User Manual

IXM6490

Prepared by:

INVIXIUM Engineering
25-November-2024

Version 1.1

Document Objective

The User Manual describes the overview of the product. It includes mechanical specifications and functional specifications.

Images shown in this document are shown for Illustrations and might look different from the actual product.

Revision History

Version	Description of Change	Author	Reviewed By	Date (DD/MM/YYYY)
1.0	First Version	INVIXIUM Engineering	INVIXIUM Engineering	25/11/2024
1.1	Minor Updates	INVIXIUM Engineering	INVIXIUM Engineering	09/12/2024

Table of Contents

1. Introduction

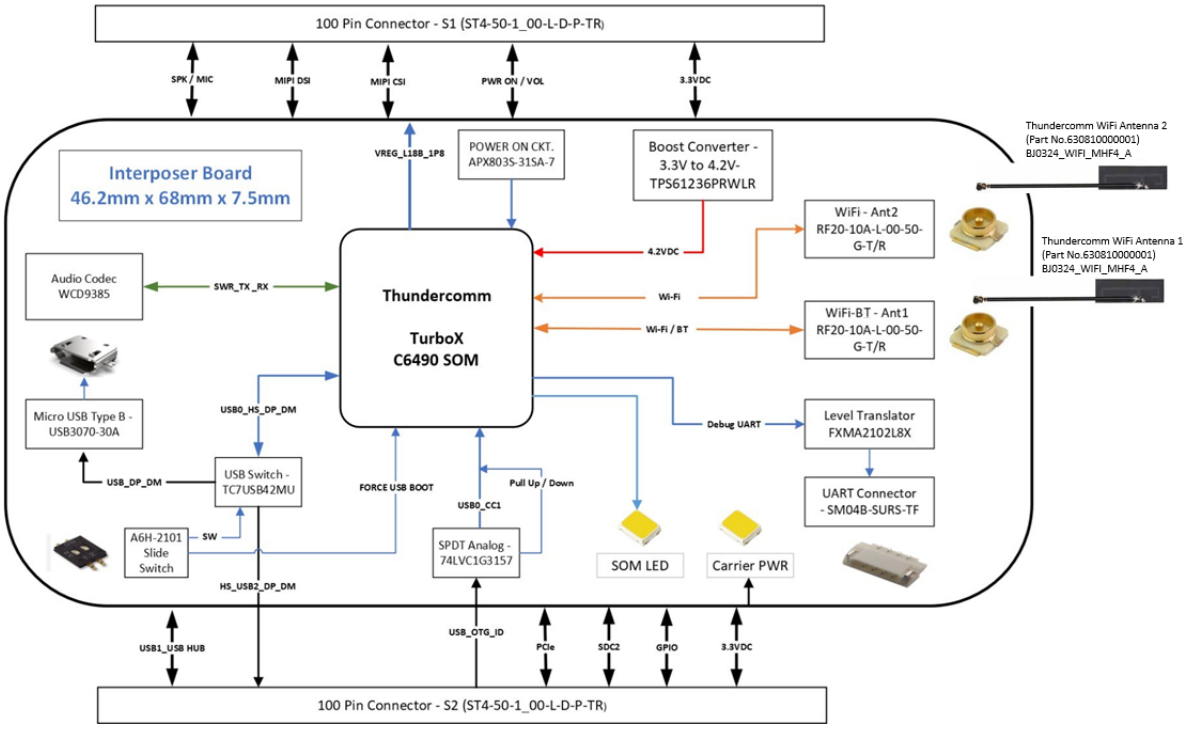
INVIXIUM has designed IXM6490 SOM board using Thundercomm TurboX C6490 SOM for its access control products. This IXM6490 SOM will be used in INVIXIUM fingerprint and face based access control products.

This board has the following features:

- It is powered on 3.3VDC.
- It has TurboX C6490 SOM with Qualcomm® Snapdragon ™ QCS6490, a 6 nm processor with superior performance and power efficiency, as well as high AI capability (12.5 TOPS).
- It supports Wi-Fi 6E with DBS & Long-Range Bluetooth and is featured with 5 x 4 -lane MIPI CSI D -PHY (2 of them compatible to support 3 -lane MIPI CSI C -PHY which is up to 48M camera).
- It also has a rich set of peripheral interfaces, including both USB 3.1 and USB 2.0 concurrency and PCIe.
- It has two antenna connectors.
- It has two 100 pin connectors to mount on other board.

2. IXM6490 SOM Block Diagram

Below is the block diagram of IXM6490 SOM. It has Thundercomm TurboX C6490 SOM mounted on it. Also, this board has two connectors of 100 pins each to connect with main board. It has connector for debugging and flashing purpose.



