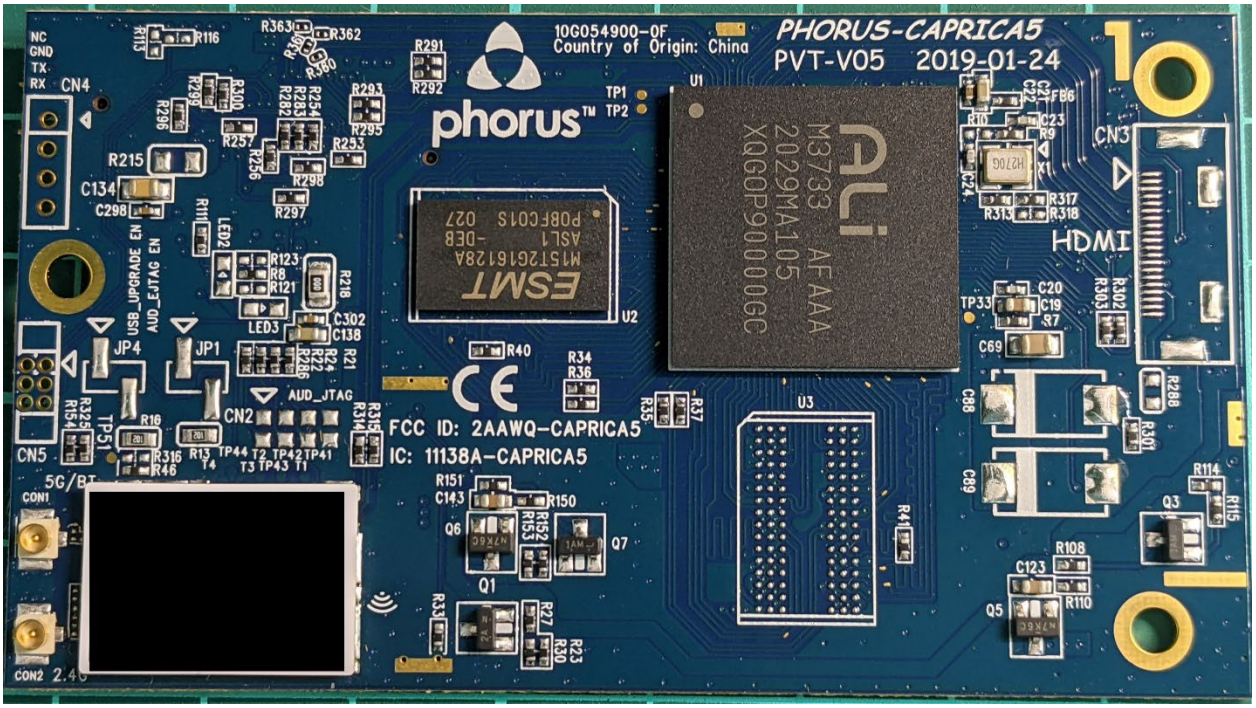
Caprica 5UXL-2
Play-Fi™ Wireless Module User Manual and Data Sheet

Oct. 6, 2023
Revision 2

Document Change Summary				
Date:	Revision:	Changes:	Author:	Approver:
20230706	1	Caprica5UXL-2 User Manual and Data Sheet	CL	
20231006	2	Add FCC, IC statement	CL	

NOTE: Picture is representative only and actual product may differ



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1 Play-Fi Wireless Module

The fifth generation Play-Fi wireless module, also known as “Caprica5 module” or “Caprica5”. Caprica5 module is a hardware implementation of DTS Play-Fi technology. Play-Fi is the enabling technology for synchronous multi-room audio distribution via wireless or wired network connectivity. Caprica5 module also supports a variety of wired and wireless connectivity options which can be utilized in speakers, stand-alone receivers, AVR’s and Sound bars.

2 Features

The Play-Fi wireless module version 5 is a programmable, high-performance, encapsulated design that enables manufacturers to build audio devices that can wirelessly distribute audio to multiple devices symmetrically or distribute a subset of multi-channel audio to a small set of speakers with pre-designated roles such as Surround Sound (asymmetric audio distribution). The supported sources include Play-Fi mobile apps, Play-Fi drivers, Play-Fi PC applet, AirPlay, AirPlay2, Spotify Connect, Amazon Alexa, Bluetooth or other sources of a manufacturer’s choice, such as audio captured from a multi-channel I2S input.

