TEST REPORT

Reference No.	:	WTX23X12264030W001
Applicant	:	Descartes System Group Inc
Address	:	105 Trafalgar Street, Floor 2 Floor 2, Nelson, 7010 New Zealand
Manufacturer	:	The same as Applicant
Address	:	The same as Applicant
Product Name	:	COREInsight BLE Beacon Tag
Model No.	:	STD001
Standards	:	**FCC PART15 SUBPART B**
Date of Receipt sample	:	2023-12-12
Date of Test	:	2023-12-12 to 2023-12-23
Date of Issue	:	2023-12-23
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:

Waltek Testing Group (Shenzhen) Co., Ltd.

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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	2023-12-23	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	COREInsight BLE Beacon Tag
Trade Name:	/
Model No.:	STD001
Adding Model(s):	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Rated Voltage:	Battery:DC3.6V
Battery Capacity:	2700mAh
Rated Power:	/
Power Adapter Model:	/
Lowest Internal Frequency:	32MHz
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	Normal working	The EUT was powered by battery; it was communicating with the IoT Gateway	/

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

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
Monitor	ASUSTeK	VG28U	/
IoT Gateway	Descartes System Group Inc	RDR001	/

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

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	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☐Chamber A:Above 1GHz					
Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
☐Chamber B:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10457	2023-02-25	2024-02-24
☒Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24
☒Chamber C:Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐Conducted Room 1#					
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24

AC LISN	Schwarz beck	NSLK8126	8126-279	2023-02-25	2024-02-24
☒Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 1#)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 2#)*	SKET	EMC-I	V2.0

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

2. SUMMARY OF TEST RESULTS

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

N/A: not applicable

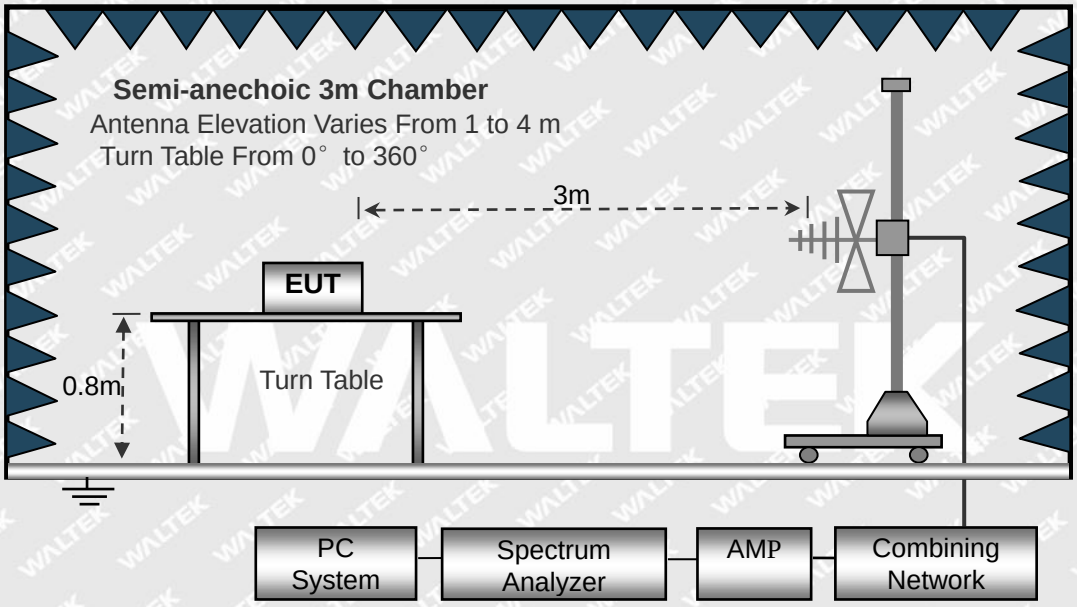
3. RADIATED EMISSION

3.1 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.

3.2 Block Diagram of Test Setup



3.3 Test Receiver Setup

Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

3.4 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:

Corr. Ampl. = Indicated Reading + Correct

Correct=Ant.Factor + Cable Loss - Ampl.Gain

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:

Margin = Corr. Ampl. – FCC Part 15.109(a) Limit

3.5 Environmental Conditions

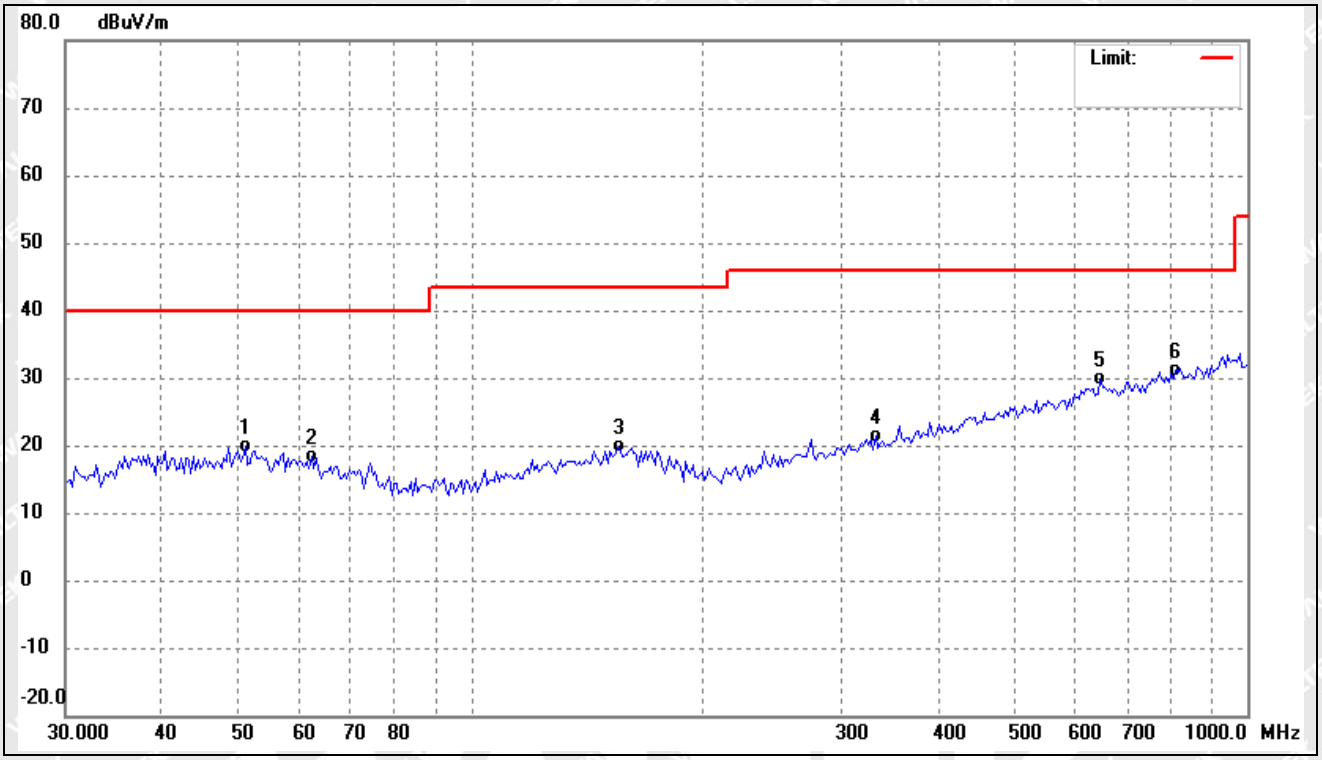
Temperature:	22.5 °C
Relative Humidity:	52 %
ATM Pressure:	1011 mbar