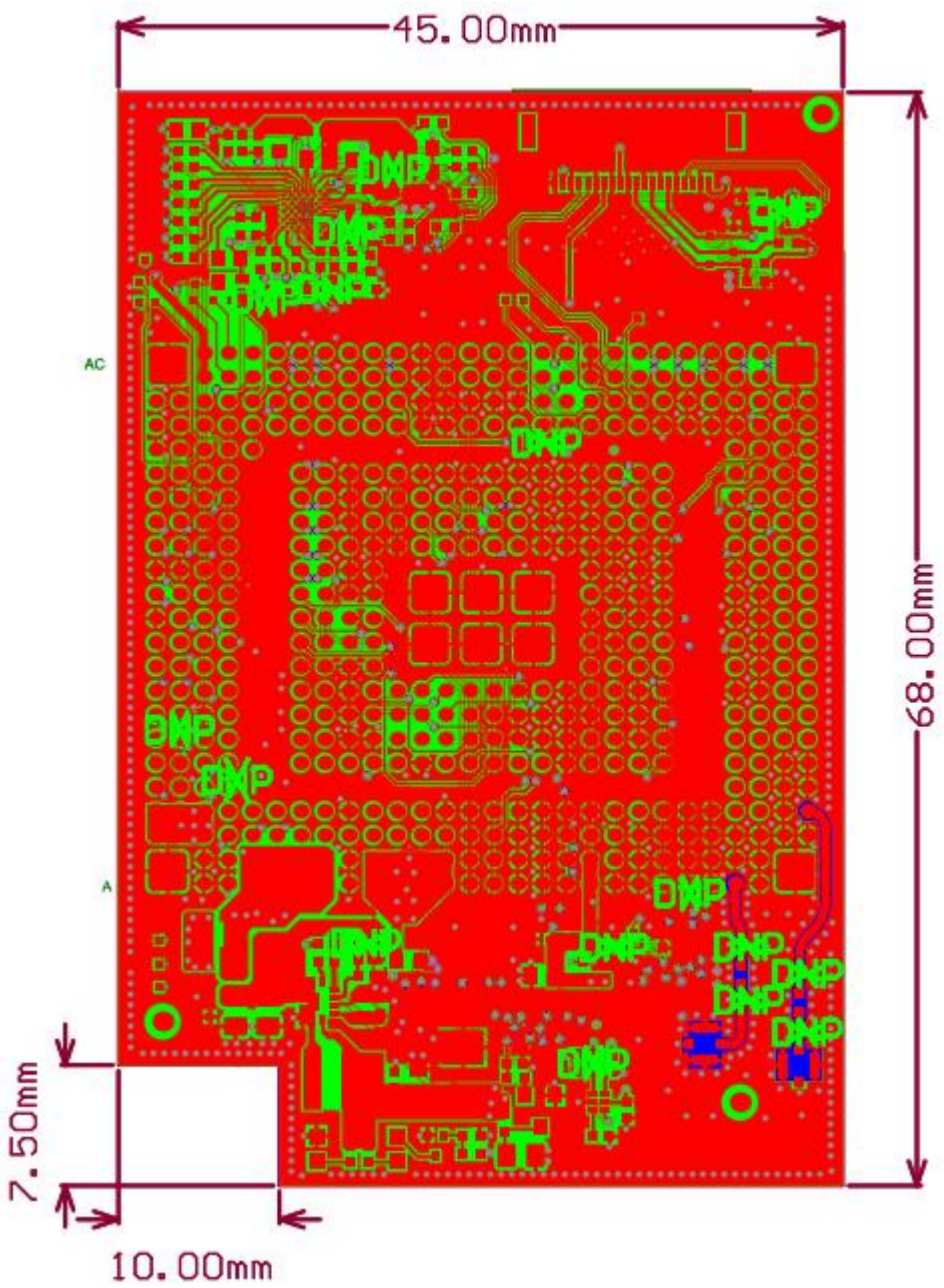
Key Features and Performance of Thundercomm TurboX C6490 SOM

Item	Description
Platform	Snapdragon™ QCS6490
	Qualcomm® Kryo™ CPU 670, Qualcomm® Adreno™ GPU 642L, Adreno 633 VPU, Adreno DPU 1075
	Qualcomm® Compute Hexagon™ DSP with dual HVX, Hexagon Co-processor (Hexagon CP) 2.0, Hexagon Tensor Accelerator
	Qualcomm® Spectra™ 570L image processing
Memory	8GB+128GB uMCP
Connectivity	802.11ax over PCIe with DBS, 2x2 MIMO (Wi-Fi 6E), Bluetooth 5.2
Video Encode	4K@30FPS for H.264/H.265
Video Decode	4K@60FPS for H.264/H.265/VP9
Display Interfaces	1x MIPI-DSI 4-lane; 4K@30FPS via DSI; 4K@60FPS display support over DisplayPort
Camera Interfaces	5 x 4-lane MIPI CSI D-PHY (2 compatible with 3-trio MIPI CSI C-PHY up to 48M camera)
OS Support	Android 13, LU, LE

