



uCOM-Q6490

SMARC Module

User's Manual 1st Ed

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Packing List

Before setting up your product, please make sure the following items have been shipped:

Item		Quantity
● uCOM-Q6490		1

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page on AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls.
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running.
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -40°C (-40°F) OR ABOVE 85°C (185°F) TO PREVENT DAMAGE.**

FCC Statement

Warning!



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

*Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur.
Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.*

产品中有毒有害物质或元素名称及含量

AAEON 主板/子板/背板

QO4-381 Rev.A2

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
本表格依据 SJ/T 11364 的规定编制。 ○：表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572标准规定的限量要求以下。 ×：表示该有害物质的某一均质材料超出了GB/T 26572的限量要求，然而该部件仍符合欧盟指令2011/65/EU 的规范。 环保使用期限(EFUP (Environmental Friendly Use Period))：10年 备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。						

China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON Main Board/Daughter Board/Backplane

QO4-381 Rev.A2

Part Name	Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
PCB Assemblies	×	○	○	○	○	○
Connector and Cable	×	○	○	○	○	○
The table is prepared in accordance with the provisions of SJ/T 11364. ○: Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572. ×: Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1). EFUP (Environment Friendly Use Period) value: 10 years Notes: This product defined period of use is under normal condition.						

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Chapter 1

Product Specifications

1.1 Specifications

System

Form Factor	SMARC 2.1 Compliant
CPU	Qualcomm Dragonwing™ QCS6490 built on Arm® v8 Cortex® technology 8-core Qualcomm® Kryo™ 670 CPU, up to 2.7 GHz
Chipset	—
Memory	Onboard LPDDR5, up to 16GB
Storage	SDIO 3.0 x 1 (for SD Card) UFS, up to 64GB
BIOS	—
MTBF (Hours)	3,050,991
Wake on LAN	—
Watchdog Timer	—
Real Time Clock	Yes
Boot Select	Module UFS
Security	—

Display

Graphics Controller	Qualcomm® Adreno™ 643 GPU, up to 812 MHz
Video Output	DP x 1 (2K @60Hz)

I/O

Ethernet	Gigabit Ethernet x 2
USB	USB 2.0 x 4 USB 3.1 x 1

I/O

Serial Port	UART x 2 (4-wire, 1.8V)
	UART x 2 (2-wire, 1.8V, one for debug port)
Audio	I2S x 1
PCIE	PCle 3.0 [x1] x 1
CANBus	—
MIPI-CSI	—
GPIO	GPIO 14-bit (one for PWM)
Other Interfaces	SPI x 2
	I2C x 3

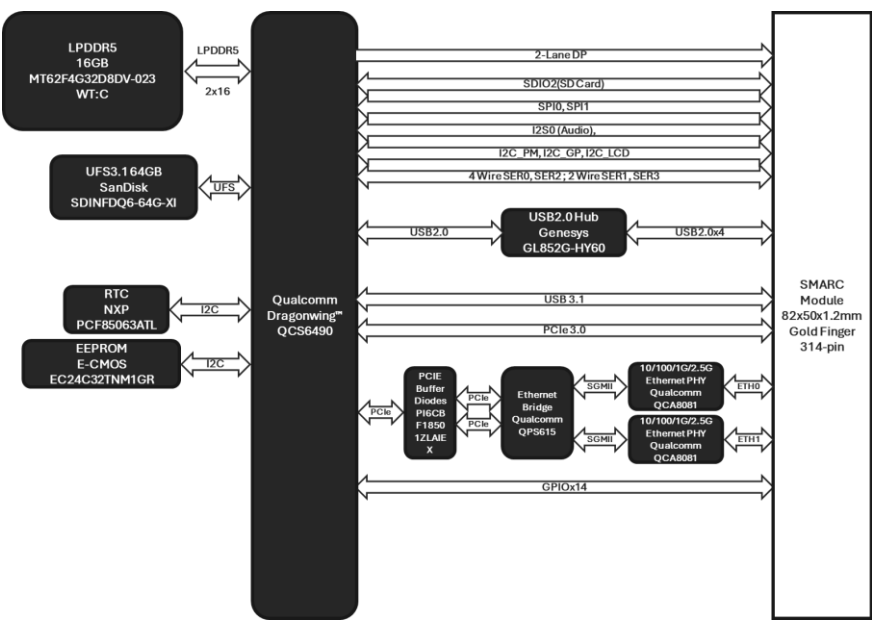
Power

Power Requirement	DC 3V – 5.25V, AT
Power Consumption	33.12W

Environmental

Dimensions	3.23" x 1.97" (82mm x 50mm)
Weight	0.0625 lb (0.02 kg)
Operating Temperature	32°F – 140°F (0 – 60°C)
	-40°F – 185°F (-40°C – 85°C), by request
Storage Temperature	-40°F – 185°F (-40°C – 85°C)
Operating Humidity	0% – 95% relative humidity, non-condensing
Certification	CE/FCC Class A
OS Support	QC Linux (kernel 6.6.97)
Support Protocol	—

