

Test Report No:
2330382R-RFUSOTHV03-A

TEST REPORT

FCC Rules&Regulations

Product Name	DC Wallbox 25kW
Brand Name	DELTA ELECTRONICS, INC.
Model No.	EIDW-U25TSUB02, EIDW-U25SSUB02, EIDW-U25LSUB02
FCC ID	H79EIDWU25TSUB02
Applicant's Name / Address	Delta Electronics Incorporated 3 Tungyuan Road Chungli Industrial Zone, Taoyuan County, 32063, Taiwan
Manufacturer's Name / Address	Delta Electronics Incorporated 3 Tungyuan Road Chungli Industrial Zone, Taoyuan County, 32063, Taiwan
Test Method Requested, Standard	FCC CFR Title 47 Part 15 Subpart C Section 15.225 ANSI C63.10-2013
Verdict Summary	IN COMPLIANCE
Documented By	 Amelia Wu / Project Specialist
Approved By	 Rueyyan Lin / Supervisor
Date of Receipt	Mar. 10, 2023
Date of Issue	Jun. 06, 2023
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.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

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

Version	Description	Issued Date
V1.0	Initial issue of report	Jun. 06, 2023

1. General Information

1.1. EUT Description

Product Name	DC Wallbox 25kW
Brand Name	DELTA ELECTRONICS, INC.
Model No.	EIDW-U25TSUB02, EIDW-U25SSUB02, EIDW-U25LSUB02
EUT Voltage	EUT 1: AC 200~277V/60Hz EUT 2: AC 208V/60Hz EUT 3: AC 480V/60Hz
Frequency	13.56 MHz
Channel Number	1 Channel
Type of Modulation	ASK

The difference for each model is shown as below:

EUT	1	2	3
Model No.	EIDW-U25SSUB02	EIDW-U25LSUB02	EIDW-U25TSUB02
EUT Rated Voltage	AC 200-277V/60Hz, 1Φ	AC 208V/60Hz, 3Φ	AC 480V/60Hz, 3Φ
LTE Cat 1 module	PLS8-X	PLS8-X	PLS8-X
Input rating	AC 200V-277V, 134A max., 60Hz	AC 208V, 90A max., 60Hz	AC 480V, 40A max., 60Hz
Output rating	DC 100-1000V, 50A max.	DC 100-1000V, 50A max.	DC 100-1000V, 50A max.

From the above models, EUT 3 (model: EIDW-U25TSUB02) was selected as representative model for the test and its data was recorded in this report.

Antenna Information				
Ant.	Brand Name	Model No.	Type	Gain (dBi)
0	EWT	EWTJ680F-I-02	PCB	10

EUT Operational Condition			
Testing Voltage	Vnom (AC 220V/60Hz)	Vmax (AC 253V/60Hz)	Vmin (AC 187V/60Hz)

Working Frequency of Each Channel	
Channel	Frequency
01	13.56 MHz

Note: The above EUT information is declared by the manufacturer.

1.2. Test Mode

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

Test Mode	Mode 1: Transmit
-----------	------------------

Test Items	Test Mode	Modulation	Result
AC Power Line Conducted Emission	Mode 1	ASK	Pass
20dB Bandwidth	Mode 1	ASK	Pass
Field Strength of Fundamental Emissions and Spectrum Mask	Mode 1	ASK	Pass
Radiated Emission	Mode 1	ASK	Pass
Frequency Tolerance	Mode 1	ASK	Pass

Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The EUT was performed at Y axis and Z axis position for radiated emission and field strength of fundamental emissions and spectrum mask tests.

The worst case was found at Y axis, so the measurement will follow this same test configuration.

