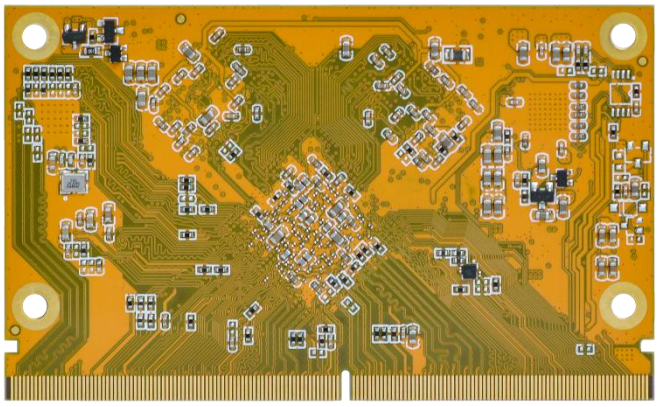
PICO3399 Reference User Manual

V5.202610





Boardcon Embedded Design

www.armdesigner.com

1. Introduction

1.1. About this Manual

This manual is intended to provide the user with an overview of the board and benefits, complete features specifications, and set up procedures. It contains important safety information as well.

1.2. Feedback and Update to this Manual

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website (www.boardcon.com , www.armdesigner.com).

These include manuals, application notes, programming examples, and updated software and hardware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers is the number one influence, If you have questions, comments, or concerns about your product or project, please no hesitate to contact us at support@armdesigner.com.

1.3. Limited Warranty

Boardcon warrants this product to be free of defects in material and workmanship for a period of one year from date of buy. During this warranty period Boardcon will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lighting or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit .In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this products.

Repairs make after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.

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1 PICO3399 Introduction

1.1 Summary

The PICO3399 is a hexa-core module which is based on the Rockchip RK3399 processor that adopts big.LITTLE CPU architecture dual core cortex-A72 and quad-core cortex-A53, Mali-T860MP4 GPU. The module supports 4K H.265 video decoding up to 60 fps, HDMI in/output, USB Type-C, Gigabit Ethernet, Android7.1 operating system, and target to 2in1 Android tablets, VR, TV-BOX, laptops, in-vehicle navigations, communications and other terminals covering industrial and consumer applications, including smart Device, advertising devices, all-in-one machines, POS systems, vehicle control terminals, thin-clients, VOIP video conferencing security / monitoring / policing, IoT, as well as other fields.

1.2 PICO3399 Specifications

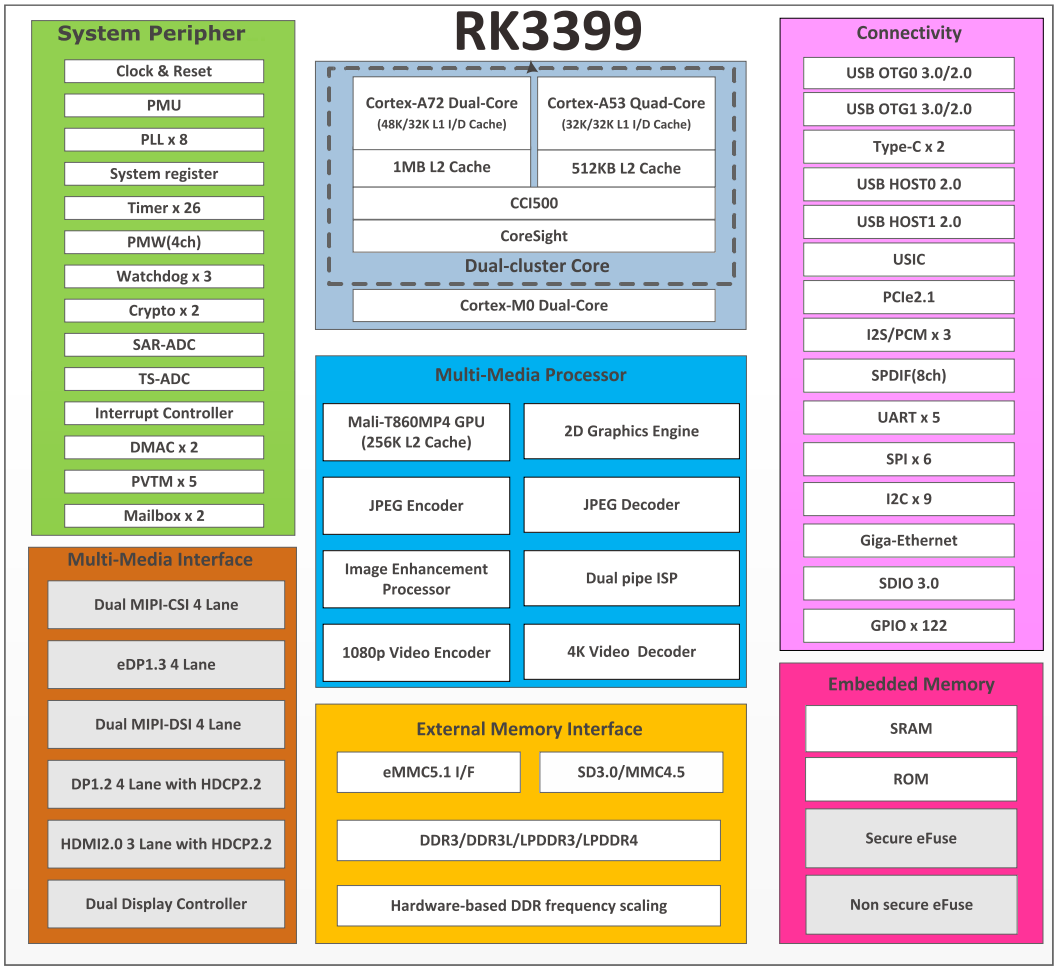
- CPU
  - Quad-core Cortex-A53 up to 1.4GHz
  - Dual-core Cortex-A72 up to 1.8GHz
  - Mali-T864 GPU
- RAM
  - On-board 4GB LPDDR4
  - 64bit data bus
- ROM
  - On-board 8GB EMMC
  - Up to 128GB
- POWER
  - high-efficiency PMIC RK808-D
- RTC
  - Option external RTC IC for more accurate time and more lower consume.
- 2 true Type-C or OTG and USB 3.0
- 2 USB 2.0 Host
- AUDIO interface
  - Support I2S/AC97/PCM
  - Support 6-ch audio output
- SPDIF output
- Watchdog
- Hardware over temperature protect IC on board
  - Support 95°C auto reset CPU not need software deploy.
  - Rerun hysteresis -10°C.
- 3 UART (2 generic and 1 debug line)
- 7 IIC interface
- 3 Camera interfaces

- 2 Mipi CSI and 1 CIF 8bits
- Supports Dual-line input

- PCIE x4 Support
- Display interface
  - 2 4lane Mipi DSI
  - EPD interface
  - HDMI 4K output
- 3 12bit ADCIN at 1.8V below
- 91 external interrupt source
- 4 HS-SPI
- 3 PWM Timer out
- 1 RTC Clock out
- 10/100M/1G Ethernet PHY on board
- External power enable control
- External power 3.3V DC out and codec power 1.8V DC out.