3.6 Summary of Test Results

Please find the results below:

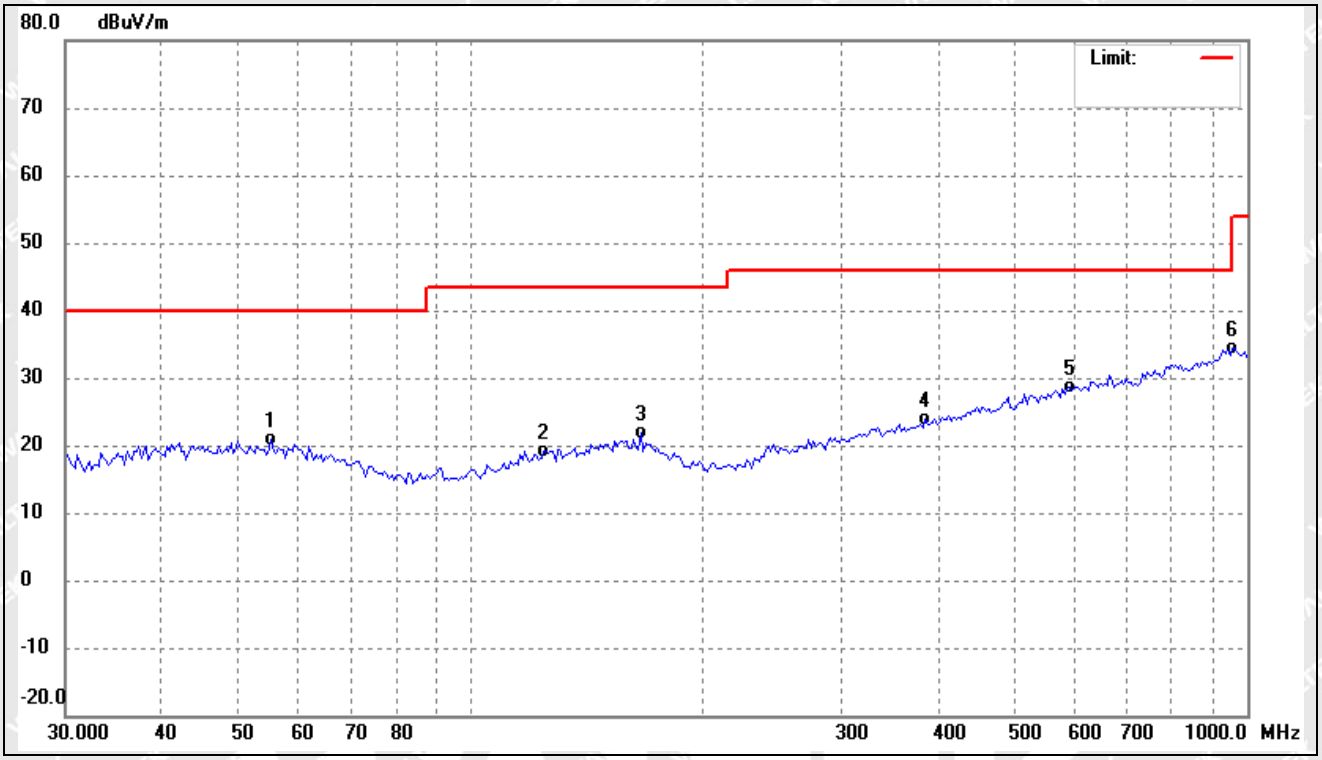
Below 1GHz

Test mode:	TM1	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	51.1756	28.12	-8.22	19.90	40.00	-20.10	-	-	QP
2	62.3038	27.84	-9.35	18.49	40.00	-21.51	-	-	QP
3	155.3305	28.43	-8.61	19.82	43.50	-23.68	-	-	QP
4	331.7858	28.69	-7.43	21.26	46.00	-24.74	-	-	QP
5	646.8217	31.29	-1.32	29.97	46.00	-16.03	-	-	QP
6	809.9238	30.62	0.39	31.01	46.00	-14.99	-	-	QP

