



FCC TEST REPORT

FCC ID: 2A4HG-TX223C

Product Name	:	Wireless charging
Model Name	:	TX223C, TX2260, TX75, TX223A, TX23, TX133C, TX133A, TX2201C, TX2201A, TX18, TX226A, T9X, TX17, TX36B, TX2260B, TX221012
Brand Name	:	N/A
Report No.	:	PTC22120605701E-FC01
Sample ID	:	PTC22120605701E-1#
Prepared for		
Dongguan Oushi Electronic Technology Co., Ltd		
Room 103, Building 2, No. 2, Jiaojiao Road, Xiegang Town, Dongguan City, Guangdong		
Prepared by		
Precise Testing & Certification Co., Ltd		
Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China		



Report No.: PTC22120605701E-FC01

1 TEST RESULT CERTIFICATION

Applicant's name : Dongguan Oushi Electronic Technology Co., Ltd
Address : Room 103, Building 2, No. 2, Jiaojiao Road, Xiegang Town,
Dongguan City, Guangdong
Manufacture's name : Dongguan Oushi Electronic Technology Co., Ltd
Address : Room 103, Building 2, No. 2, Jiaojiao Road, Xiegang Town,
Dongguan City, Guangdong
Product name : Wireless charging
Model name : TX223C, TX2260, TX75, TX223A, TX23, TX133C, TX133A, TX2201C,
TX2201A, TX18, TX226A, T9X, TX17, TX36B, TX2260B, TX221012
Standards : FCC CFR47 Part 15C
Test procedure : ANSI C63.10:2013
Test Date : Dec.18, 2022-- Jan.09, 2023
Date of Issue : Jan.10, 2023
Test Result : Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Engineer:

A handwritten signature in black ink, appearing to read 'Simon Pu'.

Simon Pu / Engineer

Technical Manager:

A handwritten signature in black ink, appearing to read 'Ronnie Liu'.

Ronnie Liu / Manager



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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	PASS
Radiated Spurious Emissions	15.209	PASS
20dB bandwidth	15.215(c)	PASS



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3 TEST FACILITY

Precise Testing & Certification Co., Ltd.

Address: Building 1, No.6 Tongxin Road, Dongcheng Street, Dongguan, China

FCC Registration Number: 790290

Designation Number: CN1219

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

CAB identifier: CN0080



4 General Information

4.1 General Description of E.U.T.

Product Name	:	Wireless charging
Model Name	:	TX223C, TX2260, TX75, TX223A, TX23, TX133C, TX133A, TX2201C, TX2201A, TX18, TX226A, T9X, TX17, TX36B, TX2260B, TX221012
Operating frequency	:	110-205KHz
Antenna Type	:	Coil Antenna
Power supply	:	DC 12V 2A via adapter input 120V 60Hz 0.5A (model:XY24SE-120200VQ-UW)
Hardware Version	:	V01
Software Version	:	V01



4.2 Test Mode

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode or test configuration mode mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Keeping TX+Charging mode

Channel list

channel	Frequency(khz)
low	110
middle	160
high	205

Test channel

channel	Frequency(khz)
middle	160



5 Equipment During Test

5.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Aug21,2023
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug21,2023
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Aug21,2023
Scope	Tektronix	TDS3032B	B014131	300MHz BW; 2 way scope	Aug21,2023
DC power	eTOMENS	eTM-1560	--	15V 60A	Aug21,2023
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Aug21,2023
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Aug21,2023

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug21,2023
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug21,2023
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Aug21,2023
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Aug21,2023
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Aug21,2023
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug21,2023
High NOISE AMPLIFIER	ZHINAN	ZN3380C	15002	10KHz-18GHz	Aug21,2023
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug21,2023
Spectrum Analyzer	Rohde&Schwarz	FSVR40	101003	10Hz-40GHz	Aug21,2023
Horn Antenna	SCHWARZBECK	BBHA9170	01066	15GHZ-40GHZ	Aug21,2023
Preamplifier	SCHWARZBECK	BBV-9721	81	18GHZ-40GHZ	Aug21,2023



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Test S/W	Tonscend	JS32-RE/4.0.0.0
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Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	BS ENV216	102453	9KHz-300MHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	9KHz-300MHz	Aug21,2023
Test S/W	Tonscend	JS32-CE/4.0.0.3			



5.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	$\pm 1.0\text{dB}$
Power Spectral Density, conducted	$\pm 2.2\text{dB}$
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conducted Emissions (150kHz~30MHz)	$\pm 3.64\text{dB}$
Radiated Emission(9KHz~30MHz)	$\pm 2.54\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 4.74\text{dB}$
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	



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5.3 Description of Support Units

