

FCC TEST REPORT

FCC ID: 2BOGS-SL

Report No. : SSP25030259-1E

Applicant : Shenzhen Shenlong Zhantuo Electronics Co., Ltd

Product Name : Electric bicycle instrument panel

Model Name : SL-P8NFC

Test Standard : FCC Part 15.225

Date of Issue : 2025-04-07







Shenzhen CCUT Quality Technology Co., Ltd.

1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen,
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This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.

Test Report Basic Information

Applicant:	Shenzhen Shenlong Zhantuo Electronics Co., Ltd 3rd Floor, Building A, Tongzhou Industrial Park, Lisonglang Community, Address of Applicant.....: Gongming Street, Guangming District, Shenzhen City, Guangdong Province	
Manufacturer:	Shenzhen Shenlong Zhantuo Electronics Co., Ltd 3rd Floor, Building A, Tongzhou Industrial Park, Lisonglang Community, Address of Manufacturer.....: Gongming Street, Guangming District, Shenzhen City, Guangdong Province	
Product Name:	Electric bicycle instrument panel	
Brand Name:	-	
Main Model:	SL-P8NFC	
Series Models:	SL-P6NFC, SL-P10NFC, SL-M5NFC, SL-609NFC, SL-206NFC, SL-611NFC, SL-611PNFC, SL-611SNFC, SL-P8NFC, SL-175	
Test Standard:	FCC Part 15 Subpart C ANSI C63.4-2014 ANSI C63.10-2013	
Date of Test	2025-03-24 to 2025-03-26	
Test Result:	PASS	
Tested By	 (Tate Chen)	
Reviewed By:	 (Lieber Ouyang)	
Authorized Signatory:	 (Lahm Peng)	
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Revision History

Revision	Issue Date	Description	Revised By
V1.0	2025-04-07	Initial Release	Lahm Peng

1. General Information

1.1 Product Information

Product Name:	Electric bicycle instrument panel
Trade Name:	-
Main Model:	SL-P8NFC
Series Models:	SL-P6NFC, SL-P10NFC, SL-M5NFC, SL-609NFC, SL-206NFC, SL-611NFC, SL-611PNFC, SL-611SNFC, SL-P8NFC, SL-175
Rated Voltage:	DC 22-60V
Test Sample No:	SSP25030259-1
Hardware Version:	V1.0
Software Version:	V1.0
Note 1: The test data is gathered from a production sample, provided by the manufacturer.	

Wireless Specification	
Wireless Standard:	RFID
Operating Frequency:	13.56MHz
Max. Field Strength:	58.79dBuV/m
Modulation:	FSK
Antenna Gain:	0dBi
Type of Antenna:	Loop Antenna
Type of Device:	<input type="checkbox"/> Portable Device <input checked="" type="checkbox"/> Mobile Device <input type="checkbox"/> Modular Device

1.2 Test Setup Information

List of Test Modes			
Test Mode	Description	Remark	
TM1	Transmitting	13.56MHz	
List and Details of Auxiliary Cable			
Description	Length (cm)	Shielded/Unshielded	With/Without Ferrite
-	-	-	-
List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
-	-	-	-

1.3 Compliance Standards

Compliance Standards	
FCC Part 15 Subpart C	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Intentional Radiators
All measurements contained in this report were conducted with all above standards	
According to standards for test methodology	
FCC Part 15 Subpart C	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Intentional Radiators
ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.
ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

1.4 Test Facilities

Laboratory Name:	Shenzhen CCUT Quality Technology Co., Ltd. 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China
CNAS Laboratory No.:	L18863
A2LA Certificate No.:	6893.01
FCC Registration No:	583813
FCC Designation No.:	CN1373
ISED Registration No.:	CN0164
All measurement facilities used to collect the measurement data are located at 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China.	

1.5 List of Measurement Instruments

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Conducted Emissions					
AMN	ROHDE&SCHWARZ	ENV216	101097	2024-08-07	2025-08-06
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100242	2024-08-07	2025-08-06
Test Cable	N/A	Cable 5	N/A	2024-08-07	2025-08-06
EMI Test Software	FARA	EZ-EMC	EMEC-3A1+	N/A	N/A
Radiated Emissions					
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100154	2024-08-07	2025-08-06
Spectrum Analyzer	KEYSIGHT	N9020A	MY48030972	2024-08-07	2025-08-06
Amplifier	SCHWARZBECK	BBV 9743B	00251	2024-08-07	2025-08-06
Amplifier	HUABO	YXL0518-2.5-45	--	2024-08-07	2025-08-06
Attenuator	QUANJUDA	6dB	220731	2024-08-07	2025-08-06
Loop Antenna	DAZE	ZN30900C	21104	2024-08-03	2025-08-02
Broadband Antenna	SCHWARZBECK	VULB 9168	01320	2024-08-03	2025-08-02
Horn Antenna	SCHWARZBECK	BBHA 9120D	02553	2024-08-03	2025-08-02
Test Cable	N/A	Cable 1	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 2	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 3	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 4	N/A	2024-08-07	2025-08-06
EMI Test Software	FARA	EZ-EMC	FA-03A2 RE+	N/A	N/A
Conducted RF Testing					
RF Test System	MWRFTTest	MW100-RFCB	220418SQS-37	2024-08-07	2025-08-06
Spectrum Analyzer	KEYSIGHT	N9020A	ATO-90521	2024-08-07	2025-08-06
Signal Generator	Agilent	N5182A	MY47071192	2024-08-07	2025-08-06
Radio Tester	ROHDE&SCHWARZ	CMW500	2K50-126968	2024-08-07	2025-08-06