2.1 ARM Cortex-based Processor

Ali M3733 with the following features:

- ARM Cortex A9 dual-core application processor with Neon/VFP and 512 KB L2 cache running at 1.0Ghz
- Security processor
- Media processor
- Advanced hardware security via on-chip Secure Boot ROM + on-chip OPT

2.2 DDR3 DRAM

2.3 NAND FLASH

2.4 Wi-Fi Standard compliance

- IEEE 802.11 a/b/g/n/ac
- IEEE 802.11e QoS Enhancement (WMM)
- IEEE 802.11h DFS, TPC, Spectrum Measurement
- 802.11ac 2x2, Wave-2 compliant with MU-MIMO STA mode
- 802.11i (WPA, WPA2) supporting open, shared key and pair-wise key authentication

2.5 Bluetooth

2.6 I2S Output

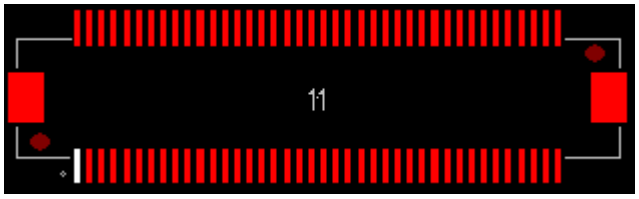
2.7 I2S Input

2.8 USB 2.0HS

3 Caprica Module Electrical Interface Definition

3.1 80-pin Board to Board Connector

Caprica5 module utilizes a 0.5mm BTB SMT Female type, P/N: 50019-08041 (Vendor: ACES). See datasheet.



4 Electrical Characteristics

This section describes the electrical characteristics of the module including power consumption.

4.1 Operating Voltages

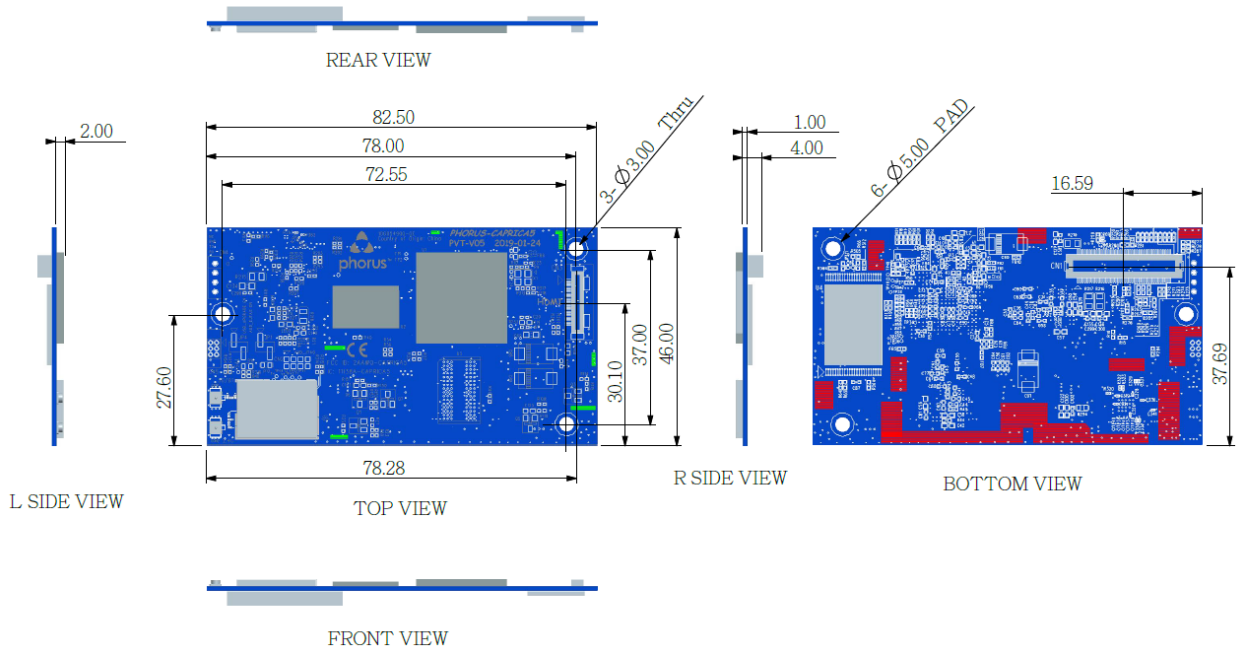
Symbol	Min (V)	Typical (V)	Max (V)
P3V3_M (3.3V)	2.97	3.3	3.63
1V5_M (1.5V)	1.425	1.5	1.575
VDDCORE_CPU_M (1.31V)	1.27	1.31	1.34
VDDCORE_M (1.06V)	1.02	1.06	1.09

