

FCC Test Report

Product Name	Mobile Computer
Model No.	RS35
FCC ID	Q3N-RS35

Applicant	Cipherlab Co, Ltd.
Address	12F, NO.333, SEC.2, DUNHUA S. RD., TAIPEI, TAIWAN, R.O.C.

Date of Receipt	June 08, 2020
Issued Date	Aug. 17, 2020
Report No.	2060284R-E3032110103
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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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 Report

Issued Date: Aug. 17, 2020

Report No.: 2060284R-E3032110103



Product Name	Mobile Computer
Applicant	Cipherlab Co, Ltd.
Address	12F, NO.333, SEC.2, DUNHUA S. RD., TAIPEI, TAIWAN, R.O.C.
Manufacturer	Cipherlab Co, Ltd.
Model No.	RS35
FCC ID.	Q3N-RS35
EUT Rated Voltage	AC 100-240V, 50-60Hz or DC 5V by USB or DC 3.8V by battery
EUT Test Voltage	AC 120V / 60Hz
Trade Name	CIPHERLAB
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By

:



(Senior Adm. Specialist / Genie Chang)

Tested By

:



(Engineer / Yunche Chen)

Approved By

:



(Director / Vincent Lin)

TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION	5
1.1. EUT Description.....	5
1.2. Operational Description	6
1.3. Tested System Details.....	7
1.4. Configuration of tested System	7
1.5. EUT Exercise Software	7
1.6. Test Facility	8
1.7. List of Test Equipment	9
1.8. Uncertainty	11
2. Conducted Emission.....	12
2.1. Test Setup	12
2.2. Limits	12
2.3. Test Procedure	12
2.4. Test Result of Conducted Emission.....	13
3. Radiated Emission.....	15
3.1. Test Setup	15
3.2. Limits	16
3.3. Test Procedure	18
3.4. Test Result of Radiated Emission.....	19
4. Band Edge	29
4.1. Test Setup	29
4.2. Limits	30
4.3. Test Procedure	30
4.4. Test Result of Band Edge	31
5. Frequency Tolerance	35
5.1. Test Setup	35
5.2. Limits	35
5.3. Test Procedure	35
5.4. Test Result of Frequency Stability.....	36
6. EMI Reduction Method During Compliance Testing	38
Attachment 1: EUT Test Photographs	
Attachment 2: EUT Detailed Photographs	

Revision History

Report No.	Version	Description	Issued Date
2060284R-E3032110103	V1.0	Initial issue of report.	2020-07-07

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Mobile Computer
Trade Name	CIPHERLAB
Model No.	RS35
FCC ID	Q3N-RS35
Frequency Range	13.56MHz
Modulation	ASK
Antenna Type	Coil Antenna
USB to Type-C Cable	Shielded, 1m
USB Docking Cable	Shielded, 1.5m, with one ferrite core boned.
Power Adapter	MFR: SUNNY, M/N: SYS1561-1005 Input: AC 100-240V, 50-60Hz Output: 5V ---2A

Frequency of Each Channel:

Channel	Frequency
Channel 1:	13.56 MHz

Note:

1. This device is a Mobile Computer with a built-in 13.56MHz transceiver.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.225
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit
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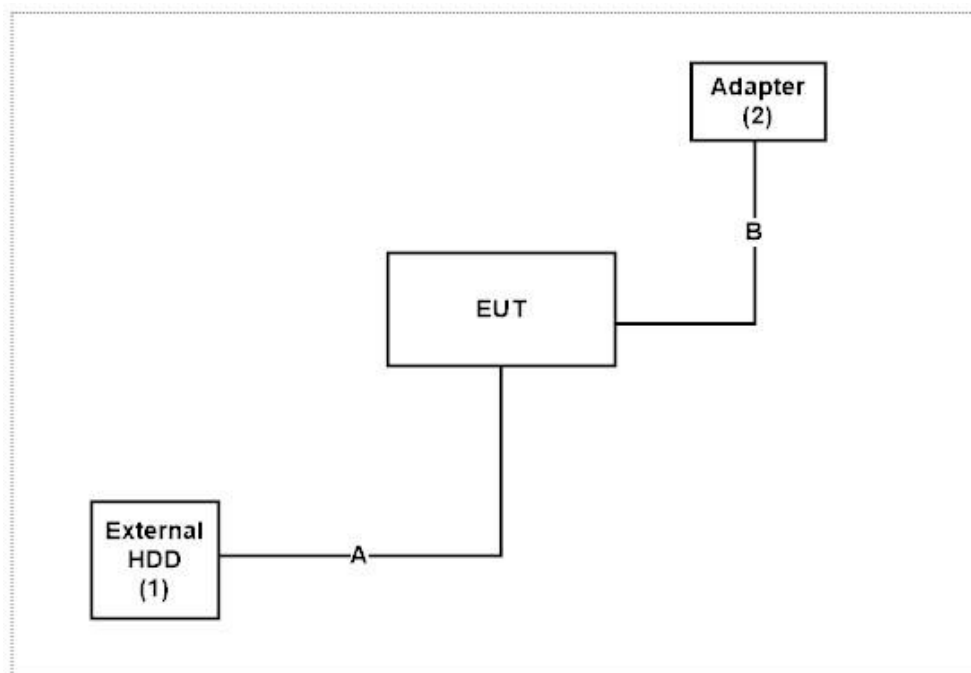
1.3. Tested System Details

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	External HDD	Transcend	TS1TSJ25H3B	F21786-0125	N/A
2	Adapter	SUNNY	SYS1561-1005	N/A	N/A

Signal Cable Type	Signal cable Description
A	USB to Type-C Cable
B	USB Docking Cable

1.4. Configuration of tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “NFC Tools Pro v1.8” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	24.6 °C
	Humidity (%RH)	10~90 %	48 %
Radiated Emission	Temperature (°C)	10~40 °C	34 °C
	Humidity (%RH)	10~90 %	47 %
Conductive	Temperature (°C)	10~40 °C	25.7 °C
	Humidity (%RH)	10~90 %	62 %

USA : FCC Registration Number: TW3023

Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
Taiwan, R.O.C.
Phone number: 886-2-8601-3788
Fax number: 886-2-8601-3789
Email address: info.tw@dekra.com
Website: <http://www.dekra.com.tw>

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2020/04/06	2021/04/05
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2019/09/25	2020/09/24
	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/07/30	2020/07/29
	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/30	2020/07/29
	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/30	2020/07/29
X	EMI Test Receiver	R&S	ESCS 30	100369	2019/11/27	2020/11/26
X	LISN	R&S	ENV216	101105	2020/04/27	2021/04/26
X	LISN	R&S	ESH3-Z5	836679/014	2020/04/26	2021/04/25
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2020/06/19	2021/06/18

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test SystemV9.0.5.

For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Test Receiver	R&S	ESR7	101602	2019/12/16	2020/12/15
X	Signal Analyzer	R&S	FSV40	101869	2020/06/24	2021/06/23
X	Loop Antenna	Teseq	HLA6121	37133	2019/10/15	2021/10/14
X	Bilog Antenna	Schaffner Chase	CBL6112B	2916	2020/01/20	2021/01/19
X	Coaxial Cable	DEKRA	L1907-001C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC001330	980254	2019/08/22	2020/08/21
	Horn Antenna	ETS-LINDGREN	3117	00228113	2020/05/28	2021/05/27
	Coaxial Cable	DEKRA	L1907-002C	280280.F141.1000D	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC05820SE	980362	2020/06/30	2021/06/29
	Amplifier	EMCI	EMC051845SE	980632	2019/08/08	2020/08/07
	Horn Antenna	Com-Power	AH-1840	101101	2019/10/31	2020/10/30
	Amplifier + Cable	EMCI	EMC184045SE	980369	2020/04/23	2021/04/22
	Bilog Antenna	Schaffner Chase	CBL6112B	2925	2020/02/20	2021/02/19
	Coaxial Cable	DEKRA	L1907-003C	00100A1B3A120M	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC001330	980255	2020/03/17	2021/03/16
	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/08	2020/08/07
	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/08	2020/08/07

Note:

1. Loop Antenna is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Test SystemV1.1.

1.8. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

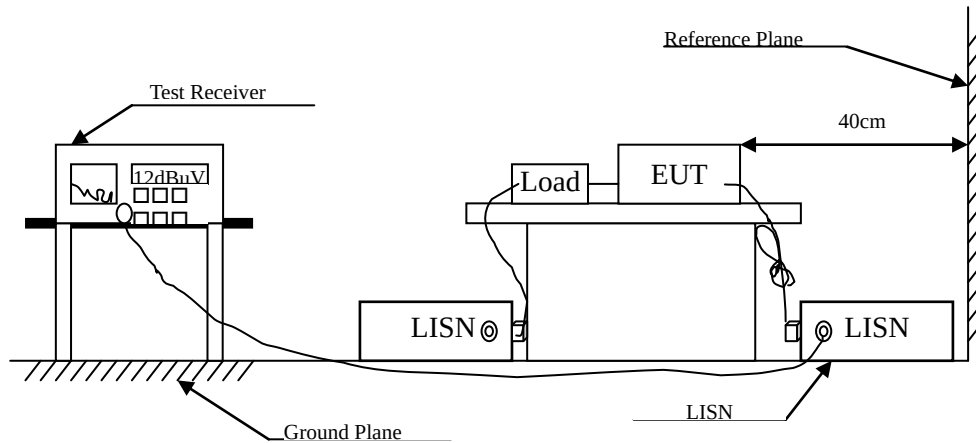
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

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	$\pm 3.42\text{dB}$
Radiated Emission	9kHz~30MHz: $\pm 3.88\text{dB}$ 30MHz~1GHz: $\pm 4.06\text{dB}$ 1GHz~18GHz: $\pm 3.71\text{dB}$ 18GHz~40GHz: $\pm 3.73\text{dB}$ 40GHz~50GHz: $\pm 3.75\text{dB}$ 50GHz~325GHz: $\pm 4.39\text{dB}$
Band Edge	9kHz~30MHz: $\pm 3.88\text{dB}$ 30MHz~1GHz: $\pm 4.06\text{dB}$ 1GHz~18GHz: $\pm 3.71\text{dB}$ 18GHz~40GHz: $\pm 3.73\text{dB}$ 40GHz~50GHz: $\pm 3.75\text{dB}$ 50GHz~325GHz: $\pm 4.39\text{dB}$
Frequency Tolerance	$\pm 1544.74\text{Hz}$

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) 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.)

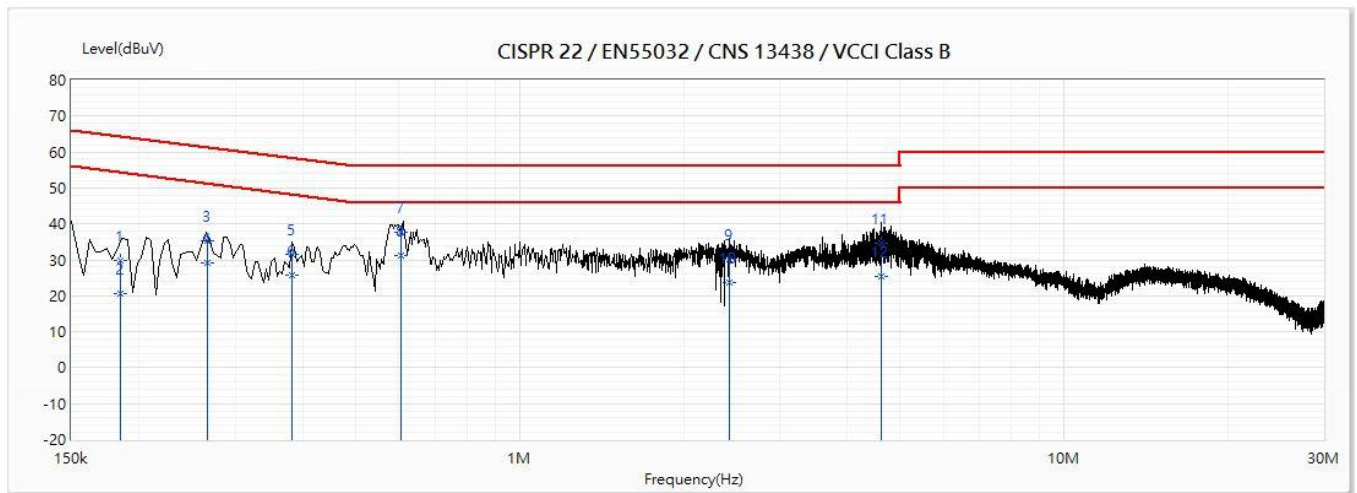
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

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

2.4. Test Result of Conducted Emission

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test date : 2020/07/06
 Test Mode : Mode 1: Transmit

L1



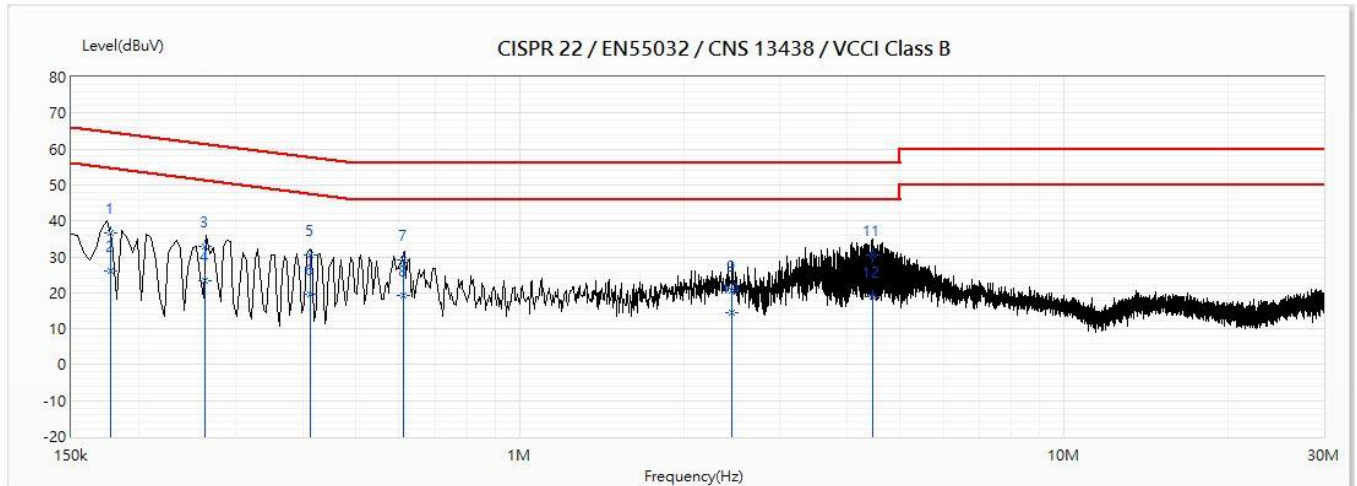
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.184	29.98	64.29	-34.31	20.17	9.80	QP
2	0.184	20.73	54.29	-33.56	10.92	9.80	AV
3	0.267	35.15	61.22	-26.08	25.35	9.80	QP
4	0.267	29.28	51.22	-21.95	19.48	9.80	AV
5	0.382	31.48	58.23	-26.75	21.68	9.80	QP
6	0.382	25.65	48.23	-22.58	15.85	9.80	AV
7	0.605	37.57	56.00	-18.43	27.77	9.80	QP
*8	0.605	31.20	46.00	-14.80	21.40	9.80	AV
9	2.431	30.08	56.00	-25.92	20.22	9.86	QP
10	2.431	23.72	46.00	-22.28	13.86	9.86	AV
11	4.612	34.52	56.00	-21.48	24.59	9.93	QP
12	4.612	25.40	46.00	-20.60	15.47	9.93	AV

Remark:

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

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test date : 2020/07/06
 Test Mode : Mode 1: Transmit

N



No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.177	36.73	64.61	-27.88	26.94	9.78	QP
2	0.177	26.16	54.61	-28.45	16.37	9.78	AV
3	0.264	32.98	61.31	-28.33	23.19	9.78	QP
4	0.264	23.49	51.31	-27.82	13.71	9.78	AV
5	0.412	30.60	57.61	-27.01	20.81	9.79	QP
6	0.412	19.64	47.61	-27.97	9.85	9.79	AV
7	0.612	29.02	56.00	-26.98	19.23	9.79	QP
8	0.612	19.18	46.00	-26.82	9.39	9.79	AV
9	2.457	20.54	56.00	-35.46	10.69	9.85	QP
10	2.457	14.63	46.00	-31.37	4.78	9.85	AV
*11	4.455	30.46	56.00	-25.54	20.55	9.92	QP
12	4.455	18.93	46.00	-27.07	9.02	9.92	AV

