



TEST REPORT

Reference No...... : WTX22X08156831W002
Applicant : Descartes Systems Group Inc.
Address : 105 Trafalgar Street, Floor 2, Nelson, Tasman 7011, New Zealand
Manufacturer : The same as Applicant
Address : The same as Applicant
Product Name : COREInsight® Reader
Model No...... : RDR001
Standards : **FCC PART15 SUBPART B**
Date of Receipt sample : 2022-08-01
Date of Test..... : 2022-08-01 to 2022-08-28
Date of Issue : 2022-08-29
Test Report Form No. : WTX_FCC PART15B_001
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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Tested by:

Mike Shi

Approved by:

Silin Chen



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**Report version**

Version No.	Date of issue	Description
Rev.00	2022-08-28	Original
/	/	/

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	COREInsight® Reader
Trade Name:	/
Model No.:	RDR001
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC12V
Rated Current:	3A
Rated Power:	/
Power Adapter Model:	Model:ATS036T-W120V Input:100-240V ~ 50-60Hz 1A MAX Output:DC12V,3A
Lowest Internal Frequency:	24MHz
Highest Internal Frequency:	2480MHz
Classification of ITE:	Class B



1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15 Subpart B: Unintentional Radiators.

ANSI C63.4-2014: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.



1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List			
Test Mode	Description	Remark	Power Supply Mode
TM1	The EMC testing sample	The EUT was connected to the AC adapter, the blue light was on	DC12V, 3A

EUT Cable List and Details				
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite	With / Without Chip
DC Cable	1.5	Unshielded	Without Ferrite	/

Special Cable List and Details				
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite	With / Without Chip
/	/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/



1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Radiated Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

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1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
☒ Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2022-03-22	2023-03-21
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2022-03-22	2023-03-21
Amplifier	Agilent	8447F	3113A06717	2022-01-07	2023-01-06
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2023-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-20	2023-03-19
☐ Chamber A: Above 1GHz					
Amplifier	C&D	PAP-1G18	2002	2022-03-22	2023-03-21
Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
☐ Chamber B: Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2022-03-22	2023-03-21
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2023-04-08
Amplifier	Agilent	8447D	2944A10179	2022-03-22	2023-03-21
☐ Chamber C: Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2022-01-07	2023-01-06
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2023-05-27
Amplifier	HP	8447F	2944A03869	2022-03-22	2023-03-21
☒ Conducted Room 1#					
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2022-03-25	2023-03-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2022-03-22	2023-03-21
AC LISN	Schwarz beck	NSLK8126	8126-224	2022-03-22	2023-03-21
☐ Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	10129	2022-03-22	2023-03-21
LISN	Rohde & Schwarz	ENV 216	100097	2022-03-22	2023-03-21

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.



2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107(a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

N/A: not applicable

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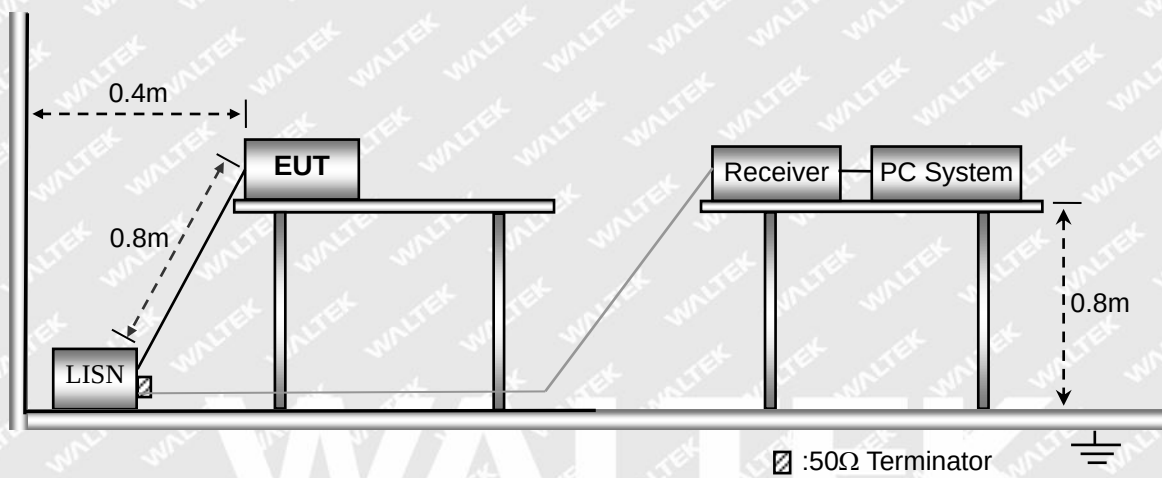


3. Conducted Emissions

3.1 Test Procedure

The test is conducted under the description of ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

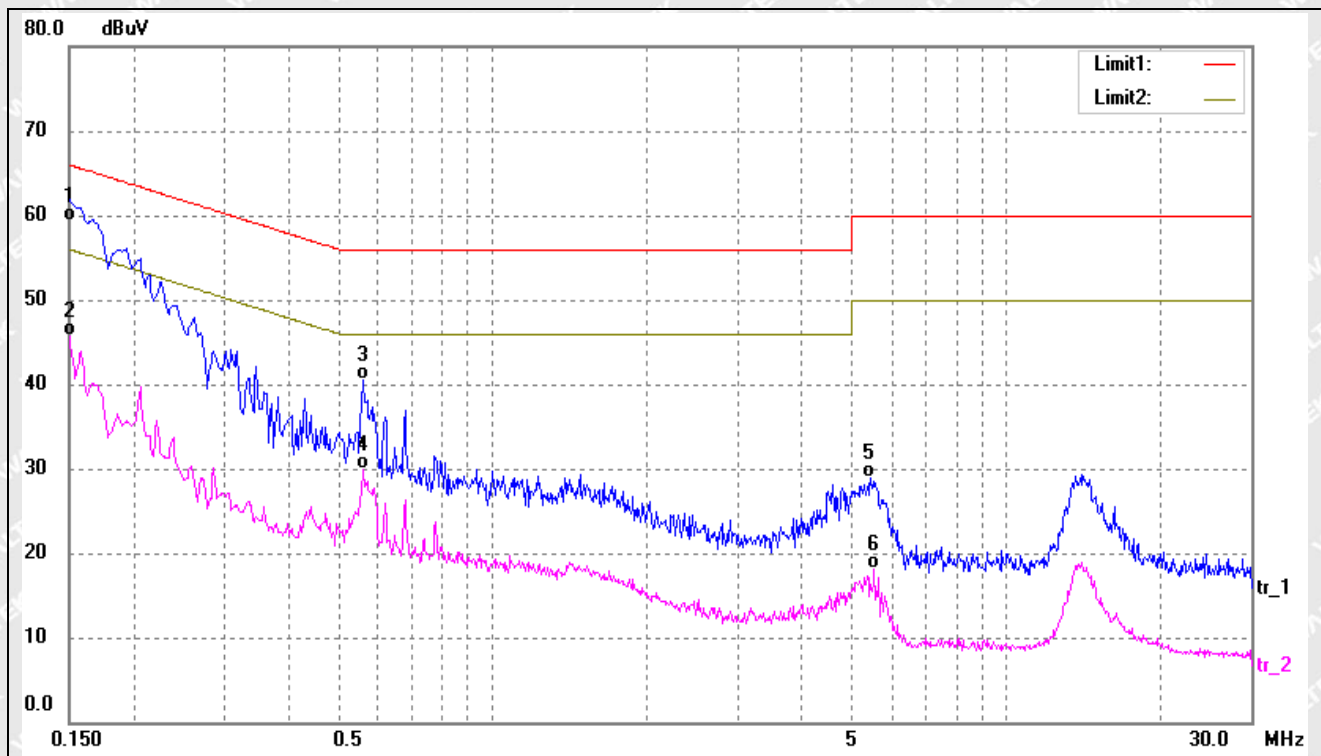
Temperature:	23.5 °C
Relative Humidity:	54 %
ATM Pressure:	1014 mbar

