

Test Report

Report No.: MTi240120009-01E1

Date of issue: 2024-01-22

Applicant: Guangdong World Precision Technology Co., Ltd.

Product: DCRF (Device Charge & Recognition Fixture)

Model(s): TE-072-A808-00000

FCC ID: 2BD9P-TE072A808

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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Test Result Certification	
Applicant:	Guangdong World Precision Technology Co., Ltd.
Address:	No. 6 Wanjiang Section, Gangkou Avenue, Wanjiang Subdistrict, Dongguan City, Guangdong Province, China.523061
Manufacturer:	Guangdong World Precision Technology Co., Ltd.
Address:	No. 6 Wanjiang Section, Gangkou Avenue, Wanjiang Subdistrict, Dongguan City, Guangdong Province, China.523061
Product description	
Product name:	DCRF (Device Charge & Recognition Fixture)
Trade mark:	N/A
Model name:	TE-072-A808-00000
Series Model:	N/A
Standards:	47 CFR Part 15C
Test Method:	ANSI C63.10-2013
Date of Test	
Date of test:	2023-08-23 to 2023-09-14 2023-12-25 to 2024-01-10
Test result:	Pass

Note: The report changes the fixture back plate with heat dissipation hole, plastic shell material ABS changed to flame-retardant PC. Only low-frequency radiation was tested for difference, the rest of the data is cited in the original report MTi230810014-03E1(date 2023-11-06).

Test Engineer	:	
		(Maleah Deng)
Reviewed By	:	
		(Leon Chen)
Approved By	:	
		(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	DCRF (Device Charge & Recognition Fixture)
Model name:	TE-072-A808-00000
Series Model:	N/A
Model difference:	N/A
Electrical rating:	Input: AC 100-240 V Wireless Output: 5W, 7.5W
Accessories:	N/A
Hardware version:	V1.0
Software version:	V1.0
Test sample(s) number:	MTi230810014-03S1001 MTi240120009-01S1001
RF specification	
Operating frequency range:	Transmitter 1: 123.8KHz-146.7KHz Transmitter 2: 123.8KHz-146.7KHz Transmitter 3: 123.8KHz-146.7KHz Transmitter 4: 123.8KHz-146.7KHz Transmitter 5: 123.8KHz-146.7KHz Transmitter 6: 123.8KHz-146.7KHz
Modulation type:	ASK
Antenna(s) type:	Coil Antenna

1.2 Description of test modes

No.	Emission test modes
Mode1	Wireless Output(5W(Coil 1))
Mode2	Wireless Output(7.5W(Coil 1))
Mode3	Wireless Output(5W(Coil 1)+5W(Coil 2))
Mode4	Wireless Output(5W(Coil 1)+7.5W(Coil 2))
Mode5	Wireless Output(5W(Coil 1)+5W(Coil 3))
Mode6	Wireless Output(5W(Coil 1)+7.5W(Coil 3))
Mode7	Wireless Output(5W(Coil 1)+5W(Coil 4))
Mode8	Wireless Output(5W(Coil 1)+7.5W(Coil 4))
Mode9	Wireless Output(5W(Coil 1)+5W(Coil 5))
Mode10	Wireless Output(5W(Coil 1)+7.5W(Coil 5))
Mode11	Wireless Output(5W(Coil 1)+5W(Coil 6))
Mode12	Wireless Output(5W(Coil 1)+7.5W(Coil 6))
Mode13	Wireless Output7.5W(Coil 1)+5W(Coil 2))
Mode14	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2))
Mode15	Wireless Output(7.5W(Coil 1)+5W(Coil 3))

Mode16	Wireless Output(7.5W(Coil 1)+7.5W(Coil 3))
Mode17	Wireless Output(7.5W(Coil 1)+5W(Coil 4))
Mode18	Wireless Output(7.5W(Coil 1)+7.5W(Coil 4))
Mode19	Wireless Output(7.5W(Coil 1)+5W(Coil 5))
Mode20	Wireless Output(7.5W(Coil 1)+7.5W(Coil 5))
Mode21	Wireless Output(7.5W(Coil 1)+5W(Coil 6))
Mode22	Wireless Output(7.5W(Coil 1)+7.5W(Coil 6))
Mode23	Wireless Output(5W(Coil 2))
Mode24	Wireless Output(7.5W(Coil 2))
Mode25	Wireless Output(5W(Coil 2)+5W(Coil 3))
Mode26	Wireless Output(5W(Coil 2)+7.5W(Coil 3))
Mode27	Wireless Output(5W(Coil 2)+5W(Coil 4))
Mode28	Wireless Output(5W(Coil 2)+7.5W(Coil 4))
Mode29	Wireless Output(5W(Coil 2)+5W(Coil 5))
Mode30	Wireless Output(5W(Coil 2)+7.5W(Coil 5))
Mode31	Wireless Output(5W(Coil 2)+5W(Coil 6))
Mode32	Wireless Output(5W(Coil 2)+7.5W(Coil 6))
Mode33	Wireless Output(7.5W(Coil 2)+5W(Coil 3))
Mode34	Wireless Output(7.5W(Coil 2)+7.5W(Coil 3))
Mode35	Wireless Output(7.5W(Coil 2)+5W(Coil 4))
Mode36	Wireless Output(7.5W(Coil 2)+7.5W(Coil 4))
Mode37	Wireless Output(7.5W(Coil 2)+5W(Coil 5))
Mode38	Wireless Output(7.5W(Coil 2)+7.5W(Coil 5))
Mode39	Wireless Output(7.5W(Coil 2)+5W(Coil 6))
Mode40	Wireless Output(7.5W(Coil 2)+7.5W(Coil 6))
Mode41	Wireless Output(5W(Coil 3))
Mode42	Wireless Output(7.5W(Coil 3))
Mode43	Wireless Output(5W(Coil 3)+5W(Coil 4))
Mode44	Wireless Output(5W(Coil 3)+7.5W(Coil 4))
Mode45	Wireless Output(5W(Coil 3)+5W(Coil 5))
Mode46	Wireless Output(5W(Coil 3)+7.5W(Coil 5))
Mode47	Wireless Output(5W(Coil 3)+5W(Coil 6))
Mode48	Wireless Output(5W(Coil 3)+7.5W(Coil 6))
Mode49	Wireless Output(7.5W(Coil 3)+5W(Coil 4))
Mode50	Wireless Output(7.5W(Coil 3)+7.5W(Coil 4))
Mode51	Wireless Output(7.5W(Coil 3)+5W(Coil 5))
Mode52	Wireless Output(7.5W(Coil 3)+7.5W(Coil 5))
Mode53	Wireless Output(7.5W(Coil 3)+5W(Coil 6))

Mode54	Wireless Output(7.5W(Coil 3)+7.5W(Coil 6))
Mode55	Wireless Output(5W(Coil 4))
Mode56	Wireless Output(7.5W(Coil 4))
Mode57	Wireless Output(5W(Coil 4)+5W(Coil 5))
Mode58	Wireless Output(5W(Coil 4)+7.5W(Coil 5))
Mode59	Wireless Output(5W(Coil 4)+5W(Coil 6))
Mode60	Wireless Output(5W(Coil 4)+7.5W(Coil 6))
Mode61	Wireless Output(7.5W(Coil 4)+5W(Coil 5))
Mode62	Wireless Output(7.5W(Coil 4)+7.5W(Coil 5))
Mode63	Wireless Output(7.5W(Coil 4)+5W(Coil 6))
Mode64	Wireless Output(7.5W(Coil 4)+7.5W(Coil 6))
Mode65	Wireless Output(5W(Coil 5))
Mode66	Wireless Output(7.5W(Coil 5))
Mode67	Wireless Output(5W(Coil 5)+5W(Coil 6))
Mode68	Wireless Output(5W(Coil 5)+7.5W(Coil 6))
Mode69	Wireless Output(7.5W(Coil 5)+5W(Coil 6))
Mode70	Wireless Output(7.5W(Coil 5)+7.5W(Coil 6))
Mode71	Wireless Output(5W(Coil 6))
Mode72	Wireless Output(7.5W(Coil 6))
Mode73	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 3))
Mode74	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 3))
Mode75	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 4))
Mode76	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 4))
Mode77	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 5))
Mode78	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 5))
Mode79	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 6))
Mode80	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 6))
Mode81	Wireless Output(7.5W(Coil 1)+5W(Coil 2)+5W(Coil 3))
Mode82	Wireless Output(7.5W(Coil 1)+5W(Coil 2)+5W(Coil 3))
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Mode90	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+5W(Coil 3))
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Mode92	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+5W(Coil 4))
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Mode159	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+5W(Coil 6))
Mode160	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+5W(Coil 4))
Mode161	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+5W(Coil 5))
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Mode175	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+5W(Coil 3)+5W(Coil 4)+5W(Coil 5))
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Mode180	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+5W(Coil 4)+5W(Coil 6))
Mode181	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+5W(Coil 5))
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Mode183	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+5W(Coil 5))
Mode184	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+5W(Coil 6))
Mode185	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+7.5W(Coil 5))
Mode186	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+7.5W(Coil 6))
Mode187	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+7.5W(Coil 5))
Mode188	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+7.5W(Coil 6))
Mode189	Wireless Output(5W(Coil 1)+5W(Coil 2)+5W(Coil 3)+ 5W(Coil 4)+5W(Coil 5)+5W(Coil 6))
Mode190	Wireless Output(7.5W(Coil 1)+5W(Coil 2)+5W(Coil 3)+ 5W(Coil 4)+5W(Coil 5)+5W(Coil 6))
Mode191	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+5W(Coil 3)+ 5W(Coil 4)+5W(Coil 5)+5W(Coil 6))
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Mode199	Wireless Output(5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+7.5W(Coil 5)+7.5W(Coil 6))
Mode200	Wireless Output(7.5W(Coil 1)+7.5W(Coil 2)+7.5W(Coil 3)+7.5W(Coil 4)+7.5W(Coil 5)+7.5W(Coil 6))
Mode201	Stand by