Equipment	Model No.	Series No.
Adapter	HW-050100E01	N/A
Mobile Phone	Samsung S9	N/A

6 Conducted Emission

Test Requirement:	: FCC CFR 47 Part 15 Section 15.207
Test Method:	: ANSI C63.10:2013
Test Result:	: PASS
Frequency Range:	: 150kHz to 30MHz
Class/Severity:	: Class B
Detector:	: Peak for pre-scan (9kHz Resolution Bandwidth)

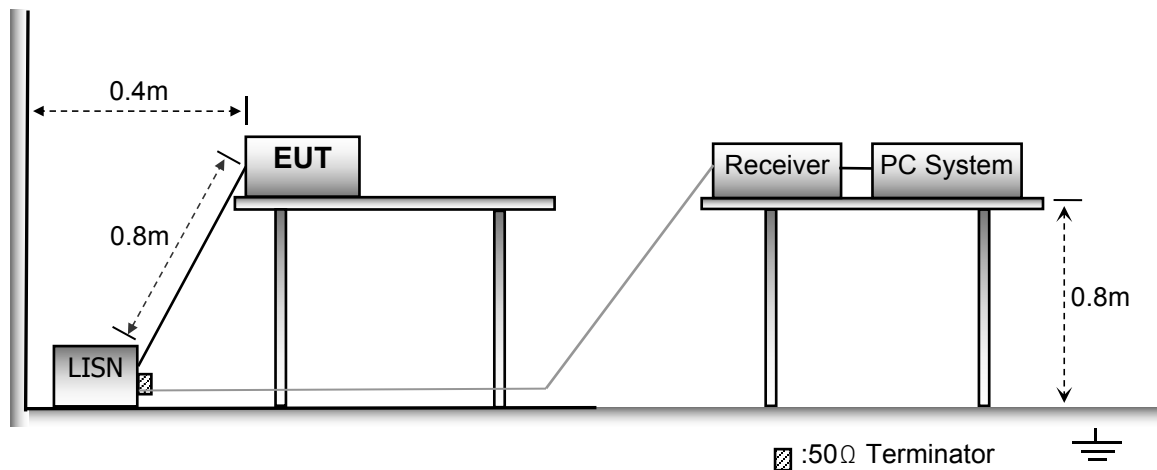
6.1 E.U.T. Operation

Operating Environment :

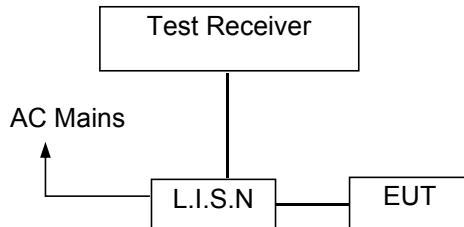
Temperature:	: 25.5 °C
Humidity:	: 51 % RH
Atmospheric Pressure:	: 101.2kPa
Test Voltage	: AC 120V/60Hz

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10: 2013



6.3 Test SET-UP (Block Diagram of Configuration)



6.4 Measurement Procedure:

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

6.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

6.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

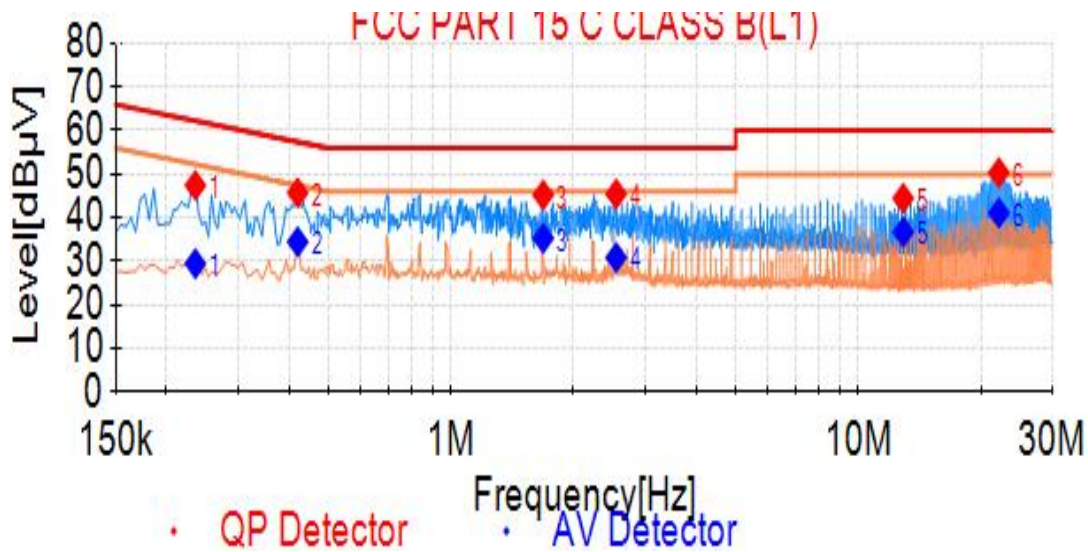
6.7 Conducted Emission Test Result

Pass.

