FCC Test Report

Product Name	Desktop PC
Model No.	GA35DX, G35DX
FCC ID	MSQ-G35DX

Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt	Oct. 16, 2019
Issued Date	Nov. 20, 2019
Report No.	19A0238R-RFUSP17V01
Report Version	V1.0

Testing Laboratory
3023

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 report of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

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Test Report

Issued Date: Nov. 20, 2019
Report No.: 19A0238R-RFUSP17V01

Product Name	Desktop PC
Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan
Manufacturer	ASUSTeK COMPUTER INC.
Model No.	GA35DX, G35DX
FCC ID.	MSQ-G35DX
EUT Rated Voltage	100-120/220-240Vac, 9/4.5A, 50/60Hz
EUT Test Voltage	AC 120 V / 60 Hz
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Anita Chou

(Senior Engineering Adm. Specialist / Anita Chou)

Tested By : Sam Hsu

(Engineer / Sam Hsu)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Desktop PC
Trade Name	ASUS
Model No.	GA35DX, G35DX
FCC ID	MSQ-G35DX
Frequency Range	13.56MHz
Modulation	ASK
Antenna Type	Loop Antenna

Frequency of Each Channel:

Channel	Frequency
Channel 1:	13.56 MHz

Note:

1. This device is a Desktop PC 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

Test Mode	Mode 1: Transmit

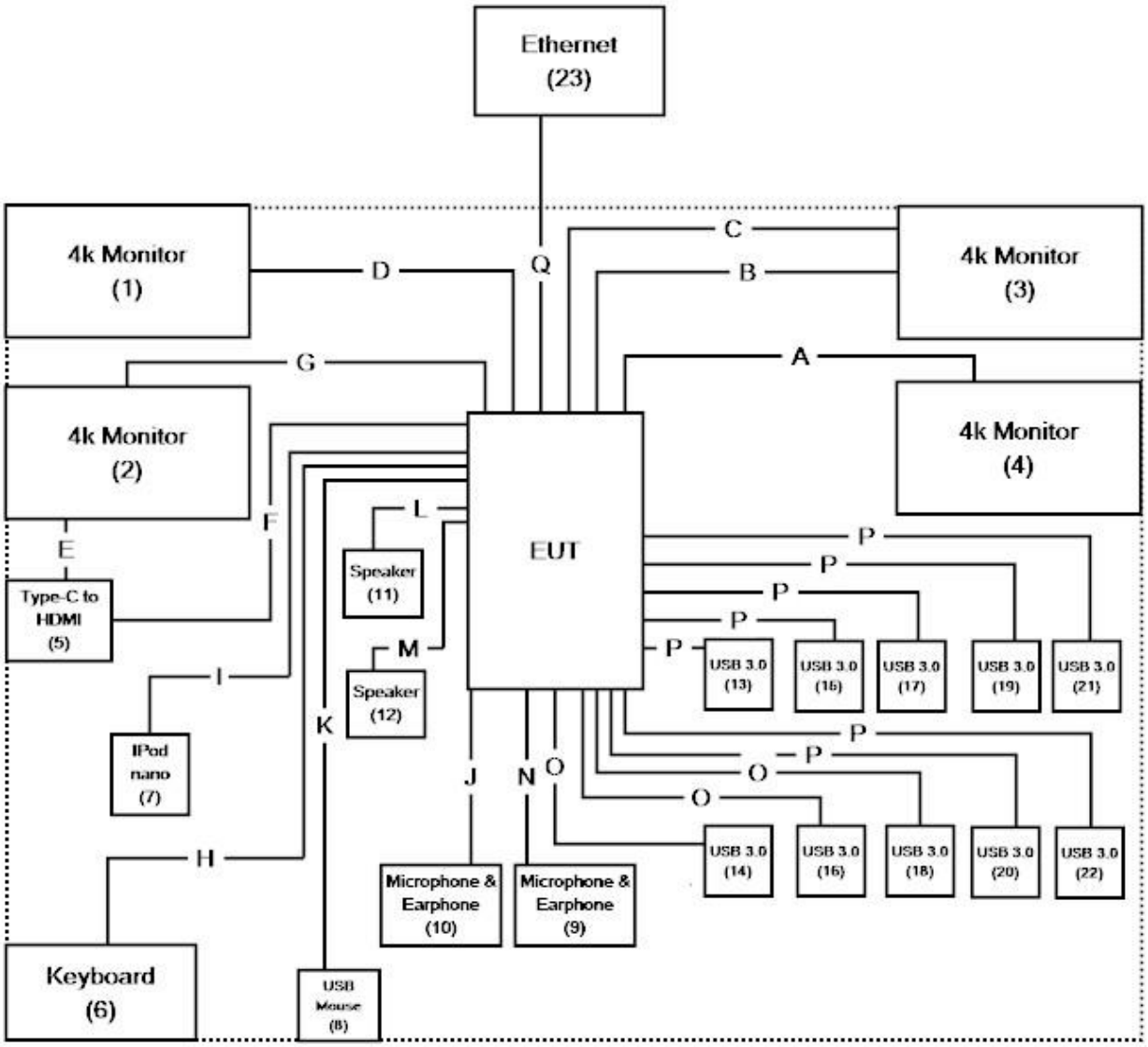
1.3. Tested System Datails

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	4k Monitor	ASUS	MX27U	H3LMRS013547	Non-Shielded, 1.8m
2	4k Monitor	ASUS	MX27U	H4LMRS038104	Non-Shielded, 1.8m
3	4k Monitor	ASUS	MX27U	H4LMRS038101	Non-Shielded, 1.8m
4	4k Monitor	ASUS	MX27U	H4LMRS038102	Non-Shielded, 1.8m
5	Type-C to HDMI	N/A	N/A	N/A	N/A
6	Keyboard	Microsoft	1576	65809394843	N/A
7	IPod nano	Apple	A1236	7M752P7LY0P	N/A
8	USB Mouse	Microsoft	1113	N/A	N/A
9	Microphone & Earphone	RONEVER	MOE241	N/A	N/A
10	Microphone & Earphone	RONEVER	MOE241	N/A	N/A
11	Speaker	PHILIPS	SBP1100	HS1A0825057480	N/A
12	Speaker	PHILIPS	SBP1100	HS1A0825057489	N/A
13	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
14	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
15	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
16	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
17	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
18	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
19	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
20	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
21	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
22	USB 3.0(1T)	Transcend	TS1TSJ25M3	C13890-3746	N/A
23	Ethernet	N/A	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	HDMI Cable	Non-Shielded, 1.8m
B	HDMI Cable	Non-Shielded, 1.8m
C	Display Cable	Non-Shielded, 1.8m
D	HDMI Cable	Non-Shielded, 1.8m
E	HDMI Cable	Non-Shielded, 1.8m
F	Type-C to HDMI Cable	Non-Shielded, 0.2m
G	Display Cable	Non-Shielded, 1.8m
H	Keyboard Cable	Shielded, 1.8m
I	IPod Cable	Shielded, 1.2m
J	Microphone & Earphone Cable	Non-Shielded, 1.2m
K	USB Mouse Cable	Shielded, 1.8m
L	Speaker Cable	Non-Shielded, 1.2m
M	Speaker Cable	Non-Shielded, 1.2m
N	Microphone & Earphone Cable	Non-Shielded, 1.2m
O	Type-C Cable	Shielded, 1.0m, three PCS.
P	USB Cable	Shielded, 1.0m, seven PCS.
Q	LAN Cable	Non-Shielded, 2.0m

1.4. Configuration of tested System



1.5. EUT Exercise Software

(1) Setup the EUT as shown in Section 1.4

(2) Execute software “Simple ATK WMI v1.0.7.2” on the EUT.

