Test report No.: 2380887R-RFUSV06S-A

TEST REPORT

Product Name	Wireless headphone
Trademark	ASUS
Model and /or type reference	R55ES
FCC ID	MSQ-RCTWSN
Applicant´s name / address	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Manufacturer´s name	ASUSTeK COMPUTER INC.
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Verdict Summary	IN COMPLIANCE
Documented By (Senior Project Specialist / Genie Chang)	Genie Chang
Tested By (Senior Engineer / Ivan Chuang)	Ivan Chuang
Approved By (Senior Engineer / Jack Hsu)	Jack Hsu
Date of Receipt	2023/08/29
Date of Issue	2023/12/13
Report Version	V1.0

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Competences and Guarantees

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.

General conditions

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

Report No.	Version	Description	Issued Date
2380887R-RFUSV06S-A	V1.0	Initial issue of report.	2023/12/13

1. General Information

1.1. EUT Description

Product Name	Wireless headphone
Trademark	ASUS
Model and /or type reference	R55ES
EUT Rated Voltage	DC 5V by USB or DC 3.7V by Battery
EUT Test Voltage	DC 5V by USB and DC 3.7V by Battery
Frequency Range	110 < f < 200 kHz
Type of Antenna	Coil
Wireless headphone	ASUS / R55ES(L)
Wireless headphone	ASUS / R55ES(R)
Wireless Charge Case	ASUS / R55ES
USB Cable	ASUS / R55ES, Shielded, 0.6m
USB-C Wireless Dongle	ASUS / R55ES-D
USB-C to USB-A adaptor dongle	ASUS / R55ES
Battery	VDL / 801736

Frequency of Channel:

Channel	Frequency (kHz)
1	128

Note:

1. The EUT is a Wireless headphone with a built-in 110 < f < 200 kHz transceiver.
2. Only the worst case is shown in the report.
3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209.

Test Mode	Mode 1	Transmit
	Mode 2	Charger mode

1.2. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Power Adapter	Apple	A1385	N/A	N/A
2	Wireless Charger base	Belkin	WIA002	35G10F66BA05195	N/A

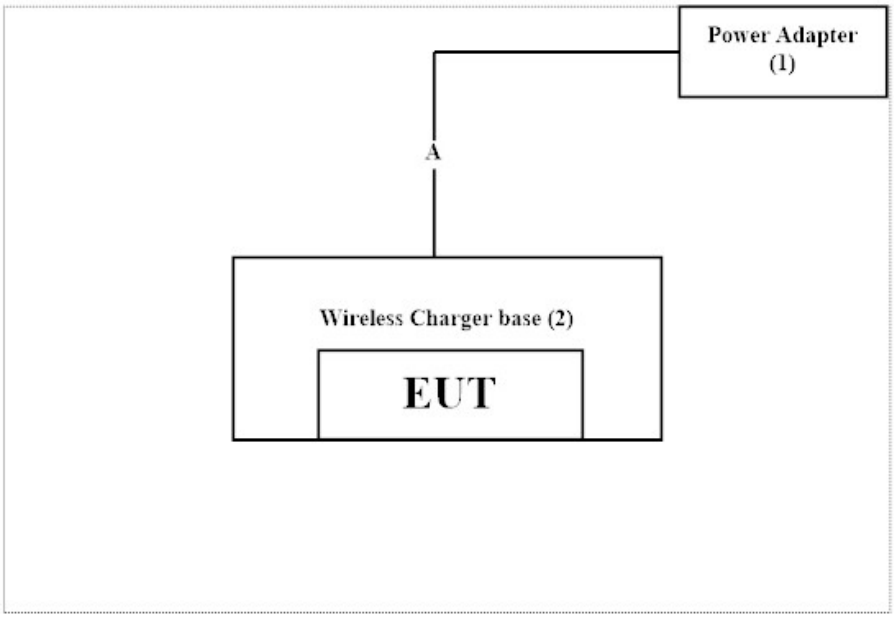
Cable Type		Cable Description
A	USB Cable	Shielded, 1m