The power is tested both AC 230v and 120v and worst case is AC 120V 60Hz for charging.



Line -120V/60Hz:

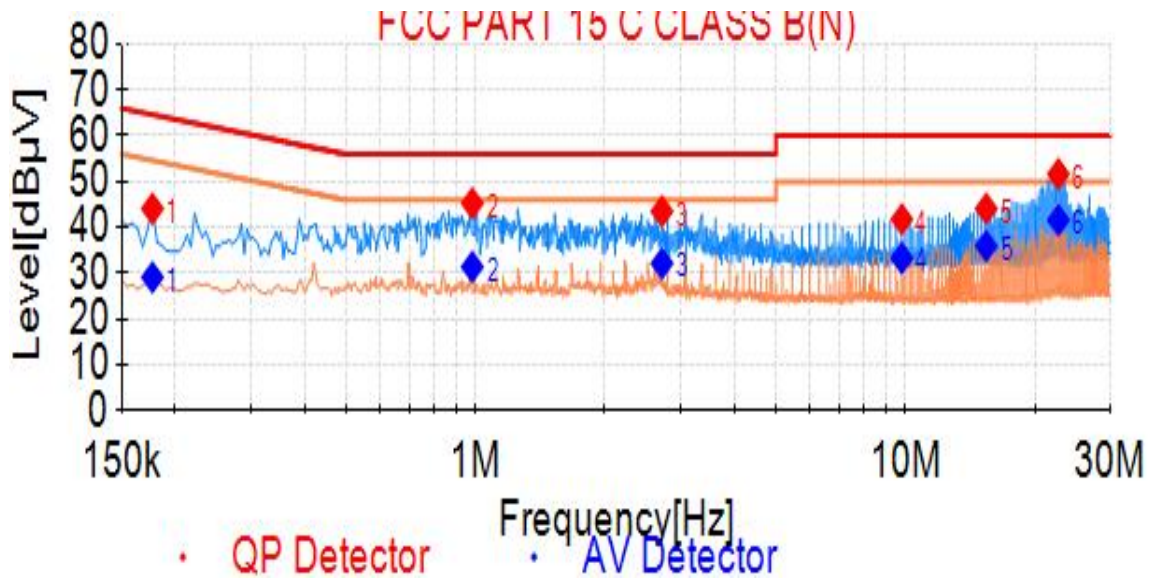


Final Data List

NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.236	47.43	62.25	14.82	29.41	52.25	22.84	PASS
2	0.420	45.72	57.45	11.73	34.44	47.45	13.01	PASS
3	1.685	45.21	56.00	10.79	35.29	46.00	10.71	PASS
4	2.544	45.44	56.00	10.56	30.84	46.00	15.16	PASS
5	12.903	44.44	60.00	15.56	36.71	50.00	13.29	PASS
6	22.160	50.33	60.00	9.67	41.10	50.00	8.90	PASS

Note: Level= Reading + Cable Loss + Factor

Neutral -120V/60Hz:



Final Data List								
NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.177	44.10	64.63	20.53	29.07	54.63	25.56	PASS
2	0.983	45.23	56.00	10.77	31.38	46.00	14.62	PASS
3	2.715	43.51	56.00	12.49	32.14	46.00	13.86	PASS
4	9.816	41.78	60.00	18.22	33.27	50.00	16.73	PASS
5	15.423	44.09	60.00	15.91	35.94	50.00	14.06	PASS
6	22.713	51.64	60.00	8.36	41.59	50.00	8.41	PASS

Note: Level= Reading + Cable Loss + Factor



7 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209
 Test Method : ANSI C63.10:2013
 Test Result : PASS
 Measurement Distance : 3m
 Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation

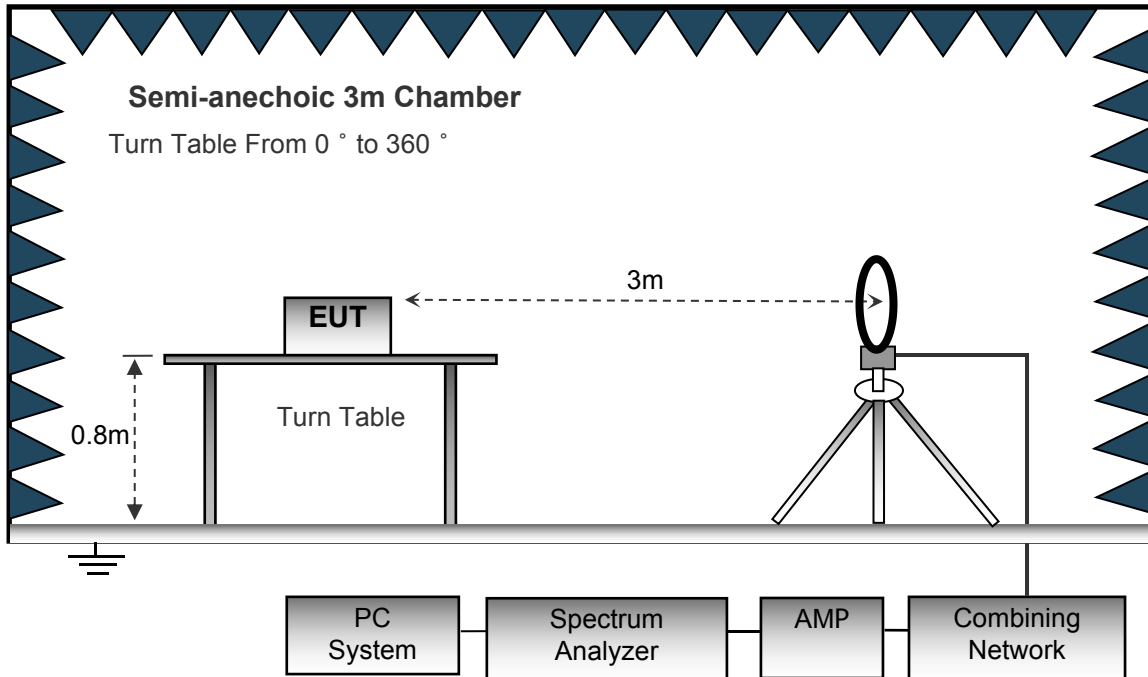
Operating Environment :

Temperature : 23.5 °C
 Humidity : 51.1 % RH
 Atmospheric Pressure : 101.2kPa

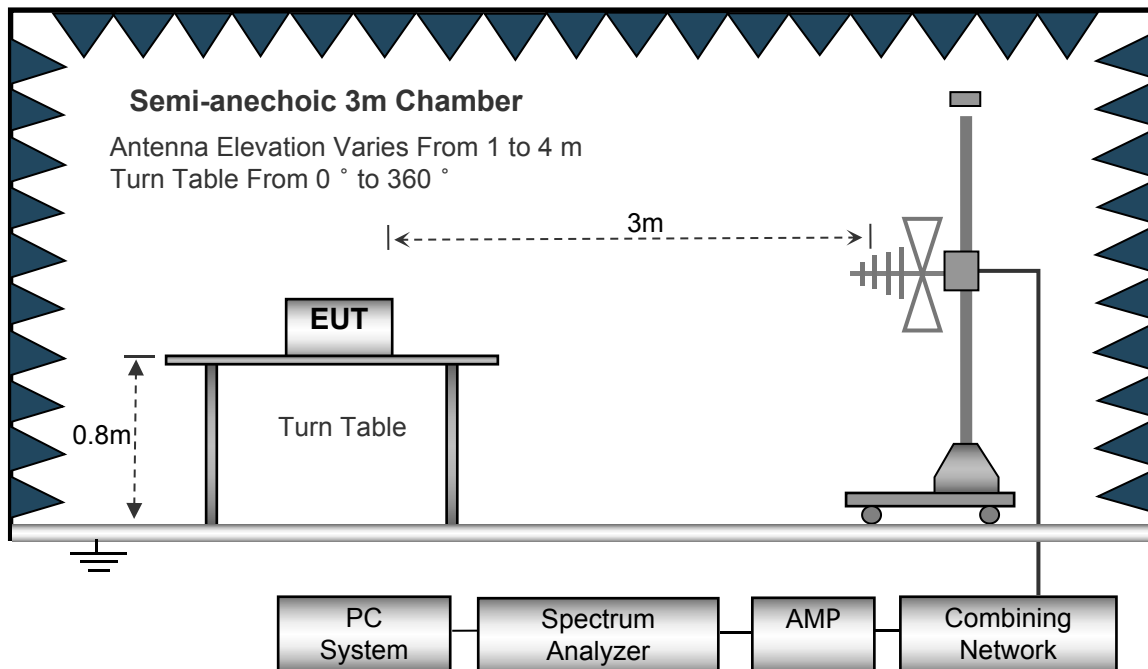
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