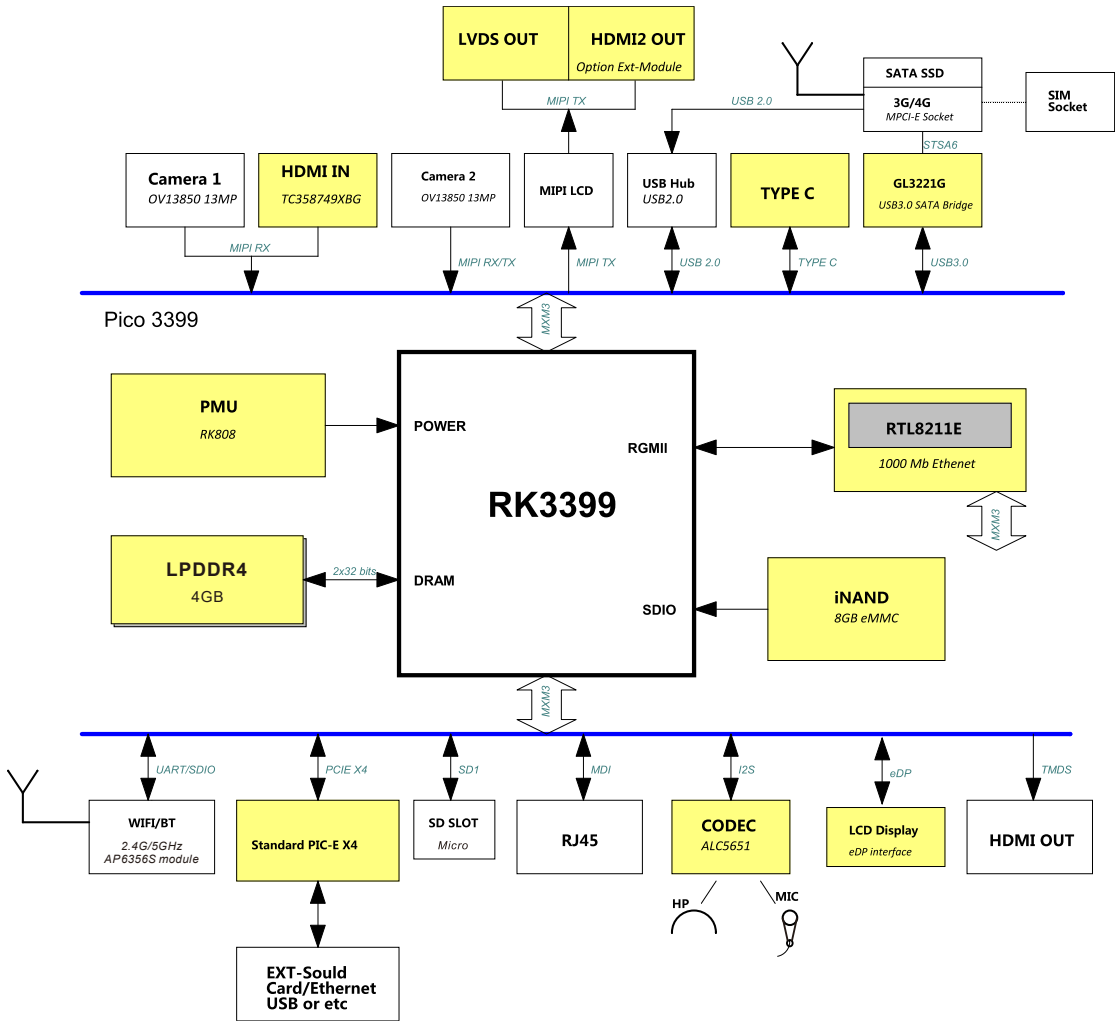
1.3 Block Diagram

- ***SoC***



Block Diagram

◆ ***Development Board***



1.4 Pin Definition

Pin	Signal	Function	Description / Alternate functions	IO Level
P1	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
P2	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
P3	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
P4	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
P5	AC_DET	EXT-AC detection in	Auto power on if connect P1	3.3-5.5V
P6	PMIC_EXT_EN	EXT-DCDC enable	To keep Peripheral turn on same time	O
P7	I2C1_SCL	I2C1 Bus Clock	GPIO4_A2	1.8V
P8	I2C1_SDA	I2C1 Bus Data	GPIO4_A1	1.8V
P9	I2S1_LRCK_RX	I2S1 LRCK input	GPIO4_A4_D	1.8V

Pin	Signal	Function	Description / Alternate functions	IO Level
P10	I2S1_SDO0	I2S1 Data0 output	GPIO4_A7_D	1.8V
P11	I2S0_SDO0	I2S0 Data0 output	GPIO3_D7_D	1.8V
P12	I2S0_SDO1	I2S0 Data1 output	GPIO3_D6_D	1.8V
P13	I2S1_LRCK_TX	I2S1 LRCK output	GPIO4_A5_D	1.8V
P14	I2S0_LRCK_TX	I2S0 LRCK output	GPIO3_D2_D	1.8V
P15	3V_GPIO4_C5	GPIO	3V_GPIO4_C5_D	3.0V
P16	I2S0_SDI0	I2S0 Data0 input	GPIO3_D3_D	1.8V
P17	3V3_UART2_RX	Debug UART RXD	GPIO4_C3_U	3.3V
P18	I2C_SCL_HDMI	I2C clock line for HDMI	GPIO4_C1_U	3.0V
P19	3V_GPIO4_D3	GPIO	3V_GPIO4_D3_D	3.0V
P20	TOUCH_RST_L	Touch screen reset	GPIO4_C6_D	3.0V
P21	3V_GPIO4_D1	GPIO	3V_GPIO4_D1_D	3.0V
P22	BT_WAKE_L	BT wake CPU in	GPIO2_D2_U or SDIO0 detection	1.8V
P23	SDIO0_D1	WIFI SDIO D1	GPIO2_C5_U or SPI5_TXD	1.8V
P24	UART0_RXD	UART receive data	GPIO2_C0_U	1.8V
P25	UART0_RTS	UART ready-to-send	GPIO2_C3_U	1.8V
P26	UART0_CTS	UART clear to send	GPIO2_C2_U	1.8V
P27	GND	Ground		0V
P28	MIPI_TX/RX_D0P	MIPI DSI or CSI	MIPI_TX1/RX1_D0P	1.8V
P29	MIPI_TX/RX_D0N	MIPI DSI or CSI	MIPI_TX1/RX1_D0N	1.8V
P30	GND	Ground		0V
P31	MIPI_TX/RX_D1P	MIPI DSI or CSI	TX1/RX1_D1P	1.8V
P32	MIPI_TX/RX_D1N	MIPI DSI or CSI	TX1/RX1_D1N	1.8V
P33	GND	Ground		0V
P34	MIPI_TX/RX_CLKP	MIPI DSI or CSI	TX1/RX1_CLKP	1.8V
P35	MIPI_TX/RX_CLKN	MIPI DSI or CSI	TX1/RX1_CLKN	1.8V
P36	GND	Ground		0V
P37	MIPI_TX/RX_D2P	MIPI DSI or CSI	TX1/RX1_D2P	1.8V
P38	MIPI_TX/RX_D2N	MIPI DSI or CSI	TX1/RX1_D2N	1.8V
P39	GND	Ground		0V
P40	MIPI_TX/RX_D3P	MIPI DSI or CSI	TX1/RX1_D3P	1.8V
P41	MIPI_TX/RX_D3N	MIPI DSI or CSI	TX1/RX1_D3N	1.8V
P42	GND	Ground		0V
P43	MIPI_RX_D3P	MIPI CSI	RX0_D3P	1.8V
P44	MIPI_RX_D3N	MIPI CSI	RX0_D3N	1.8V
P45	GND	Ground		0V
P46	MIPI_RX_D2P	MIPI CSI	RX0_D2P	1.8V
P47	MIPI_RX_D2N	MIPI CSI	RX0_D2N	1.8V
P48	GND	Ground		0V
P49	MIPI_RX_CLKP	MIPI CSI	MIPI_RX0_CLKP	1.8V
P50	MIPI_RX_CLKN	MIPI CSI	MIPI_RX0_CLKP	1.8V