1.3 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
Smartphone	IPhone 13	/	Apple
Smartphone	IPhone 13	/	Apple
Smartphone	IPhone 13	/	Apple
Smartphone	IPhone 13	/	Apple
Smartphone	IPhone 13	/	Apple
Smartphone	IPhone 13	/	Apple
Smartphone	IPhone 13	/	Apple
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Measurement	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	±3.1dB
Occupied channel bandwidth	±3 %
Radiated spurious emissions (9kHz~30MHz)	±4.3dB
Radiated spurious emissions (30MHz~1GHz)	±4.7dB
Temperature	±1 °C
Humidity	± 5 %

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

2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Antenna requirement	47 CFR Part 15C	47 CFR Part 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15C	47 CFR Part 15.207(a)	Pass
3	20dB Occupied Bandwidth	47 CFR Part 15C	47 CFR Part 15.215(c)	Pass
4	Emissions in frequency bands (below 30MHz)	47 CFR Part 15C	47 CFR Part 15.209	Pass
5	Emissions in frequency bands (30MHz - 1GHz)	47 CFR Part 15C	47 CFR Part 15.209	Pass

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Conducted Emission at AC power line						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2023-04-26	2024-04-25
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2023-05-05	2024-05-04
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2023-06-03	2024-06-02
20dB Occupied Bandwidth						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
Emissions in frequency bands (below 30MHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-06-26	2024-06-25
Emissions in frequency bands (30MHz - 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-06-26	2024-06-25
5	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03

5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	Refer to 47 CFR 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.
Description of the antenna of EUT:	The antenna of the EUT is permanently attached.
Conclusion:	The EUT complies with the requirement of FCC PART 15.203.

6 Radio Spectrum Matter Test Results (RF)

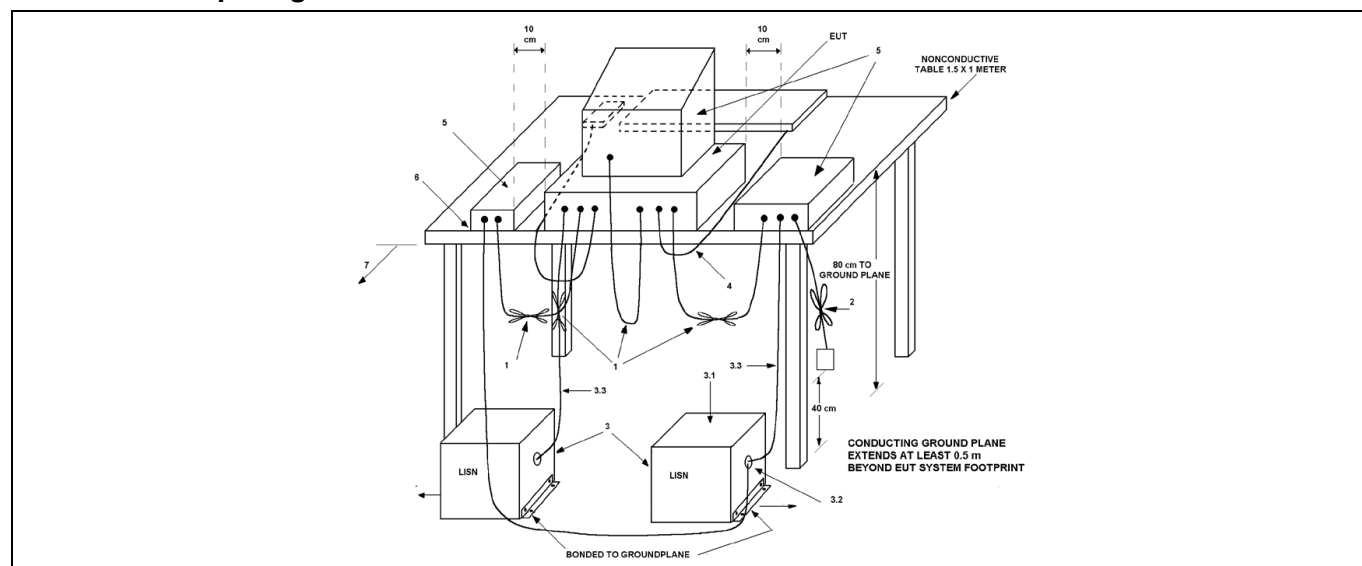
6.1 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dB μ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	*Decreases with the logarithm of the frequency.		
Test Method:	ANSI C63.10-2013 section 6.2		
Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices		

6.1.1 E.U.T. Operation:

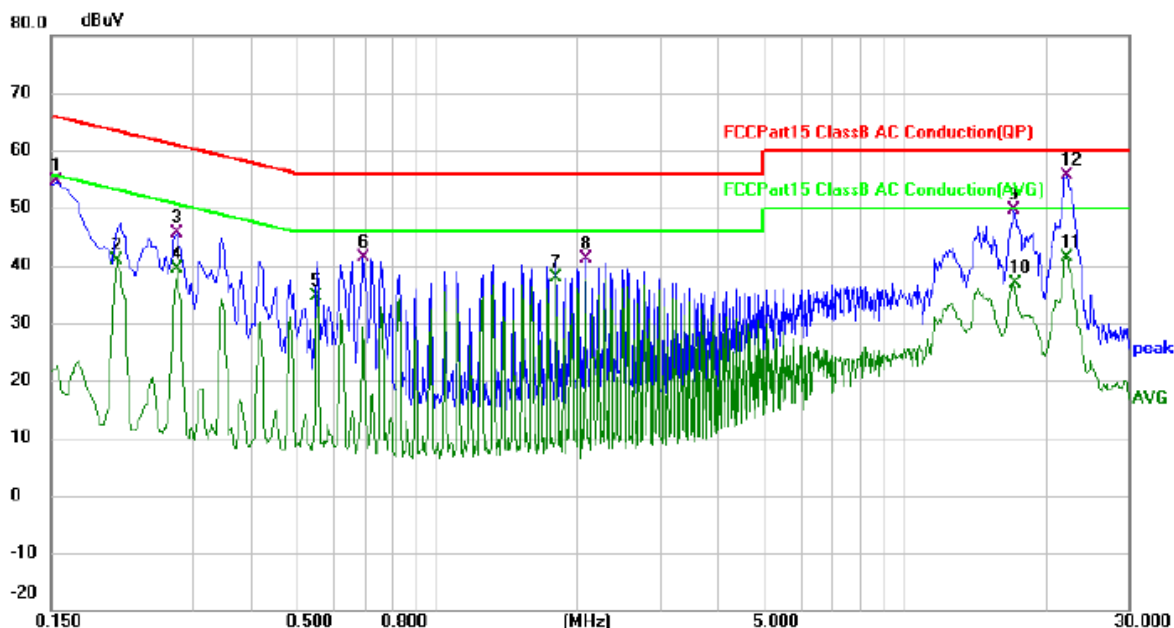
Operating Environment:			
Temperature:	25.6 °C	Humidity:	67 %
		Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1-201		
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode200) is recorded in the report		