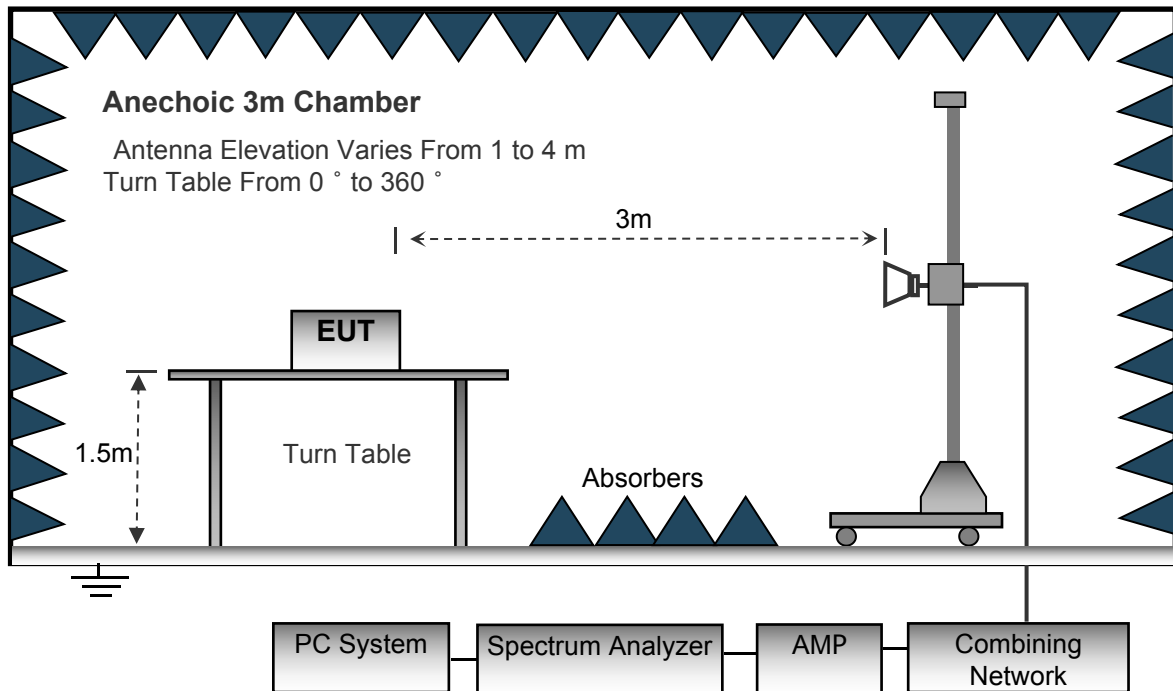
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



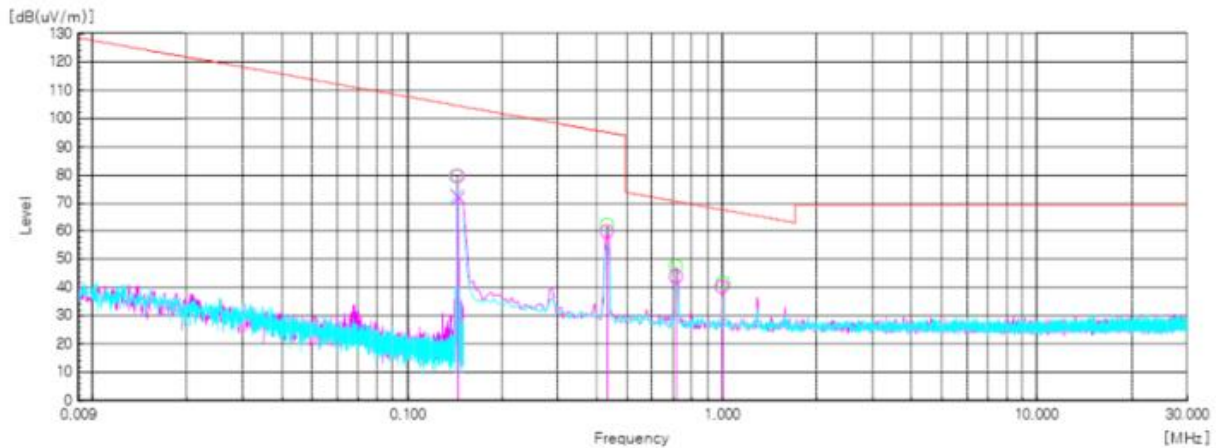
7.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2013.
2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
7. Test Procedure of measurement (For Above 1GHz):
 - 1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
 - 2) Change the antenna polarization and repeat 1) with vertical polarization.
 - 3) Make a hardcopy of the spectrum.
 - 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
 - 5) Change the analyser mode to Clear/ Write and found the cone of emission.
 - 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
 - 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
 - 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.