3. IXM6490 SOM Images

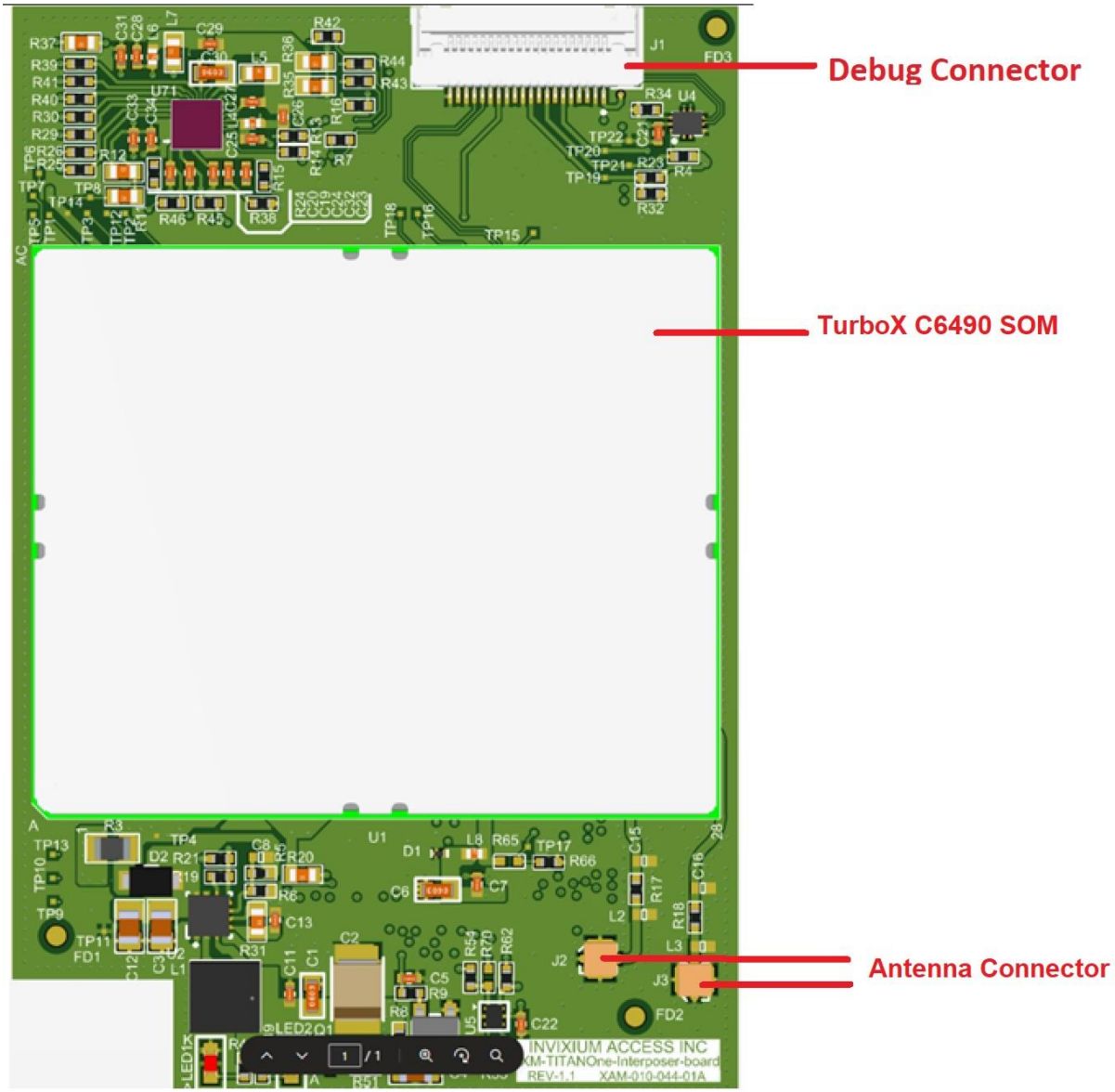
3.1. Mechanical Dimension

Below is the mechanical dimension of IXM6490 SOM. It is 45mm in width and 68mm in height.