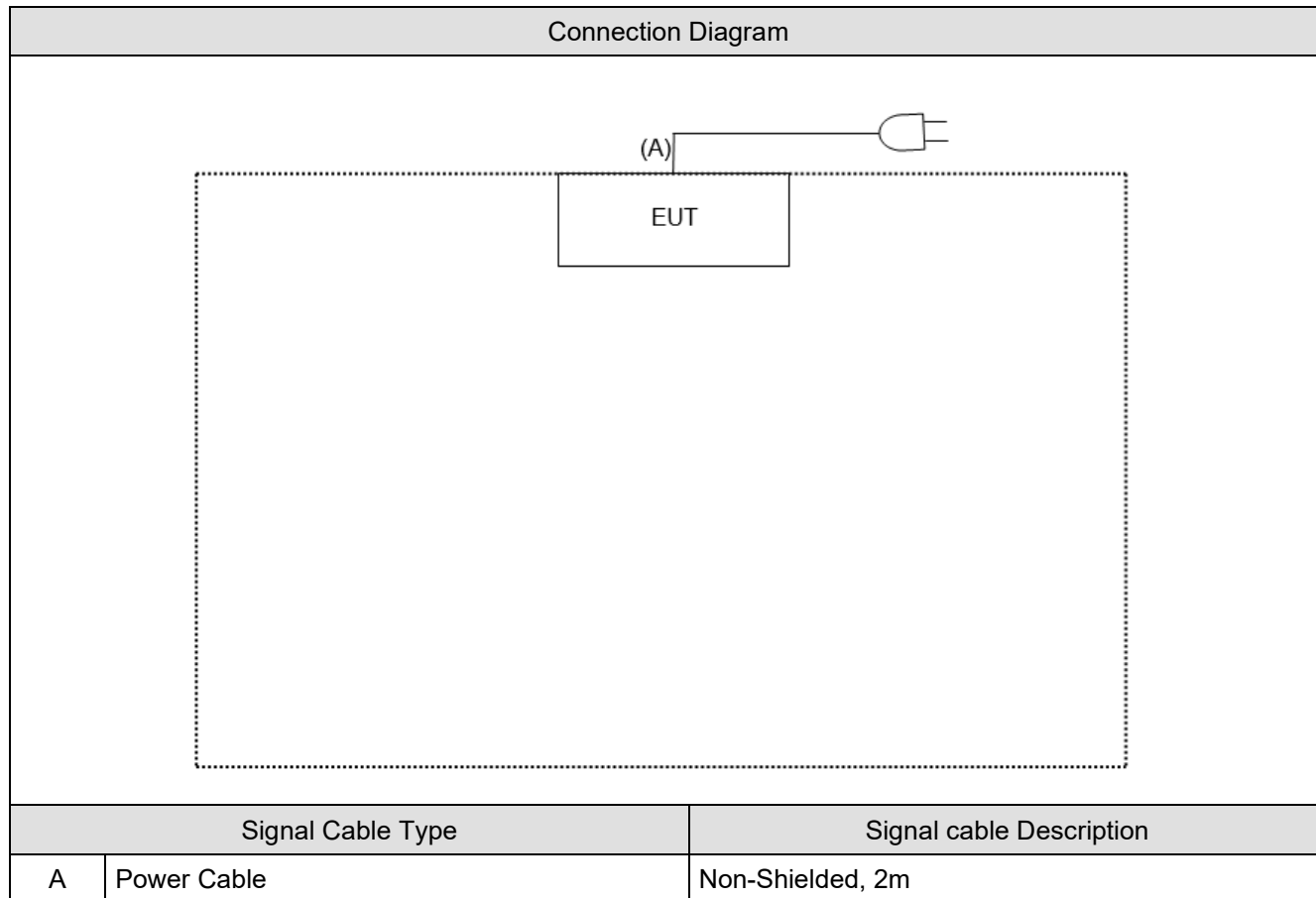
1.3. Comments and Remarks

The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

1.4. Tested System Details

N/A

1.5. Configuration of tested System



1.6. EUT Operation of during Test

1	EUT power on.
2	Make the EUT to start the continuous transmitting.
3	Verify that device is working properly.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Actually	Tested by	Test Date	Test Site
Temperature (°C)	AC Power Line Conducted Emission	22.5	Scott Chang	2023/03/16	HC-SR02
Humidity (%RH)		60			
Temperature (°C)	Emission Bandwidth	22	Clemens Fang	2023/03/15	HC-SR12
Humidity (%RH)		64			
Temperature (°C)	Field Strength of Fundamental Emissions and Spectrum Mask	22	Cyril Chen	2023/03/14	HC-CB02
Humidity (%RH)		60			
Temperature (°C)	Radiated Emission	22	Cyril Chen	2023/03/14	HC-CB02
Humidity (%RH)		60			
Temperature (°C)	Frequency Stability	22	Clemens Fang	2023/03/15	HC-SR12
Humidity (%RH)		64			

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA : FCC Registration Number: TW3024
Canada : CAB identifier : TW3024

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <http://www.dekra.com.tw>

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-582-8001 2. +886-3-582-8001
Fax number	1. +886-3-582-8958 2. +886-3-582-8958
Email address	info.tw@dekra.com
Website	http://www.dekra.com.tw
Note: Test site number for address 1 includes HC-SR02. Test site number for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.	

1.8. List of Test Equipment

HC-SR02

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2022/12/19	2023/12/18
EMI Test Receiver	R&S	ESR3	102608	2022/05/30	2023/05/29
LISN	R&S	ENV216	100092	2022/04/29	2023/04/28
Coaxial Cable(9 m)	Harbour	RG-400	HC-SR02	2022/08/15	2023/08/14
DEKRA Testing System	DEKRA	Version 2.0	HC-SR02	N/A	N/A

HC-SR12

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Temperature & Humidity Test Chamber	KSON	THS-B4T-150	A0401	2022/12/07	2023/12/06
Signal and Spectrum Analyzer	R&S	FSVA40	101435	2022/05/30	2023/05/29

HC-CB02

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2022/09/29	2023/09/28
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1272	2022/05/19	2023/05/18
EMI Test Receiver	R&S	ESR7	102260	2022/12/01	2023/11/30
Magnetic Loop Antenna	Teseq	HLA 6121	44287	2022/10/21	2023/10/20
Pre-Amplifier	EMCI	EMC01820I	980365	2022/04/15	2023/04/14
Coaxial Cable(13m)	Suhner	SF104	HC-CB02	2022/08/15	2023/08/14
Radiated Software	AUDIX	e3 V9	HC-CB02_1	N/A	N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

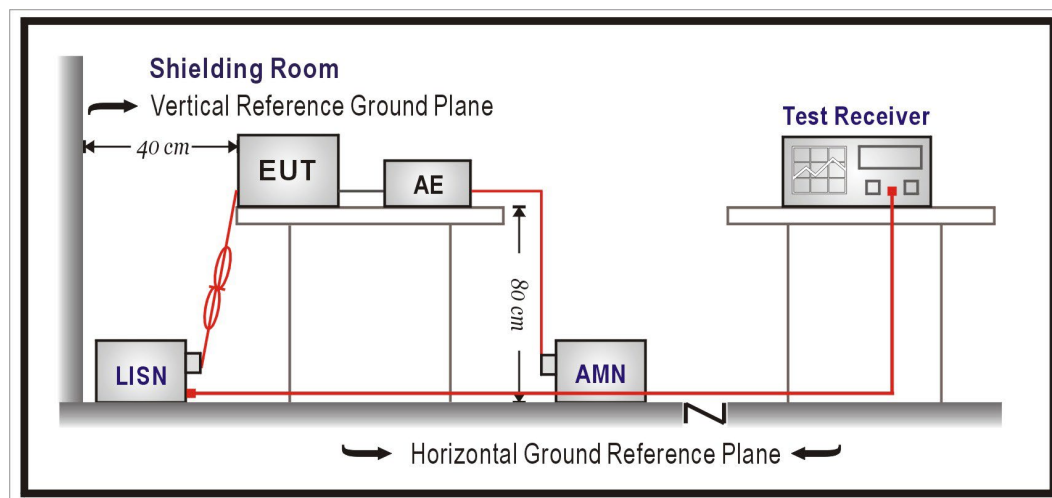
1.9. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$)).