(3) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (℃)	10~40 ℃	25 ℃
	Humidity (%RH)	10~90 %	60 %
Radiated Emission	Temperature (℃)	10~40 ℃	25 ℃
	Humidity (%RH)	10~90 %	65 %
Conductive	Temperature (℃)	10~40 ℃	25 ℃
	Humidity (%RH)	10~90 %	55 %

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

Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2019/02/26	2020/02/25
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	2019/11/19	2020/11/18
X	LISN	R&S	ENV216	101105	2019/04/10	2020/04/09
X	LISN	R&S	ESH3-Z5	836679/014	2019/04/10	2020/04/09
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2019/06/20	2020/06/19

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	Spectrum Analyzer	R&S	FSP40	100170	2019/03/11	2020/03/10
X	Loop Antenna	Teseq	HLA6121	37133	2019/10/15	2021/10/14
X	Bilog Antenna	Schaffner Chase	CBL6112B	2794	2019/06/23	2020/06/22
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	2019/05/02	2020/05/01
	Coaxial Cable	DEKRA	L1907-002C	280280.F141.1000D	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC05820SE	980362	2019/06/26	2020/06/25
	Amplifier	EMCI	EMC051845SE	SN980632	2019/08/08	2020/08/07
	Horn Antenna	Com-Power	AH-1840	101101	2019/10/29	2020/10/30
	Amplifier + Cable	EMCI	EMC184045SE	980369	2019/04/16	2020/04/15
	Bilog Antenna	Schaffner Chase	CBL6112B	2916	2019/06/23	2020/06/22
	Coaxial Cable	DEKRA	L1907-003C	00100A1B3A120M	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC001330	980255	2019/06/28	2020/06/27
	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/08	2020/08/07
	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/08	2020/08/07

Note:

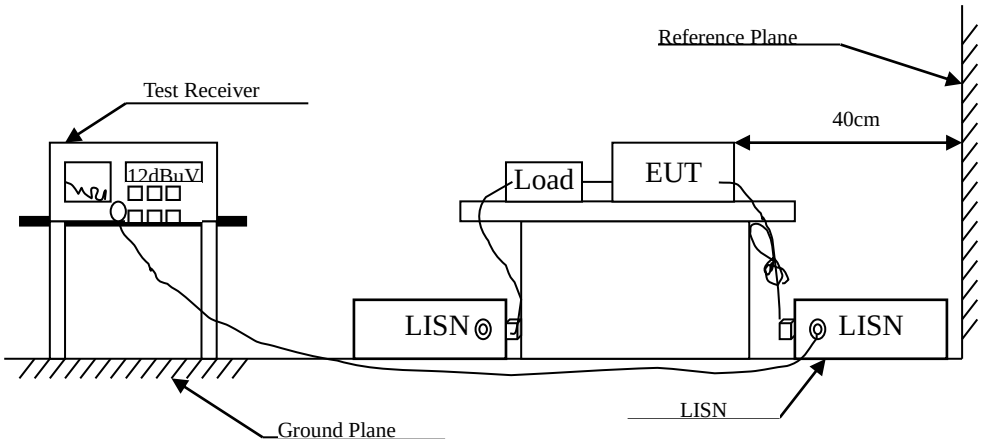
1. Loop Antenna is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version :QuieTek EMI System V2.1.134.

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.

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(注)	56-46(注)
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 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

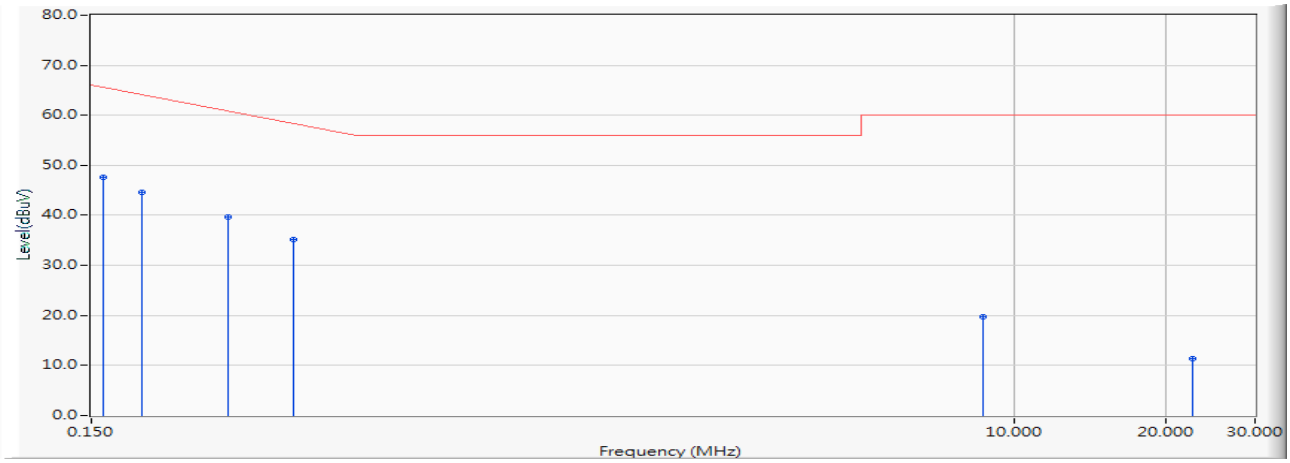
2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : Desktop PC
Test Item : Conducted Emission Test
Test date : 2019/11/12
Test Mode : Mode 1: Transmit