4.2 Power Consumption

Name	3V3_M	1V5_M	VDDCORE_CPU_M	VDDCORE_M
Voltage (V)	3.3	1.5	1.31	1.06
Current (mA)	360	510	670	940

5 Mechanical Outline

All measurements in millimeters



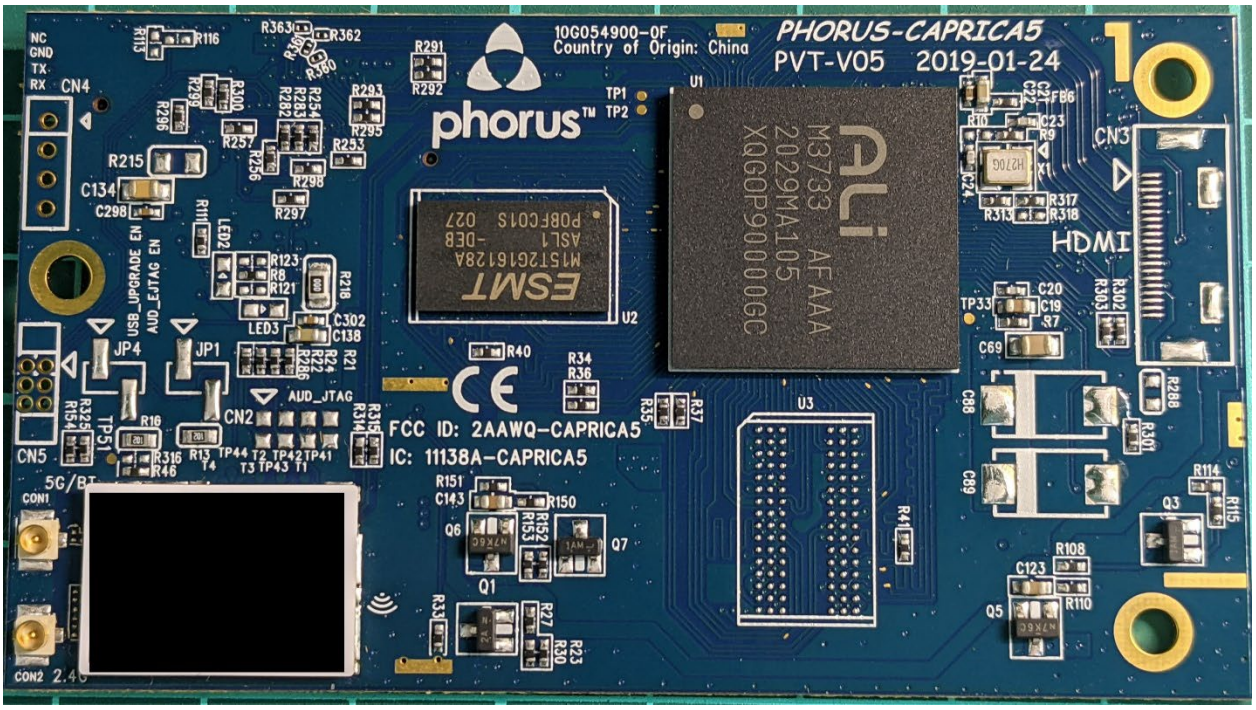
5 Configuration Details

NOTE: These part numbers are filled out after a configuration and feature set have been developed in cooperation with the brand partner.

