FCC TEST REPORT

FCC ID: 2ASJOSH001-2

Product Name	:	Power charging station
Model Name	:	SH001-2
Brand Name	:	PLUGIN
Report No.	:	PTC18113002601E-FC01

Prepared for

Zhongshan kangfu electric appliance Co., Ltd

No.56,Silieyong road,Dongfeng,Zhongshan,Guangdong, China

Prepared by

Dongguan Precise Testing & Certification Corp., Ltd.

Building D, Baoding Technology Park, Guangming Road 2, Guangming Community, Dongcheng District, Dongguan, Guangdong, China

1TEST RESULT CERTIFICATION

Applicant's name	:	Zhongshan kangfu electric appliance Co., Ltd
Address	:	No.56,Silieyong road,Dongfeng,Zhongshan,Guangdong, China
Manufacture's name	:	Zhongshan kangfu electric appliance Co., Ltd
Address	:	No.56,Silieyong road,Dongfeng,Zhongshan,Guangdong, China
Product name	:	Power charging station
Model name	:	SH001-2
Standards	:	FCC CFR47 Part 15C
Test procedure	:	ANSI C63.10:2013
Test Date	:	Mar.04-Mar.28 2019
Date of Issue	:	Mar.29 2019
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:

Leo Yang / Engineer

Technical Manager:

Chris Du / Manager

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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	PASS
Radiated Spurious Emissions	15.209	PASS

3 TEST FACILITY

Dongguan Precise Testing & Certification Corp., Ltd.

Address: Building D, Baoding Technology Park, Guangming Road2, Dongcheng District, Dongguan, Guangdong, China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A-1

4 General Information

4.1 General Description of E.U.T.

Product Name	:	Power charging station
Model Name	:	SH001-2
Operating frequency	:	110-205KHz
Numbers of Channel	:	20 Channels
Antenna Type	:	Inductive Loop Coil Antenna
Antenna Gain	:	0dBi
Type of Modulation	:	ASK
Power supply	:	AC 120V, 60Hz

4.2 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible 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	CH01
Mode 2	CH10
Mode 3	CH20
Mode 4	Keeping TX+Charging mode

For Conducted Emission	
Final Test Mode	Description
Mode 4	Keeping TX+Charging mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH10
Mode 3	CH20

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**0.110**	6	0.135	11	0.160	16	0.185
2	0.115	7	0.140	12	0.165	17	0.190
3	0.120	8	0.145	13	0.170	18	0.195
4	0.125	9	0.150	14	0.175	19	0.200
5	0.130	**10**	**0.155**	15	0.180	20	0.205

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	Sep. 19, 2019
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Sep. 19, 2019
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Sep. 19, 2019

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
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-26.5GHz	Sep.19, 2019
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Sep.19, 2019
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Sep.19, 2019
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Sep.19, 2019
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Sep.19, 2019
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Sep.19, 2019
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Sep.19, 2019
Horn Antenna	SCHWARZBECK	BBHA 9170	9170-181	14GHz-40GHz	Sep.25, 2019
Amplifier	SCHWARZBECK	BBV 9721	9721-205	18GHz-40GHz	Sep.19, 2019
RF Cable	R&S	R204	R21X	1GHz-40GHz	Sep.19, 2019

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Sep. 19, 2019
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	9KHz-300MHz	Sep. 19, 2019
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	9KHz-300MHz	Sep. 19, 2019

5.2 Measurement Uncertainty

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

5.3 Description of Support Units

Equipment	Model No.	Series No.
Adapter	-	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)

