



Test report No: 2380577R-E3012110001-A

## FCC TEST REPORT

Product Name	Multimedia device with Bluetooth and WLAN
Trademark	BOSCH
Model and /or type reference	CCS2SBXQ
FCC ID	2AUXS-CCS2SBXQ
Applicant's name / address	Robert Bosch GmbH Robert-Bosch-Strasse 200, 31139 Hildesheim, Germany
Manufacturer's name / address	Robert Bosch GmbH Robert-Bosch-Strasse 200, 31139 Hildesheim, Germany
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart B: 2021, Class B
Verdict Summary	IN COMPLIANCE
Documented By (Senior Engineering Adm. Specialist / Anita Chou )	<i>Anita Chou</i>
Approved By (Director / Vincent Lin)	<i>Vincent Lin</i>
Date of Report	2023/08/17
Date of Issue	2023/11/29
Report No.	2380577R-E3012110001-A
Report Version	V1.0

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Product Photos: Please refer to the file: 2380577R-Product Photos

## Competences and Guarantees

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DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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## General conditions

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1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

## **Revision History**

<b>Report No.</b>	<b>Version</b>	<b>Description</b>	<b>Issued Date</b>
2380577R-E3012110001-A	V1.0	Initial issue of report.	2023-11-29

## 1. General Information

### 1.1. EUT Description

Product Name	Multimedia device with Bluetooth and WLAN
Trademark	BOSCH
Model No.	CCS2SBXQ
EUT Max Frequency	5825 MHz
EUT Rated Voltage	DC 9V-16V
EUT Test Voltage	DC 12V by Battery

Note:

The product includes two configurations with the following as below:

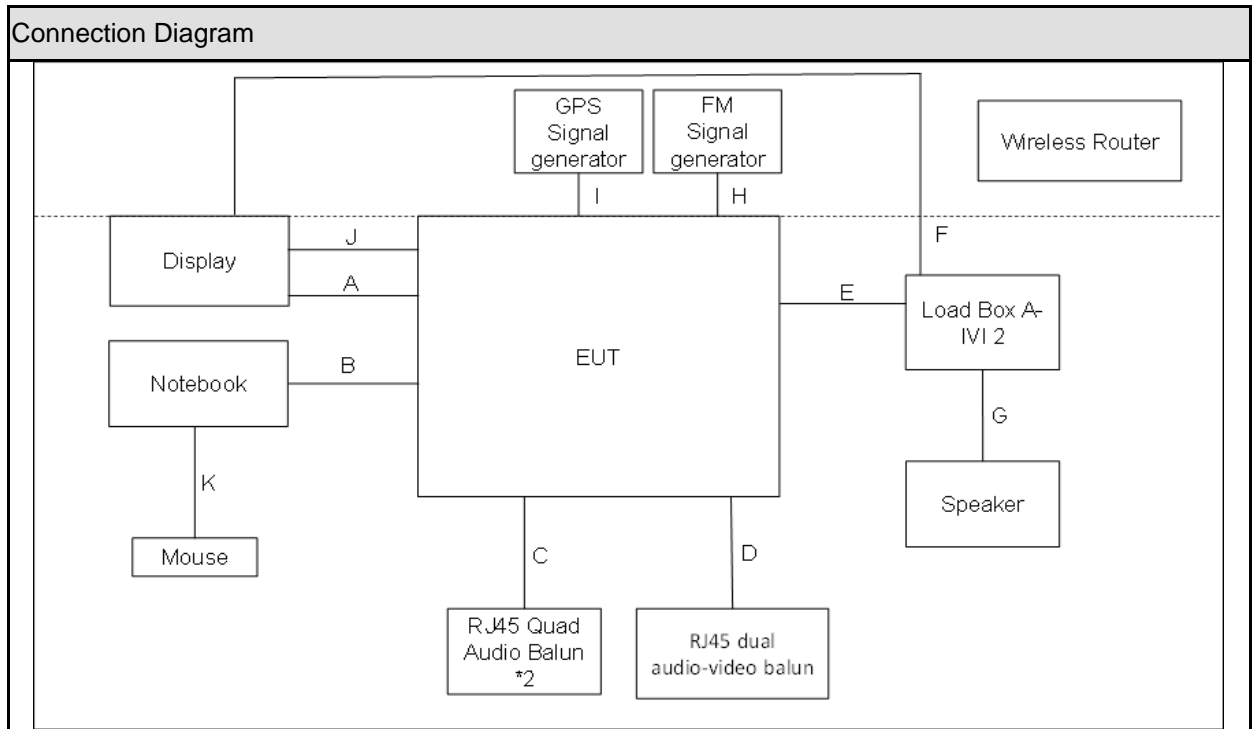
Model name	HW Version Identification Number (HVIN)	Description
CCS2SBXQ	NA1	Internal Antenna / External Antenna
	NA2	2x Internal Antenna