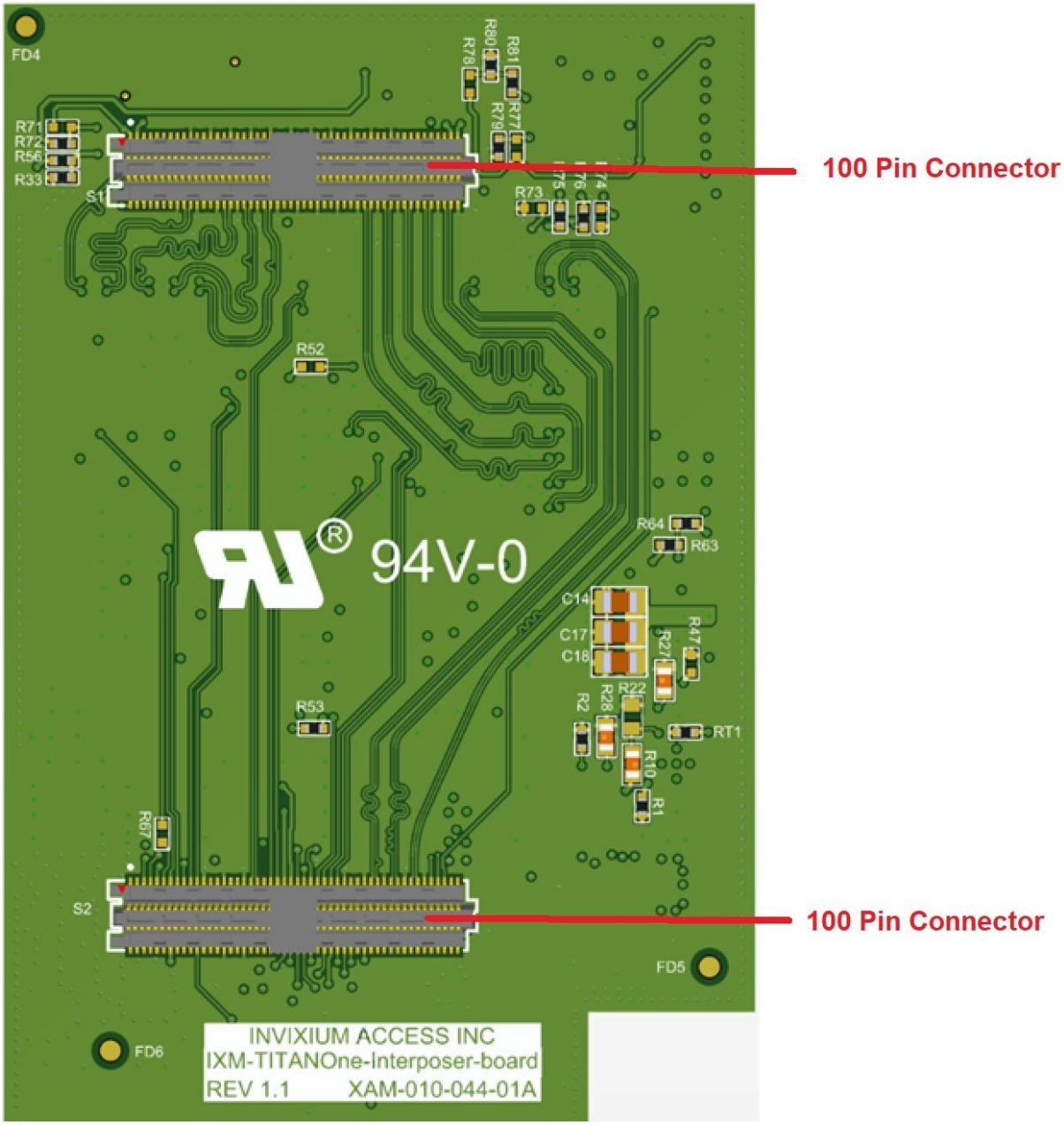


3.2. IXM6490 SOM Key Component

Below images show IXM6490 SOM Key Component Location.

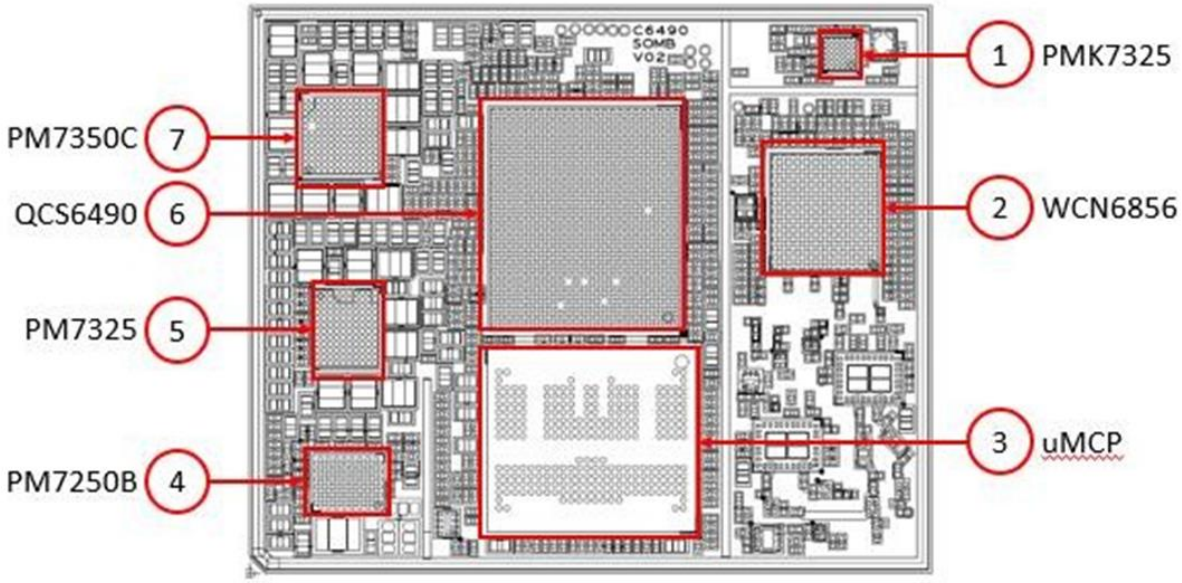


Front Side



Back Side

Below image shows Thundercomm TurboX C6490 SOM Key Component Location.



4. IXM6490 SOM with Antenna

4.1. Antenna Specification

Product name	WIFI Tri-band Flexible Antenna		
Part number	630810000001		
Frequency	2400-2500 MHz	5150-5900 MHz	5925~7125 MHz
Polarization	Linear		
Operating with matching	-40℃ to 80℃		
Storage with matching	-40℃ to 80℃		
RF Power	2.0 Watts		
Impedance with matching	50 Ohms		
Antenna type	Dipole		
Connector type	I-PEX MHF 4 (Compatible)		
Cable diameter	Ø0.81mm		
Cable Length	150mm		

5. IXM6490 SOM Interface Description

IXM6490 SOM has two 100 pins connectors. Please find below detailed description of each pin.

Pin Interface S1 (100 PINs):

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
1	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	Power supply input for SOM.
2	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	Power supply input for SOM.
3	WCD9385_HPH_R	HPH_R	Pin #52	U71- WCD9385-Audio Codec – Speaker
4	WCD9385_AMIC1_INP	AMIC1_INP	Pin #5	U71- WCD9385-Audio Codec – AMIC
5	WCD9385_HPH_REF_L	HPH_REF_L	Pin #40	U71- WCD9385-Audio Codec – Speaker
6	WCD9385_HPH_REF_R	HPH_REF_R	Pin #41	U71- WCD9385-Audio Codec - Speaker
7	WCD9385_AMIC2_INP	AMIC2_INP	Pin #16	U71- WCD9385-Audio Codec - AMIC
8	WCD9385_HPH_L	HPH_L	Pin #58	U71- WCD9385-Audio Codec - Speaker
9	NC	NC	NC	NC
10	GND			
11	MIPI_CSI1_LANE3_P	CSI1_B2_LN3_P	AA28	MIPI CSI 1 (D-PHY), differential lane 3– positive MIPI CSI 1 (C-PHY), trio lane 2 – B
12	MIPI_CSI1_LANE3_M	CSI1_C2_LN3_M	AA27	MIPI CSI 1 (D-PHY), differential lane 3 – negative MIPI CSI 1 (C-PHY), trio lane 2 – C
13	GND			
14	MIPI_CSI1_LANE2_M	CSI1_A2_LN2_M	Y27	MIPI CSI 1 (D-PHY), differential lane 2 –