3.4 Summary of Test Results

Please find the results below:



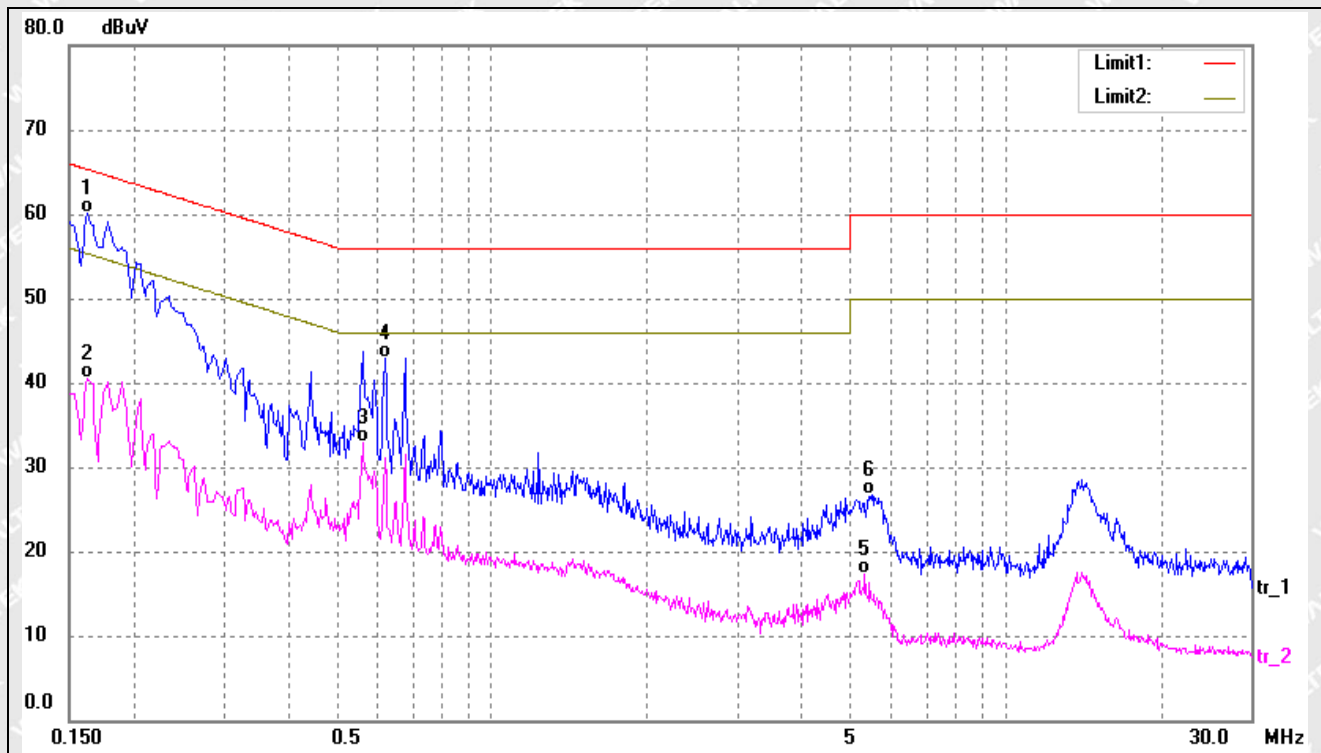
Test mode:	TM1	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1500	49.08	10.32	59.40	65.99	-6.59	QP
2	0.1500	35.36	10.32	45.68	55.99	-10.31	AVG
3	0.5580	30.31	10.21	40.52	56.00	-15.48	QP
4	0.5580	19.63	10.21	29.84	46.00	-16.16	AVG
5	5.4500	18.63	10.33	28.96	60.00	-31.04	QP
6	5.5460	7.83	10.33	18.16	50.00	-31.84	AVG



Test mode:	TM1	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1620	49.72	10.31	60.03	65.36	-5.33	QP
2	0.1620	30.24	10.31	40.55	55.36	-14.81	AVG
3	0.5580	22.75	10.21	32.96	46.00	-13.04	AVG
4	0.6180	32.64	10.20	42.84	56.00	-13.16	QP
5	5.3300	6.92	10.33	17.25	50.00	-32.75	AVG
6	5.5020	16.45	10.33	26.78	60.00	-33.22	QP

4. RADIATED EMISSION

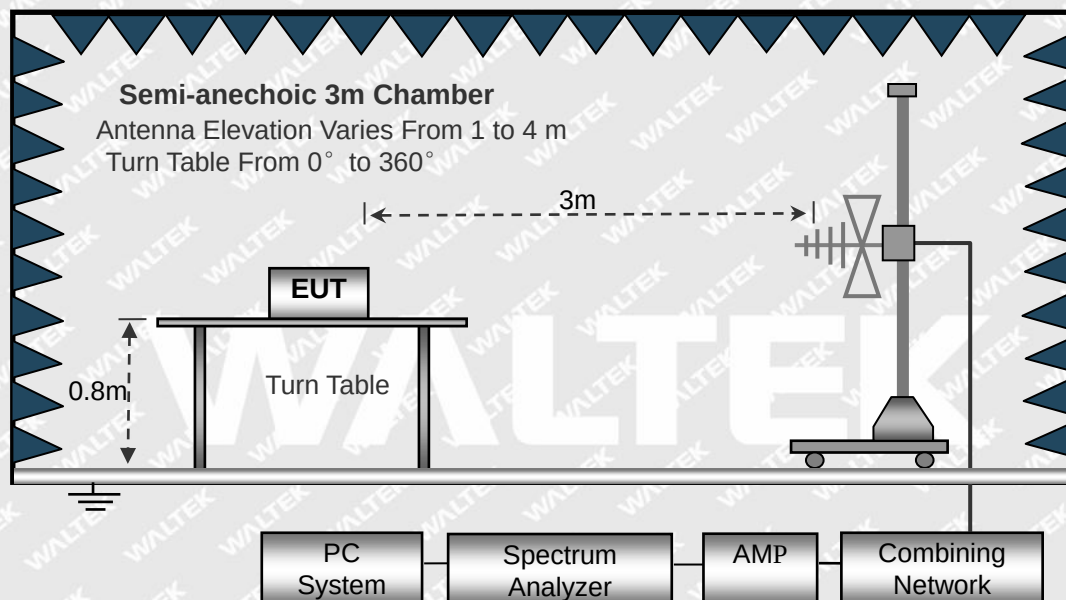
4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