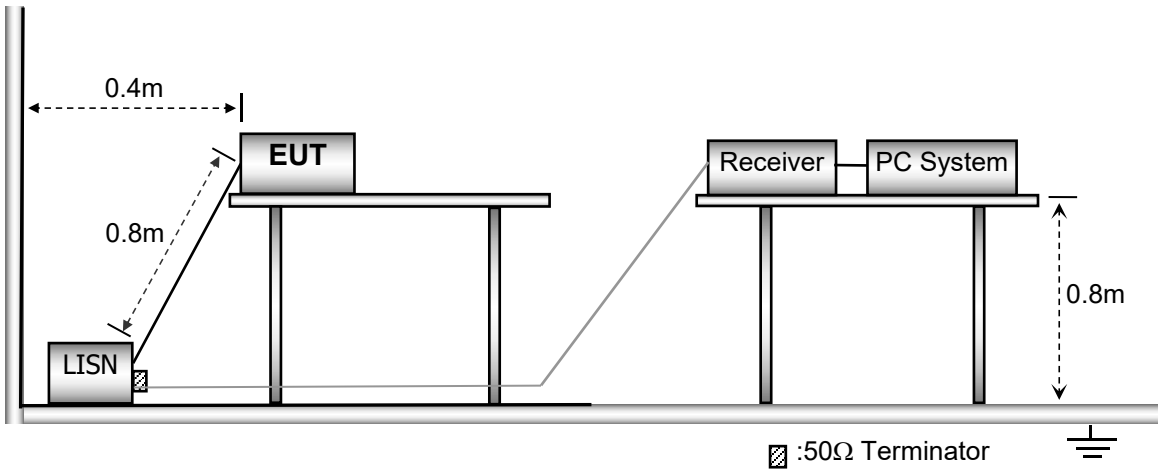
6.1 E.U.T. Operation

Operating Environment **:**

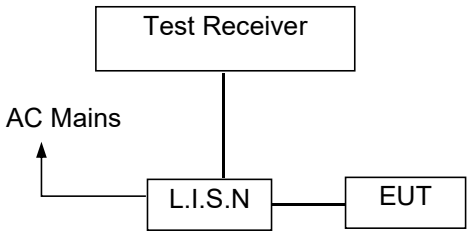
Temperature:	:	25.5 °C
Humidity:	:	51 % RH
Atmospheric Pressure:	:	101.2kPa
Test Voltage	:	AC 120V/60Hz

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.