Pin	Signal	Function	Description / Alternate functions	IO Level
P51	GND	Ground		0V
P52	MIPI_RX_D1P	MIPI CSI	MIPI_RX0_D1P	1.8V
P53	MIPI_RX_D1N	MIPI CSI	MIPI_RX0_D1N	1.8V
P54	GND	Ground		0V
P55	MIPI_RX_D0P	MIPI CSI	MIPI_RX0_D0P	1.8V
P56	MIPI_RX_D0N	MIPI CSI	MIPI_RX0_D0P	1.8V
P57	GND	Ground		0V
P58	TX_C-	HDMI TMDS Clock-	HDMI_TCN	1.8V
P59	TX_C+	HDMI TMDS Clock+	HDMI_TCP	1.8V
P60	GND	Ground		0V
P61	TX_0-	HDMI TMDS Data0-	HDMI_TX0N	1.8V
P62	TX_0+	HDM TMDS Data0+	HDMI_TX0P	1.8V
P63	GND	Ground		0V
P64	TX_1-	HDMI TMDS Data1-	HDMI_TX1N	1.8V
P65	TX_1+	HDMI TMDS Data1+	HDMI_TX1P	1.8V
P66	GND	Ground		0V
P67	TX_2-	HDMI TMDS Data2-	HDMI_TX2N	1.8V
P68	TX_2+	HDMI TMDS Data2+	HDMI_TX2P	1.8V
P69	GND	Ground		0V
P70	TYPEC0_RX1N	Receiver serial data -		1.8V
P71	TYPEC0_RX1P	Receiver serial data+		1.8V
P72	GND	Ground		0V
P73	TYPEC0_TX1P	Transmitter serial data +		1.8V
P74	TYPEC0_TX1N	Transmitter serial data -		1.8V
P75	TYPEC0_RX2N	Receiver serial data -		1.8V
P76	TYPEC0_RX2P	Receiver serial data+		1.8V
P77	GND	Ground		0V
P78	TYPEC0_TX2P	Transmitter serial data +		1.8V
P79	TYPEC0_TX2N	Transmitter serial data -		1.8V
P80	GND	Ground		0V
P81	TYPEC1_RX1N	Receiver serial data -		1.8V
P82	TYPEC1_RX1P	Receiver serial data+		1.8V
P83	GND	Ground		0V
P84	TYPEC1_TX1P	Transmitter serial data +		1.8V
P85	TYPEC1_TX1N	Transmitter serial data -		1.8V
P86	GND	Ground		0V
P87	TYPEC1_RX2N	Receiver serial data -		1.8V
P88	TYPEC1_RX2P	Receiver serial data+		1.8V
P89	GND	Ground		0V
P90	TYPEC1_TX2P	Transmitter serial data +		1.8V
P91	TYPEC1_TX2N	Transmitter serial data -		1.8V

Pin	Signal	Function	Description / Alternate functions	IO Level
P92	GND	Ground		0V
P93	TYPEC1_AUXM	AUX differential Tx serial data		1.8V
P94	TYPEC1_AUXP	AUX differential Rx serial data		1.8V
P95	GND	Ground		0V
P96	PCIE_RX1_P	PCIe differential data input signal +		1.8V
P97	PCIE_RX1_N	PCIe differential data input signal -		1.8V
P98	GND	Ground		0V
P99	PCIE_TX1P	PCIe differential data output signal +		1.8V
P100	PCIE_TX1N	PCIe differential data output signal -		1.8V
P101	GND	Ground		0V
P102	PCIE_RX0_P	PCIe differential data input signal +		1.8V
P103	PCIE_RX0_N	PCIe differential data input signal -		1.8V
P104	GND	Ground		0V
P105	PCIE_TX0P	PCIe differential data output signal +		1.8V
P106	PCIE_TX0N	PCIe differential data output signal -		1.8V
P107	GND	Ground		0V
P108	PCIE_REF_CLKN	Reference clock -	PCIE_RCLK_100M_N	1.8V
P109	PCIE_REF_CLKP	Reference clock +	PCIE_RCLK_100M_P	1.8V
P110	GND	Ground		0V
P111	HOST0_DP	USB host 0 data +		1.8V
P112	HOST0_DM	USB host 0 data -		1.8V
P113	GND	Ground		0V
P114	HOST1_DP	USB host 1 data +		1.8V
P115	HOST1_DM	USB host 1 data -		1.8V
P116	GND	Ground		0V
P117	GND	Ground		0V
P118	WIFI_REG_ON_H	WIFI Regulators power EN	GPIO0_B2_d	1.8V
P119	WIFI_HOST_WAKE_L	WIFI to wake-up HOST	GPIO0_A3/SDIO0_WRPT_d	1.8V
P120	GPIO0_B3	GPIO		1.8V

Pin	Signal	Function	Description / Alternate functions	IO Level
P121	GPIO1_A1	GPIO	ISP0_SHUTTER_TRIG/ISP1_SHUTTER_TRIG/TCPD_CC0_VCONN_EN_d	1.8V
P122	SPI1_TXD	SPI serial data output	GPIO1_B0/SPI1_TXD/UART4_TX_u	1.8V
P123	I2C4_SDA	I2C data line	GPIO1_B3	1.8V
P124	I2C4_SCL	I2C serial clock line	GPIO1_B4	1.8V
P125	3V3_GPIO3_B2	GPIO3_B2_u	MAC_RXER/I2C5_SDA	3.3V
P126	GND	Ground		0V
P127	CIF_CLKOUT	Camera main clock output	GPIO2_B3/SPI2_CLK/VOP_DEn	1.8V
P128	GND	Ground		0V
P129	CIF_D2	Camera interface input pixel data	GPIO2_A2/VOP_D2	1.8V
P130	CIF_D5	Camera interface input pixel data	GPIO2_A5/VOP_D5	1.8V
P131	CIF_D3	Camera interface input pixel data	GPIO2_A3/VOP_D3	1.8V
P132	CIF_D4	Camera interface input pixel data	GPIO2_A4/VOP_D4	1.8V
P133	CIF_D6	Camera interface input pixel data	GPIO2_A6/VOP_D6	1.8V
P134	GND	Ground		0V
P135	I2C2_SDA	I2C data line	GPIO2_A0/VOP_D0/CIF_D0	1.8V
P136	I2C7_SDA	I2C data line	GPIO2_A7/VOP_D7/CIF_D7	1.8V
P137	CIF_PDN0	CIF power ON/OFF	GPIO2_B4/SPI2_CSn0_u	1.8V
P138	GND	Ground		0V
P139	GND	Ground		0V
P140	eDP_TX3P	eDP data lane positive output		1.8V
P141	eDP_TX3N	eDP data lane negative output		1.8V
P142	GND	Ground		0V
P143	eDP_TX2P	eDP data lane positive output		1.8V
P144	eDP_TX2N	eDP data lane negative output		1.8V
P145	GND	Ground		0V
P146	NC	Not connect		/
P147	NC	Not connect		/
P148	eDP_TX1P	eDP data lane positive output		1.8V