4.2 Block Diagram of Test Setup





4.3 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\begin{aligned}\text{Corr. Ampl.} &= \text{Indicated Reading} + \text{Correct} \\ \text{Correct} &= \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}\end{aligned}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

4.5 Environmental Conditions

Temperature:	22.5°C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

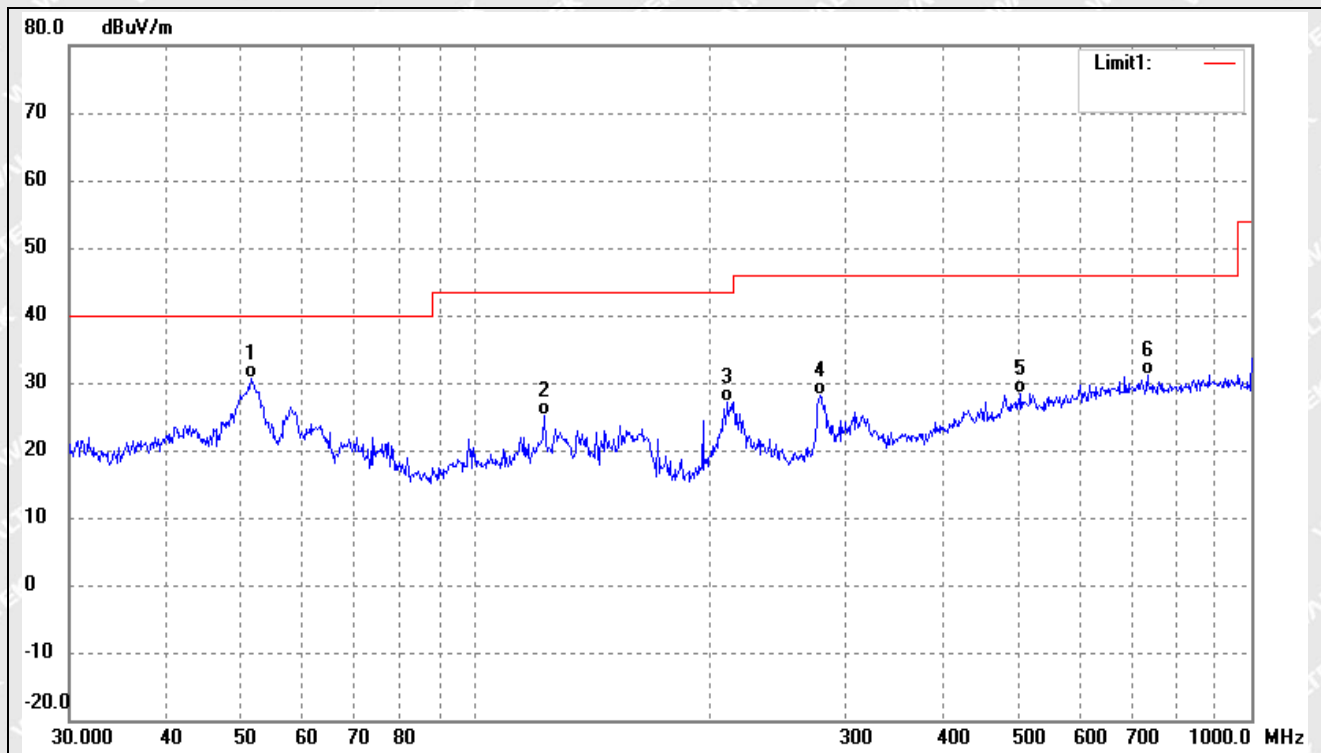
4.6 Summary of Test Results

Please find the results below:



Below 1GHz

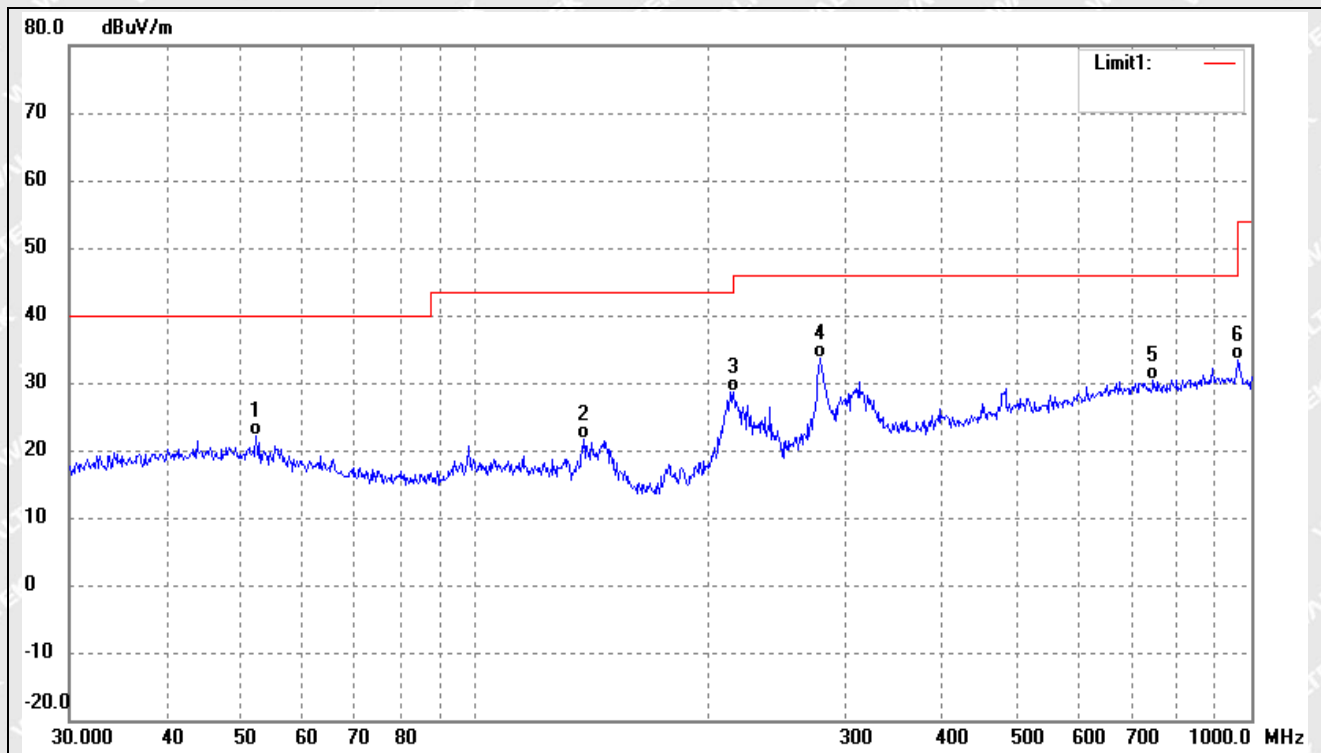
Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.4807	37.70	-7.19	30.51	40.00	-9.49	-	-	QP
2	122.8340	35.28	-10.12	25.16	43.50	-18.34	-	-	QP
3	211.5265	36.55	-9.38	27.17	43.50	-16.33	-	-	QP
4	278.0669	35.69	-7.55	28.14	46.00	-17.86	-	-	QP
5	504.7062	29.60	-1.22	28.38	46.00	-17.62	-	-	QP
6	734.4913	29.38	1.65	31.03	46.00	-14.97	-	-	QP