DTS Part Number	Brand	Software (Product ID) code version	Customer PN (if applicable)
TBD			

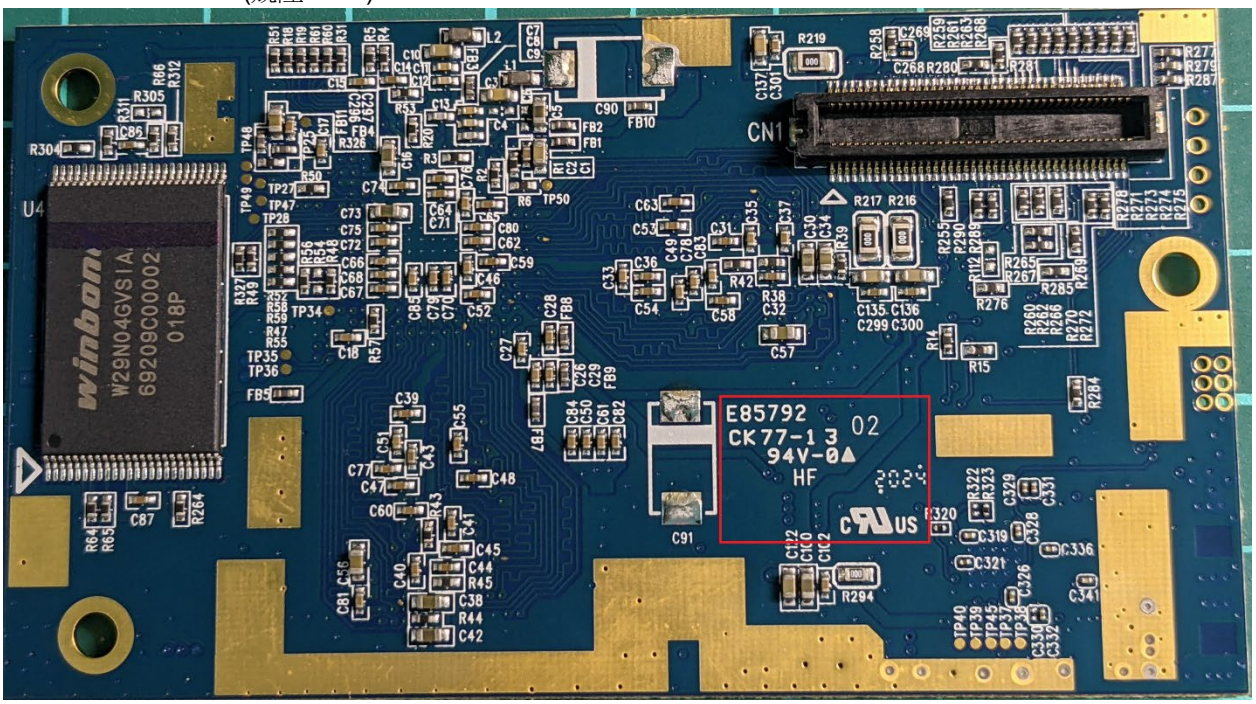
NOTE: Pictures are representative only and actual product may differ

Top side:

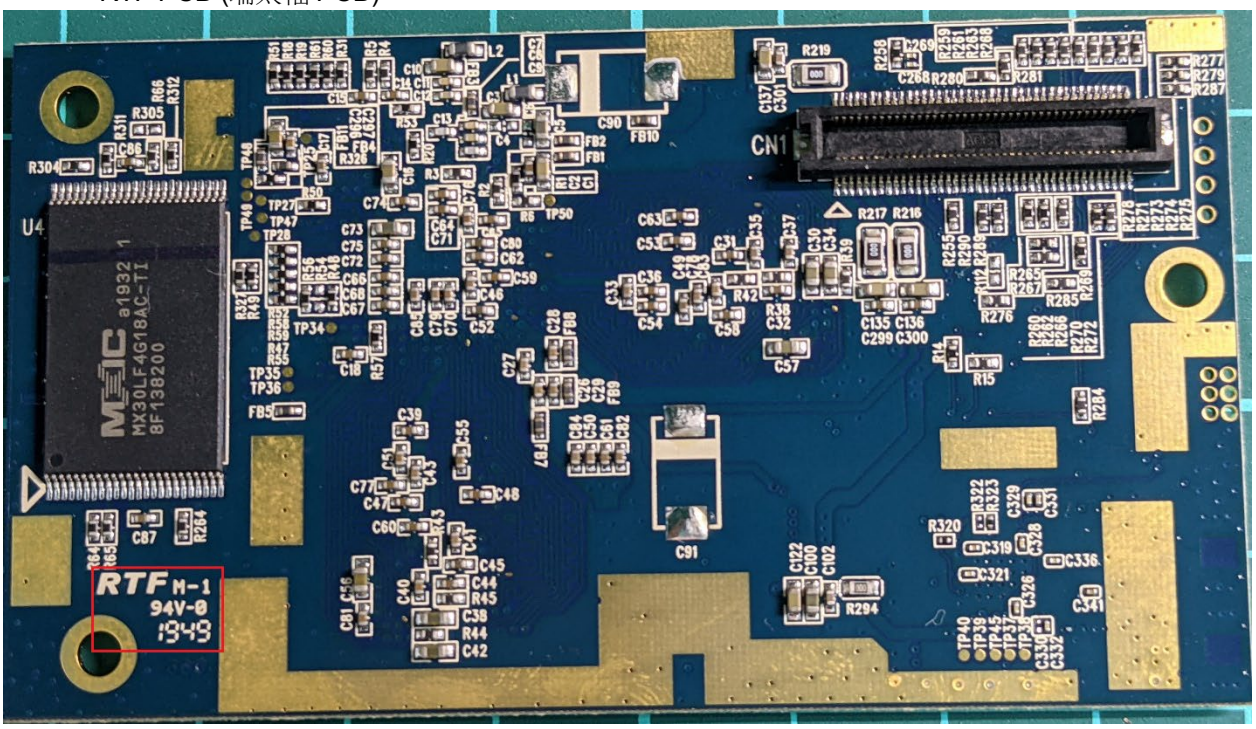


Bottom side:

Two PCB suppliers.
APCB PCB (競陸 PCB)



RTF PCB (瑞太福 PCB)



15.19

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.

15.21

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

RF Exposure:

This device contains transmitters and receivers which emit Radio Frequency (RF) energy. The device is designed to comply with the limits for exposure to RF energy set by the Federal Communications Commission (FCC) of the United States and Industry Canada (IC) of Canada.
This device contains transmitters and receivers which emit Radio Frequency (RF) energy. The device is designed to comply with the limits for exposure to RF energy set by the Federal Communications Commission (FCC) of the United States and Industry Canada (IC) of Canada.

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

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 20cm between the radiator & your body.

1. 4.3

   Contains IC: 11138A-CAPRICA5UXL

2. 6.8

   For expediting the testing, measurements may be performed using only the antenna with highest gain of
   each combination of transmitter and antenna type, with the transmitter output power set at the maximum
   level. However, the transmitter shall comply with the applicable requirements under all operational
   conditions and when in combination with any type of antenna from the list

provided in the test report
(and in the notice to be included in the user manual, provided below).
When measurements at the antenna port are used to determine the RF output power, the effective gain of
the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

RF Exposure

Cet appareil contient des émetteurs et des récepteurs qui émettent de l'énergie radiofréquence (RF). L'appareil est conçu pour respecter les limites d'exposition à l'énergie RF fixées par la Federal Communications Commission (FCC) des États-Unis et par Industrie Canada (IC) du Canada

6.4

Industry Canada statement:

This device complies with Industry Canada license-exempt RSSs. Operation is subjectto 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'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

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

Caution:

1) 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;

2) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

3) For devices with detachable antenna(s), the maximum antenna gain permitted for

devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and

fAvertissement:

1) Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

2) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la imitation P.I.R.E.;

3) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant la bande 5725-5850 MHz doit se conformer à la limitation P.I.R.E spécifiée pour l'exploitation point à point et non point à point, selon le cas.

Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated withminimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This radio transmitter (IC: 11138A-CAPRICA5UXL has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for usewith this device.