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
				negative MIPI CSI 1 (C-PHY), trio lane 2 – A
15	MIPI_CSI1_LANE2_P	CSI1_C1_LN2_P	Y28	MIPI CSI 1 (D-PHY), differential lane 2 – positive MIPI CSI 1 (C-PHY), trio lane 1 – C
16	GND			
17	MIPI_CSI1_LANE1_P	CSI1_A1_LN1_P	W28	MIPI CSI 1 (D-PHY), differential lane 1 – positive MIPI CSI 1 (C-PHY), trio lane 1 – A
18	MIPI_CSI1_LANE1_M	CSI1_B1_LN1_M	W27	MIPI CSI 1 (D-PHY), differential lane 1 – negative MIPI CSI 1 (C-PHY), trio lane 1 – B
19	GND			
20	MIPI_CSI1_CLK_M	CSI1_A0_CLK_M	U27	MIPI CSI 1 (D-PHY), differential clock – negative MIPI CSI 1 (C-PHY), trio lane 0 – A
21	MIPI_CSI1_CLK_P	CSI1_NC_CLK_P	U28	MIPI CSI 1 (D-PHY), differential clock – positive MIPI CSI 1 (C-PHY), no connect
22	GND			
23	MIPI_CSI1_LANE0_M	CSI1_C0_LN0_M	V27	MIPI CSI 1 (D-PHY), differential lane 0 – negative MIPI CSI 1 (C-PHY), trio lane 0 – C
24	MIPI_CSI1_LANE0_P	CSI1_B0_LN0_P	V28	MIPI CSI 1 (D-PHY), differential lane 0 – positive MIPI CSI 1 (C-PHY), trio lane 0 – B
25	GND			
26	MIPI_DSI_LANE3_P	NC	NC	Not Connected

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
27	MIPI_DSI_LANE3_N	NC	NC	Not Connected
28	GND			
29	MIPI_DSI_LANE2_P	NC	NC	Not Connected
30	MIPI_DSI_LANE2_N	NC	NC	Not Connected
31	GND			
32	MIPI_DSI_LANE1_N	NC	NC	Not Connected
33	MIPI_DSI_LANE1_P	NC	NC	Not Connected
34	GND			
35	MIPI_DSI_LANE0_P	NC	NC	Not Connected
36	MIPI_DSI_LANE0_N	NC	NC	Not Connected
37	GND			
38	MIPI_DSI1_CLK_N	NC	NC	Not Connected
39	MIPI_DSI1_CLK_P	NC	NC	Not Connected
40	GND			
41	MIC_TEST	TBD	TBD	AMIC
42	CDC_HPH_R_SOM	TBD	TBD	Speaker
43	CDC_HPH_REF_SOM	TBD	TBD	Speaker
44	CDC_HPH_L_SOM	TBD	TBD	Speaker
45	POWER_ON	PHONE_ON_N	M8	Power-on key ground switch (200 kΩ internal PU to 1.1 V)
46	VOLN_N	PM_RESIN_N	L8	Reset Keypad volume down button
47	HDMI_DDC_DATA	NC	NC	Not Connected
48	HDMI_DDC_CLK	NC	NC	Not Connected
49	VREG_S4_1P8_CONN	VREG_L18B_1P8	A19	PX-3, 1.8V Just for GPIO pull up
50	VREG_S4_1P8_CONN	VREG_L18B_1P8	B19	PX-3, 1.8V Just for GPIO pull up
51	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	
52	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	
53	CAM2_MCLK	CAM_MCLK1	L22	Camera master clock 1

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
54	SLIMBUS_DATA1_CARRIER - TP	NC	NC	Not Connected
55	CAM2_I2C_SCL	CCI_I2C1_SCL	V22	Dedicated camera control interface I2C serial data
56	CAM1_MCLK	CAM_MCLK0	M20	Camera master clock 0
57	CAM2_I2C_SDA	CCI_I2C1_SDA	U22	Dedicated camera control interface I2C serial data
58	GND			
59	MIPI_CSI0_LANE0_M	CSI0_C0_LN0_M	AC25	MIPI CSI 0 (D-PHY), differential lane 0 – negative
60	MIPI_CSI0_LANE0_P	CSI0_B0_LN0_P	AB25	MIPI CSI 0 (D-PHY), differential lane 0 – positive
61	GND			
62	MIPI_CSI0_CLK_M	CSI0_A0_CLK_M	AC26	MIPI CSI 0 (D-PHY), differential clock – negative
63	MIPI_CSI0_CLK_P	CSI0_NC_CLK_P	AB26	MIPI CSI 0 (D-PHY), differential clock – positive
64	GND			
65	MIPI_CSI0_LANE1_P	CSI0_A1_LN1_P	AB24	MIPI CSI 0 (D-PHY), differential lane 1 – positive
66	MIPI_CSI0_LANE1_M	CSI0_B1_LN1_M	AC24	MIPI CSI 0 (D-PHY), differential lane 1 – negative
67	GND			
68	MIPI_CSI0_LANE2_M	CSI0_A2_LN2_M	AC23	MIPI CSI 0 (D-PHY), differential lane 2 – negative

