

# Test Report

Product Name	Desktop PC
Model No.	G35CA
FCC ID	MSQ-G35CA

Applicant	ASUSTeK COMPUTER INC.
Address	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

Date of Receipt	Dec. 09, 2022
Issued Date	Feb. 15, 2023
Report No.	22B0946R-RFUSV10S-A
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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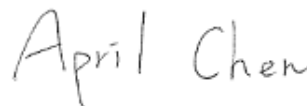
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

# Test Report



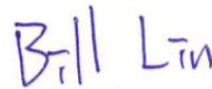
Product Name	Desktop PC
Applicant	ASUSTeK COMPUTER INC.
Address	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Manufacturer	ASUSTeK COMPUTER INC.
Model No.	G35CA
FCC ID.	MSQ-G35CA
EUT Rated Voltage	AC 100-240V / 50-60Hz
EUT Test Voltage	AC 120V / 60Hz
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



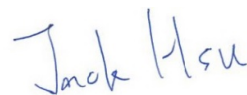
(Senior Project Specialist / April Chen)

Tested By :



(Senior Engineer / Bill Lin)

Approved By :



(Senior Engineer / Jack Hsu)

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Appendix 1: EUT Test Photographs

Appendix 2: Product Photos-Please refer to the file: 22B0946R-Product Photos

## Revision History

<b>Report No.</b>	<b>Version</b>	<b>Description</b>	<b>Issued Date</b>
22B0946R-RFUSV10S-A	V1.0	Initial issue of report.	Feb. 15, 2023

## 1. General Information

### 1.1. EUT Description

Product Name	Desktop PC
Trade Name	ASUS
Model No.	G35CA
FCC ID	MSQ-G35CA
Frequency Range	13.56 MHz
Modulation	ASK
Antenna Type	Loop

#### Antenna List

No.	Manufacturer	Part No.	Antenna Type
1	ASUS	59PD0340 NF0A01S	Loop

#### Frequency of Each Channel:

Channel	Frequency (MHz)
1	13.56

#### Note:

1. This device is a Desktop PC with a built-in 13.56 MHz 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. Only the worst case is shown in the report.

Test Mode	Mode 1	Transmit
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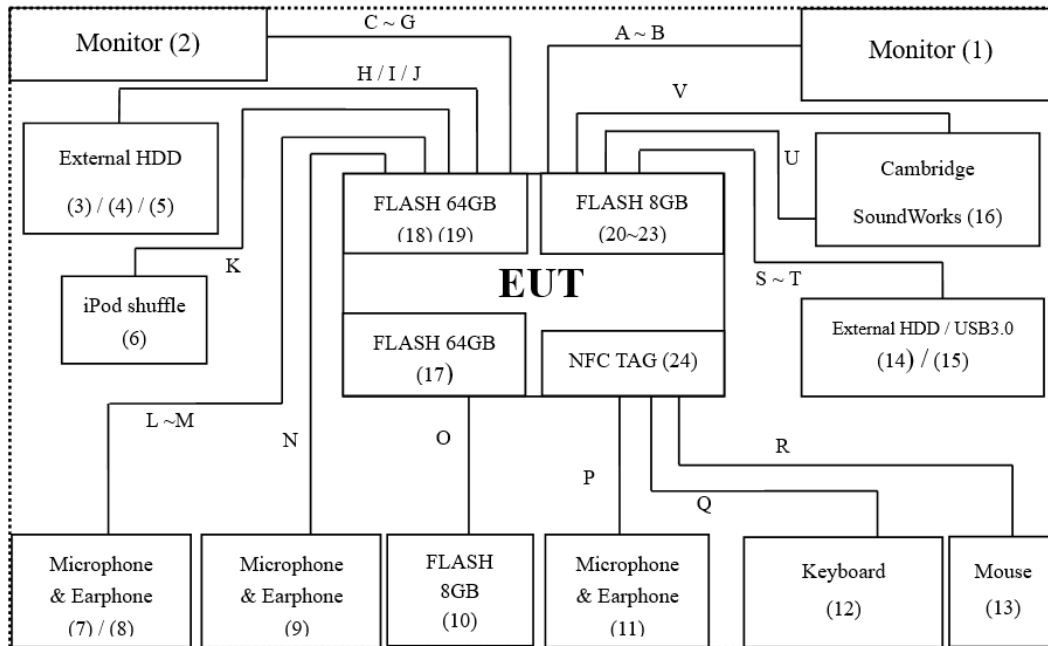
## 1.2. Tested System Details

