodes at up to 1080P, up to 4GB of RAM, dual-band 2.4/5.0 GHz wireless LAN, Bluetooth 4.0, two Gigabit Ethernet, two USB 2.0 and 4G/LTE Modem(Optional).

The **Geniatech AKITIO RS-V2L100** are including the follow key feature and compliances

- **Compliance:** CE/FCC
- RZ/V2L SoC: Renesas Electronics RZ/V2L Microprocessors combine a Dual Cortex®-A55 (1.2GHz) CPU, 16-bit DDR3L/DDR4 interface, and a 3D graphics engine with Arm® Mali-G31
- **DA7211 AUDIO CODEC:** The DA7211 is a high denition audio codec with integrated true-ground capless headphone driver suitable for a variety of low power, digital portable audio products.
- **Memory:** DDR4: 4GB / EMMC FLASH: 8GB
- **Ethernet:** Two (2) \* RJ45, 10/100/1000M
- **CONNECTIVITY:** DA16600 Wi-Fi® + BLUETOOTH® Low Energy (BLE), LTE Cat-M1 Cellular IoT Module plus MICRO-SIM SLOT(Optional)
- **Interfaces:** AKITIO RS-V2L100 supports different high-speed interfaces such as MIPI-DSI / MIPI-CSI / USB2.0. RZ/V2L supports Linux systems and is mainly oriented to the customized market of Internet of things gateway, POS terminal, industrial control panel, industrial detection, industrial control box, cloud terminal, vehicle central control and other industries.

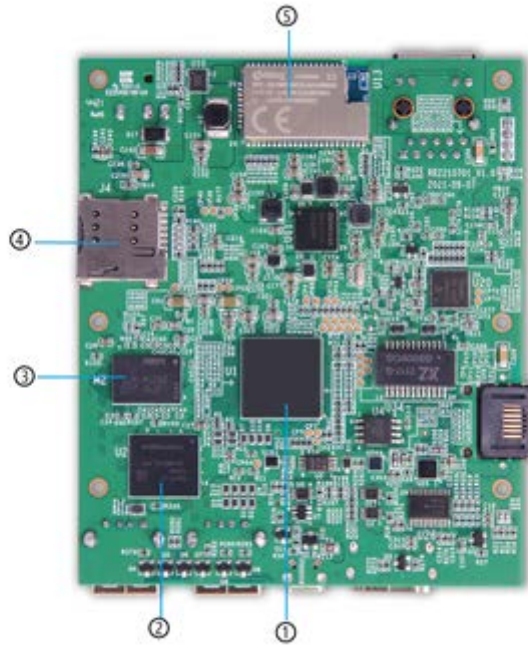
## 2. PRODUCT OVERVIEW

TOP View-as below picture.



No.	Name	Description
①	USB2.0 HOST	*1(USB Type-A)
②	USB2.0 HOST	*1(USB Type-A)
③	USB-OTG	*1(Micro-USB Type)
④	High-Speed Connector1	*1(MIPI-CSI/MIPI-DSI/USB/SD1)
⑤	High-Speed Connector2	*1(SPI/GPIO)
⑥	HDMI Connector	*1(up to 1080P60)
⑦	SD CARD Socket (up to 64GB)	*1
⑧	Gigabit RJ45 Connector1	*1
⑨	Low-Speed Connector1	*1(UART/I2C/SPI/GPIO/I2S)
⑩	Low-Speed Connector2	*1(Speak/MIC)
⑪	UART Debug connector	*1
⑫	Gigabit RJ45 Connector2	*1
⑬	Model Switch	*1
⑭	DC-IN Jack	*1(12V 3A)
⑮	LTE/4G	*1 (Optional)

Bottom view is as below picture.