6.1.2 Test Setup Diagram:



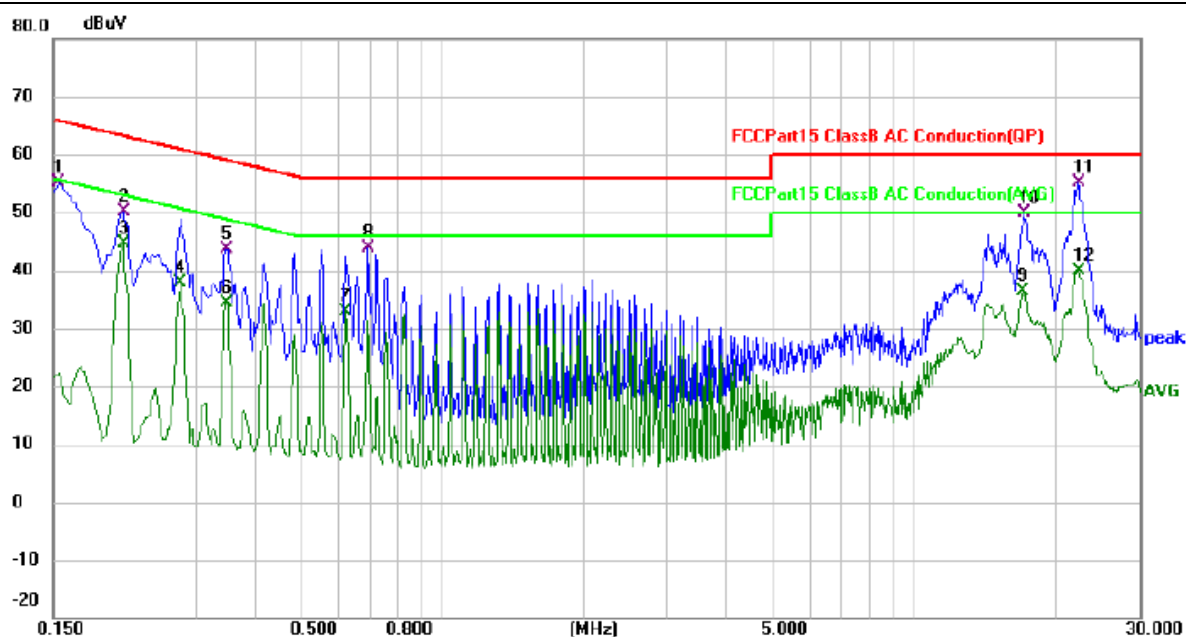
6.1.3 Test Data:

Mode200(AC 120/60Hz) / Line: Line



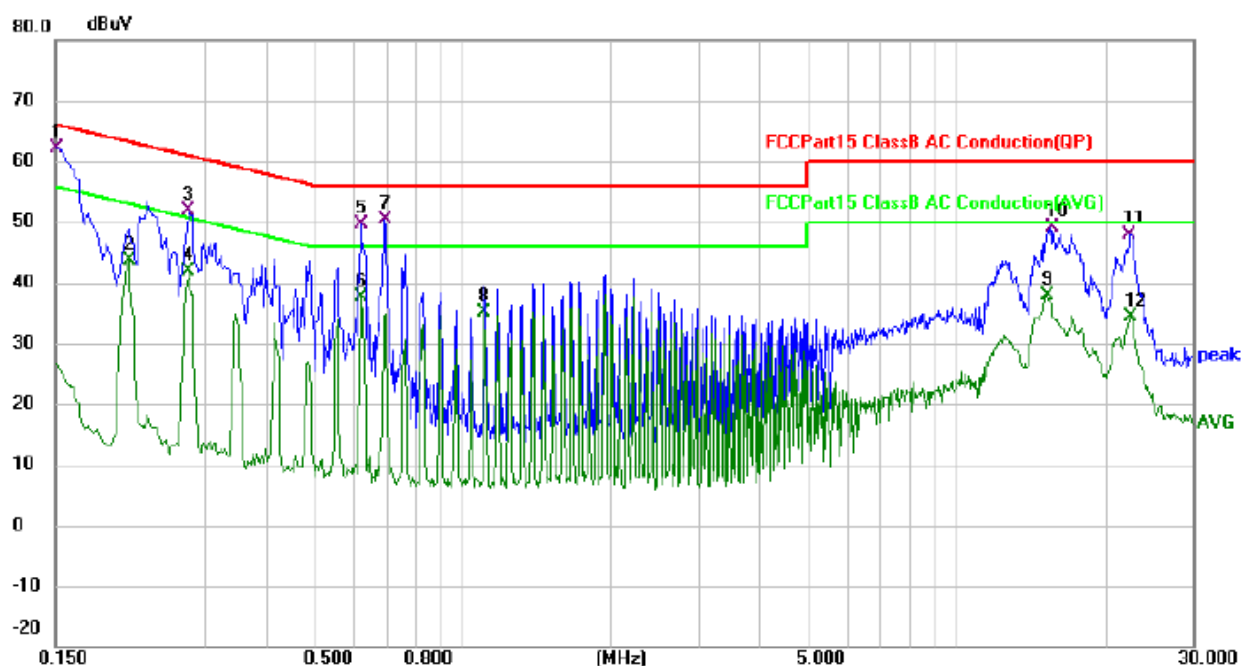
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1539	44.36	10.28	54.64	65.79	-11.15	QP	
2		0.2060	30.14	10.70	40.84	53.37	-12.53	AVG	
3		0.2779	34.88	10.83	45.71	60.88	-15.17	QP	
4		0.2779	28.44	10.83	39.27	50.88	-11.61	AVG	
5		0.5540	23.15	11.43	34.58	46.00	-11.42	AVG	
6		0.6940	29.68	11.75	41.43	56.00	-14.57	QP	
7		1.8020	24.24	13.68	37.92	46.00	-8.08	AVG	
8		2.0820	31.21	10.02	41.23	56.00	-14.77	QP	
9		17.0660	39.16	10.57	49.73	60.00	-10.27	QP	
10		17.1660	26.25	10.57	36.82	50.00	-13.18	AVG	
11		22.1220	30.76	10.71	41.47	50.00	-8.53	AVG	
12	*	22.2300	45.03	10.71	55.74	60.00	-4.26	QP	

Mode200(AC 120/60Hz) / Line: Neutral



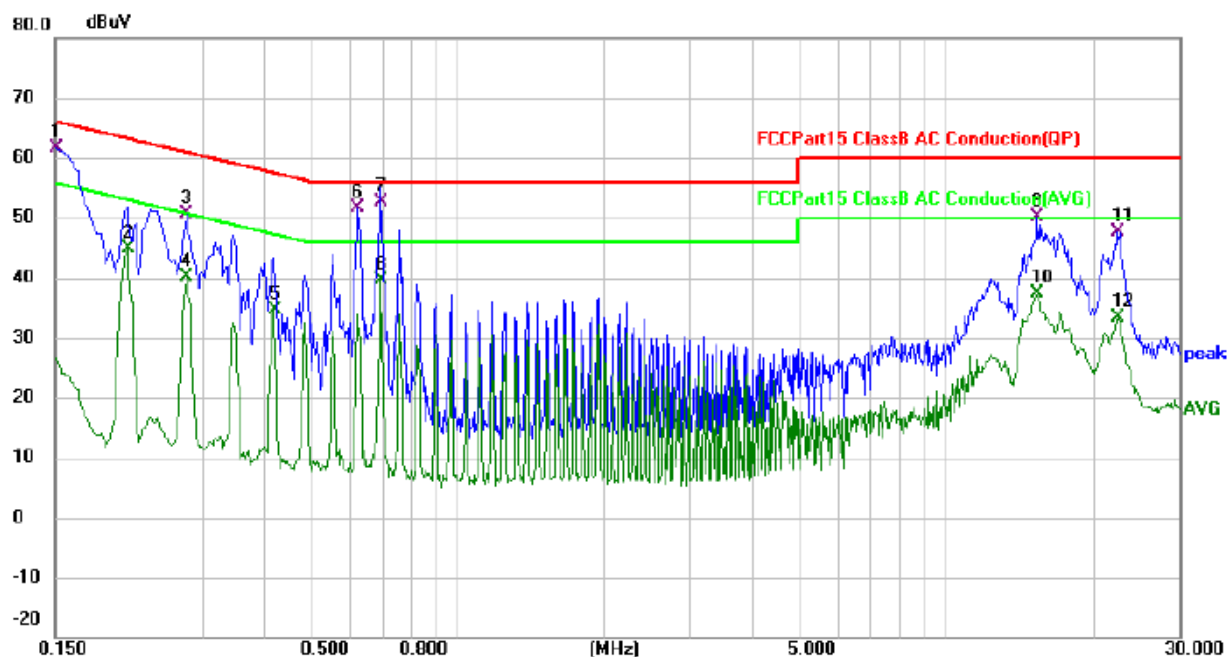
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	dBuV	Factor	ment			
					dBuV	dBuV	dB	Detector
								Comment
1		0.1539	44.86	10.28	55.14	65.79	-10.65	QP
2		0.2100	39.60	10.62	50.22	63.21	-12.99	QP
3		0.2100	33.91	10.62	44.53	53.21	-8.68	AVG
4		0.2779	27.08	10.79	37.87	50.88	-13.01	AVG
5		0.3460	32.79	10.94	43.73	59.06	-15.33	QP
6		0.3460	23.55	10.94	34.49	49.06	-14.57	AVG
7		0.6260	21.29	11.62	32.91	46.00	-13.09	AVG
8		0.6940	32.19	11.77	43.96	56.00	-12.04	QP
9		17.0180	25.78	10.57	36.35	50.00	-13.65	AVG
10		17.0620	39.24	10.57	49.81	60.00	-10.19	QP
11	*	22.2060	44.42	10.74	55.16	60.00	-4.84	QP
12		22.2060	29.16	10.74	39.90	50.00	-10.10	AVG

