

FCC SDoC TEST REPORT

Report No.: DDT-R21052503-1E2

Applicant	:	TPV Electronics (Fujian) Co.,Ltd.
Address	:	Rongqiao Economic and Technological Development Zone,Fuqing City,Fujian Province,P.R.China
Equipment under Test	:	LCD Monitor
Model No.	:	**32P2***** ("*" = 0-9, A-Z, a-z, +, -, /, \ or blank. All models difference are in sale marketing)

Issued By: Tianjin Dongdian Testing Service Co., Ltd.

Address: No.19, Weisi Road, MIP, Develop Area, Tianjin, China, 300385

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Test Report Declare

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Model No.	:	**32P2***** ("*" = 0-9, A-Z, a-z, +, -, /, \ or blank. All models difference are in sale maiketing)

Test Standard Used:
ANSI C63.4: 2014; 47 CFR FCC Part 15 Subpart B

We Declare:

The equipment described above is tested and assessed by Tianjin Dongdian Testing Service Co., Ltd. and in the configuration assessed the equipment complied with the standards specified above. The tested and assessed results are contained in this test report and Tianjin Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these assessments.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No.:	DDT-R21052503-1E2		
Date of Receipt:	May 26, 2021	Date of Test:	May 31, 2021 ~ Jun. 07, 2021

Prepared By:

May Zhang

May Zhang/Engineer

Approved By:

Aaron Zhang

Aaron Zhang/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Tianjin Dongdian Testing Service Co., Ltd.



Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Jun. 09, 2021	

1. Summary of test results

Description of Test Item	Standard	Result
Conducted emission at AC mains terminals	ANSI C63.4: 2014; 47 CFR FCC Part 15 Subpart B	PASS
Radiated emission	ANSI C63.4: 2014; 47 CFR FCC Part 15 Subpart B	PASS

2. General test information

2.1. Description of EUT

EUT* Name	: LCD Monitor
Model Number	: **32P2*****
Serial Number	: -
EUT function description	: Please refer to user manual of this device
Power supply	: 100-240V 50/60Hz
Test Voltage	: 110V 60Hz
EUT Class	: Class B
Maximum work frequency	: 597 MHz

Note: EUT is the ab. of equipment under test.

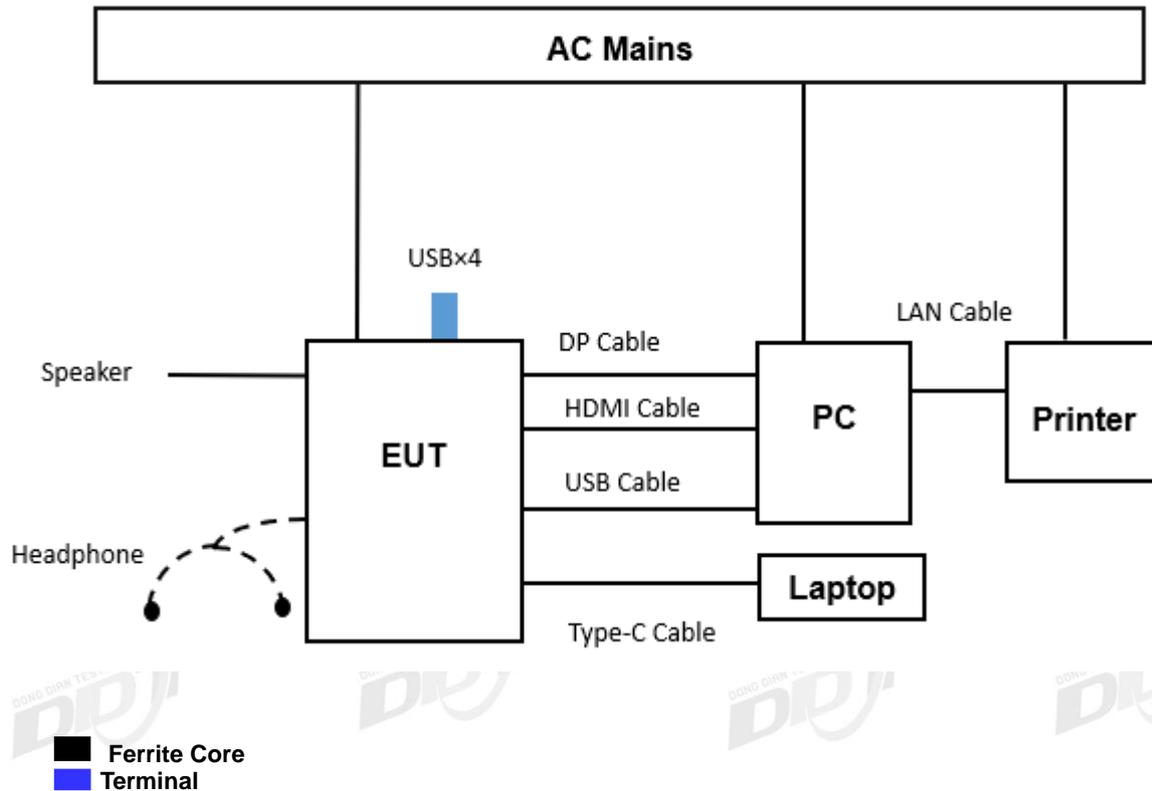
2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
AC Cable	N/A	N/A	Length: 1.5m/1.8m, Unshielded	N/A
HDMI Cable	N/A	N/A	Length: 1.5m/1.8m, Shielded	N/A
DP Cable	N/A	N/A	Length: 1.5m/1.8m, Shielded	N/A
Type-C Cable	N/A	N/A	Length: 1.5m/1.8m, Shielded	N/A
USB Cable	N/A	N/A	Length: 1.5m/1.8m, Shielded	N/A
AUDIO Cable	N/A	N/A	Length: 1.5m/1.8m, Shielded	N/A