No.	Name	Description
①	RZ/V2L SOC	*1(2x Cortex-A55 + 1* Cortex-M33)
②	8G eMMC	*1
③	4G DDR4	*1
④	SIM Card SLOT (micro)	*1
⑤	WIFI/BT Module	*1

● **UART Debug connector(J2)**

Pin No.	Pin definition	Pin No.	Pin definition
1	SCIFO_RXD	2	AGND
3	SCIFO_TXD	4	D3.3V_M

● **High Speed Connector 1(HS1)**

Pin No.	Pin definition	Pin No.	Pin definition
1	HS1_SD1_DATA0	2	MIPI_CSIO_CLKP
3	HS1_SD1_DATA1	4	MIPI_CSIO_CLKN
5	HS1_SD1_DATA2	6	GND
7	HS1_SD1_DATA3	8	MIPI_CSIO_D0P
9	HS1_SD1_CLK	10	MIPI_CSIO_D0N
11	HS1_SD1_CMD	12	GND
13	GND	14	MIPI_CSIO_D1P
15	P39_0_HS1_CLK0	16	MIPI_CSIO_D1N
17	P39_1_HS1_CLK1	18	GND

19	GND	20	MIPI_CS10_D2P
21	MIPI_DS12_CLKP	22	MIPI_CS10_D2N
23	MIPI_DS12_CLKN	24	GND
25	GND	26	MIPI_CS10_D3P
27	MIPI_DS12_D0P	28	MIPI_CS10_D3N
29	MIPI_DS12_D0N	30	GND
31	GND	32	HS1_I2C2_SCL
33	MIPI_DS12_D1P	34	HS1_I2C2_SDA
35	MIPI_DS12_D1N	36	HS1_I2C3_SCL
37	GND	38	HS1_I2C3_SDA
39	MIPI_DS12_D2P	40	GND
41	MIPI_DS12_D2N	42	-
43	GND	44	-
45	MIPI_DS12_D3P	46	GND
47	MIPI_DS12_D3N	48	-
49	GND	50	-
51	USB3_HUB_DP	52	GND
53	USB3_HUB_DN	54	-
55	GND	56	-
57	-	58	GND
59	-	60	-

● High Speed Connector 2(HS2)

Pin No.	Pin definition	Pin No.	Pin definition
1	-	2	-
3	-	4	-
5	-	6	GND
7	-	8	-
9	-	10	-
11	-	12	GND
13	-	14	-
15	GND	16	-
17	-	18	GND
19	-	20	-
21	-	22	-
23	-	24	GND
25	GND	26	-
27	-	28	-
29	-	30	GND
31	GND	32	HS2_SPI2_CLK
33	-	34	HS2_SPI2_CS
35	-	36	HS2_SPI2_MOSI

37	GND	38	HS2_SPI2_MISO
39	-	40	HS2_GPIO_V
41	-	42	HS2_GPIO_W
43	GND	44	HS2_GPIO_X
45	-	46	HS2_GPIO_Y
47	-	48	-
49	GND	50	-
51	-	52	-
53	-	54	-
55	GND	56	GND
57	-	58	-
59	-	60	-