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. Monitor	Lenovo	H20215FE0	VY549709	Non-Shielded, 1.8m
2. Monitor	DELL	U2415	CN-01RMGX-74261-63 H-09UL-A02	Non-Shielded, 1.8m
3. External HDD	Transcend	TS1TSJ25H3B	F21786-0125	N/A
4. External HDD	Transcend	TS1TSJ25H3B	F21786-0019	N/A
5. External HDD	Transcend	TS1TSJ25H3B	F21786-0005	N/A
6. iPod shuffle	APPLE	A1373	CC4PW26LF4RY	N/A
7. Microphone & Earphone	KINYO	EM-2101	N/A	N/A
8. Microphone & Earphone	Verbatim	C09024VB	N/A	N/A
9. Microphone & Earphone	KINYO	EM-2101	N/A	N/A
10. FLASH 8GB	Kingston	DT100G3/8GB	N/A	N/A
11. Microphone & Earphone	Verbatim	C09024VB	N/A	N/A
12. Keyboard	Logitech	K120	N/A	N/A
13. Mouse	Logitech	U0026	N/A	N/A
14. External HDD	Transcend	TS1TSJ25H3B	F21786-0103	N/A
15. USB 3.0	WD	WDBUZG0010 BBK- PESN	WX11A166S2Y3	N/A
16. Cambridge SoundWorks	DigiSun	AU263	N/A	N/A
17. FLASH 64GB	Transcend	JetFlash 790C	N/A	N/A
18. FLASH 64GB	Transcend	JetFlash 790C	N/A	N/A
19. FLASH 64GB	Transcend	JetFlash 790C	N/A	N/A
20. FLASH 8GB	Kingston	DT100G3/8GB	N/A	N/A
21. FLASH 8GB	Kingston	DT100G3/8GB	N/A	N/A
22. FLASH 8GB	Kingston	DT100G3/8GB	N/A	N/A
23. FLASH 8GB	Kingston	DT100G3/8GB	N/A	N/A
24. NFC TAG	ASUS	NFC TAG	N/A	N/A

Cable Type		Cable Description
A	HDMI Cable	Shielded, 1.8m
B	Display Cable	Shielded, 1.8m
C	HDMI Cable	Shielded, 1.8m
D	HDMI Cable	Shielded, 1.8m
E	Display Cable	Shielded, 1.8m
F	Display Cable	Shielded, 1.8m
G	Mini Display Cable	Shielded, 1.8m
H	USB Cable	Shielded, 0.5m
I	USB Cable	Shielded, 0.5m
J	USB Cable	Shielded, 0.5m
K	3.5mm Audio Cable	Shielded, 1m
L	Microphone & Earphone Cable	Non-shielded, 1.7m
M	Microphone & Earphone Cable	Non-shielded, 1.2m
N	Microphone & Earphone Cable	Non-shielded, 1.7m
O	USB Cable	Shielded, 0.8m
P	Microphone & Earphone Cable	Non-shielded, 1.2m
Q	USB Cable	Non-shielded, 1.5m
R	USB Cable	Non-shielded, 1.8m
S	USB Cable	Shielded, 0.5m
T	USB Cable	Shielded, 0.5m
U	Cambridge SoundWorks Cable	Non-shielded, 1m
V	Power to USB Cable	Non-shielded, 1m

### 1.3. Configuration of tested System



### 1.4. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.3
- (2) Turn on the power of all equipment.
- (3) Using NFC TAG to trigger NFC continuous transmission.
- (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 °C	23.4 °C
	Humidity (%RH)	10~90 %	55.2 %
Radiated Emission	Temperature (°C)	10~40 °C	21.0 °C
	Humidity (%RH)	10~90 %	60.0 %
Conductive	Temperature (°C)	10~40 °C	21.0 °C
	Humidity (%RH)	10~90 %	55.0 %

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  
 Address : No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan  
 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  
 Email Address : [info.tw@dekra.com](mailto:info.tw@dekra.com)  
 Website : <http://www.dekra.com.tw>

## 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	2022/06/23	2023/06/22
V	Two-Line V-Network	R&S	ENV216	101306	2022/05/23	2023/05/22
V	Two-Line V-Network	R&S	ENV216	101307	2022/07/04	2023/07/03
V	Coaxial Cable	SUHNER	RG400_BNC	RF001	2022/05/24	2023/05/23

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 210616 dekra V9.