2.3. Test peripherals

Device	Manufacturer	Model No.	Serial No.	Remark
Desktop PC	HP	TPC-W058-MT	8CG0321Q58	N/A
Desktop PC	Samsung	DM700T6A-A99	JVTG98EJ2C004QX	N/A
Desktop PC	Samsung	DM700T6A-A99	JVTG98EJ2C0087L	N/A
Laptop	HP	HP ProBook 455R G6	5CD0122F5D	N/A
Keyboard	DELL	N/A	N/A	N/A
Mouse	DELL	N/A	N/A	N/A
Printer	SAMSUNG	CLP-365W/SEE	Z8DLBABC200070K	N/A
Speaker	JBL	GO2+	N/A	N/A

2.4. Block diagram EUT configuration for test



2.5. EUT operating mode(s)

Mode1: HDMI1	Connect HDMI cable from PC's HDMI port to EUT's HDMI Port. The test signal is scrolling 'H' with 1kHz audio playing.
Mode2: HDMI2	Connect HDMI cable from PC's HDMI port to EUT's HDMI Port. The test signal is scrolling 'H' with 1kHz audio playing.
Mode3: DP	Connect DP cable from PC's DP port to EUT's DP Port. The test signal is scrolling 'H' with 1kHz audio playing.
Mode4: Type-C	Connect Type-C cable from PC's Type-C port to EUT's Type-C Port. The test signal is scrolling 'H' with 1kHz audio playing.

2.6. Deviations of test standard

No Deviation.

2.7. Test laboratory

Tianjin Dongdian Testing Service Co., Ltd.

Address: No.19, Weisi Road, MIP, Develop Area, Tianjin, China, 300385

Tel: +86-22-58038033, <http://www.dgddt.com>, Email: ddt@dgddt.com

NVLAP (National Voluntary Laboratory Accreditation Program) CODE: 500036-0

CNAS (China National Accreditation Service for Conformity Assessment) CODE: L13402

FCC Designation Number: CN5004; FCC Test Firm Registration Number: 368676

2.8. Measurement uncertainty

Test Item	Uncertainty
Conducted disturbance at mains terminals	3.4dB (150KHz-30MHz)
Uncertainty for Radiation Emission test (30MHz-1GHz)	5.2 dB (Antenna Polarize: H)
	5.2 dB (Antenna Polarize: V)
Uncertainty for Radiation disturbance test (1GHz to 6GHz)	5.0dB(1-6GHz)

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Conducted Emission Test Report

3.1. General information

Test date	Jun. 07, 2021	Test engineer	Sam	
Climate condition	Ambient temperature	25.6±1°C	Relative humidity	39±1%
	Atmospheric pressure	100.5±0.2 kPa		
Test place	Shield Room 2#			

3.2. Test Equipment

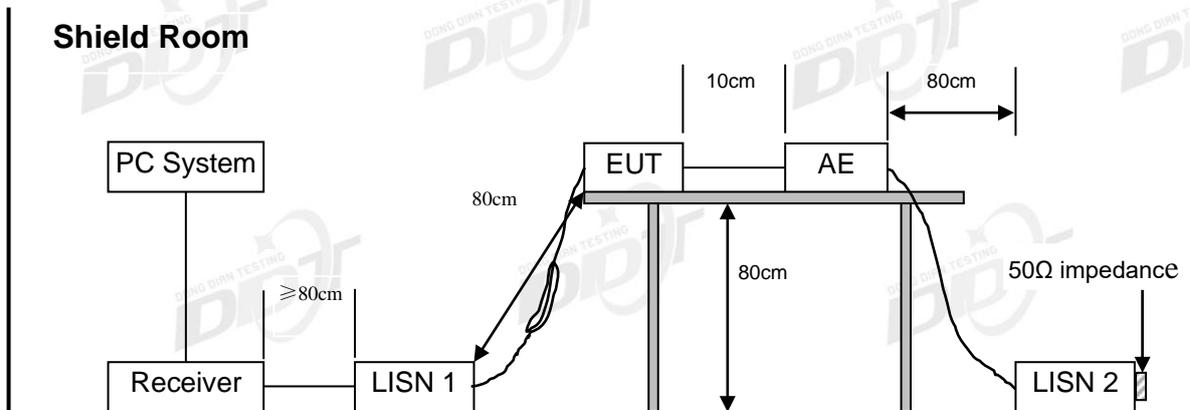
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Test Receiver	R&S	ESCI	101032	Mar. 03, 2021	1 Year
LISN 1	R&S	ENV216	101122	Nov. 09, 2020	1 Year
LISN 2	R&S	ENV216	101254	Mar. 17, 2021	1 Year
Test software	TOYO	EP5/CE	V 5.4.40	N/A	N/A