Test item	Uncertainty
AC Power Line Conducted Emission	± 2.34 dB
Emission Bandwidth	± 282.55 Hz
Field Strength of Fundamental Emissions and Spectrum Mask	± 3.52 dB
Radiated Emission	± 3.52 dB
Frequency Stability	± 282.55 Hz

2. AC Power Line Conducted Emission

2.1. Test Setup



2.2. Test Limit

Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

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 50 ohm termination. (Please refer 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 C63.10: 2013 on conducted measurement.

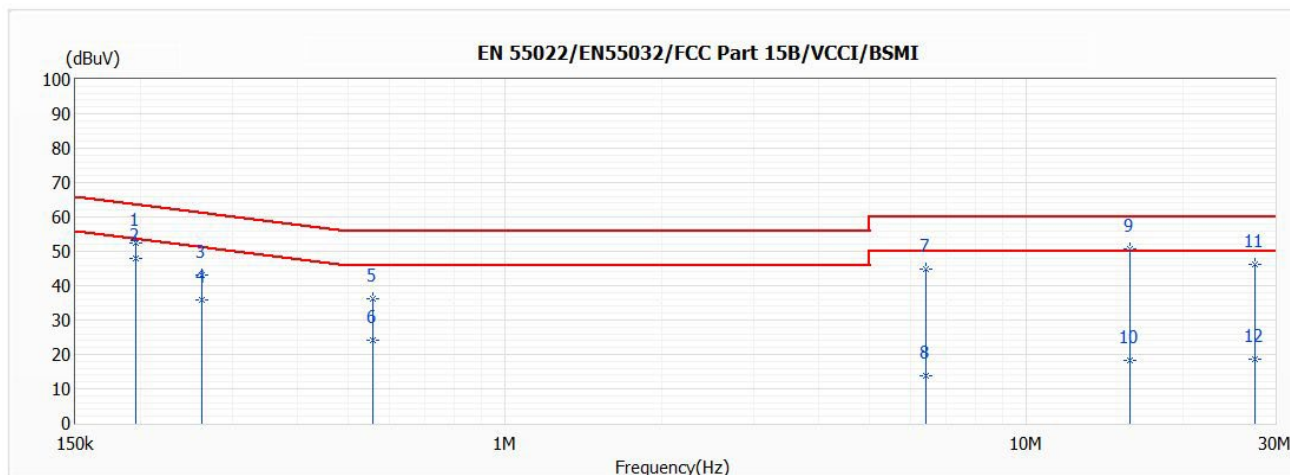
Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