**For Radiated measurements /HY-CB03**

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
	Loop Antenna	AMETEK	HLA6121	56736	2022/05/14	2023/05/13
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-675	2021/08/11	2023/08/10
	Horn Antenna	ETS-Lindgren	3117	00201259	2021/11/09	2022/11/08
	Horn Antenna	Com-Power	AH-840	101087	2022/06/16	2023/06/15
V	Pre-Amplifier	SGH	SGH0301-9	20211007-10	2022/02/22	2023/02/21
	Pre-Amplifier	EMCI	EMC051835SE	980313	2021/11/24	2022/11/23
	Pre-Amplifier	EMCI	EMC05820SE	980310	2022/07/28	2023/07/27
	Pre-Amplifier	EMCI	EMC184045SE	980369	2022/05/12	2023/05/11
	Coaxial Cable	EMCI	EMC102-KM-K M-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-K M-7000	170242		
	Filter	MICRO TRONICS	BRM50702	G251	2022/07/27	2023/07/26
	Filter	MICRO TRONICS	BRM50716	G188	2022/07/27	2023/07/26
V	EMI Test Receiver	R&S	ESR3	102793	2021/12/15	2022/12/14
V	Spectrum Analyzer	R&S	FSV3044	101113	2022/01/25	2023/02/24
V	Coaxial Cable	SGH	SGH18	2021005-1	2022/03/18	2023/03/17
	Coaxial Cable	SGH	SGH18	202108-4		
	Coaxial Cable	SGH	SGH18	GD20110223-1		
	Coaxial Cable	SGH	HA800	GD20110222-3		

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 210616 dekra V9.

### 1.7. Uncertainty

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

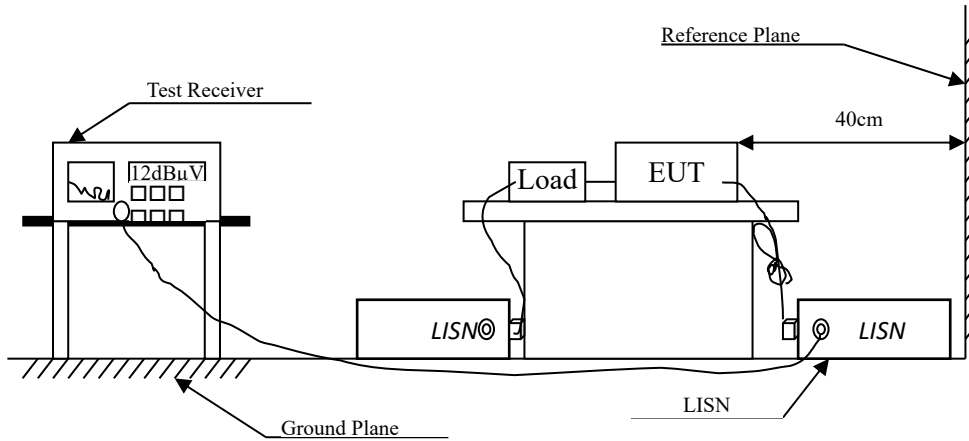
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%.

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	±3.42 dB	
Radiated Emission	Under 1GHz ±4.05 dB	Above 1GHz ±3.73 dB
Band Edge	Under 1GHz ±4.05 dB	Above 1GHz ±3.73 dB
Frequency Tolerance	±1544.74 Hz	

## 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	56-46
0.50 - 5.0	56	46
5.0 - 30	60	50

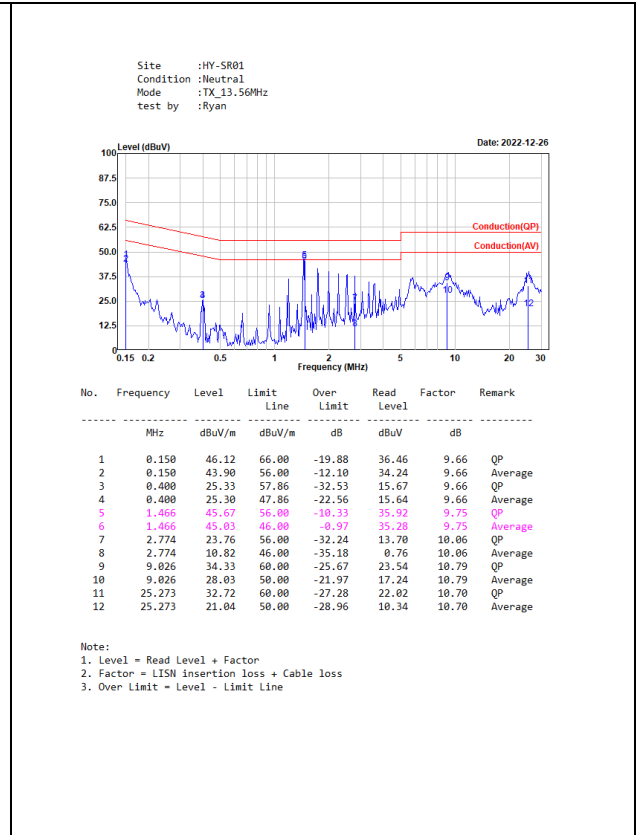
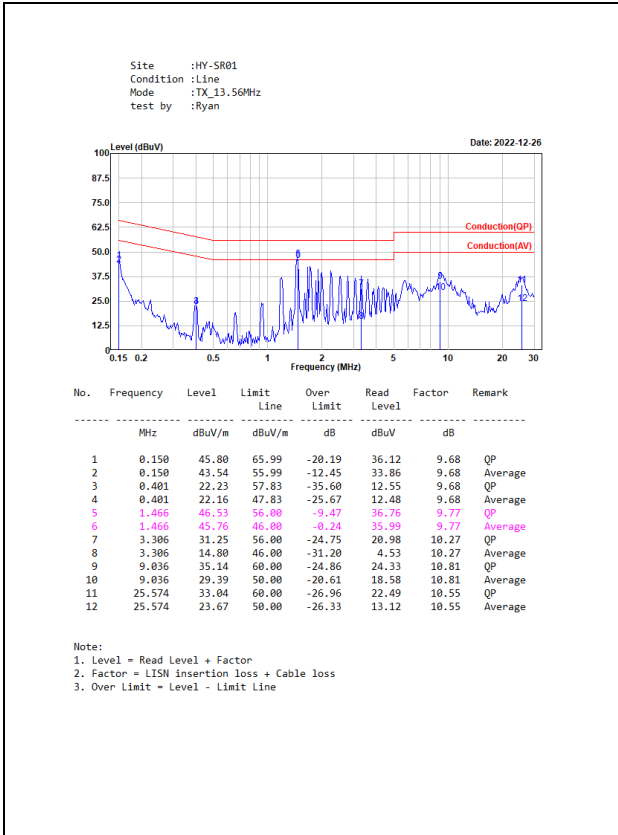
### 2.3. Test Procedure

