Test Report

Report No.	:	MTi241220013-05E2
Date of issue	:	2025-03-11
Applicant	:	Shenzhen Torich Electronic Technology Co., Ltd
Product	:	TRI-MODE WIRELESS MECHANICAL KEYBOARD
Model(s)	:	MK-010, MK-008, MK-009, MK-011, MK-012, MK-013, MK-014, MK-015, KF-004, KF-002, KF-003, KF-005, KF-006, KF-007, KF-10, KF-11, KF-12, KF-13, KF-14, KF-15, KF-16, KF-17, KF-18, KF-19, KF-20, KF-21, KF-22, KF-23, KF-24, KF-25, KF-26, KF-27, KF-28, KF-29, KF-30, KF-32, KF-33, KF-31
FCC ID	:	2AW3GMK-010

Shenzhen Microtest Co., Ltd.

TEST REPORT

Report No.: MTi241220013-05E2

Table of contents

1 General Description 4
1.1 Description of the EUT 4
1.2 Description of test modes 4
1.3 Environmental Conditions 6
1.4 Description of support units 6
1.5 Measurement uncertainty 6

2 Summary of Test Result 7
3 Test Facilities and accreditations 8
3.1 Test laboratory 8

4 List of test equipment 9
5 Evaluation Results (Evaluation) 10
5.1 Antenna requirement 10

6 Radio Spectrum Matter Test Results (RF) 10
6.1 Conducted Emission at AC power line 10
6.2 Occupied Bandwidth 13
6.3 Field strength of fundamental 17
6.4 Band edge emissions (Radiated) 21
6.5 Emissions in frequency bands (below 1GHz) 24
6.6 Emissions in frequency bands (above 1GHz) 28

Photographs of the test setup 33
Photographs of the EUT 34

TEST REPORT

Report No.: MTi241220013-05E2

Test Result Certification	
Applicant	Shenzhen Torich Electronic Technology Co., Ltd
Applicant Address	4/5F, Unit B2, Fenghuang Gang 3Rd Industiral Area Baotian 1st Road, No.231, Bao'An District, Shenzhen, China
Manufacturer	Shenzhen Torich Electronic Technology Co., Ltd
Manufacturer Address	4/5F, Unit B2, Fenghuang Gang 3Rd Industiral Area Baotian 1st Road, No.231, Bao'An District, Shenzhen, China
Factory	Shenzhen Torich Electronic Technology Co., Ltd
Factory Address	4/5F, Unit B2, Fenghuang Gang 3Rd Industiral Area Baotian 1st Road, No.231, Bao'An District, Shenzhen, China
Product description	
Product name	TRI-MODE WIRELESS MECHANICAL KEYBOARD
Trademark	N/A
Model name	MK-010
Series Model(s)	MK-008, MK-009, MK-011, MK-012, MK-013, MK-014, MK-015, KF-004, KF-002, KF-003, KF-005, KF-006, KF-007, KF-10, KF-11, KF-12, KF-13, KF-14, KF-15, KF-16, KF-17, KF-18, KF-19, KF-20, KF-21, KF-22, KF-23, KF-24, KF-25, KF-26, KF-27, KF-28, KF-29, KF-30, KF-32, KF-33, KF-31
Standards	47 CFR Part 15.249
Test Method	ANSI C63.10-2013
Testing Information	
Date of test	2025-01-21 to 2025-03-10
Test result	Pass

Prepared by:	Letter Lan	Letter. Lan.
Reviewed by:	David Lee	David. Lee
Approved by:	Lewis Lian	Lewis Lian

1 General Description

1.1 Description of the EUT

Product name:	TRI-MODE WIRELESS MECHANICAL KEYBOARD
Model name:	MK-010
Series Model(s):	MK-008, MK-009, MK-011, MK-012, MK-013, MK-014, MK-015, KF-004, KF-002, KF-003, KF-005, KF-006, KF-007, KF-10, KF-11, KF-12, KF-13, KF-14, KF-15, KF-16, KF-17, KF-18, KF-19, KF-20, KF-21, KF-22, KF-23, KF-24, KF-25, KF-26, KF-27, KF-28, KF-29, KF-30, KF-32, KF-33, KF-31
Model difference:	All the models are the same circuit and module, except the model name.
Electrical rating:	Input: DC 5V/500mA Battery: DC 3.7V 4000mAh
Accessories:	Cable: USB-A to Type-C cable (1.8m) *1
Hardware version:	V1P7
Software version:	V0103
Test sample(s) number:	MTi241220013-05S1001
RF specification	
Operating frequency range:	2402MHz to 2480MHz
Channel number:	40
Modulation type:	GFSK
Antenna(s) type:	PCB
Antenna(s) gain:	2.08dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX

1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476

8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Test Channel List
Operation Band: 2.4G

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
1	2402	2440	2480

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Test Software: IT308RFTool_V0.0.001
For power setting, refer to below table.