Test mode:	TM1	Polarity:	Vertical
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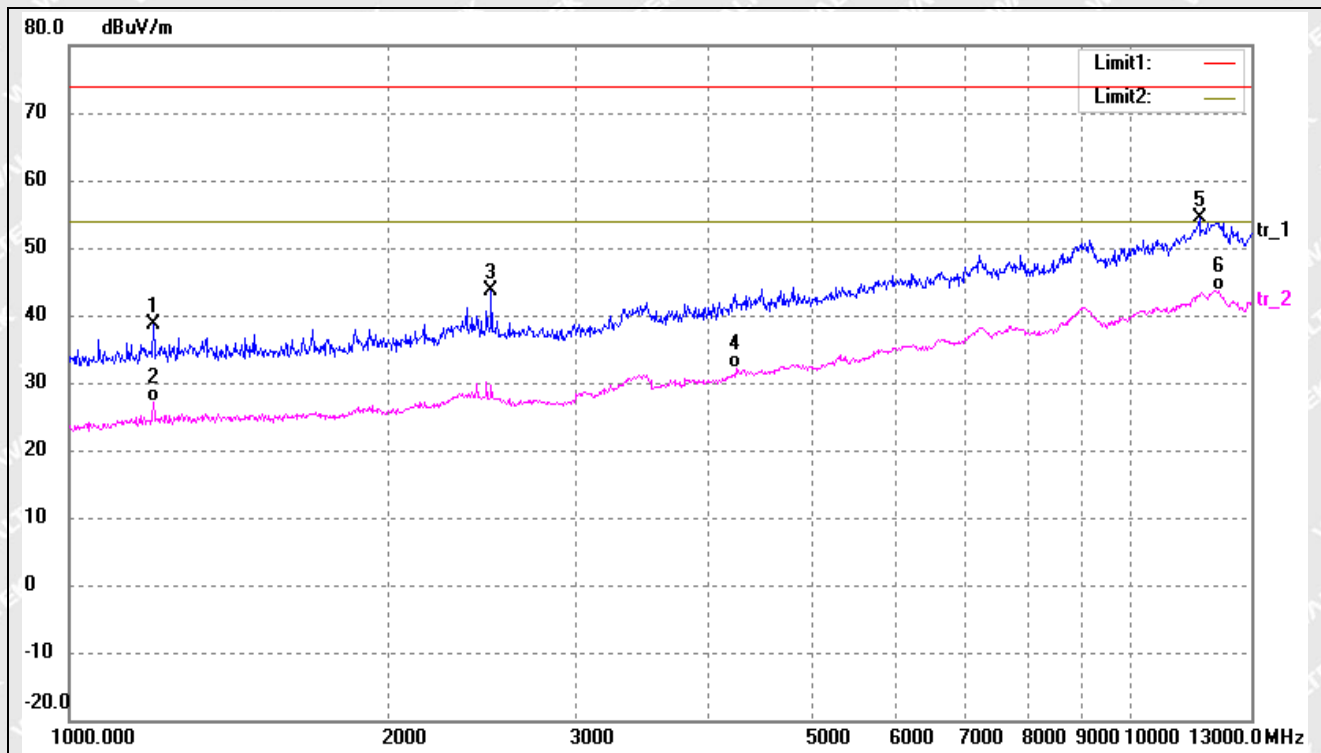


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.2079	29.30	-7.29	22.01	40.00	-17.99	-	-	QP
2	137.9029	33.71	-12.09	21.62	43.50	-21.88	-	-	QP
3	215.2678	38.02	-9.28	28.74	43.50	-14.76	-	-	QP
4	278.0669	41.14	-7.55	33.59	46.00	-12.41	-	-	QP
5	747.4826	28.73	1.74	30.47	46.00	-15.53	-	-	QP
6	962.1623	30.86	2.54	33.40	54.00	-20.60	-	-	QP