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 0.1 5MHz to 30 MHz using a receiver bandwidth of 9 kHz.

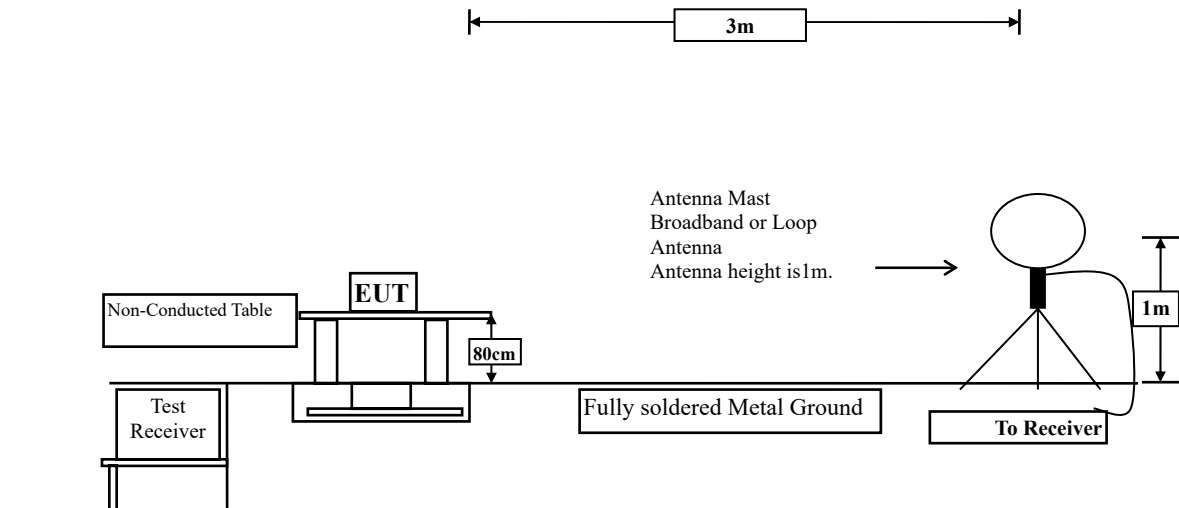
### 2.4. Test Result of Conducted Emission