1.6 Measurement Uncertainty

Test Item	Conditions	Uncertainty
Conducted Emissions	9kHz ~ 30MHz	±1.64 dB
Radiated Emissions	9kHz ~ 30MHz	±2.88 dB
	30MHz ~ 1GHz	±3.32 dB
	1GHz ~ 18GHz	±3.50 dB
	18GHz ~ 40GHz	±3.66 dB
Frequency Stability	9kHz ~ 26GHz	±0.16 ppm
Occupied Bandwidth	9kHz ~ 26GHz	±4.0 %
DC Voltage	DC 0~30V	±0.1 %
Temperature	-40~50℃	±0.3℃

2. Summary of Test Results

FCC Rule	Description of Test Item	Result
FCC Part 15.203	Antenna Requirement	Passed
FCC Part 15.207	Conducted Emissions	N/A
FCC Part 15.209, 15.225(a)	Radiated Emissions	Passed
FCC Part 15.225(b)(c)	Out of Band Emissions	Passed
FCC Part 15.225(e)	Frequency Stability	Passed
FCC Part 15.215(c)	Occupied Bandwidth	Passed
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: Not applicable		

3. Antenna Requirement

3.1 Standard and Limit

According to FCC Part 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.

3.2 Test Result

This product has an Loop antenna, fulfill the requirement of this section.

4. Radiated Emissions

4.1 Standard and Limit

According to §15.225(a), The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15848 microvolts/meter at 30 meters.

According to §15.225(d) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

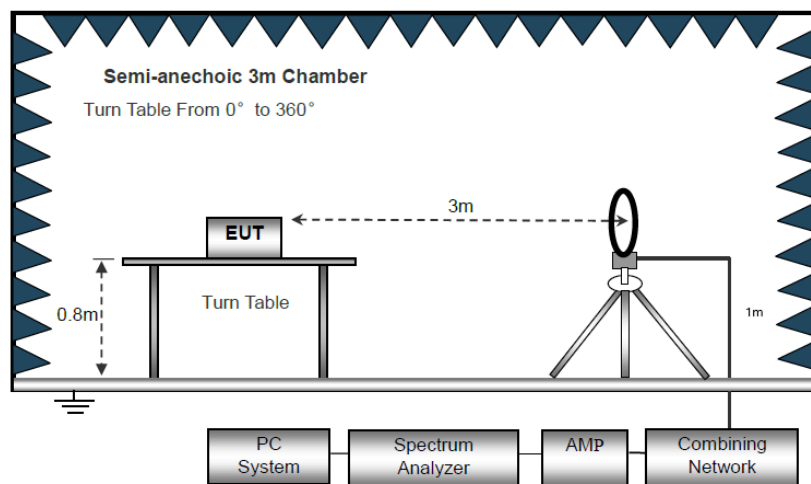
According to the rule FCC Part 15.209, Radiated emission limit for a wireless device as below:

Frequency of Emission (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3
Note: The more stringent limit applies at transition frequencies.		

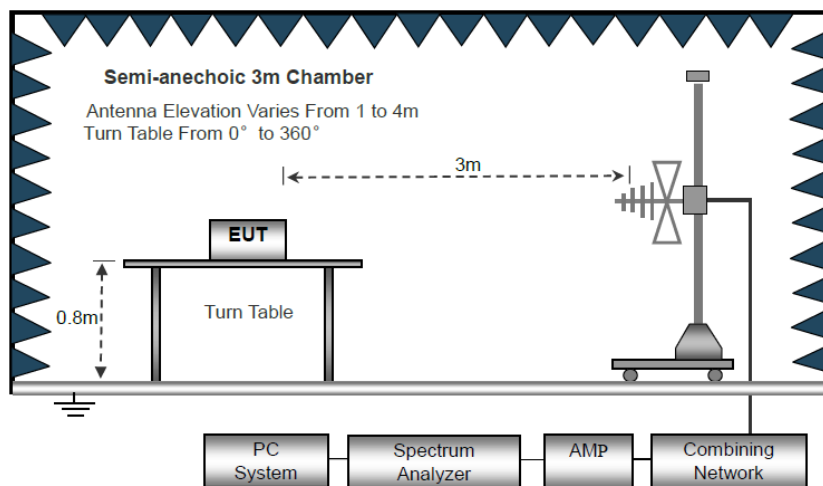
Note: Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