Line1



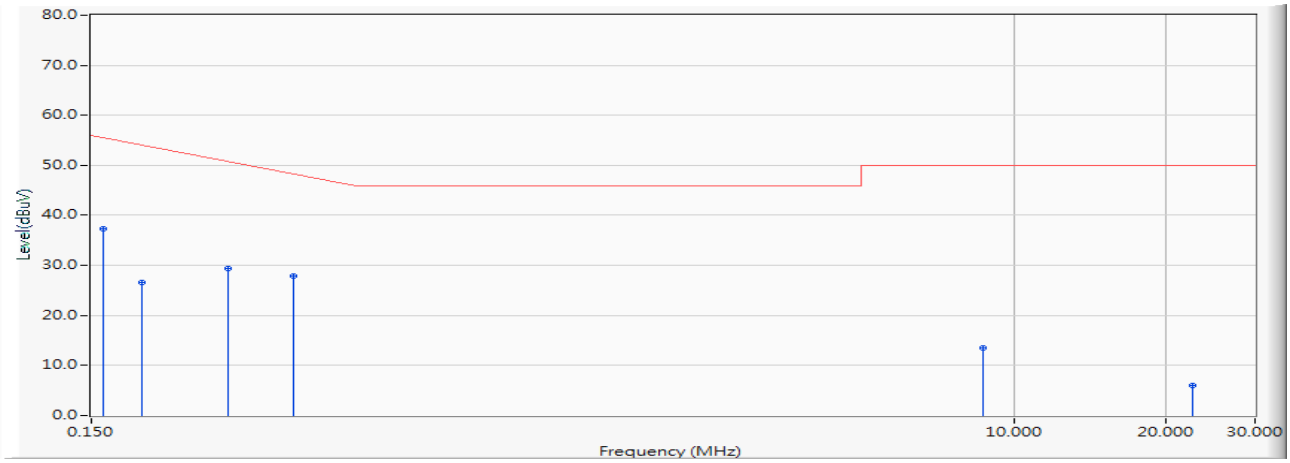
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.158	9.656	37.960	47.616	-18.155	65.771	QUASIPEAK
2		0.189	9.657	34.920	44.577	-20.309	64.886	QUASIPEAK
3		0.279	9.661	29.980	39.641	-22.673	62.314	QUASIPEAK
4		0.377	9.665	25.540	35.205	-24.309	59.514	QUASIPEAK
5		8.681	9.947	9.840	19.787	-40.213	60.000	QUASIPEAK
6		22.599	10.168	1.280	11.448	-48.552	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Desktop PC
Test Item : Conducted Emission Test
Test date : 2019/11/12
Test Mode : Mode 1: Transmit

Line1



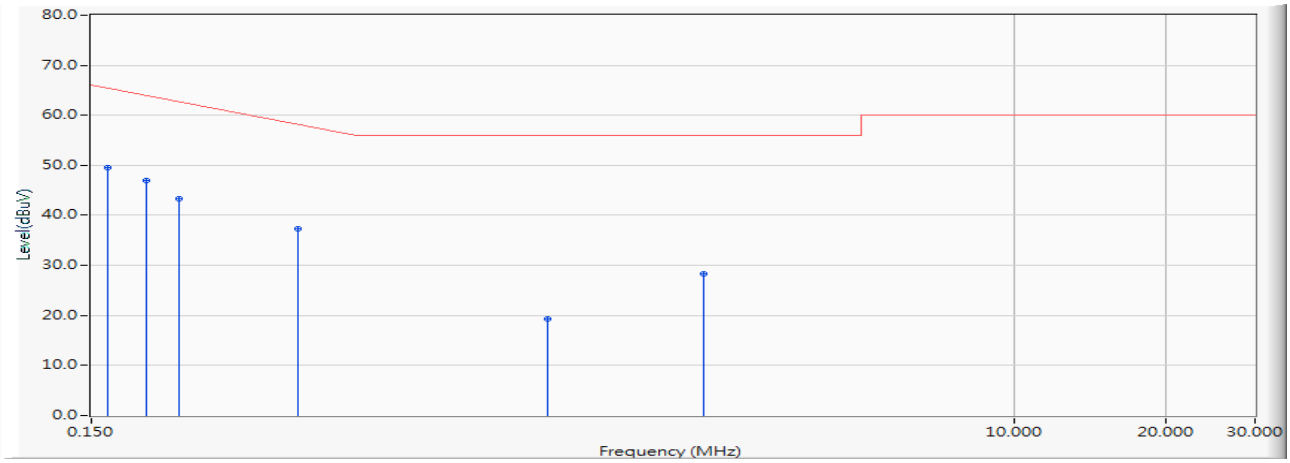
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.158	9.656	27.720	37.376	-18.395	55.771	AVERAGE
2		0.189	9.657	16.890	26.547	-28.339	54.886	AVERAGE
3		0.279	9.661	19.800	29.461	-22.853	52.314	AVERAGE
4		0.377	9.665	18.230	27.895	-21.619	49.514	AVERAGE
5		8.681	9.947	3.550	13.497	-36.503	50.000	AVERAGE
6		22.599	10.168	-4.240	5.928	-44.072	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Desktop PC
Test Item : Conducted Emission Test
Test date : 2019/11/12
Test Mode : Mode 1: Transmit

Line2



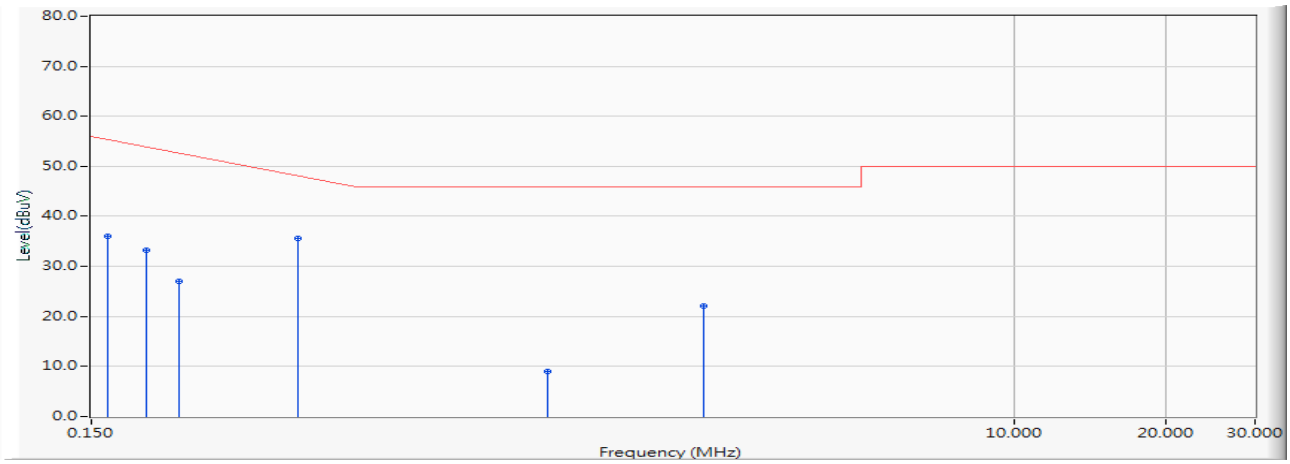
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.162	9.695	39.940	49.635	-16.022	65.657	QUASIPEAK
2		0.193	9.688	37.220	46.908	-17.863	64.771	QUASIPEAK
3		0.224	9.689	33.600	43.289	-20.597	63.886	QUASIPEAK
4		0.384	9.695	27.540	37.235	-22.079	59.314	QUASIPEAK
5		1.201	9.739	9.560	19.299	-36.701	56.000	QUASIPEAK
6		2.435	9.795	18.440	28.235	-27.765	56.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Desktop PC
Test Item : Conducted Emission Test
Test date : 2019/11/12
Test Mode : Mode 1: Transmit