## 1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Pre-Test Mode	
Mode 1: Normal Operation (FM 98.1 MHz + WiFi + BT + GPS)	
Final Test Mode	
Emission	Mode 1

### 1.3. Configuration & Details of Tested System



#### Tested System Details

Product	Manufacturer	Model No.	No.	Cable Type & Description
Display	Mitsubishi	DU-7NJ233A	A	Signal *2, shielded 1.6m
			J	Signal, non-shielded 7m
Notebook	DELL	Latitude 5580	B	USB, shielded 1.8m
RJ45 Quad Audio Balun *2	THOMANN	NB2.2	C	RJ45 *2, shielded 1.9m
RJ45 dual audio-video balun	THOMANN	NB4.0	D	RJ45, shielded 1.9m
Load Box A-IVI 2	BOSCH	N/A	E	Signal *3, non-shielded 1.9m
			F	Signal, non-shielded 1.9m
Speaker	Pioneer	TS-G1620F-2	G	Signal, non-shielded 1.5m
Signal generator	R&S	SMY 01	H	Signal *3, non-shielded 7m
GPS Simulator	Oroila	GSG-5	I	Signal, non-shielded 7m
Mouse	Microsoft	MSK-1113(B)	K	USB, shielded 1.8m, core *1

Notebook Display software : scrcpy(v1.24)

GPS software : scrcpy(v1.24)

#### Wireless Devices Inf.

Product	Manufacturer	Model No.
Wireless Router	ASUS	ROG RAPTURE GT-AXE11000

Note:

- Use Full system setup configuration determines Worst-Case Mode.
- Use 2dB law program determines Max. Cable Configuration and Worst-Case Mode.
- Radiated emission item test: Performed using the Horn Antenna 3dB Beamwidth to 3m from the EUT size sufficient to cover the procedure.
- Radiated emission item test: Performed using the Horn Antenna 3dB Beamwidth non 3m distance sufficient to cover the size of the EUT program.

#### 1.4. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.3.
2	Turn on the power of all equipment.
3	Use the notebook execution software "scrcpy.exe" to display the EUT screen.
4	All the features of the EUT operation normally.



## 2. Technical Test

### 2.1. Summary of Test Result

- No deviations from the test standards  
 Deviations from the test standards as below description:

Emission				
Performed Item	Normative References	Test Performed	Test Site	Verdict
Conducted Emission	FCC CFR Title 47 Part 15 Subpart B:2021, Class B CISPR 22:2008, ANSI C63.4-2014 ANSI C63.4a-2017	No	--	N/A
Radiated Emission	FCC CFR Title 47 Part 15 Subpart B:2021, Class B CISPR 22:2008, ANSI C63.4-2014 ANSI C63.4a-2017	Yes	FS-CB03	Pass

Note:

1. Test Site information refers to test Laboratory Information.

USA	FCC Registration Number: TW1127
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Site Description	Accredited by TAF
	Accredited Number: 3023

Test Laboratory:	DEKRA Testing and Certification Co., Ltd. Linkou Laboratory
Address:	No.5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C
Phone number:	+886-2-8601-3788
Fax number:	+886-2-8601-3789
Test Site	
LK:	No.5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C
FS:	No.6, Lane 75, Wenlin St., Linkou Dist., New Taipei City, 244017, Taiwan, R.O.C
HY:	No.26, Huaya 1 st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C