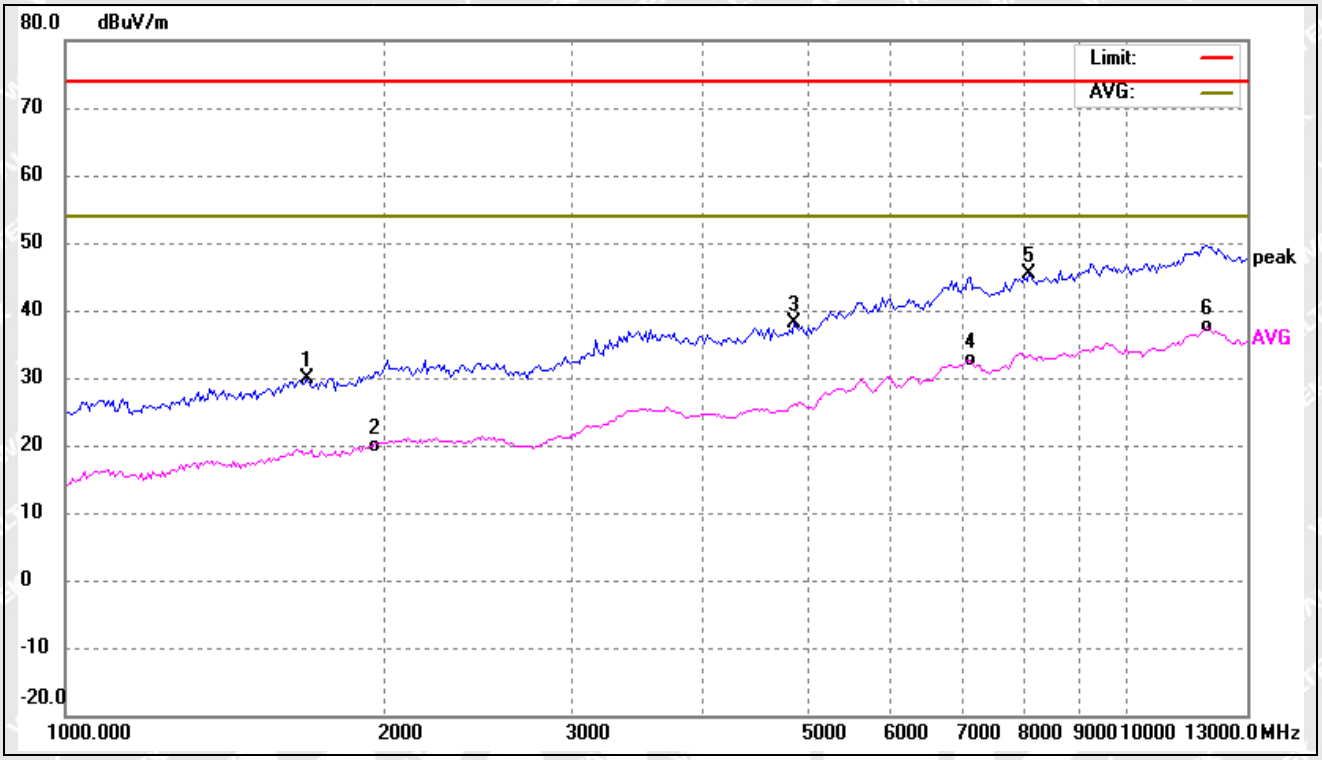
Test mode:	TM1	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	55.2883	29.46	-8.64	20.82	40.00	-19.18	-	-	QP
2	124.0501	29.48	-10.25	19.23	43.50	-24.27	-	-	QP
3	165.4716	30.52	-8.76	21.76	43.50	-21.74	-	-	QP
4	384.5447	30.24	-6.28	23.96	46.00	-22.04	-	-	QP
5	590.3511	30.52	-1.94	28.58	46.00	-17.42	-	-	QP
6	958.7135	32.03	2.26	34.29	46.00	-11.71	-	-	QP

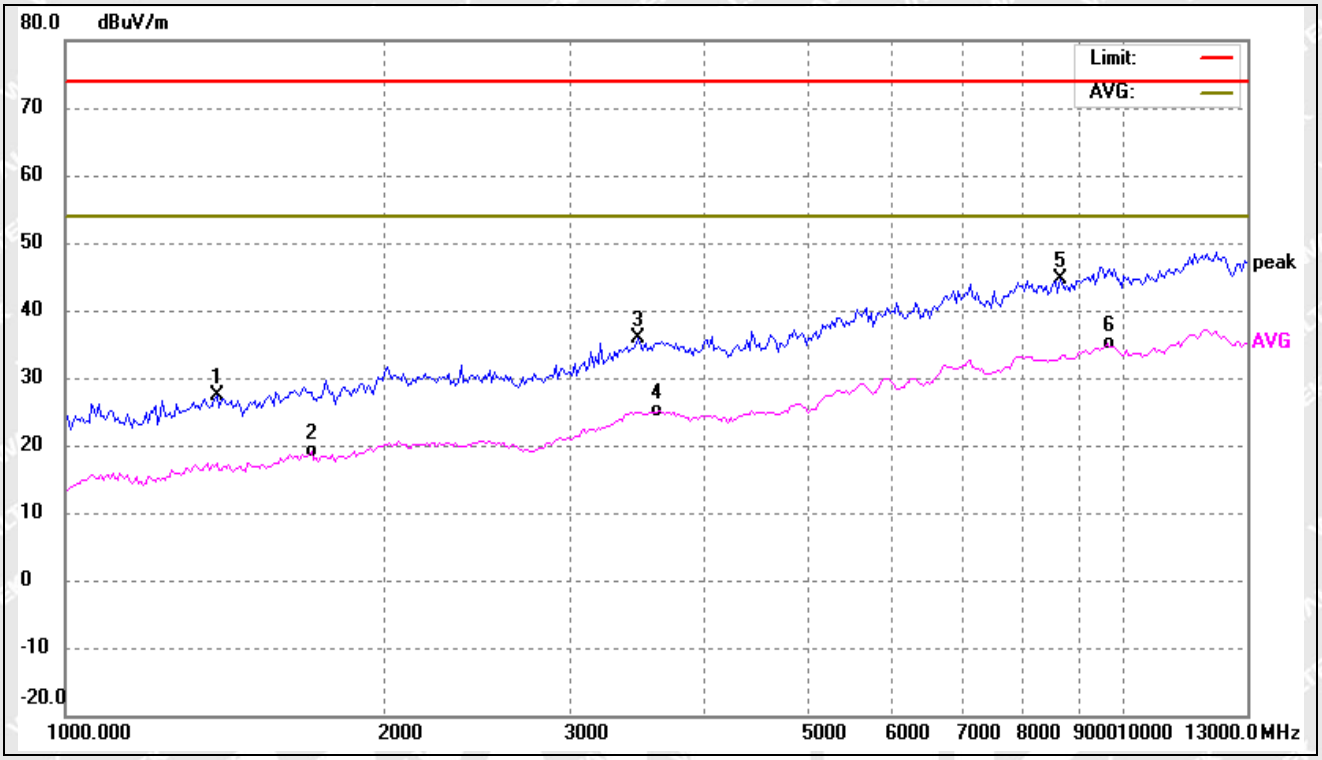
Above 1GHz

Test mode:	TM1	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	1689.273	51.28	-21.46	29.82	74.00	-44.18	-	-	peak
2	1950.768	39.86	-19.92	19.94	54.00	-34.06	-	-	AVG
3	4870.396	50.70	-12.58	38.12	74.00	-35.88	-	-	peak
4	7124.563	38.76	-6.01	32.75	54.00	-21.25	-	-	AVG
5	8101.530	50.47	-5.04	45.43	74.00	-28.57	-	-	peak
6	11912.238	37.62	0.06	37.68	54.00	-16.32	-	-	AVG