4.2 Test Procedure

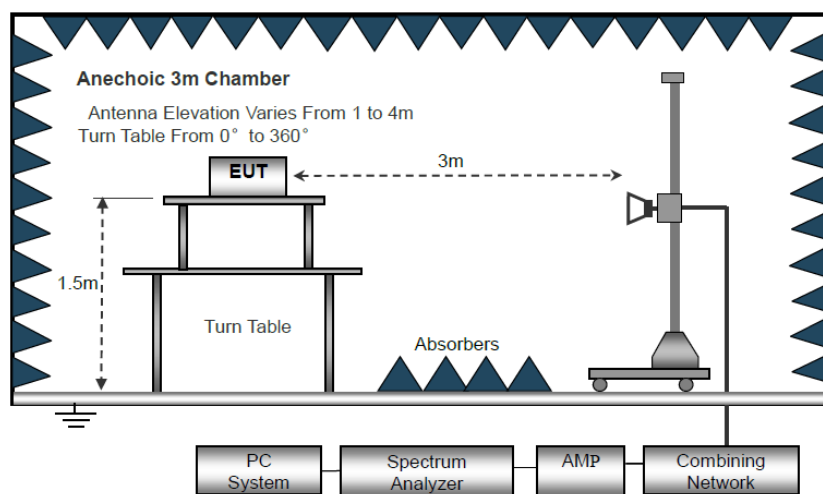
Test is conducting under the description of ANSI C63.10 - 2013 section 6.3 to 6.6.



Block Diagram of Radiated Emission Below 30MHz



Block Diagram of Radiated Emission From 30MHz to 1GHz



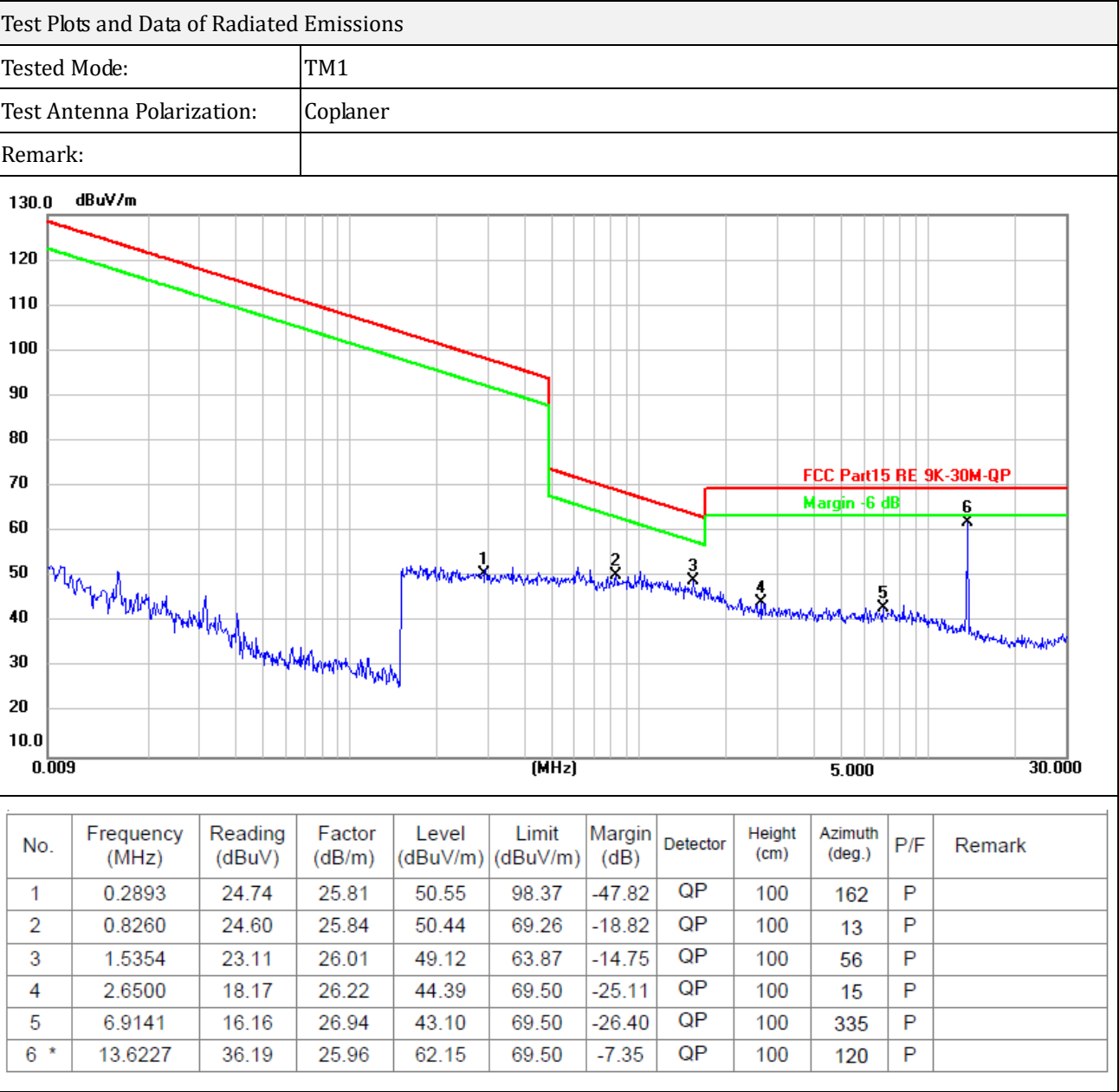
Block Diagram of Radiated Emission Above 1GHz