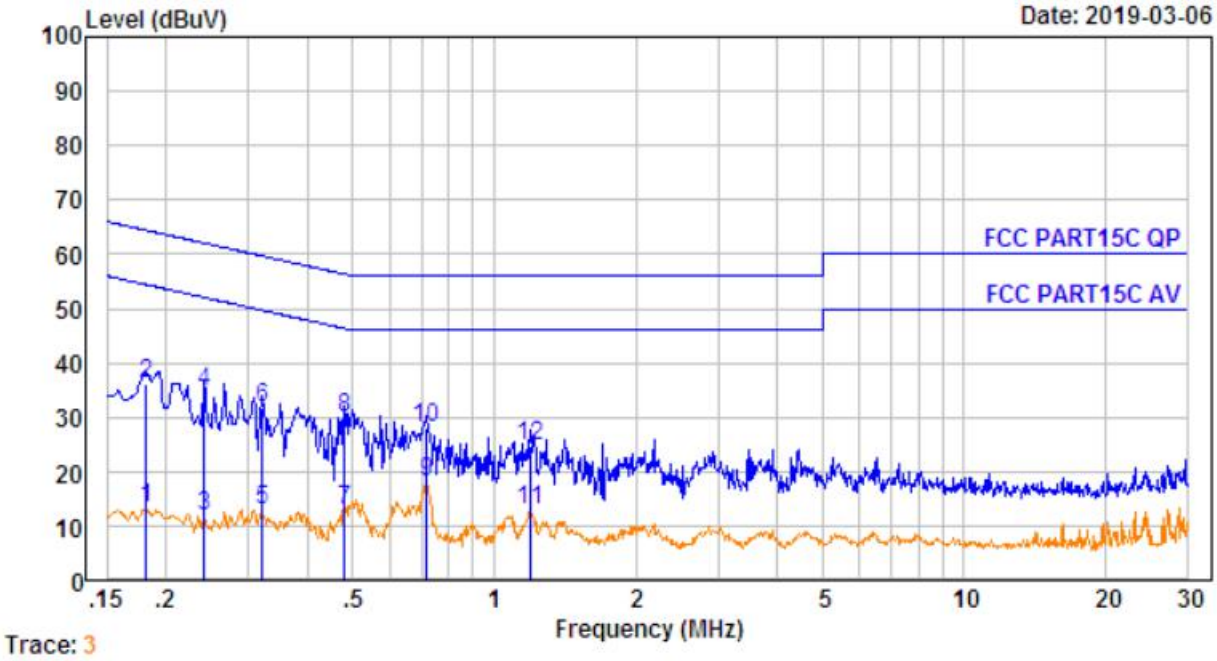
6.6 Measurement Description

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

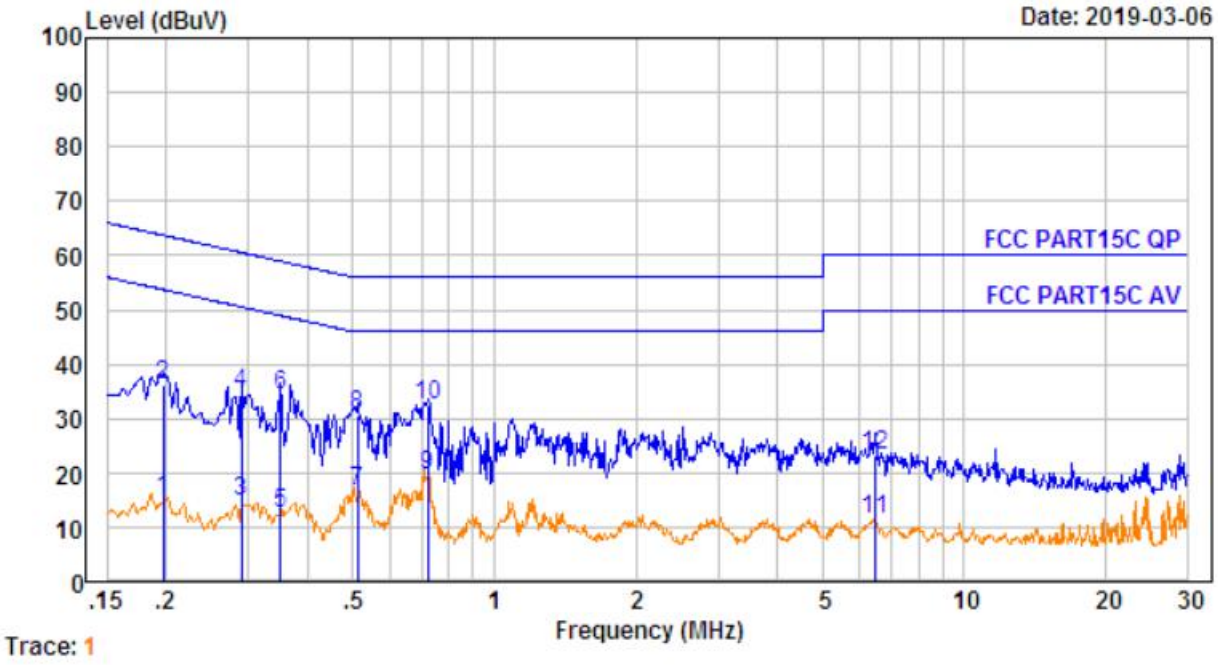
Pass.

Line -120V/60Hz:



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.182	0.25	9.56	3.50	13.31	54.42	-41.11	Average
2.	0.182	0.25	9.56	26.32	36.13	64.42	-28.29	QP
3.	0.242	0.32	9.63	1.78	11.73	52.04	-40.31	Average
4.	0.242	0.32	9.63	24.86	34.81	62.04	-27.23	QP
5.	0.322	0.38	9.69	2.79	12.86	49.66	-36.80	Average
6.	0.322	0.38	9.69	21.73	31.80	59.66	-27.86	QP
7.	0.481	0.43	9.77	2.86	13.06	46.32	-33.26	Average
8.	0.481	0.43	9.77	19.84	30.04	56.32	-26.28	QP
9.	0.720	0.44	9.80	7.90	18.14	46.00	-27.86	Average
10.	0.720	0.44	9.80	17.82	28.06	56.00	-27.94	QP
11.	1.197	0.46	9.83	2.55	12.84	46.00	-33.16	Average
12.	1.197	0.46	9.83	14.53	24.82	56.00	-31.18	QP

Neutral -120V/60Hz:



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.198	0.28	9.62	5.33	15.23	53.71	-38.48	Average
2.	0.198	0.28	9.62	26.29	36.19	63.71	-27.52	QP
3.	0.289	0.36	9.70	4.64	14.70	50.54	-35.84	Average
4.	0.289	0.36	9.70	24.80	34.86	60.54	-25.68	QP
5.	0.350	0.39	9.74	2.25	12.38	48.96	-36.58	Average
6.	0.350	0.39	9.74	24.28	34.41	58.96	-24.55	QP
7.	0.513	0.43	9.81	6.53	16.77	46.00	-29.23	Average
8.	0.513	0.43	9.81	20.56	30.80	56.00	-25.20	QP
9.	0.724	0.44	9.83	9.23	19.50	46.00	-26.50	Average
10.	0.724	0.44	9.83	22.20	32.47	56.00	-23.53	QP
11.	6.488	0.54	9.98	0.87	11.39	50.00	-38.61	Average
12.	6.488	0.54	9.98	12.89	23.41	60.00	-36.59	QP

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(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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

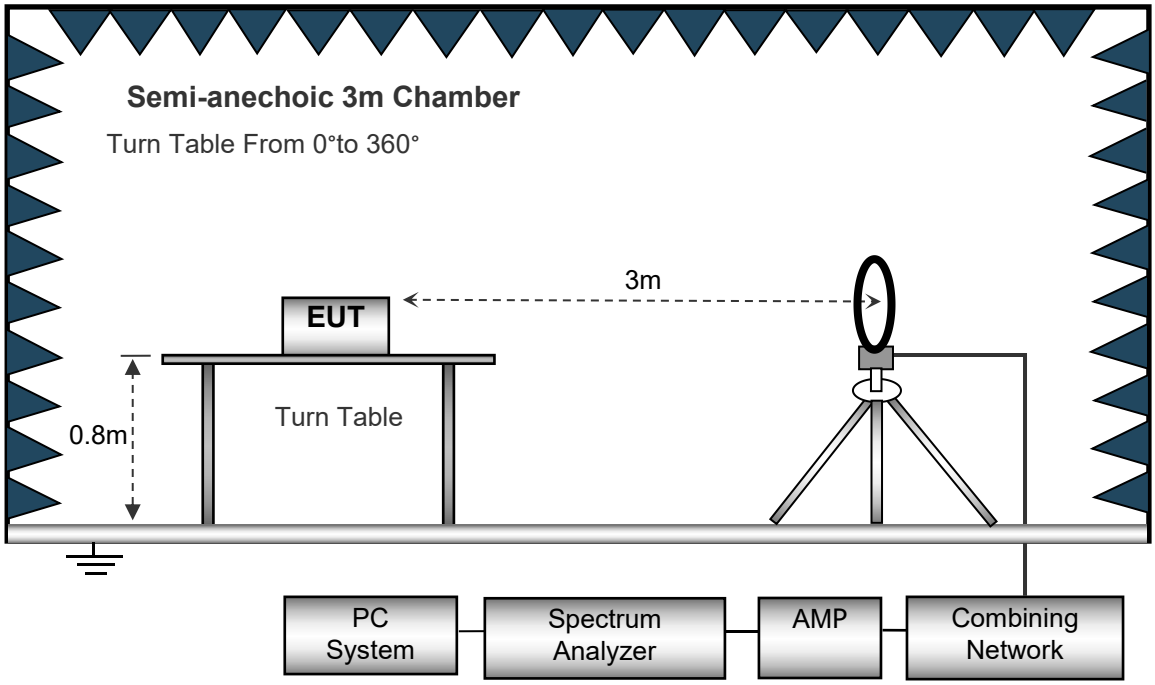
Humidity : 51.1 % RH

Atmospheric Pressure : 101.2kPa

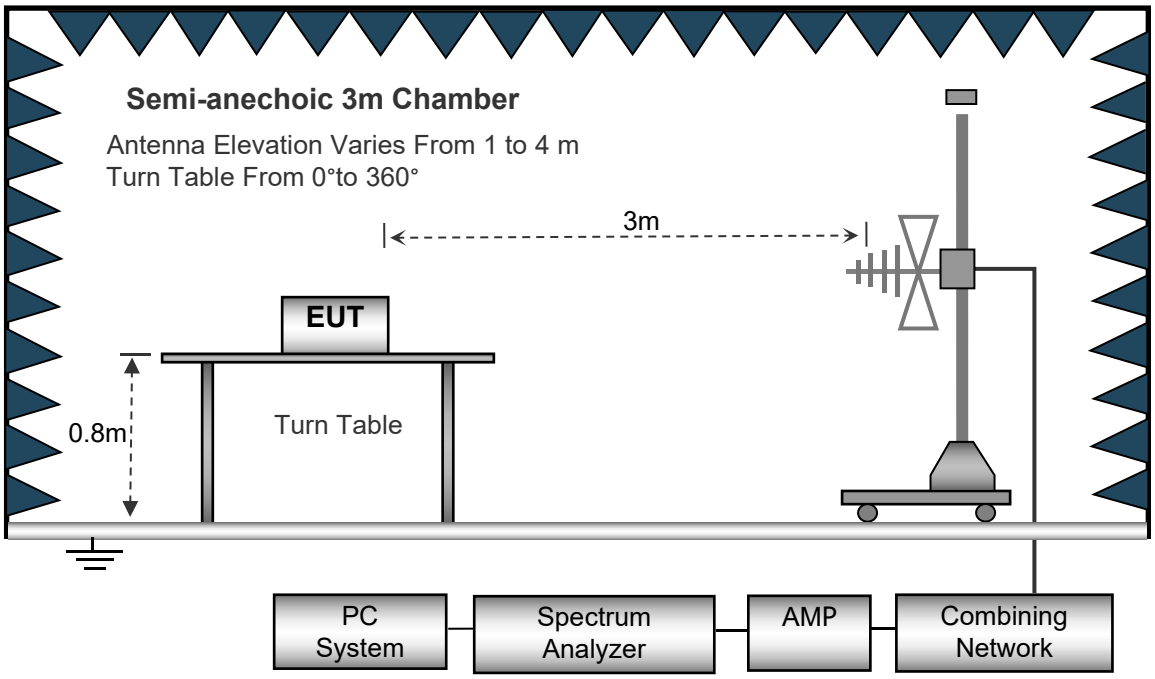
7.2 Test Setup

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

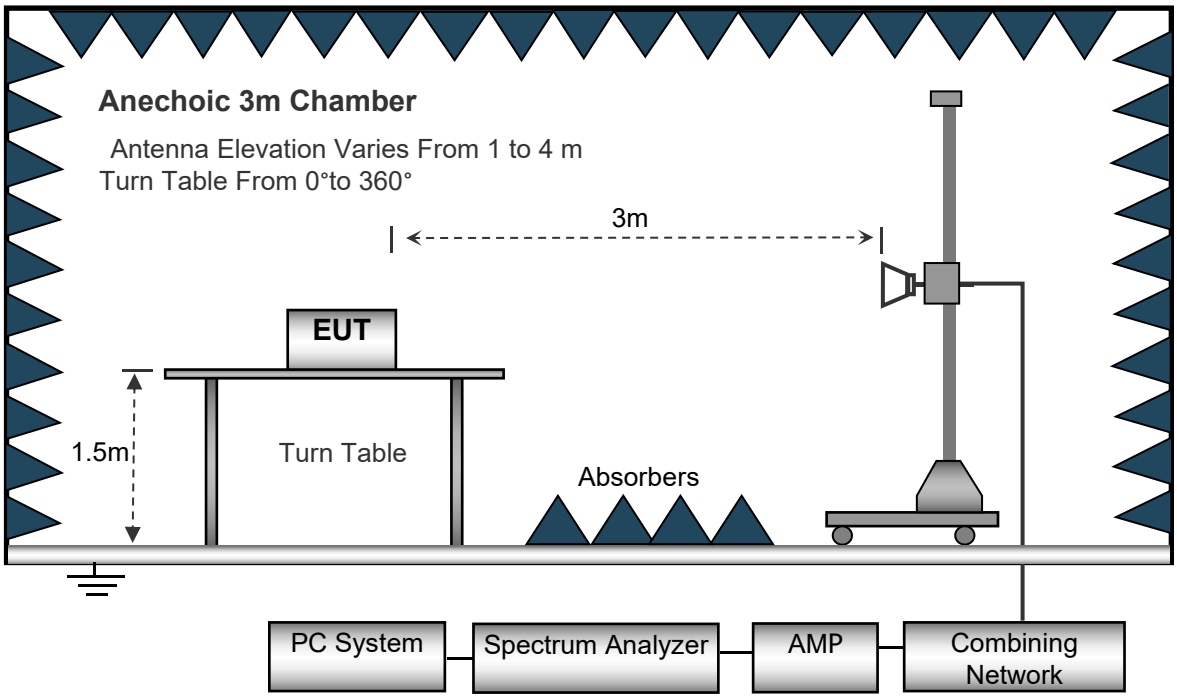
The test setup for emission measurement below 30MHz.