## 2.2. List of Test Equipment

### Radiated Emission (Below 1GHz) / FS-CB03

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Due Date
Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	00953	2023/3/10	2024/3/9
EMI Test Receiver	R&S	ESR26	101706	2023/4/24	2024/4/23
Coaxial Cable	SUHNER	SUCOFLEX 106	RF003/A RF003/B RF003/C	2023/7/5	2024/7/4
Coaxial Cable	RON SOL	MP533A	AC030-MP	2023/7/5	2024/7/4
Preamplifier	EMCI	EMC001330	980316	2023/6/26	2024/6/25
NSA	DEKRA	N/A	N/A	2023/7/5	2024/7/4
Test Software version : e3 V9					

### Note: Test Receiver Detector: Quasipeak Bandwidth: 120kHz

### Radiated Emission (Above 1GHz) / FS-CB03

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Due Date
Double Ridged Guide Horn Antenna	ETS-Lindgren	3117	00203800	2023/1/12	2024/1/11
Horn Antenna	COM-POWER	AH-840	101087	2023/6/30	2024/6/29
EMI Test Receiver	R&S	ESR26	101706	2023/4/24	2024/4/23
Signal Analyzer	R&S	FSV40	101148	2023/5/16	2024/5/15
Coaxial Cable	SUHNER	SUCOFLEX 106	RF003/B RF003/C	2023/7/5	2024/7/4
Coaxial Cable	RON SOL	R-Test EW0630	RF003/D	2023/7/5	2024/7/4
Coaxial Cable	RON SOL	MP533A	AC030-MP	2023/7/5	2024/7/4
Microwave Preamplifier	EMCI	EMC051835SE	980311	2023/2/4	2024/2/3
Microwave Preamplifier with cable	EMCI	EMC184045SE	980314	2023/8/30	2024/8/29
VSWR	DEKRA	N/A	N/A	2023/7/4	2024/7/3
Test Software version : e3 V9					

### **2.3. Measurement Uncertainty**

#### Radiated Emission Below 1GHz

The measurement uncertainty is evaluated as  $\pm 3.35$  dB.

#### Radiated Emission Above 1GHz

The measurement uncertainty is evaluated as  $\pm 4.64$  dB.

## 2.4. Test Environment

Performed Item	Items	Required
Radiated Emission	Temperature (°C)	10-40
	Humidity (%RH)	10-90