3.3. Reference Standard

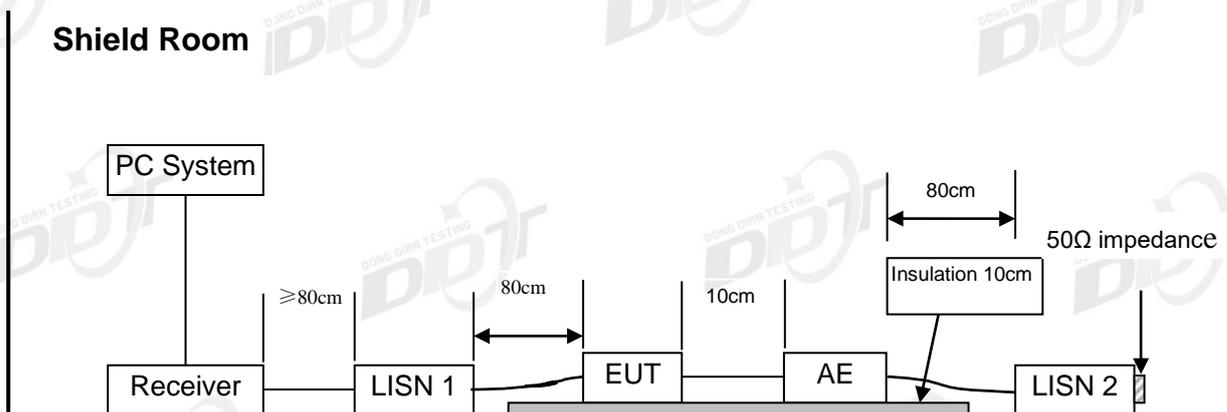
ANSI C63.4: 2014; 47 CFR FCC Part 15 Subpart B