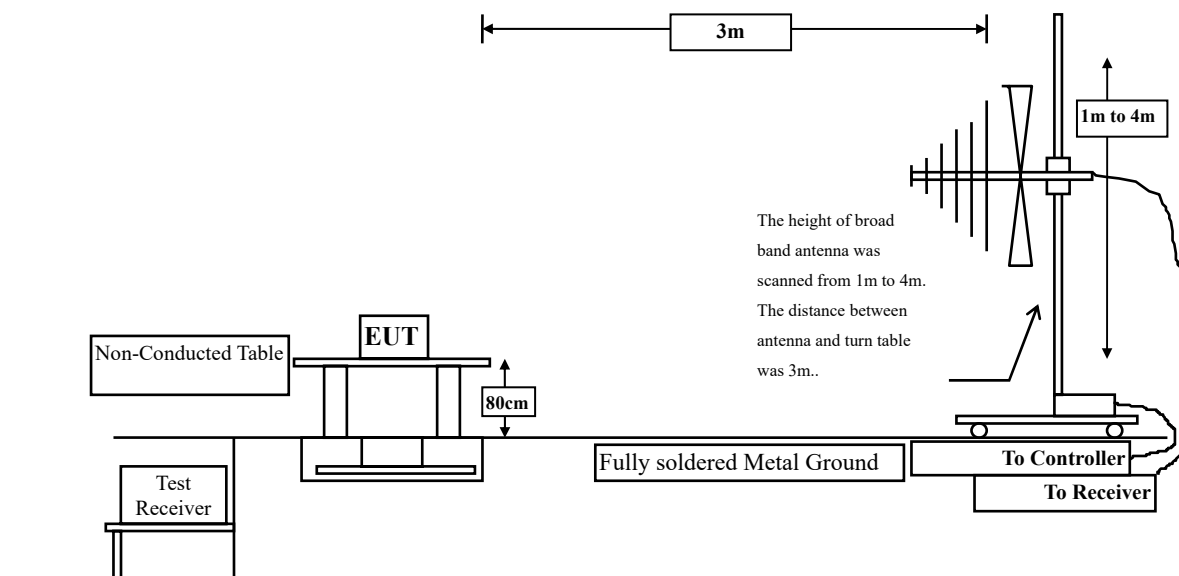
### 3. Radiated Emission

#### 3.1. Test Setup

##### Radiated Emission Under 30 MHz



##### Radiated Emission Below 1 GHz



### 3.2. Limits

#### ➤ Fundamental electric field strength Limit

<b>FCC Part 15 Subpart C Paragraph 15.225 Limits</b>				
Fundamental Frequency MHz	Field strength of fundamental			
	$\mu\text{V/m}$	Distance (meter)	$\text{dB}\mu\text{V/m}$	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 ( $\text{dB}\mu\text{V}$ ) =  $20 \log$  RF Voltage ( $\mu\text{V}$ ).
  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 quasi-peak detector.

#### ➤ Spurious electric field strength Limit

<b>FCC Part 15 Subpart C Paragraph 15.209 Limits</b>		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	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 ( $\text{dB}\mu\text{V}$ ) =  $20 \log$  RF Voltage ( $\mu\text{V}$ ).
  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.

### 3.3. Test Procedure

Fundamental 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 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.

