Tuesday, February 13, 2024

RE: Description of LTE Antenna for FCC application: 2AVAZ-CFAS-G5-US

The Cabinet uses LTE antenna JCG410L manufactured by Jiaxing Jinchang Electronic Technolody Co.,Ltd to send / receive data via the cellular network.

The antenna is directly connected to the cellular modem module (BG96 or EC21) via a 55mm u.fl to sma cable. The cable physically soldered to 21000 CMKE Motherboard via through hole pins, these are for mechanical mounting only and are not electrically connected to the ground plane of the PCB.

Specification

See document JCG410L for antenna specifications from the manufacturer.
See document FT8.7.0092-16A FT-SMA-KWE-1.37-55.pdf for specification of the antenna cable connecting the antenna to the LTE module.

Location

The antenna is directly connected to 21000 CMKE Motherboard, as seen in Figure 1 below. As seen in Figure 2, the antenna is visible from the rear of the cabinet, however once installed by an authorized installer, the antenna is not visible or able to be accessed by the customer as the cabinet is mounted with screws to the wall.

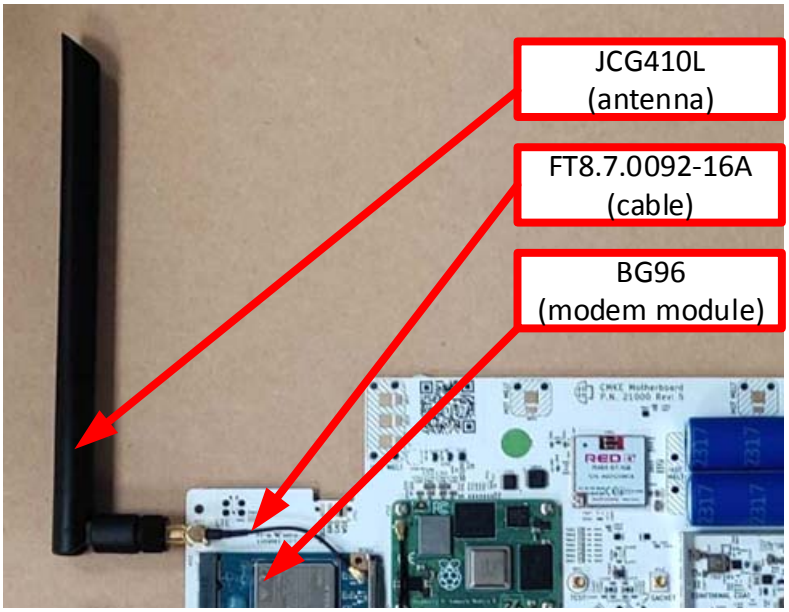


Figure 1: 21000 CMKE Motherboard with installed modules.