Line2



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.162	9.695	26.360	36.055	-19.602	55.657	AVERAGE
2		0.193	9.688	23.460	33.148	-21.623	54.771	AVERAGE
3		0.224	9.689	17.350	27.039	-26.847	53.886	AVERAGE
4	*	0.384	9.695	25.860	35.555	-13.759	49.314	AVERAGE
5		1.201	9.739	-0.710	9.029	-36.971	46.000	AVERAGE
6		2.435	9.795	12.240	22.035	-23.965	46.000	AVERAGE

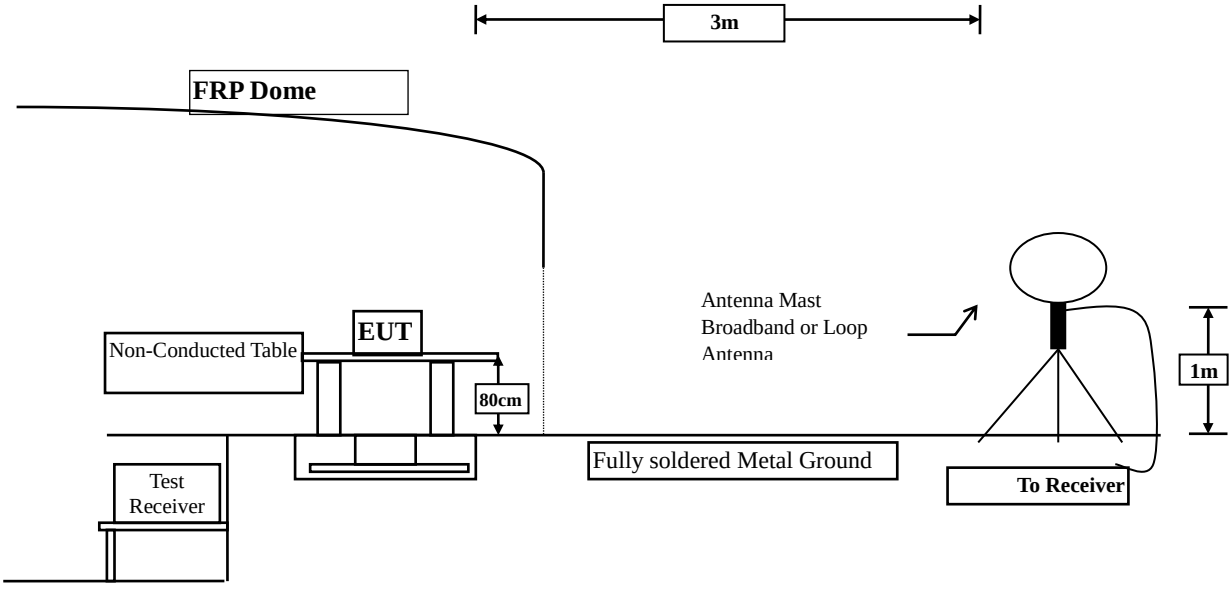
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