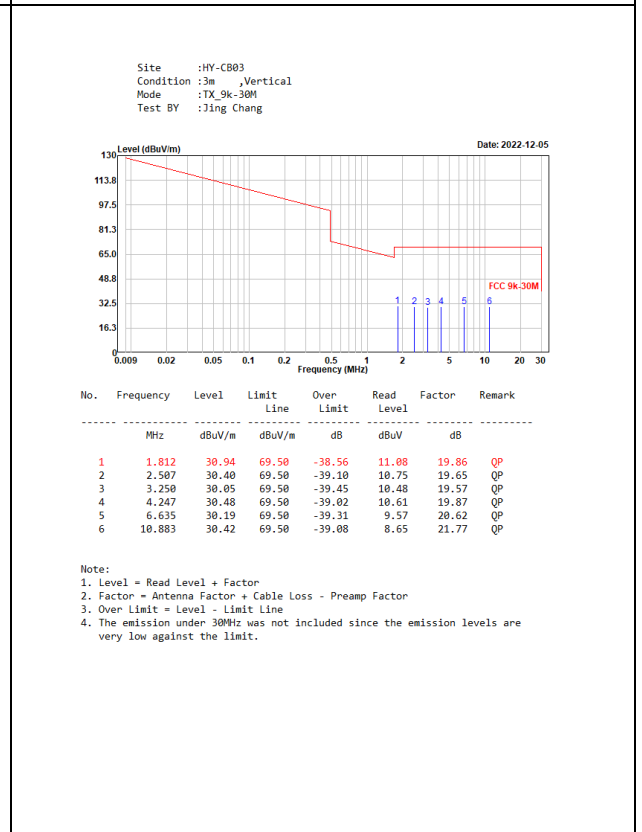
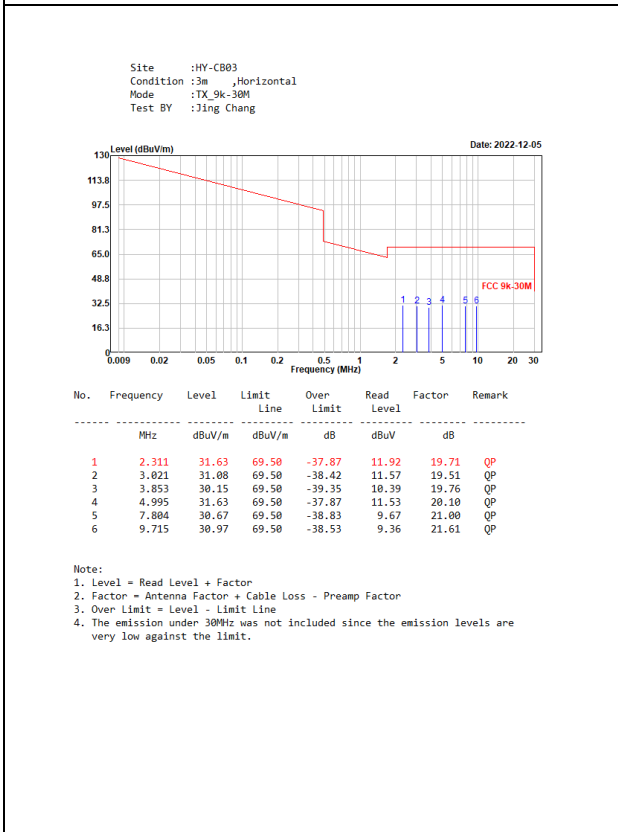
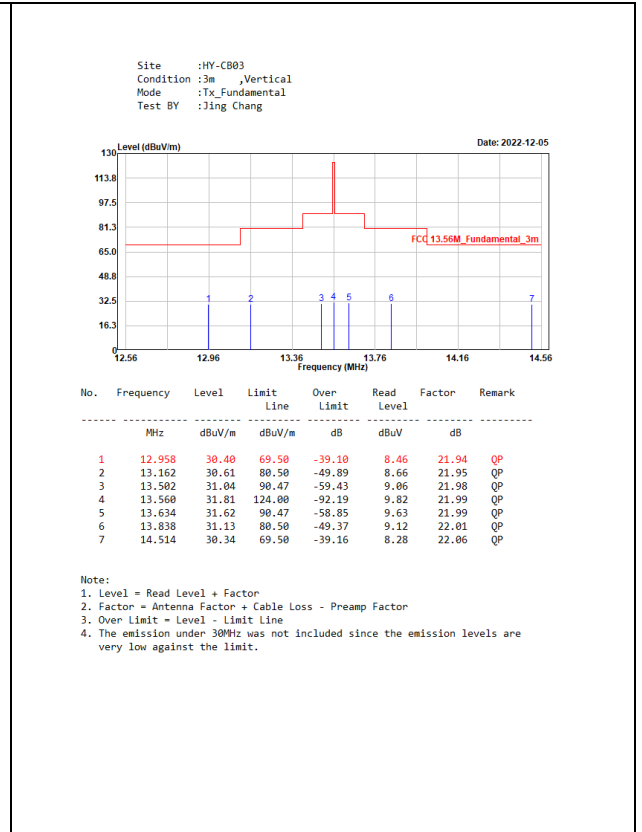
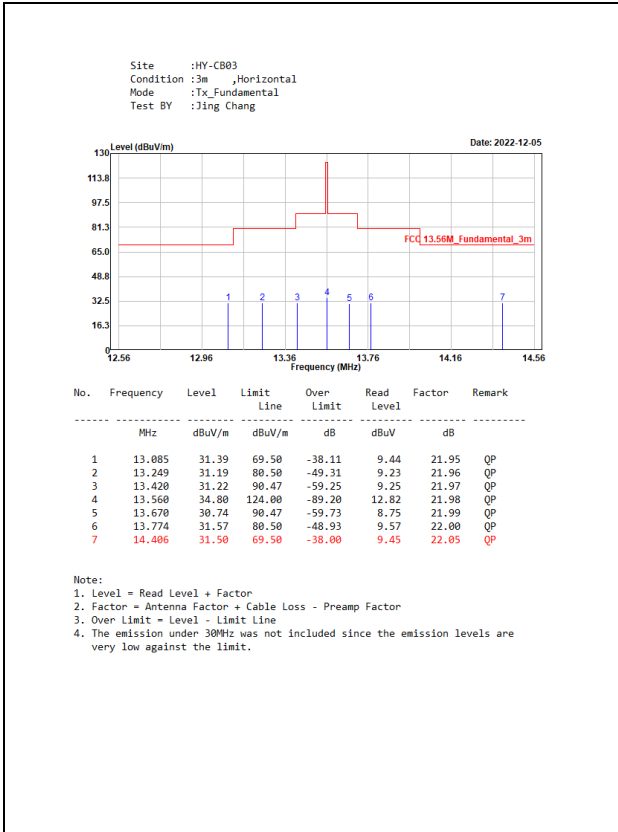
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