Test mode:	TM1	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	1389.538	50.43	-22.97	27.46	74.00	-46.54	-	-	peak
2	1706.729	40.38	-21.36	19.02	54.00	-34.98	-	-	AVG
3	3469.198	50.37	-14.40	35.97	74.00	-38.03	-	-	peak
4	3633.458	39.43	-14.35	25.08	54.00	-28.92	-	-	AVG
5	8661.390	49.54	-5.02	44.52	74.00	-29.48	-	-	peak
6	9599.191	38.44	-3.38	35.06	54.00	-18.94	-	-	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

Product Label

Packaging Label

Proposed Label Location on EUT

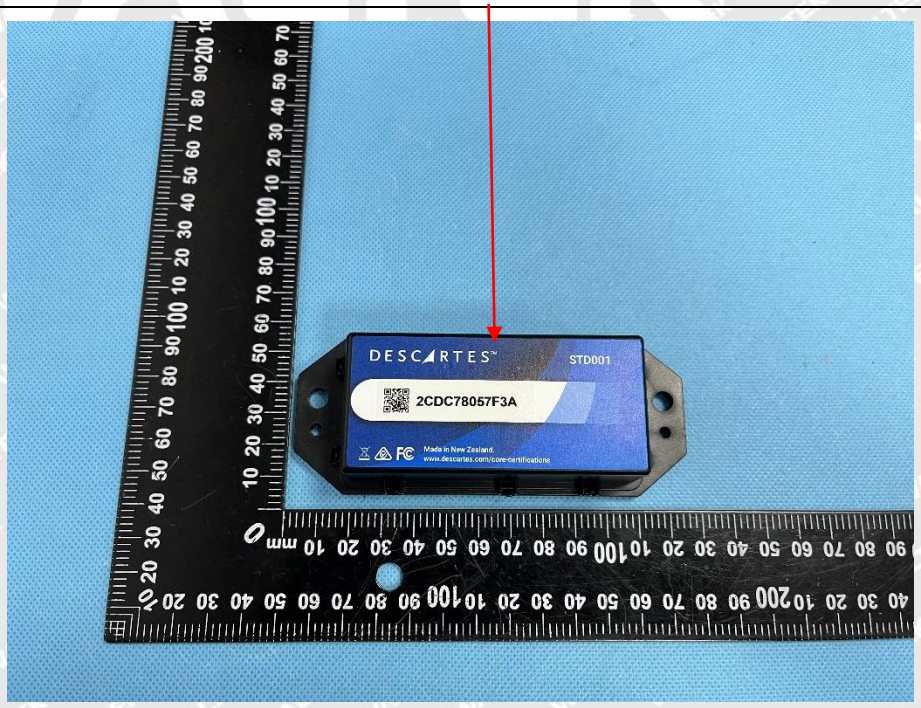
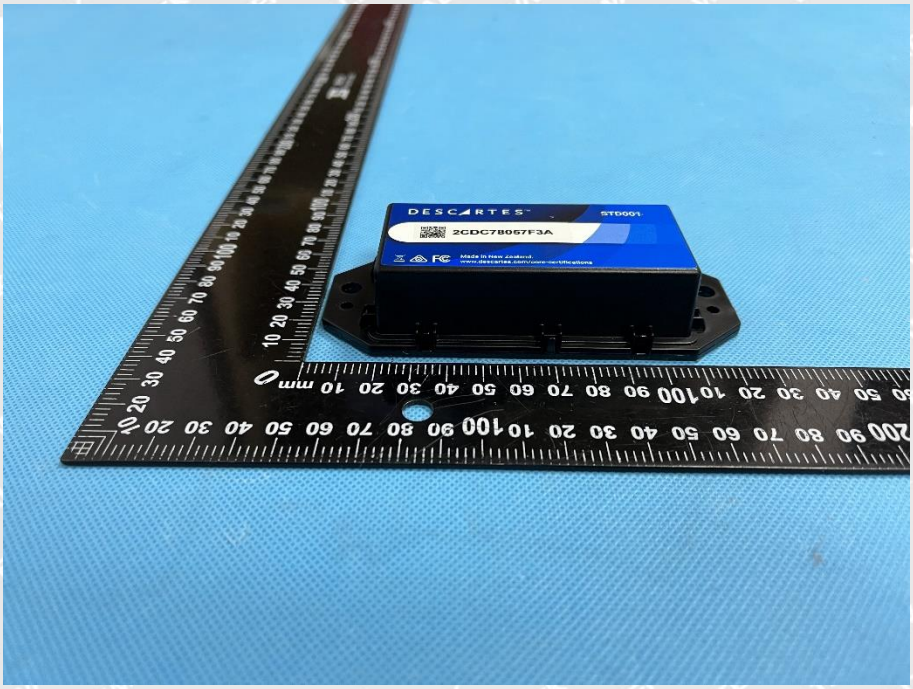
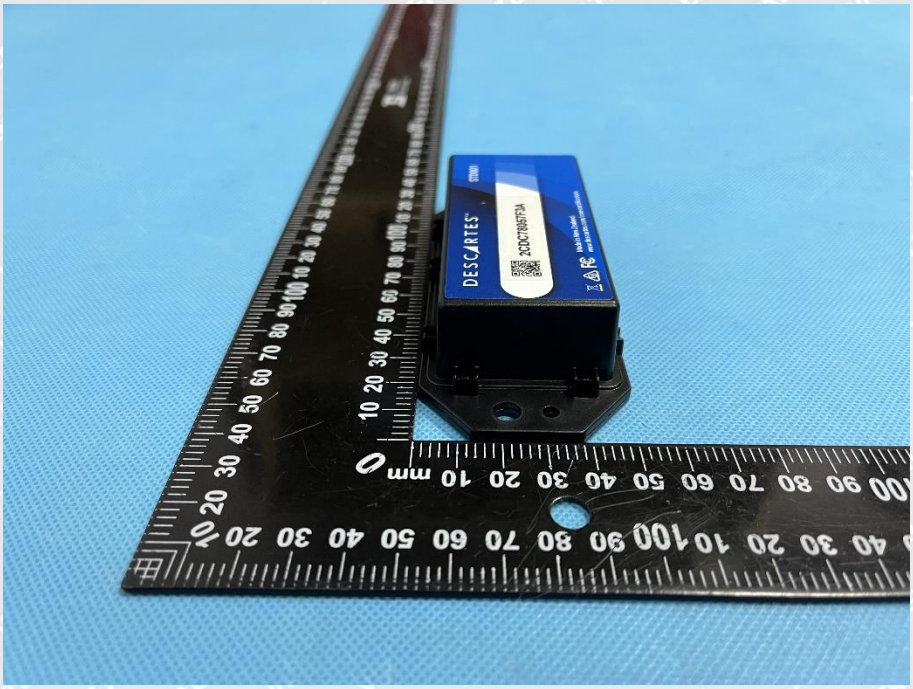
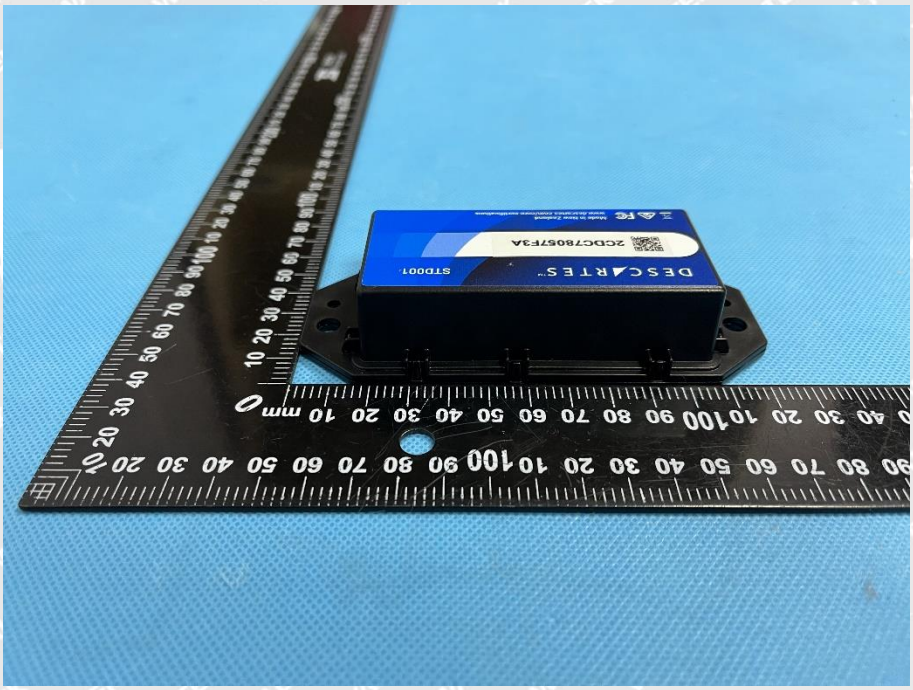
FCC Label Location	