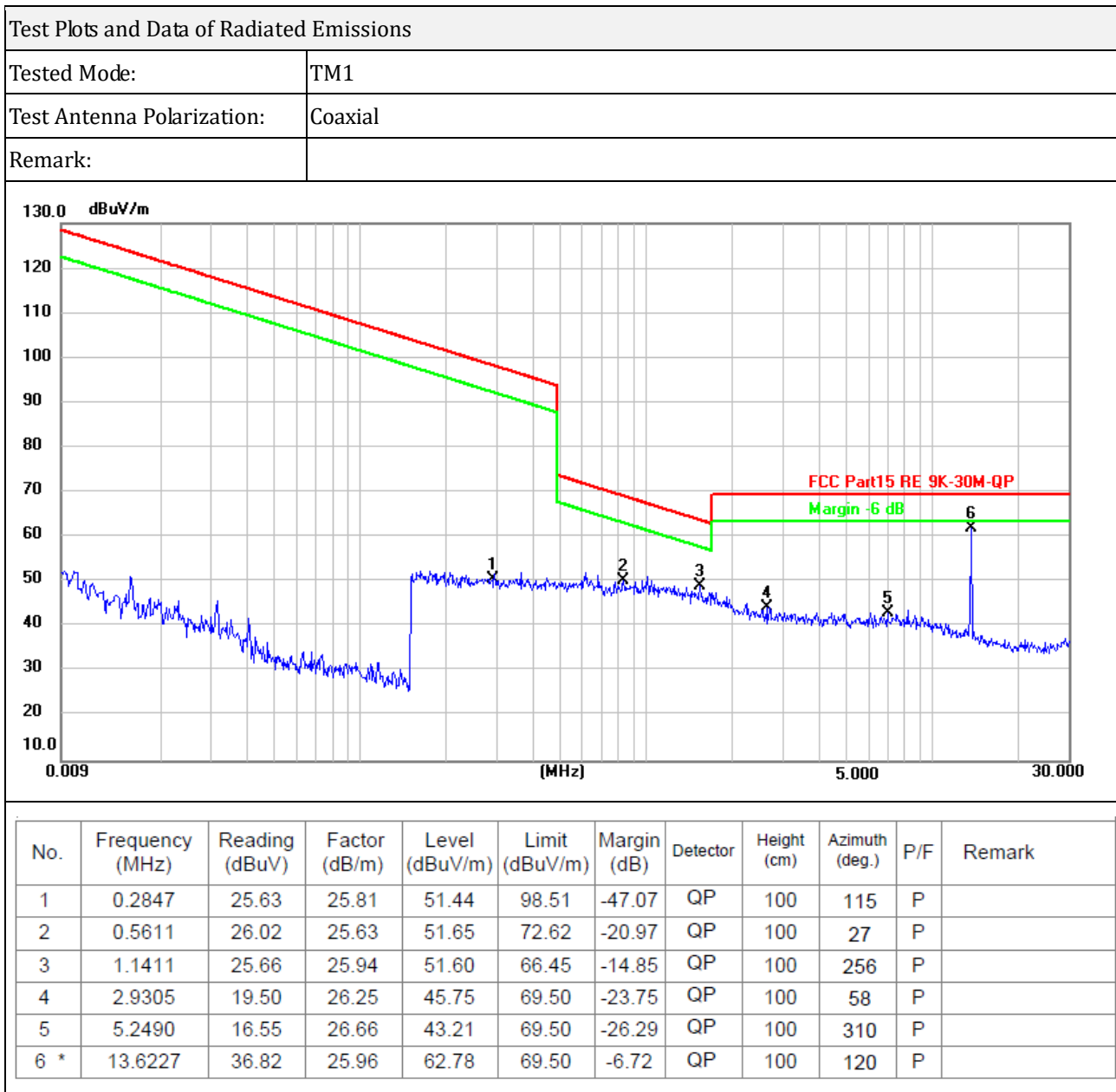
- a) The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.
- b) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- c) Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for $f \geq 1\text{GHz}$, 100 kHz for $f < 1\text{GHz}$, 10kHz for $f < 30\text{MHz}$
VBW \geq RBW, Sweep = auto
Detector function = peak
Trace = max hold
- d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- e) The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.
- f) For the actual test configuration, please refer to the related item - EUT test photos.

4.3 Test Data and Results

Based on all tested data, the EUT complied with the FCC Part 15.225 standard limit for a wireless device, and with the worst case as below:

Remark: Level = Reading + Factor, Margin = Level - Limit





Note 1: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Note 2: Testing is carried out with frequency rang 9kHz to the tenth harmonics. The measurements greater than 20dB below the limit from 9kHz to 30MHz.