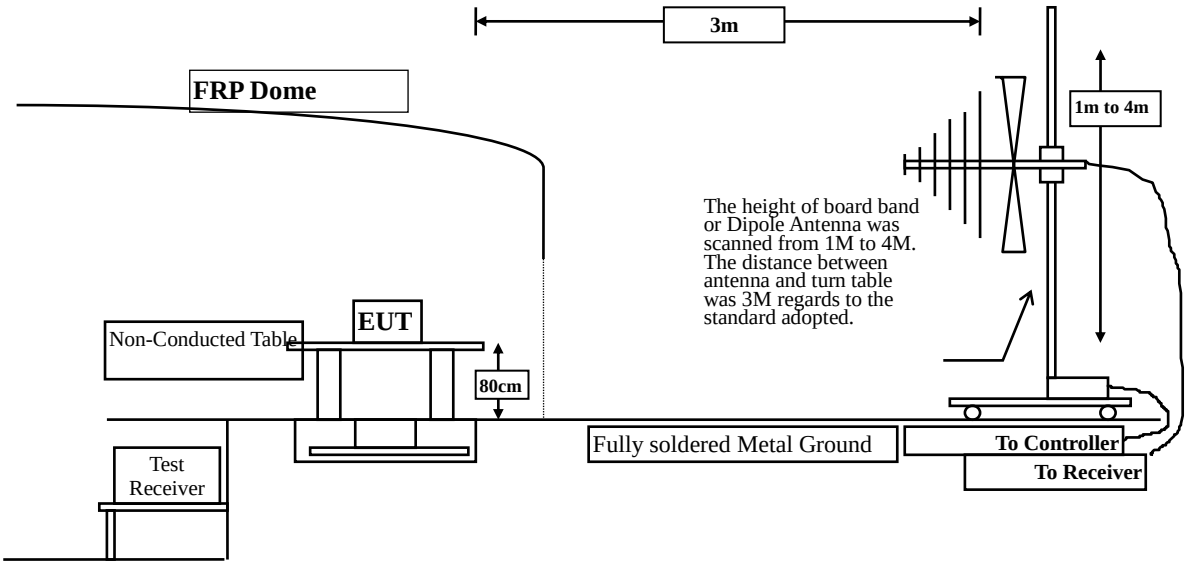
3. Radiated Emission

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. Uncertainty

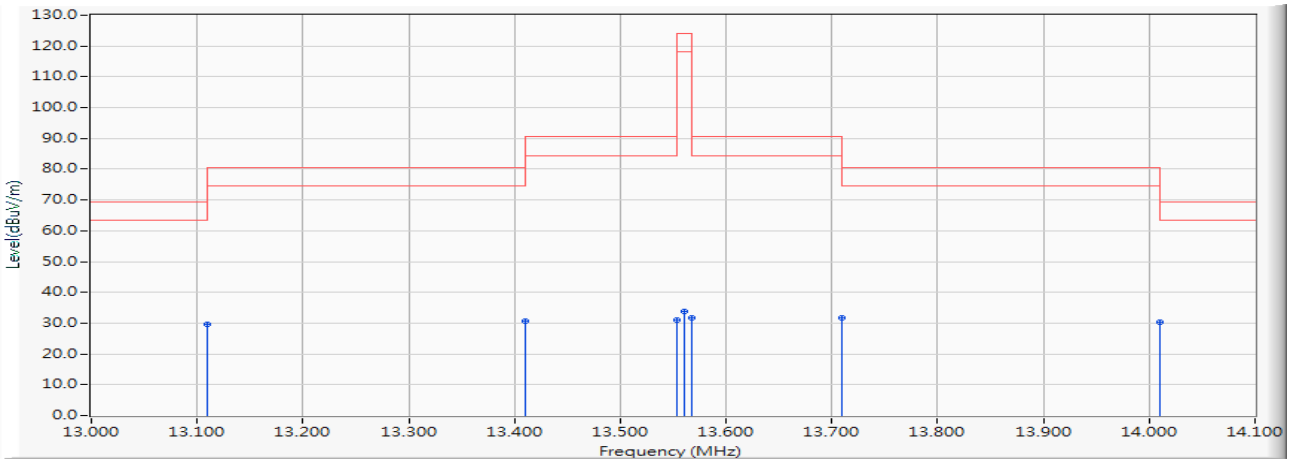
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

3.5. Test Result of Radiated Emission

Product : Desktop PC
Test Item : Fundamental Radiated Emission
Test Site : No.3 OATS
Test date : 2019/10/29
Test Mode : Mode 1: Transmit

HORIZONTAL



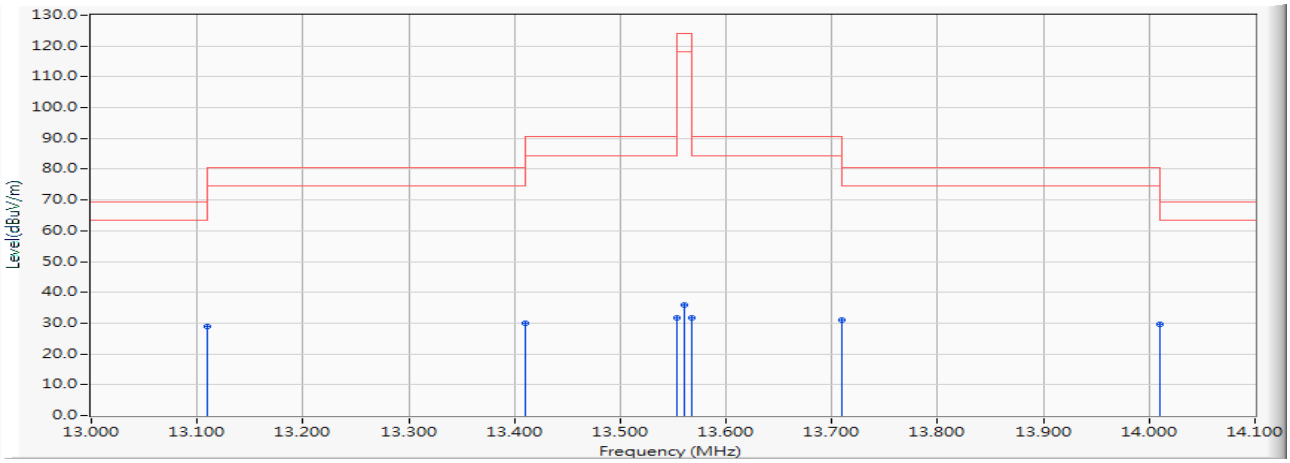
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		13.110	21.010	8.600	29.610	-39.890	69.500	QUASIPEAK
2		13.410	21.040	9.800	30.840	-49.660	80.500	QUASIPEAK
3		13.553	21.056	10.000	31.056	-59.414	90.470	QUASIPEAK
4		13.560	21.058	12.600	33.658	-90.342	124.000	QUASIPEAK
5		13.567	21.060	10.600	31.660	-58.810	90.470	QUASIPEAK
6		13.710	21.070	10.500	31.570	-48.930	80.500	QUASIPEAK
7	*	14.010	21.100	9.300	30.400	-39.100	69.500	QUASIPEAK

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. Measurement Level = Reading Level + Correct Factor.

Product : Desktop PC
Test Item : Fundamental Radiated Emission
Test Site : No.3 OATS
Test date : 2019/10/29
Test Mode : Mode 1: Transmit

VERTICAL



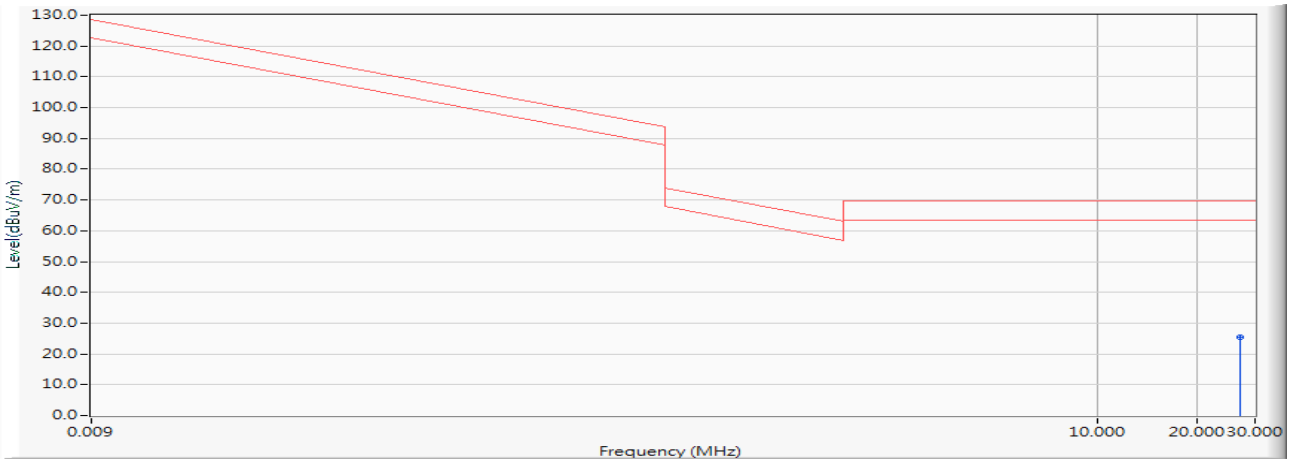
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		13.110	21.010	7.900	28.910	-40.590	69.500	QUASIPEAK
2		13.410	21.040	9.100	30.140	-50.360	80.500	QUASIPEAK
3		13.553	21.056	10.600	31.656	-58.814	90.470	QUASIPEAK
4		13.560	21.058	14.800	35.858	-88.142	124.000	QUASIPEAK
5		13.567	21.060	10.600	31.660	-58.810	90.470	QUASIPEAK
6		13.710	21.070	9.800	30.870	-49.630	80.500	QUASIPEAK
7	*	14.010	21.100	8.500	29.600	-39.900	69.500	QUASIPEAK

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. Measurement Level = Reading Level + Correct Factor.