Mode	2402MHz	2440MHz	2480MHz
1M	-25	-25	-25
2M	-25	-25	-25

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
USB-A HUAWEI CHARGE(10W)	HW-050200C02	K95212KA103561	HUAWEI
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 (above 1GHz)	±5.3dB
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 15.249	47 CFR Part 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15.249	47 CFR 15.207(a)	Pass
3	Occupied Bandwidth	47 CFR Part 15.249	47 CFR 15.215(c)	Pass
4	Field strength of fundamental	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(b)(1)	Pass
5	Band edge emissions (Radiated)	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(d)	Pass
6	Emissions in frequency bands (below 1GHz)	47 CFR Part 15.249	47 CFR 15.209(a) 47 CFR 15.249(d)	Pass
7	Emissions in frequency bands (above 1GHz)	47 CFR Part 15.249	47 CFR 15.209(a) 47 CFR 15.249(d)	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	2024-03-20	2025-03-19
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2024-03-21	2025-03-20
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2024-03-20	2025-03-19
Occupied Bandwidth						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2024-03-20	2025-03-19
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2024-03-21	2025-03-20
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-21	2025-03-20
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2024-03-21	2025-03-20
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2024-03-21	2025-03-20
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2024-03-21	2025-03-20
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2024-03-21	2025-03-20
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2024-03-20	2025-03-19
9	DC Power Supply	Agilent	E3632A	MY40027695	2024-03-21	2025-03-20
Field strength of fundamental Band edge emissions (Radiated) Emissions in frequency bands (above 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-06-17	2025-06-16
3	Amplifier	Agilent	8449B	3008A01120	2024-03-20	2025-03-19
4	MXA signal analyzer	Agilent	N9020A	MY54440859	2024-03-21	2025-03-20
5	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-21	2025-03-20
6	Horn antenna	Schwarzbeck	BBHA 9170	00987	2023-06-17	2025-06-16
7	Pre-amplifier	Space-Dtronics	EWLAN1840G	210405001	2024-03-21	2025-03-20
Emissions in frequency bands (below 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2024-03-23	2025-03-22
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2024-03-20	2025-03-19

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.

6 Radio Spectrum Matter Test Results (RF)

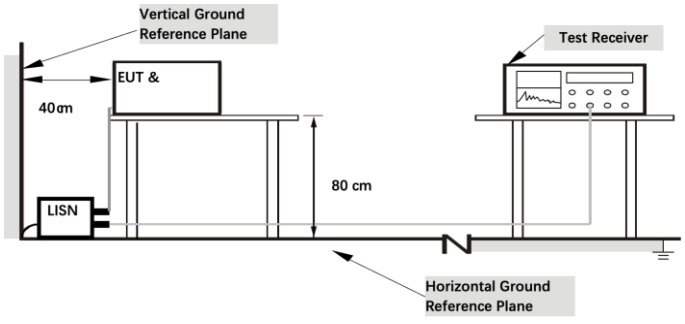
6.1 Conducted Emission at AC power line

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 μH/50 ohms line impedance stabilization network (LISN).
Test Limit:	Frequency of emission (MHz) / Conducted limit (dBμV): 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:

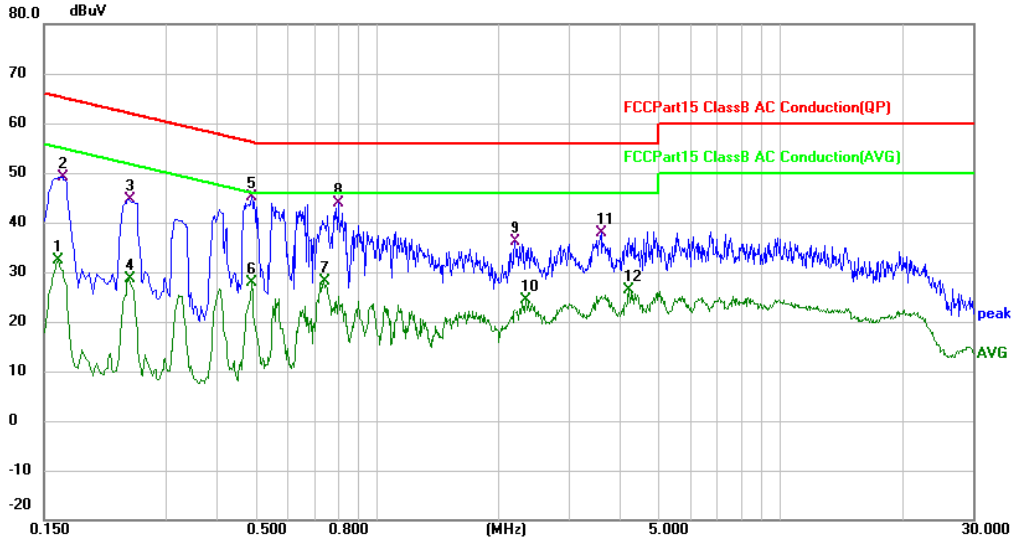
Operating Environment:					
Temperature:	34.2 °C	Humidity:	31.1 %	Atmospheric Pressure:	98 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.1.2 Test Setup Diagram:



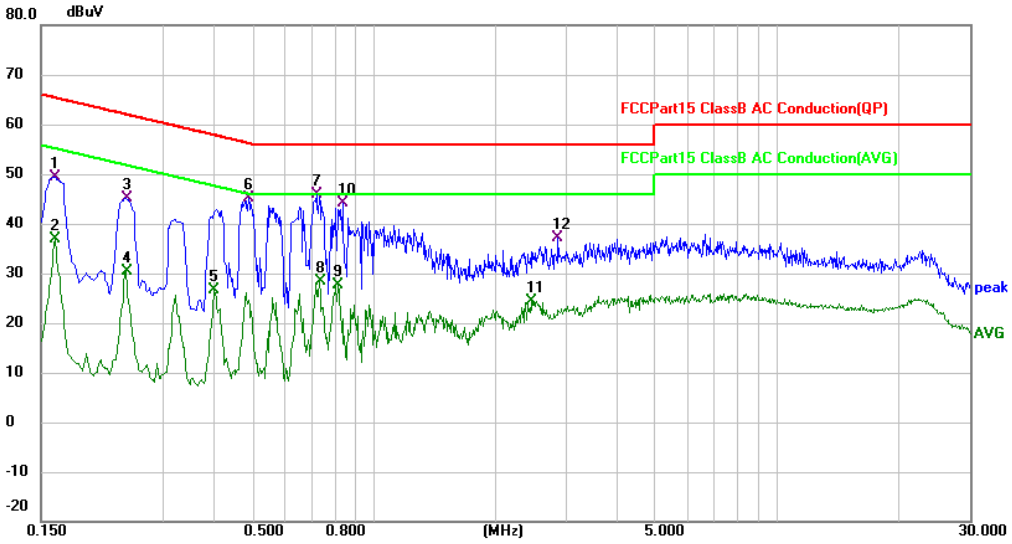
6.1.3 Test Data:

Mode1 / Line: Line / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	22.02	10.30	32.32	55.36	-23.04	AVG	
2		0.1660	38.80	10.30	49.10	65.16	-16.06	QP	
3		0.2420	34.24	10.32	44.56	62.03	-17.47	QP	
4		0.2420	18.41	10.32	28.73	52.03	-23.30	AVG	
5	*	0.4900	34.69	10.43	45.12	56.17	-11.05	QP	
6		0.4900	17.51	10.43	27.94	46.17	-18.23	AVG	
7		0.7420	17.73	10.49	28.22	46.00	-17.78	AVG	
8		0.8020	33.51	10.49	44.00	56.00	-12.00	QP	
9		2.1940	25.60	10.56	36.16	56.00	-19.84	QP	
10		2.3540	13.87	10.55	24.42	46.00	-21.58	AVG	
11		3.6100	27.22	10.56	37.78	56.00	-18.22	QP	
12		4.2419	15.75	10.56	26.31	46.00	-19.69	AVG	

Mode1 / Line: Neutral / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	39.15	10.30	49.45	65.36	-15.91	QP	
2		0.1620	26.47	10.30	36.77	55.36	-18.59	AVG	
3		0.2420	34.73	10.32	45.05	62.03	-16.98	QP	
4		0.2420	20.11	10.32	30.43	52.03	-21.60	AVG	
5		0.4020	16.13	10.39	26.52	47.81	-21.29	AVG	
6		0.4900	34.64	10.43	45.07	56.17	-11.10	QP	
7	*	0.7220	35.48	10.48	45.96	56.00	-10.04	QP	
8		0.7340	17.92	10.48	28.40	46.00	-17.60	AVG	
9		0.8139	17.06	10.50	27.56	46.00	-18.44	AVG	
10		0.8380	33.62	10.51	44.13	56.00	-11.87	QP	
11		2.4700	13.83	10.55	24.38	46.00	-21.62	AVG	
12		2.8699	26.60	10.57	37.17	56.00	-18.83	QP	

6.2 Occupied Bandwidth

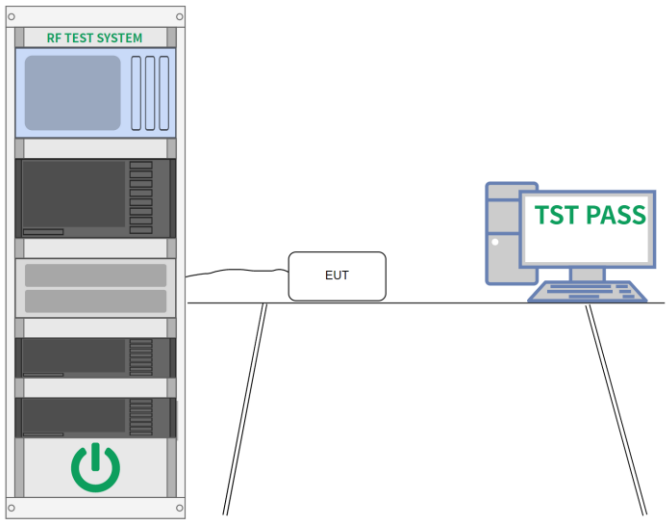
Test Requirement:	47 CFR 15.215(c)
Test Limit:	Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the 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 [(reference value) − 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:	25.3 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.2.2 Test Setup Diagram:

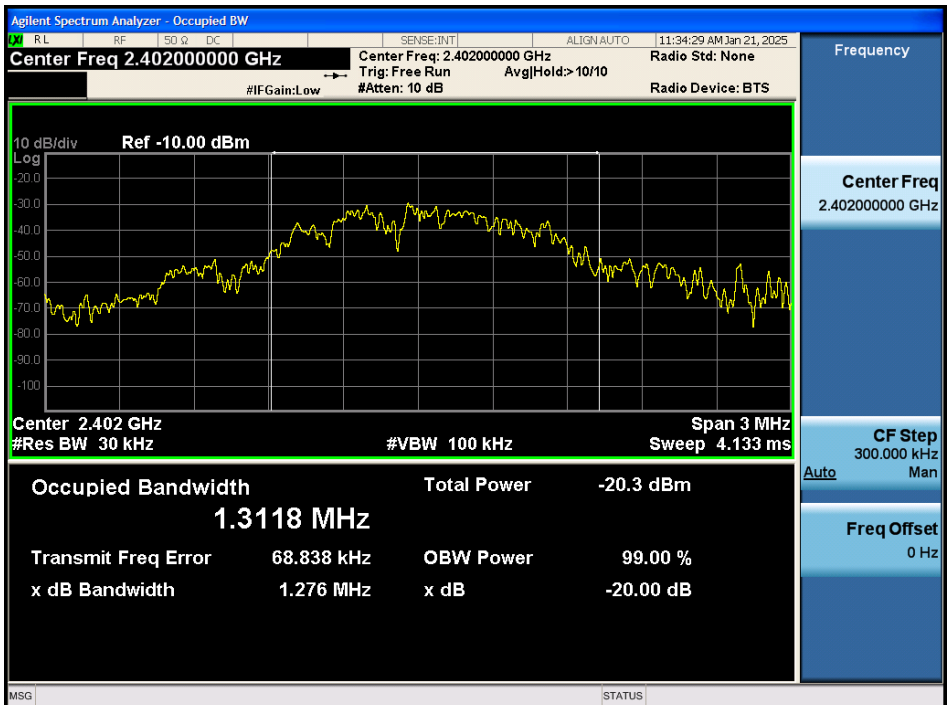


6.2.3 Test Data:

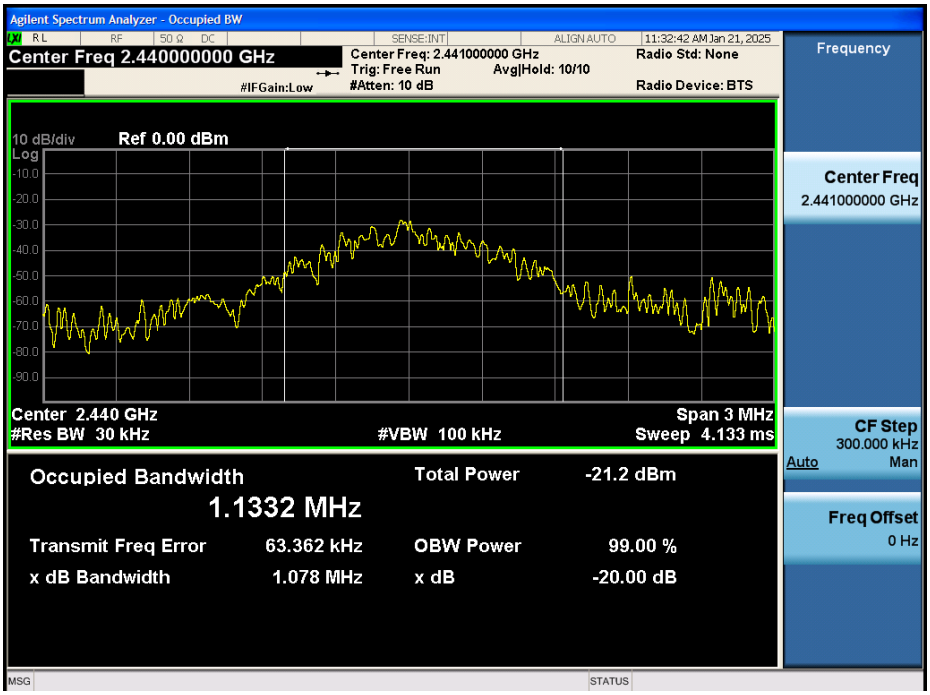
Frequency (MHz)	20dB bandwidth (MHz)
2402	1.3118
2440	1.1332
2480	1.0763