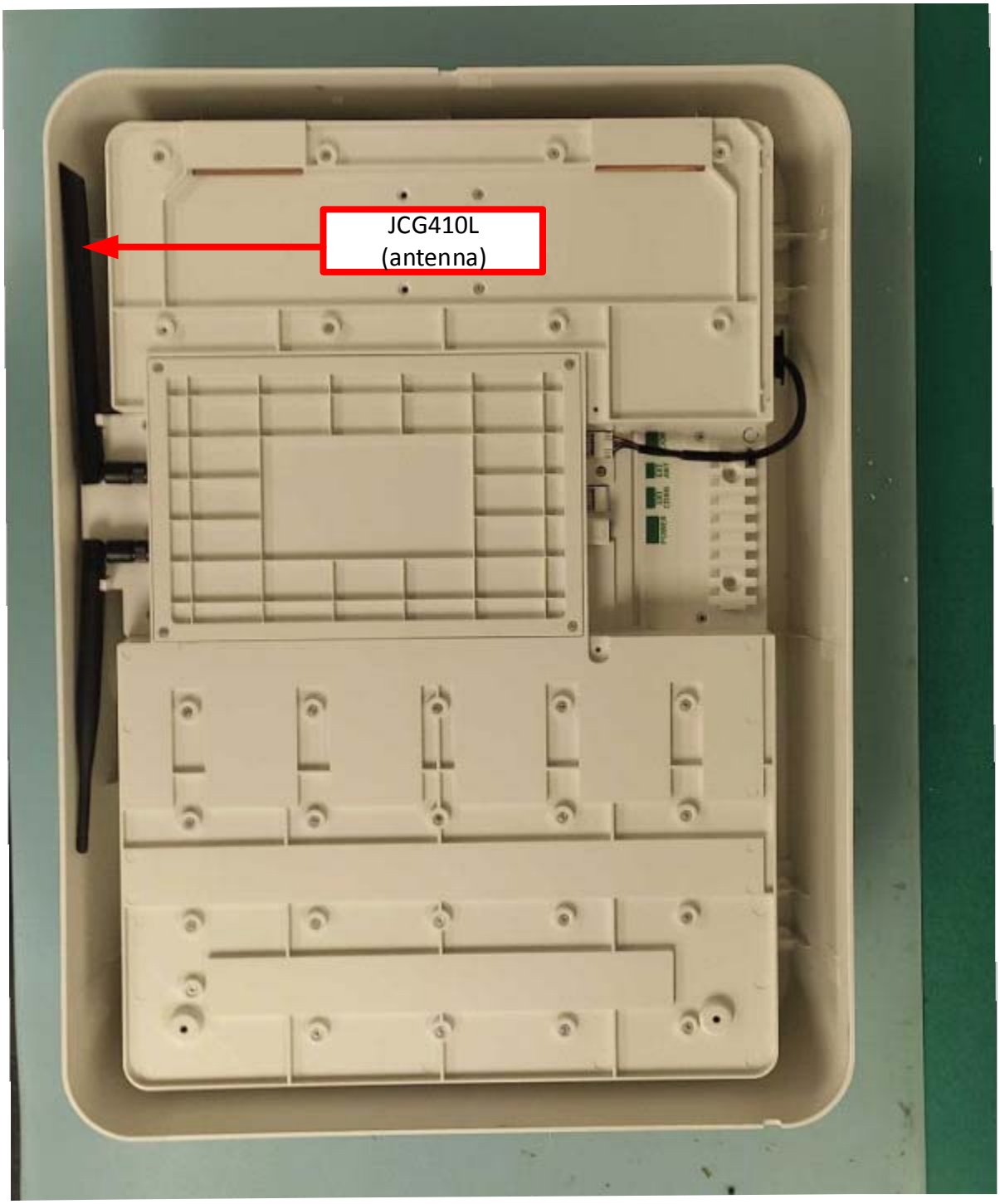


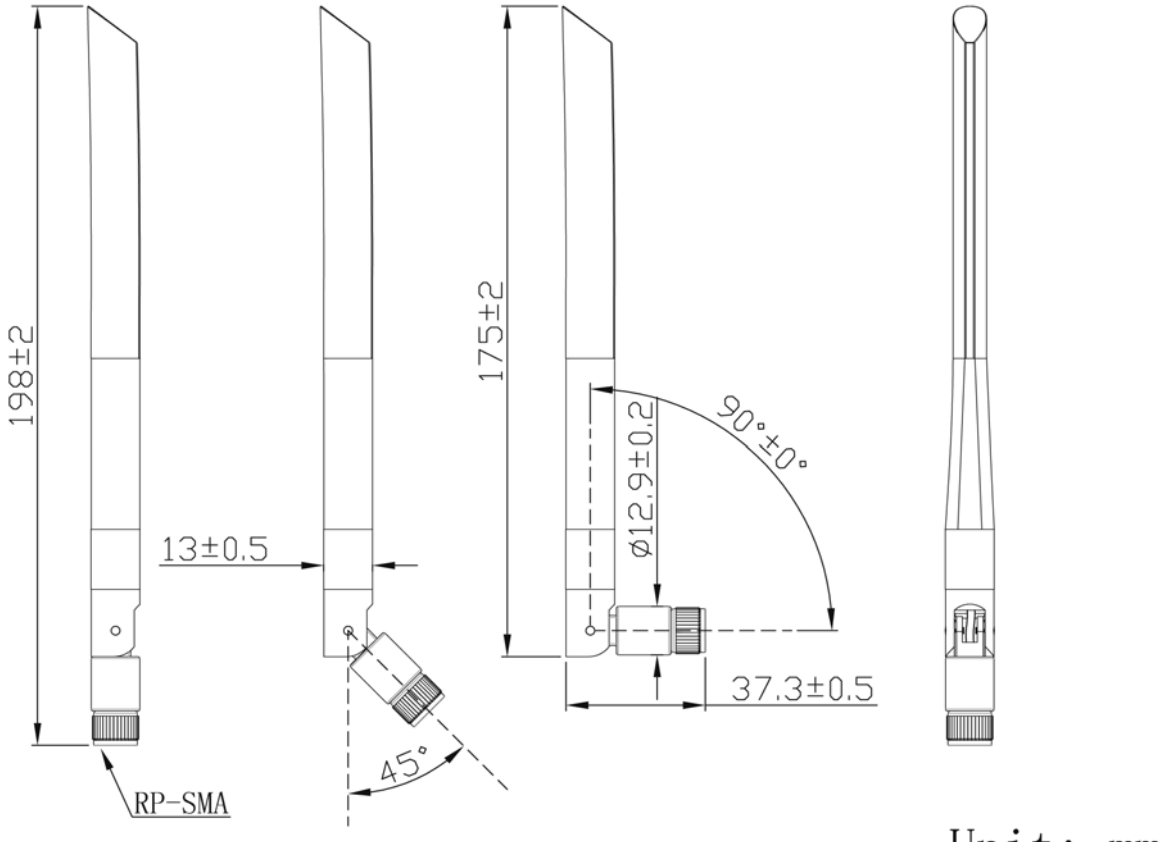
Figure 2: Rear view of cabinet showing JCG410L antenna location.

Jinchang Electron Global Service

LTE Antenna

JCG410L

DIMENSIONS



Unit: mm

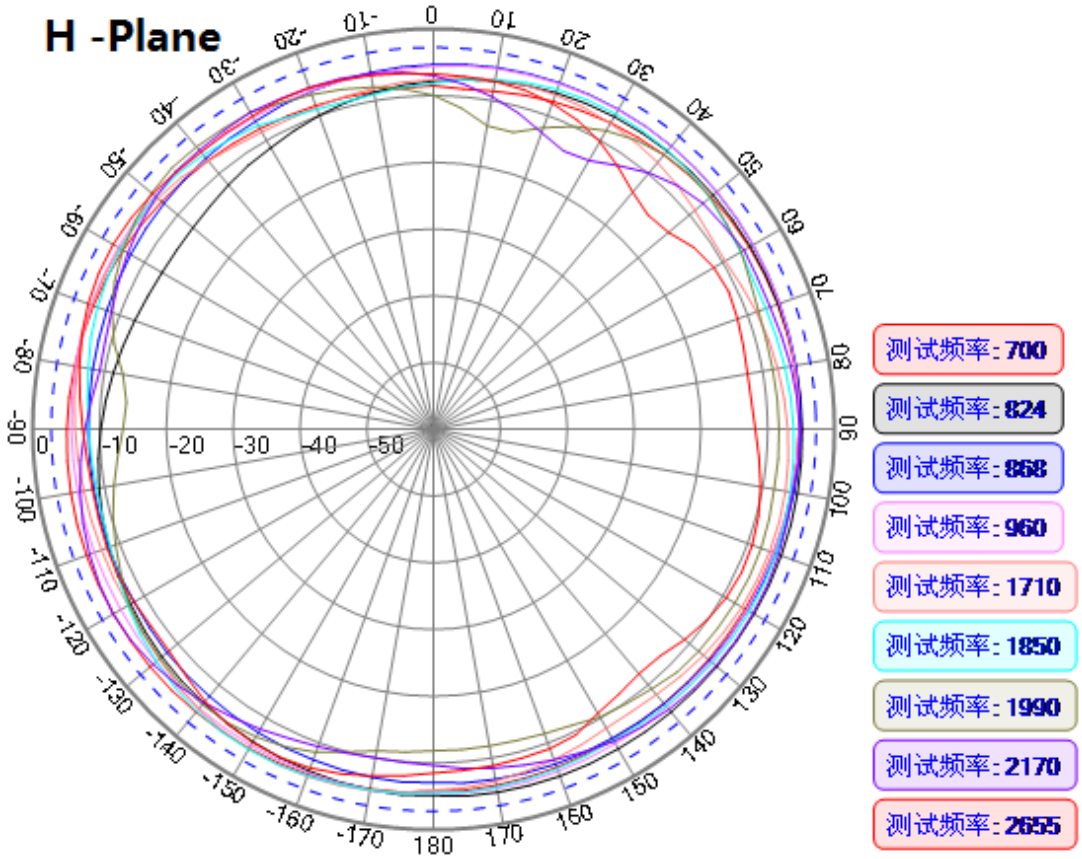
JIAXING JINCHANG ELECTRONIC TECHNOLOGY CO.,LTD
Add: 398#,Zhenye Road, South Street, Jiaxing, Zhejiang, China
Http:// www.jinchanggps.com E-mail:jcgps@vip.163.com
Tel: 86-0573-83692157/83692605/83958637 Fax:86-0573-83958635

Jinchang Electron Global Service

SPECIFICATIONS

Item		Specifications
Antenna	Center Frequency	698~960/1710~2655MHz
	Polarization	Linear
	Gain	3dBi typ.
	V.S.W.R	＜3.0
	Impedance	50Ω
	Connector	SMA Male
Environmental	Operating Temperature	-40℃~+85℃
	Vibration	10 to 55Hz with 1.5mm amplitude 2hours
	Environmentally Friendly	ROHS Compliant