2.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207

2.5. Test Result of AC Power Line Conducted Emission

Test Mode	Mode 1: Transmit	Phase	Line
Test Condition	13.56 MHz		

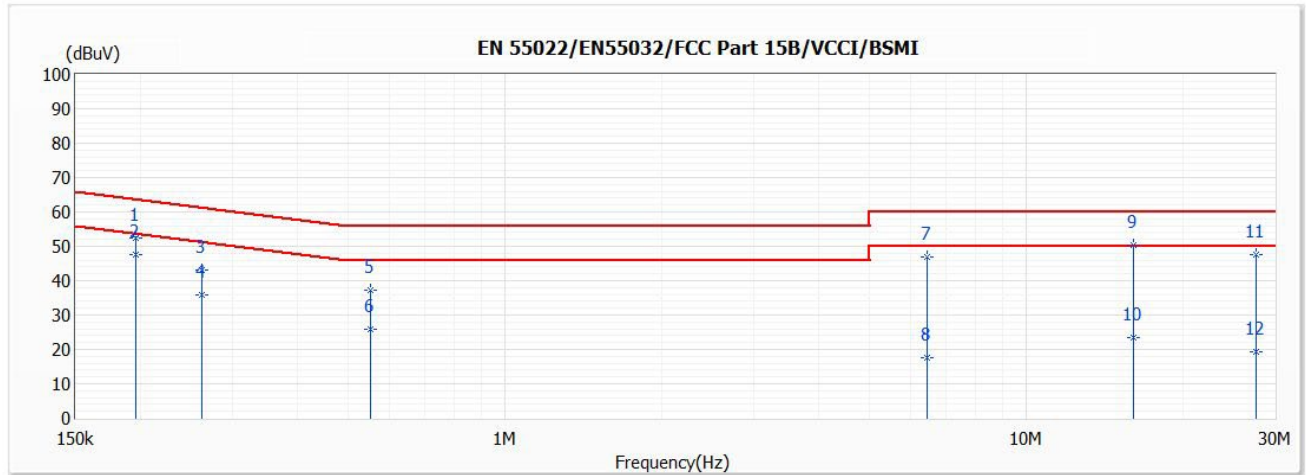


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.196	52.47	63.79	-11.32	42.86	9.61	QP
*2	0.196	47.92	53.79	-5.87	38.31	9.61	AV
3	0.261	42.95	61.39	-18.44	33.33	9.62	QP
4	0.261	35.92	51.39	-15.47	26.30	9.62	AV
5	0.556	36.12	56.00	-19.88	26.47	9.65	QP
6	0.556	24.30	46.00	-21.70	14.65	9.65	AV
7	6.425	44.71	60.00	-15.29	34.76	9.95	QP
8	6.425	13.70	50.00	-36.30	3.75	9.95	AV
9	15.773	50.63	60.00	-9.37	40.38	10.25	QP
10	15.773	18.24	50.00	-31.76	7.99	10.25	AV
11	27.390	46.28	60.00	-13.72	35.77	10.51	QP
12	27.390	18.51	50.00	-31.49	8.00	10.51	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Test Mode	Mode 1: Transmit	Phase	Neutral
Test Condition	13.56 MHz		



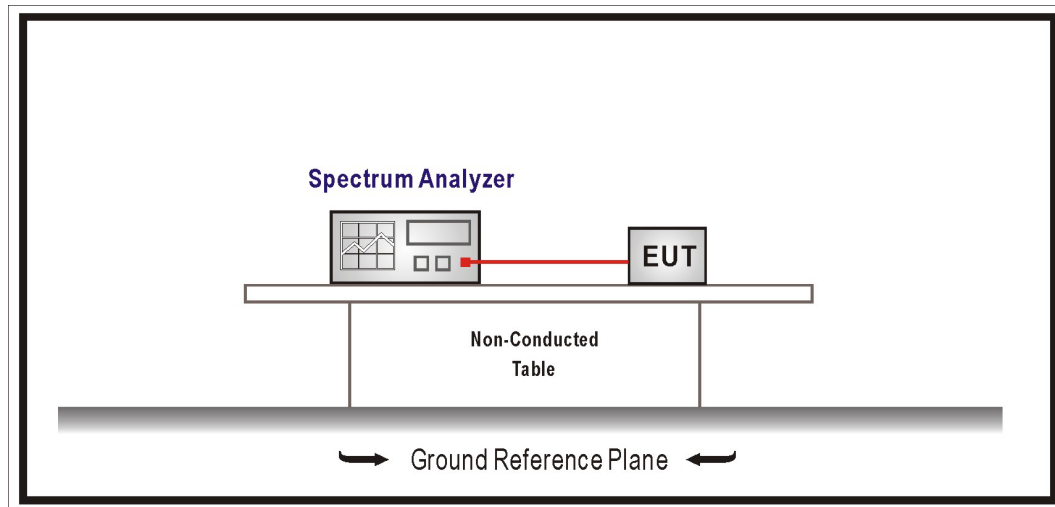
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.196	52.46	63.79	-11.33	42.85	9.61	QP
*2	0.196	47.68	53.79	-6.11	38.07	9.61	AV
3	0.262	42.96	61.38	-18.42	33.34	9.62	QP
4	0.262	35.86	51.38	-15.52	26.24	9.62	AV
5	0.551	37.18	56.00	-18.82	27.53	9.65	QP
6	0.551	25.99	46.00	-20.01	16.34	9.65	AV
7	6.444	46.73	60.00	-13.27	36.76	9.97	QP
8	6.444	17.49	50.00	-32.51	7.52	9.97	AV
9	16.029	50.37	60.00	-9.63	39.99	10.38	QP
10	16.029	23.31	50.00	-26.69	12.93	10.38	AV
11	27.542	47.57	60.00	-12.43	36.77	10.80	QP
12	27.542	19.29	50.00	-30.71	8.49	10.80	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

3. Emission Bandwidth

3.1. Test Setup



3.2. Test Limit

Intentional radiators must be designed to ensure that the emission bandwidth of the emissions in the specific band. (13.553 ~ 13.567 MHz)