Test plots

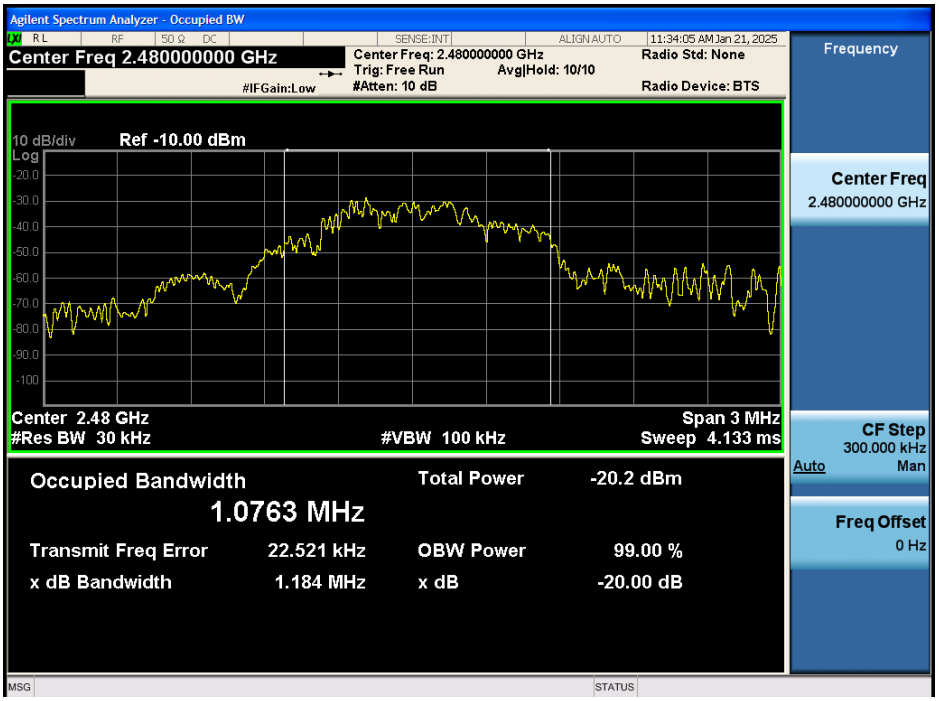
2402MHz



2440MHz



2480MHz


Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω DC
SENSE:INT
ALIGN AUTO
11:34:05 AM Jan 21, 2025
Center Freq 2.480000000 GHz
#IFGain:Low
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref -10.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 4.133 ms
Occupied Bandwidth
1.0763 MHz
Total Power
-20.2 dBm
Transmit Freq Error
22.521 kHz
OBW Power
99.00 %
x dB Bandwidth
1.184 MHz
x dB
-20.00 dB
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

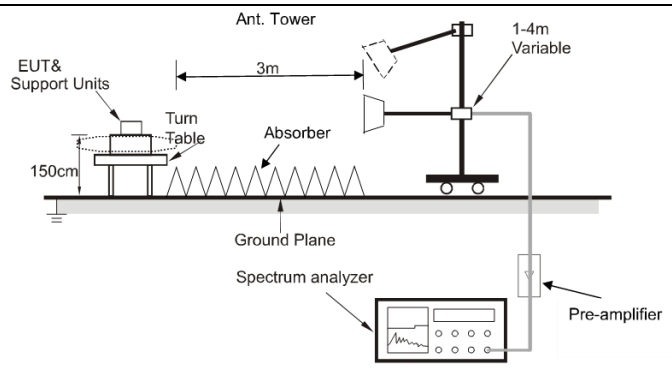
6.3 Field strength of fundamental

Test Requirement:	Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following: Fundamental frequency / Field strength of fundamental (millivolts/meter) / Field strength of harmonics (microvolts/meter) 902-928 MHz / 50 / 500 2400-2483.5 MHz / 50 / 500 5725-5875 MHz / 50 / 500 24.0-24.25 GHz / 250 / 2500 The field strength of emissions in this band shall not exceed 2500 millivolts/meter.
Test Method:	ANSI C63.10-2013 section 6.6
Procedure:	ANSI C63.10-2013 section 6.6

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.2 °C	Humidity:	55.5 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Mode1 / Polarization: Horizontal / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2402.000	72.99	-4.26	68.73	114.00	-45.27	peak
2	*	2402.000	70.35	-4.26	66.09	94.00	-27.91	AVG

Mode1 / Polarization: Vertical / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2402.000	65.80	-4.26	61.54	114.00	-52.46	peak
2	*	2402.000	62.64	-4.26	58.38	94.00	-35.62	AVG

Mode1 / Polarization: Horizontal / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2440.000	65.51	-4.38	61.13	114.00	-52.87	peak
2	*	2440.000	62.62	-4.38	58.24	94.00	-35.76	AVG