Radiation Pattern



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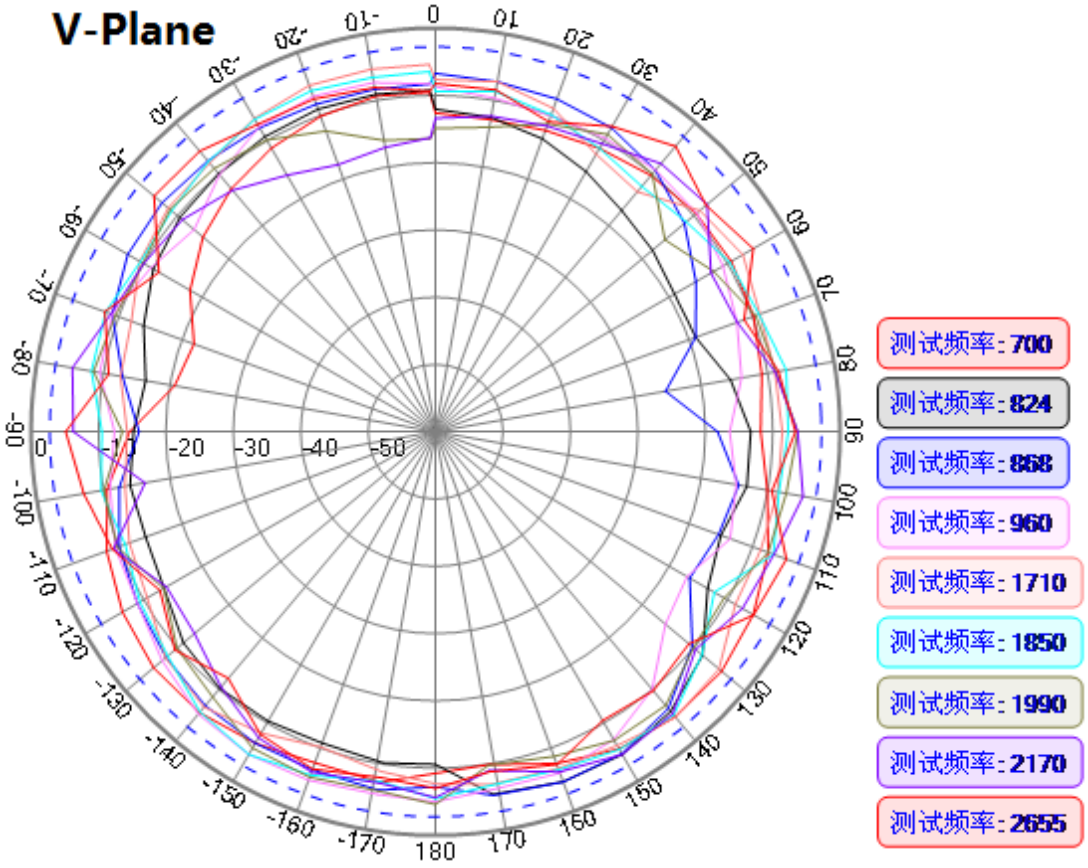

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Tuesday, February 13, 2024

RE: Description of Bluetooth Antenna for FCC application: 2AVAZ-CFAS-G5-US

The Cabinet uses BT / Wifi antenna JCW410 manufactured by Jiaxing Jinchang Electronic Technolody Co.,Ltd to send / receive data via Bluetooth to the installer of the cabinet using the installer app on their phone. Once the installation process is complete the BT radio feature is de-activated.

The antenna is directly connected to the Raspberry Pi CM4 via a 100mm u.fl to sma cable. The cable physically soldered to 21000 CMKE Motherboard via through hole pins, these are for mechanical mounting only and are not electrically connected to the ground plane of the PCB.

Specification

See document JCW410.pdf for antenna specifications from the manufacturer.
See document FT8.7.0092-17A FT-SMA-KWE-1.37-100.pdf for specification of the antenna cable connecting the antenna to the LTE module.

Location

The antenna is directly connected to 21000 CMKE Motherboard, as seen in Figure 1 below. As seen in Figure 2, the antenna is visible from the rear of the cabinet, however once installed by an authorized installer, the antenna is not visible or able to be accessed by the customer as the cabinet is mounted with screws to the wall.

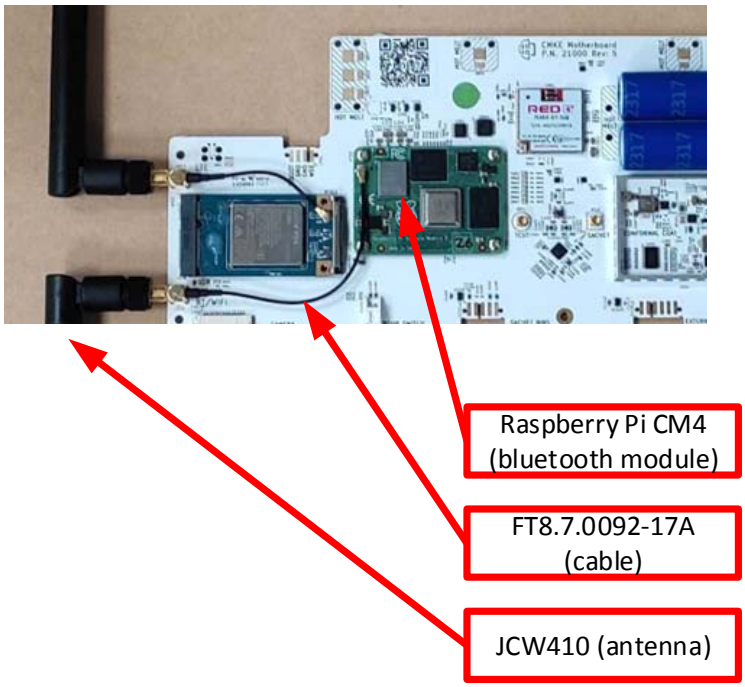


Figure 1: 21000 CMKE Motherboard with installed modules.