Pin	Signal	Function	Description / Alternate functions	IO Level
P149	eDP_TX1N	eDP data lane negative output		1.8V
P150	GND	Ground		0V
P151	eDP_TX0P	eDP data lane positive output		1.8V
P152	eDP_TX0N	eDP data lane negative output		1.8V
P153	GND	Ground		0V
P154	eDP_AXUP	eDP CH-AUX positive differential output		1.8V
P155	eDP_AXUN	eDP CH-AUX negative differential output		1.8V
P156	GND	Ground		0V
Pin	**Signal**	**Function**	**Description**	**IO Level**
S1	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
S2	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
S3	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
S4	VCC_SYS	Main Power Input	3.4-5.5V Wide power input	P
S5	VBuck	RTC Power Input	If not need, Can NC it.	3.0V
S6	GND	Ground		0V
S7	RTC_CLKO_WIFI	RTC CLK Output for WIFI	32.768KHz	1.8V
S8	GND	Ground		0V
S9	POWER_KEY	Key input	Single function	5V
S10	Reset_KEY	Key input	Single function	5V
S11	Reset_OUT	Main Reset Out	NC	/
S12	I2S0_SDO3	I2S serial data output	GPIO3_D4	1.8V
S13	I2S0_SCLK	I2S serial clock	GPIO3_D0	1.8V
S14	I2C1_SCLK	I2SC serial clock	GPIO4_A3	1.8V
S15	I2S1_SDI0	I2S serial data input	GPIO4_A6	1.8V
S16	I2S0_SDO2	I2S serial data output	GPIO3_D5_d /I2S0_SDI2SDO2	1.8V
S17	LCD_BL_PWM	Backlight PWM output	GPIO4_C2/PWM0/VOP0_PWM/ VOP1_PWM_d	3.0V
S18	I2S0_LRCK_RX	Left & right channel signal for receiving serial data	GPIO3_D1	1.8V
S19	3V_GPIO4_D0	GPIO4_D0_U	PCIE_CLKREQnB	3.0V
S20	PCIE_PRSNT		GPIO4_D6_d	3.0V
S21	3V_GPIO4_D2	GPIO	GPIO4_D2_d	3.0V
S22	GND	Ground		0V
S23	I2S_CLK	I2S clock	GPIO4_A0	1.8V
S24	GND	Ground		0V

Pin	Signal	Function	Description / Alternate functions	IO Level
S25	PCIE_PRSNT1#		GPIO4_D5_d	3.0V
S26	3V3_UART2_TX	UART serial data output		3.3V
S27	3V_GPIO4_D4	GPIO	GPIO4_D4_d	3.0V
S28	I2C_SDA_HDMI	I2C data line for HDMI	GPIO4_C0_u	3.0V
S29	HDMI_CEC	HDMI CEC signal	GPIO4_C7/EDP_HOTPLUG_u	3.0V
S30	GND	Ground		0V
S31	SDIO0_CLK	SDIO card clock	GPIO2_D1_u	1.8V
S32	GND	Ground		0V
S33	HDMI_HPD	HDMI hot plug detect input		3.3V
S34	GPIO2_D3	GIPO	SDIO0_PWREN_d	1.8V
S35	GPIO2_D4	GPIO	SDIO0_BKPWR_d	1.8V
S36	SDIO0_CMD	WIFI SDIO command output and response input	GPIO2_D0_u	1.8V
S37	SDIO0_D2	WIFI SDIO D2	GPIO2_C6/SPI5_CLK_u	1.8V
S38	SDIO0_D3	WIFI SDIO D3	GPIO2_C7/SPI5_CSn0_u	1.8V
S39	UART0_TXD	UART serial data output	GPIO2_C1_u	1.8V
S40	SDIO0_D0	WIFI SDIO D0	GPIO2_C4/SPI5_RXD_u	1.8V
S41	GND	Ground		0V
S42	MIPI_TX_D3N	MIPI DSI		1.8V
S43	MIPI_TX_D3P	MIPI DSI		1.8V
S44	GND	Ground		0V
S45	MIPI_TX_D2N	MIPI DSI		1.8V
S46	MIPI_TX_D2P	MIPI DSI		1.8V
S47	GND	Ground		0V
S48	MIPI_TX_CLKN	MIPI DSI Clock -		1.8V
S49	MIPI_TX_CLKP	MIPI DSI Clock +		1.8V
S50	GND	Ground		0V
S51	MIPI_TX_D1N	MIPI DSI		1.8V
S52	MIPI_TX_D1P	MIPI DSI		1.8V
S53	GND	Ground		0V
S54	MIPI_TX_D0N	MIPI DSI		1.8V
S55	MIPI_TX_D0P	MIPI DSI		1.8V
S56	GND	Ground		0V
S57	GND	Ground		0V
S58	VCC3V3_SYS	VCC_IO Output	For Peripheral used	3.3V
S59	VCC3V3_SYS	VCC_IO Output	For Peripheral used	3.3V
S60	VCC3V3_SYS	VCC_IO Output	For Peripheral used	3.3V
S61	VCC_EFUSE	eFuse program and sense power input	If not need, Can NC it.	1.8V
S62	VCC_EFUSE	eFuse program and sense power input	If not need, Can NC it.	1.8V

Pin	Signal	Function	Description / Alternate functions	IO Level
S63	GND	Ground		0V
S64	TYPEC0_AUXM	AUX differential Tx serial data		1.8V
S65	TYPEC0_AUXP	AUX differential Rx serial data		1.8V
S66	GND	Ground		0V
S67	TYPEC0_CC1	Configuration Channel1	NC it	/
S68	GND	Ground		0V
S69	TYPEC0_RCLKP	External reference clock	NC it	1.8V
S70	TYPEC0_RCLKN	External reference clock	NC it	1.8V
S71	GND	Ground		0V
S72	TYPEC0_CC2	Configuration Channel2	NC it	/
S73	GND	Ground		0V
S74	TYPEC0_DP	USB 2.0 data DP		1.8V
S75	TYPEC0_DM	USB 2.0 data DN		1.8V
S76	TYPEC1_DM	USB 2.0 data DN		1.8V
S77	TYPEC1_DP	USB 2.0 data DP		1.8V
S78	GND	Ground		0V
S79	ADKEY_IN	10bit ADC input signal	ADC_IN1	1.8V
S80	ADC_IN2	10bit ADC input signal	Need pull high.	1.8V
S81	ADC_IN3	10bit ADC input signal	Need pull high.	1.8V
S82	GND	Ground		0V
S83	TYPEC0_ID	USB 2.0 OTG ID detection	Input	3.3V
S84	TYPEC0_U2VBUS DET	VBUS BUMP into the PHY for VBUS monitor	TYPEC0 Vbus Input	3.3V
S85	GND	Ground		0V
S86	PCIE_RX3_N	PCIe differential data input signals		1.8V
S87	PCIE_RX3_P	PCIe differential data input signals		1.8V
S88	GND	Ground		0V
S89	PCIE_TX3P	PCIe differential data output signal		1.8V
S90	PCIE_TX3N	PCIe differential data output signal		1.8V
S91	GND	Ground		0V
S92	PCIE_RX2_N	PCIe differential data input signals		1.8V
S93	PCIE_RX2_P	PCIe differential data input signals		1.8V
S94	GND	Ground		0V