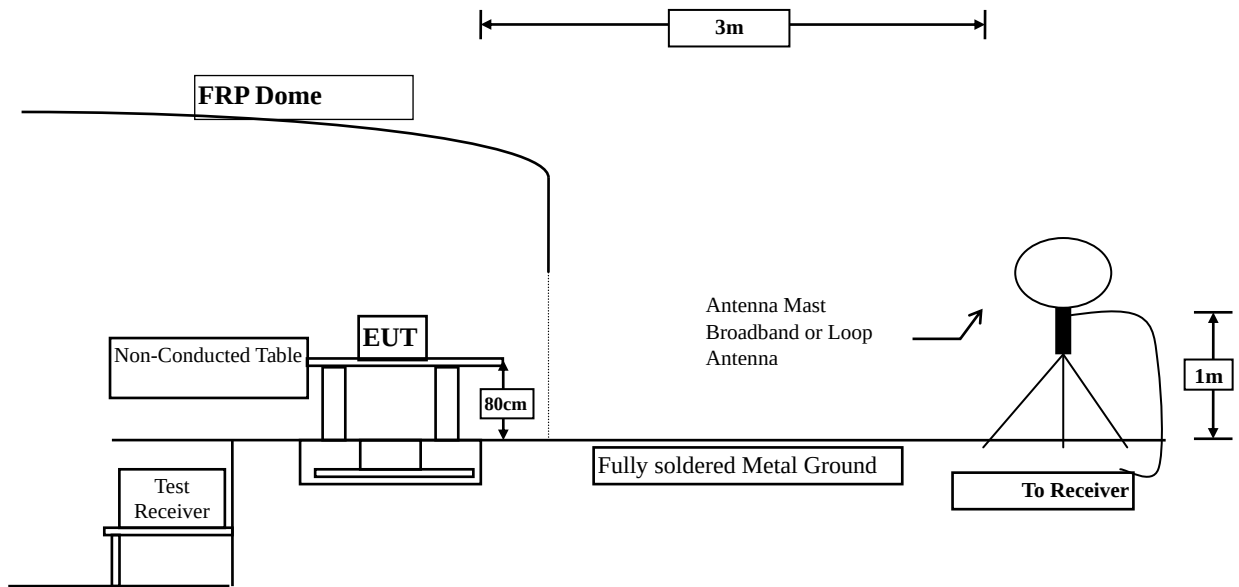
Remark:

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

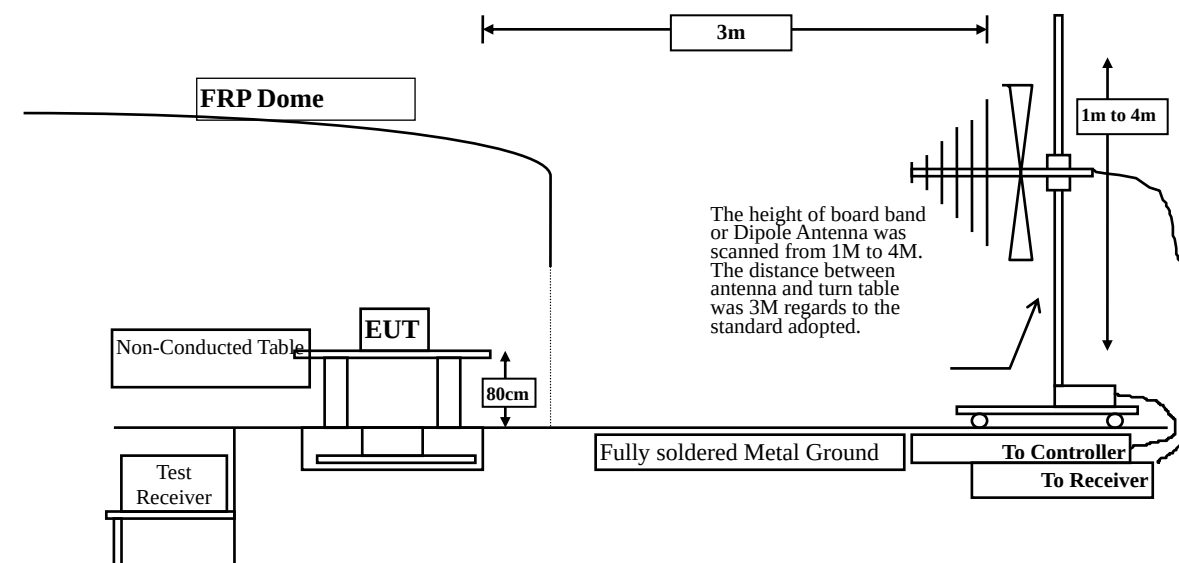
3. Radiated Emission

3.1. Test Setup

9kHz~30MHz



30MHz~1GHz



3.2. Limits

➤ Fundamental electric field strength Limit

FCC Part 15 Subpart C Paragraph 15.225 Limits				
Fundamental Frequency MHz	Field strength of fundamental			
	uV/m	Distance (meter)	dBuV/m	Distance (meter)
13.553 – 13.567	15848	30	124	3
13.410 – 13.553 and 13.567 – 13.710	334	30	90.47	3
13.110 – 13.410 and 13.710 – 14.010	106	30	80.50	3
Outside of the 13.110 – 14.010	See 15.209 Limits			

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

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. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

➤ Spurious electric field strength Limit

FCC Part 15 Subpart C Paragraph 15.209 Limits			
Frequency MHz	uV/m	dBuV/m	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	See Remark ¹	300
0.490-1.705	24000/F(kHz)	See Remark ¹	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. RF Voltage (dBuV) = 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

Fundamental electric field strength:

The EUT and its simulators are placed on a turn table which is 1 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum electric field strength.

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

The antenna which is 1 meter above ground. All X-axis, Y-axis and Z-axis polarization of the antenna are set on measurement.

Spurious electric field strength:

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 antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

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 C6310: 2013 on radiated measurement.

On any frequency the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, 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.

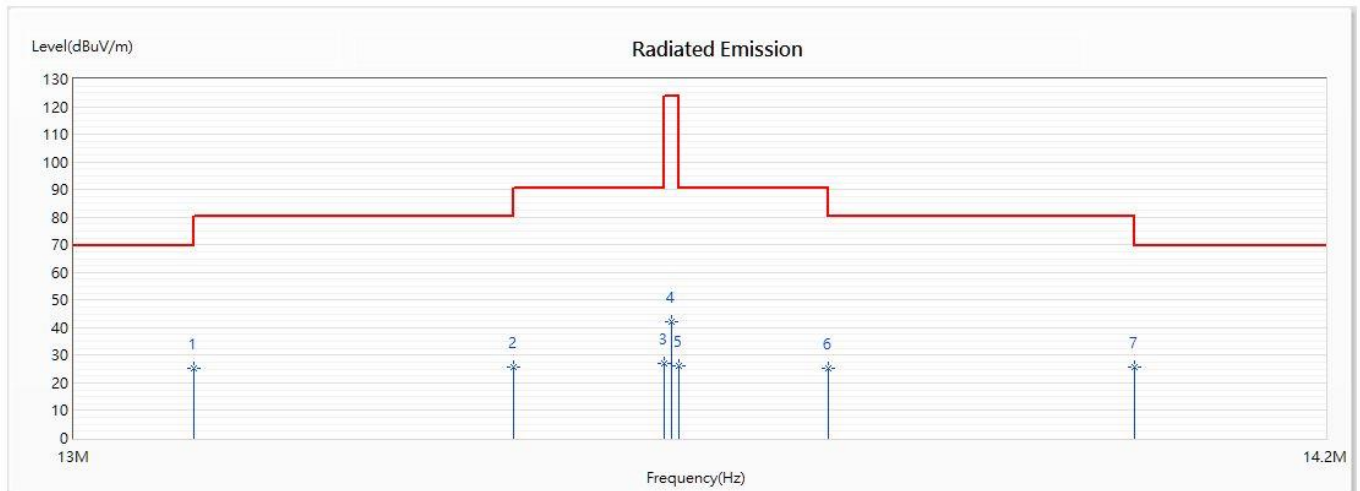
The bandwidth below 30MHz setting on the field strength meter is 9kHz and above 30MHz is 120kHz.

The frequency range from 9kHz to 10th harmonics is checked.