3.4. Block Diagram of Test Setup

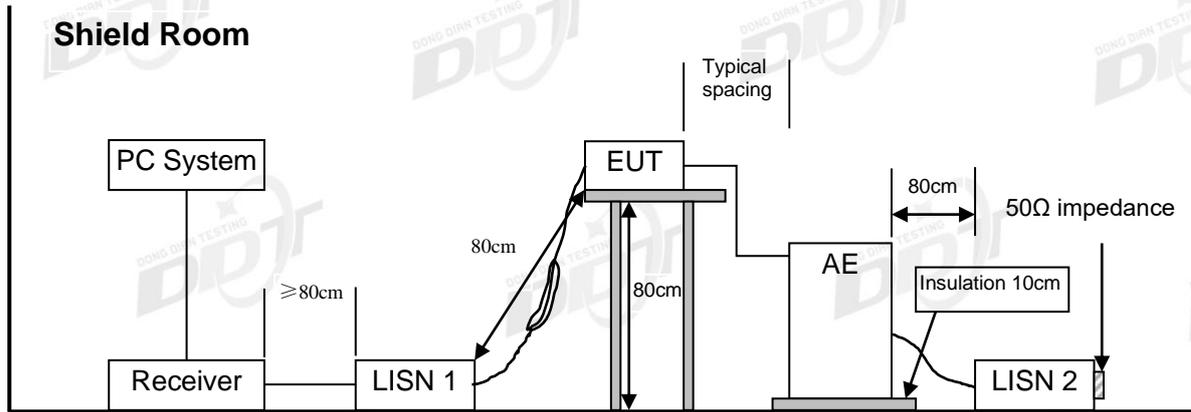
For table-top equipment



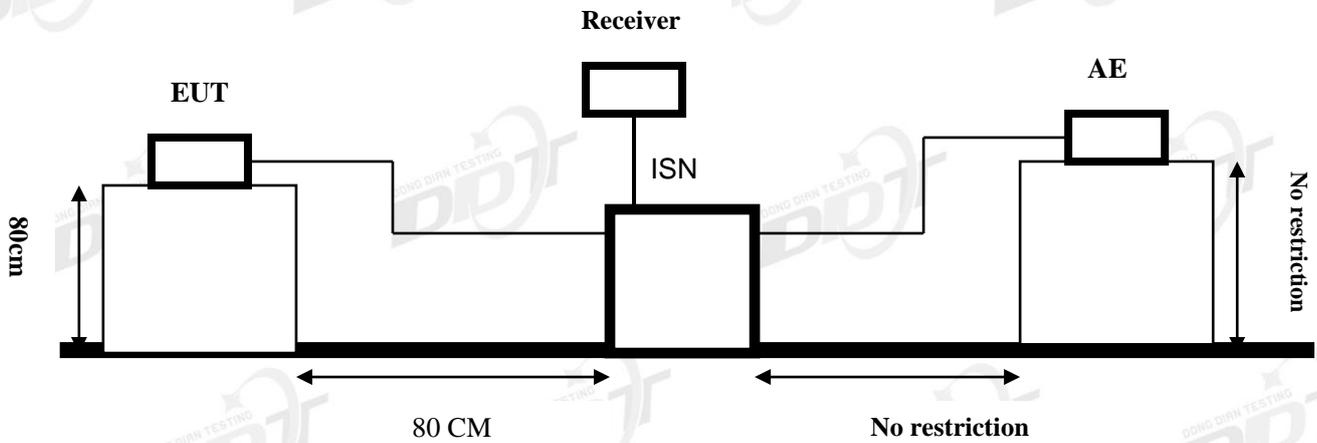
For floor standing equipment



For combinations equipment



For telecommunication port



3.5. Limits

Class A

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	79	66
500kHz ~ 30MHz	73	60

Class B

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Class B telecommunication port

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	84 ~ 74*	74 ~ 64*
5MHz ~ 30MHz	74	64

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.6. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm (table-top device)/0.1m (floor stand device) above the ground plane.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.5 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

The EUT with following test modes were pre-tested:

No.	Operation Mode	Cable Length	Resolution
1. *	Mode 1 HDMI1	1.8m	3840*2160@60Hz
2.		1.8m	1920*1080@60Hz
3.		1.8m	800*600@60Hz
4.	Mode 2 HDMI2	1.5m	3840*2160@60Hz
5.		1.5m	1920*1080@60Hz
6.		1.5m	800*600@60Hz
7.	HDMI1/2	1.8m	DVD
8.	Mode 3 DP	1.8m	3840*2160@60Hz
9.		1.8m	1920*1080@60Hz
10.		1.8m	800*600@60Hz
11.		1.5m	3840*2160@60Hz
12.	Mode 4 Type-C	1.8m	3840*2160@60Hz
13.		1.8m	1920*1080@60Hz
14.		1.8m	800*600@60Hz
15.		1.8m	Full Load
16.		1.5m	3840*2160@60Hz
17.	HDMI1 3840*2160@60Hz with 1.5m power cord		

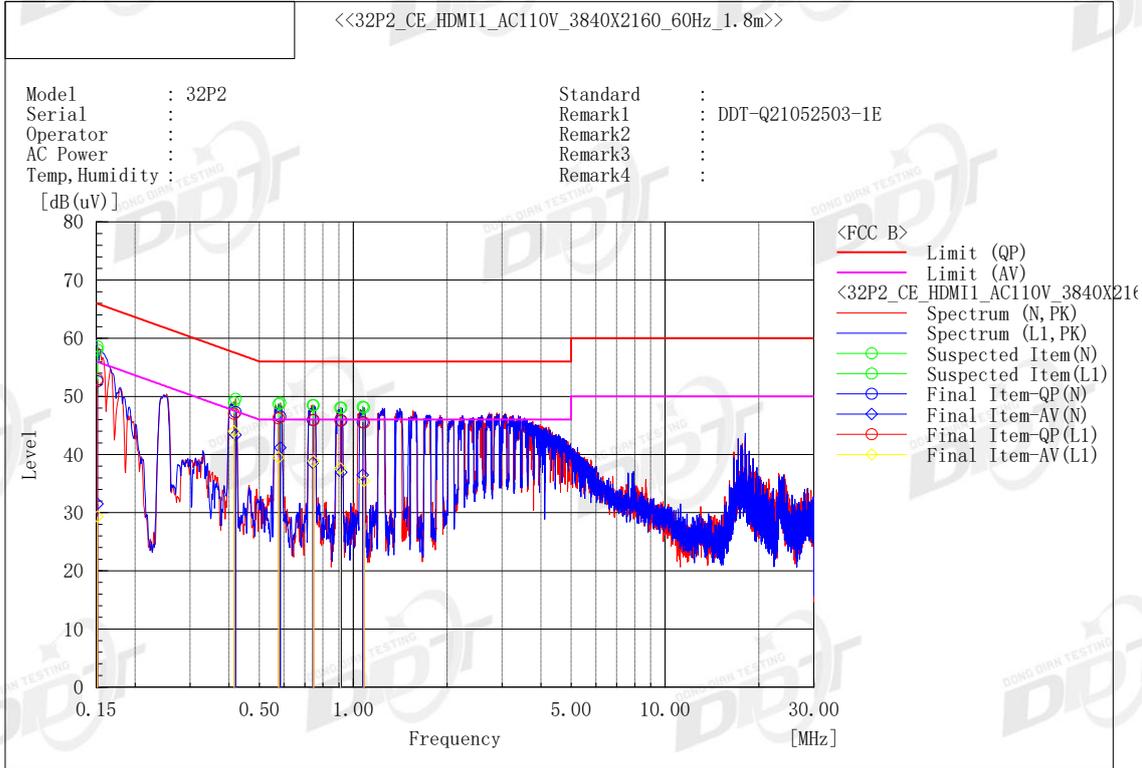
* Means the worst test mode.