EXHIBIT 2 - EUT PHOTOGRAPHS

EUT View 1	
EUT View 2	

EUT View 3	
EUT View 4	

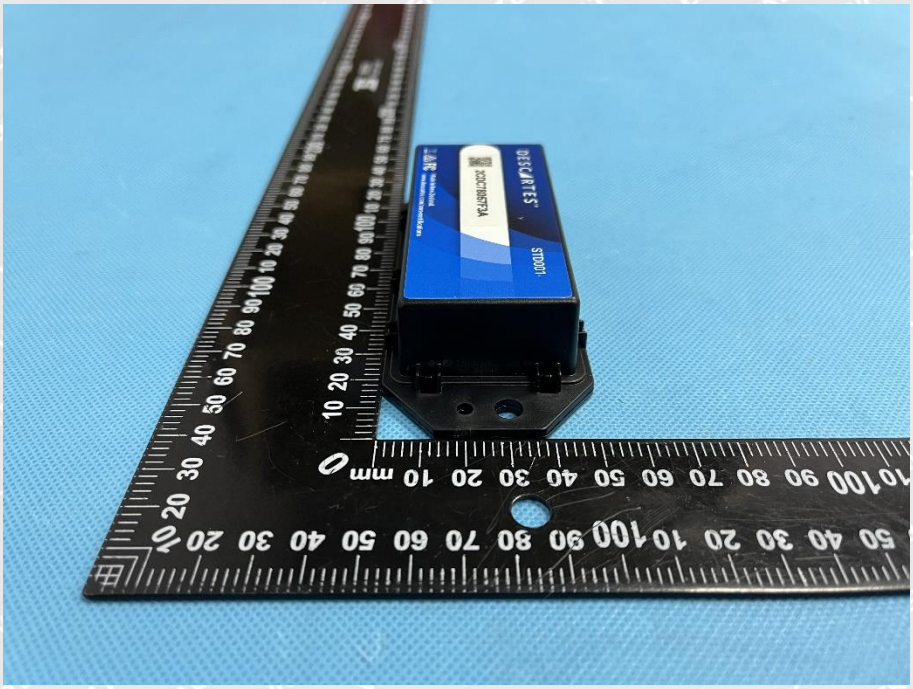
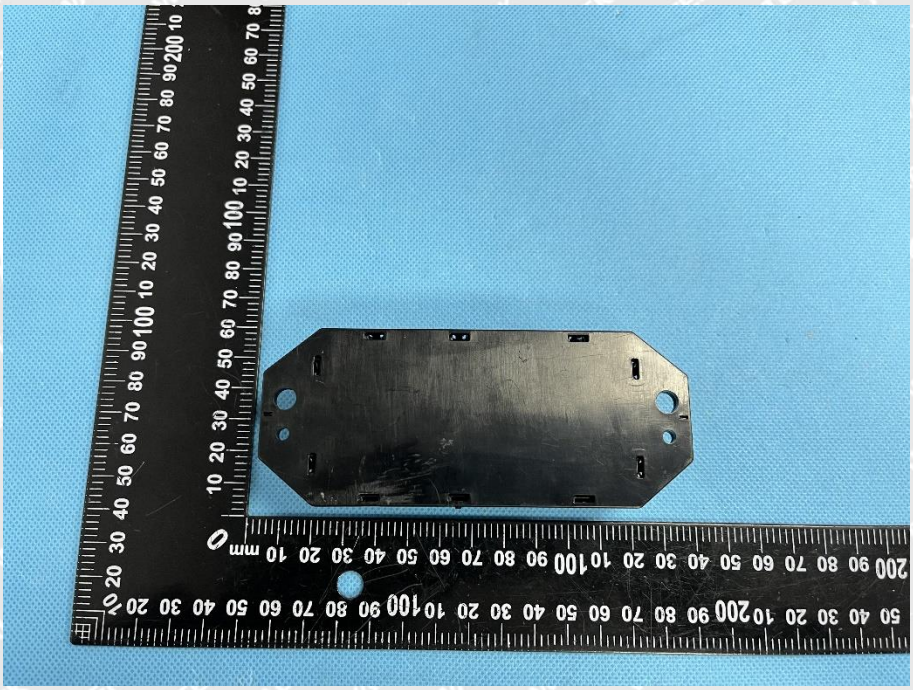