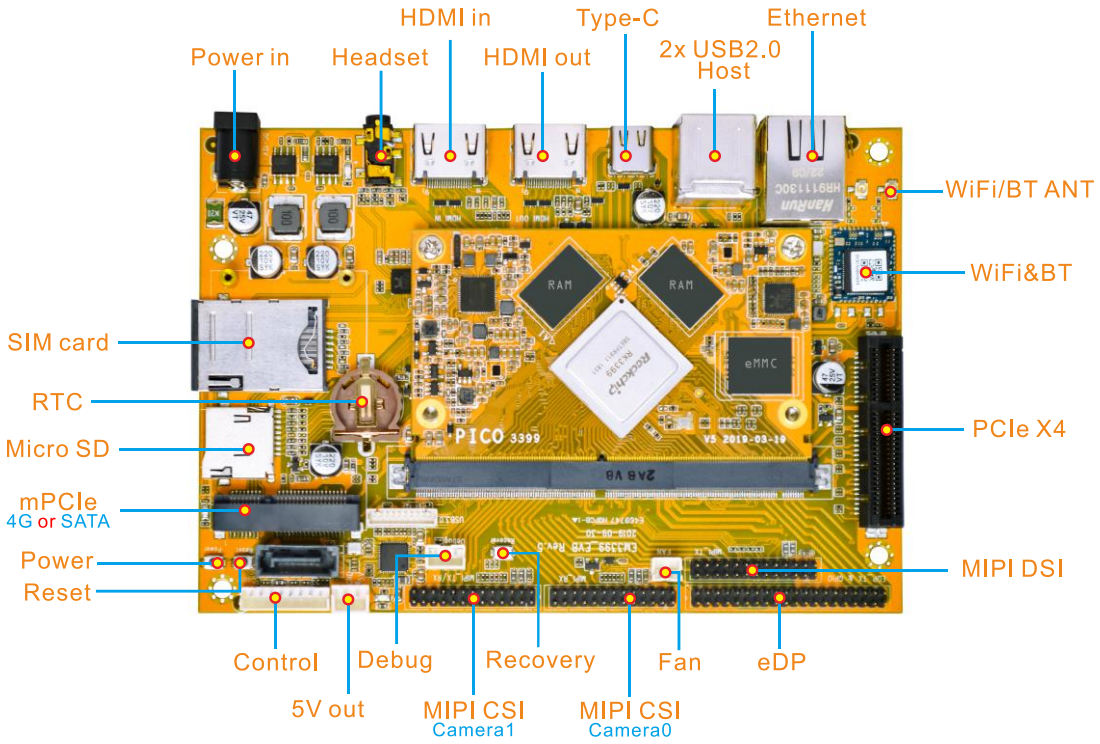
Pin	Signal	Function	Description / Alternate functions	IO Level
S95	PCIE_TX2P	PCIe differential data output signal		1.8V
S96	PCIE_TX2N	PCIe differential data output signal		1.8V
S97	GND	Ground		0V
S98	BT_HOST_WAKE_L	Bluetooth device to wake-up HOST	GPIO0_A4/SDIO0_INTn_d	1.8V
S99	SDMMC_D2	SDMMC card data input and output	GPIO4_B2/APJTAG_TCK_u	3.0V
S100	SDMMC_D0	SDMM card data input and output	GPIO4_B0/UART2A_RX_u	3.0V
S101	SDMMC_D1	SDMMC card data input and output	GPIO4_B1/UART2A_TX_u	3.0V
S102	SDMMC_CMD	SDMMC card command output and response input	GPIO4_B5/MCUJTAG_TMS_u	3.0V
S103	SDMMC0_DET_L	SDMMC card detect signal	GPIO0_A7_u	1.8V
S104	GND	Ground		0V
S105	SDMMC_CLK	SDMMC card clock	GPIO4_B4/MUCJTAG_TCK_d	3.0V
S106	GND	Ground		0V
S107	BT_REG_ON_H	Regulators power enable/disable	GPIO0_B1/PMUIO2_VOLSEL_d	1.8V
S108	SDMMC_D3	SDMMC card data input and output	GPIO4_B3/APJTAG_TMS_u	3.0V
S109	GPIO0_B0	GPIO	SDMMC0_WRPT/TEST_CLKOUT2_u	1.8V
S110	GPIO0_B5	GPIO	TCPD_VBUS_FDIS/TCPD_VBUS_SOURCE3_d	1.8V
S111	GPIO1_A4	GPIO	ISP0_PRELIGHT_TRIG/ISP1_PRELIGHT_TRIG_d	1.8V
S112	GPIO1_A2	GPIO	ISP0_FLASHTRIGIN/ISP1_FLASHTRIGIN/TCPD_CC1_VCONN_EN_d	1.8V
S113	GPIO1_A0	GPIO	ISP0_SHUTTER_EN/ISP1_SHUTTER_EN/TCPD_VBUS_SINK_EN_d	1.8V
S114	GPIO0_A6	GPIO	PWM3A_IR_d	1.8V
S115	GPIO1_A3	GPIO	ISP0_FLASHTRIGOUT/ISP1_FLASHTRIGOUT_d	1.8V
S116	SDMMC0_PWR_H		GPIO0_A1/DDRIO_PWROFF/TCPD_CCDB_EN_u	1.8V
S117	GND	Ground		0V

Pin	Signal	Function	Description / Alternate functions	IO Level
S118	SPI1_CLK	SPI serial clock	GPIO1_B1/PMCU_JTAG_TCK_u	1.8V
S119	SPI1_CSn0	SPI first chip select signal	GPIO1_B2/PMCU_JTAG_TMS_u	1.8V
S120	PCIE_PERST#		GPIO1_C2/SPI3_CSn0_u	1.8V
S121	PCIE_WAKE#		GPIO1_B5_d	1.8V
S122	GND	Ground		0V
S123	RK3399_26M_OUT	Cannot use for WIFI	GPIO0_A2_d	1.8V
S124	GND	Ground		0V
S125	SPI1_RXD	SPI serial data input	GPIO1_A7/UART4_RX_u	1.8V
S126	OTP_OUT_H	Over temperature signal out	GPIO1_A6/TSADC_INT_z	1.8V
S127	GPIO1_C6	GPIO	TCPD_VBUS_SOURCE0_d	1.8V
S128	GPIO1_D0	GPIO	TCPD_VBUS_SOURCE2_d	1.8V
S129	VCCA1V8_CODEC	Codec Power output	APIO5_VDDPST Max 300mA	1.8V
S130	GND	Ground		0V
S131	GND	Ground		0V
S132	I2C2_SCL	I2C serial clock line	GPIO2_A1/VOP_D1/CIF_D1	1.8V
S133	I2C7_SCL	I2C serial clock line	GPIO2_B0/VOP_CLK/CIF_VSYNC	1.8V
S134	I2C6_SDA	I2C data line	GPIO2_B1/SPI2_RXD/CIF_HREF	1.8V
S135	I2C6_SCL	I2C serial clock line	GPIO2_B2/SPI2_TXD/CIF_CLKIN	1.8V
S136	GND	Ground		0V
S137	GND	Ground		0V
S138	SPDIF_TX	S/PDIF biphase data output	GPIO3_C0/MAC_COL/UART3_CTSn	3.3V
S139	GND	Ground		0V
S140	GND	Ground		0V
S141	LED0_AD0	Ethernet Link LED	PHYAD0	3.3V
S142	LED1_AD1	Ethernet Speed LED	PHYAD1	3.3V
S143	LED2_RXDLY	Receiver Clock Timing Control		3.3V
S144	GND	Ground		0V
S145	MDI0-	100M/1G Ethernet MDI0-		3.3V
S146	MDI0+	100M/1G Ethernet MDI0+		3.3V
S147	GND	Ground		0V
S148	NC	Not connect		/
S149	NC	Not connect		/
S150	MDI1-	100M/1G Ethernet MDI1-		3.3V
S151	MDI1+	100M/1G Ethernet MDI1+		3.3V

Pin	Signal	Function	Description / Alternate functions	IO Level
S152	GND	Ground		0V
S153	MDI2-	100M/1G Ethernet MDI2-		3.3V
S154	MDI2+	100M/1G Ethernet MDI2+		3.3V
S155	GND	Ground		0V
S156	MDI3-	100M/1G Ethernet MDI3-		3.3V
S157	MDI3+	100M/1G Ethernet MDI3+		3.3V
S158	GND	Ground		0V

Note: Most of pin is 1.8V I/O. except the Schematic marked 3.0V/3.3 parts.