3.7. Test Result

PASS. (See below detailed test result)

Note 1: All emissions not reported below are too low against the prescribed limits.

Operating Mode 1: HDMI1 IN



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.58427	36.8	31.5	9.7	46.5	41.2	56.0	46.0	9.5	4.8
2	0.74233	36.1	28.8	9.8	45.9	38.6	56.0	46.0	10.1	7.4
3	1.07246	35.8	26.7	9.8	45.6	36.5	56.0	46.0	10.4	9.5
4	0.15148	42.9	21.8	9.7	52.6	31.5	65.9	55.9	13.3	24.4
5	0.41958	37.6	33.6	9.7	47.3	43.3	57.5	47.5	10.2	4.2
6	0.91663	36.0	27.1	9.8	45.8	36.9	56.0	46.0	10.2	9.1

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c. f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.57615	36.5	29.8	9.7	46.2	39.5	56.0	46.0	9.8	6.5
2	0.15148	43.2	19.6	9.7	52.9	29.3	65.9	55.9	13.0	26.6
3	0.74676	36.2	29.1	9.7	45.9	38.8	56.0	46.0	10.1	7.2
4	1.0828	35.7	25.7	9.7	45.4	35.4	56.0	46.0	10.6	10.6
5	0.90998	36.2	27.9	9.7	45.9	37.6	56.0	46.0	10.1	8.4
6	0.41514	37.3	34.3	9.7	47.0	44.0	57.5	47.5	10.5	3.5

Note1) Level (Quasi-Peak and/or C/Average) = Meter Reading + Factor

Note2) Line = Polarity of input power (Live or Neutral)

N : Abbreviation of Neutral Polarity, L1 : Abbreviation of Live Polarity,

Note3) Factor = LISN Insertion Loss + Cable Loss

Note4) Margin = Limit - Level (Quasi-Peak and/or C/Average)

Note5) C/Average : Abbreviation of CISPR Average

4. Radiated Emissions

4.1. General information

Test date	May 31, 2021 & Jun. 03, 2021	Test engineer	Sam	
Climate condition	Ambient temperature	22.7±1°C	Relative humidity	39±1%
	Atmospheric pressure	100.2±0.2kPa		
Test place	10m Chamber			

4.2. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	R&S	ESCI	101024	Mar. 03, 2021	1 Year
EMI Test Receiver	R&S	ESCI	101397	Mar. 03, 2021	1 Year
Bilog Antenna	TESEQ	CBL6112D	30997	Jan, 17, 2020	2 Year
Bilog Antenna	TESEQ	CBL6112D	30999	Jan, 17, 2020	2 Year
Amplifier	Sonoma	310N	300913	Mar. 03, 2021	1 Year
Amplifier	Sonoma	310N	300914	Mar. 03, 2021	1 Year
Ant Mast	Innco	MA4000	N/A	N/A	N/A
Ant Mast	Innco	MA4000	N/A	N/A	N/A
Mast Controller	Innco	CO2000	N/A	N/A	N/A
Mast Controller	Innco	CO2000	N/A	N/A	N/A
RF Selector 4CH	TOYO	NS4904N	Selector1	N/A	N/A
RF Selector 4CH	TOYO	NS4904N	Selector2	N/A	N/A
Test software	TOYO	EP5/RE	V 5.7.10	N/A	N/A
EMI Test Receiver	R&S	ESU26	100244	Mar. 04, 2021	1 Year
Double Ridged Horn Antenna	TESEQ	BHA9118	31754	Sep. 14, 2019	2 Year
Pre-amplifier	TOYO	TPA0108-40	0934	Mar. 02,2021	1 Year
Test software	TOYO	EP5/RE	V 5.7.10	N/A	N/A