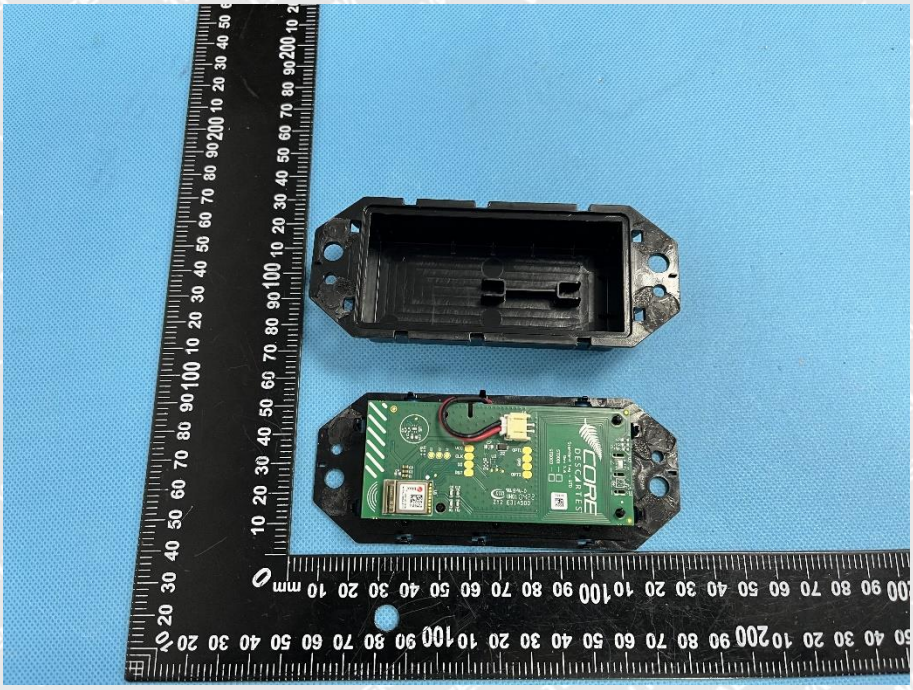
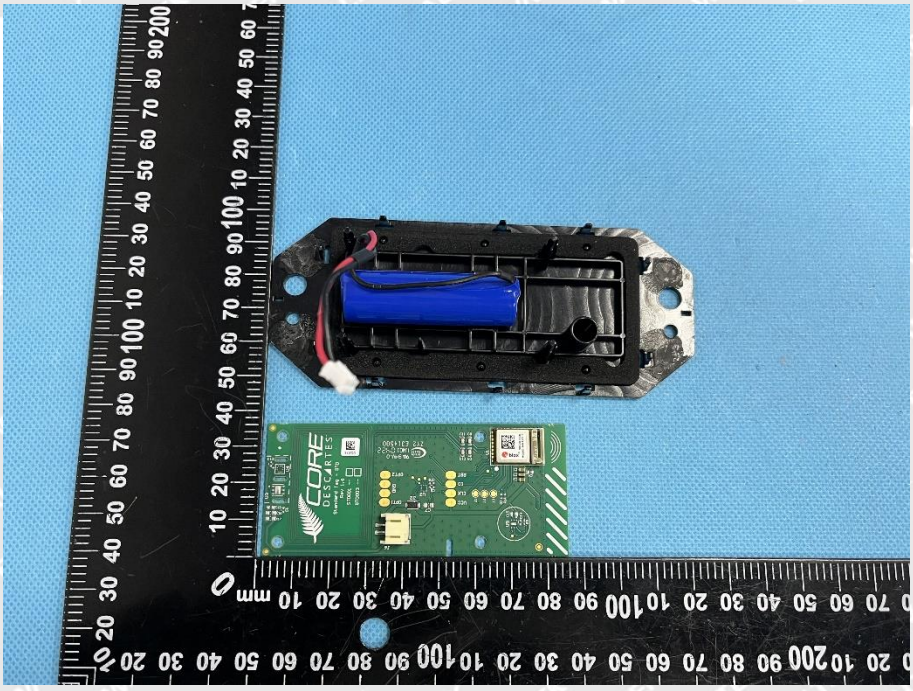
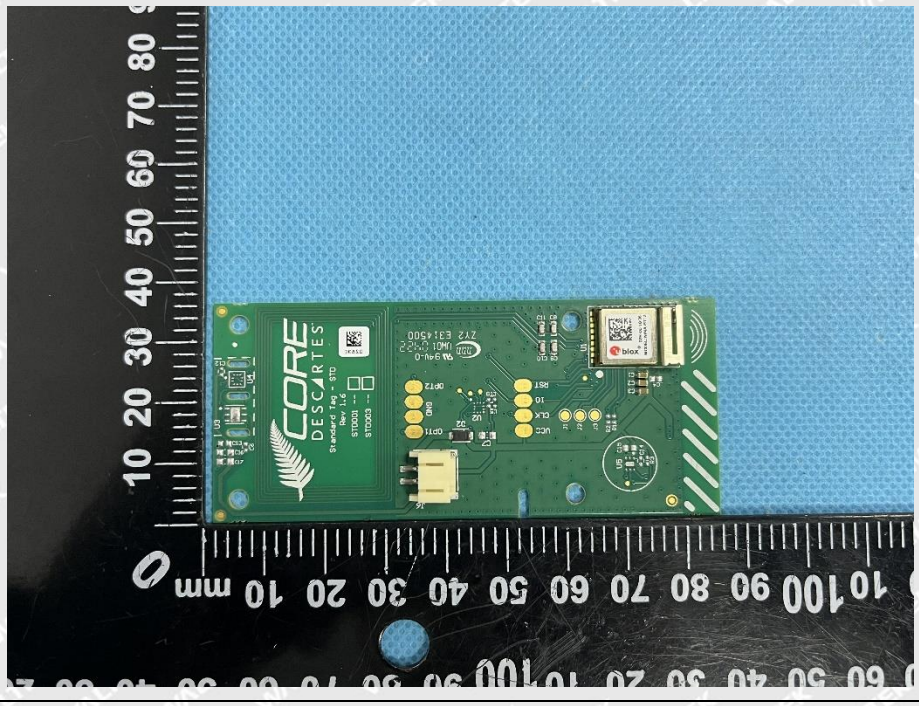
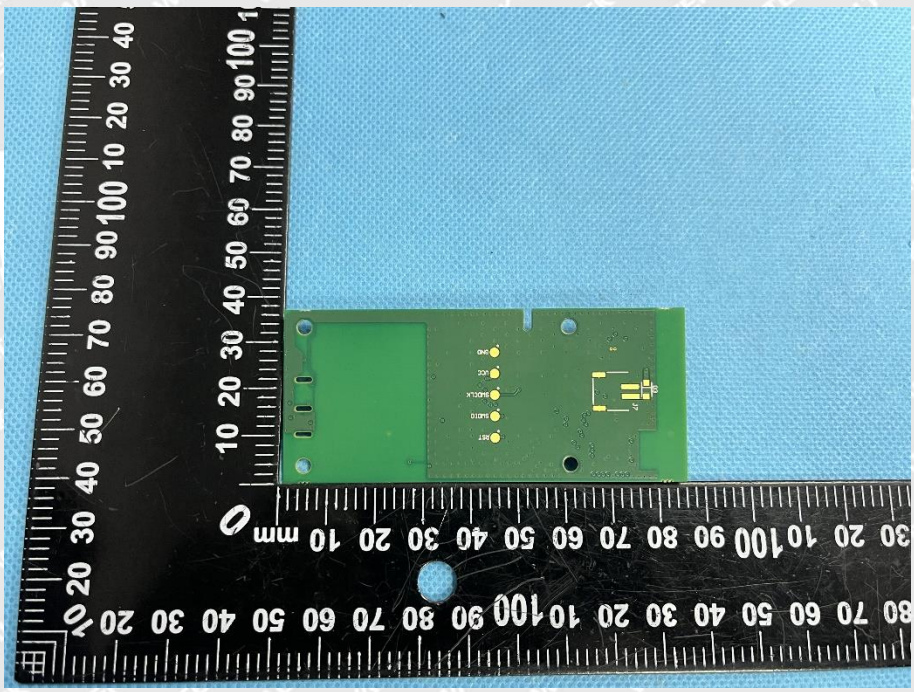
EUT View 5	
EUT View 6	