Product : Desktop PC
Test Item : General Radiated Emission Data (below 30MHz)
Test Site : No.3 OATS
Test date : 2019/10/29
Test Mode : Mode 1: Transmit

Horizontal



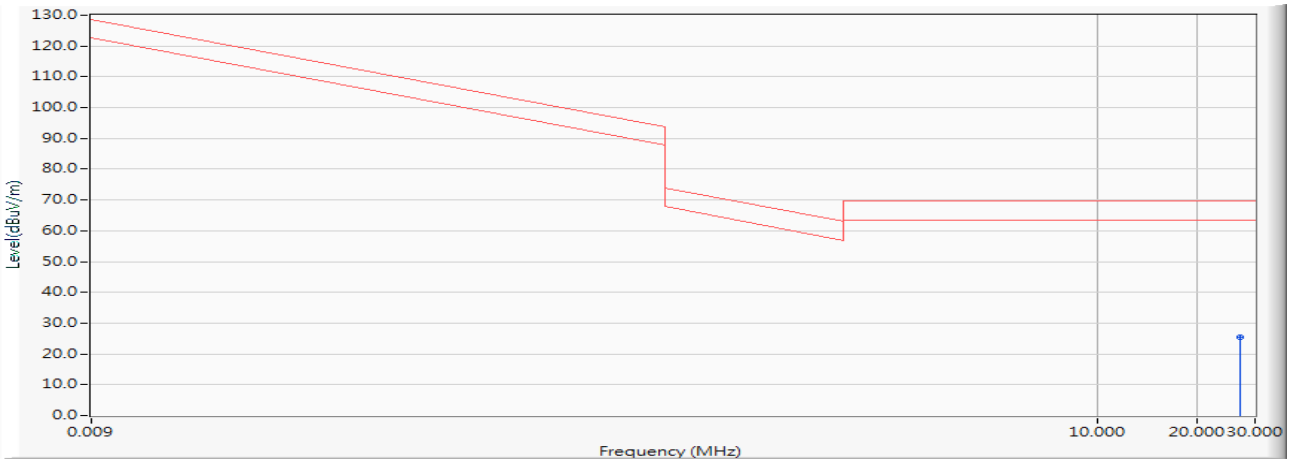
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	27.120	21.700	3.900	25.600	-43.940	69.540	QUASIPEAK

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. Measurement Level = Reading Level + Correct Factor.

Product	:	Desktop PC
Test Item	:	General Radiated Emission Data (below 30MHz)
Test Site	:	No.3 OATS
Test date	:	2019/10/29
Test Mode	:	Mode 1: Transmit

Vertical



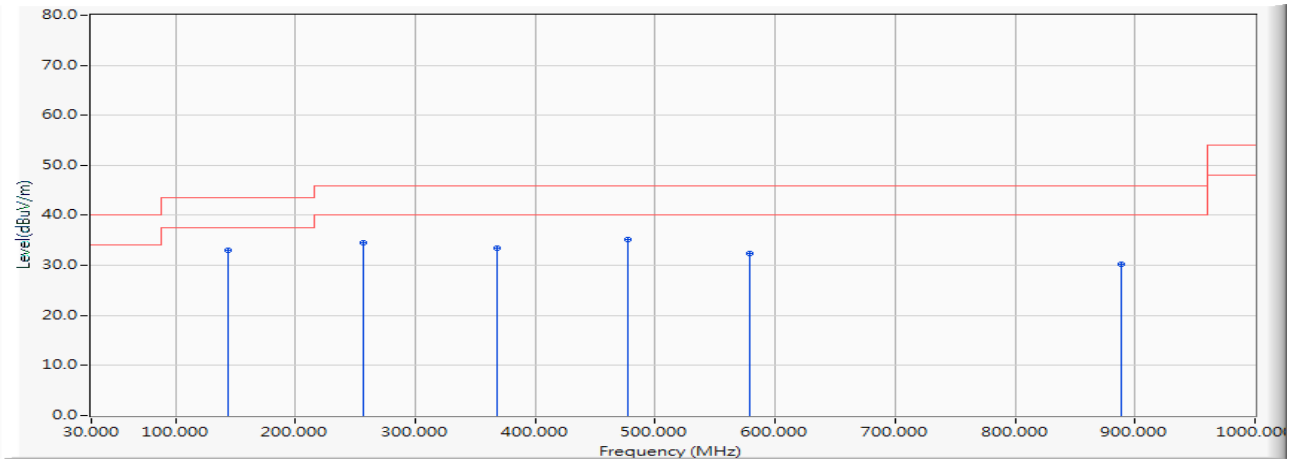
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	27.120	21.700	3.700	25.400	-44.140	69.540	QUASIPEAK

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. Measurement Level = Reading Level + Correct Factor.

Product : Desktop PC
Test Item : General Radiated Emission Data (above 30MHz)
Test Site : No.3 OATS
Test date : 2019/10/30
Test Mode : Mode 1: Transmit

Horizontal



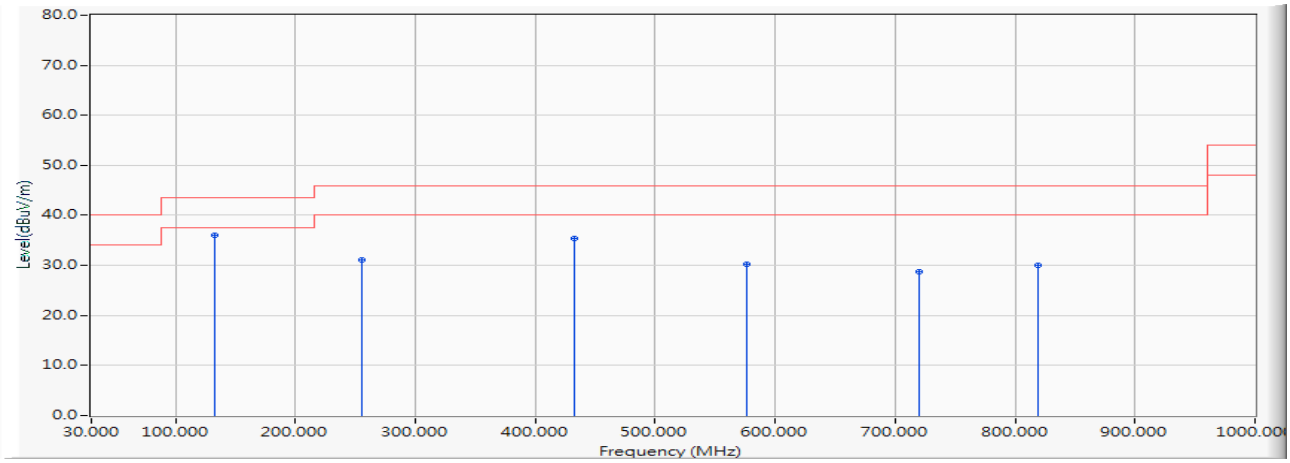
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	143.870	-15.976	48.962	32.986	-10.514	43.500	QUASIPEAK
2		256.333	-15.364	49.851	34.488	-11.512	46.000	QUASIPEAK
3		368.797	-10.375	43.939	33.565	-12.435	46.000	QUASIPEAK
4		477.043	-10.122	45.367	35.245	-10.755	46.000	QUASIPEAK
5		578.261	-6.760	39.100	32.340	-13.660	46.000	QUASIPEAK
6		888.942	-6.812	37.048	30.236	-15.764	46.000	QUASIPEAK