Antenna Info:

WLAN 2.4G	Antenna Type	PIFA、Dipole
	Antenna Peak Gain(dBi)	PIFA 4.8dBi / Dipole 5dBi
WLAN 5G	Antenna Type	PIFA、Dipole
	Antenna Peak Gain(dBi)	PIFA 6.06dBi / Dipole 4dBi

Le présent émetteur radio (IC: 11138A-CAPRICA5UXL a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés cidessous et ayant ungain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont legain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

If the ISED certification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains IC: 11138A-CAPRICA5UXL”.

Si le numéro de certification ISDE n'est pas visible lorsque le module est installé à l'intérieur d'un autre appareil, alors l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module inclus.
Cette étiquette extérieure peut utiliser un libellé comme celui-ci: “ Contient IC: 11138A-CAPRICA5UXL “.

Plaque signalétique du produit final:
Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante:
"Contient des IC: 11138A-CAPRICA5UXL ".

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 manue

Must use the device only in host devices that meet the FCC/ISED RF exposure category of mobile, which means the device is installed and used at distances of at least 20cm from persons.
The end user manual shall include FCC Part 15 /ISED RSS-GEN compliance statementsrelated to the transmitter as show in this manual.
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, ICES-003.
Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host.
Must have on the host device a label showing Contains FCC ID: 2AAWQ-CAPRICA5UXL-2, Contains IC: 11138A-CAPRICA5UXL
The use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer’s instruction manual.

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.

l'hôte doit utiliser l'instrument uniquement dans des dispositifs qui répondent à la fcc / (catégorie d'exposition rf mobile, ce qui signifie le dispositif est installé et utilisé à une distance d'au moins 20 cm de personnes.
le manuel de l'utilisateur final doit inclure la partie 15 / (fac rss gen déclarations de conformité relatives à l'émetteur que de montrer dans ce manuel.
le fabricant est responsable de la conformité de l'hôte, le système d'accueil avec le module installé avec toutes les autres exigences applicables du système comme la partie 15 b, ices - 003. accueillir le fabricant est fortement recommandé de confirmer la conformité avec les exigences de la fcc / (émetteur lorsque le module est installé dans l'hôte.
le dispositif d'accueil doivent avoir une étiquette indiquant contient FCC ID: 2AAWQ-CAPRICA5UXL-2, contient IC : 11138A-CAPRICA5UXL

Modular Approval(FCC)

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions: 1) The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and 2) the transmitter module may not be co-located with any other transmitter or antenna. As long as 2 conditions above are 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 (for example, digital device emissions, PC peripheral requirements, etc.).

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module 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 FCC authorization.

USERS MANUAL OF THE END PRODUCT:

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.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: 2AAWQ-CAPRICA5UXL-2 ". The following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

Modular Approval (ISED)

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions: 1)The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and 2)the transmitter module may not be co-located with any other transmitter or antenna. As long as 2 conditions above are 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 (for example, digital device emissions, PC peripheral requirements, etc.).

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the ISED authorization for this module in combination with the host equipment is no longer considered valid and the ISED ID of the module 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.

USERS MANUAL OF THE END PRODUCT:

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.

LABEL OF THE END PRODUCT:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains transmitter module IC: 11138A-CAPRICA5UXL.

KDB 996369 D03 rule section

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15C/E.

2.6

The equipment (module) complies with FCC RF radiation exposure limits set forth for an uncontrolled environment, this equipment should be installed an operated with a minimum distance 20cm,between the radiator and your body.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such than 20 cm can be maintained between the antenna and users.

WLAN 2.4G	Antenna Type	PIFA、Dipole
	Antenna Peak Gain(dBi)	PIFA 4.8dBi / Dipole 5dBi
WLAN 5G	Antenna Type	PIFA、Dipole
	Antenna Peak Gain(dBi)	PIFA 6.06dBi / Dipole 4dBi

2.8 Label and compliance information

The host system using this module, should have label in a visible area indicated the following texts : Contains FCC ID: 2AAWQ-CAPRICA5UXL-2

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

2.11

The host manufacture is **recommended to use KDB 996369 Module Integration** Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties.

2.12

Only grantees are permitted to make permissive changes, if the module will be used differently than granted conditions, please contact us to ensure modifications will not affect compliance.