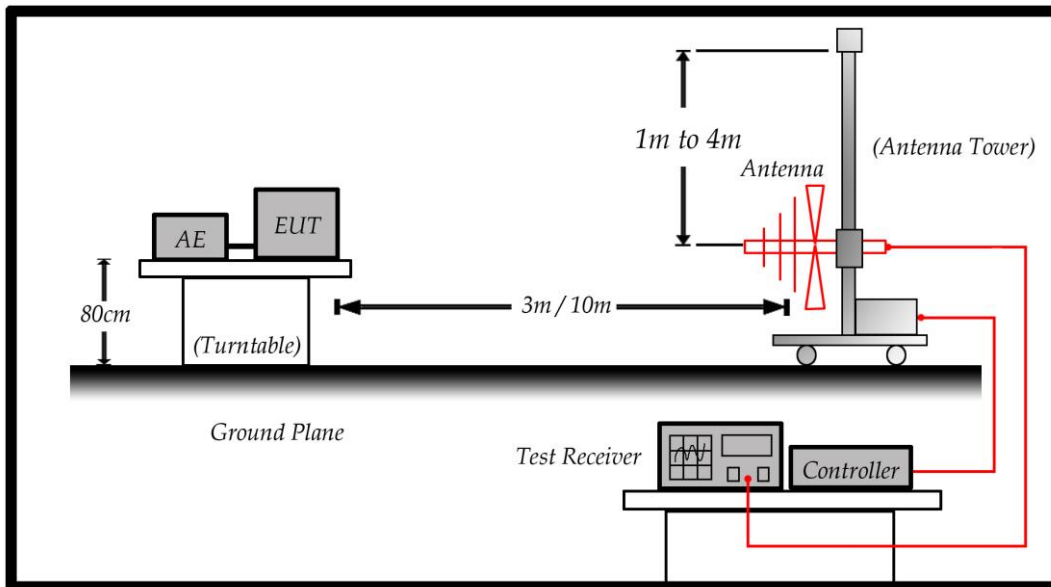
### 3. Radiated Emission

#### 3.1. Test Specification

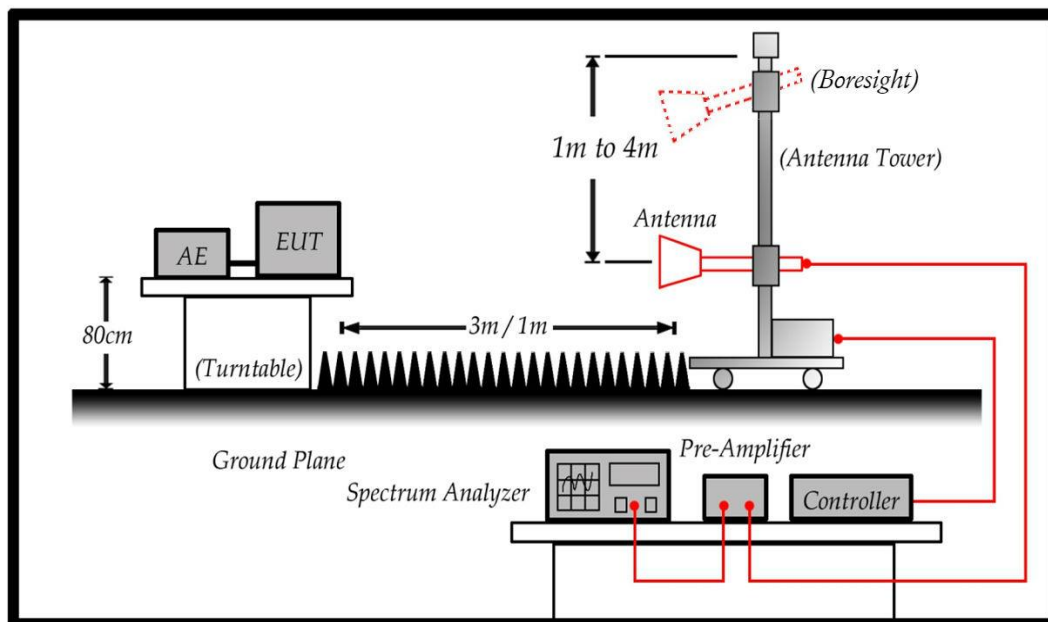
According to Standard : FCC Part 15 Subpart B & CISPR 22

#### 3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



### 3.3. Limit

Under 1GHz test shall not exceed the following value:

Limits		
Frequency (MHz)	Distance (m)	dBuV/m
30 – 230	10	30
230 – 1000	10	37

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Above 1GHz test shall not exceed the following value:

FCC Part 15 Subpart B Paragraph 15.109 Limits (dBuV/m)		
Frequency (MHz)	Distance (m)	dBuV/m
30-88	3	40
88-216	3	43.5
216-960	3	46.0
960-1000	3	54
1000-40000	3	54
18000-40000	1	63.5

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

### 3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground.

The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna (boresight antenna tower) can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

On any frequency or frequencies below or equal to 1000MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