Note:

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

Product : Desktop PC
Test Item : General Radiated Emission Data (above 30MHz)
Test Site : No.3 OATS
Test date : 2019/10/30
Test Mode : Mode 1: Transmit

Vertical



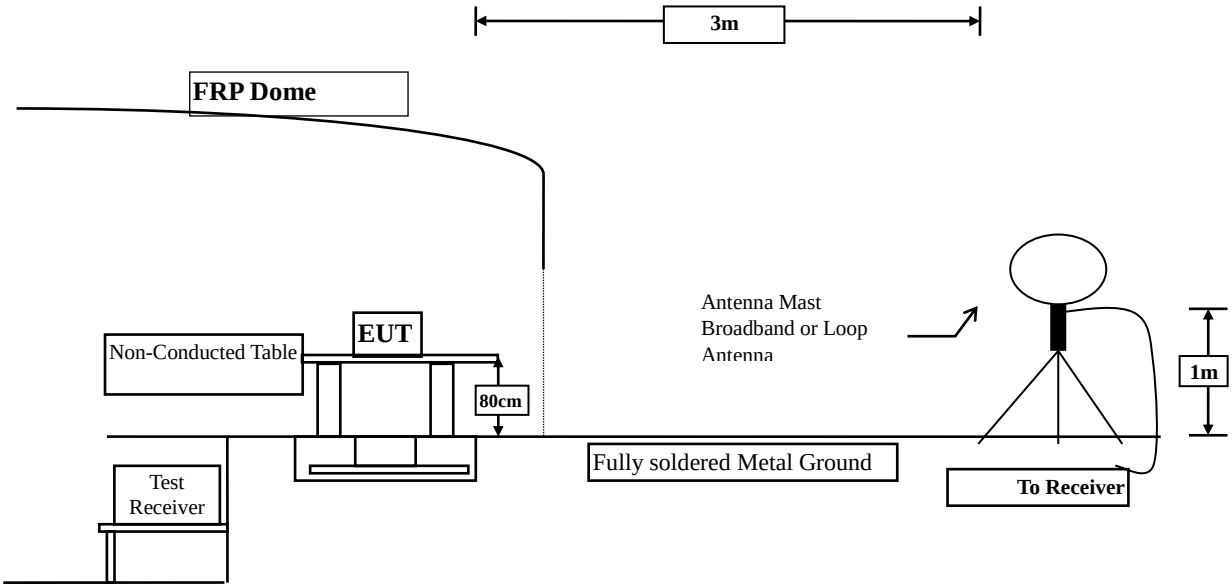
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	132.623	-14.570	50.684	36.114	-7.386	43.500	QUASIPEAK
2		254.928	-15.363	46.466	31.103	-14.897	46.000	QUASIPEAK
3		432.058	-8.628	44.046	35.418	-10.582	46.000	QUASIPEAK
4		576.855	-6.874	37.054	30.180	-15.820	46.000	QUASIPEAK
5		720.246	-8.698	37.365	28.667	-17.333	46.000	QUASIPEAK
6		818.652	-7.816	37.808	29.992	-16.008	46.000	QUASIPEAK

Note:

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

4. Band Edge

4.1. Test Setup



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.

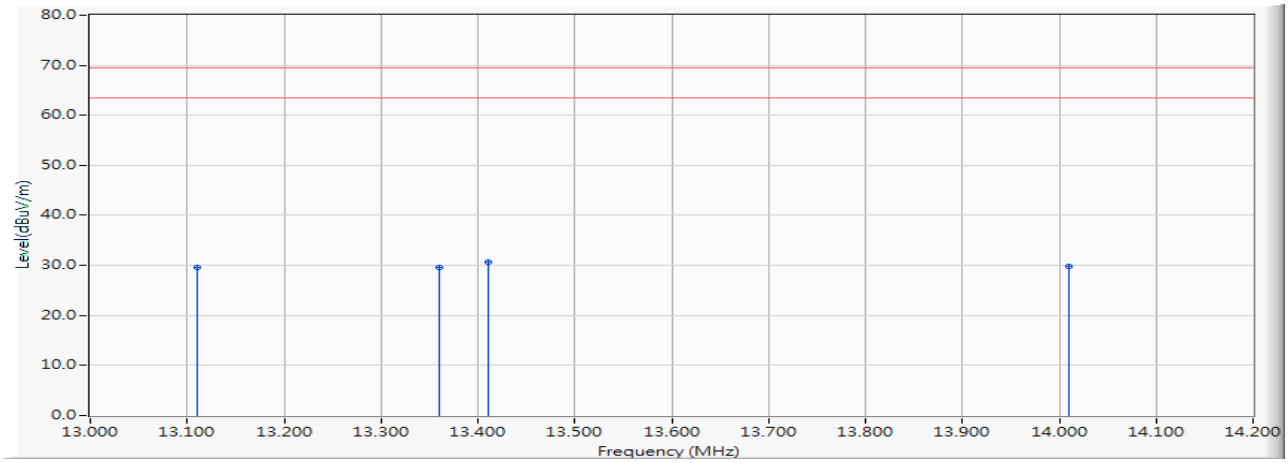
4.4. Uncertainty

± 4.08 dB above 1GHz
± 4.22 dB below 1GHz

4.5. Test Result of Band Edge

Product : Desktop PC
Test Item : Band Edge Data
Test Site : No.3 OATS
Test date : 2019/10/29
Test Mode : Mode 1: Transmit