3.3. Test Procedures

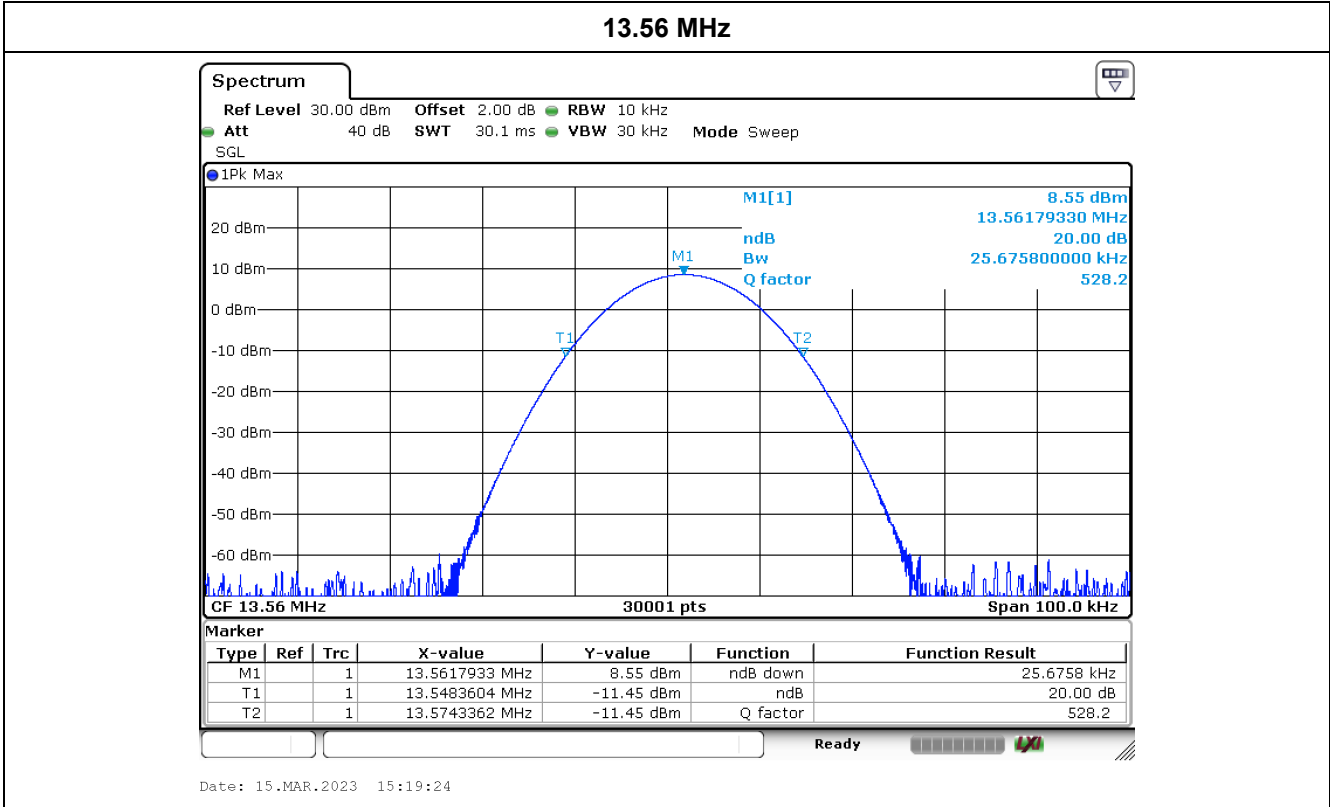
1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. Because the measured signal is CW or CW-like adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

3.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.225.

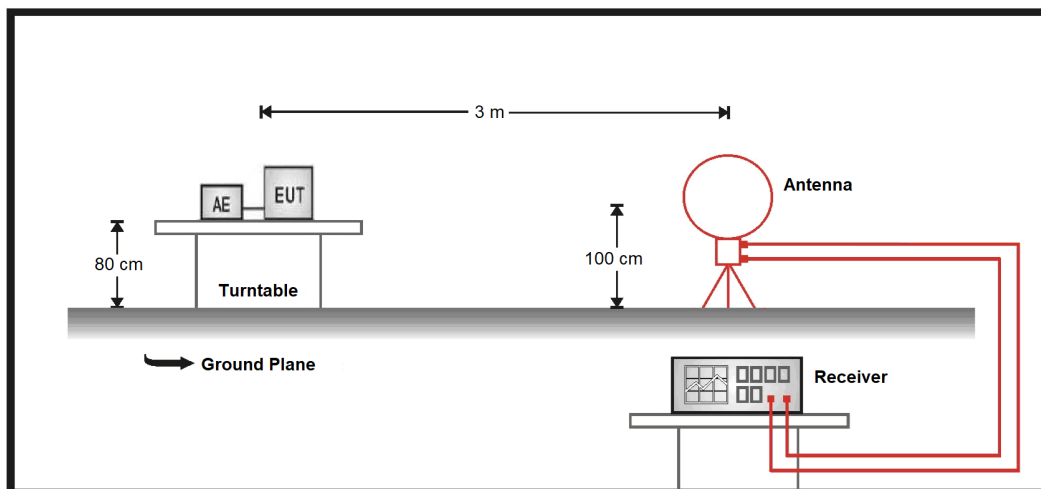
3.5. Test Result of Emission Bandwidth

Frequency (MHz)	Measure Level (kHz)	Limit (MHz)
13.56	25.675	-



4. Field Strength of Fundamental Emissions and Spectrum Mask

4.1. Test Setup



4.2. Test Limit

Field Strength of Fundamental Emissions			
Frequencies (MHz)	Field Strength (microvolts/meter) at 30m	Field Strength (dBμV/m) at 10m	Field Strength (dBμV/m) at 3m
13.553 – 13.567 MHz	15848	103.08 (QP)	124 (QP)
Quasi peak measurement of the fundamental.			

Spectrum Mask					
Rules and specifications	CFR 47 Part 15 section 15.225(a)-(d)				
Description	Compliance with the spectrum mask is tested using a spectrum analyzer with RBW set to a 9kHz for the band 13.553 – 13.567 MHz.				
Limit	Freq. of Emission (MHz)	Field Strength			
		(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m
	1.705~13.110	30	29.5	48.6	69.5
	13.110~13.410	106	40.5	59.6	80.5
	13.410~13.553	334	50.5	69.6	90.5
	13.553~13.567	15848	84.0	103.1	124.0
	13.567~13.710	334	50.5	69.6	90.5
	13.710~14.010	106	40.5	59.6	80.5
	14.010~30.000	30	29.5	48.6	69.5

4.3. Test Procedure

1. Configure the EUT according to ANSI C63.10: 2013. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
4. For Fundamental emissions, use the receiver to measure QP reading.
5. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
6. Compliance with the spectrum mask is tested using a spectrum analyzer with RBW set to a 9kHz for the band 13.553 – 13.567 MHz.

4.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.225.