3.4. Test Result of Radiated Emission

Product : Mobile Computer
 Test Item : Fundamental Radiated Emission
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

X-axis - HORIZONTAL



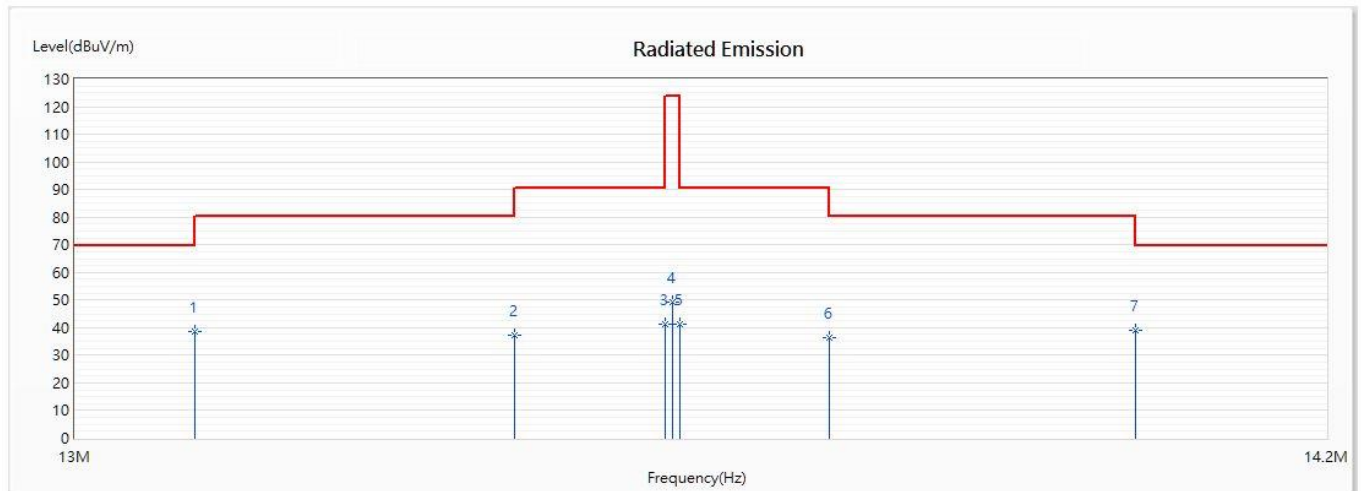
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	13.11	25.31	69.50	-44.19	3.62	21.69	QP
2	13.41	25.63	80.50	-54.87	3.93	21.70	QP
3	13.553	27.23	90.47	-63.24	5.52	21.71	QP
4	13.56	42.19	124.00	-81.81	20.48	21.71	QP
5	13.567	26.11	90.47	-64.36	4.40	21.71	QP
6	13.71	25.35	80.50	-55.15	3.64	21.71	QP
* 7	14.01	25.65	69.50	-43.85	3.93	21.72	QP

Note:

1. Fundamental Limit=84dBuV/m + 40*Log (30(m)/3(m))=124dBuV/m
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : Fundamental Radiated Emission
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

X-axis - VERTICAL



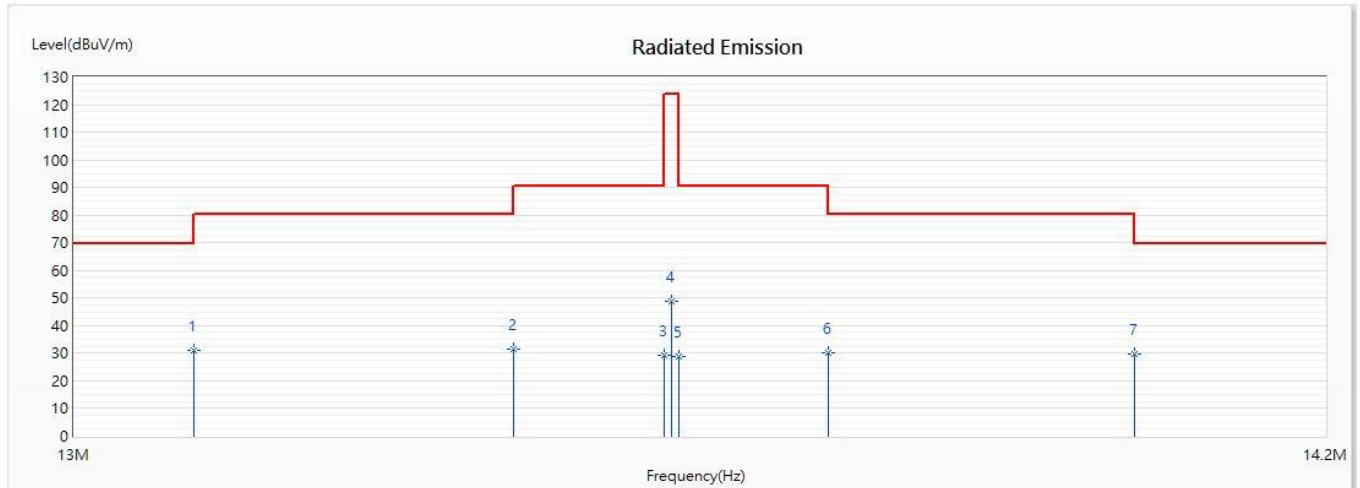
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	13.11	38.75	69.50	-30.75	17.06	21.69	QP
2	13.41	37.06	80.50	-43.44	15.36	21.70	QP
3	13.553	41.35	90.47	-49.12	19.64	21.71	QP
4	13.56	49.12	124.00	-74.88	27.41	21.71	QP
5	13.567	41.33	90.47	-49.14	19.62	21.71	QP
6	13.71	36.39	80.50	-44.11	14.68	21.71	QP
* 7	14.01	38.86	69.50	-30.64	17.14	21.72	QP

Note:

1. Fundamental Limit=84dBuV/m + 40*Log (30(m)/3(m))=124dBuV/m
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : Fundamental Radiated Emission
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Y-axis - HORIZONTAL

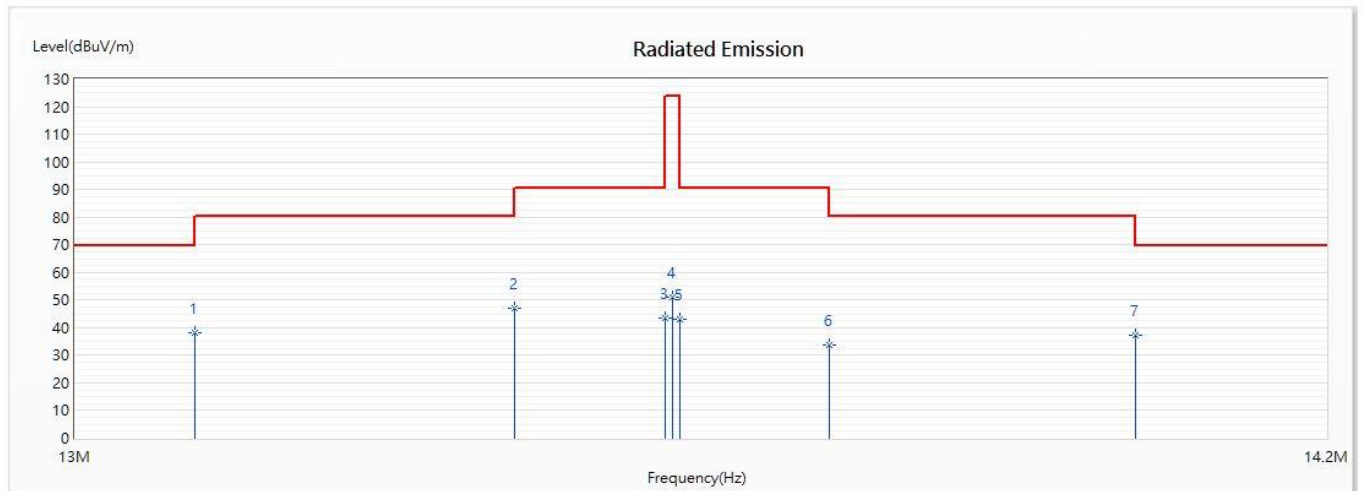


Note:

1. Fundamental Limit = $84 \text{ dBuV/m} + 40 \cdot \log(30 \text{ m} / 3 \text{ m}) = 124 \text{ dBuV/m}$
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : Fundamental Radiated Emission
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Y-axis - VERTICAL