Mode200(AC 240/60Hz) / Line: Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	51.88	10.28	62.16	66.00	-3.84	QP	
2		0.2100	32.88	10.70	43.58	53.21	-9.63	AVG	
3		0.2779	41.12	10.83	51.95	60.88	-8.93	QP	
4		0.2779	30.93	10.83	41.76	50.88	-9.12	AVG	
5		0.6220	38.02	11.59	49.61	56.00	-6.39	QP	
6		0.6260	25.90	11.61	37.51	46.00	-8.49	AVG	
7		0.6940	38.51	11.75	50.26	56.00	-5.74	QP	
8		1.1100	22.61	12.59	35.20	46.00	-10.80	AVG	
9		15.2220	27.29	10.52	37.81	50.00	-12.19	AVG	
10		15.4740	38.64	10.52	49.16	60.00	-10.84	QP	
11		22.5060	37.07	10.71	47.78	60.00	-12.22	QP	
12		22.5900	23.57	10.71	34.28	50.00	-15.72	AVG	

Mode200(AC 240/60Hz) / Line: Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	51.35	10.29	61.64	66.00	-4.36	QP	
2		0.2100	34.35	10.62	44.97	53.21	-8.24	AVG	
3		0.2779	39.90	10.79	50.69	60.88	-10.19	QP	
4		0.2779	29.41	10.79	40.20	50.88	-10.68	AVG	
5		0.4180	23.49	11.09	34.58	47.49	-12.91	AVG	
6		0.6260	40.02	11.62	51.64	56.00	-4.36	QP	
7	*	0.6940	40.82	11.77	52.59	56.00	-3.41	QP	
8		0.6940	27.81	11.77	39.58	46.00	-6.42	AVG	
9		15.3820	39.57	10.51	50.08	60.00	-9.92	QP	
10		15.3900	26.90	10.51	37.41	50.00	-12.59	AVG	
11		22.5260	36.97	10.74	47.71	60.00	-12.29	QP	
12		22.5419	22.62	10.74	33.36	50.00	-16.64	AVG	

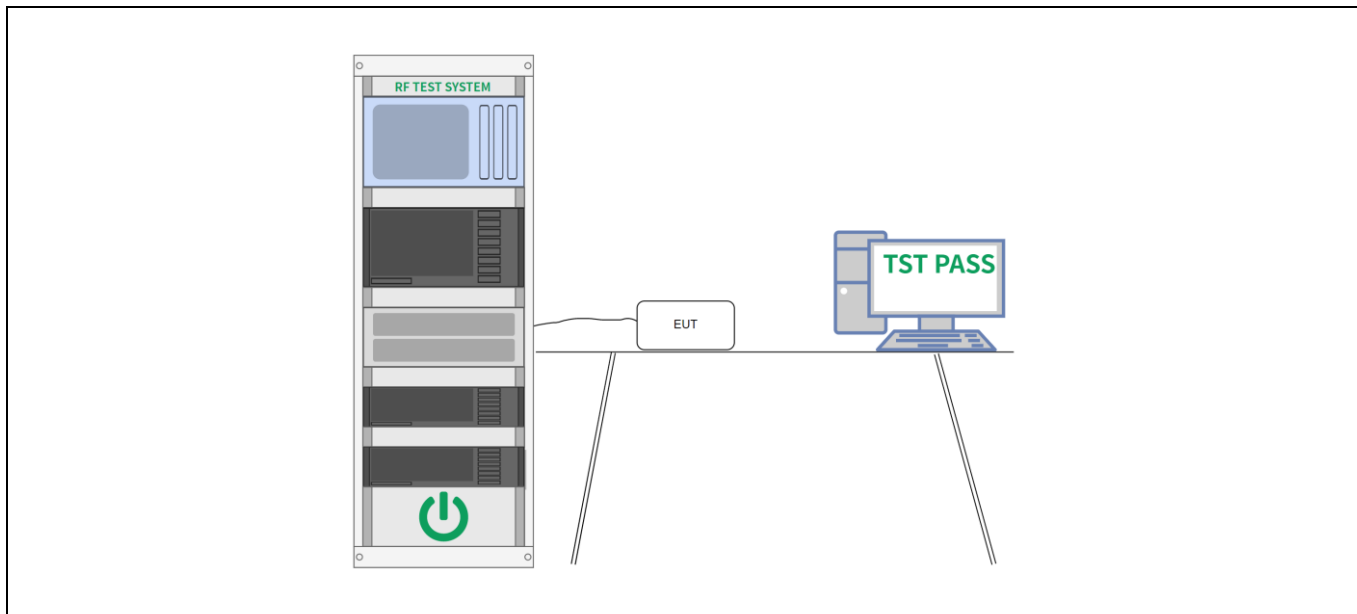
6.2 20dB Occupied Bandwidth

Test Requirement:	47 CFR Part 15.215(c)
Test Limit:	Refer to 47 CFR 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.
Test Method:	ANSI C63.10-2013, section 6.9.2
Procedure:	a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the “-xx dB down amplitude” using $[(\text{reference value}) - \text{xx}]$. Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-xx dB down amplitude” determined in step h). If a marker is below this “-xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “-xx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth. k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

6.2.1 E.U.T. Operation:

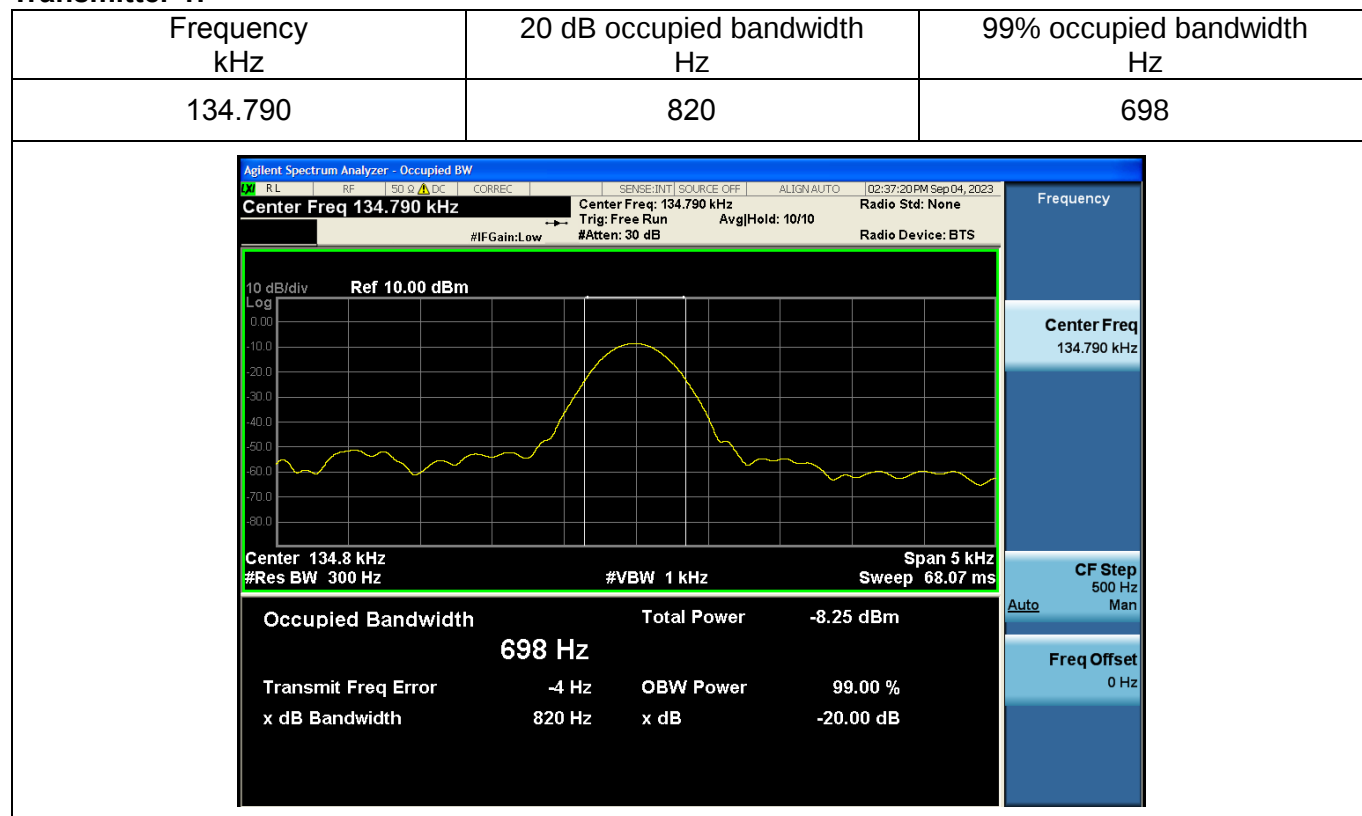
Operating Environment:					
Temperature:	31.5 °C	Humidity:	40.5 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1-201				