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
69	MIPI_CSI0_LANE2_P	CSI0_C1_LN2_P	AB23	MIPI CSI 0 (D-PHY), differential lane 2 – positive
70	GND			
71	MIPI_CSI0_LANE3_M	CSI0_C2_LN3_M	AC22	MIPI CSI 0 (D-PHY), differential lane 3 – negative
72	MIPI_CSI0_LANE3_P	CSI0_B2_LN3_P	AB22	MIPI CSI 0 (D-PHY), differential lane 3 – positive
73	GND			
74	HDMI_TMDS_CLK_M	NC	NC	Not Connected
75	HDMI_TMDS_CLK_P	NC	NC	Not Connected
76	GND			
77	HDMI_TMDS_TX0_M	NC	NC	Not Connected
78	HDMI_TMDS_TX0_P	NC	NC	Not Connected
79	GND			
80	HDMI_TMDS_TX1_M	NC	NC	Not Connected
81	HDMI_TMDS_TX1_P	NC	NC	Not Connected
82	GND			
83	HDMI_TMDS_TX2_M	NC	NC	Not Connected
84	HDMI_TMDS_TX2_P	NC	NC	Not Connected
85	GND			
86	MIPI_DSI0_LANE3_M	MIPI_DSI0_L3_M	T7	MIPI DSI 4 (D-PHY), differential lane 3 – negative
87	MIPI_DSI0_LANE3_P	MIPI_DSI0_L3_P	T8	MIPI DSI 4 (D-PHY), differential lane 3 – positive
88	GND			
89	MIPI_DSI0_LANE2_M	MIPI_DSI0_L2_M	U7	MIPI DSI 4 (D-PHY), differential lane 2 – negative

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
90	MIPI_DSI0_LANE2_P	MIPI_DSI0_L2_P	U8	MIPI DSI 4 (D-PHY), differential lane 2 – positive
91	GND			
92	MIPI_DSI0_LANE1_P	MIPI_DSI0_L1_P	R8	MIPI DSI 4 (D-PHY), differential lane 1 – positive
93	MIPI_DSI0_LANE1_M	MIPI_DSI0_L1_M	R7	MIPI DSI 4 (D-PHY), differential lane 1 – negative
94	GND			
95	MIPI_DSI0_LANE0_P	MIPI_DSI0_L0_P	V8	MIPI DSI 4 (D-PHY), differential lane 0 – positive
96	MIPI_DSI0_LANE0_M	MIPI_DSI0_L0_M	V7	MIPI DSI 4 (D-PHY), differential lane 0 – negative
97	GND			
98	MIPI_DSI0_CLK_P	MIPI_DSI0_CLK_P	P8	MIPI DSI 4 (D-PHY), differential clock – positive
99	MIPI_DSI0_CLK_M	MIPI_DSI0_CLK_M	P7	MIPI DSI 4 (D-PHY), differential clock – negative
100	GND			

SOM Pin Interface S2 (100 PINs):

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
101	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	
102	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	
103	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	
104	VPH_PWR_3P3_CONN	+3.3VDC Supply to Buck Converter	Power supply input for SOM.	
105	WIEGAND_INPUT_2	SM_GPIO_35	R13	PX-3 IO - GPIO
106	WIEGAND_INPUT_1	SM_GPIO_34	T12	PX-3 IO - GPIO
107	ACP_LED_1	SM_GPIO_27	W26	PX-3 IO - GPIO
108	RS485_TXEN	SM_GPIO_101	N8	SDM_BOOT_0
109	WIEGAND_OUTPUT_1	SM_GPIO_62	AA6	PX-3 IO - GPIO
110	VOLP_N	KYPD_VOL_UP_N	L7	Keypad volume up button
111	FORCED_USB_BOOT	FORCED_USB_BOOT	M7	USB BOOT
112	SD_SPI_CS_N	SM_GPIO_59	T1	QUP0 SE3
113	PIC_ICSPDAT_SOM	SM_GPIO_102	R3	SDM_FAST_BOOT_1
114	V5_OTG	USB_VBUS	A10, A11, A12, A13, B10, B11, B12, B13	USB output during USB-OTG operation
115	ACP_LED_2	SM_GPIO_26	U26	PX-3 IO - GPIO
116	SD_SPI_MISO	SM_GPIO_56	R1	QUP0 SE3
117	RELAY_OUT	SM_GPIO_42	K2	PX-3 IO - GPIO
118	SD_SPI_CLK	SM_GPIO_58	T2	QUP0 SE3
119	CAM1_I2C_SDA	CCI_I2C0_SDA	V20	Dedicated camera control interface I2C serial data
120	SD_SPI_MOSI	SM_GPIO_57	R2	QUP0 SE3
121	CAM1_I2C_SCL	CCI_I2C0_SCL	V21	Dedicated camera control interface I2C serial data