Above 1GHz

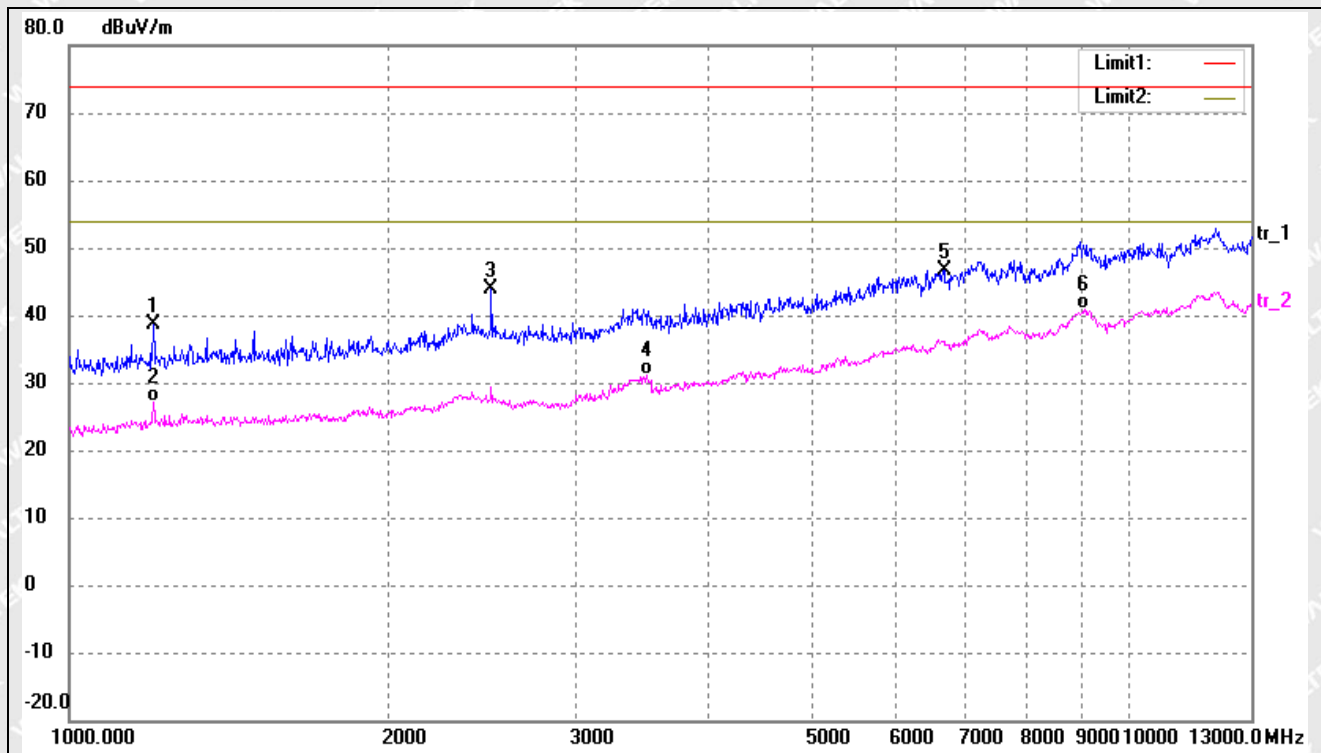
Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1199.748	51.54	-12.90	38.64	74.00	-35.36	-	-	peak
2	1199.748	40.01	-12.90	27.11	54.00	-26.89	-	-	AVG
3	2498.491	51.71	-8.08	43.63	74.00	-30.37	-	-	peak
4	4248.778	36.66	-4.58	32.08	54.00	-21.92	-	-	AVG
5	11612.610	45.24	9.22	54.46	74.00	-19.54	-	-	peak
6	12099.096	33.88	9.83	43.71	54.00	-10.29	-	-	AVG



Test mode:	TM1	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1199.748	51.54	-12.90	38.64	74.00	-35.36	-	-	peak
2	1199.748	39.95	-12.90	27.05	54.00	-26.95	-	-	AVG
3	2498.491	51.84	-8.08	43.76	74.00	-30.24	-	-	peak
4	3496.265	36.87	-5.67	31.20	54.00	-22.80	-	-	AVG
5	6672.953	45.56	1.19	46.75	74.00	-27.25	-	-	peak
6	9054.768	34.53	6.25	40.78	54.00	-13.22	-	-	AVG

Remark: '-' Means the test Degree and Height are not recorded by the test software and only show the worst case in the test report.



EXHIBIT 1 - PRODUCT LABELING

Proposed FCC Label Format

DESCARTES™	
Model No: RDR001	Input: 12V --- 3A
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.	
Contains FCC ID: XMR201903EG25G Contains FCC ID: XPYNINAB1	
 Made in New Zealand.	

Specifications: Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT. Where the EUT is constructed in two or more sections connected by wires and marketed together, the above statement is required to be affixed only to the main control unit. When the EUT is so small or for such use that it is not practicable to place the statement on it, the above information shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