Note 3: For 9kHz-30MHz, Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

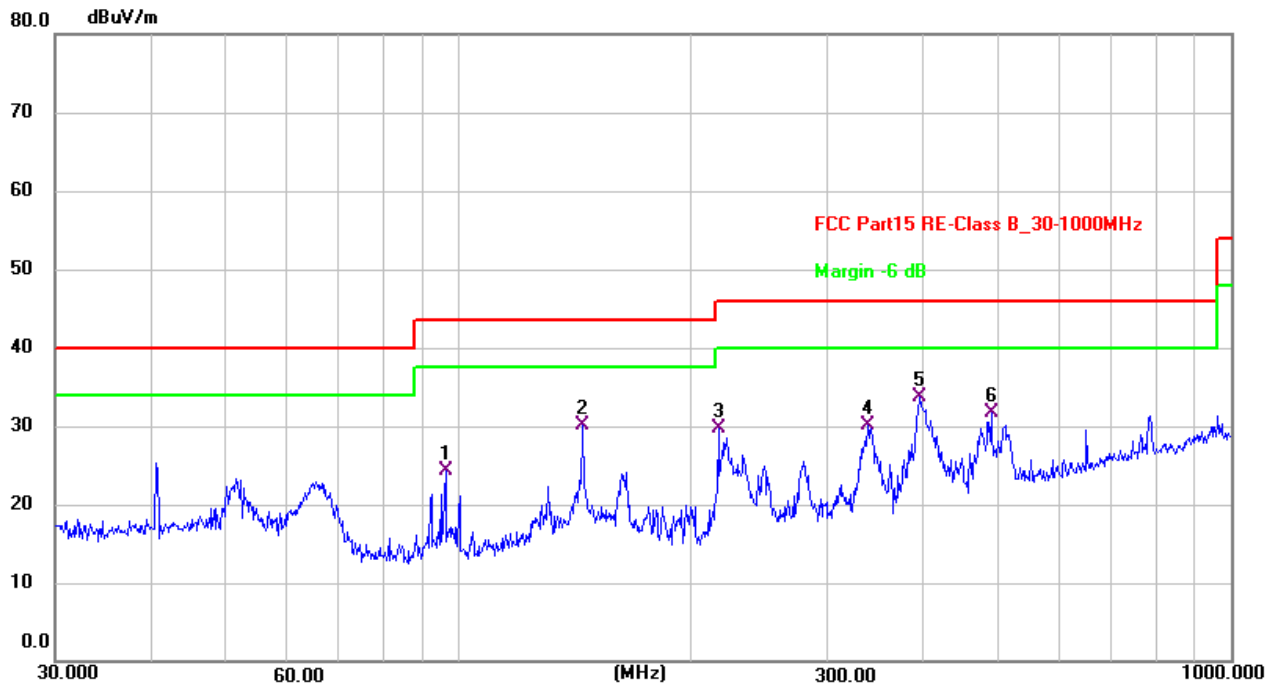
Limit line = specific limits (dBuV) + distance extrapolation factor.

Radiated Emission Test Data (30MHz to 1GHz)

Tested Mode: TM1

Test Antenna Polarization: Horizontal

Remark:



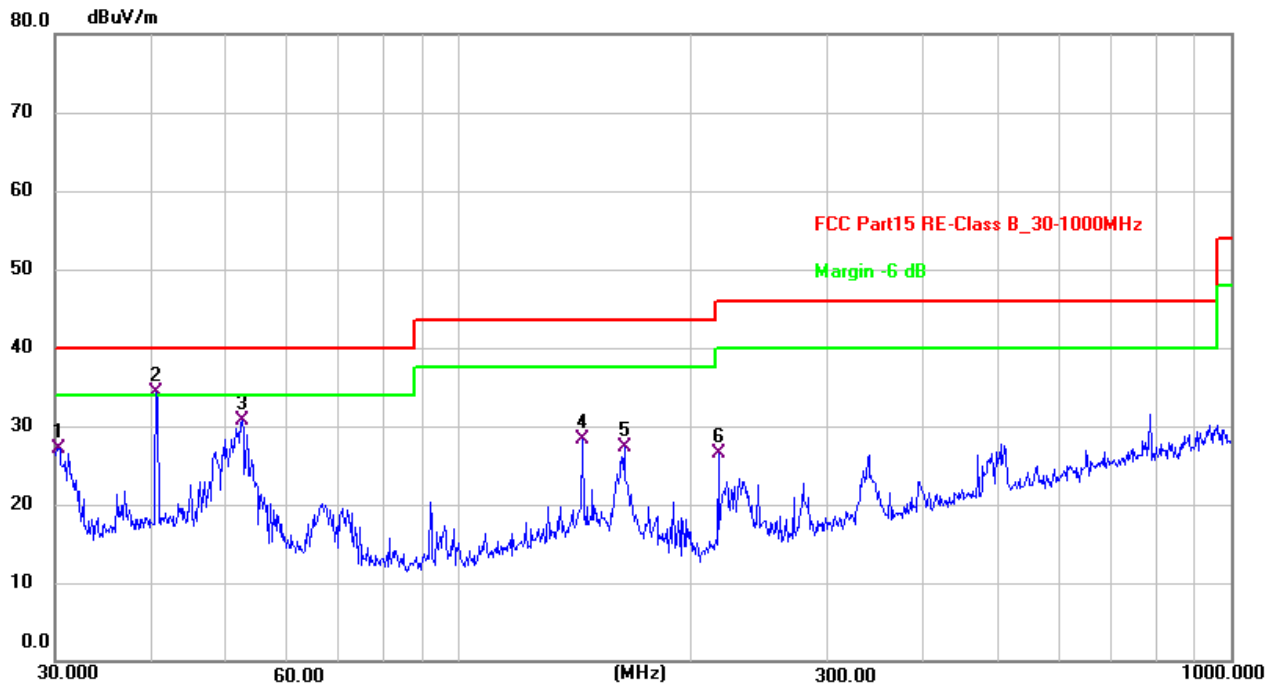
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	96.0986	36.86	-12.53	24.33	43.50	-19.17	QP	199	19	P	
2	144.8418	38.01	-7.99	30.02	43.50	-13.48	QP	199	349	P	
3	216.7828	41.55	-11.84	29.71	46.00	-16.29	QP	100	12	P	
4	338.4001	37.26	-7.24	30.02	46.00	-15.98	QP	100	355	P	
5 *	394.8545	39.40	-5.74	33.66	46.00	-12.34	QP	100	12	P	
6	489.0269	35.29	-3.54	31.75	46.00	-14.25	QP	199	349	P	