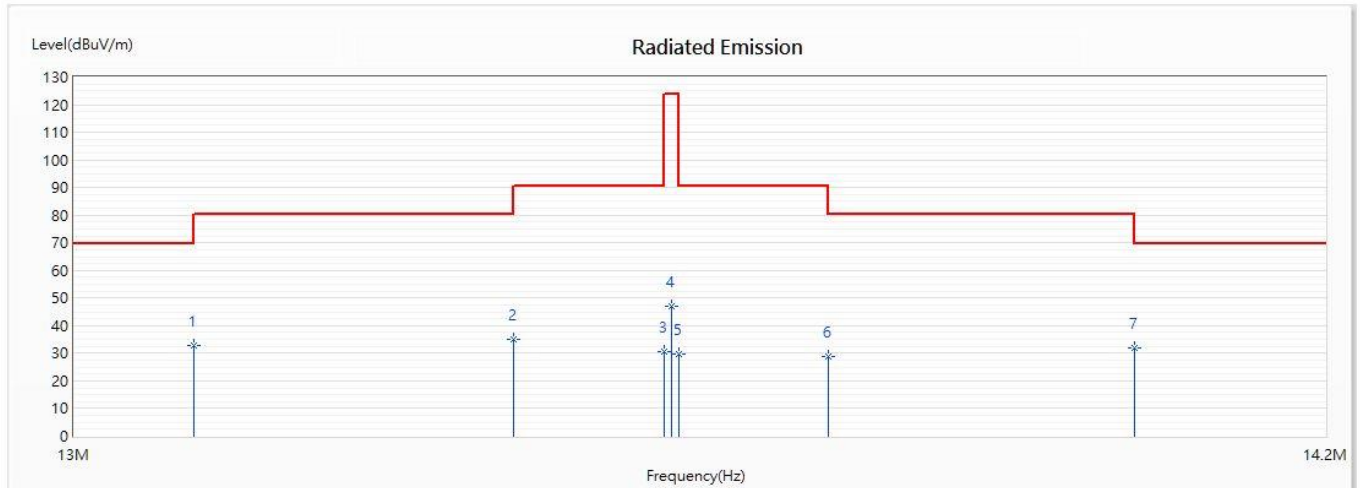
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	13.11	37.98	69.50	-31.52	16.29	21.69	QP
2	13.41	47.25	80.50	-33.25	25.55	21.70	QP
3	13.553	43.27	90.47	-47.20	21.56	21.71	QP
4	13.56	51.23	124.00	-72.77	29.52	21.71	QP
5	13.567	43.18	90.47	-47.29	21.47	21.71	QP
6	13.71	33.65	80.50	-46.85	11.94	21.71	QP
7	14.01	37.21	69.50	-32.29	15.49	21.72	QP

Note:

1. Fundamental Limit=84dBuV/m + 40*Log (30(m)/3(m))=124dBuV/m
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : Fundamental Radiated Emission
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Z-axis- HORIZONTAL



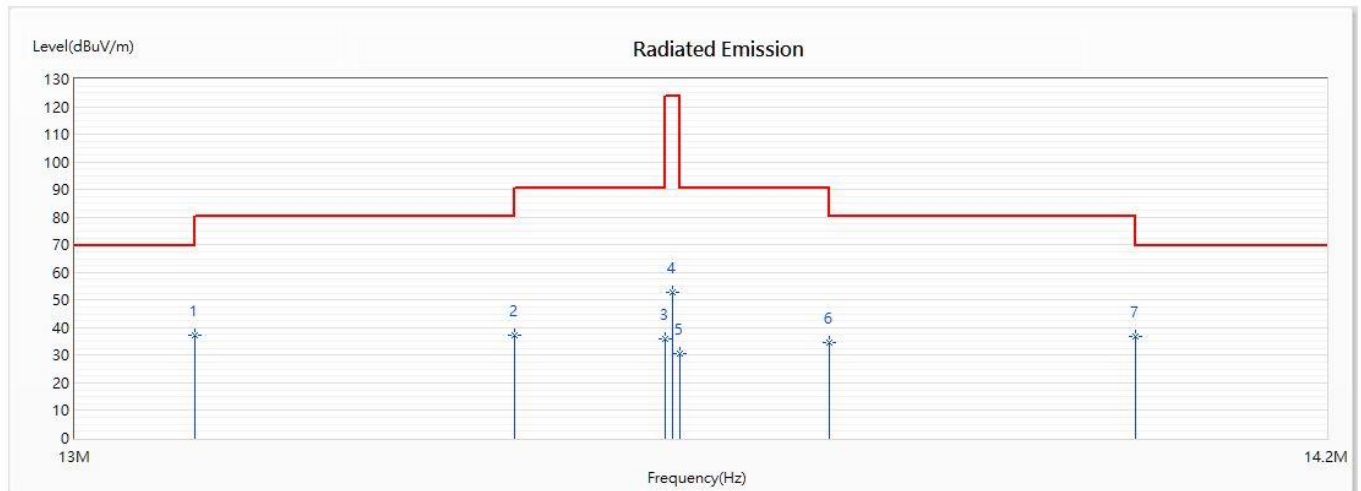
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	13.11	32.86	69.50	-36.64	11.17	21.69	QP
2	13.41	35.15	80.50	-45.35	13.45	21.70	QP
3	13.553	30.67	90.47	-59.80	8.96	21.71	QP
4	13.56	46.99	124.00	-77.01	25.28	21.71	QP
5	13.567	29.58	90.47	-60.89	7.87	21.71	QP
6	13.71	29.02	80.50	-51.48	7.31	21.71	QP
7	14.01	31.92	69.50	-37.58	10.20	21.72	QP

Note:

1. Fundamental Limit=84dBuV/m + 40*Log (30(m)/3(m))=124dBuV/m
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : Fundamental Radiated Emission
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Z-axis - VERTICAL



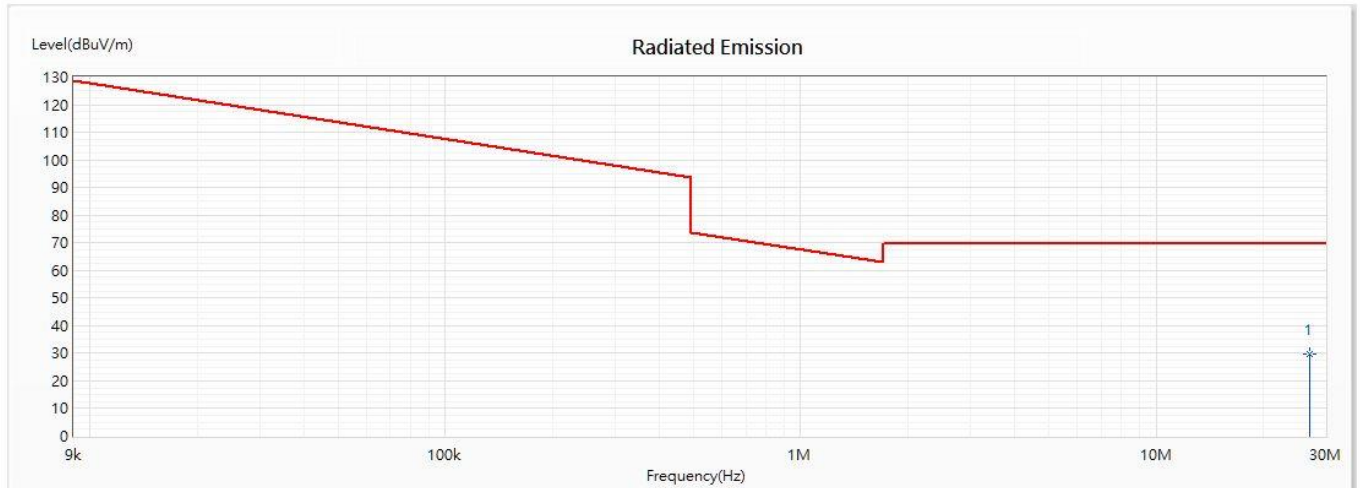
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	13.11	37.22	69.50	-32.28	15.53	21.69	QP
2	13.41	37.21	80.50	-43.29	15.51	21.70	QP
3	13.553	36.13	90.47	-54.34	14.42	21.71	QP
4	13.56	52.59	124.00	-71.41	30.88	21.71	QP
5	13.567	30.56	90.47	-59.91	8.85	21.71	QP
6	13.71	34.69	80.50	-45.81	12.98	21.71	QP
7	14.01	36.77	69.50	-32.73	15.05	21.72	QP

Note:

1. Fundamental Limit=84dBuV/m + 40*Log (30(m)/3(m))=124dBuV/m
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : General Radiated Emission Data (below 30MHz)
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Horizontal