7.5 Summary of Test Results

Test Frequency: 9KHz-30MHz



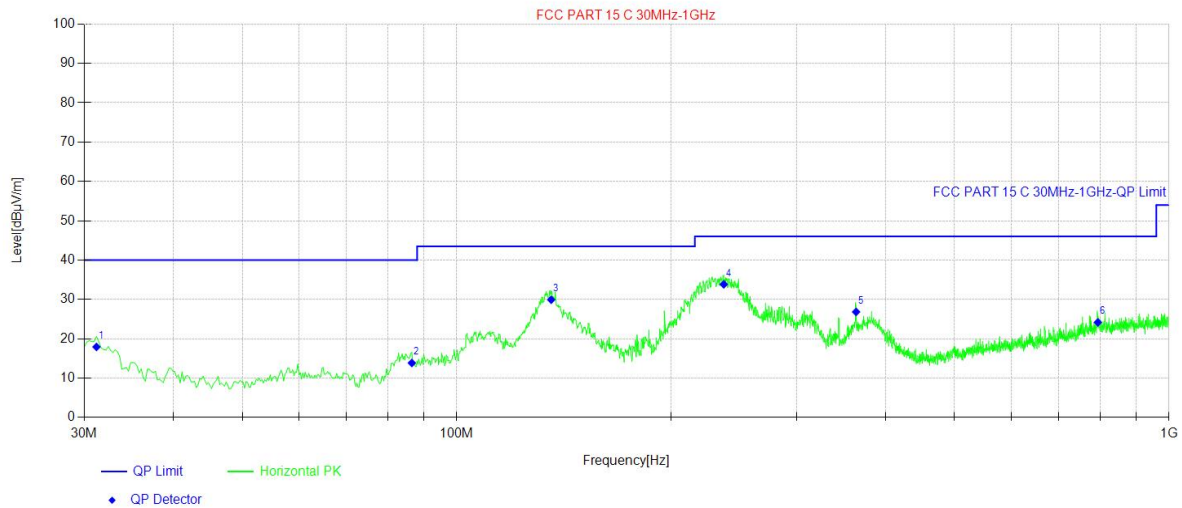
Frequency (MHZ)	Reading (dBuV)	POL (H/V)	CABLE LOSS (dB)	AMP GAIN (dB)	ANTENNA FACTOR (dB)	FACTOR (dB)	3m field strength (dBuV/m)	Result at 300m (dBuV/m)	Limit at 300m (dBuV/m)	Margin (dB)	remark
0.125	97.20	H	0.55	-32.76	19.91	-12.30	84.90	4.90	25.67	20.77	PK
0.430	72.30	H	0.58	-32.73	19.76	-12.40	59.90	-20.10	14.93	35.03	PK
0.717	56.20	H	0.70	-32.73	19.73	-12.30	43.90	3.90	30.49	26.59	PK
1.004	52.40	H	0.82	-32.72	19.70	-12.20	40.20	0.20	27.57	27.37	PK

Remark: According to FCC Part 15.209(d), the emission limits for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Radiated emission limits in these three bans are based on measurements employing an average detector. The value PK>QP>AV, so it is regular.



Test Frequency: 30MHz ~ 1GHz

Horizontal:

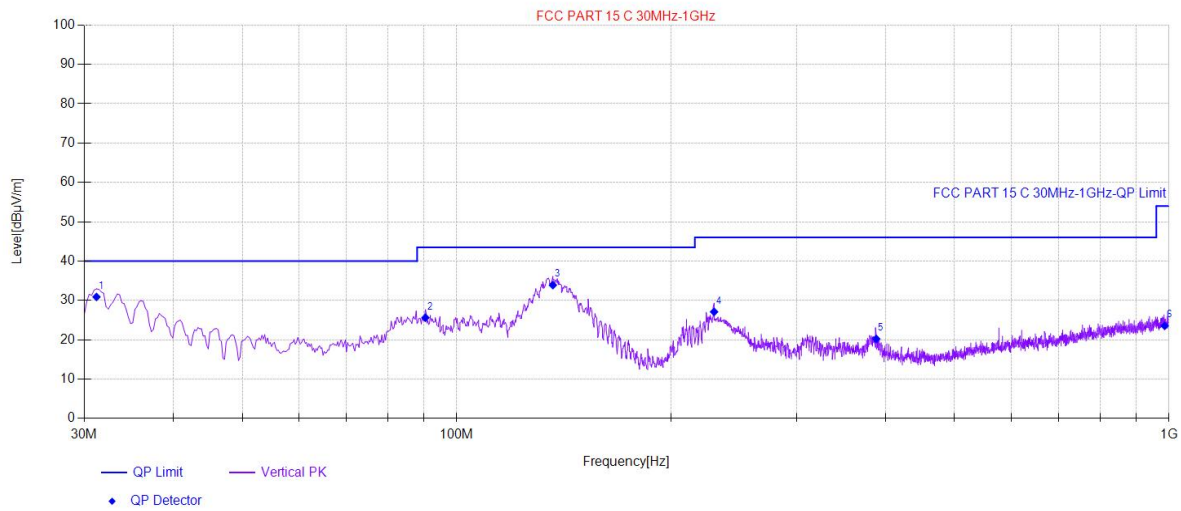


Final Data List[QP]							
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	31.21	36.2	-18.27	17.93	40.00	22.07	Horizontal
2	86.50	34.74	-20.89	13.85	40.00	26.15	Horizontal
3	135.73	46.76	-16.84	29.92	43.50	13.58	Horizontal
4	237.10	51.7	-17.86	33.84	46.00	12.16	Horizontal
5	363.68	40.85	-14.01	26.84	46.00	19.16	Horizontal
6	794.60	28.74	-4.57	24.17	46.00	21.83	Horizontal

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor



Vertical:

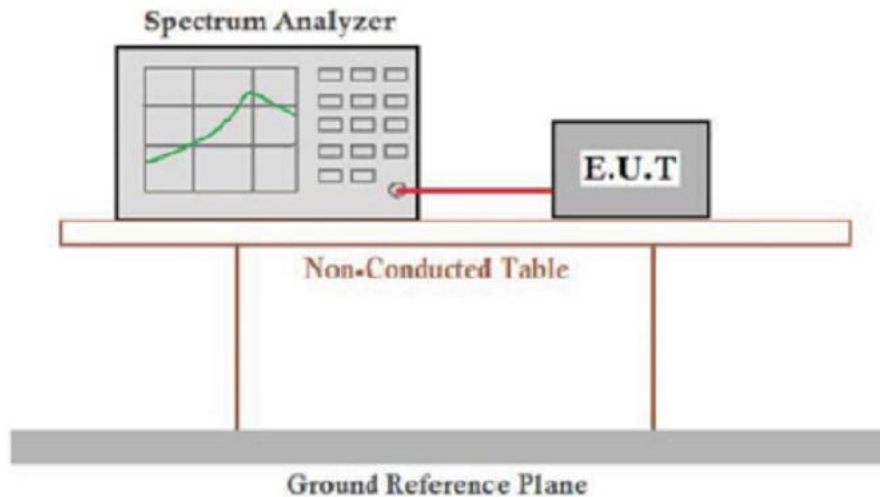


Final Data List[QP]							
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	31.21	49.17	-18.27	30.90	40.00	9.10	Vertical
2	90.38	46.24	-20.63	25.61	43.50	17.89	Vertical
3	136.46	50.69	-16.79	33.90	43.50	9.60	Vertical
4	229.82	45.27	-18.16	27.11	46.00	18.89	Vertical
5	388.17	33.76	-13.54	20.22	46.00	25.78	Vertical
6	986.18	25.22	-1.67	23.55	54.00	30.45	Vertical

Remark: Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

8 20dB Bandwidth

8.1 Block Diagram of Test Setup



8.2 Rules and specifications

DFR 47 Part 15.215(c)