Radiated Emission Test Data (30MHz to 1GHz)

Tested Mode: TM1

Test Antenna Polarization: Vertical

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	30.3173	36.10	-8.91	27.19	40.00	-12.81	QP	100	241	P	
2 *	40.5591	42.52	-8.30	34.22	40.00	-5.78	QP	100	88	P	
3	52.3912	39.43	-8.76	30.67	40.00	-9.33	QP	100	115	P	
4	144.8418	36.29	-7.99	28.30	43.50	-15.20	QP	100	280	P	
5	163.7550	35.42	-8.21	27.21	43.50	-16.29	QP	100	185	P	
6	216.7828	38.32	-11.84	26.48	46.00	-19.52	QP	100	308	P	

5. Band-edge Emissions

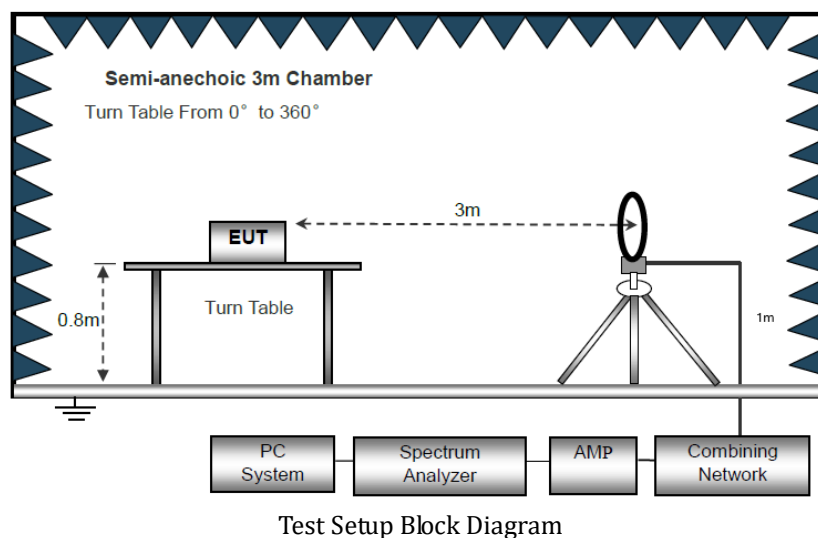
5.1 Standard and Limit

According to FCC 15.225 (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

According to FCC 15.225 (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

5.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.3 to 6.4 and section 6.10.



As the radiated emissions testing, set the RBW=10kHz VBW=30kHz, observed the outside band of 13.11MHz to 14.01MHz, than mark the higher-level emission for comparing with the FCC rules.

6.3 Test Data and Results

Based on all tested data, the EUT complied with the FCC Part 15.225 standard limit, and with the worst case as below:

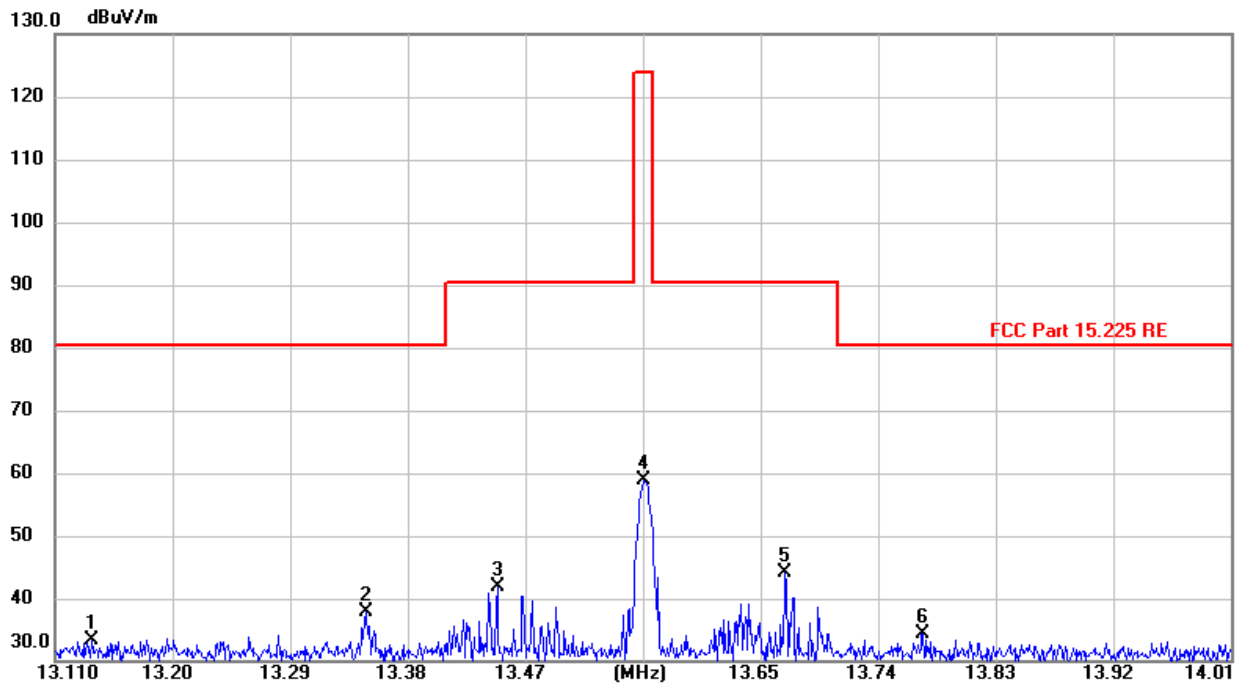
Remark: Level = Reading + Factor, Margin = Level - Limit

Test Plots and Data of Out of Band Emissions

Tested Mode: TM1

Test Antenna Polarization: Coplaner

Remark:



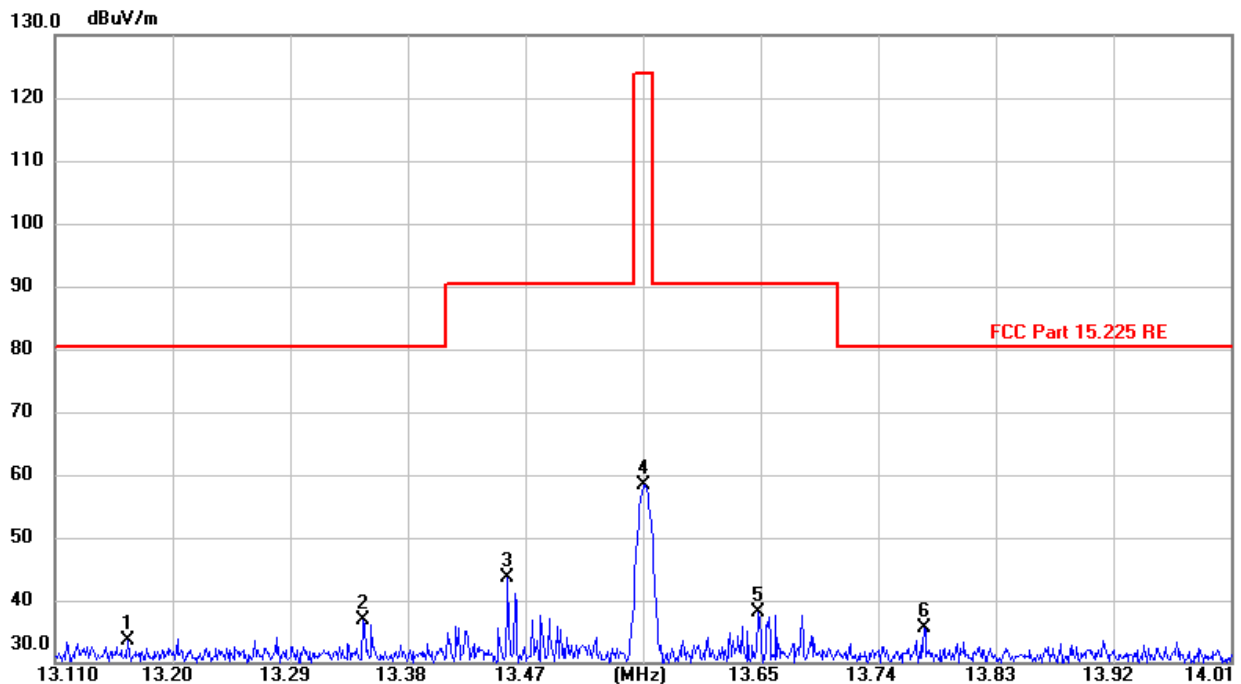
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	13.1380	13.43	19.84	33.27	80.50	-47.23	QP	100	11	P	
2 *	13.3475	18.00	19.82	37.82	80.50	-42.68	QP	100	29	P	
3	13.4481	22.15	19.80	41.95	90.47	-48.52	QP	100	351	P	
4	13.5610	39.01	19.78	58.79	124.00	-65.21	QP	100	128	P	
5	13.6690	24.25	19.77	44.02	90.47	-46.45	QP	100	89	P	
6	13.7742	14.74	19.75	34.49	80.50	-46.01	QP	100	67	P	