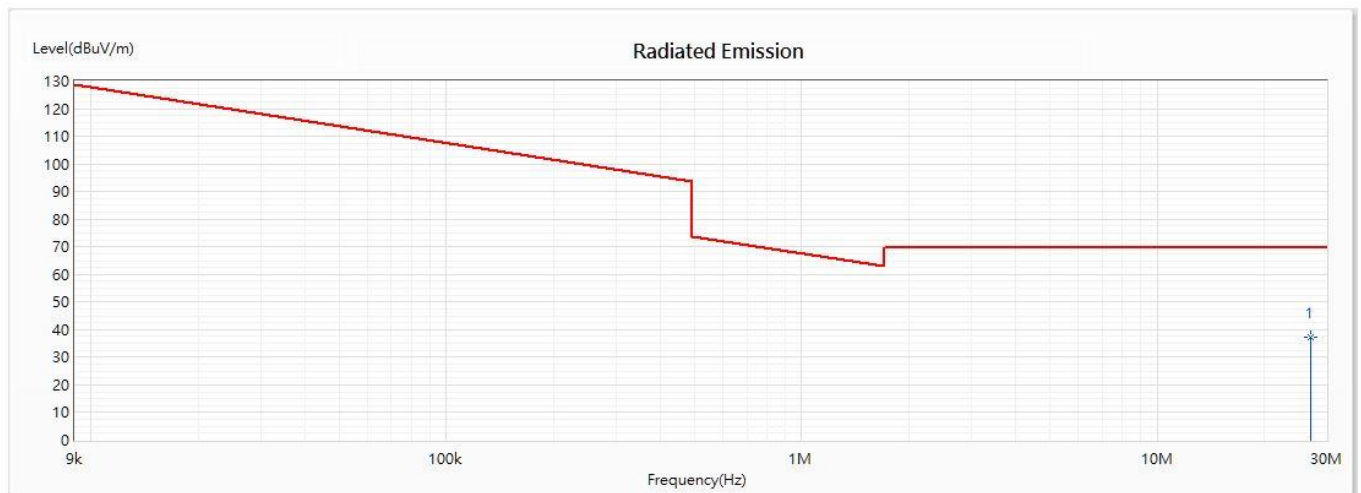
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	27.12	29.61	69.54	-39.93	7.71	21.90	QP

Note:

1. Limit=29.54dBuV/m + 40*Log (30(m)/3(m))=69.54dBuV/m
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : General Radiated Emission Data (below 30MHz)
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Vertical



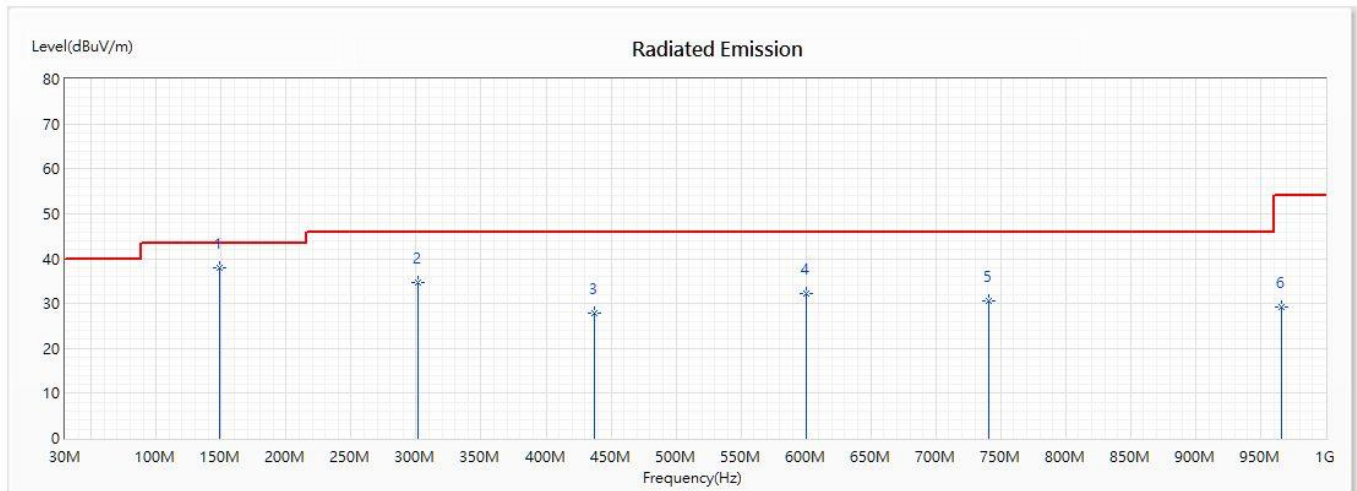
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	27.12	37.39	69.54	-32.15	15.49	21.90	QP

Note:

1. $\text{Limit} = 29.54 \text{ dBuV/m} + 40 \cdot \log(30 \text{ m} / 3 \text{ m}) = 69.54 \text{ dBuV/m}$
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. "*" means the worst emission level.
4. $\text{Emission Level} = \text{Reading Level} + \text{Correct Factor}$.

Product : Mobile Computer
 Test Item : General Radiated Emission Data (above 30MHz)
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Horizontal



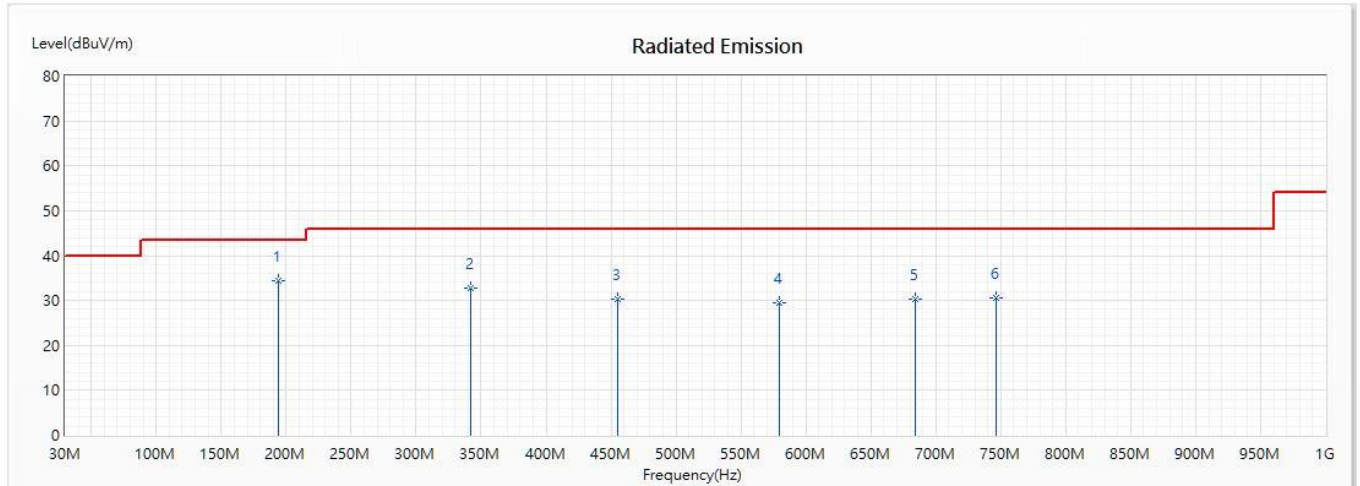
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	148.34	38.01	43.50	-5.49	50.74	-12.73	QP
2	301.6	34.56	46.00	-11.44	42.72	-8.16	QP
3	437.4	27.86	46.00	-18.14	31.54	-3.68	QP
4	600.36	32.30	46.00	-13.70	32.48	-0.18	QP
5	741.01	30.50	46.00	-15.50	29.93	0.57	QP
6	966.05	29.15	54.00	-24.85	31.14	-1.99	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. "*" means the worst emission level.
3. Emission Level = Reading Level + Correct Factor

Product : Mobile Computer
 Test Item : General Radiated Emission Data (above 30MHz)
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	193.93	34.36	43.50	-9.14	46.42	-12.06	QP
2	342.34	32.88	46.00	-13.12	40.38	-7.50	QP
3	454.86	30.25	46.00	-15.75	34.21	-3.96	QP
4	579.99	29.49	46.00	-16.51	30.54	-1.05	QP
5	683.78	30.34	46.00	-15.66	33.40	-3.06	QP
6	746.83	30.51	46.00	-15.49	30.61	-0.10	QP

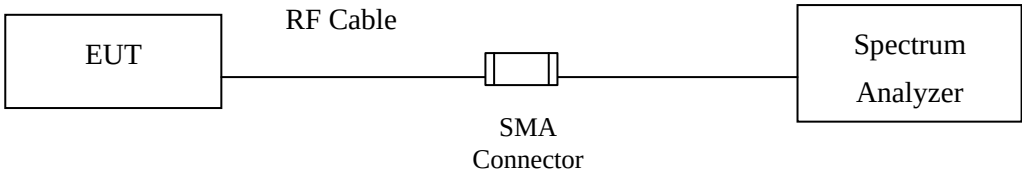
Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. “*” means the worst emission level.
3. Emission Level = Reading Level + Correct Factor