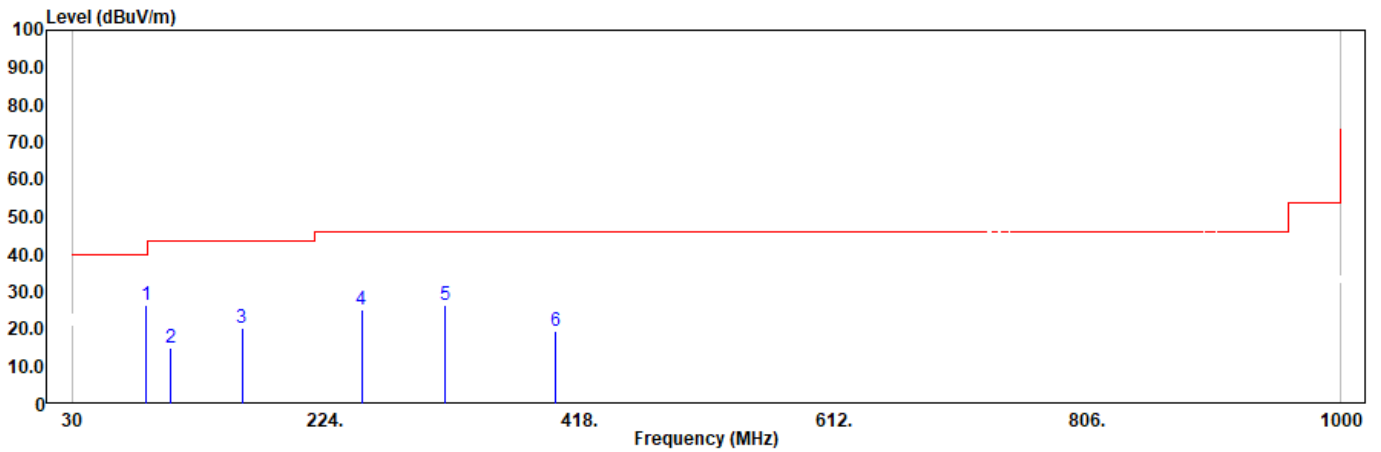
For class A, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter (Test Receiver) is 120kHz and above 1GHz is 1MHz.

### 3.5. Test Result

Model No	CCS2SBXQ	Site	FS-CB03
Test Voltage	DC 12V by Battery	Test Date	2023-11-23
Test Mode	Mode 1	Engineer	Chris Hu
Polarity	Horizontal	Temperature (°C)	24.5
Test Condition	--	Humidity (%RH)	67



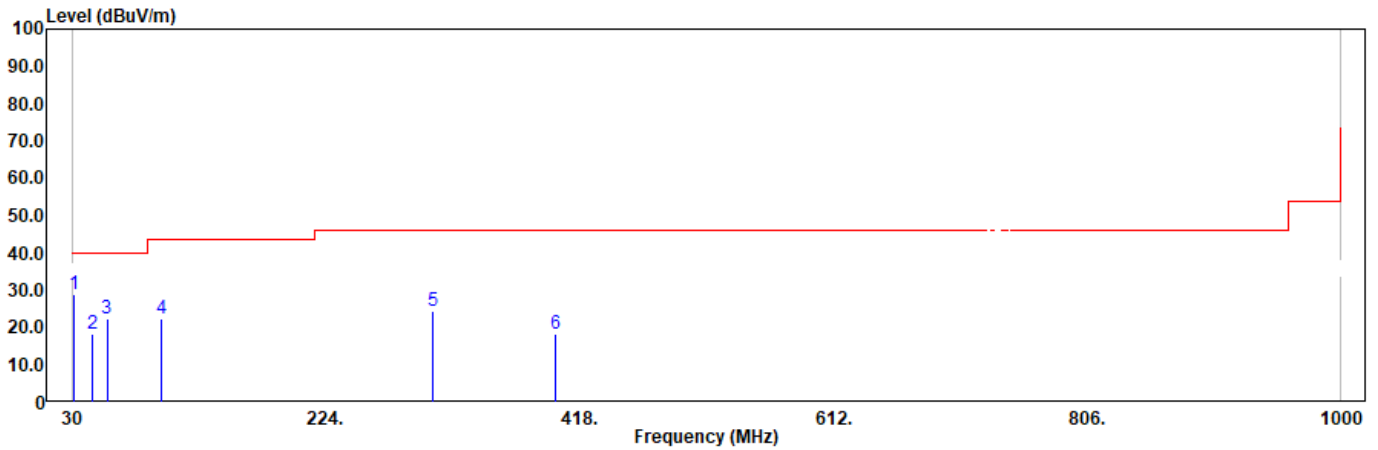
No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Reading Level (dBUV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1*	86.914	26.73	40.00	-13.27	42.97	-16.24	400	73	QP
2	105.019	15.07	43.50	-28.43	29.11	-14.04	200	360	QP
3	160.034	20.32	43.50	-23.18	30.46	-10.14	200	231	QP
4	251.387	25.47	46.00	-20.53	36.33	-10.87	100	312	QP
5	315.665	26.38	46.00	-19.62	34.89	-8.51	100	0	QP
6	399.887	19.49	46.00	-26.51	25.92	-6.43	100	296	QP

Remark:

1. "\*" means this data is the worst margin; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
3. Margin=Emission Level - Limit.
4. The above 1 GHz test. When PEAK measures level less than AV limit by 20 dBUV, its average is not measured separately.