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
122	USB_OTG_ID	USB_SS-H_HS-L_SEL	AA11	Connected to ID Pin of Micro USB., Not supported on SOM by default.
123	GND			
124	NC	NC	NC	Not Connected
125	USB3_P1_SS_RX_DM	NC	NC	Not Connected
126	NC	NC	NC	Not Connected
127	USB3_P1_SS_RX_DP	NC	NC	Not Connected
128	NC	NC	NC	Not Connected
129	GND			
130	GND			
131	HS_USB2_DP	USB0_HS_DP	F1	U4 - Switch
132	USB3_P1_SS_TX_DM	NC	NC	Not Connected
133	HS_USB2_DM	USB0_HS_DM	G1	U4 - Switch
134	USB3_P1_SS_TX_DP	NC	NC	Not Connected
135	GND			
136	GND			
137	USBHUB_P1_HS_DP	USB1_HS_DP	AC18	USB1_HS – positive
138	VREG_S4_1P8	VREG_L18B_1P8	A19	PX-3, 1.8V Just for GPIO pull up
139	USBHUB_P1_HS_DM	USB1_HS_DM	AB18	USB1_HS – negative
140	VREG_S4_1P8	VREG_L18B_1P8	B19	PX-3, 1.8V Just for GPIO pull up
141	GND			
142	NC	NC	NC	Not Connected
143	TP_I2C_SCLK	SM_GPIO_53	R15	TP0_SCL
144	NC	NC	NC	Not Connected
145	TP_I2C_SDA	SM_GPIO_52	T14	TP0_SDA
146	NC	NC	NC	Not Connected
147	WDATA0_1V8	SM_GPIO_25	Y26	PX-3 IO - GPIO
148	BLSP8_I2C_SDA	SM_GPIO_8	L25	QUP0 SE2 Lane0/1
149	EM_ANT_SOM	SM_GPIO_16	H22	PX-3 IO - GPIO
150	BLSP8_I2C_SCL	SM_GPIO_9	R25	QUP0 SE2 Lane0/1

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
151	TP_INT	SM_GPIO_81	N8	TP0_INT
152	APQ_RESOUT_N	SM_GPIO_80	N1	PX-3 IO - GPIO
153	LCD0_BACKLIGHT_PWM	PM_C_GPIO_08	U4	PX-3 IO - GPIO
154	PIC_MCLR_SOM	SM_GPIO_103	L4	SDM_BOOT_3
155	GPIO_INT_N	SM_GPIO_18	F22	PX-3 IO - GPIO
156	PIC_ICSPCLK_SOM	SM_GPIO_104	J3	SDM_BOOT_2
157	LCD0_RST_N	SM_GPIO_43	H1	TP0_RST
158	JTAG_PS_HOLD	NC	NC	Not Connected
159	SDC_INPUT_1	SM_GPIO_44	T13	PX-3 IO - GPIO
160	SD_CARD-DET_N	SD_CARD_DET_N	M10	Insert detection
161	BLSP8_UART_TX	SM_GPIO_38	U15	
162	VREG_L13_2P95	VREG_L6C_2P96	Y4	Power supply - SD
163	BLSP8_UART_RX	SM_GPIO_39	U16	
164	SDC2_DATA_2	SDC2_DATA_2	V10	Secure digital controller 2 data bit 2
165	GND			
166	SDC2_DATA_1	SDC2_DATA_1	U10	Secure digital controller 2 data bit 1
167	SLIM_BUS_DATA0_CARRIER	NC	NC	Not Connected
168	SDC2_CLK	SDC2_CLK	T10	Secure digital controller 2 clock
169	SLIM_BUS_CLK_CARRIER	NC	NC	Not Connected
170	SDC2_DATA_3	SDC2_DATA_3	U11	Secure digital controller 2 data bit 3
171	GND			
172	SDC2_CMD	SDC2_CMD	T11	Secure digital controller 2 command
173	PCIE1_EP_REFCLK_P	PCIE1_REFCLK_P	AC11	PCIe 0 Gen 3 reference clock – positive

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
174	SDC2_DATA_0	SDC2_DATA_0	V11	Secure digital controller 2 data bit 0
175	PCIE1_EP_REFCLK_N	PCIE1_REFCLK_M	AB11	PCIe 0 Gen 3 reference clock – negative
176	VREG_L21_2P95	VREG_L9C_2P96	Y5	Power supply - SD
177	GND			
178	JTAG_TRST_N	NC	NC	Not Connected
179	PCIE1_TX_P	PCIE1_TX0_P	AC7	PCIe 1 Gen 3 Transmit lane 1– positive
180	JTAG_RESOUT_N	NC	NC	Not Connected
181	PCIE1_TX_N	PCIE1_TX0_M	AB7	PCIe 1 Gen 3 Transmit lane 1– negative
182	JTAG_TDO	NC	NC	Not Connected
183	GND			
184	JTAG_TDI	NC	NC	Not Connected
185	PCIE1_RX_P	PCIE1_RX0_P	AC8	PCIe 0 Gen 3 receive lane 1 – positive
186	JTAG_TCK	NC	NC	Not Connected
187	PCIE1_RX_N	PCIE1_RX0_M	AB8	PCIe 0 Gen 3 receive lane 1 – negative
188	JTAG_TMS	NC	NC	Not Connected
189	GND			
190	CDC_IN_MBHC_CONN	NC	NC	Not Connected
191	PCIE1_CLKREQ_N	PCIE1_CLK_REQ_N	Y16	PCIe Clock request
192	WDATA1_1V8	SM_GPIO_24	V26	PX-3 IO - GPIO
193	SDC_INPUT_2	SM_GPIO_47	U13	PX-3 IO - GPIO
194	PROX_INT	SM_GPIO_17	J22	PX-3 IO - GPIO
195	WIEGAND_OUTPUT_0	SM_GPIO_61	AB5	PX-3 IO - GPIO
196	JTAG_RTCK_R	NC	NC	Not Connected
197	HDMI_CEC	NC	NC	Not Connected
198	NC	NC	NC	Not Connected

#Pin	Pin Name	Pin Name (Thundercomm C6490)	#Pin (Thundercomm C6490)	Description
199	HDMI_HOT_PLUG_DETECT	NC	NC	Not Connected
200	V5_SB	NC	NC	Not Connected

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the 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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 25cm between the radiator& your body.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C&E has been investigated. It is applicable to the modular.