● **LOW Speed Connector 1(LS1)**

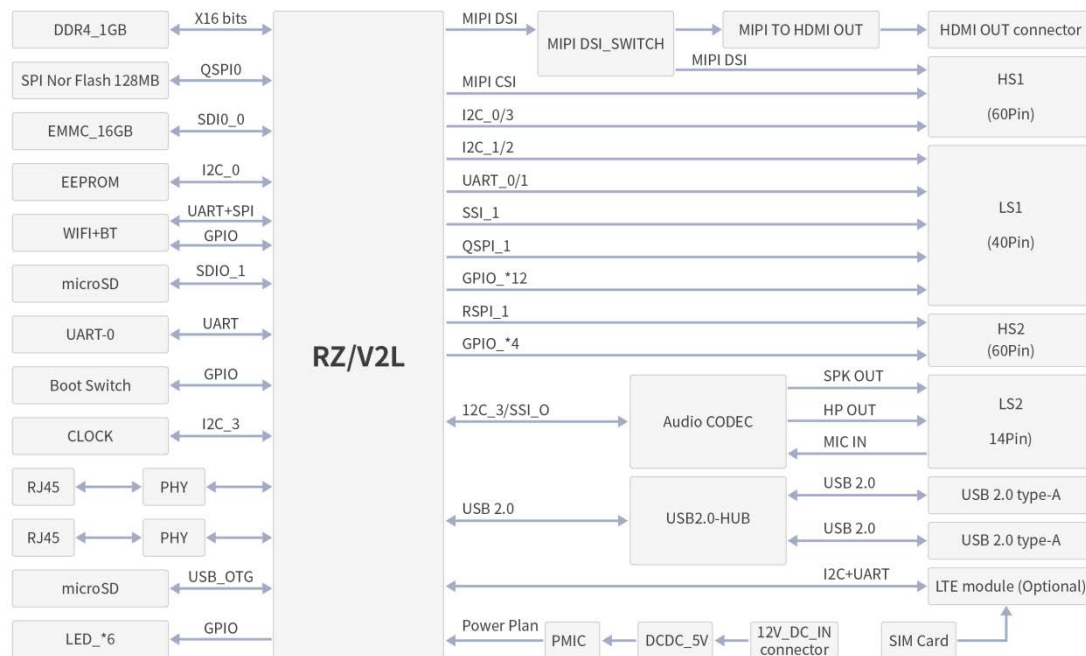
Pin No.	Pin definition	Pin No.	Pin definition
1	AGND	2	AGND
3	UART0_CTS	4	Power_Key
5	UART0_TX	6	SYS_RESET
7	UART0_RX	8	LS1_SPI0_SCLK
9	UART0_RTS	10	LS1_SPI0_MISO
11	UART1_TX	12	LS1_SPI0_CS
13	UART1_RX	14	LS1_SPI0_MOSI
15	LS1_I2C0_SCL	16	LS1_I2S1_LRCK
17	LS1_I2C0_SDA	18	LS1_I2S1_CK
19	LS1_I2C1_SCL	20	LS1_I2S1_SDOOUT
21	LS1_I2C1_SDA	22	LS1_I2S1_SDIN
23	LS1_GPIO-A	24	LS1_GPIO-B
25	LS1_GPIO-C	26	LS1_GPIO-D
27	LS1_GPIO-E	28	LS1_GPIO-F
29	LS1_GPIO-G	30	LS1_GPIO-H
31	LS1_GPIO-I	32	LS1_GPIO-J
33	LS1_GPIO-K	34	LS1_GPIO-L
35	D1.8V_M	36	DC_12V
37	D5.0V	38	DC_12V
39	AGND	40	AGND

● **LOW Speed Connector 2(LS2)**

Pin No.	Pin definition	Pin No.	Pin definition
1	SPK_P	2	HP_P
3	SPK_N	4	HP_N
5	AGND	6	HP_DET
7	MIC1_IN	8	D5.0V
9	MIC2_IN	10	DC_12V

11	MIC_BIAS	12	DC_12V
13	AGND	14	AGND

● HW BLOCK DIAGRAM



### 3. FEATURES

CHIPSET	Renesas RZ/V2L	
MARKET AREA	Global	
Processor	OS	Yocto (Linux)
	CPU	2xCortex-A55 core up to 1.2GHz per core 1x Cortex-M33 core up to 200MHz
	LPDDR4	4GB (4 or 8G optional)
	EMMC FLASH	8GB eMMC 5.1 (16/64/128GB optional)
NETWORK	Ethernet	2*RJ45, 10/100/1000M
	WiFi	WiFi Module 2.4G/5.8G (optional)
	Bluetooth	BT4.0 (integrated in the WiFi module)
	4G LTE	Optional
Interface	HDMI Out	*1(up to 1080P60)
	USB 2.0	*2
	SIM Card slot	*1
	USB-OTG	*1
	DC IN	*1 (12V/3A Power adapter, Bootup with electrify)
Connectivity I/O	<b>1x High-Speed Connector1</b> • intergrade MIPI-CSI/MIPI-DSI/USB/SD1 function	