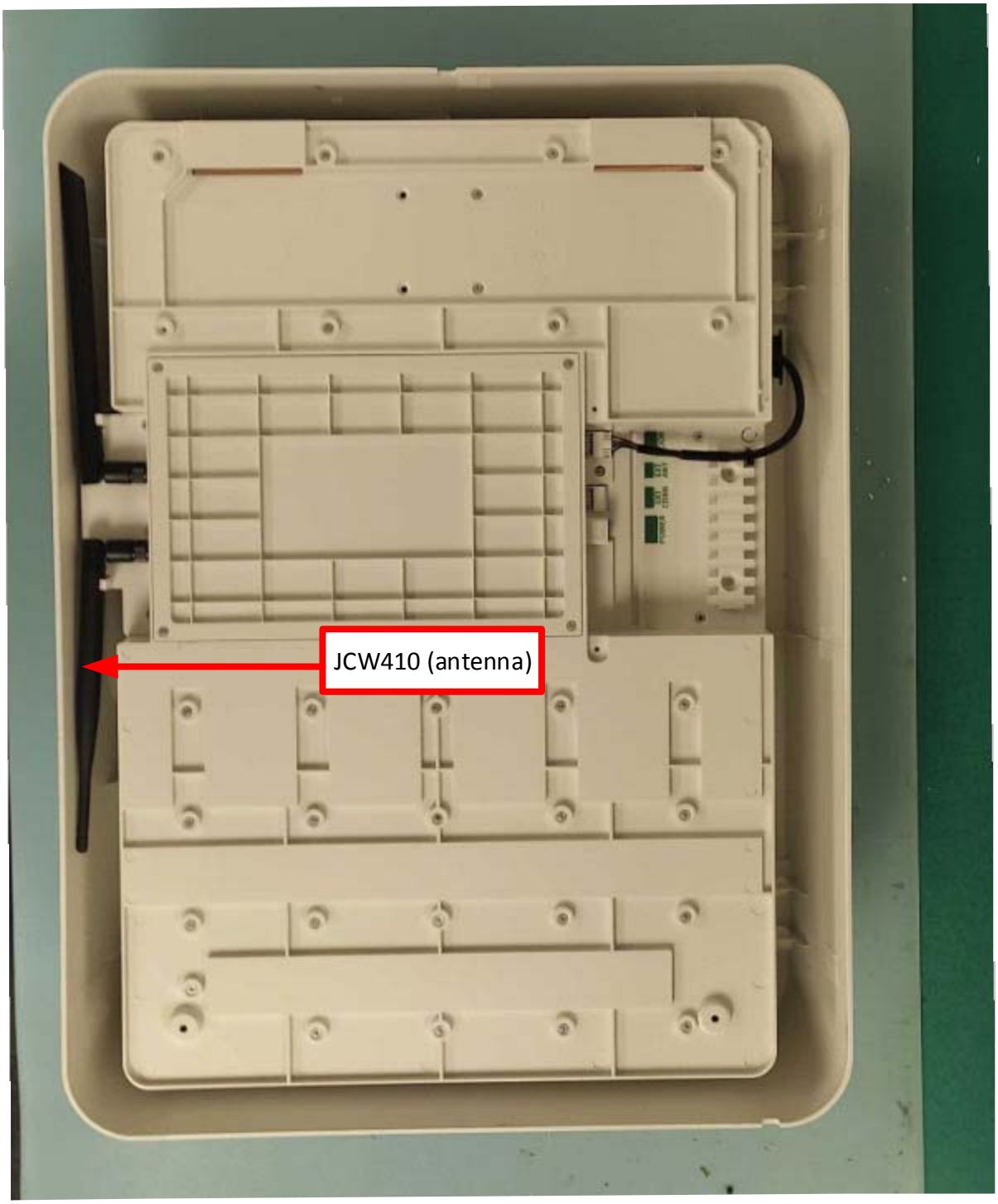


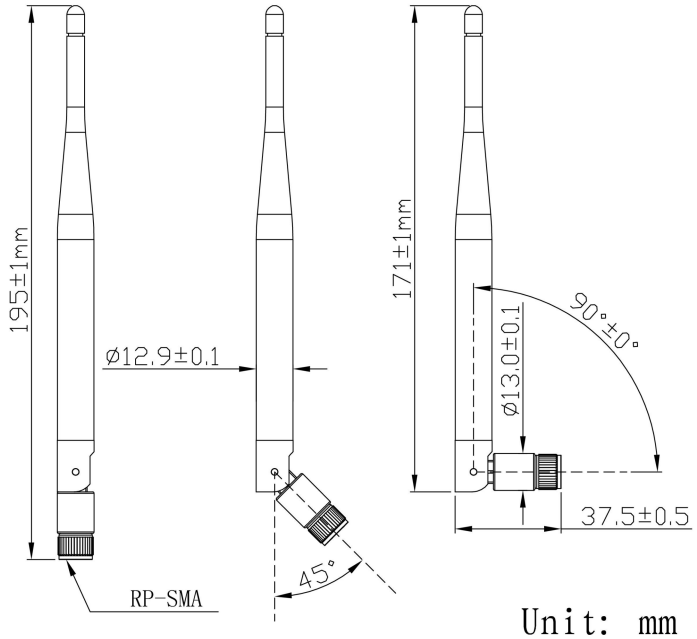
Figure 2: Rear view of cabinet showing JCG410L antenna location.

Jinchang Electron Global Service

WIFI Antenna

JCW410

DIMENSIONS



Unit: mm

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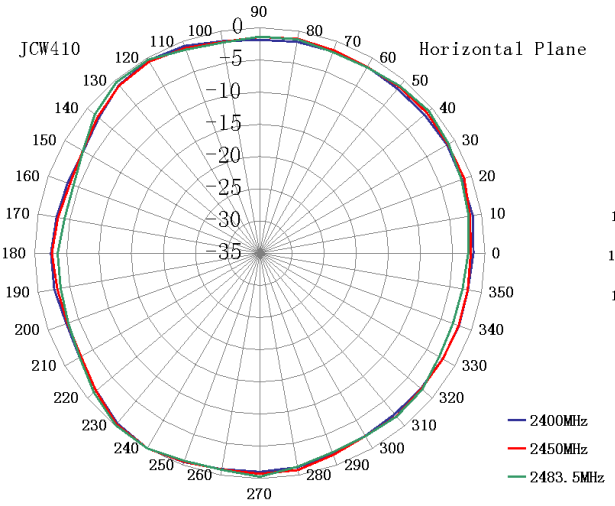
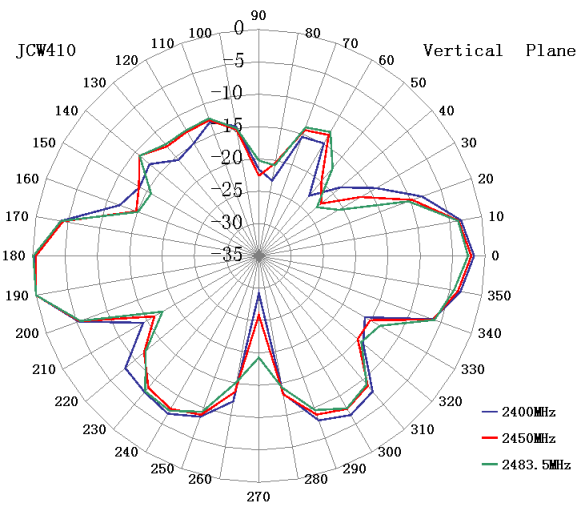
Jinchang Electron Global Service

SPECIFICATIONS

Item		Specifications
Antenna	Frequency Range	2400~2483.5MHz
	Band Width	83.5MHz
	Polarization	Linear
	Gain	5dBi
	V.S.W.R	＜2.0
	Impendance	50Ω
	Connector	RP-SMA Male or others
Environmental	Operating Temperature	-40℃~+85℃
	Vibration	10 to 55Hz with 1.5mm amplitude 2hours
	Environmentally Friendly	ROHS Compliant

Radiation Pattern





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Tuesday, February 13, 2024

RE: PCB Dipole Description (21173 PCBA Dipole) for application of FCC ID: 2AVAZ-CFAS-G5-US

The UHF RFID uses a simple half wavelength pcb dipole antenna which consists of two copper elements on a single sided 1.6mm FR4 pcb. The right hand side element (with letters C, D) is directly soldered to the outer conductor of the coaxial cable. The inner conductor of the coax cable is soldered to the copper under letters (A and B) Note that the holes above the letters are for mechanical mountings (heat stake pin locations) and are in base FR4 only.