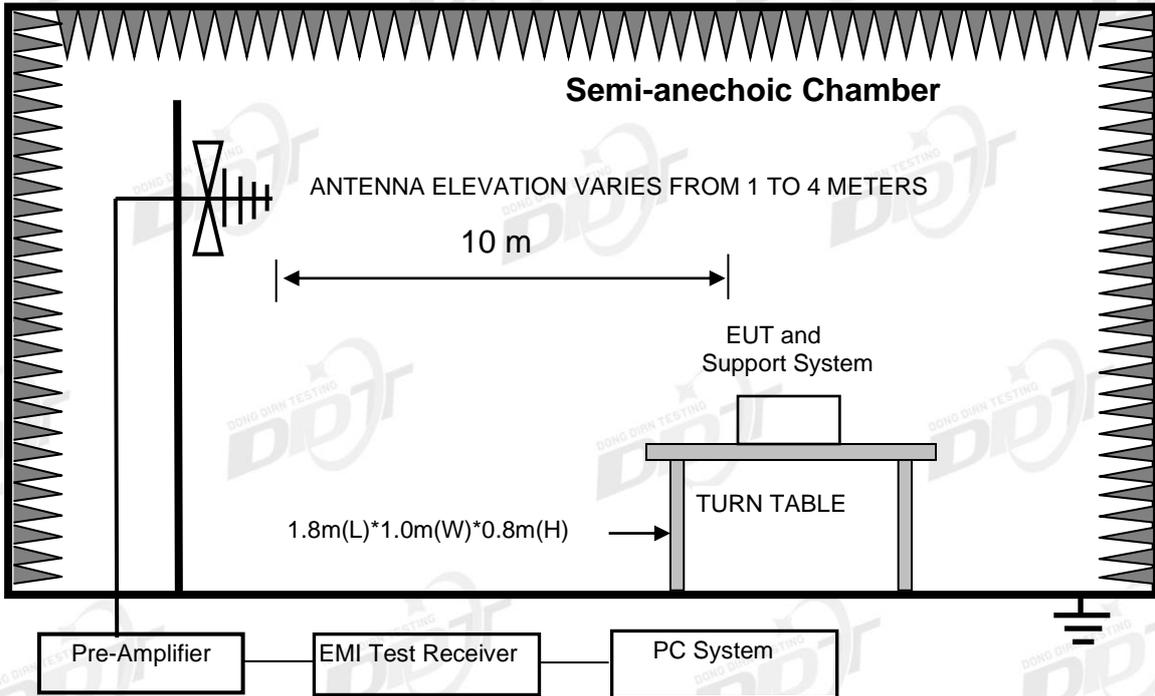
Notes. N/A means Not applicable.

4.3. Reference Standard

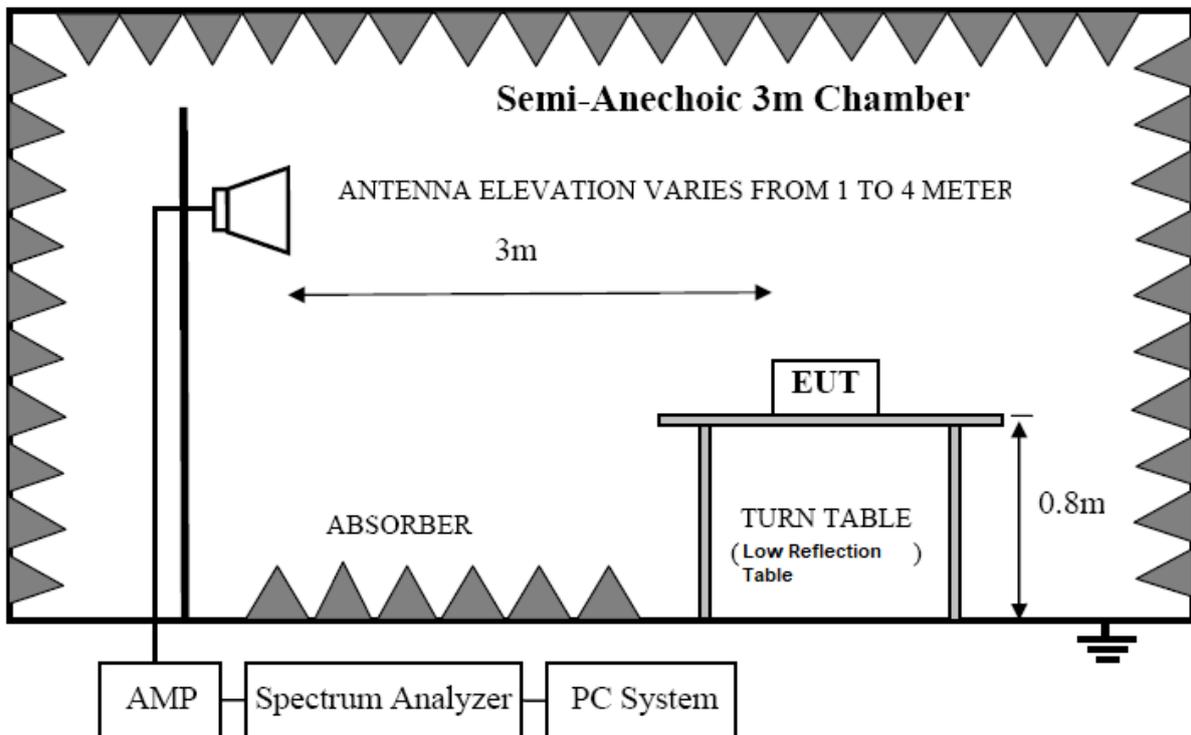
ANSI C63.4: 2014; 47 CFR FCC Part 15 Subpart B

4.4. Block diagram of test setup

Below 1GHz



Above 1GHz



4.5. Limits

Class B

Frequency (MHz)	Distance (Meters)	Field Strengths Limits dB(μ V)/m
30--88	10	30.0
88--216	10	33.5
216--960	10	36.0
960-1000	10	44.0
Above 1000	3	74.0(Peak), 54.0(Average)

Note: (1) The smaller limit shall apply at the cross point between two frequency bands.