Charger mode

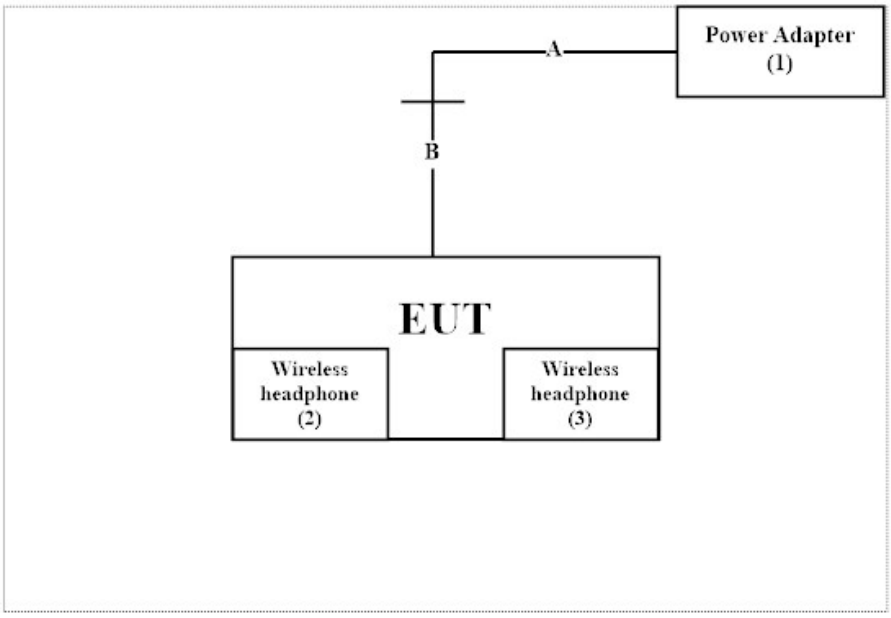
Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Power Adapter	Apple	A1385	N/A	N/A
2	Wireless headphone	ASUS	R55ES(L)	N/A	N/A
3	Wireless headphone	ASUS	R55ES(R)	N/A	N/A

Cable Type		Cable Description
A	USB Cable	Shielded, 1.8m
B	USB Cable	Shielded, 0.6m

1.3. Configuration of Test System



Charger mode



1.4. EUT Exercise Software

1	Setup the EUT as shown in Section 1.3.
2	Turn on the power of all equipment.
3	Start the continuous receiver.
4	Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 ℃	26.7 ℃
	Humidity (%RH)	10~90 %	58.0 %
Radiated Emission	Temperature (°C)	10~40 ℃	23.5 ℃
	Humidity (%RH)	10~90 %	65.3 %

USA	FCC Registration Number: TW0033
Canada	CAB Identifier Number: TW3023 / Company Number: 26930

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
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist.,Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	+886-3-275-7255
Fax Number	+886-3-327-8031

1.6. List of Test Equipment

For Conduction Measurements / HY-SR01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	EMI Test Receiver	R&S	ESR7	101601	2023/06/20	2024/06/19
V	Two-Line V-Network	R&S	ENV216	101306	2023/03/16	2024/03/15
V	Two-Line V-Network	R&S	ENV216	101307	2023/08/17	2024/08/16
V	Coaxial Cable	SUHNER	RG400_BNC	RF001	2023/01/10	2024/01/09

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "V" are used to measure the final test results.
3. Test Software Version: e3 230303 dekra V9.

For Radiated Measurements / HY-CB02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Loop Antenna	AMETEK	HLA6121	49611	2023/02/21	2024/02/20
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0678	2021/09/23	2023/09/22
V	Horn Antenna	RF SPIN	DRH18-E	210503A18ES	2023/02/24	2024/02/23
V	Horn Antenna	Com-Power	AH-840	101101	2021/11/30	2023/11/29
V	Pre-Amplifier	SGH	EM330	60736	2023/01/10	2024/01/09
V	Pre-Amplifier	SGH	PRAMP118	20200203	2023/01/10	2024/01/09
V	Pre-Amplifier	EMCI	EMC05820SE	980285	2023/01/10	2024/01/09
V	Pre-Amplifier	EMCI	EMC184045SE	980369	2023/01/10	2024/01/09
	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
V	Filter	MICRO TRONICS	BRM50702	G249	2023/01/05	2024/01/04
	Filter	MICRO TRONICS	BRM50716	G187	2023/01/05	2024/01/04
V	EMI Test Receiver	R&S	ESR7	101601	2023/06/20	2024/06/19
V	Spectrum Analyzer	R&S	FSV3044	101113	2023/02/04	2024/02/03
V	Coaxial Cable	SGH	HA800	GD20110223-2	2023/01/10	2024/01/09
	Coaxial Cable	SGH	HA800	GD20110222-4		
	Coaxial Cable	SGH	SGH18	2021005-2		
	Coaxial Cable	SGH	SGH18	202108-5		