Mode1 / Polarization: Vertical / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2440.000	68.99	-4.38	64.61	114.00	-49.39	peak
2	*	2440.000	66.31	-4.38	61.93	94.00	-32.07	AVG

Mode1 / Polarization: Horizontal / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2480.000	67.47	-4.23	63.24	114.00	-50.76	peak
2	*	2480.000	64.39	-4.23	60.16	94.00	-33.84	AVG

Mode1 / Polarization: Vertical / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2480.000	66.04	-4.23	61.81	114.00	-52.19	peak
2	*	2480.000	62.91	-4.23	58.68	94.00	-35.32	AVG

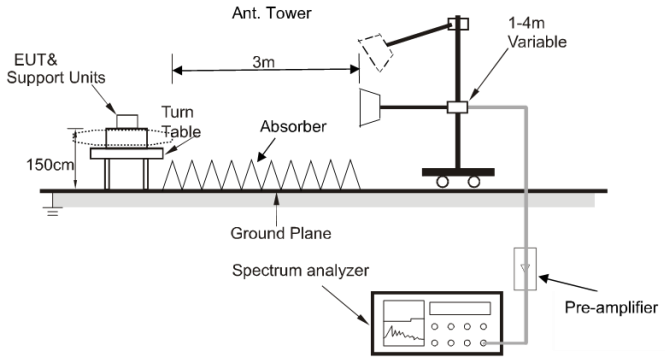
6.4 Band edge emissions (Radiated)

<table>
<tr><td>Test Requirement:</td><td>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.</td></tr>
<tr><td>Test Limit:</td><td>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.
<table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** 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. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013 section 6.6.4</td></tr>
<tr><td>Procedure:</td><td>ANSI C63.10-2013 section 6.6.4</td></tr>
</table>

6.4.1 E.U.T. Operation:

<table>
<tr><td colspan="6">Operating Environment:</td></tr>
<tr><td>Temperature:</td><td>23.2 °C</td><td>Humidity:</td><td>55.5 %</td><td>Atmospheric Pressure:</td><td>100 kPa</td></tr>
<tr><td>Pre test mode:</td><td colspan="5">Mode1</td></tr>
<tr><td>Final test mode:</td><td colspan="5">Mode1</td></tr>
</table>

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Mode1 / Polarization: Horizontal / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	46.77	-4.83	41.94	74.00	-32.06	peak
2		2310.000	36.49	-4.83	31.66	54.00	-22.34	AVG
3	*	2390.000	68.18	-4.31	63.87	74.00	-10.13	peak
4		2390.000	41.91	-4.31	37.60	54.00	-16.40	AVG
5		2400.000	66.23	-4.25	61.98	74.00	-12.02	peak
6		2400.000	40.98	-4.25	36.73	54.00	-17.27	AVG

Mode1 / Polarization: Vertical / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	47.05	-4.83	42.22	74.00	-31.78	peak
2		2310.000	36.43	-4.83	31.60	54.00	-22.40	AVG
3		2390.000	56.06	-4.31	51.75	74.00	-22.25	peak
4		2390.000	36.92	-4.31	32.61	54.00	-21.39	AVG
5		2400.000	55.72	-4.25	51.47	74.00	-22.53	peak
6	*	2400.000	37.22	-4.25	32.97	54.00	-21.03	AVG

Mode1 / Polarization: Horizontal / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	57.58	-4.21	53.37	74.00	-20.63	peak
2		2483.500	37.37	-4.21	33.16	54.00	-20.84	AVG
3		2500.000	47.15	-4.10	43.05	74.00	-30.95	peak
4		2500.000	36.53	-4.10	32.43	54.00	-21.57	AVG

Mode1 / Polarization: Vertical / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	67.43	-4.21	63.22	74.00	-10.78	peak
2		2483.500	41.47	-4.21	37.26	54.00	-16.74	AVG
3	*	2500.000	45.72	-4.10	41.62	74.00	-32.38	peak
4		2500.000	36.48	-4.10	32.38	54.00	-21.62	AVG

6.5 Emissions in frequency bands (below 1GHz)

<table>
<tr><td>Test Requirement:</td><td>47 CFR 15.249(a)
47 CFR 15.249(d)</td></tr>
<tr><td>Test Limit:</td><td>Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

<table>
<tr><th>Fundamental frequency</th><th>Field strength of fundamental (millivolts/meter)</th><th>Field strength of harmonics (microvolts/meter)</th></tr>
<tr><td>902-928 MHz</td><td>50</td><td>500</td></tr>
<tr><td>2400-2483.5 MHz</td><td>50</td><td>500</td></tr>
<tr><td>5725-5875 MHz</td><td>50</td><td>500</td></tr>
<tr><td>24.0-24.25 GHz</td><td>250</td><td>2500</td></tr>
</table>