4.6. Test Procedure

Procedure of Preliminary Test

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm (table-top device)/0.1m (floor stand device) above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.5 and test equipment as described in clause 4.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

The antenna was placed at 10 meters(for 30MHz – 1GHz) and 3 meters(for above 1 GHz) away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Analyzer / Receiver quickly scanned from 30MHz to 1GHz and 1GHz to 6GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The test mode(s) described in clause 2.5 were scanned during the preliminary test:

After the preliminary scan, we found the test mode producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.

The Analyzer / Receiver scanned from 30MHz to 1GHz and 1GHz to 6GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.

For emissions from 30MHz to 1GHz, Quasi-Peak values were measured with EMI Receiver and the bandwidth of Receiver is 120 KHz.

For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz

The test data of the worst-case condition(s) was recorded.

The EUT with following test modes were pre-tested:

For frequency range 30MHz ~ 1GHz:

No.	Operation Mode	Cable Length	Resolution
1.	Mode 1 HDMI1	1.8m	3840*2160@60Hz
2.		1.8m	1920*1080@60Hz
3.		1.8m	800*600@60Hz
4. *	Mode 2 HDMI2	1.5m	3840*2160@60Hz
5.		1.5m	1920*1080@60Hz
6.		1.5m	800*600@60Hz
7.	HDMI1/2	1.8m	DVD
8.	Mode 3 DP	1.8m	3840*2160@60Hz
9.		1.8m	1920*1080@60Hz
10.		1.8m	800*600@60Hz
11.		1.5m	800*600@60Hz
12.	Mode 4 Type-C	1.8m	3840*2160@60Hz
13.		1.8m	1920*1080@60Hz
14.		1.8m	800*600@60Hz
15.		1.8m	Full Load
16.		1.5m	800*600@60Hz
17.	HDMI2 3840*2160@60Hz with 1.5m power cord		
18.	HDMI2 1920*1080@60Hz with headphone		
19.	HDMI2 1920*1080@60Hz without headphone		

* Means the worst test mode.

For frequency range above 1GHz:

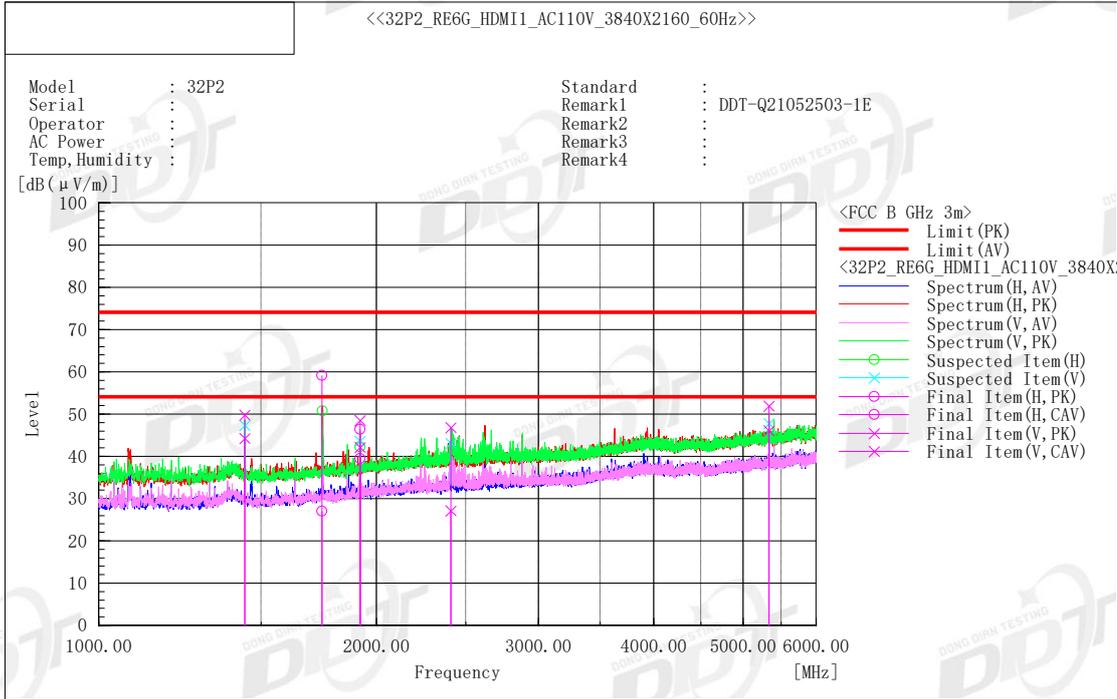
No.	Operation Mode	Cable Length	Resolution
1. *	Mode 1 HDMI1	1.8m	3840*2160@60Hz
2.		1.8m	1920*1080@60Hz
3.		1.8m	800*600@60Hz
4.	Mode 2 HDMI2	1.5m	3840*2160@60Hz
5.		1.5m	1920*1080@60Hz
6.		1.5m	800*600@60Hz
7.	HDMI1/2	1.8m	DVD
8.	Mode 3 DP	1.8m	3840*2160@60Hz
9.		1.8m	1920*1080@60Hz
10.		1.8m	800*600@60Hz
11.		1.5m	3840*2160@60Hz
12.	Mode 4 Type-C	1.8m	3840*2160@60Hz
13.		1.8m	1920*1080@60Hz
14.		1.8m	800*600@60Hz
15.		1.8m	Full Load
16.		1.5m	800*600@60Hz
17.	HDMI1 3840*2160@60Hz with 1.5m power cord		
18.	HDMI1 1920*1080@60Hz with headphone		
19.	HDMI1 1920*1080@60Hz without headphone		
* Means the worst test mode.			