4.5. Test Result of Field Strength of Fundamental Emissions

Site :HC-CB04
Condition :3m Loop
Mode :Fundamental_X-Y
Test By :Cyril

No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	13.560	9.42	84.00	-74.58	28.08	-18.66	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Loop
Mode :Fundamental_Y-Y
Test By :Cyril

No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	13.560	6.97	84.00	-77.03	25.63	-18.66	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

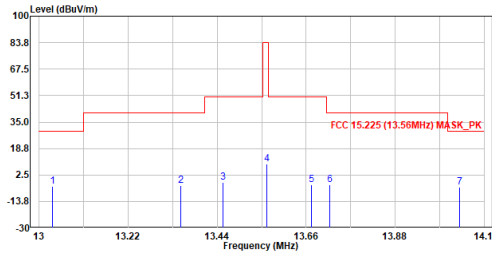
Site :HC-CB04
Condition :3m Loop
Mode :Fundamental_Z-Y
Test By :Cyril

No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	13.560	0.97	84.00	-83.03	19.63	-18.66	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

4.6. Test Result of Spectrum Mask

Site :HC-CB04
Condition :3m Loop
Mode :Mask_X-Y
Test By :Cyril

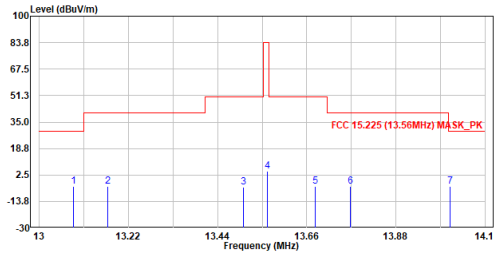


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	13.033	-4.26	29.50	-33.76	14.42	-18.68	Peak
2	13.351	-4.08	40.50	-44.58	14.59	-18.67	Peak
3	13.455	-2.04	50.50	-52.54	16.62	-18.66	Peak
4	13.562	9.28	84.00	-74.72	27.94	-18.66	Peak
5	13.673	-3.52	50.50	-54.02	15.13	-18.65	Peak
6	13.719	-3.44	40.50	-43.94	15.21	-18.65	Peak
7	14.040	-4.86	29.50	-34.36	13.78	-18.64	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Loop
Mode :Mask_Y-Y
Test By :Cyril

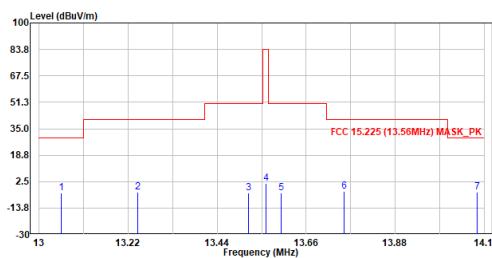


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	13.085	-4.50	29.50	-34.00	14.18	-18.68	Peak
2	13.169	-4.48	40.50	-44.98	14.19	-18.67	Peak
3	13.504	-4.80	50.50	-55.30	13.86	-18.66	Peak
4	13.562	5.02	84.00	-78.98	23.68	-18.66	Peak
5	13.680	-4.58	50.50	-55.08	14.07	-18.65	Peak
6	13.768	-4.34	40.50	-44.84	14.31	-18.65	Peak
7	14.014	-4.68	29.50	-34.18	13.96	-18.64	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Loop
Mode :Mask_Z-Y
Test By :Cyril



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	13.055	-4.35	29.50	-33.85	14.33	-18.68	Peak
2	13.243	-3.86	40.50	-44.36	14.81	-18.67	Peak
3	13.517	-4.45	50.50	-54.95	14.21	-18.66	Peak
4	13.561	1.33	84.00	-82.67	19.99	-18.66	Peak
5	13.598	-4.57	50.50	-55.07	14.09	-18.66	Peak
6	13.753	-3.47	40.50	-43.97	15.18	-18.65	Peak
7	14.082	-3.99	29.50	-33.49	14.65	-18.64	Peak

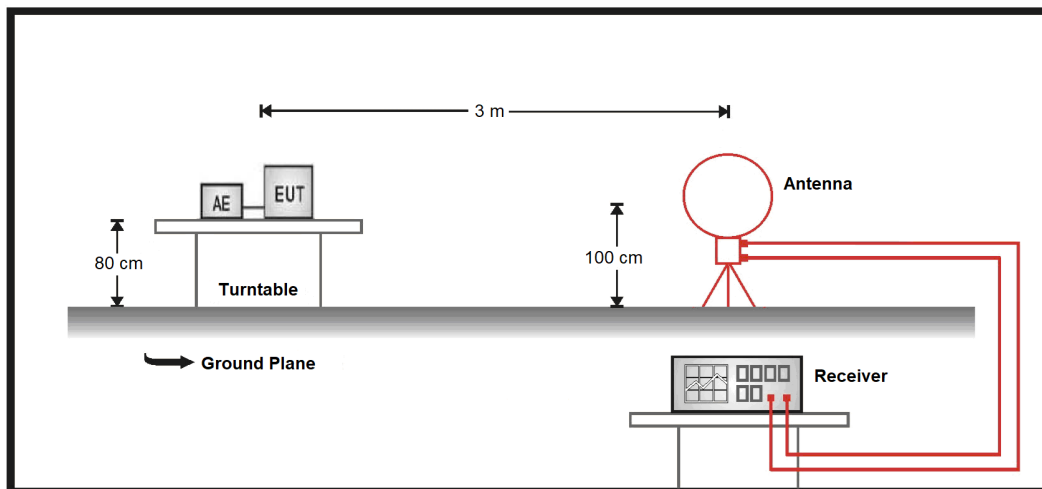
Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