1.2 Block Diagram

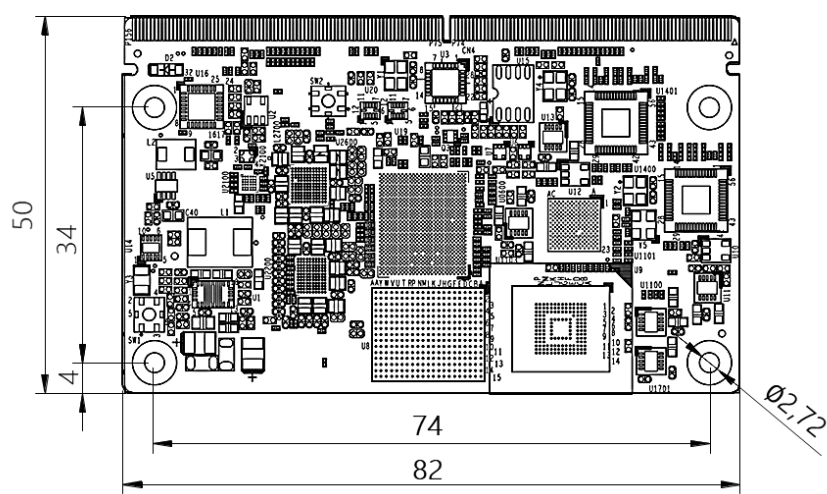


Chapter 2

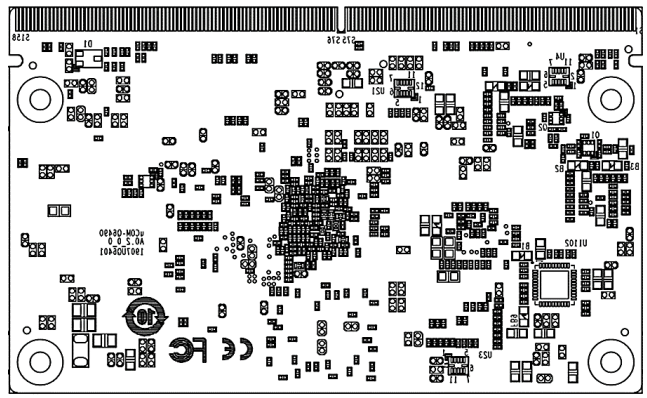
Hardware Information

2.1 Dimensions

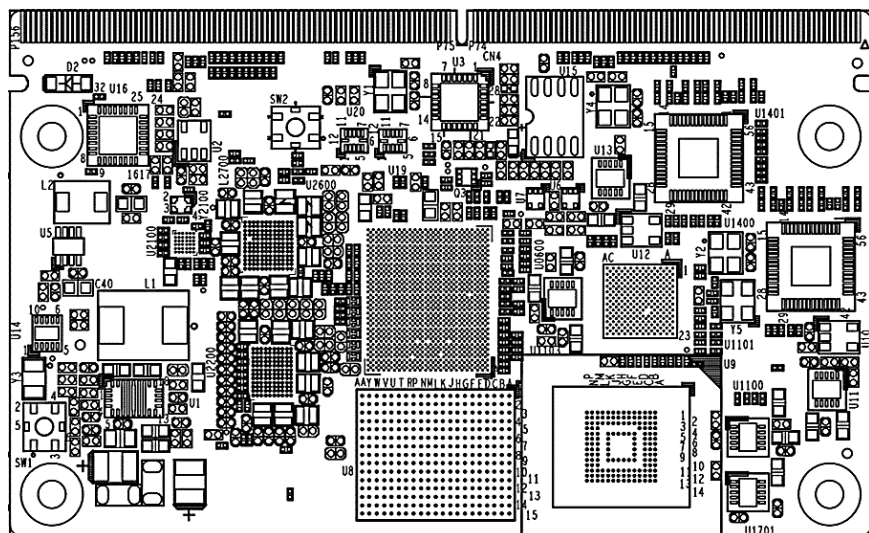
Top Side



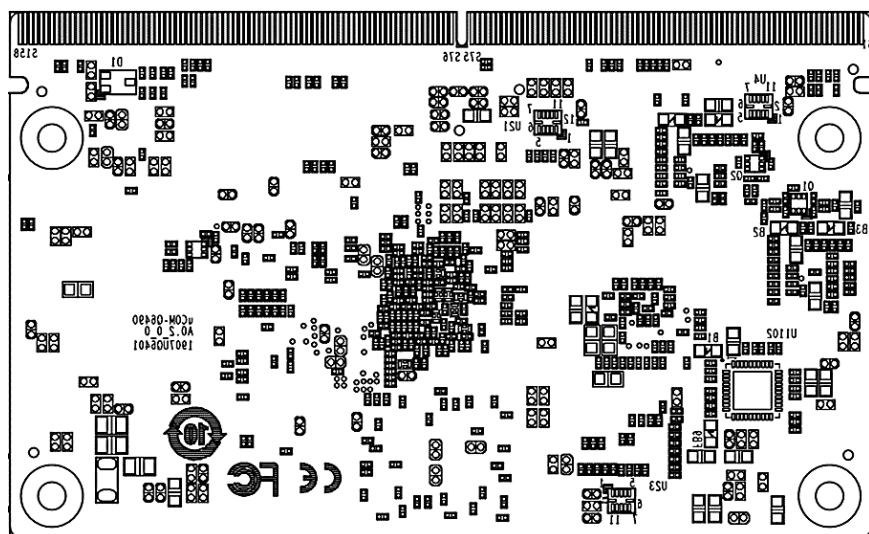
Bottom Side



Top Side



Bottom Side



2.3 MXM Gold Finger (CN1)

Pin	Pin Name	Pin	Pin Name
P1	NC	S1	I2C_CAM1_CK
P2	GND	S2	I2C_CAM1_DAT
P3	CSI1_CK+	S3	GND
P4	CSI1_CK-	S4	NC
P5	GBE1_SDP	S5	I2C_CAM0_CK
P6	GBE0_SDP	S6	CAM_MCK
P7	CSI1_RX0+	S7	I2C_CAM0_DAT
P8	CSI1_RX0-	S8	CSI0_CK+
P9	GND	S9	CSI0_CK-
P10	CSI1_RX1+	S10	GND
P11	CSI1_RX1-	S11	CSI0_RX0+
P12	GND	S12	CSI0_RX0-
P13	CSI1_RX2+	S13	GND
P14	CSI1_RX2-	S14	CSI0_RX1+
P15	GND	S15	CSI0_RX1-
P16	CSI1_RX3+	S16	GND
P17	CSI1_RX3-	S17	GBE1_MDI0+
P18	GND	S18	GBE1_MDI0-
P19	GBE0_MDI3-	S19	GBE1_LINK_MID#
P20	GBE0_MDI3+	S20	GBE1_MDI1+
P21	GBE0_LINK_MID#	S21	GBE1_MDI1-
P22	GBE0_LINK_MAX#	S22	GBE1_LINK_MAX#
P23	GBE0_MDI2-	S23	GBE1_MDI2+
P24	GBE0_MDI2+	S24	GBE1_MDI2-
P25	GBE0_LINK_ACT#	S25	GND
P26	GBE0_MDI1-	S26	GBE1_MDI3+
P27	GBE0_MDI1+	S27	GBE1_MDI3-
P28	GBE0_CTREF	S28	GBE1_CTREF