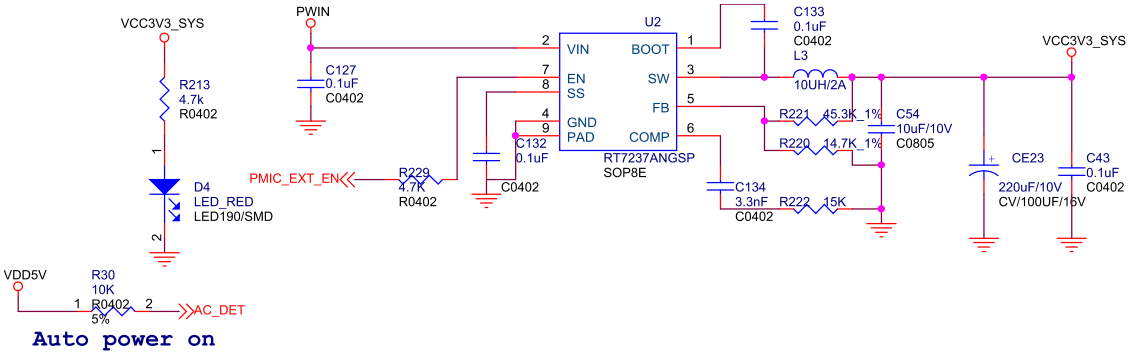
1.5 Baseboard (EM3399)



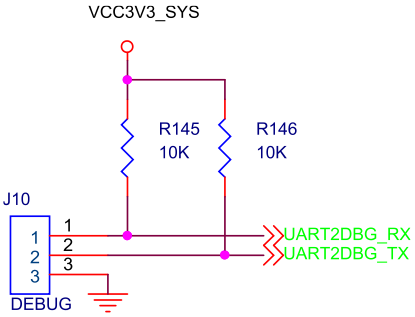
2 Hardware Design Guide

2.1 Peripheral Circuit Reference

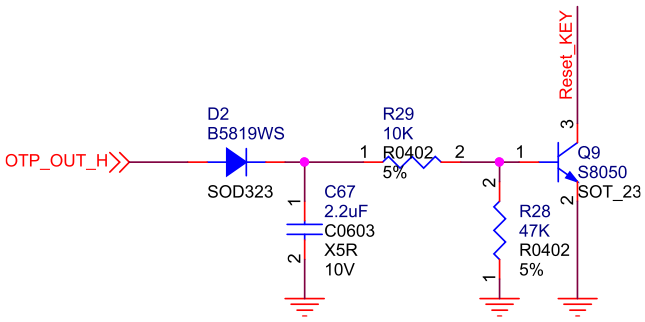
2.1.1 External Power and AC_Det Part Circuit