HORIZONTAL



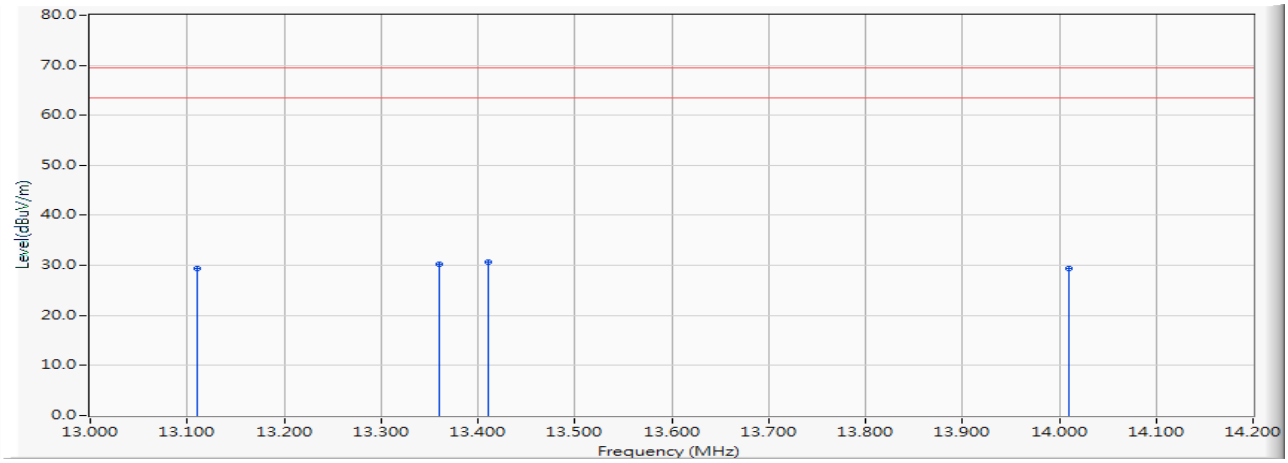
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		13.110	21.010	8.500	29.510	-40.030	69.540	QUASIPEAK
2		13.360	21.040	8.500	29.540	-40.000	69.540	QUASIPEAK
3	*	13.410	21.040	9.600	30.640	-38.900	69.540	QUASIPEAK
4		14.010	21.100	8.800	29.900	-39.640	69.540	QUASIPEAK

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. Measurement Level = Reading Level + Correct Factor

Product	:	Desktop PC
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test date	:	2019/10/29
Test Mode	:	Mode 1: Transmit

VERTICAL



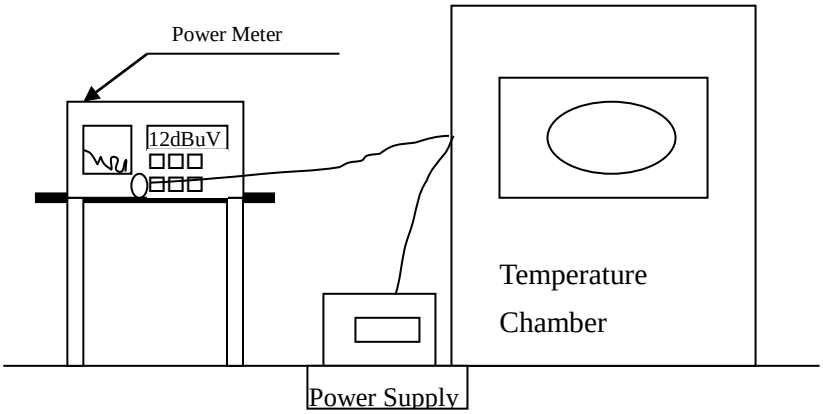
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		13.110	21.010	8.400	29.410	-40.130	69.540	QUASIPEAK
2		13.360	21.040	9.100	30.140	-39.400	69.540	QUASIPEAK
3	*	13.410	21.040	9.600	30.640	-38.900	69.540	QUASIPEAK
4		14.010	21.100	8.300	29.400	-40.140	69.540	QUASIPEAK

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. Measurement Level = Reading Level + Correct Factor

5. Frequency Tolerance

5.1. Test Setup



5.2. Limits

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency.

5.3. 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.

5.4. Uncertainty

± 283 Hz

5.5. Test Result of Frequency Stability

Product : Desktop PC
Test Item : Frequency Tolerance
Test Site : Temperature Chamber
Test date : 2019/11/08
Test Mode : Mode 1: Transmit

Temperature (°C)	Voltage (V)	Observe Time	Declared Frequency (MHz)	Read Frequency (MHz)	Tolerance (%)	Limit (%)
20	120	start	13.56	13.56001	0.000037	± 0.01 %
		2mins	13.56	13.56001	0.000037	
		5mins	13.56	13.56001	0.000037	
		10mins	13.56	13.56001	0.000037	
20	132	start	13.56	13.56001	0.000037	± 0.01 %
		2mins	13.56	13.56001	0.000037	
		5mins	13.56	13.56001	0.000037	
		10mins	13.56	13.56001	0.000037	
20	108	start	13.56	13.56001	0.000037	± 0.01 %
		2mins	13.56	13.56001	0.000037	
		5mins	13.56	13.56001	0.000037	
		10mins	13.56	13.56001	0.000037	
50	120	start	13.56	13.56001	0.000074	± 0.01 %
		2mins	13.56	13.56001	0.000074	
		5mins	13.56	13.56001	0.000074	
		10mins	13.56	13.56001	0.000074	
40	120	start	13.56	13.56001	0.000074	± 0.01 %
		2mins	13.56	13.56001	0.000074	
		5mins	13.56	13.56001	0.000074	
		10mins	13.56	13.56001	0.000074	
30	120	start	13.56	13.56001	0.000074	± 0.01 %
		2mins	13.56	13.56001	0.000074	
		5mins	13.56	13.56001	0.000074	
		10mins	13.56	13.56001	0.000074	

10	120	start	13.56	13.56001	0.000037	± 0.01 %
		2mins	13.56	13.56001	0.000037	
		5mins	13.56	13.56001	0.000037	
		10mins	13.56	13.56001	0.000037	
0	120	start	13.56	13.56003	0.000221	± 0.01 %
		2mins	13.56	13.56003	0.000221	
		5mins	13.56	13.56003	0.000221	
		10mins	13.56	13.56003	0.000221	
-10	120	start	13.56	13.56003	0.000221	± 0.01 %
		2mins	13.56	13.56003	0.000221	
		5mins	13.56	13.56003	0.000221	
		10mins	13.56	13.56003	0.000221	
-20	120	start	13.56	13.56003	0.000221	± 0.01 %
		2mins	13.56	13.56003	0.000221	
		5mins	13.56	13.56003	0.000221	
		10mins	13.56	13.56003	0.000221	

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.