Proposed Label Location on EUT

FCC Label Location

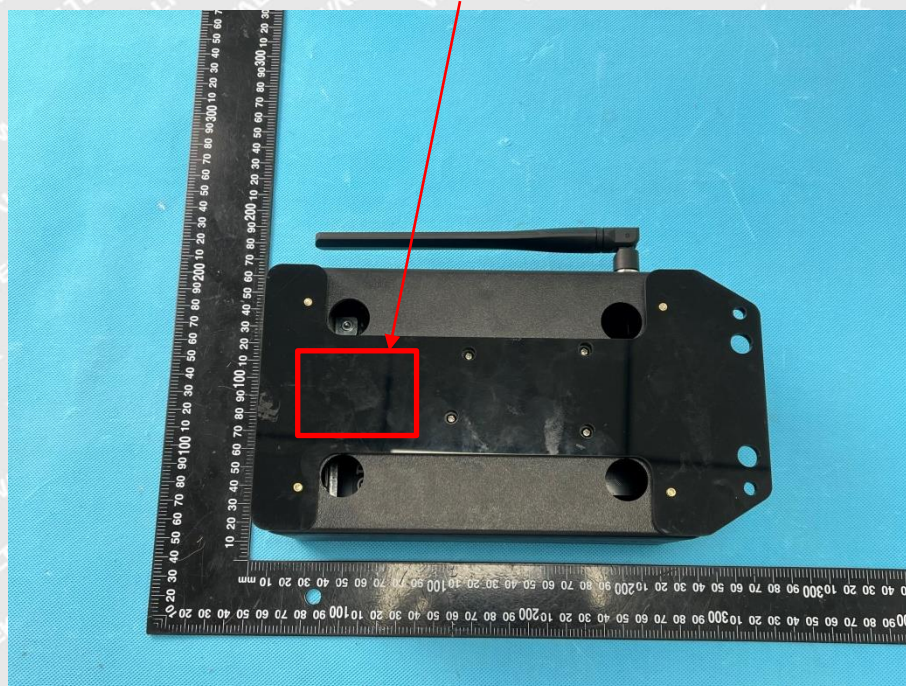




EXHIBIT 2 - EUT PHOTOGRAPHS

EUT View 1



EUT View 2





EUT View 3



EUT View 4





EUT View 5

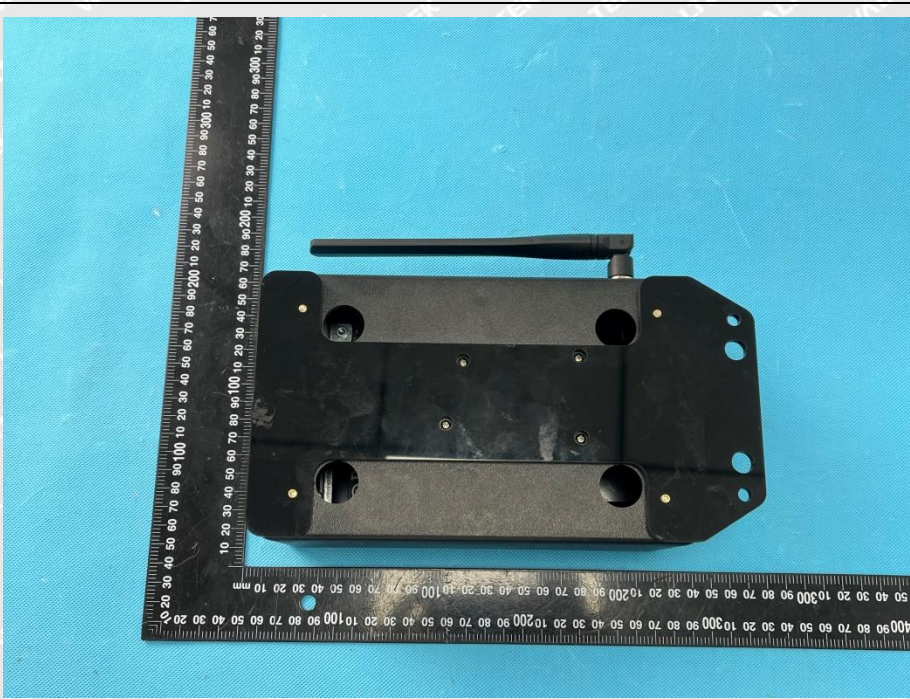


EUT View 6





EUT View 7



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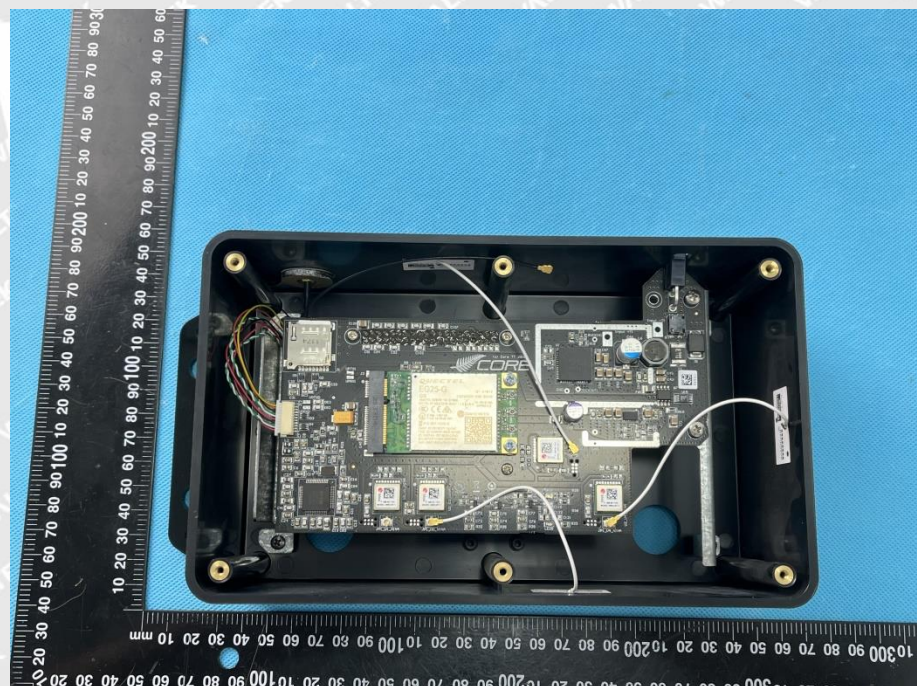