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	

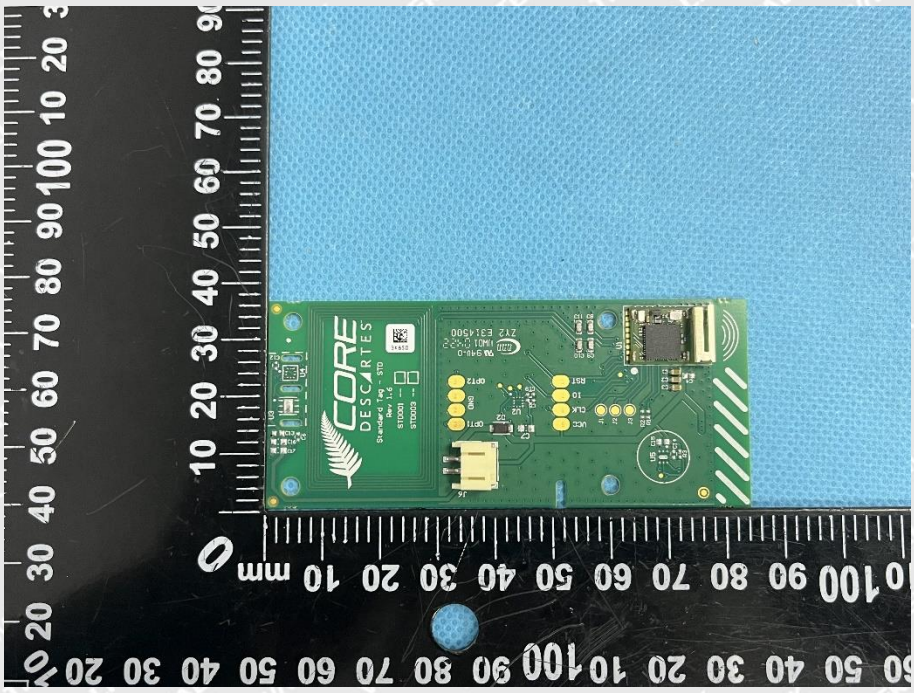
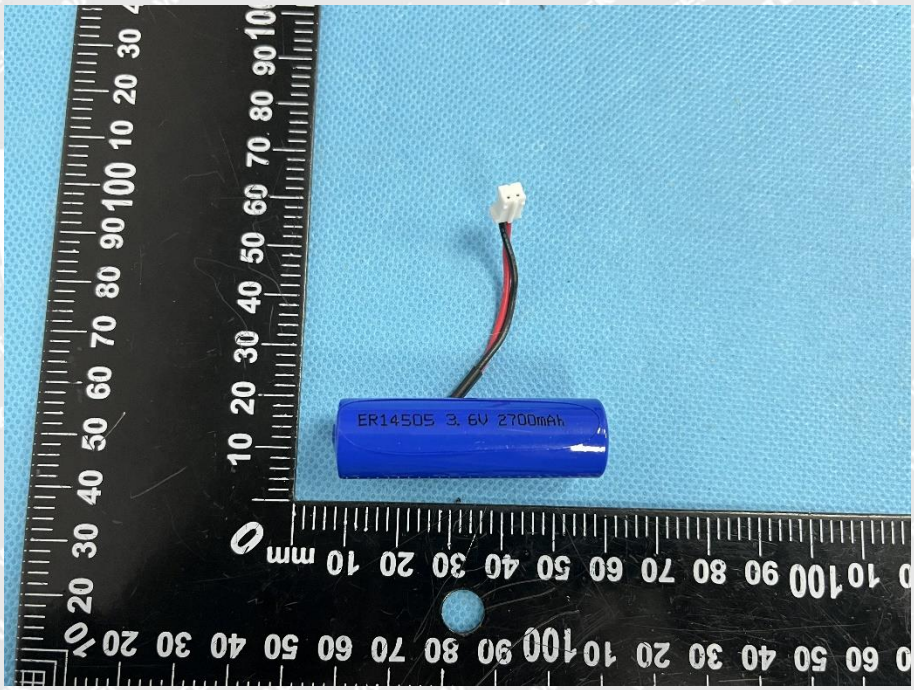
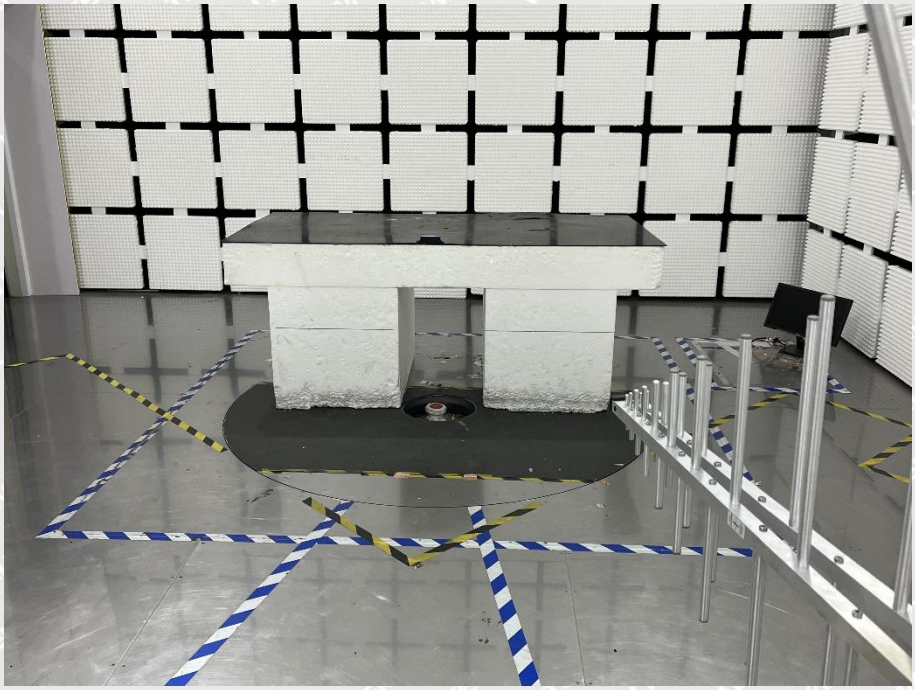
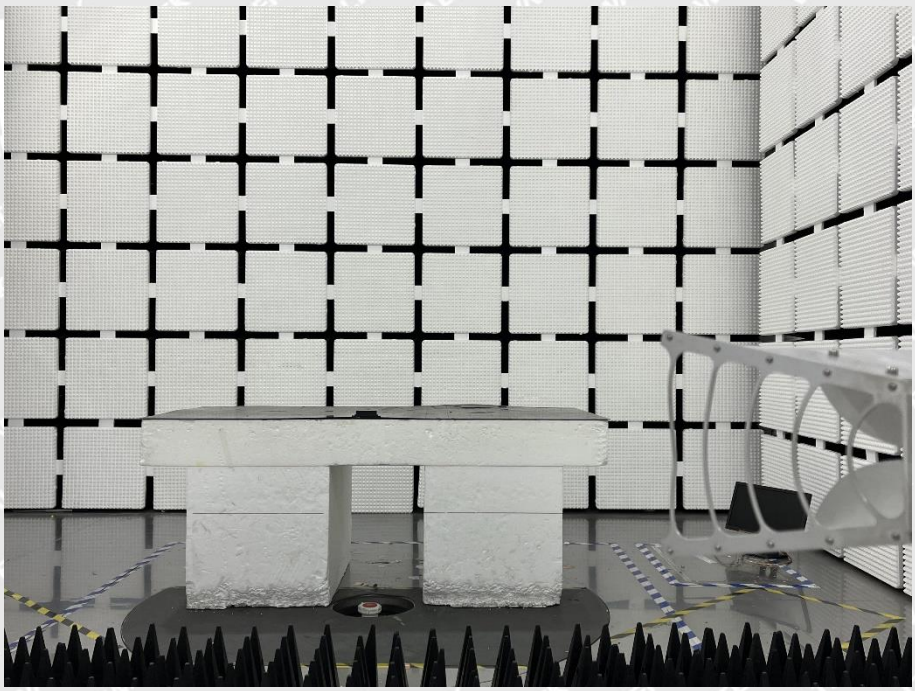
Solder Board-Component View 3	