Model No	CCS2SBXQ	Site	FS-CB03
Test Voltage	DC 12V by Battery	Test Date	2023-11-23
Test Mode	Mode 1	Engineer	Chris Hu
Polarity	Vertical	Temperature (°C)	24.5
Test Condition	--	Humidity (%RH)	67

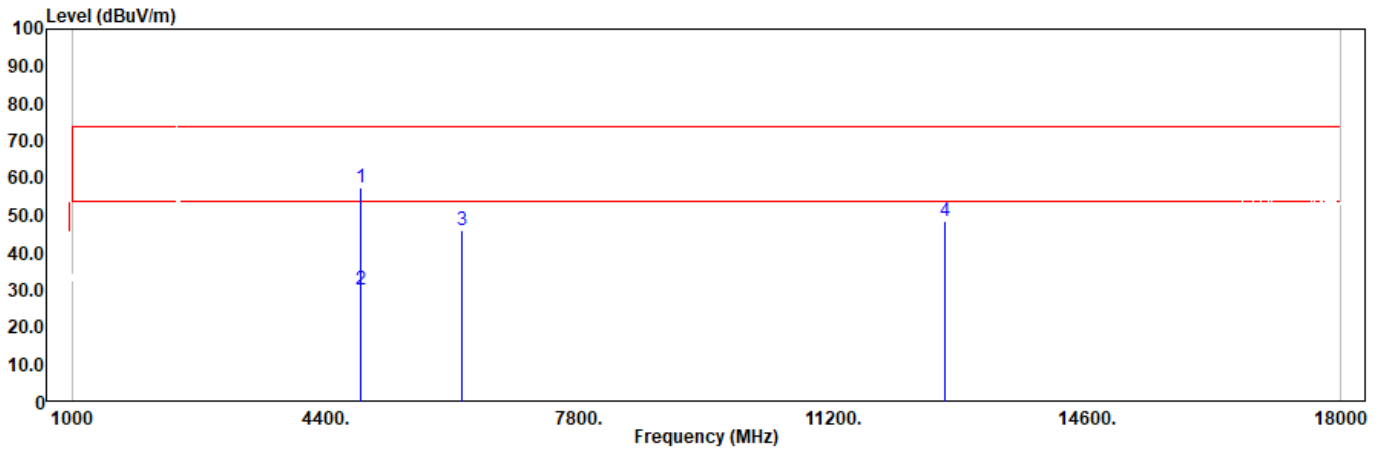


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1*	32.263	28.88	40.00	-11.12	41.23	-12.35	100	294	QP
2	45.708	18.41	40.00	-21.59	28.70	-10.30	100	294	QP
3	56.901	22.62	40.00	-17.38	33.22	-10.59	100	294	QP
4	98.981	22.33	43.50	-21.17	37.44	-15.11	200	348	QP
5	306.055	24.65	46.00	-21.35	33.57	-8.92	200	229	QP
6	399.855	18.27	46.00	-27.73	24.71	-6.43	200	270	QP

Remark:

1. "\*" means this data is the worst margin;"!" means this data is over limit.
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Polarity	Horizontal	Temperature (°C)	24.5
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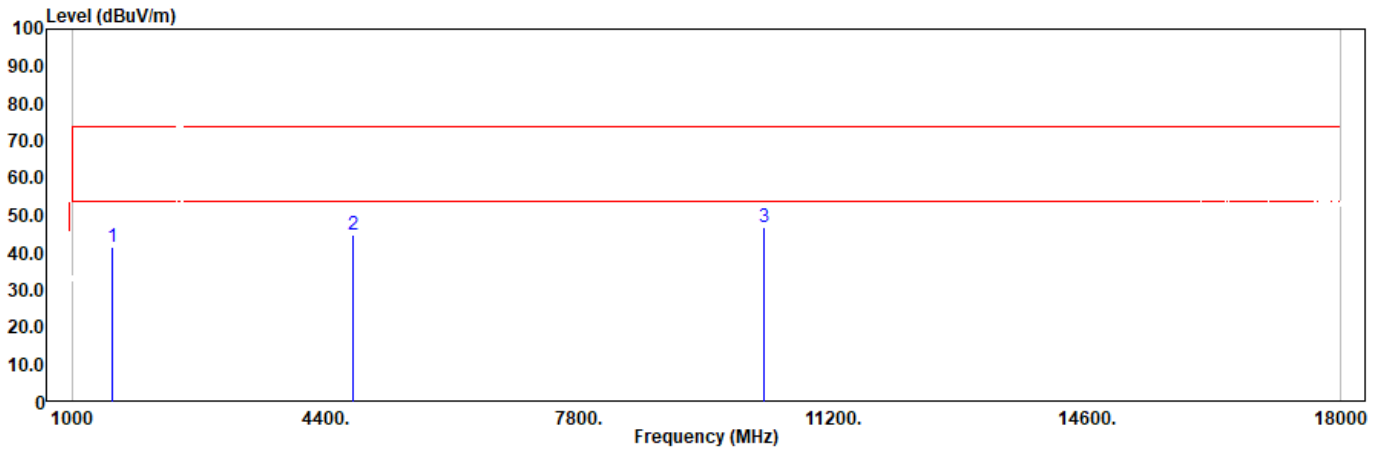


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1*	4872.336	57.42	74.00	-16.58	56.22	1.19	200	234	Peak
2	4872.336	30.41	54.00	-23.59	29.21	1.19	200	234	Average
3	6232.710	46.17	74.00	-27.83	42.48	3.70	100	12	Peak
4	12688.970	48.68	74.00	-25.32	37.68	11.00	100	84	Peak

Remark:

1. "\*" means this data is the worst margin; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
3. Margin=Emission Level - Limit.
4. The above 1 GHz test. When PEAK measures level less than AV limit by 20 dBuV, its average is not measured separately.

Model No	CCS2SBXQ	Site	FS-CB03
Test Voltage	DC 12V by Battery	Test Date	2023-11-23
Test Mode	Mode 1	Engineer	Chris Hu
Polarity	Vertical	Temperature (°C)	24.5
Test Condition	--	Humidity (%RH)	67