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.

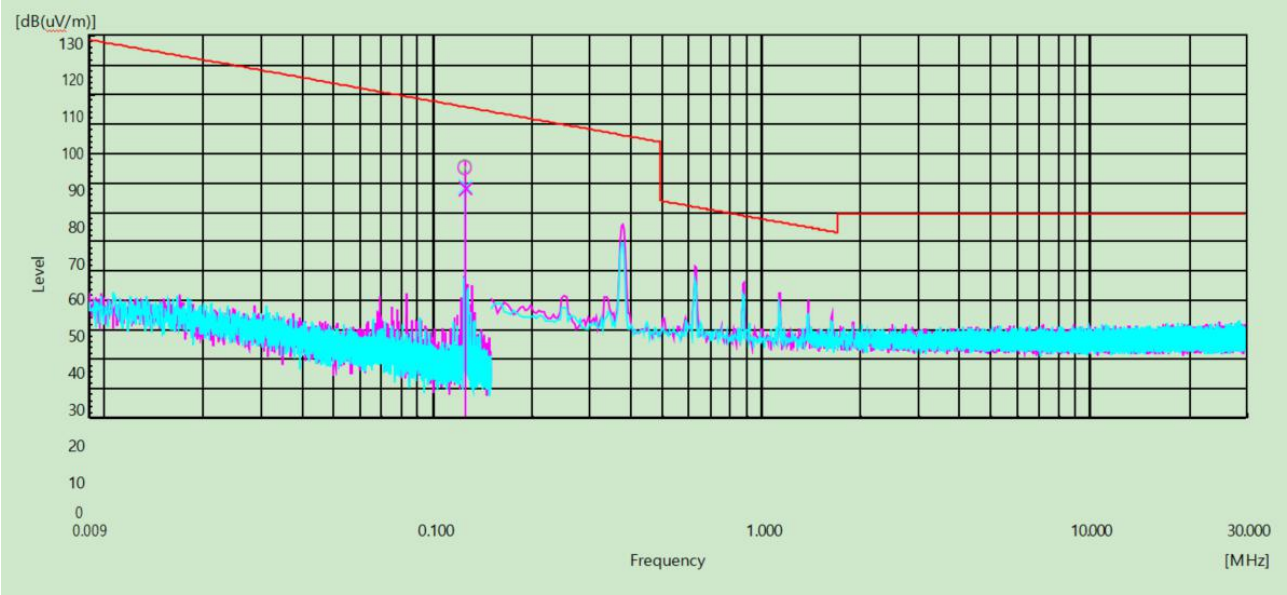
7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.

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



requency [MHz]	Reading [dB(μV)]	Pol. [V/H]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	3m Field Strength [dB(μV/m)]	Result at 300m [dB(μV/m)]	Limit at 300m [dB(μV/m)]	Margin [dB]
0.125	96.80	H	0.55	-32.76	19.91	-12.30	84.50	4.50	25.67	21.17
0.126	90.60	V	0.55	-32.76	19.91	-12.30	78.30	-1.70	25.60	27.30