6.2.2 Test Setup Diagram:

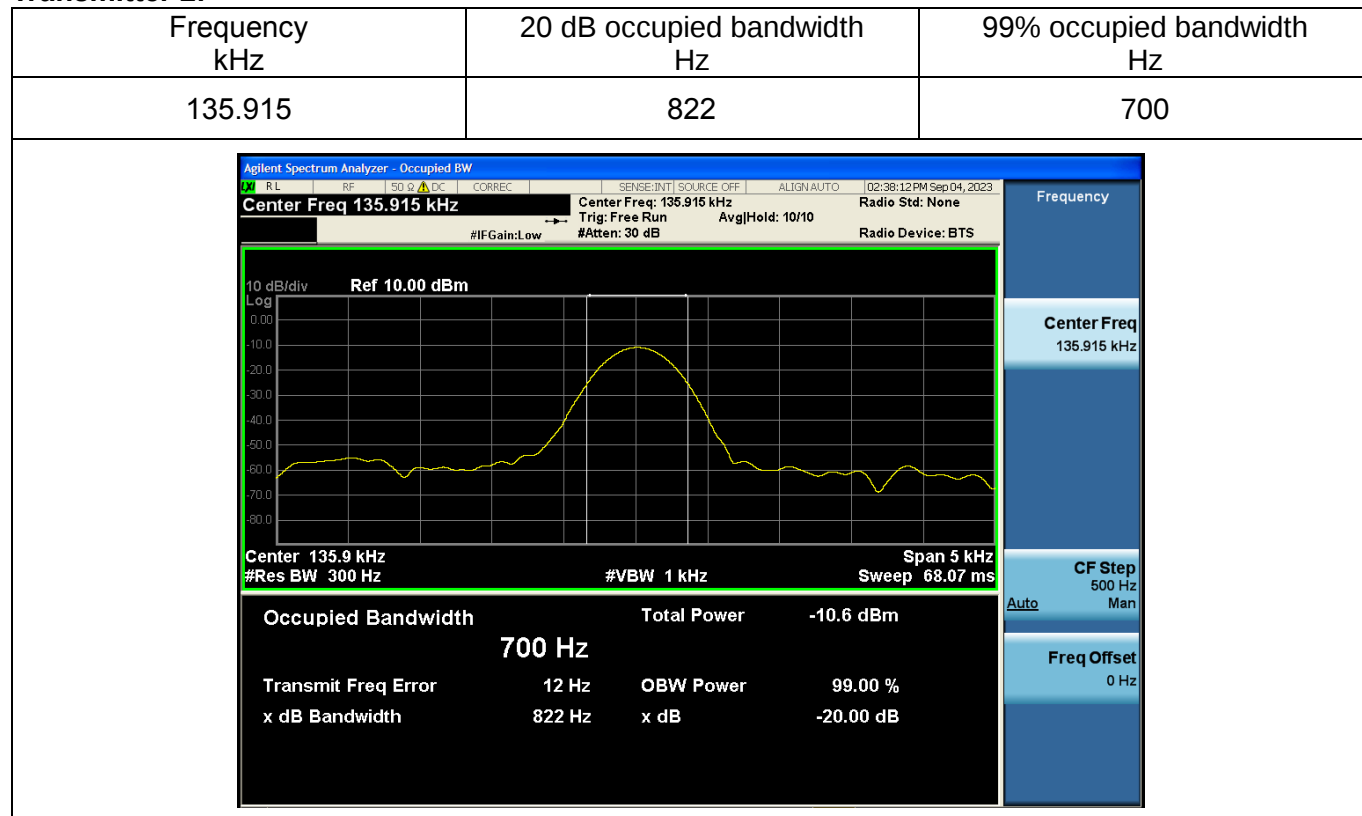


6.2.3 Test Data:

Transmitter 1:

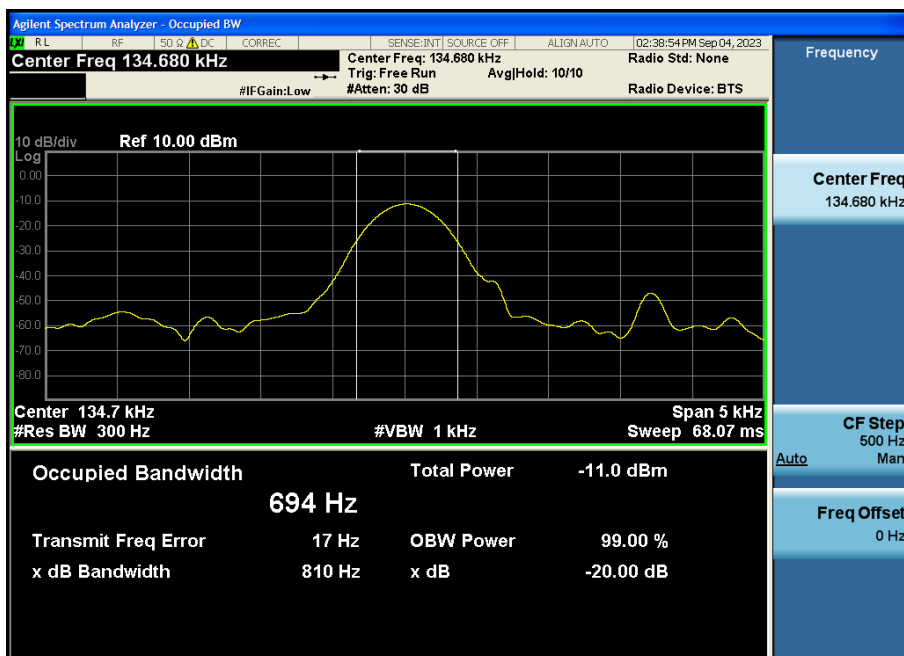


Transmitter 2:

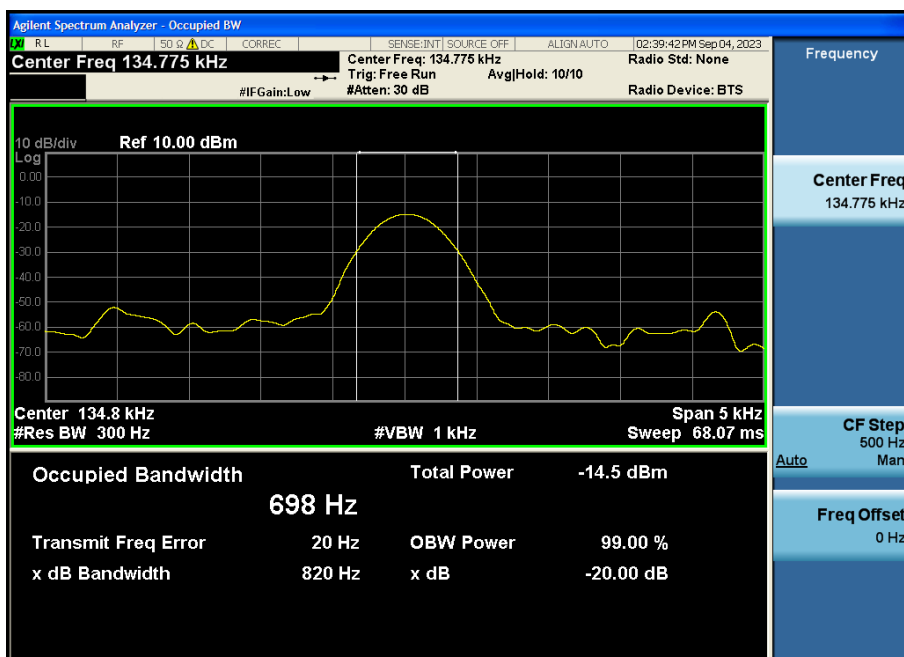


Transmitter 3:

Frequency kHz	20 dB occupied bandwidth Hz	99% occupied bandwidth Hz
134.680	810	694

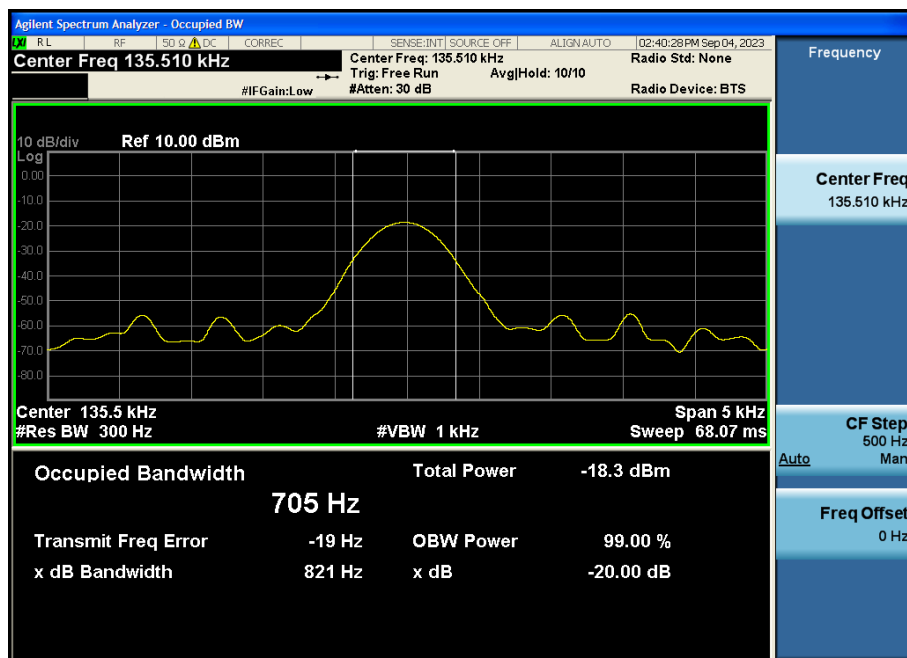

Transmitter 4:

Frequency kHz	20 dB occupied bandwidth Hz	99% occupied bandwidth Hz
134.775	820	698

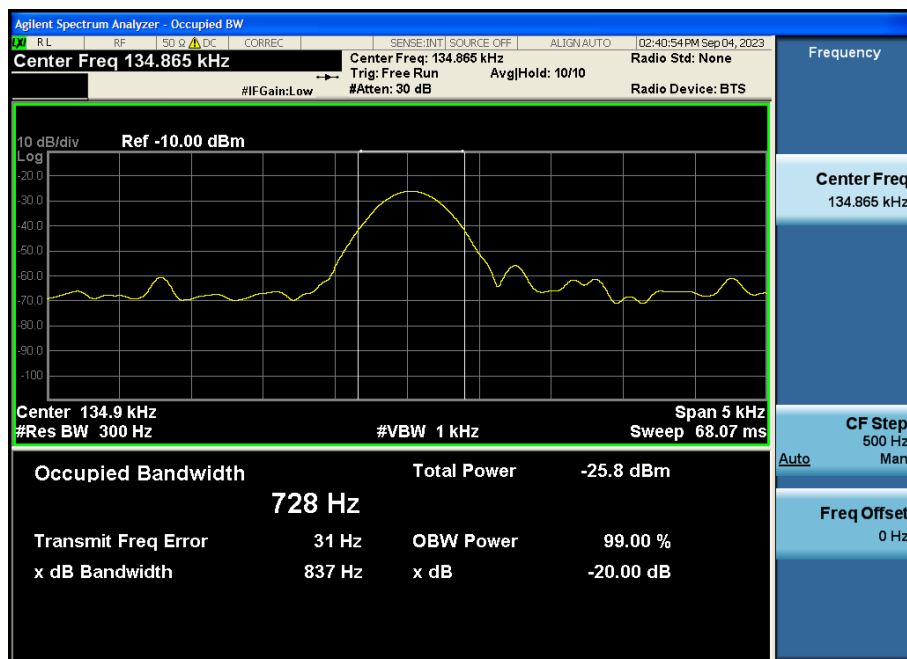


Transmitter 5:

Frequency kHz	20 dB occupied bandwidth Hz	99% occupied bandwidth Hz
135.510	821	705


Transmitter 6:

Frequency kHz	20 dB occupied bandwidth Hz	99% occupied bandwidth Hz
134.865	837	728



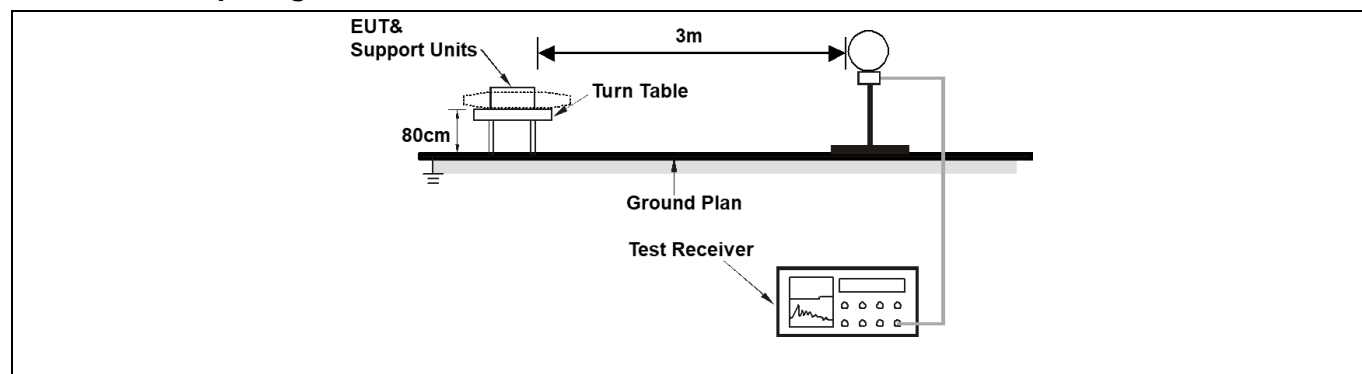
6.3 Emissions in frequency bands (below 30MHz)

Test Requirement:	47 CFR Part 15.209		
Test Limit:	Frequency (MHz)	Field strength (microvolts/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
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.			
Test Method:	ANSI C63.10-2013 section 6.4		
Procedure:	ANSI C63.10-2013 section 6.4		

6.3.1 E.U.T. Operation:

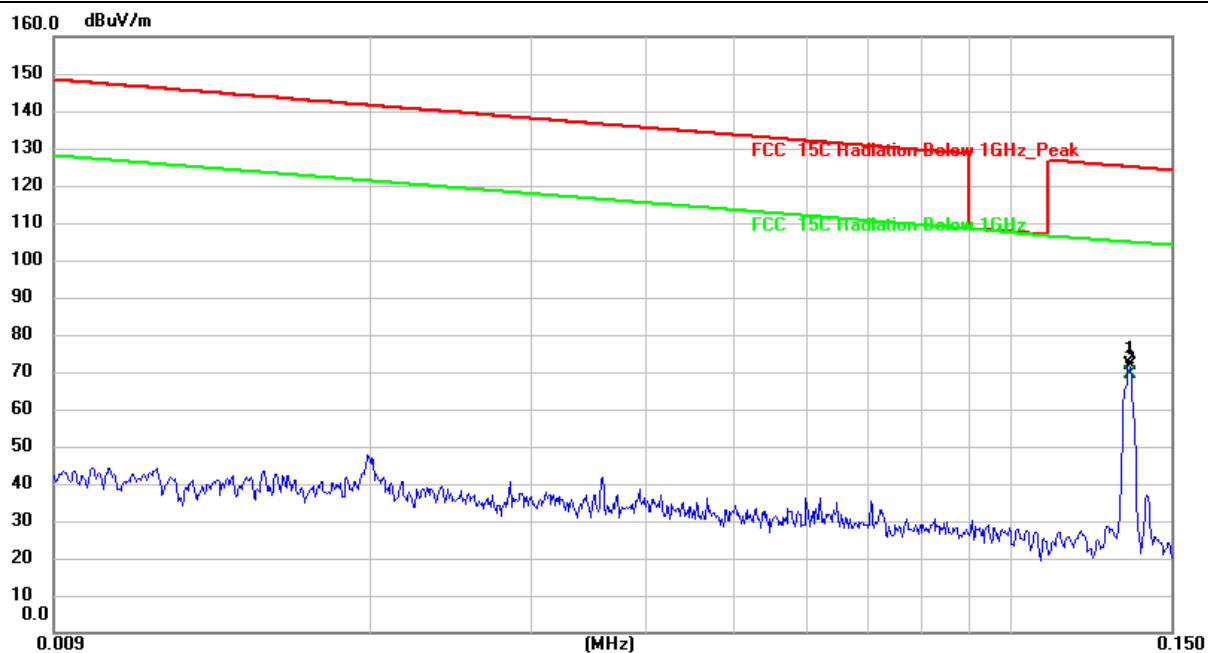
Operating Environment:			
Temperature:	16.5 °C	Humidity:	43.2 %
		Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1-201		
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode200) is recorded in the report		