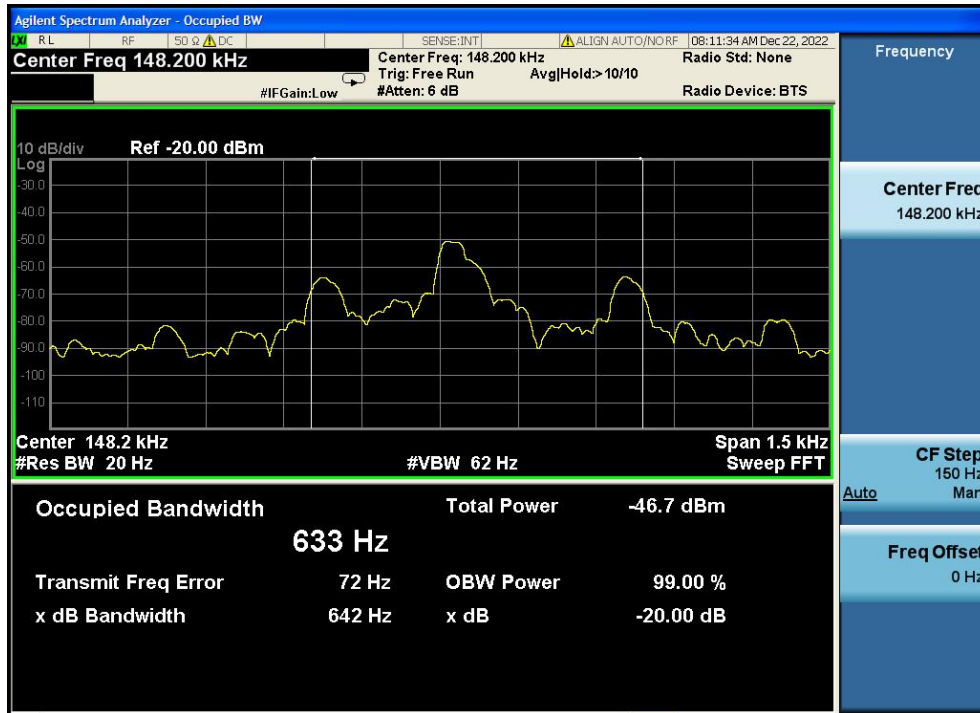
ANSI C63.10-2013

8.3 Test Procedure

Intentional radiator operating under the alternative provisions to the general emission limits, as contained in 15.217 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be demonstrated by measuring the radiated emissions.

8.4 Result

Pass.

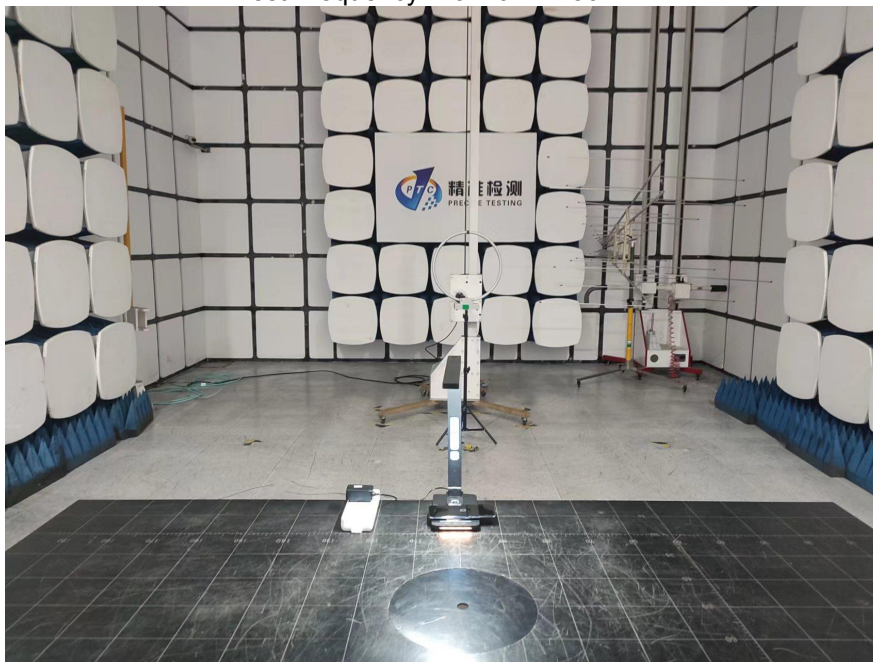


9 TEST PHOTOS

Conducted Emissions

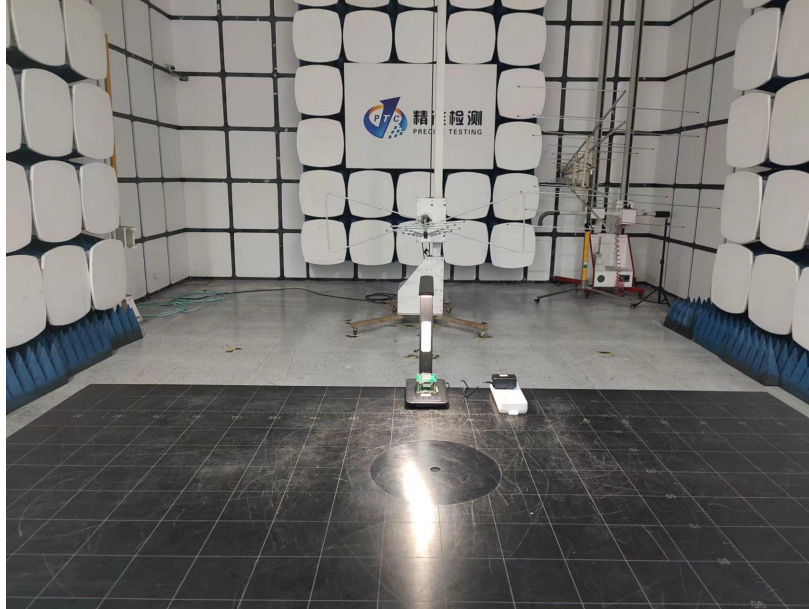


Radiated Spurious Emissions
Test Frequency From 9KHz-30MHz





Test frequency from 30MHz-1000MHz





Report No.: PTC22120605701E-FC01

10 EUT PHOTOS

Please reference "Ext photos" and "Int photos"

*******THE END REPORT*******