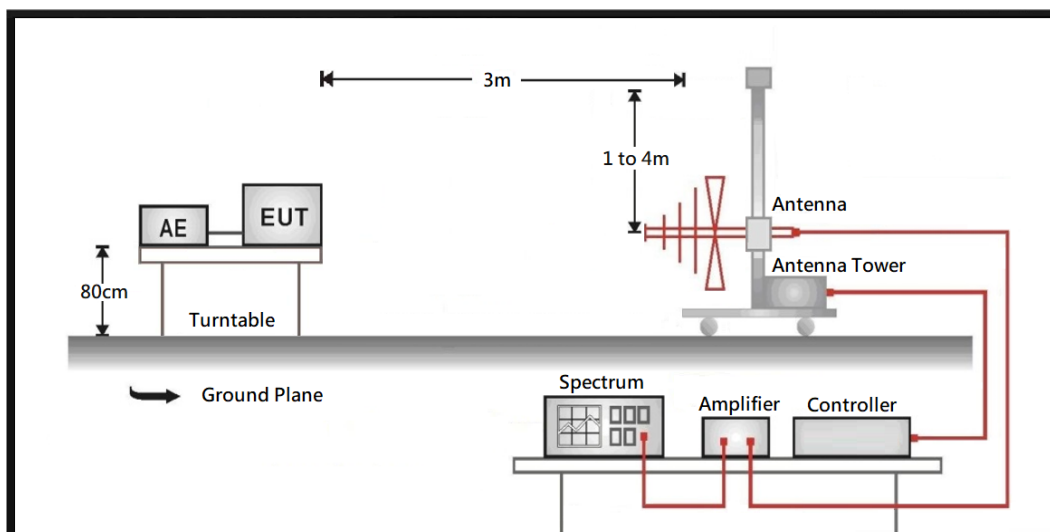
5. Radiated Emission

5.1. Test Setup

9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



5.2. Test Limit

The field strength of any emissions which appear outside of 13.553 ~ 13.567MHz band shall not exceed the general radiated emissions limits.

Frequency (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	20 log (2400/F(kHz))	300
0.490 – 1.705	24000/F(kHz)	20 log (24000/F(kHz))	30
1.705 - 30	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Remarks:

1. Field strength (dBuV/m) = 20 log Field strength (uV/m)
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

5.3. Test Procedure

1. Configure the EUT according to ANSI C63.10: 2013. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

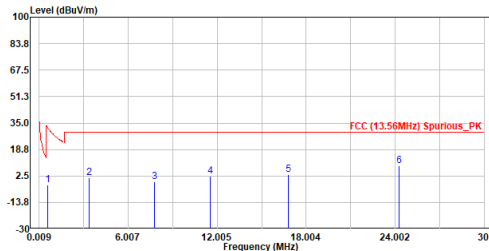
5.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.225.

5.5. Test Result of Radiated Emission

9 kHz ~ 30 MHz

Site :HC-CB04
Condition :3m Loop
Mode :9k-30M_X-Y
Test By :Cyril

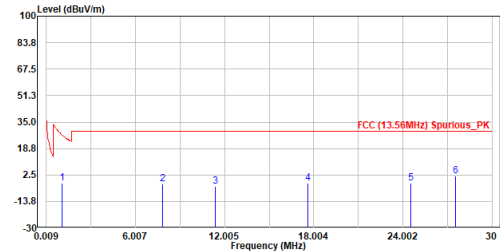


No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	0.582	-2.86	32.31	-35.17	17.52	-20.38	Peak
2	3.374	1.39	29.54	-28.15	21.89	-20.50	Peak
3	7.795	-1.00	29.54	-30.54	18.55	-19.55	Peak
4	11.547	2.54	29.54	-27.00	21.28	-18.74	Peak
5	16.795	3.14	29.54	-26.40	21.67	-18.53	Peak
6	24.278	8.59	29.54	-20.95	26.95	-18.36	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Loop
Mode :9k-30M_Y-Y
Test By :Cyril

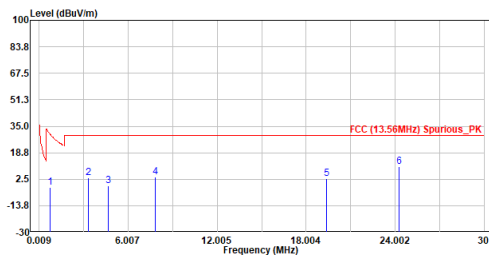


No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	1.889	-2.65	26.87	-29.52	17.66	-20.31	Peak
2	7.843	-2.96	29.54	-32.50	16.57	-19.53	Peak
3	11.394	-4.26	29.54	-33.80	14.48	-18.74	Peak
4	17.587	-2.31	29.54	-31.85	16.19	-18.50	Peak
5	24.515	-2.53	29.54	-32.07	15.83	-18.36	Peak
6	27.547	1.66	29.54	-27.88	19.99	-18.33	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Loop
Mode :9k-30M_Z-Y
Test By :Cyril



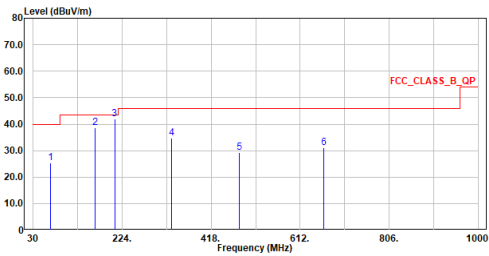
No.	Frequency MHz	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Read Level dBuV	Factor dB	Remark
1	0.762	-2.55	29.97	-32.52	17.80	-20.35	Peak
2	3.326	3.45	29.54	-26.09	23.95	-20.50	Peak
3	4.685	-1.58	29.54	-31.12	18.92	-20.50	Peak
4	7.837	3.91	29.54	-25.63	23.45	-19.54	Peak
5	19.401	3.06	29.54	-26.48	21.48	-18.42	Peak
6	24.275	10.27	29.54	-19.27	28.63	-18.36	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
= $40 \cdot \log(3/300) = -80\text{dB @}300\text{m}$
= $40 \cdot \log(3/30) = -40\text{dB @}30\text{m}$
5. The other emission levels were very low against the limit.