After a soldering process, the dipole is then low pressure over moulded over the soldered area to provide strain relief.

The theoretical maximum gain of the antenna is 2.15dBi.

Figure 1: Antenna on VNA, Centerpoint is 926MHz

Construction

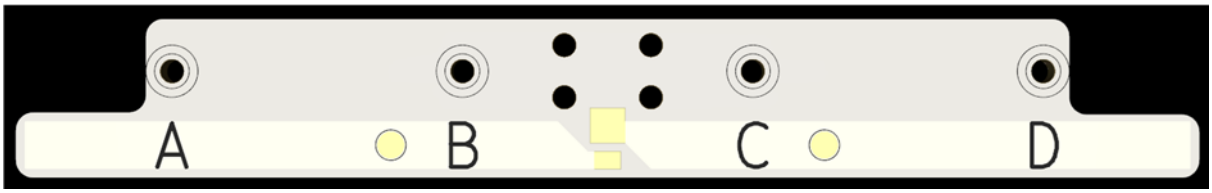

Figure 2: Dipole antenna copper areas

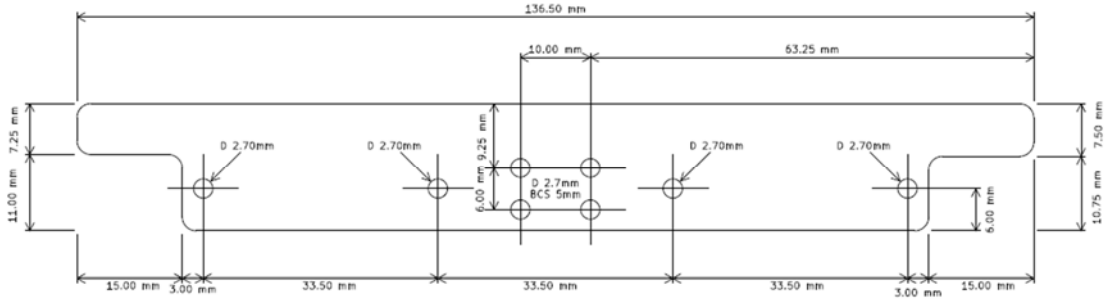

Figure 3: Dimensions of Antenna

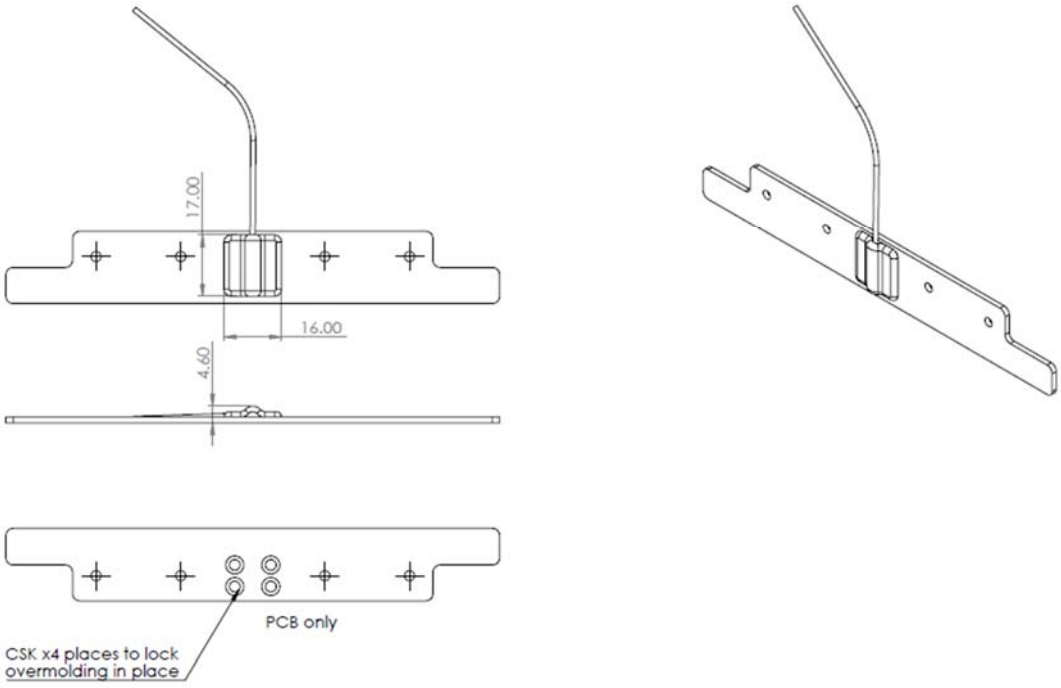

Figure 4: Mechanical Description of Over mould

Installation

16 x 21173 Dipole Antennas are installed within the chassis of the cabinet, the dipoles are either soldered directly to 21000 CMKE Motherboard, which contains the UHF radio module (RED4S) or soldered directly to 21191 CMKE Sachet Antennas.

21191 CMKE Sachet Antennas is connected to 21000 CMKE Motherboard using 1.37mm coax cable terminated with MMCX connectors.

Only one antenna is active at a time, the selection of which is controlled through RF Switched P.N. SKY13418-485 and SKY13414-485 placed on 21000 and 21191.

Once soldered down, high temperature rated hot melt is applied over the solder joint to protect it from corrosion and to provide strain relief.

Locations

Figure 5 shows the solder point locations on 21000 and 21191 where 21173 are terminated to. Note that the solder connection is covered by high temperature rated hot melt.

Figure 6 shows the locations of 21173 Dipoles inside the chassis of the cabinet. Please note that 21191 has been removed for the photo to not obscure the locations in the sachet bin area.

Figure 7 shows the locations of 21173 Dipole obscured by 21000 CMKE Motherboard.

Figure 8 shows an example of 21173 Dipole installed inside the sachet bin. Note the heat stake pin locations for fixing.