4.7. Test result

PASS. (See below detailed test result)

Note: All emissions not reported below are too low against the prescribed limits.

Operating Mode 1: HDMI1 IN



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	1747.204	H	75.4	43.2	-16.2	59.2	27.0	74.0	54.0	14.8	27.0	124.0	204.9
2	1440.042	V	67.1	61.6	-17.3	49.8	44.3	74.0	54.0	24.2	9.7	224.0	195.2
3	5332.525	V	58.4	52.6	-6.5	51.9	46.1	74.0	54.0	22.1	7.9	247.0	199.0
4	1920.059	V	63.8	57.4	-15.3	48.5	42.1	74.0	54.0	25.5	11.9	234.0	175.6
5	2410.468	V	61.2	41.5	-14.4	46.8	27.1	74.0	54.0	27.2	26.9	145.0	259.0
6	1920.053	H	61.7	54.8	-15.3	46.4	39.5	74.0	54.0	27.6	14.5	145.0	151.7

Note1) (P) : Abbreviation of Antenna Polarity

Note2) Reading PK / C/AV : Received raw Peak / C/Average signal

Note3) Factor = Antenna factor + Cable loss – Amplifier gain

Note4) Level PK / C/AV = Reading PK / C/AV + Factor, Real signal Peak / C/Average level

Note5) Margin PK / C/AV = Limit – Level PK / C/AV

PK : Abbreviation of Peak

C/AV : Abbreviation of CISPR Average

5. Test Setup Photos

5.1. Conducted emission at the mains ports



[Front]



[Rear]

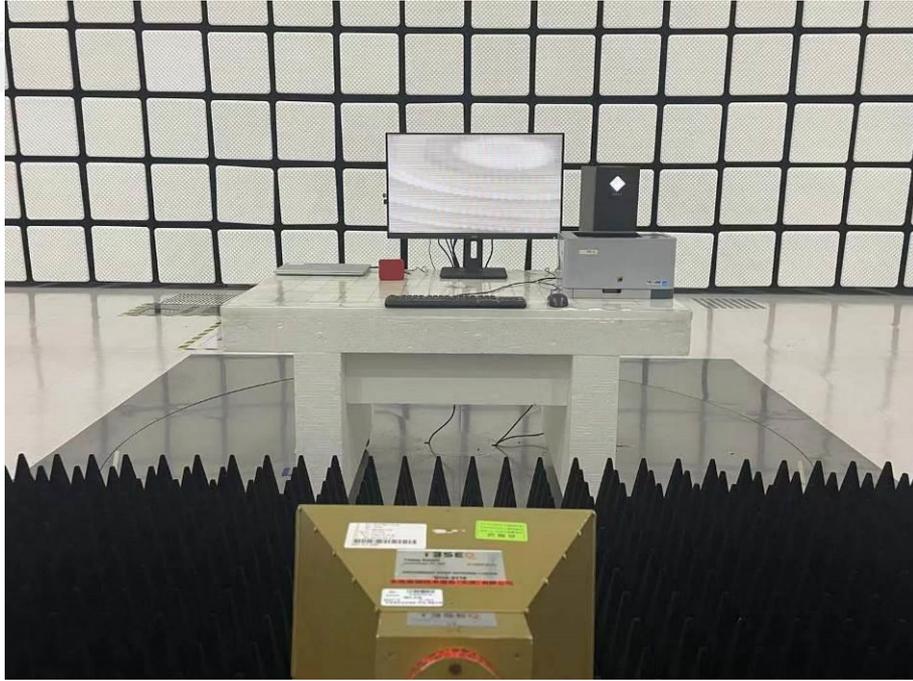
5.2. Radiated mission



[Front]



[Rear]



[Front]



[Rear]

Appendix I

Regulatory Statement and Label Marking Advice for the FCC SDoC

1. Marking Suggested for the label:

Trade Name and model number

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2. Statement suggested for the User Manual:

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

Notes: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: If shielded cables or special accessories are required for compliance, a statement

must be included which instructs the user to employ them, for example, Shielded cables must be used with this unit to ensure compliance with the Class B FCC limits.

END OF REPORT