30 MHz ~ 1 GHz

Site :HC-CB04
Condition :3m Horizontal
Mode :30M-1G_Y
Test By :Cyril

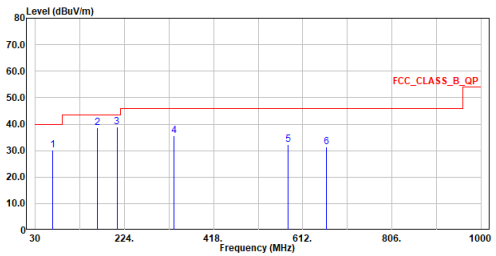


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	Limit	Level	dB	
1	67.830	25.44	40.00	-14.56	29.29	-3.85	QP
2	165.994	38.63	43.50	-4.87	41.64	-3.01	QP
3	207.704	41.96	43.50	-1.54	48.42	-6.46	QP
4	331.961	34.78	46.00	-11.22	36.24	-1.46	QP
5	480.080	29.15	46.00	-16.85	26.93	2.22	QP
6	663.992	31.11	46.00	-14.89	25.26	5.85	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
 $= 40 \cdot \log(3/300) = -80\text{dB @300m}$
 $= 40 \cdot \log(3/30) = -40\text{dB @30m}$
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Vertical
Mode :30M-1G_Y
Test By :Cyril



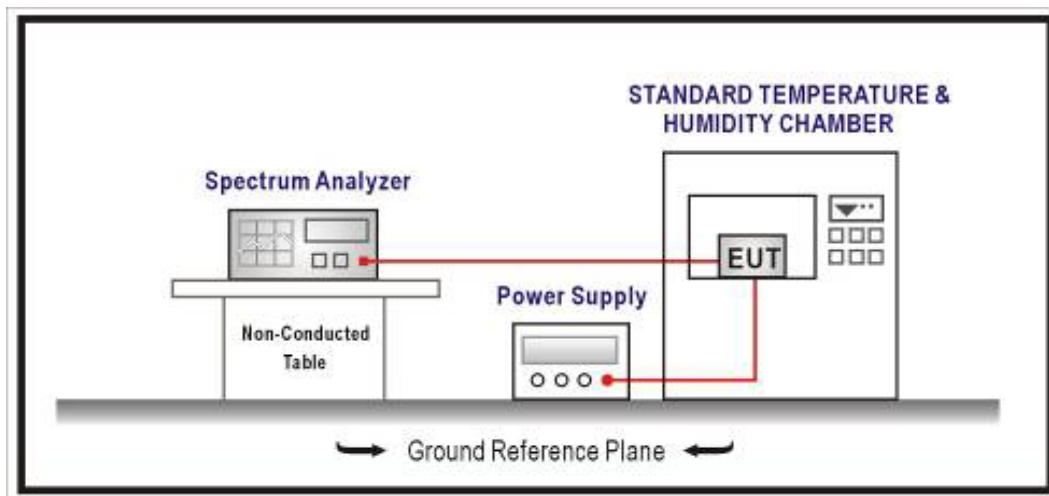
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	Limit	Level	dB	
1	67.830	30.24	40.00	-9.76	34.09	-3.85	QP
2	165.994	38.78	43.50	-4.72	41.79	-3.01	QP
3	207.704	38.94	43.50	-4.56	45.40	-6.46	QP
4	331.961	35.57	46.00	-10.43	37.03	-1.46	QP
5	580.960	32.25	46.00	-13.75	27.91	4.34	QP
6	663.992	31.32	46.00	-14.68	25.47	5.85	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert distance formula
 $= 40 \cdot \log(3/300) = -80\text{dB @300m}$
 $= 40 \cdot \log(3/30) = -40\text{dB @30m}$
5. The other emission levels were very low against the limit.

6. Frequency Stability

6.1. Test Setup



6.2. Test Limit

Carrier frequency stability shall be maintained to $\pm 0.01\%$ (± 100 ppm).

6.3. Test Procedures

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

For battery operated equipment, the equipment tests shall be performed using a new battery.

6.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.225.

6.5. Test Result of Frequency Stability

Test Conditions		Frequency (MHz)	Frequency Tolerance (%)	Limit (%)
20°C	220V	13.561345	0.00992	± 0.01
20°C	187V	13.561350	0.00996	± 0.01
20°C	253V	13.561350	0.00996	± 0.01

Test Conditions		Frequency (MHz)	Frequency Tolerance (%)	Limit (%)
-30°C	220V	13.56136	0.00999	± 0.01
-20°C	220V	13.56136	0.00999	± 0.01
-10°C	220V	13.56136	0.00999	± 0.01
0°C	220V	13.56136	0.00999	± 0.01
10°C	220V	13.56135	0.00996	± 0.01
20°C	220V	13.56134	0.00988	± 0.01
30°C	220V	13.56133	0.00977	± 0.01
40°C	220V	13.56135	0.00996	± 0.01
50°C	220V	13.56135	0.00996	± 0.01