P29	GBE0_MDI0-	S29	NC
P30	GBE0_MDI0+	S30	NC
P31	SPIO_CS1#	S31	GBE1_LINK_ACT#
P32	GND	S32	NC
P33	SDIO_WP	S33	NC
P34	SDIO_CMD	S34	GND
P35	SDIO_CD#	S35	USB4+
P36	SDIO_CK	S36	USB4-
P37	SDIO_PWR_EN	S37	USB3_VBUS_DET

Pin	Pin Name	Pin	Pin Name
P38	GND	S38	AUDIO_MCK
P39	SDIO_D0	S39	I2S0_LRCK
P40	SDIO_D1	S40	I2S0_SDOUT
P41	SDIO_D2	S41	I2S0_SDIN
P42	SDIO_D3	S42	I2S0_CK
P43	SPI0_CS0#	S43	NC
P44	SPI0_CK	S44	NC
P45	SPI0_DIN	S45	NC
P46	SPI0_DO	S46	NC
P47	GND	S47	GND
P48	NC	S48	I2C_GP_CK
P49	NC	S49	I2C_GP_DAT
P50	GND	S50	I2S2_LRCK
P51	NC	S51	I2S2_SDOUT
P52	NC	S52	I2S2_SDIN
P53	GND	S53	I2S2_CK
P54	SPI1_CS0#	S54	NC
P55	SPI1_CS1#	S55	NC
P56	SPI1_CK	S56	NC
P57	SPI1_DIN	S57	NC
P58	SPI1_DO	S58	NC
P59	GND	S59	NC
P60	USB0+	S60	NC
P61	USB0-	S61	GND
P62	USB0_EN_OC#	S62	USB3_SSTX+
P63	USB0_VBUS_DET	S63	USB3_SSTX-
P64	USB0_OTG_ID	S64	GND
P65	USB1+	S65	USB3_SSRX+
P66	USB1-	S66	USB3_SSRX-
P67	USB1_EN_OC#	S67	GND
P68	GND	S68	USB3+
P69	USB2+	S69	USB3-
P70	USB2-	S70	GND
P71	USB2_EN_OC#	S71	NC
P72	NC	S72	NC
P73	NC	S73	GND
P74	USB3_EN_OC#	S74	NC
P75	PCIE_A_RST#	S75	NC
P76	USB4_EN_OC#	S76	NC