Note:

1. Bi-Log Antenna is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with "V" are used to measure the final test results.
3. Test Software Version: e3 230303 dekra V9.

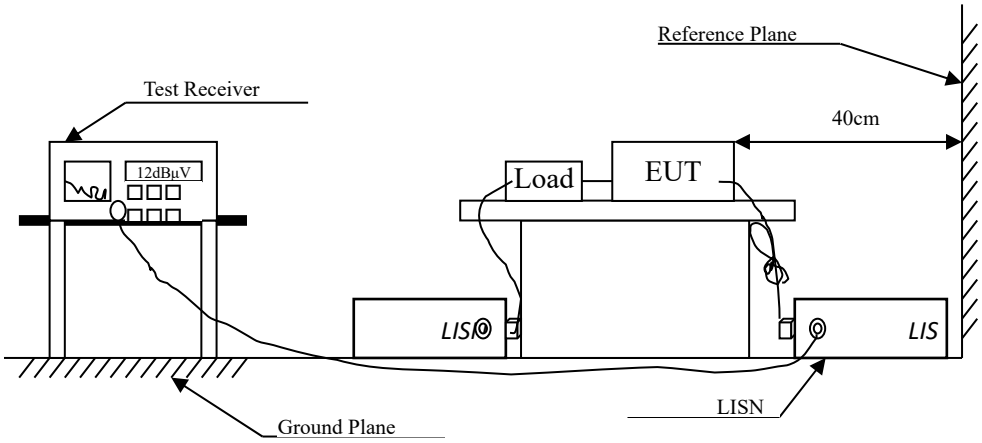
1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document.
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.
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.

Test item	**Uncertainty**
Conducted Emission	±3.50 dB
Radiated Emission	9 kHz~30 MHz: ±3.88 dB 30 MHz~1 GHz: ±4.42 dB 1 GHz~18 GHz: ±4.28 dB 18 GHz~40 GHz: ±3.90 dB

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56(註)	56-46(註)
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

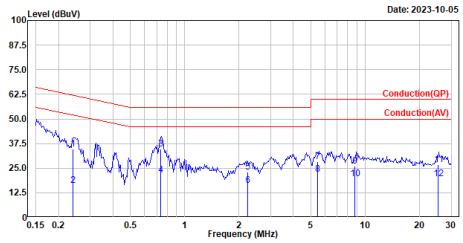
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

2.4. Test Result of Conducted Emission

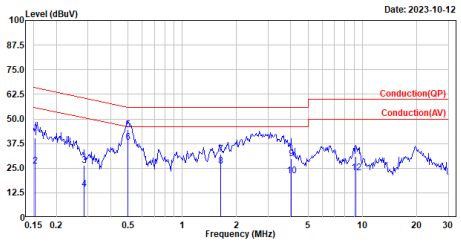
Site :HY-SR01
Condition :Line
Mode :Charge mode
test by :Shane



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.241	34.85	62.06	-27.21	25.17	9.68	QP
2	0.241	16.41	52.06	-35.65	6.73	9.68	Average
3	0.739	34.79	56.00	-21.21	25.09	9.70	QP
4	0.739	21.51	46.00	-24.49	11.81	9.70	Average
5	2.236	23.12	56.00	-32.88	13.22	9.90	QP
6	2.236	16.34	46.00	-29.66	6.44	9.90	Average
7	5.476	28.39	60.00	-31.61	17.56	10.83	QP
8	5.476	21.71	50.00	-28.29	10.88	10.83	Average
9	8.759	26.15	60.00	-33.85	15.34	10.81	QP
10	8.759	19.56	50.00	-30.44	8.75	10.81	Average
11	25.397	26.97	60.00	-33.03	16.42	10.55	QP
12	25.397	19.62	50.00	-30.38	9.07	10.55	Average