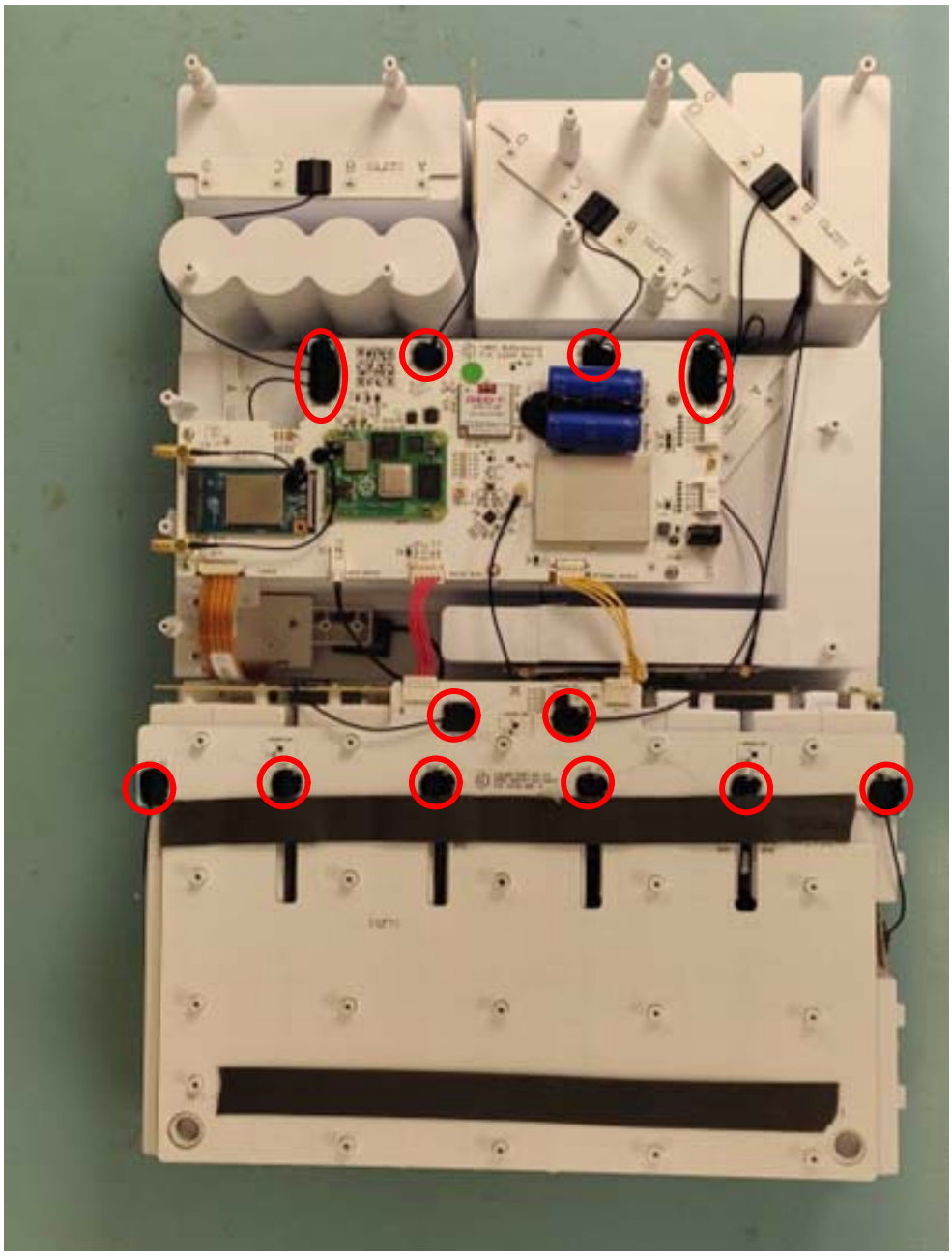

Figure 5: Solder Point locations of 21173 Dipoles

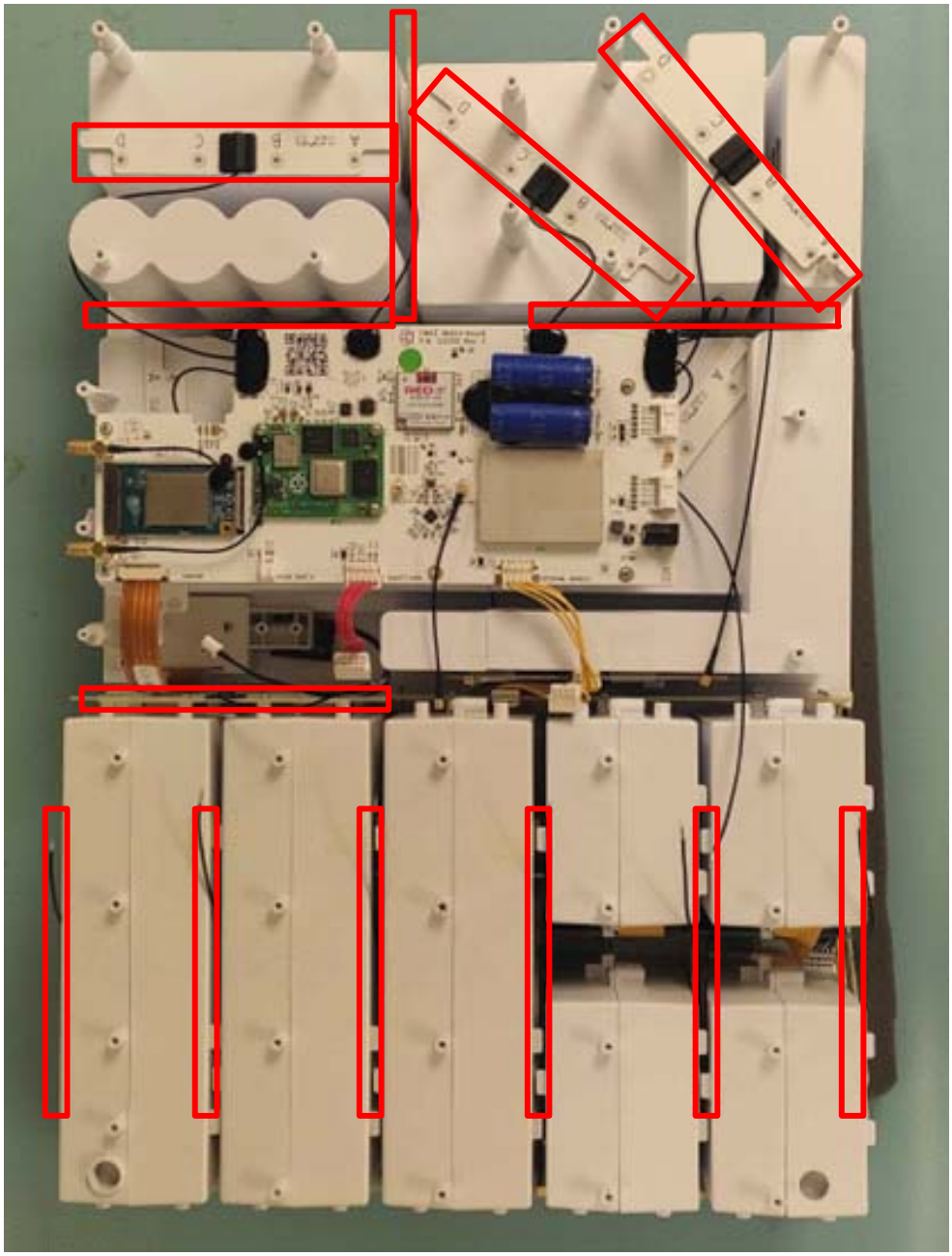

Figure 6: Antenna Locations shown with 21191 removed

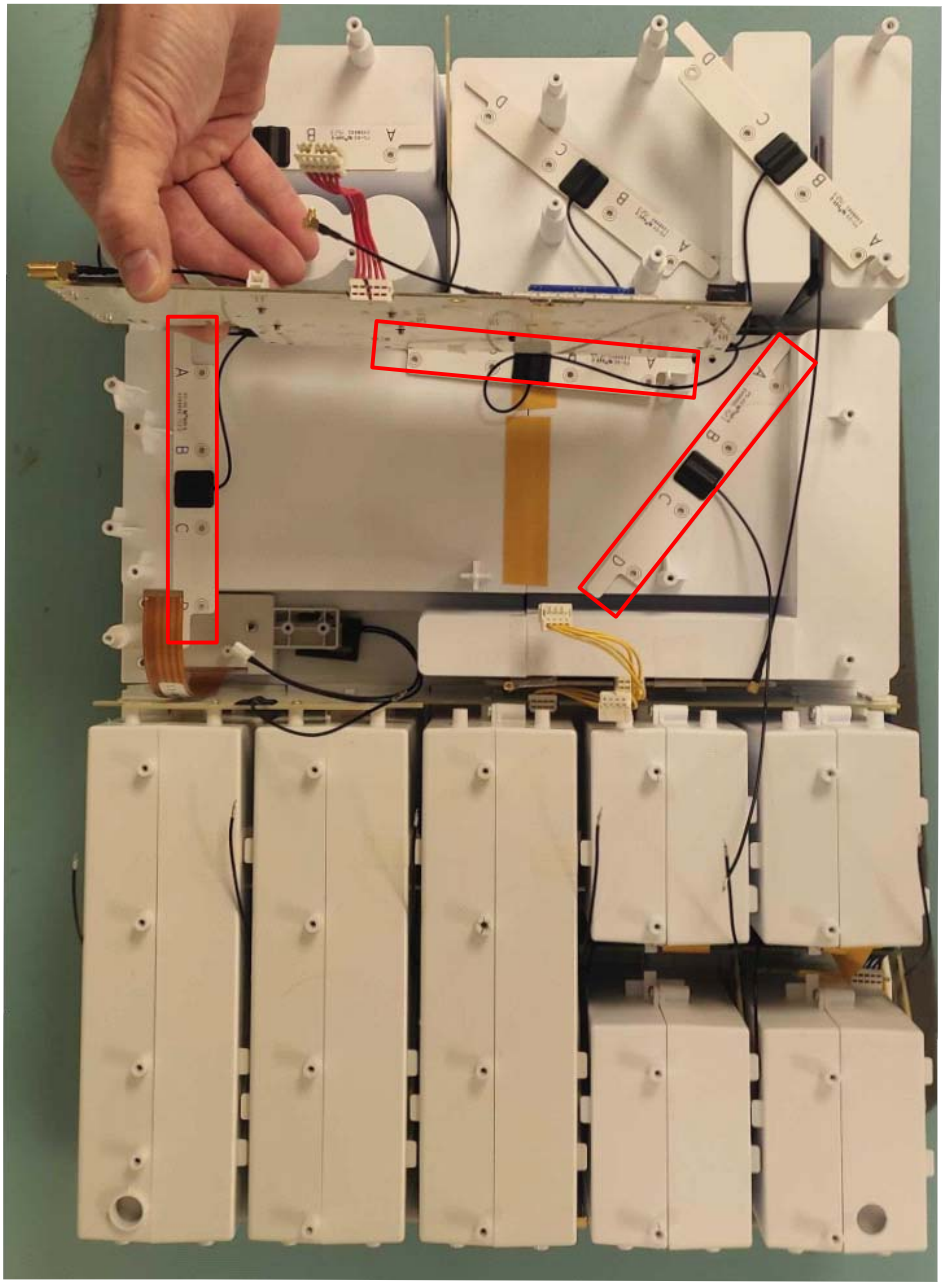

Figure 7: 21000 Lifted to show 21173 PCB Dipole locations.

Figure 8: Example of 21173 PCB Dipole installed with heat-stake in the sachet bin area.

Tuesday, February 13, 2024

RE: Description of NFC Antennas for application of FCC ID: 2AVAZ-CFAS-G5-US

Frequency Bands

- 13.56MHz
- Bandwidth: 2.26kHz

Description

The NFC on the cabinet utilises the ST25R3911B chip from ST Electronics. The chip is placed on the 21000 CMKE Motherboard and is powered from 3.3V regulators.

The antennas used for the NFC scanning are all located on the same PCB: 21191 CMKE Sachet Antennas

The RF connection is made between the 21000 CMKE Motherboard and 21191 CMKE Sachet Antennas using 1.37mm 50R Coax cable, terminated with MMCX connectors. Access to the two boards is not possible to the customer without full unauthorized disassembly of the unit.

21191 CMKE Sachet Antennas contains 10x NFC antennas, all the same physical dimension and tuning.

Only one Antenna is active at a time, the selection of which is controlled through RF Switches P.N. SKY13418-485 and SKY13414-485 placed on 21191.