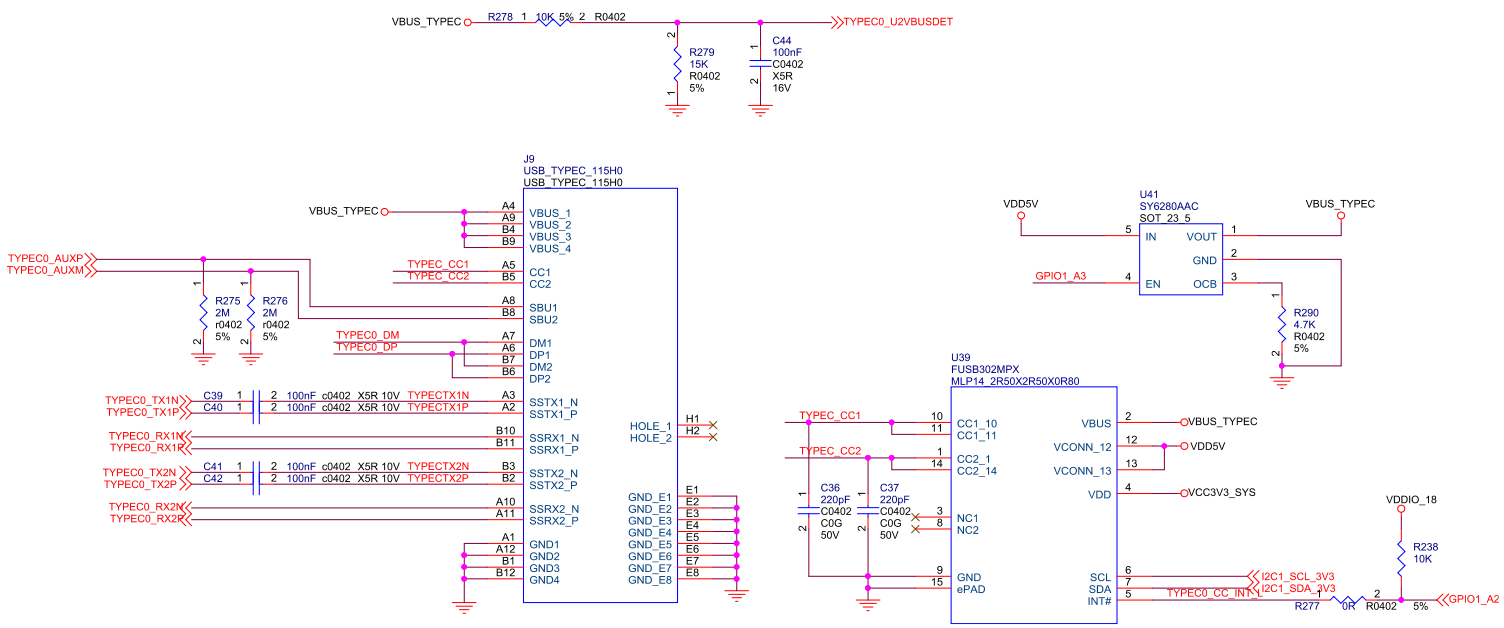
2.1.2 Debug Circuit



2.1.3 Software Over Temperature Protect Circuit

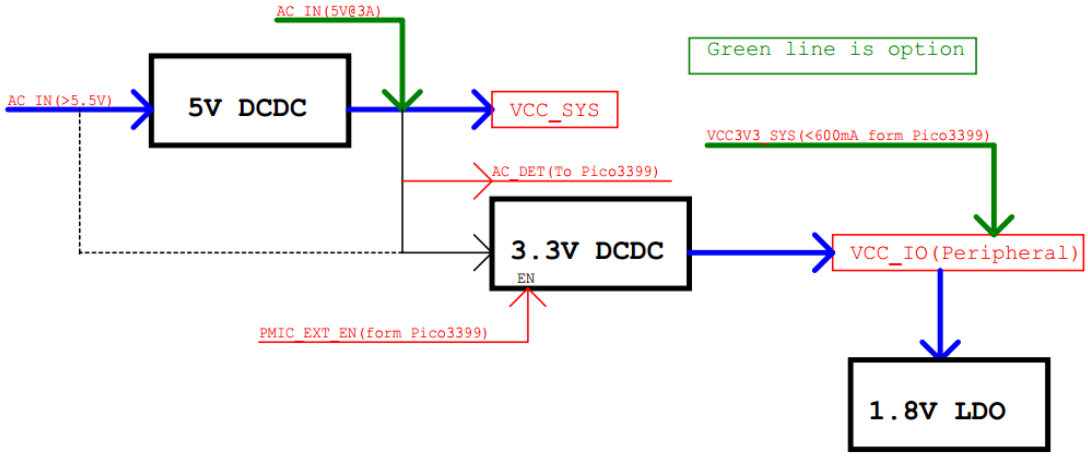


2.1.4 Type-C Interface Circuit

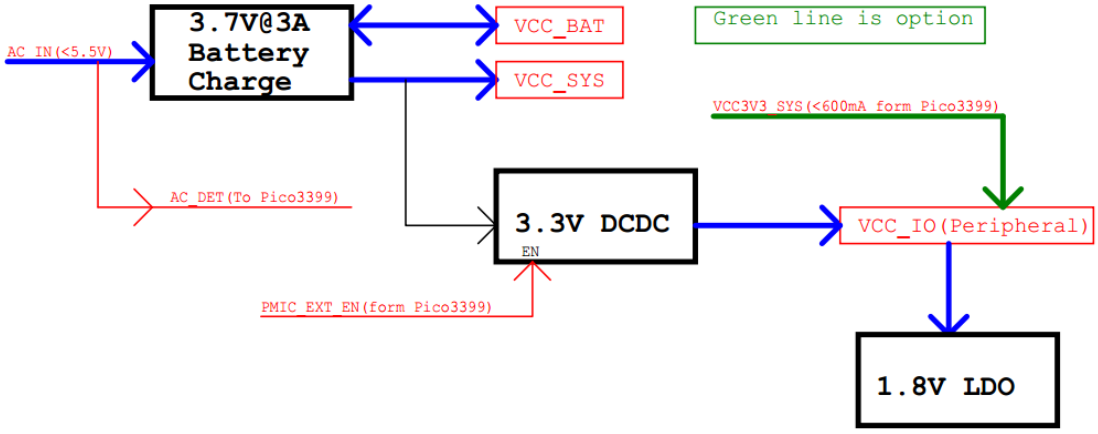


2.2 Power Topology Reference

2.2.1 AC Input Only



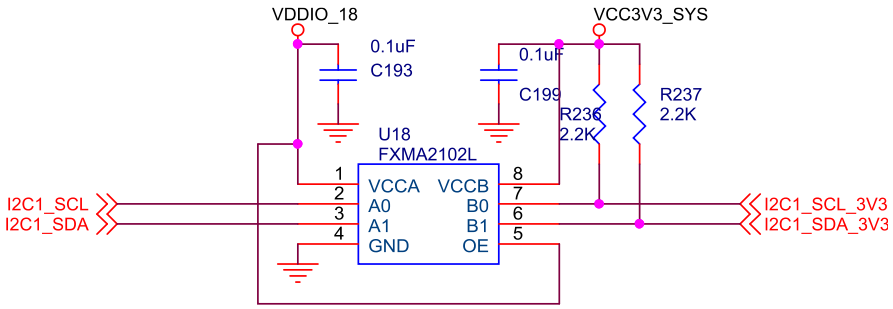
2.2.2 3.7V Battery Input



If used 2-4 Cell battery, the solution **BQ25700A+ CW2015CSAD+ NB679GD** is recommended.