Solder Board-Component View 4	

EXHIBIT 4 - TEST SETUP PHOTOGRAPHS

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

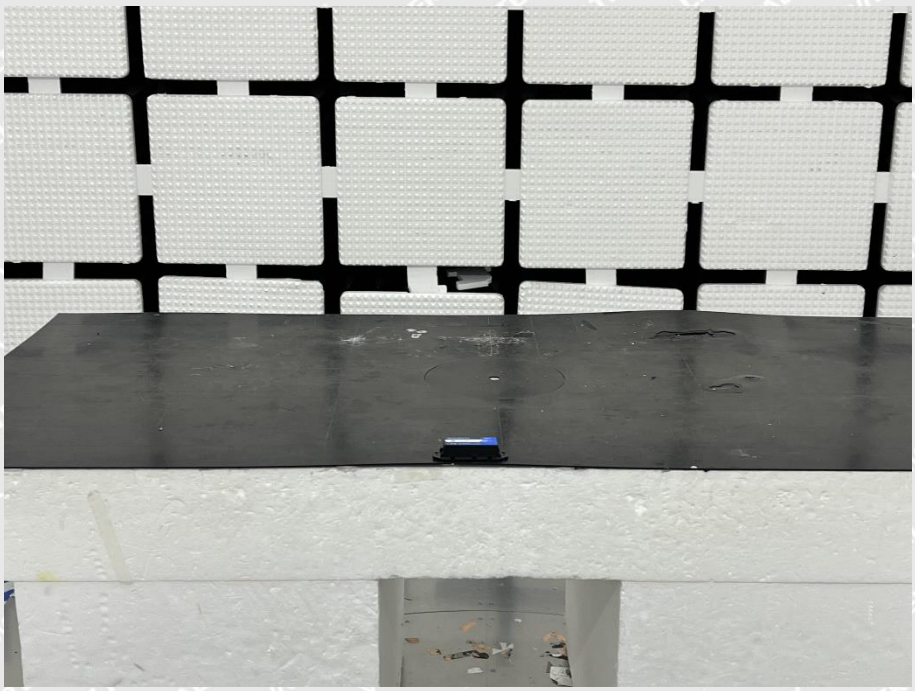
	

EXHIBIT 5 - USERS MANUAL

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 *******