Note:
1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

Site :HY-SR01
Condition :Neutral
Mode :Charge mode
test by :Shane



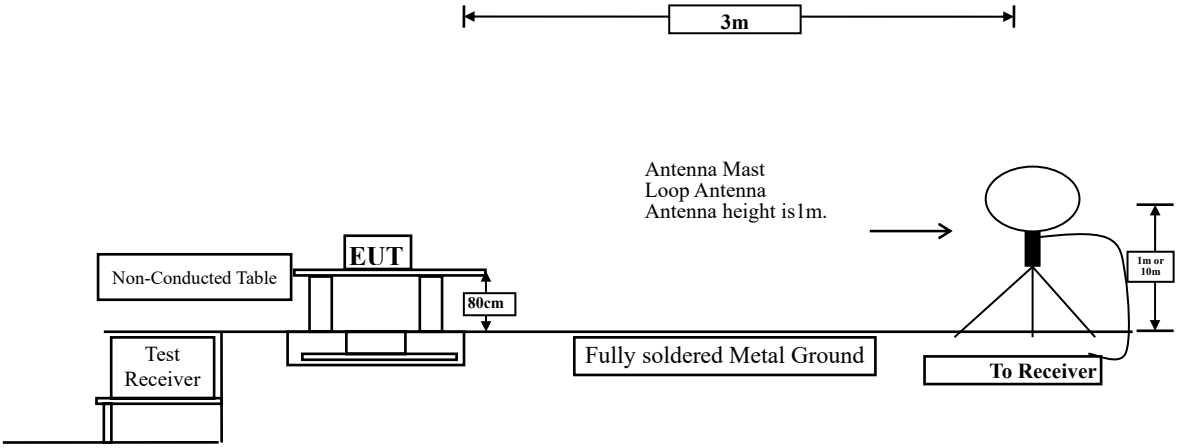
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.152	40.41	65.88	-25.47	30.75	9.66	QP
2	0.152	25.92	55.88	-29.96	16.26	9.66	Average
3	0.285	26.32	60.66	-34.34	16.67	9.65	QP
4	0.285	14.17	50.66	-36.49	4.52	9.65	Average
5	0.501	44.53	56.00	-11.47	34.87	9.66	QP
6	0.501	38.26	46.00	-7.74	28.60	9.66	Average
7	1.631	32.19	56.00	-23.81	22.42	9.77	QP
8	1.631	26.14	46.00	-19.86	16.37	9.77	Average
9	4.034	29.96	56.00	-26.04	19.47	10.49	QP
10	4.034	21.14	46.00	-24.86	10.65	10.49	Average
11	9.210	30.99	60.00	-29.01	20.19	10.80	QP
12	9.210	22.52	50.00	-27.48	11.72	10.80	Average