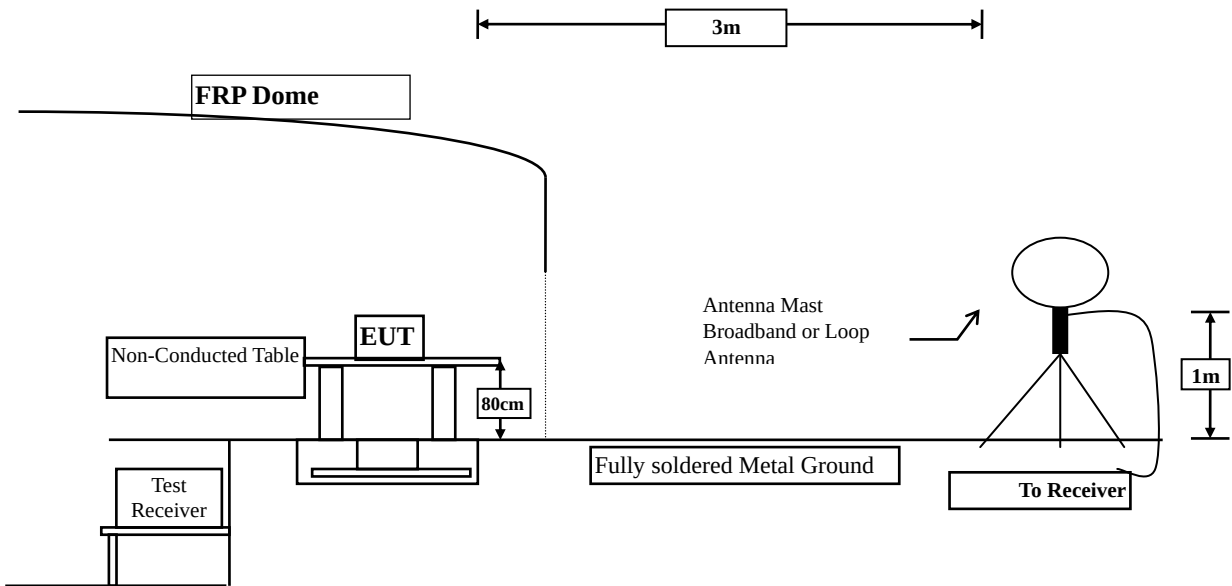
4. Band Edge

4.1. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



4.2. Limits

In any 9 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 50 dB below that in the 9 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

4.3. 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. 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.

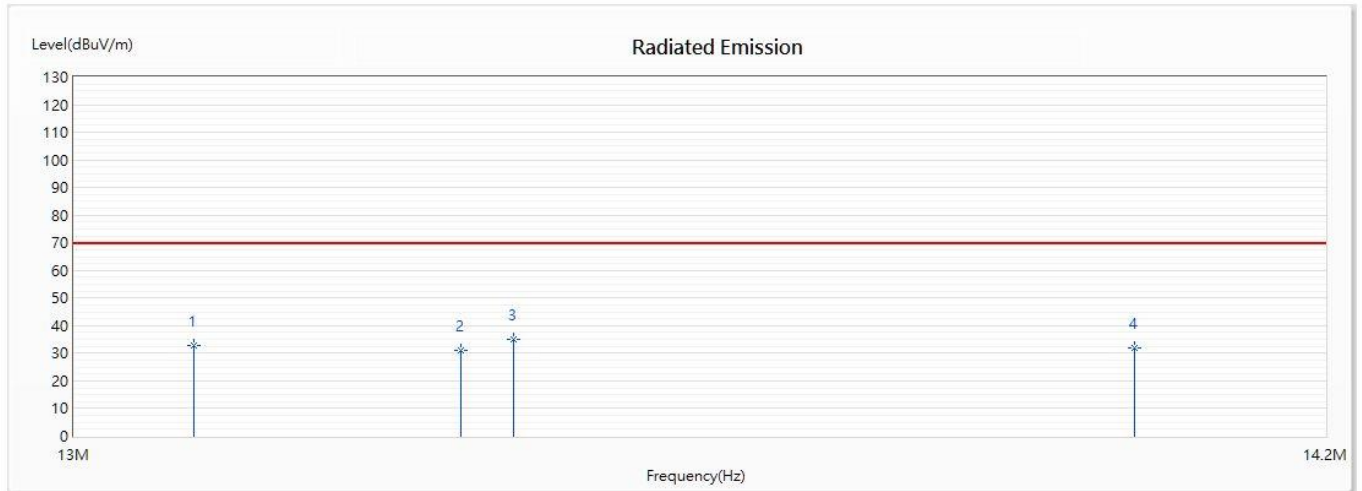
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth below 30MHz setting on the field strength meter is 9kHz and above 30MHz is 120kHz.

4.4. Test Result of Band Edge

Product : Mobile Computer
 Test Item : Band Edge Data
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

HORIZONTAL



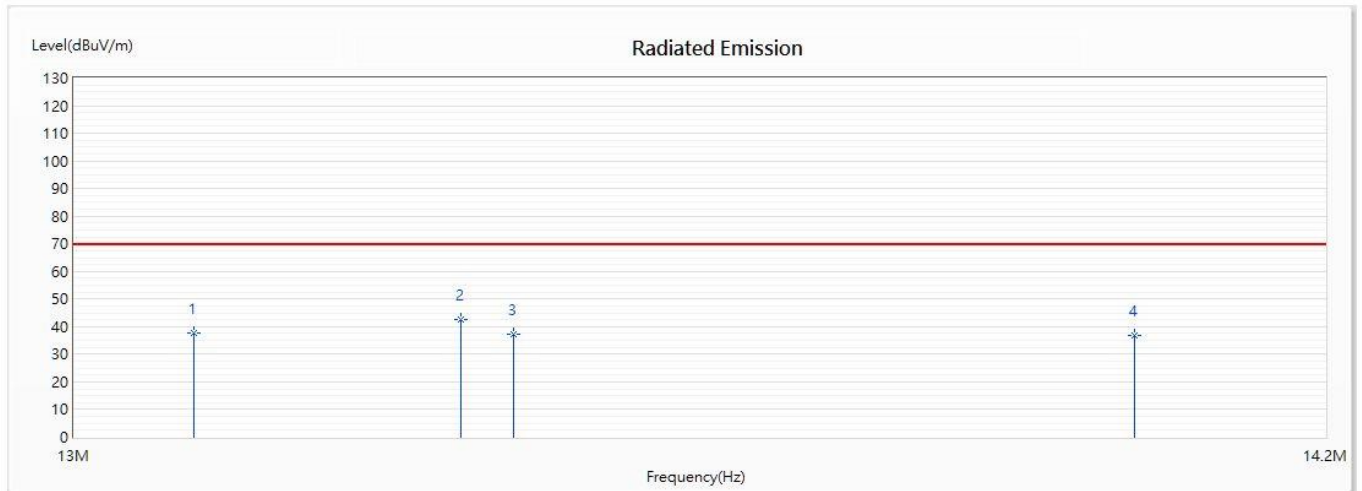
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	13.11	32.86	69.54	-36.68	11.17	21.69	QP
2	13.36	30.93	69.54	-38.61	9.23	21.70	QP
* 3	13.41	35.15	69.54	-34.39	13.45	21.70	QP
4	14.01	31.92	69.54	-37.62	10.20	21.72	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + Correct Factor.

Product : Mobile Computer
 Test Item : Band Edge Data
 Test date : 2020/06/23
 Test Mode : Mode 1: Transmit