Test Plots and Data of Out of Band Emissions

Tested Mode: TM1

Test Antenna Polarization: Coaxial

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	13.1658	13.77	19.83	33.60	80.50	-46.90	QP	100	26	P	
2 *	13.3458	16.99	19.82	36.81	80.50	-43.69	QP	100	57	P	
3	13.4565	23.86	19.79	43.65	90.47	-46.82	QP	100	338	P	
4	13.5610	38.50	19.78	58.28	124.00	-65.72	QP	100	196	P	
5	13.6480	18.31	19.78	38.09	90.47	-52.38	QP	100	48	P	
6	13.7751	15.79	19.75	35.54	80.50	-44.96	QP	100	241	P	

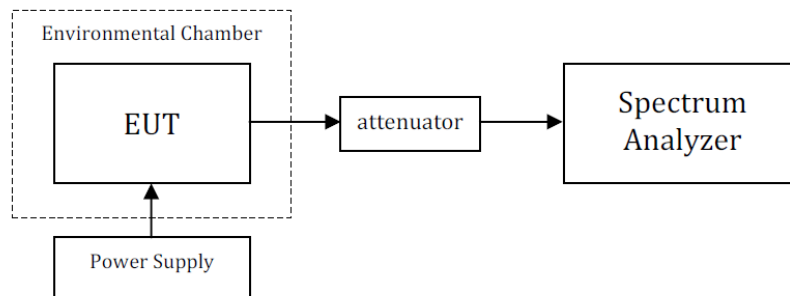
6. Frequency Stability

6.1 Standard and Limit

According to 15.225(e) 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.

6.2 Test Procedure

Test is conducting under the description of ANSI C63.10-2013 section 6.8.



Test Setup Block Diagram

6.3 Test Data and Results

Reference Frequency: 13.56MHz, Limit: 100ppm			
Temperature (°C)	Power Supplied (VDC)	Frequency Error	
		Error (Hz)	Error (ppm)
50	32	165	12.17
40	32	137	10.1
30	32	122	9.0
20	32	113	8.33
10	32	96	7.08
0	32	81	5.97
-10	32	77	5.68
-20	32	63	4.65

Reference Frequency: 13.56MHz, Limit: 100ppm			
Temperature (°C)	Power Supplied (VDC)	Frequency Error	
		Error (Hz)	Error (ppm)
20	28.8	108	7.96
	35.2	103	7.6

7. Occupied Bandwidth

7.1 Standard and Limit

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

7.2 Test Procedure

According to the ANSI 63.10-2013, section 6.9, the emission bandwidth test method as follows.

- 1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
 - 2) Set the spectrum analyzer to any one measured frequency within its operating range.
 - 3) Set RBW = 9.1Hz, VBW = 91Hz, Sweep = Auto.
 - 4) Set a reference level on the measuring instrument equal to the highest peak value.
 - 5) Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level.
- Record the frequency difference as the emission bandwidth.

All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

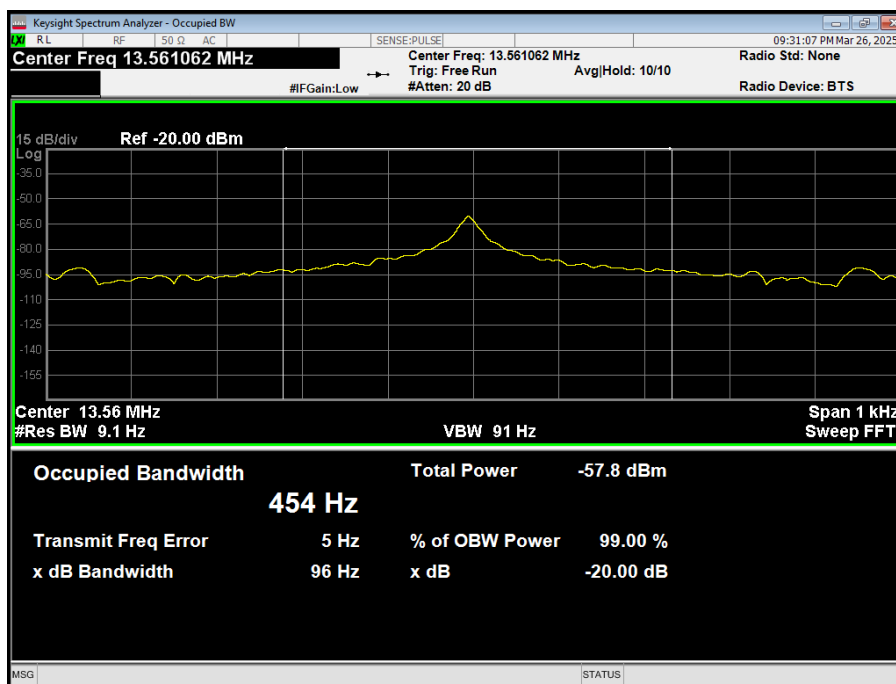


Test Setup Block Diagram

7.3 Test Data and Results

Test Frequency	20dB Bandwidth	99% Bandwidth
13.56MHz	96Hz	454Hz

Test Plots of Occupied Bandwidth



***** END OF REPORT *****