	<p><b>1x High-Speed Connector1</b></p> <ul style="list-style-type: none"> <li>• Support SPI/GPIO</li> </ul> <p><b>1x Low-Speed Connector1</b></p> <ul style="list-style-type: none"> <li>• UART/I2C/SPI/GPIO/I2S</li> </ul> <p><b>1x Low-Speed Connector2</b></p> <ul style="list-style-type: none"> <li>• Speak/MIC</li> </ul>
Power	DC 12V / 3A (12V/3A Power adapter, Bootup with electrify)
Dimensions	100mm*85mm
Debug Interface	<ul style="list-style-type: none"> <li>• Arm® CoreSight™ architecture</li> <li>• JTAG / SWD interface supported</li> <li>• ETF 16 KBytes for program flow trace (each cluster)</li> <li>• JTAG Disable supported</li> </ul>

## 4. SUPPORT FORMATS

### Audio

- 4 channels bidirectional serial transfer
- 2 external clock sources available
- Full Duplex communication (channel 0, 1, and 3)
- Support of I2S / Monaural / TDM audio formats
- Support of master and slave functions
- Generation of programmable word clock and bit clock
- Multi-channel formats
- Support of 8, 16, 18, 20, 22, 24, and 32-bit data formats
- Support of 32-stage FIFO for transmission and reception
- Support of LR-clock continue function in which the LR-clock signal is not stopped

### Video

- H.264 codec module
- Encoding / Decoding support
  - H.264 / AVC (High Profile / Main Profile / Baseline Profile)
  - H.264 / MVC (Stereo High Profile)
- Color format (input in encoding): YcbCr 4:2:0 semi-planar supported
- Color format (output in decoding): YcbCr 4:2:0 semi-planar supported