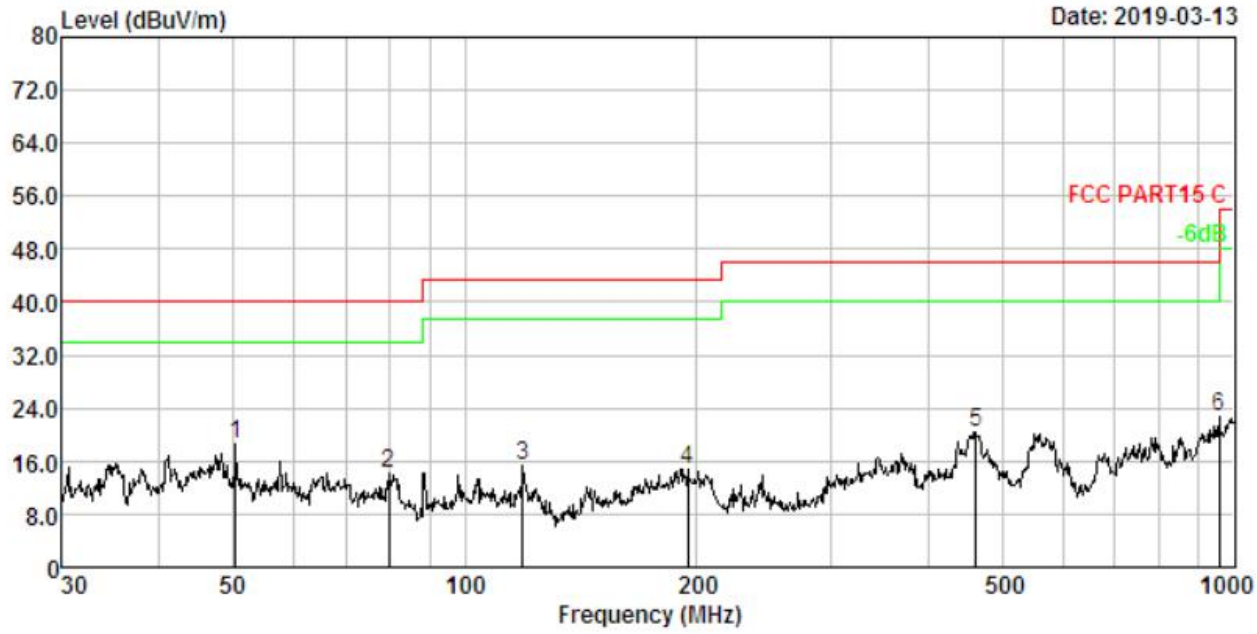
Note1. Factor = Cable loss + Amp gain + Antenna factor Note2. According to §15.31 (f)(2);

Result at 300 m (dBμV/m) = 3 m Field Strength Result (dBμV/m) - 40log(300/3) (dBμV/m).

Note3. The limit above was calculated based on table of §15.209 (a).