6.3.2 Test Setup Diagram:



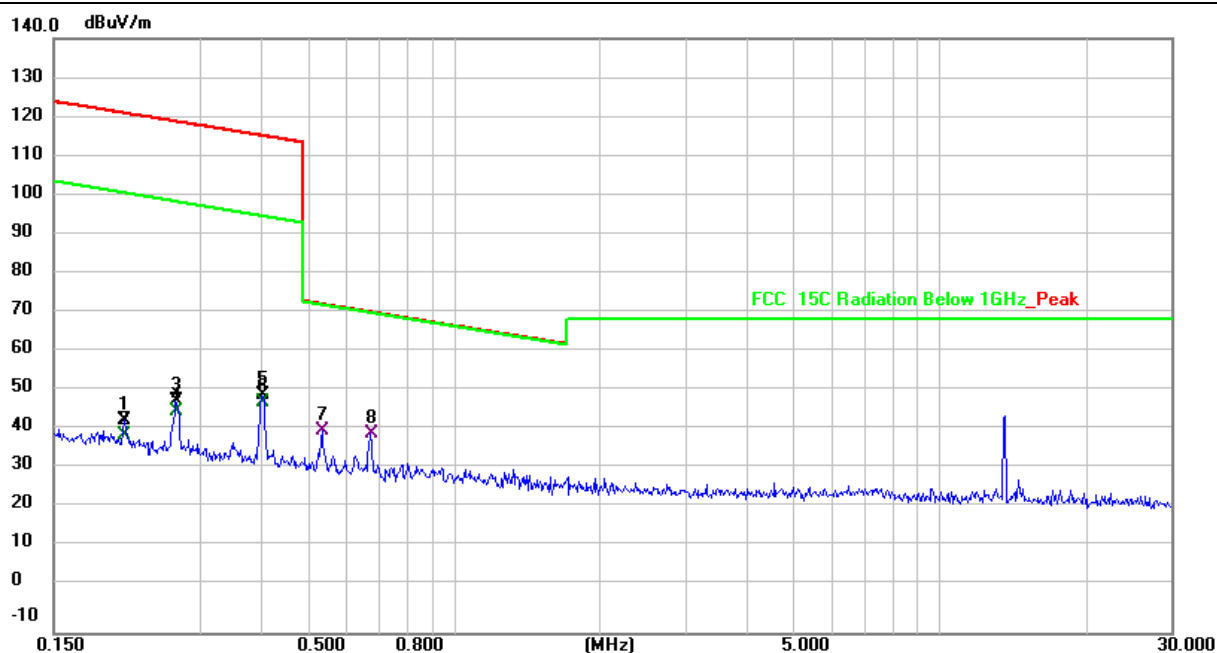
6.3.3 Test Data:

Mode200 / Polarization: Site axis



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.1346	51.89	19.94	71.83	125.04	-53.21	peak
2 *	0.1348	49.31	19.94	69.25	105.03	-35.78	AVG

Mode200 / Polarization: Site axis



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.2094	23.69	20.10	43.79	121.20	-77.41	peak
2	0.2094	20.15	20.10	40.25	101.20	-60.95	AVG
3	0.2672	28.58	20.04	48.62	119.08	-70.46	peak
4	0.2672	26.17	20.04	46.21	99.08	-52.87	AVG
5	0.4018	30.31	19.88	50.19	115.53	-65.34	peak
6	0.4019	28.36	19.88	48.24	95.52	-47.28	AVG
7	0.5350	21.28	19.76	41.04	73.04	-32.00	QP
8 *	0.6719	20.54	19.74	40.28	71.07	-30.79	QP

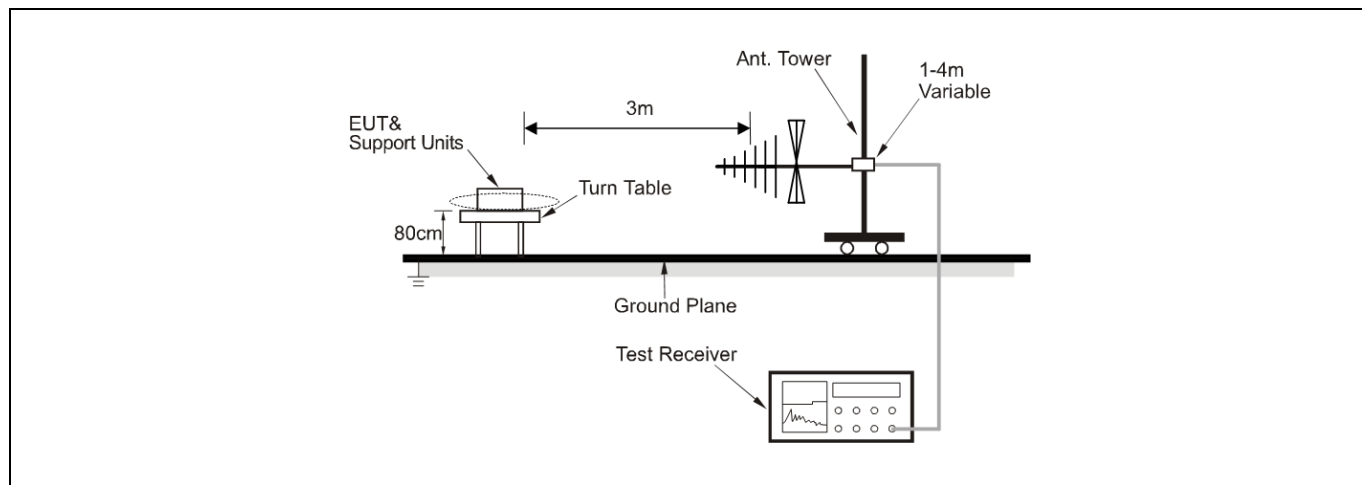
6.4 Emissions in frequency bands (30MHz - 1GHz)

Test Requirement:	47 CFR Part 15.209		
Test Limit:	Frequency (MHz)	Field strength (microvolts/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
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.			
Test Method:	ANSI C63.10-2013 section 6.5		
Procedure:	ANSI C63.10-2013 section 6.5		

6.4.1 E.U.T. Operation:

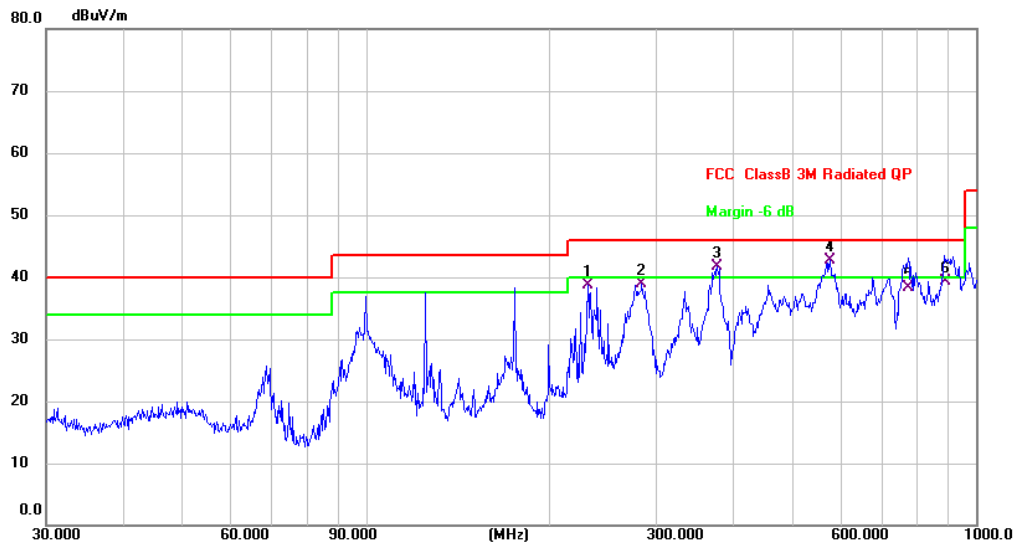
Operating Environment:			
Temperature:	16.5 °C	Humidity:	43.2 %
		Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1-201		
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode200) is recorded in the report		