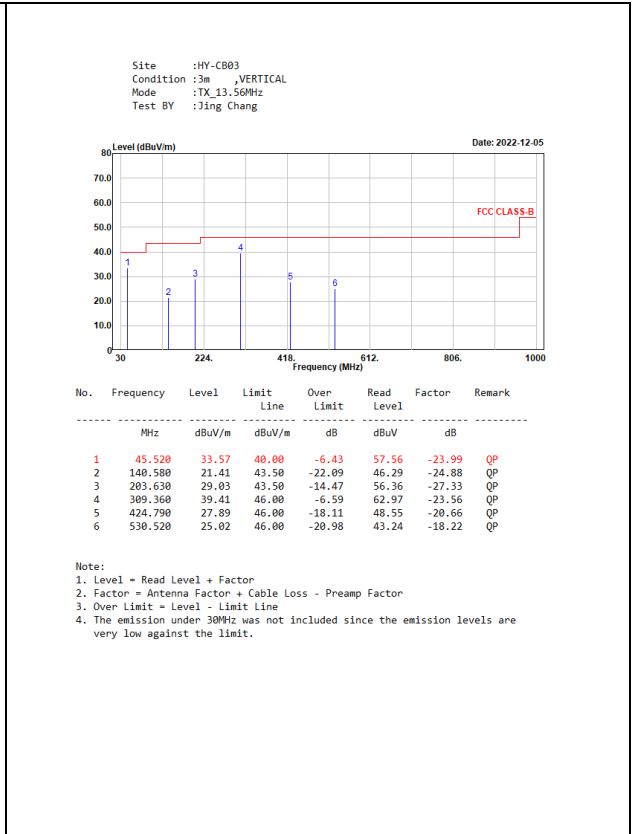
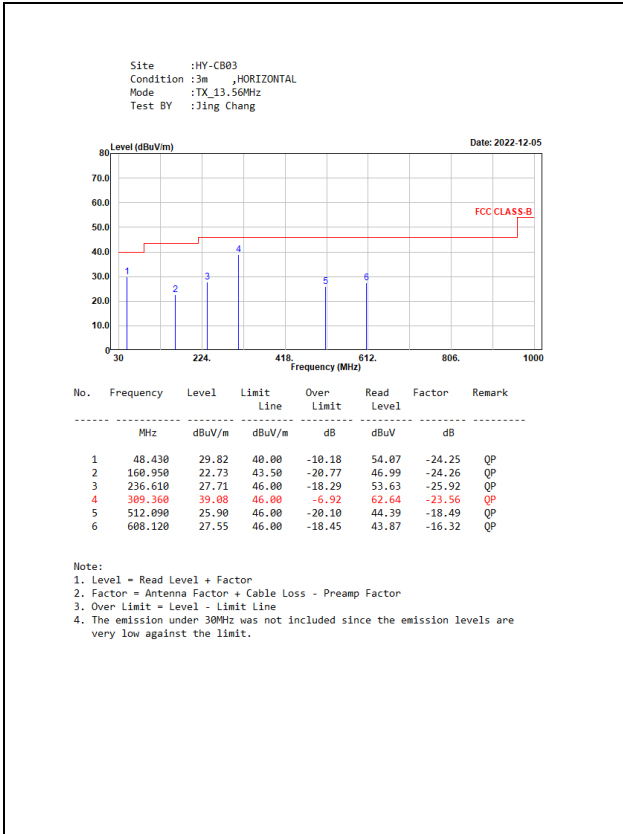
The bandwidth below 30MHz setting on the field strength meter is 9 kHz and above 30 MHz is 120 kHz.

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



### 3.4. Test Result of Radiated Emission

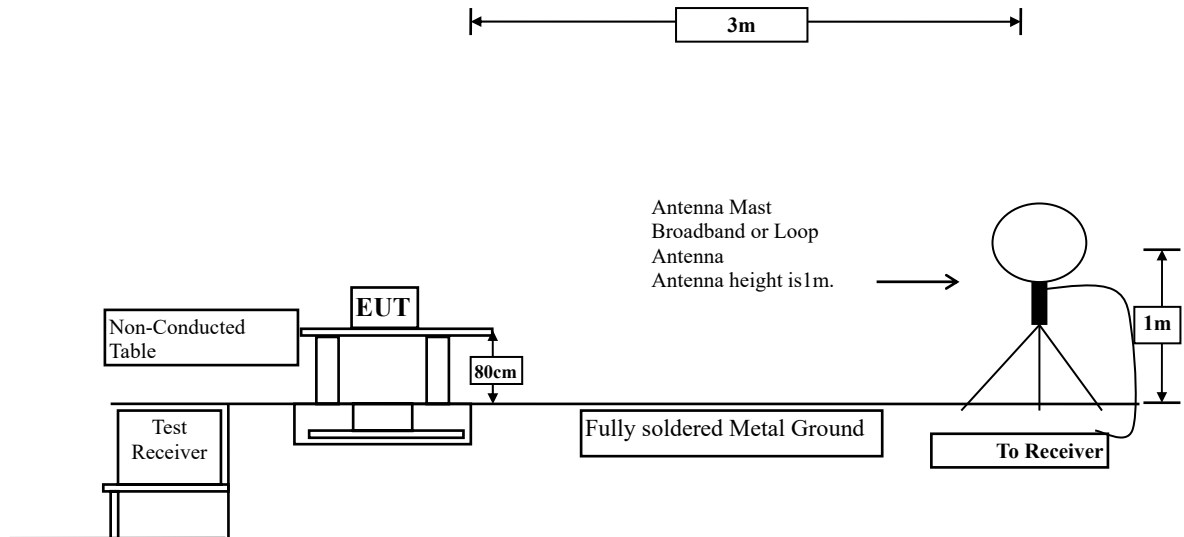




## 4. Band Edge

### 4.1. Test Setup

Radiated Emission Under 30 MHz



### 4.2. Limits

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in Section 15.209. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209