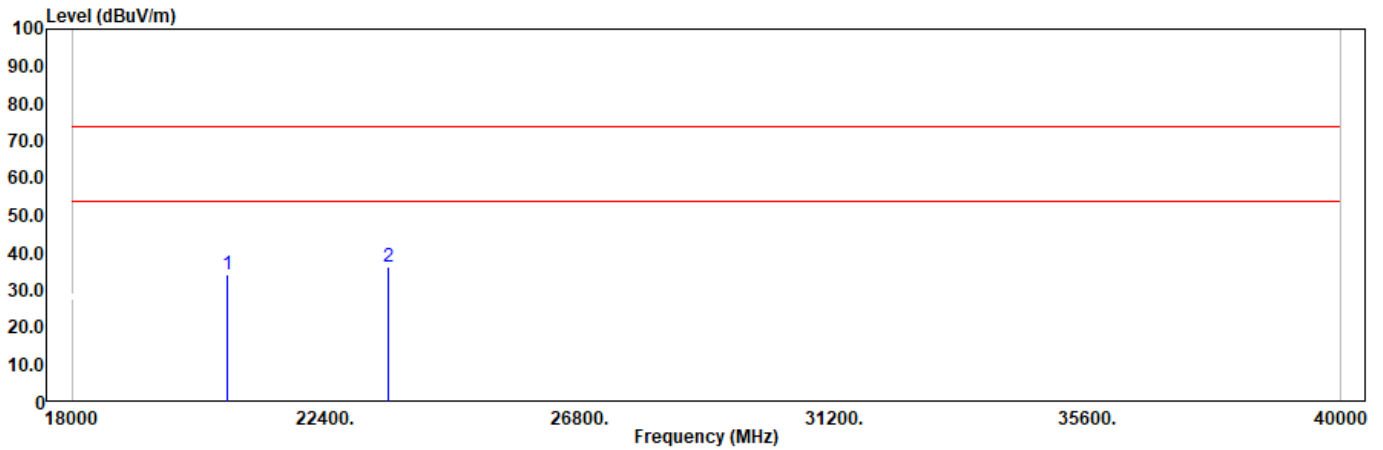


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1	1552.500	41.69	74.00	-32.31	50.98	-9.29	126	360	Peak
2	4769.750	44.79	74.00	-29.21	43.68	1.11	151	360	Peak
3*	10260.750	46.76	74.00	-27.24	38.95	7.81	100	161	Peak

Remark:

1. "\*" means this data is the worst margin; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
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Polarity	Horizontal	Temperature (°C)	24.5
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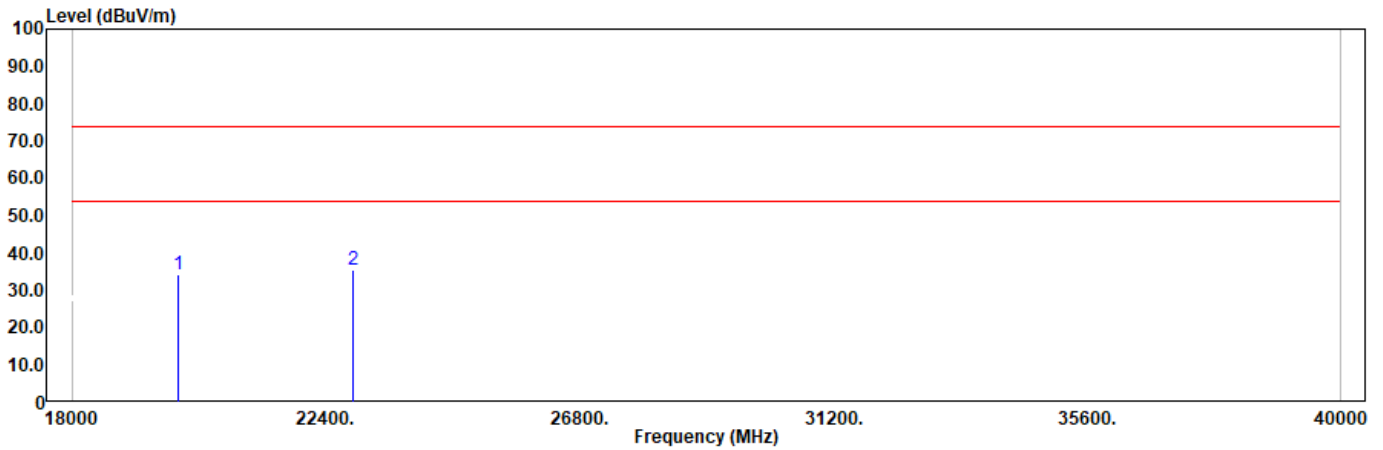


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1	20690.000	34.14	74.00	-39.86	32.22	1.92	100	298	Peak
2*	23478.000	36.23	74.00	-37.77	32.37	3.86	100	26	Peak

Remark:

1. "\*" means this data is the worst margin;"!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
3. Margin=Emission Level - Limit.
4. The above 1 GHz test. When PEAK measures level less than AV limit by 20 dBuV, its average is not measured separately.

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No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Ant Pos (cm)	TT Pos (deg)	Detector Type
1	19854.000	34.36	74.00	-39.64	34.65	-0.29	100	156	Peak
2*	22888.000	35.36	74.00	-38.64	32.30	3.06	100	54	Peak

Remark:

1. "\*" means this data is the worst margin;"!" means this data is over limit.
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3. Margin=Emission Level - Limit.
4. The above 1 GHz test. When PEAK measures level less than AV limit by 20 dBuV, its average is not measured separately.