Note:
1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

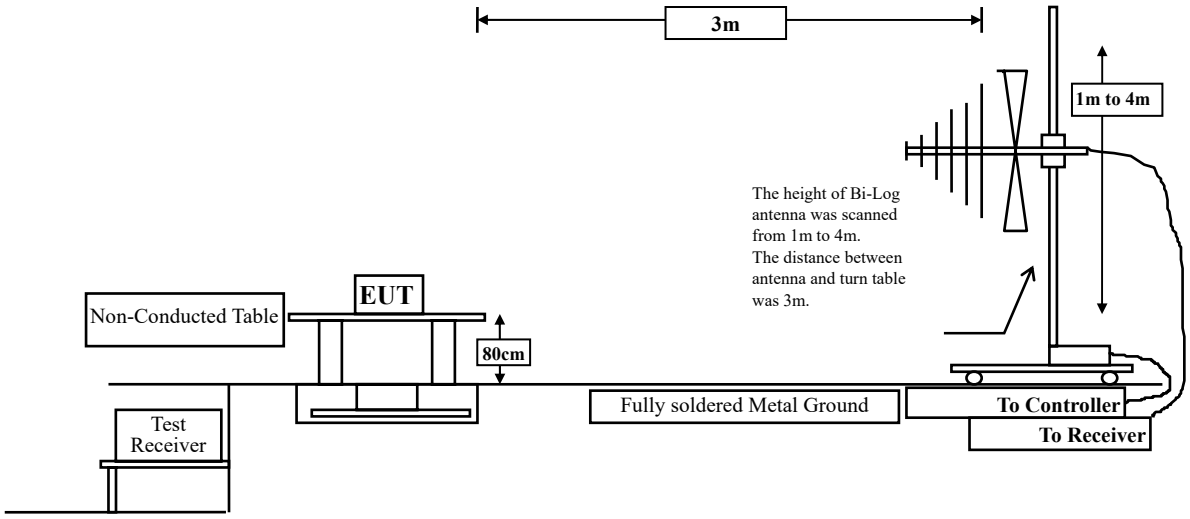
3. Radiated Emission

3.1. Test Setup

Radiated Emission Under 30 MHz



Radiated Emission Below 1 GHz



3.2. Limits

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks : 1. RF Voltage (dBμV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.209 requirements.

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. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna 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 according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30 MHz setting on the field strength meter is 9 kHz and 30 MHz~1 GHz is 120 kHz and above 1 GHz is 1 MHz. Radiated emission measurements below 1 GHz are made using broadband Bilog antenna and above 1 GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission.

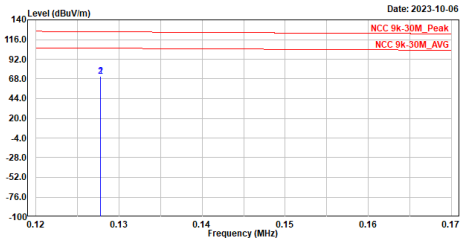
The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

The measurement frequency range form 9 kHz – 10 th Harmonic of fundamental was investigated.

3.4. Test Result of Radiated Emission

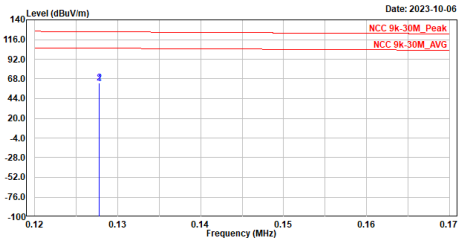
Site :HY-CB02
Condition :3m ,Horizontal
mode :TX_Fundamental 128K
Test by :Nova



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.128	71.54	125.47	-53.93	52.60	18.94	Peak
2	0.128	70.94	105.47	-34.53	52.00	18.94	Average

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

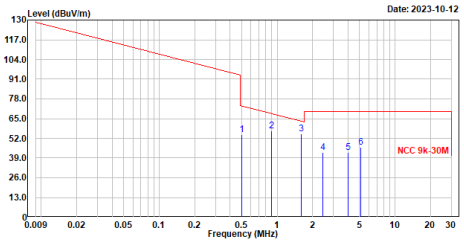
Site :HY-CB02
Condition :3m ,Vertical
mode :TX_Fundamental 128K
Test by :Nova



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.128	62.54	125.47	-62.93	43.60	18.94	Peak
2	0.128	62.74	105.47	-42.73	43.80	18.94	Average

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

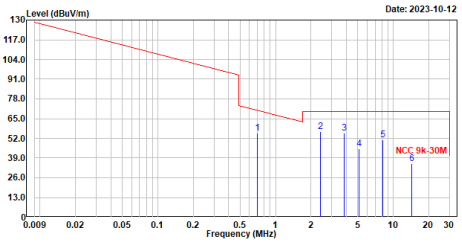
Site :HY-CB02
Condition :3m ,Horizontal
mode :TX_9k-30M
Test by :Nova



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.503	54.21	73.57	-19.36	34.61	19.60	QP
2	0.895	57.13	68.58	-11.45	37.63	19.50	QP
3	1.603	55.13	63.53	-8.40	35.75	19.38	QP
4	2.449	42.69	69.54	-26.85	23.39	19.30	QP
5	3.999	42.58	69.54	-26.96	22.98	19.60	QP
6	5.112	46.25	69.54	-23.29	26.32	19.93	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