VERTICAL



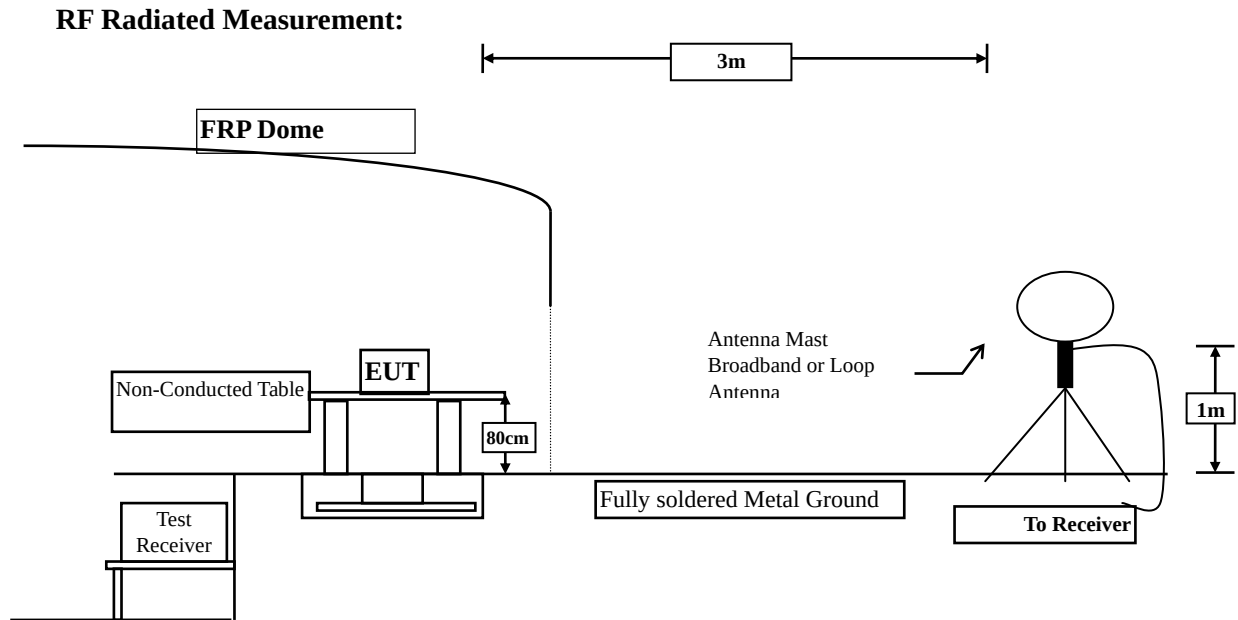
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	13.11	37.22	69.54	-32.32	15.53	21.69	QP
* 2	13.36	42.66	69.54	-26.88	20.96	21.70	QP
3	13.41	37.21	69.54	-32.33	15.51	21.70	QP
4	14.01	36.77	69.54	-32.77	15.05	21.72	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + Correct Factor.

5. 20dB Bandwidth

5.1. Test Setup



5.2. Limits

§15.215

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through §15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

§15.225

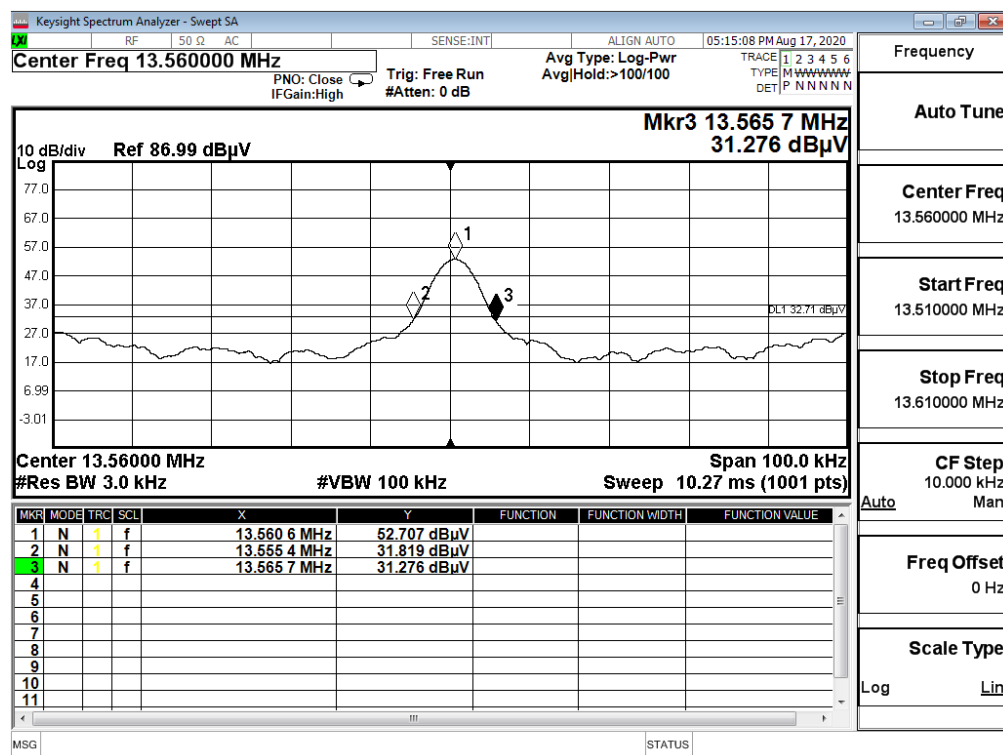
Operation within the band 13.11MHz ~ 14.010MHz.

5.3. Test Procedure

The spectrum analyzer connects to the receiver antenna and setting the RBW = 3KHz, the VBW is set to 3 times or more than RBW.

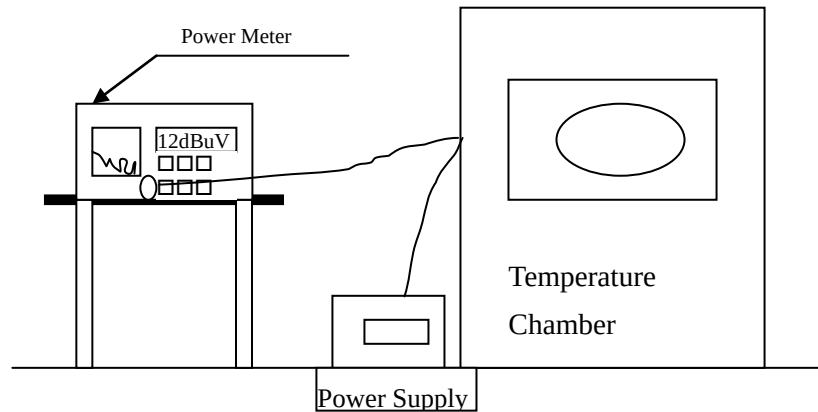
Product : Mobile Computer
 Test Item : 20dB Bandwidth
 Test date : 2020/08/17
 Test Mode : Mode 1: Transmit

Test Frequency (MHz)	Measurement Level (MHz)	Limit (MHz)	Result
13.56	13.5554	>13.11	PASS
	13.5657	<14.01	
20dB Bandwidth	0.0103	--	



6. Frequency Tolerance

6.1. Test Setup



6.2. Limits

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.

6.3. Test Procedure

The over 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 Result of Frequency Stability

Product : Mobile Computer
 Test Item : Frequency Tolerance
 Test Site : Temperature Chamber
 Test date : 2019/06/22
 Test Mode : Mode 1: Transmit

Temperature (°C)	Voltage (V)	Observe Time	Declared Frequency (MHz)	Read Frequency (MHz)	Tolerance (%)	Limit (%)
20	110	start	13.56	13.56000	0.000000	±0.01 %
		2mins	13.56	13.56000	0.000000	
		5mins	13.56	13.56000	0.000000	
		10mins	13.56	13.56020	0.001475	
20	126.5	start	13.56	13.56000	0.000000	±0.01 %
		2mins	13.56	13.56000	0.000000	
		5mins	13.56	13.56010	0.000737	
		10mins	13.56	13.56050	0.003687	
20	93.5	start	13.56	13.56000	0.000000	±0.01 %
		2mins	13.56	13.56000	0.000000	
		5mins	13.56	13.56050	0.003687	
		10mins	13.56	13.56050	0.003687	
50	110	start	13.56	13.56000	0.000000	±0.01 %
		2mins	13.56	13.55900	-0.007375	
		5mins	13.56	13.55950	-0.003687	
		10mins	13.56	13.55950	-0.003687	
40	110	start	13.56	13.55900	-0.007375	±0.01 %
		2mins	13.56	13.55900	-0.007375	
		5mins	13.56	13.55950	-0.003687	
		10mins	13.56	13.55910	-0.006637	
30	110	start	13.56	13.56000	0.000000	±0.01 %
		2mins	13.56	13.56000	0.000000	
		5mins	13.56	13.56020	0.001475	
		10mins	13.56	13.56020	0.001475	

10	110	start	13.56	13.56000	0.000000	± 0.01 %
		2mins	13.56	13.56000	0.000000	
		5mins	13.56	13.55900	-0.007375	
		10mins	13.56	13.56050	0.003687	
0	110	start	13.56	13.55900	-0.007375	± 0.01 %
		2mins	13.56	13.55900	-0.007375	
		5mins	13.56	13.55950	-0.003687	
		10mins	13.56	13.56020	0.001475	
-10	110	start	13.56	13.56050	0.003687	± 0.01 %
		2mins	13.56	13.56050	0.003687	
		5mins	13.56	13.56050	0.003687	
		10mins	13.56	13.56100	0.007375	
-20	110	start	13.56	13.56000	0.000000	± 0.01 %
		2mins	13.56	13.55900	-0.007375	
		5mins	13.56	13.56050	0.003687	
		10mins	13.56	13.56100	0.007375	

7. EMI Reduction Method During Compliance Testing

No modification was made during testing.