### 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 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 C63.10: 2013 on radiated measurement.

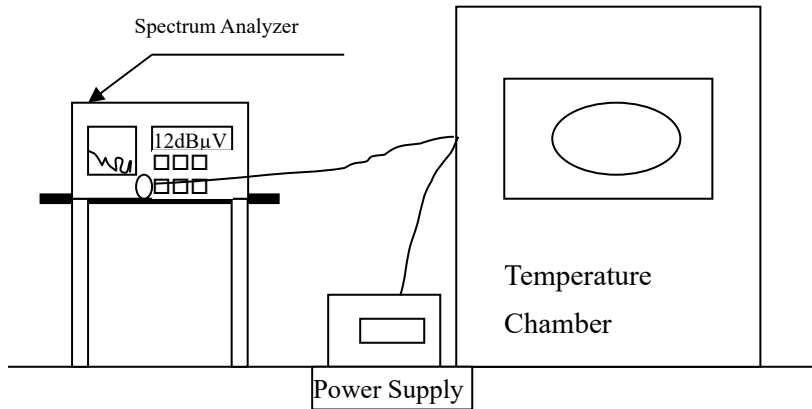
The bandwidth below 30 MHz setting on the field strength meter is 9 kHz and above 30 MHz is 120 kHz.

#### 4.4. Test Result of Band Edge



## 5. Frequency Tolerance

### 5.1. Test Setup



### 5.2. Limits

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

### 5.3. Test Procedure

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.

## 5.4. Test Result of Frequency Stability

Product : Desktop PC  
 Test Item : Frequency Tolerance  
 Test Mode : Transmit  
 Test date : 2022/12/09

Temperature (°C)	Voltage (V)	Observe Time	Declared Frequency (MHz)	Read Frequency (MHz)	Tolerance (%)	Limit (%)
20	120	start	13.56	13.55980	-0.001497	± 0.01 %
		2mins	13.56	13.55980	-0.001497	
		5mins	13.56	13.55980	-0.001497	
		10mins	13.56	13.55980	-0.001497	
20	138	start	13.56	13.55980	-0.001497	± 0.01 %
		2mins	13.56	13.55980	-0.001497	
		5mins	13.56	13.55980	-0.001497	
		10mins	13.56	13.55980	-0.001497	
20	102	start	13.56	13.55980	-0.001497	± 0.01 %
		2mins	13.56	13.55980	-0.001497	
		5mins	13.56	13.55980	-0.001497	
		10mins	13.56	13.55980	-0.001497	
50	120	start	13.56	13.55973	-0.001974	± 0.01 %
		2mins	13.56	13.55973	-0.001974	
		5mins	13.56	13.55973	-0.001974	
		10mins	13.56	13.55973	-0.001974	
40	120	start	13.56	13.55978	-0.001654	± 0.01 %
		2mins	13.56	13.55978	-0.001654	
		5mins	13.56	13.55978	-0.001654	
		10mins	13.56	13.55978	-0.001654	
30	120	start	13.56	13.55980	-0.001441	± 0.01 %
		2mins	13.56	13.55980	-0.001441	
		5mins	13.56	13.55980	-0.001441	
		10mins	13.56	13.55980	-0.001441	

10	120	start	13.56	13.55986	-0.001014	± 0.01 %
		2mins	13.56	13.55986	-0.001014	
		5mins	13.56	13.55986	-0.001014	
		10mins	13.56	13.55986	-0.001014	
0	120	start	13.56	13.55987	-0.000959	± 0.01 %
		2mins	13.56	13.55987	-0.000959	
		5mins	13.56	13.55987	-0.000959	
		10mins	13.56	13.55987	-0.000959	
-10	120	start	13.56	13.55987	-0.000959	± 0.01 %
		2mins	13.56	13.55987	-0.000959	
		5mins	13.56	13.55987	-0.000959	
		10mins	13.56	13.55987	-0.000959	
-20	120	start	13.56	13.55986	-0.001069	± 0.01 %
		2mins	13.56	13.55986	-0.001069	
		5mins	13.56	13.55986	-0.001069	
		10mins	13.56	13.55986	-0.001069	