EXHIBIT 3 - EUT INTERNAL PHOTOGRAPHS

**EUT Housing and Board
View 1**

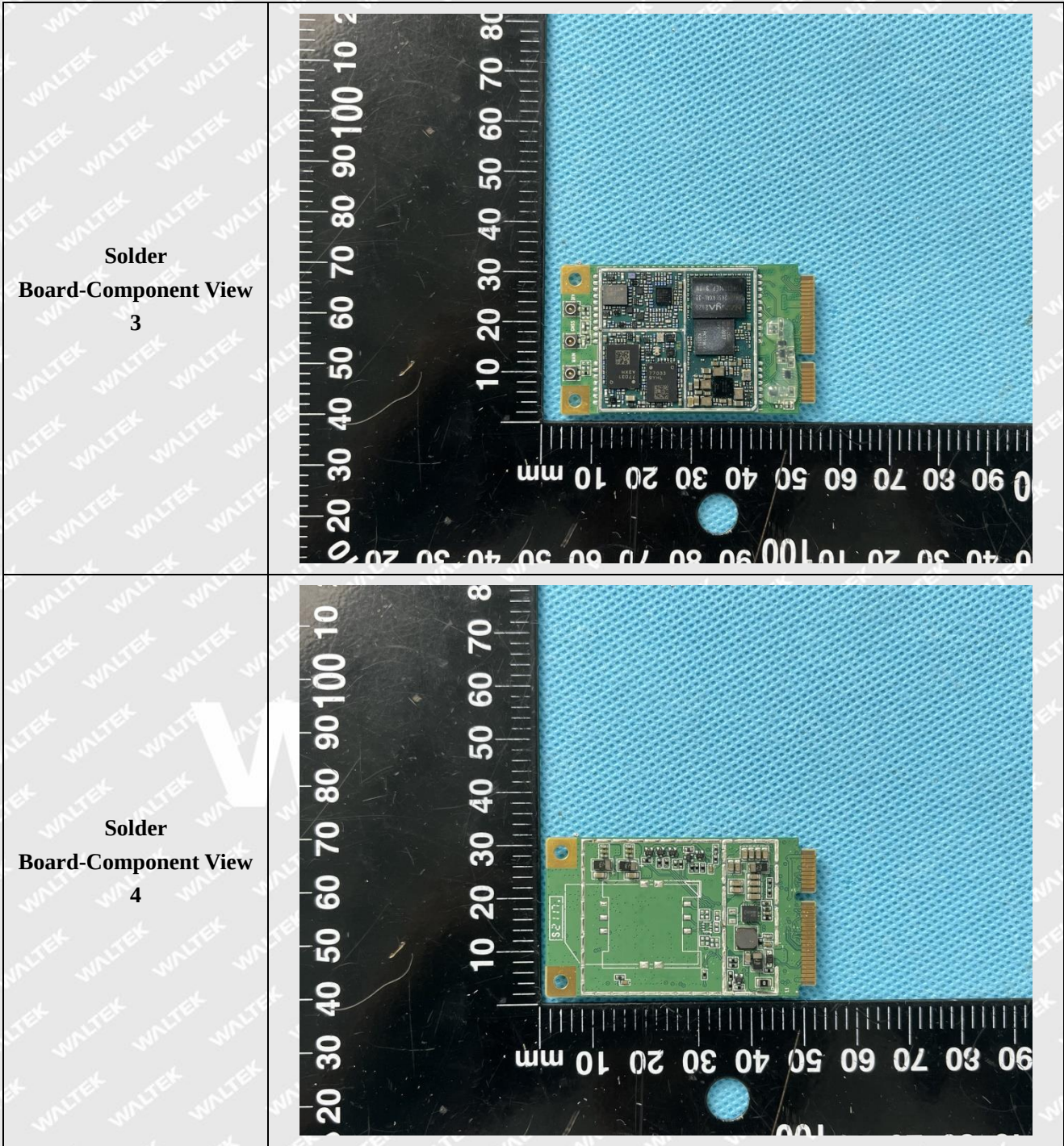


**EUT Housing and Board
View 2**



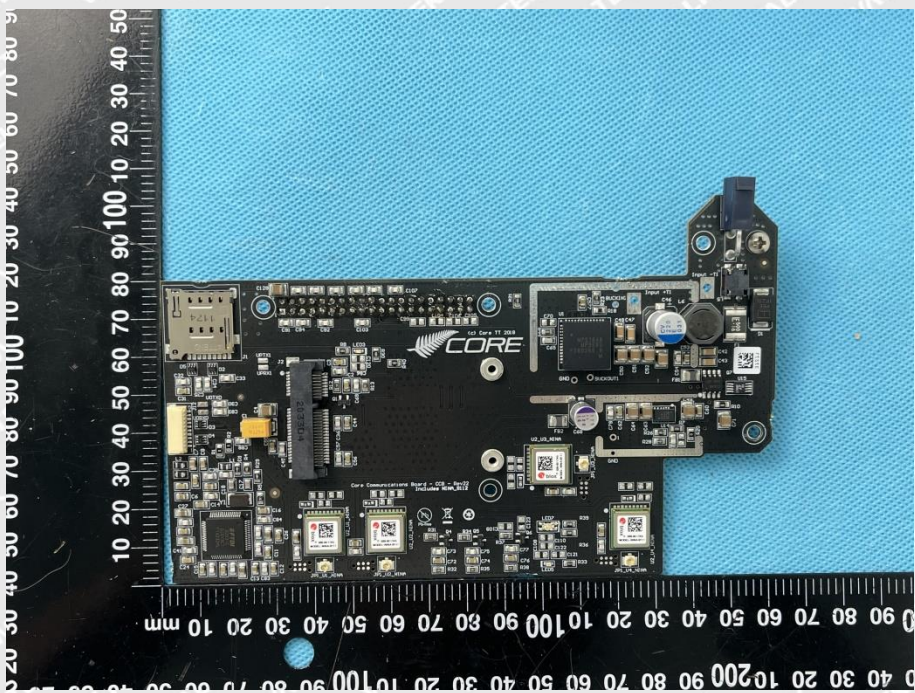


Solder Board-Component View 1	
Solder Board-Component View 2	

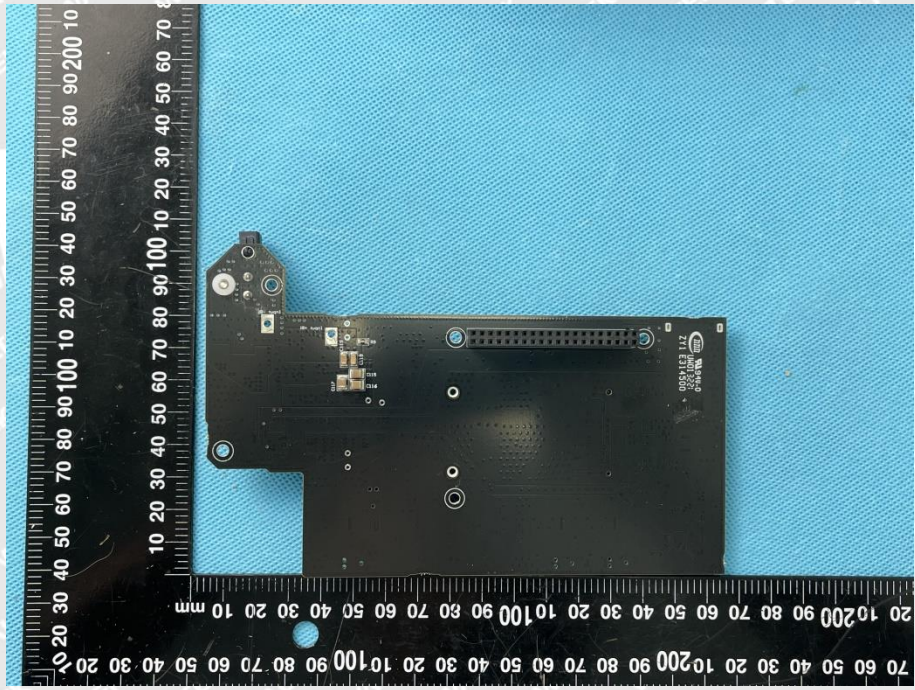




Solder
Board-Component View
5

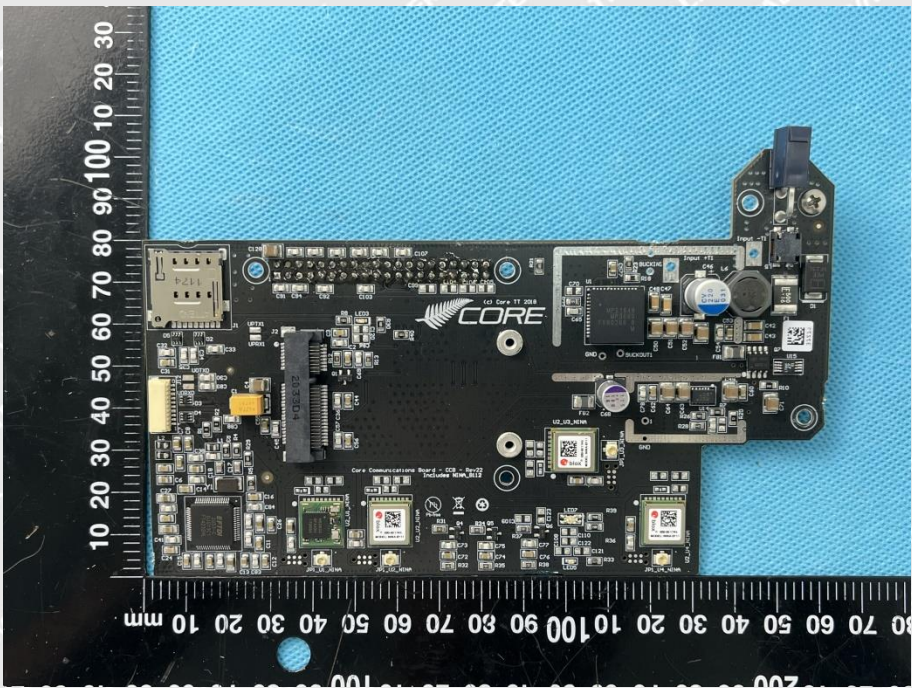


Solder
Board-Component View
6

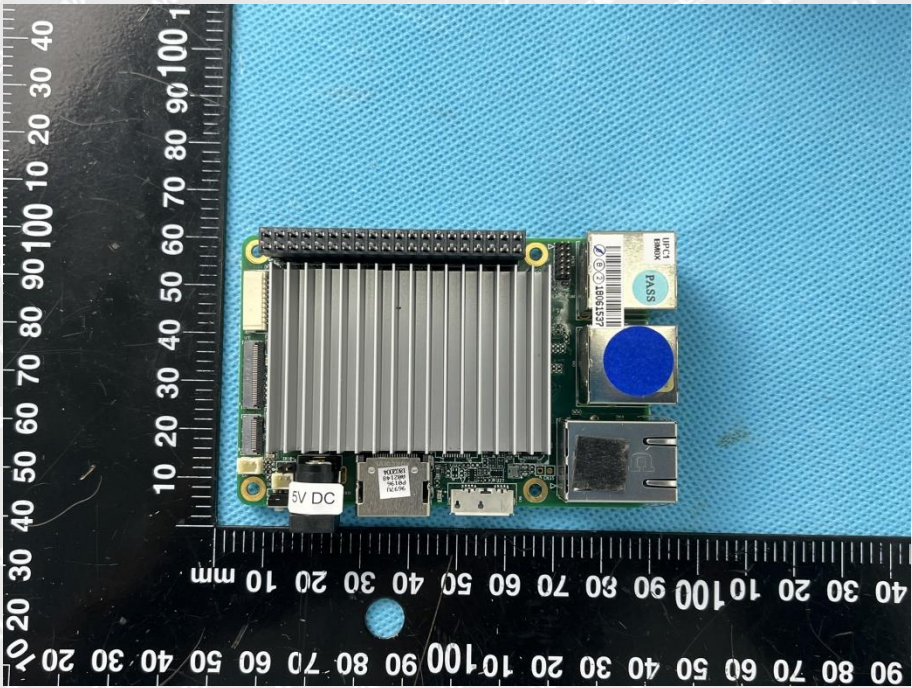




Solder
Board-Component View
7



Solder
Board-Component View
8



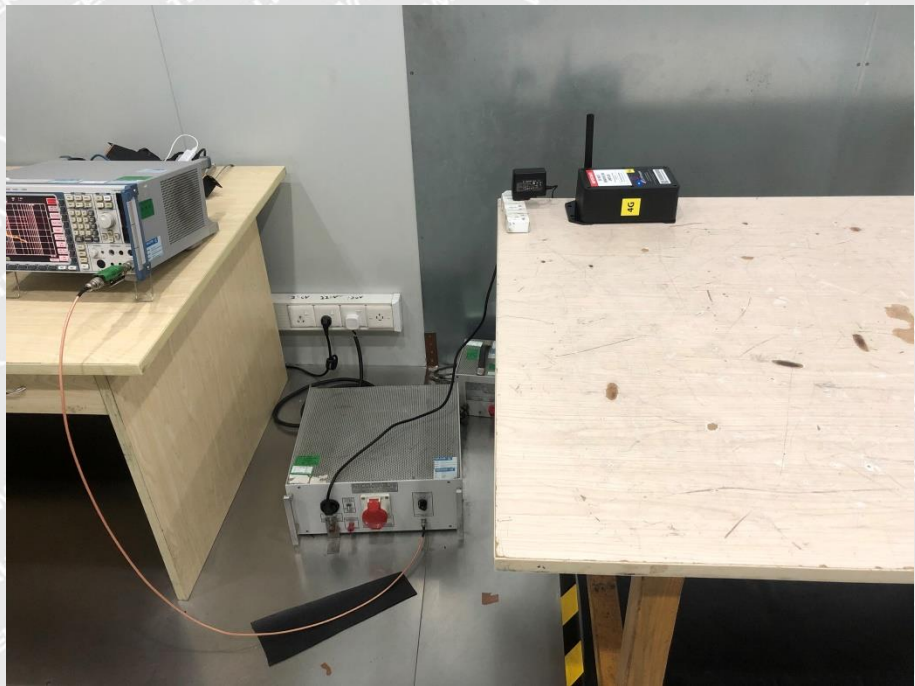


Solder Board-Component View 9	
Solder Board-Component View 10	

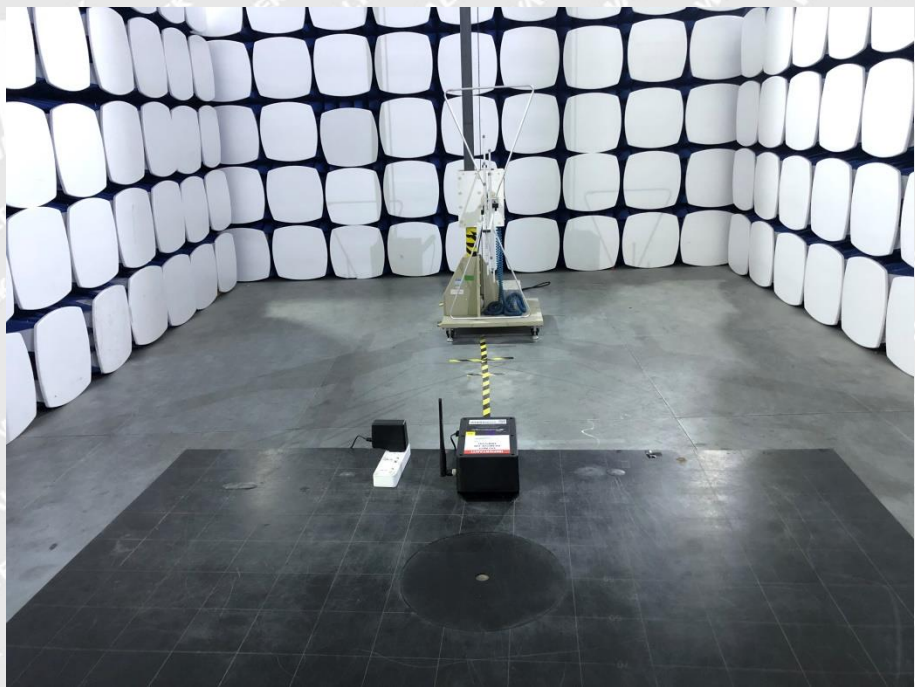


EXHIBIT 4 - TEST SETUP PHOTOGRAPHS

**Conducted Emission
Test Setup**



**Radiation Emission Test
View (30MHz to 1GHz)**





**Radiation Emission Test
View (Above 1GHz)**



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EXHIBIT 5 - USERS MANUAL

Information to Users

According to the FCC Part 15.19, 15.21, and 15.105 rules, for this EUT, the instructions or operation manual furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

FCC Caution

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.

NOTE 1: 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.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

***** END OF REPORT *****