Construction

21191 CMKE Sachet Antennas measures 212mm x 336mm and is constructed from 4 layer 1.6mm FR4.

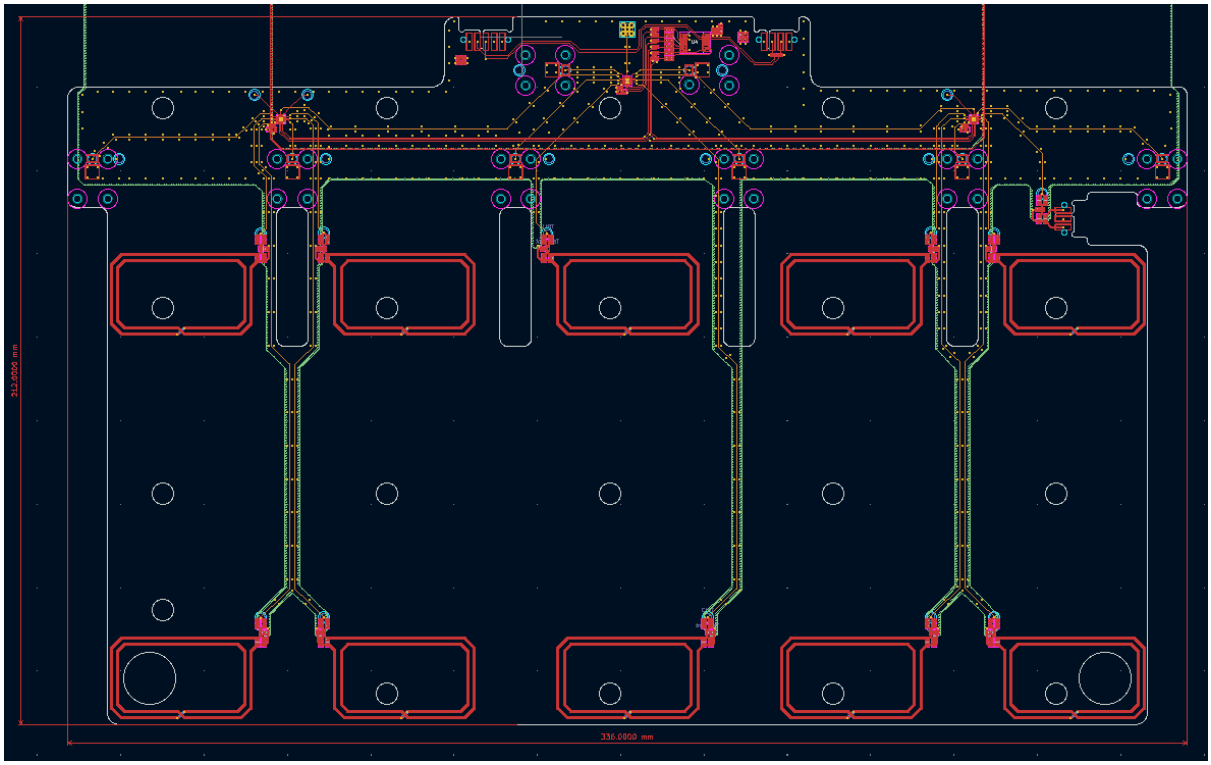

Figure 1: 21191 CMKE Sachet Antennas

The antenna is constructed from two loops of 1mm wide microstrip on the outer loop measures 25mm x 43mm.

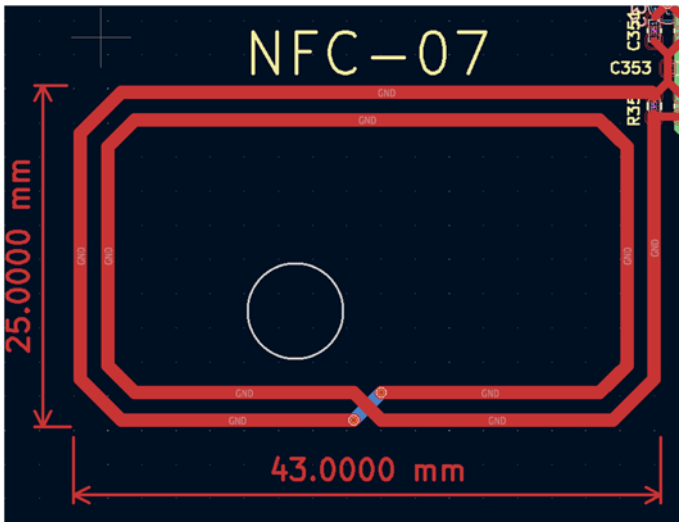

Figure 2: Example of NFC Antenna on 21191

Location

21191 CMKE Sachet Antennas is installed at the back of the sachet bin area of the chassis as shown in Figure 3.

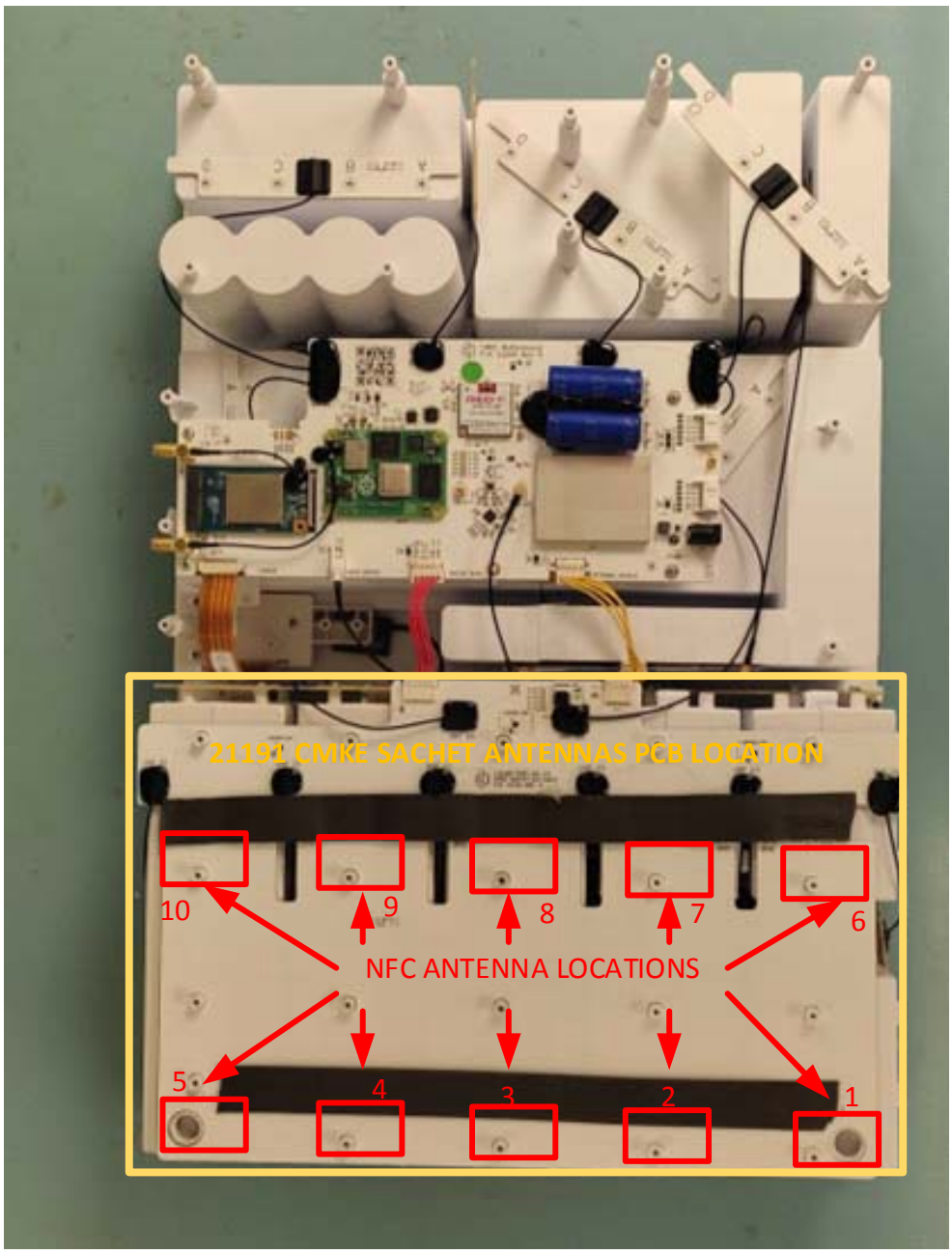

Figure 3: NFC Antenna locations