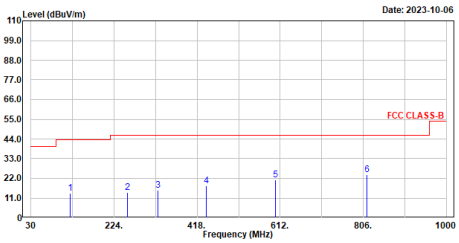
Site :HY-CB02
Condition :3m ,Vertical
mode :TX_9k-30M
Test by :Nova



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.699	55.41	70.72	-15.31	35.81	19.60	QP
2	2.398	56.31	69.54	-13.23	37.01	19.30	QP
3	3.812	55.27	69.54	-14.27	35.73	19.54	QP
4	5.082	45.03	69.54	-24.51	25.13	19.90	QP
5	8.152	51.22	69.54	-18.32	30.32	20.90	QP
6	14.412	35.13	69.54	-34.41	13.83	21.30	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

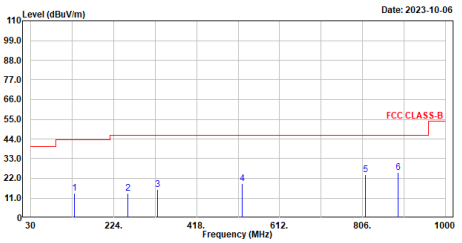
Site :HY-CB02
Condition :3m ,HORIZONTAL
mode :TX_RE
Test by :NOVA



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	122.247	13.61	43.50	-29.89	34.46	-20.85	QP
2	255.719	14.00	46.00	-32.00	33.75	-19.75	QP
3	327.208	15.44	46.00	-30.56	32.81	-17.37	QP
4	438.855	18.01	46.00	-27.99	32.63	-14.62	QP
5	600.360	21.21	46.00	-24.79	32.24	-11.03	QP
6	814.051	24.27	46.00	-21.73	32.40	-8.13	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

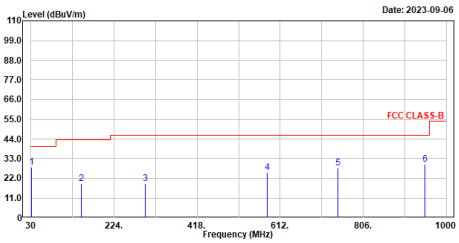
Site :HY-CB02
Condition :3m ,VERTICAL
mode :TX_RE
Test by :NOVA



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	131.656	13.53	43.50	-29.97	33.61	-20.08	QP
2	256.592	13.59	46.00	-32.41	33.30	-19.71	QP
3	325.947	15.77	46.00	-30.23	33.19	-17.42	QP
4	524.603	19.28	46.00	-26.72	32.29	-13.01	QP
5	812.790	23.90	46.00	-22.10	32.03	-8.13	QP
6	889.226	25.33	46.00	-20.67	32.68	-7.35	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

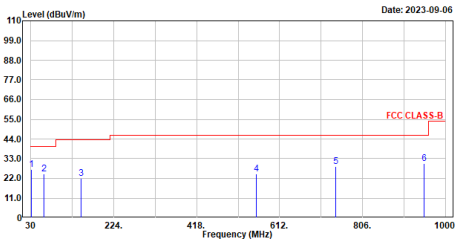
Site :HY-CB02
Condition :3m ,HORIZONTAL
mode :charge mode
Test by :Rock



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	31.261	28.26	40.00	-11.74	48.53	-20.27	QP
2	148.437	18.91	43.50	-24.59	37.56	-18.65	QP
3	296.944	18.97	46.00	-27.03	37.32	-18.35	QP
4	582.318	25.53	46.00	-20.47	36.97	-11.44	QP
5	746.539	27.78	46.00	-18.22	36.40	-8.62	QP
6	950.530	29.77	46.00	-16.23	36.09	-6.32	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :HY-CB02
Condition :3m ,VERTICAL
mode :charge mode
Test by :Rock



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	31.455	27.04	40.00	-12.96	47.29	-20.25	QP
2	60.555	24.43	40.00	-15.57	43.81	-19.38	QP
3	148.437	22.06	43.50	-21.44	40.71	-18.65	QP
4	557.971	24.58	46.00	-21.42	36.82	-12.24	QP
5	742.562	28.50	46.00	-17.50	37.15	-8.65	QP
6	950.530	30.26	46.00	-15.74	36.58	-6.32	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.