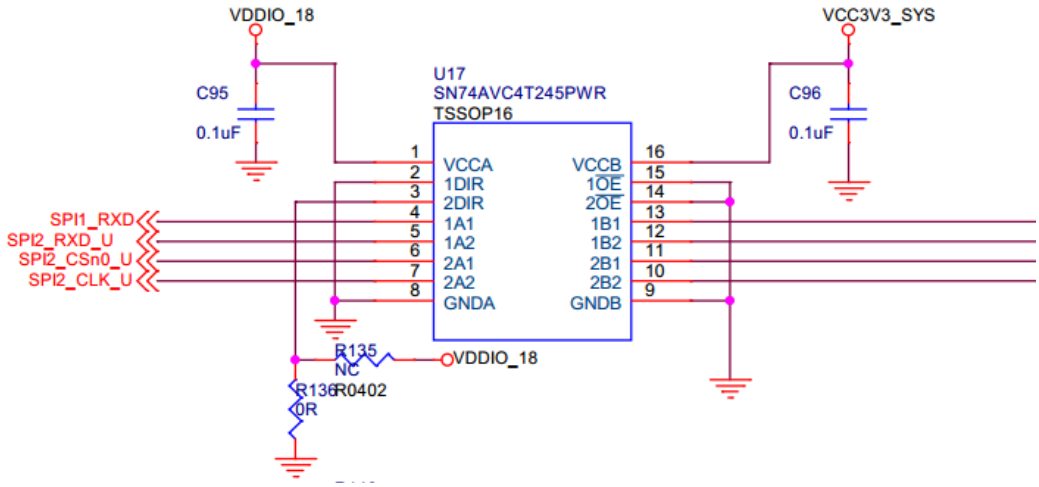
2.3 GPIO Level-shift Reference

2.3.1 UART or I2C Circuit



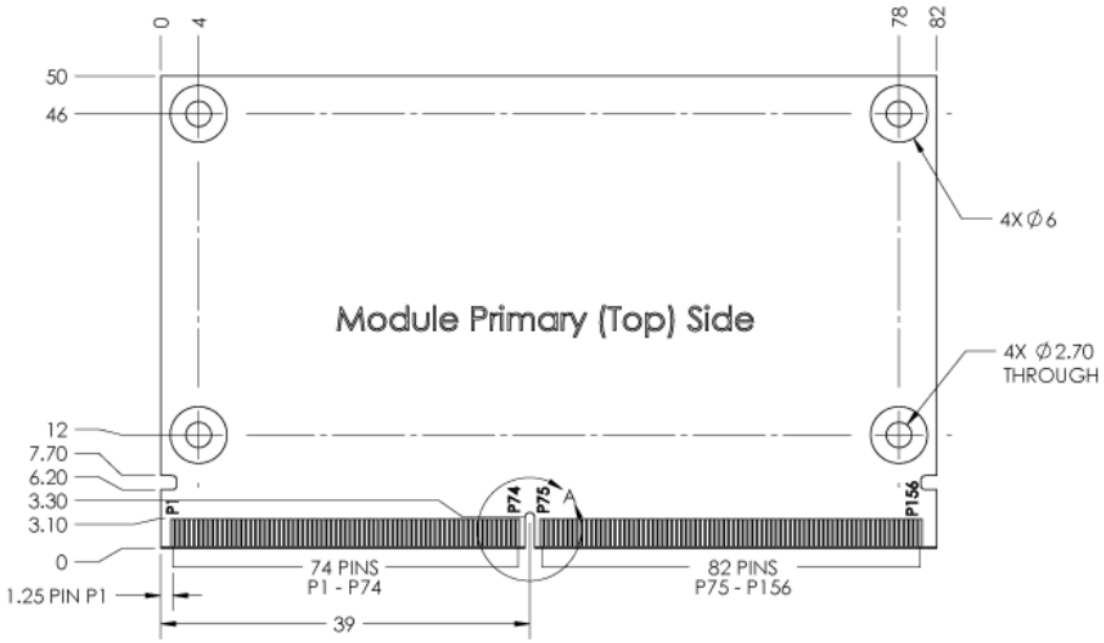
I2C Level Shift

2.3.2 GPIO or SPI Circuit

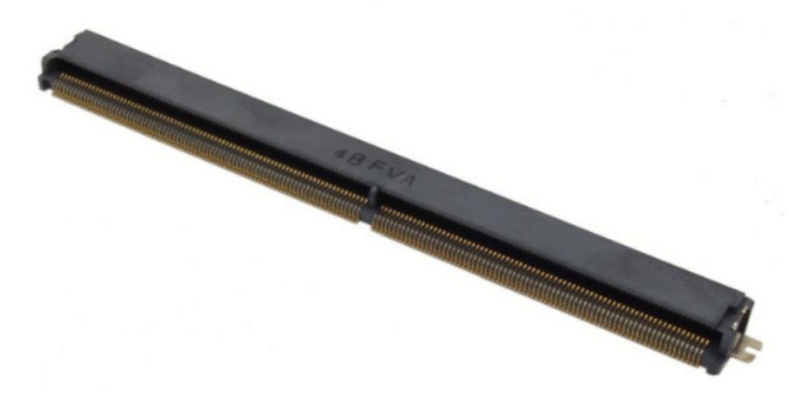


2.4 Dimensions and Footprint

2.4.1 Mechanical Specifications

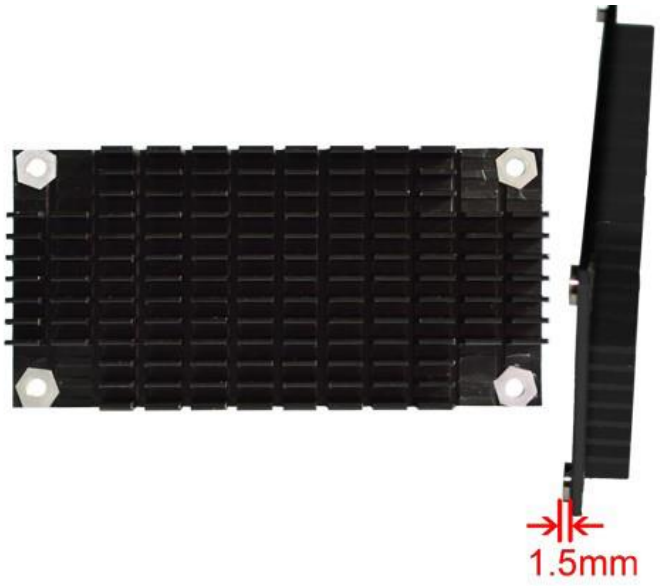


2.4.2 B2B Connector Specifications



MXM 3.0 314Pin connector (Foxconn AS0B821-S43B-7H)

2.4.3 Heat Sink Attachment Option



3 Electric Property and Certifications

3.1 Electric property

3.1.1 Dissipation and Temperature

Symbol	Parameter		Min	Typ	Max	Unit
VCC_SYS	System Voltage		3.4	5	5.5	V
VCC3V3_SYS	IO Voltage		3.3-5%	3.3	3.3+5%	V
Vrvpp	Max ripple Voltage				0.15	V
Isys_max	VCC_SYS input Max			1080	2450	mA
Ivio_max	VCC3V3_SYS output Max			500	650	mA
VCC_RTC(I)	RK808 Integrates		2.5	3.3	5.5	V
Iirtc	I-RTC Current			35	60	uA
VCC_RTC(E)	*External RTC IC*		*1.8*	*3*	*3.6*	*V*
Iertc	*E-RTC Current*				*8*	*uA*
Ta	Operating Temperature	Commercial	0	NA	70	°C
		Extended Commercial	-20	NA	85	°C
Tstg	Storage Temperature		-40	NA	85	°C

Grey color parts are not preinstalled.

3.1.2 Reliability of Test

High Temperature Operating Test		
Contents	Operating 8H in high temperature	55°C ± 2°C
Result	Pass	

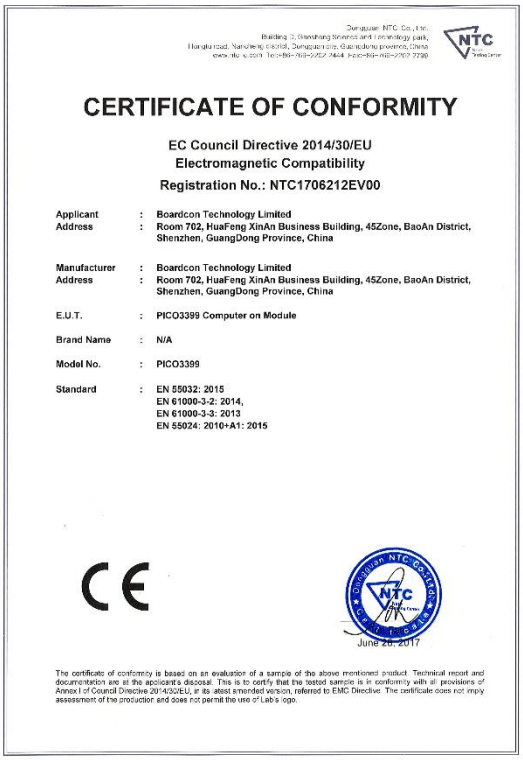
Operating life Test		
Contents	Operating in room	120h
Result	Pass	

3.2 Certifications

3.2.1 Environmental Testing

The module conforms to ROHS.

3.2.2 Certifications



Dongguan NTC Co., Ltd.
Building 3, Shenzhong Science and Technology park,
Hongfa road, Nanzheng district, Dongguan city, Guangdong province, China
www.ntc-a.com Tel:+86-769-3272 7444 Fax:+86-769-2202 2799

CERTIFICATE OF CONFORMITY

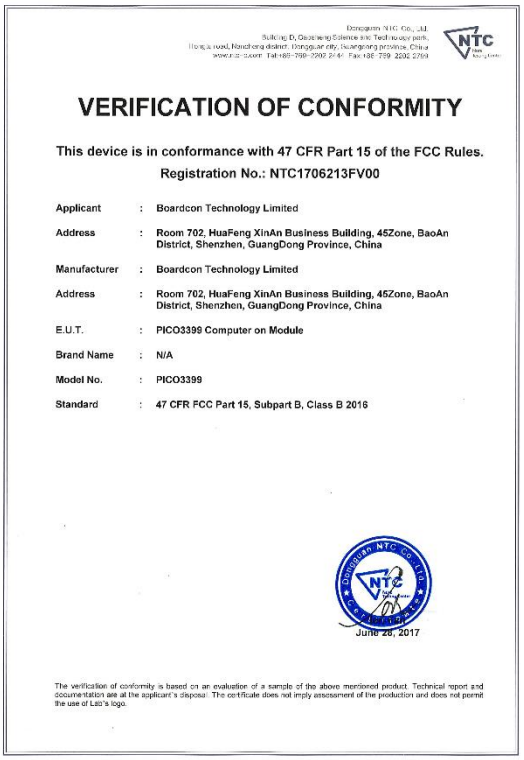
EC Council Directive 2014/30/EU
Electromagnetic Compatibility
Registration No.: NTC1706212EV00

Applicant	:	Boardcon Technology Limited
Address	:	Room 702, HuaFeng XinAn Business Building, 45Zone, BaoAn District, Shenzhen, GuangDong Province, China
Manufacturer	:	Boardcon Technology Limited
Address	:	Room 702, HuaFeng XinAn Business Building, 45Zone, BaoAn District, Shenzhen, GuangDong Province, China
E.U.T.	:	PICO3399 Computer on Module
Brand Name	:	N/A
Model No.	:	PICO3399
Standard	:	EN 55032: 2015 EN 61000-3-2: 2014, EN 61000-3-3: 2013 EN 55024: 2010+A1: 2015

CE

June 26, 2017

The certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical report and documentation are at the applicant's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2014/30/EU, or its latest amended version, referred to EMC Directive. The certificate does not imply assessment of the production and does not permit the use of Lab's logo.



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VERIFICATION OF CONFORMITY

This device is in conformance with 47 CFR Part 15 of the FCC Rules.
Registration No.: NTC1706213FV00

Applicant	:	Boardcon Technology Limited
Address	:	Room 702, HuaFeng XinAn Business Building, 45Zone, BaoAn District, Shenzhen, GuangDong Province, China
Manufacturer	:	Boardcon Technology Limited
Address	:	Room 702, HuaFeng XinAn Business Building, 45Zone, BaoAn District, Shenzhen, GuangDong Province, China
E.U.T.	:	PICO3399 Computer on Module
Brand Name	:	N/A
Model No.	:	PICO3399
Standard	:	47 CFR FCC Part 15, Subpart B, Class B 2016

June 26, 2017

The verification of conformity is based on an evaluation of a sample of the above mentioned product. Technical report and documentation are at the applicant's disposal. The certificate does not imply assessment of the production and does not permit the use of Lab's logo.