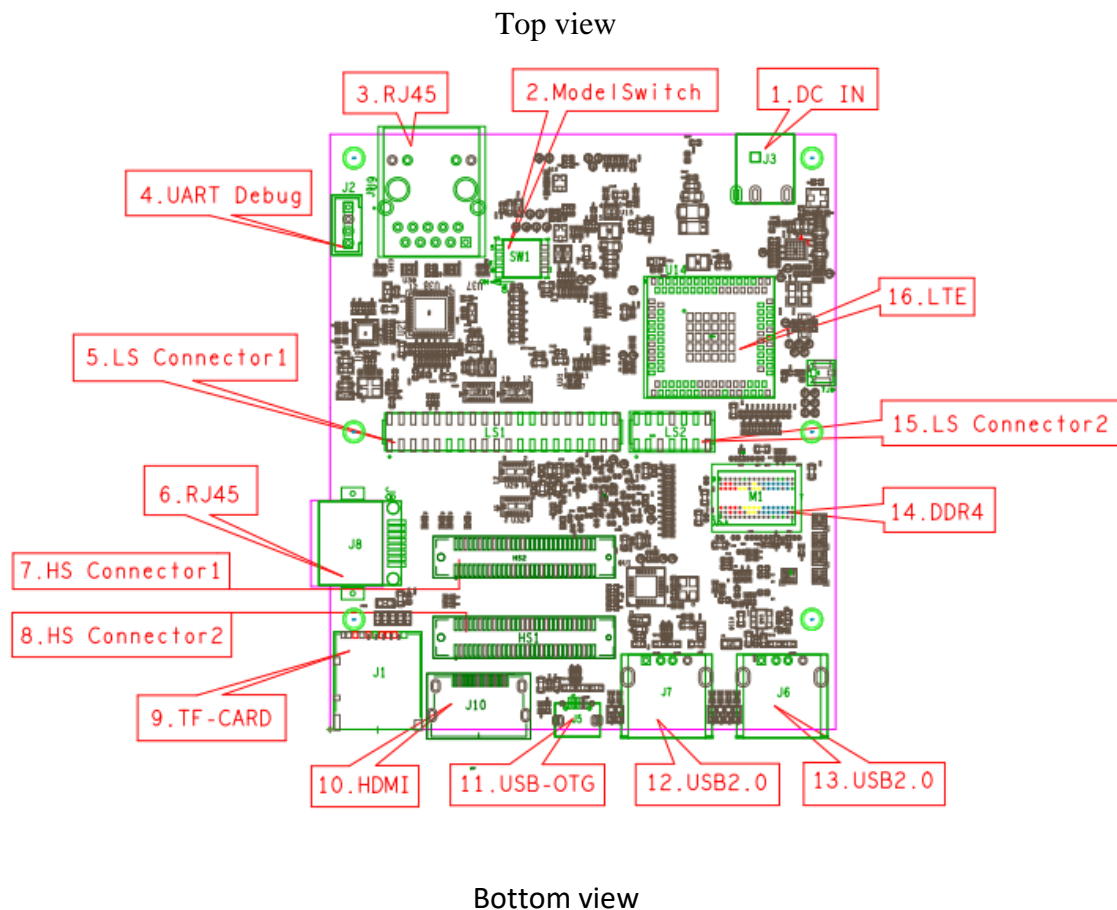
### Image Scaling Unit

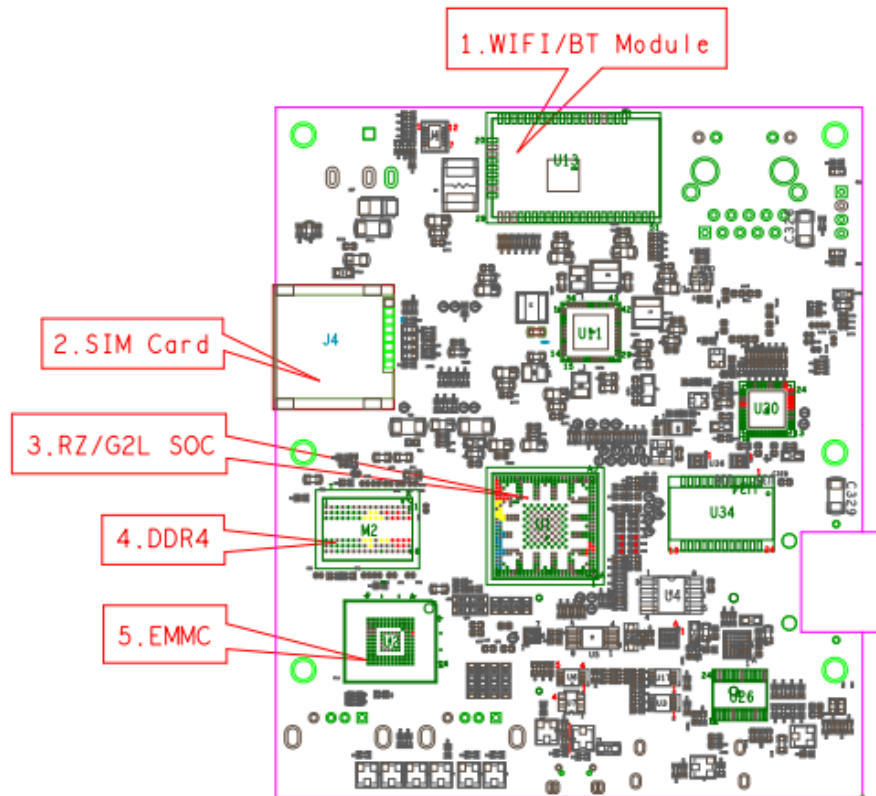
- Scaling down function with bilinear interpolation
- Input image Size (max): 5M (2800 × 2047)
- Output image Size (max): Full HD (1920 × 1080)
- Support Color format Conversion
- RGB / ARGB / YcbCr422 / YcbCr420 / RAW (Grayscale)

## 5. PRECAUTIONS FOR USE

1. Relative humidity:  $\leq 90\%$ .
2. Operation temperature: commercial ( $0^{\circ}\text{C} \sim 60^{\circ}\text{C}$ )/Extended commercial ( $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ ).
3. Keep the Board away from static electricity.
4. Keep the Board away from water and other liquid.
5. Don't use long connect wires which may affect performance and image quality.

## 6. ACTIVE KEY COMPONENTS





## 7. BSP, FIRMWARE, SDK & APPLICATION

Kernel version: linux cip 4.19

Yocto version: DUNFELL 3.1

## 8. LEGAL DISCLAIMER

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