6.4.2 Test Setup Diagram:



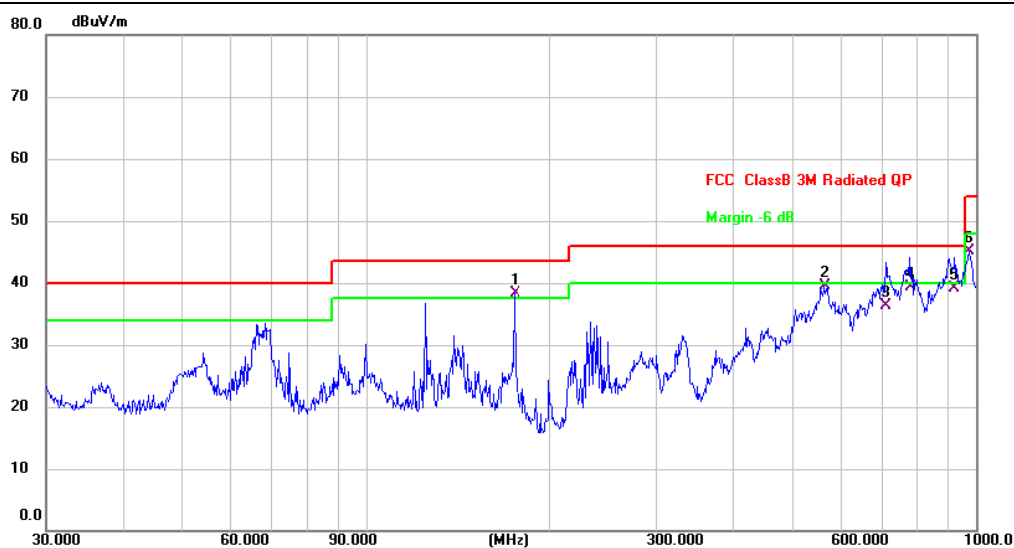
6.4.3 Test Data:

Mode200 / Polarization: Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		231.7178	46.00	-7.26	38.74	46.00	-7.26	QP	
2		283.9791	45.19	-6.34	38.85	46.00	-7.15	QP	
3	!	377.2590	46.31	-4.67	41.64	46.00	-4.36	QP	
4	*	576.6443	45.70	-2.95	42.75	46.00	-3.25	QP	
5		774.1584	38.56	-0.32	38.24	46.00	-7.76	QP	
6		887.6098	36.68	2.56	39.24	46.00	-6.76	QP	

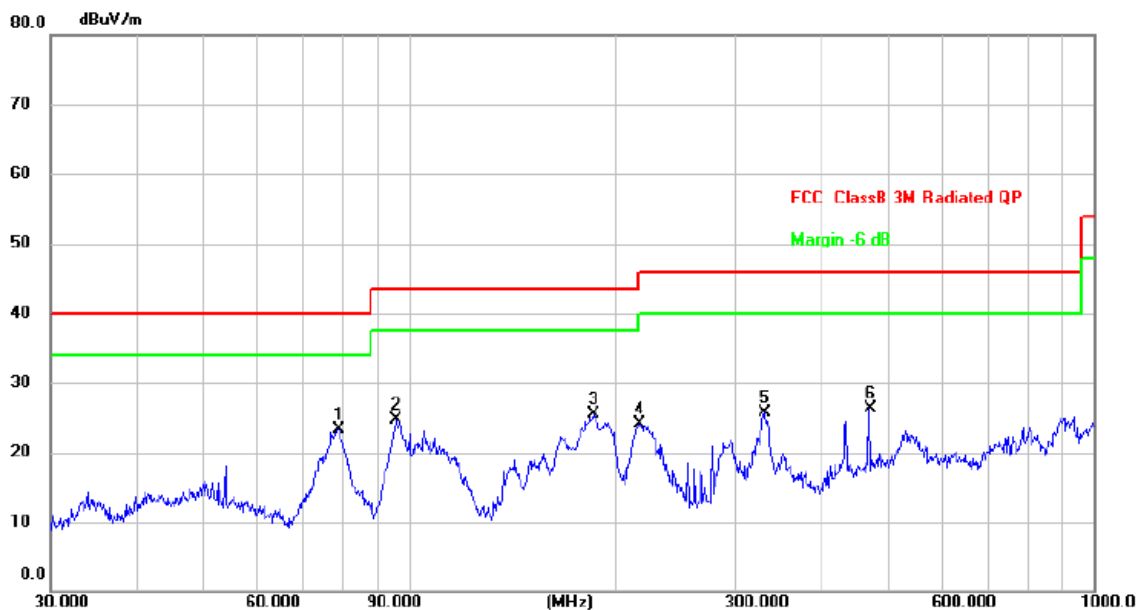
Mode200 / Polarization: Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	175.0368	49.28	-11.07	38.21	43.50	-5.29	QP	
2		564.6389	41.30	-1.75	39.55	46.00	-6.45	QP	
3		711.6734	35.72	0.55	36.27	46.00	-9.73	QP	
4		779.6068	39.55	-0.30	39.25	46.00	-6.75	QP	
5		922.5157	36.75	2.45	39.20	46.00	-6.80	QP	
6		972.3374	41.16	3.99	45.15	54.00	-8.85	QP	

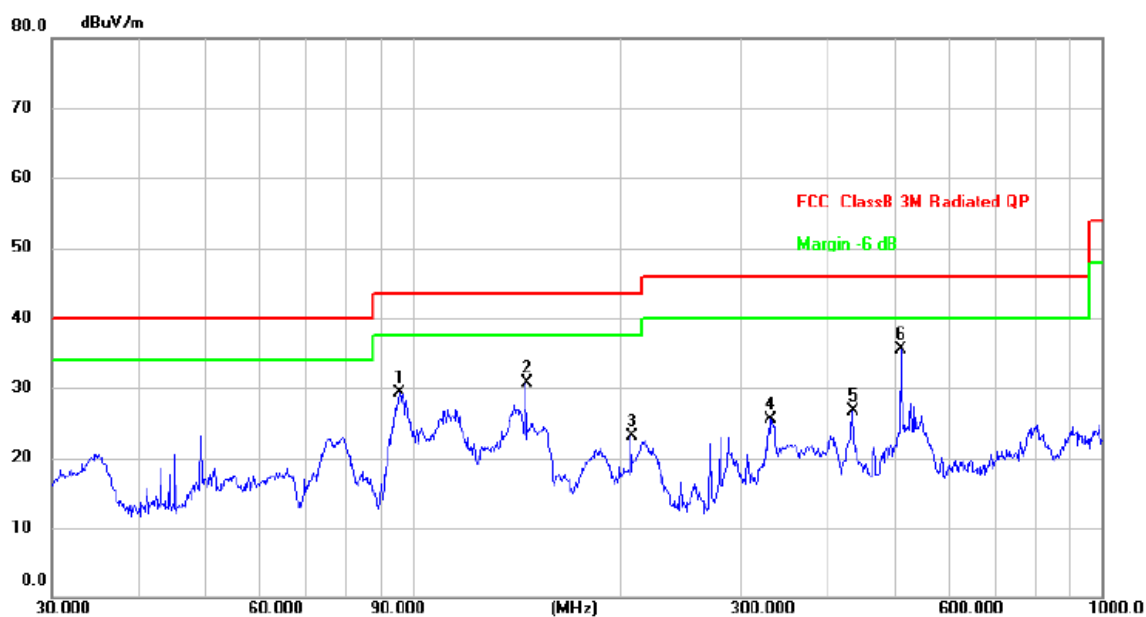
Difference test data:

Mode200 / Polarization: Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	78.9652	41.45	-18.21	23.24	40.00	-16.76	QP	
2		95.7622	40.54	-15.78	24.76	43.50	-18.74	QP	
3		185.7882	41.02	-15.60	25.42	43.50	-18.08	QP	
4		216.0240	38.66	-14.51	24.15	46.00	-21.85	QP	
5		330.1949	36.47	-10.75	25.72	46.00	-20.28	QP	
6		470.5232	35.52	-9.14	26.38	46.00	-19.62	QP	

Mode200 / Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		95.7622	45.15	-15.78	29.37	43.50	-14.13	QP	
2		145.8611	47.61	-16.98	30.63	43.50	-12.87	QP	
3		207.1226	36.75	-13.63	23.12	43.50	-20.38	QP	
4		331.3546	36.26	-10.72	25.54	46.00	-20.46	QP	
5		434.0651	36.04	-9.33	26.71	46.00	-19.29	QP	
6	*	510.0436	43.93	-8.38	35.55	46.00	-10.45	QP	

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix - EUT Photos

----End of Report----