Pin	Pin Name	Pin	Pin Name
P77	NC	S77	NC
P78	PCIE_A_CKREQ#	S78	NC
P79	GND	S79	NC
P80	NC	S80	GND
P81	NC	S81	NC
P82	GND	S82	NC
P83	PCIE_A_REFCK+	S83	GND
P84	PCIE_A_REFCK-	S84	NC
P85	GND	S85	NC
P86	PCIE_A_RX+	S86	GND
P87	PCIE_A_RX-	S87	NC
P88	GND	S88	NC
P89	PCIE_A_TX+	S89	GND
P90	PCIE_A_TX-	S90	NC
P91	GND	S91	NC
P92	NC	S92	GND
P93	NC	S93	DP0_LANE0+
P94	GND	S94	DP0_LANE0-
P95	NC	S95	DP0_AUX_SEL
P96	NC	S96	DP0_LANE1+
P97	GND	S97	DP0_LANE1-
P98	NC	S98	DP0_HPD
P99	NC	S99	NC
P100	GND	S100	NC
P101	NC	S101	GND
P102	NC	S102	NC
P103	GND	S103	NC
P104	NC	S104	USB3_OTG_ID
P105	NC	S105	DP0_AUX+
P106	NC	S106	DP0_AUX-
P107	NC	S107	LCD1_BKLT_EN
P108	GPIO0/CAM0_PWR#	S108	DSI1_CLK+
P109	GPIO1/CAM1_PWR#	S109	DSI1_CLK-
P110	GPIO2/CAM0_RST#	S110	GND
P111	GPIO3/CAM1_RST#	S111	DSI1_D0+
P112	GPIO4/HDA_RST#	S112	DSI1_D0-
P113	GPIO5/PWM_OUT	S113	DSI1_TE
P114	GPIO6/TACHIN	S114	DSI1_D1+
P115	GPIO7	S115	DSI1_D1-

Pin	Pin Name	Pin	Pin Name
P116	GPIO8	S116	LCD1_VDD_EN
P117	GPIO9	S117	DSI1_D2+
P118	GPIO10	S118	DSI1_D2-
P119	GPIO11	S119	GND
P120	GND	S120	DSI1_D3+
P121	I2C_PM_CK	S121	DSI1_D3-
P122	I2C_PM_DAT	S122	LCD1_BKLT_PWM
P123	BOOT_SEL0#	S123	GPIO13
P124	BOOT_SEL1#	S124	GND
P125	BOOT_SEL2#	S125	NC
P126	RESET_OUT#	S126	NC
P127	RESET_IN#	S127	NC
P128	POWER_BTN#	S128	NC
P129	SER0_TX	S129	NC
P130	SER0_RX	S130	GND
P131	SER0_RTS#	S131	NC
P132	SER0_CTS#	S132	NC
P133	GND	S133	NC
P134	SER1_TX	S134	NC
P135	SER1_RX	S135	NC
P136	SER2_TX	S136	GND
P137	SER2_RX	S137	NC
P138	SER2_RTS#	S138	NC
P139	SER2_CTS#	S139	I2C_LCD_CK
P140	SER3_TX	S140	I2C_LCD_DAT
P141	SER3_RX	S141	NC
P142	GND	S142	GPIO12
P143	NC	S143	GND
P144	NC	S144	NC
P145	NC	S145	WDT_TIME_OUT#
P146	NC	S146	PCIE_WAKE#
P147	VDD_IN	S147	VDD_RTC
P148	VDD_IN	S148	LID#
P149	VDD_IN	S149	SLEEP#
P150	VDD_IN	S150	VIN_PWR_BAD#
P151	VDD_IN	S151	CHARGING#
P152	VDD_IN	S152	CHARGER_PRSENT#
P153	VDD_IN	S153	CARRIER_STBY#
P154	VDD_IN	S154	CARRIER_PWR_ON

Pin	Pin Name	Pin	Pin Name
P155	VDD_IN	S155	FORCE_RECOV#
P156	VDD_IN	S156	BATLOW#
		S157	TEST#
		S158	GND