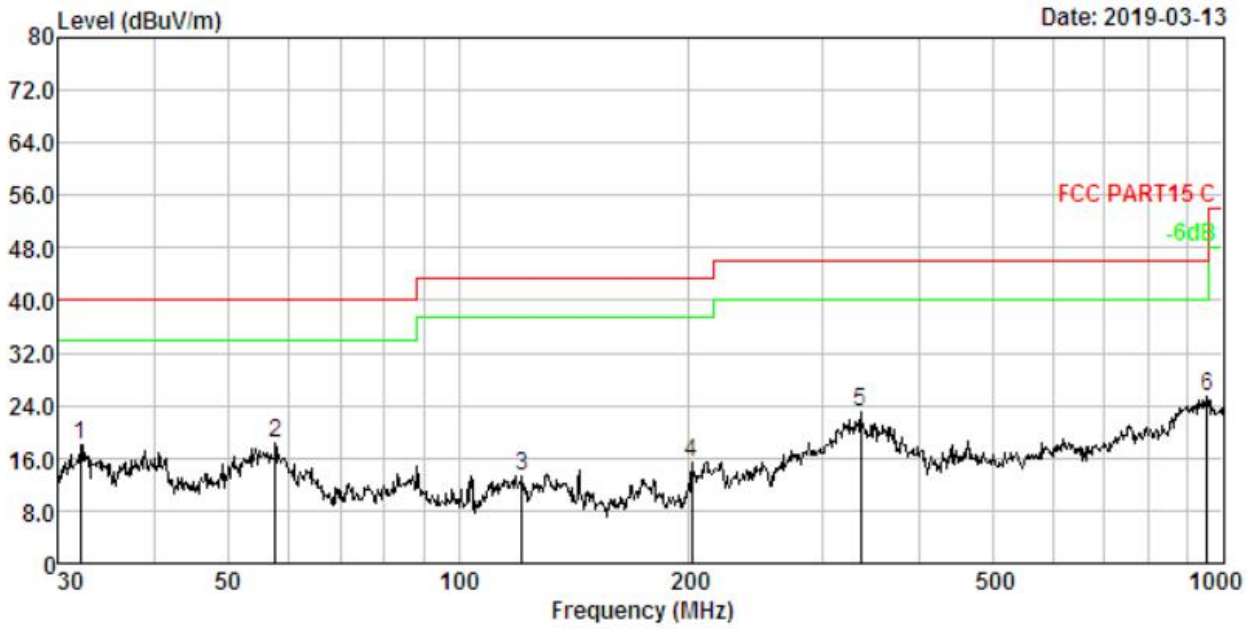
Test Frequency: 30MHz ~ 1GHz

Horizontal:



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	50.409	1.52	12.24	35.09	30.15	18.70	40.00	-21.30	QP
2.	79.800	1.94	8.81	33.79	30.31	14.23	40.00	-25.77	QP
3.	119.018	2.30	11.94	31.62	30.45	15.41	43.50	-28.09	QP
4.	195.137	2.75	10.73	31.96	30.62	14.82	43.50	-28.68	QP
5.	462.346	3.53	16.56	31.29	30.92	20.46	46.00	-25.54	QP
6.	955.438	4.19	23.43	26.34	31.17	22.79	46.00	-23.21	QP

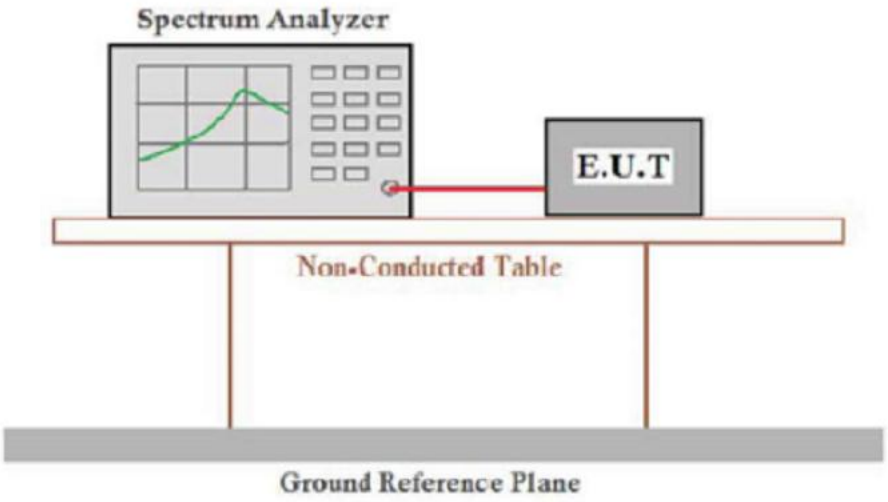
Vertical:



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	32.067	1.12	13.22	33.79	29.99	18.14	40.00	-21.86	QP
2.	57.594	1.65	12.04	34.90	30.20	18.39	40.00	-21.61	QP
3.	121.123	2.32	12.10	29.37	30.46	13.33	43.50	-30.17	QP
4.	202.100	2.78	10.42	32.91	30.63	15.48	43.50	-28.02	QP
5.	336.035	3.24	14.00	36.51	30.81	22.94	46.00	-23.06	QP
6.	952.094	4.19	23.43	28.80	31.17	25.25	46.00	-20.75	QP

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 altemative 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 deomonstrated by measuring the radiated emissions.

8.4 Result

Pass.


Center Freq 125.000 kHz
Center Freq: 125.000 kHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 125 kHz
#Res BW 1 kHz
#VBW 3 kHz
Span 10 kHz
Sweep 9.6 ms
Occupied Bandwidth
2.419 kHz
Total Power
1.02 dBm
Transmit Freq Error
4 Hz
OBW Power
99.00 %
x dB Bandwidth
2.850 kHz
x dB
-20.00 dB

9 Antenna Requirement

9.1 Regulation

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

9.2 Result

-Complied

The transmitter has permanently attached Loop Coil antenna (internal antenna) on board.

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