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

Operation of 5850-5895MHz, 5925-6425 MHz, 6425-6525MHz, 6525-6875MHz, 6875-7125MHz are restricted to indoor use only.

Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, this equipment should be installed and operated with minimum distance of 25cm from your body.

2.7 Antennas

This module device tested with follow antennas information.

Antenna	Antenna Description	Antenna type	Impedance	Maximum antenna gain
Antenna 1	Bluetooth/Wi-Fi Antenna	Dipole	50Ω	Bluetooth/2.4G Wi-Fi: 2.5dBi, 5/6G Wi-Fi: 2.6dBi
Antenna 2	Wi-Fi Antenna	Dipole	50Ω	2.4G Wi-Fi: 2.5dBi, 5/6G Wi-Fi: 2.6dBi

2.8 Label and compliance information

The module with label, FCC ID: S38-IXM6490 listed. Please refer to label.

The final end product must be labeled in a visible area with the following" Contains FCC ID: S38-IXM6490"

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B

ISED Warning:

This device complies with Innovation, Science, and Economic Development Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d' Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil nedoit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device is compliance with RF exposure guidelines, users can obtain Canadian information on RF exposure and compliance.The minimum distance from body to use the device is 25cm.

Le présent appareil est conforme Après examen de ce matériel aux conformité ou aux limites d'intensité de champ RF, les utilisateurs peuvent sur l'exposition aux radiofréquences et la conformité and compliance d'acquérir les informations correspondantes. La distance minimale du corps àutiliser le dispositif est de 25cm.

This Class B digital apparatus complies with Canadian ICES-003."

Cet appareil numérique de classe b est conforme àla norme nmb-003 du canada.

Specific operational use conditions

The device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

Operation of 5250-5350MHz, 5850-5895MHz, 5925-6425 MHz, 6425-6525MHz, 6525-6875MHz, 6875-7125MHz are restricted to indoor use only.

Devices shall not be used for control of or communications with unmanned aircraft systems.

Operation on oil platforms, automobiles, trains, maritime vessels and aircraft shall be prohibited except for on large aircraft flying above 3,048 m (10,000 ft).

Conditions d'utilisation opérationnelles spécifiques

The device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

Operation of 5250-5350MHz, 5850-5895MHz, 5925-6425 MHz, 6425-6525MHz, 6525-6875MHz, 6875-7125MHz are restricted to indoor use only.

Les appareils ne doivent pas être utilisés pour contrôler ou communiquer avec des systèmes d'aéronefs sans pilote.

L'utilisation sur des plateformes pétrolières, des automobiles, des trains, des navires et des aéronefs est interdite, sauf sur des gros aéronefs volant àplus de 3,048 m (10,000 ft).

This device is intended only for OEM integrators under the following condition: The transmitter module may not be co-located with any other transmitter or antenna. As long as the condition above is met, further transmitter test will not be required. However, the OEM integrator is still

responsible for testing their end-product for any additional compliance requirements required with this module installed.
Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:
Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne. Tant que les 1 condition ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

Important Note:
In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the ISED cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.
Any company of the host device which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to RSS-247, RSS-248 and RSS-Gen requirement, only if the test result comply with RSS-247, RSS-248 and RSS-Gen requirement, then the host can be sold legally.
Remarque importante :
Si ces conditions ne peuvent pas être respectées (par exemple, certaines configurations d'ordinateurs portables ou la colocalisation avec un autre émetteur), l'autorisation canadienne n'est plus considérée comme valide et l'ISED ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera responsable de la réévaluation du produit final (y compris l'émetteur) et de l'obtention d'une autorisation canadienne distincte.
Toute entreprise de l'appareil hôte qui installe ce module avec une approbation modulaire limitée doit effectuer le test d'émission rayonnée et d'émission parasite conformément aux exigences RSS-247, RSS-248 et RSS-Gen, uniquement si le résultat du test est conforme aux exigences RSS-247, RSS-248 et RSS-Gen, l'hôte peut alors être vendu légalement.

End Product Labeling
The final end product must be labeled in a visible area with the following:
Contains IC: 10891A-IXM6490.
Plaque signalétique du produit final
Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante:
Contains IC: 10891A-IXM6490.

Manual Information to the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.
Manuel d'information à l'utilisateur final
L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant

à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.
Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

This radio transmitter [IC: 10891A-IXM6490] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below:
Cet émetteur radio [IC: 10891A-IXM6490] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous:

Antenna	Antenna Description	Antenna type	Impedance	Maximum antenna gain
Antenna 1	Bluetooth/Wi-Fi Antenna	Dipole	50Ω	Bluetooth/2.4G Wi-Fi: 2.5dBi, 5/6G Wi-Fi: 2.6dBi
Antenna 2	Wi-Fi Antenna	Dipole	50Ω	2.4G Wi-Fi: 2.5dBi, 5/6G Wi-Fi: 2.6dBi

Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
Les types d'antennes non inclus dans cette liste qui ont un gain supérieur au gain maximum indiqué pour tout type répertorié sont strictement interdits pour l'utilisation avec cet appareil.