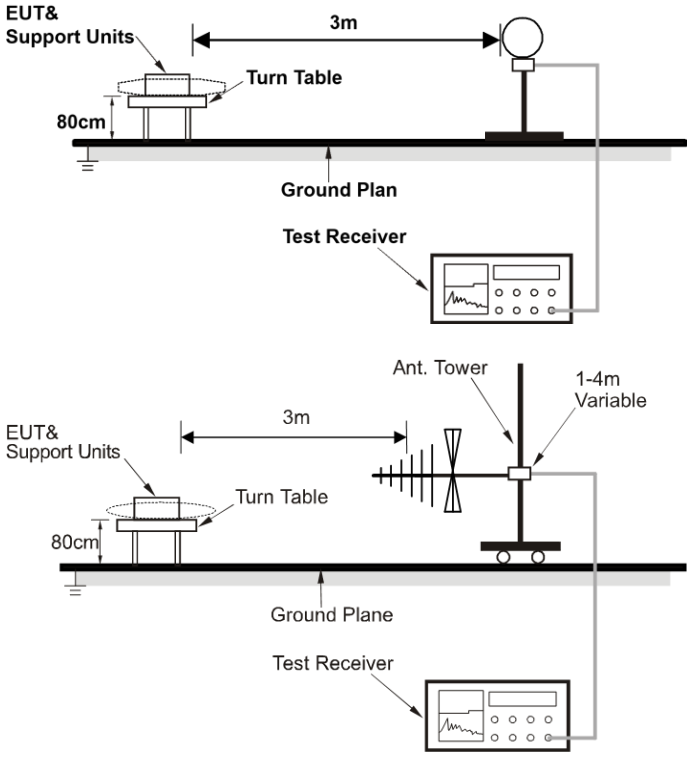
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** 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.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
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.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013 section 6.5</td></tr>
<tr><td>Procedure:</td><td>ANSI C63.10-2013 section 6.5</td></tr>
</table>

6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.2 °C	Humidity:	55.5 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

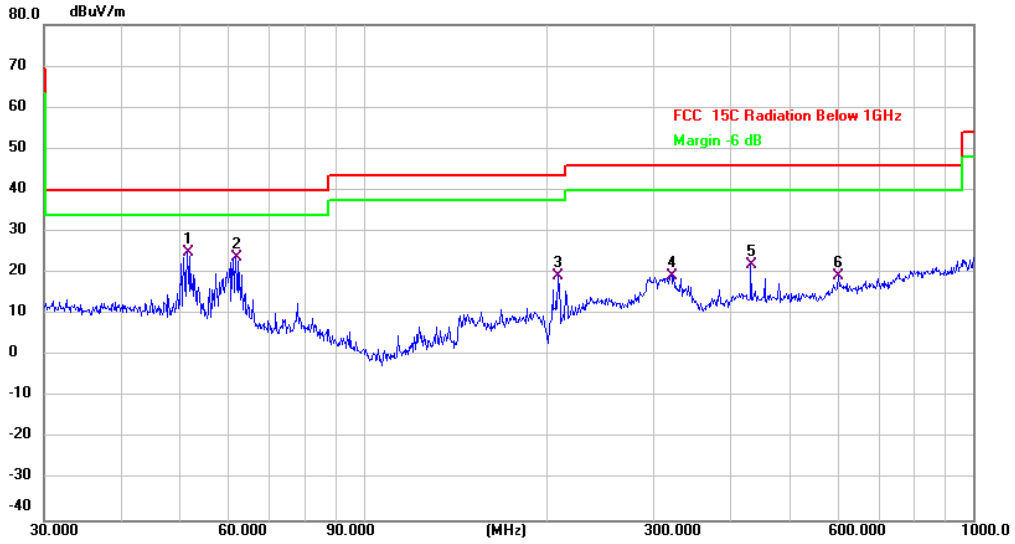
Note:
The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.
All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.

6.5.2 Test Setup Diagram:



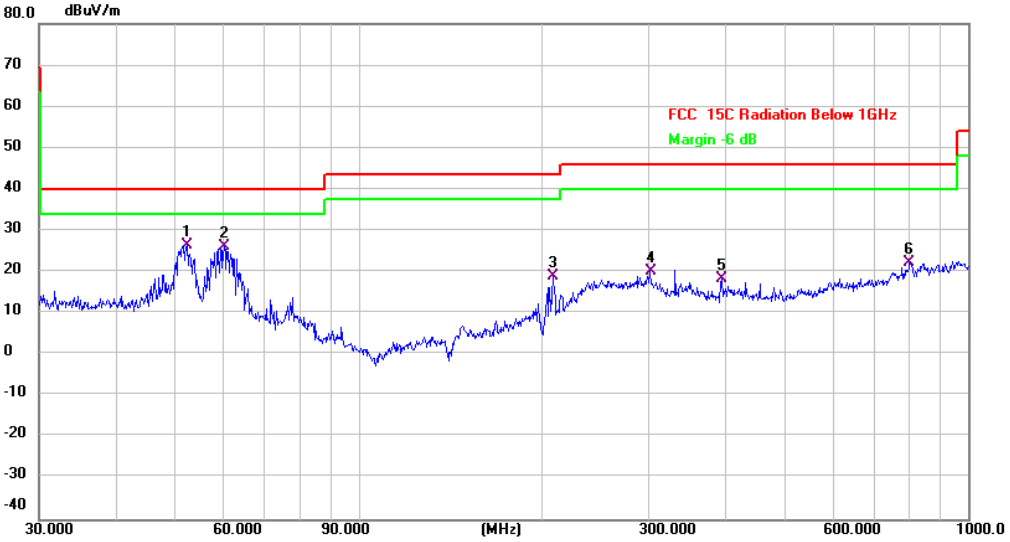
6.5.3 Test Data:

Mode1 / Polarization: Horizontal / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	51.4807	40.53	-15.64	24.89	40.00	-15.11	QP	
2		61.7781	41.10	-17.36	23.74	40.00	-16.26	QP	
3		209.3129	38.69	-19.40	19.29	43.50	-24.21	QP	
4		319.9370	35.89	-16.66	19.23	46.00	-26.77	QP	
5		432.5457	35.64	-13.70	21.94	46.00	-24.06	QP	
6		601.4265	29.80	-10.48	19.32	46.00	-26.68	QP	

Mode1 / Polarization: Vertical / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	52.3912	47.77	-21.46	26.31	40.00	-13.69	QP	
2		60.2801	47.56	-21.39	26.17	40.00	-13.83	QP	
3		209.3129	41.31	-22.40	18.91	43.50	-24.59	QP	
4		301.4224	36.07	-15.92	20.15	46.00	-25.85	QP	
5		394.8545	32.73	-14.50	18.23	46.00	-27.77	QP	
6		801.7863	28.86	-6.53	22.33	46.00	-23.67	QP	

6.6 Emissions in frequency bands (above 1GHz)

<table>
<tr><td>Test Requirement:</td><td>47 CFR 15.249(a)
47 CFR 15.249(d)</td></tr>
<tr><td>Test Limit:</td><td>Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

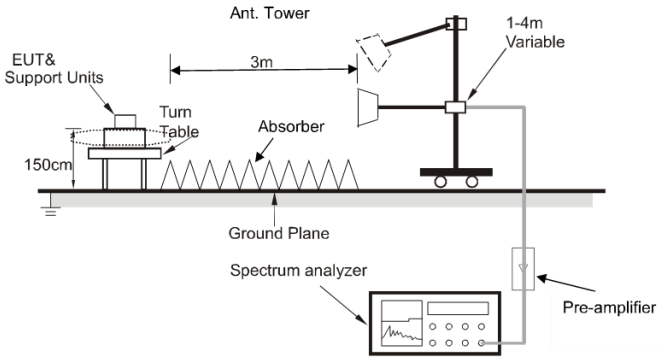
<table>
<tr><th>Fundamental frequency</th><th>Field strength of fundamental (millivolts/meter)</th><th>Field strength of harmonics (microvolts/meter)</th></tr>
<tr><td>902-928 MHz</td><td>50</td><td>500</td></tr>
<tr><td>2400-2483.5 MHz</td><td>50</td><td>500</td></tr>
<tr><td>5725-5875 MHz</td><td>50</td><td>500</td></tr>
<tr><td>24.0-24.25 GHz</td><td>250</td><td>2500</td></tr>
</table>

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** 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.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
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.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2013 section 6.6</td></tr>
<tr><td>Procedure:</td><td>ANSI C63.10-2013 section 6.6</td></tr>
</table>

6.6.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.2 °C	Humidity:	55.5 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.6.2 Test Setup Diagram:



6.6.3 Test Data:

Mode1 / Polarization: Horizontal / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4804.000	53.90	0.53	54.43	74.00	-19.57	peak
2	*	4804.000	47.83	0.53	48.36	54.00	-5.64	AVG
3		7206.000	41.59	7.90	49.49	74.00	-24.51	peak
4		7206.000	35.36	7.90	43.26	54.00	-10.74	AVG
5		9608.000	44.06	8.85	52.91	74.00	-21.09	peak
6		9608.000	37.74	8.85	46.59	54.00	-7.41	AVG

Mode1 / Polarization: Vertical / CH: L

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4804.000	47.81	0.53	48.34	74.00	-25.66	peak
2		4804.000	41.83	0.53	42.36	54.00	-11.64	AVG
3		7206.000	41.97	7.90	49.87	74.00	-24.13	peak
4		7206.000	35.35	7.90	43.25	54.00	-10.75	AVG
5		9608.000	43.98	8.85	52.83	74.00	-21.17	peak
6	*	9608.000	37.72	8.85	46.57	54.00	-7.43	AVG

Mode1 / Polarization: Horizontal / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4880.000	46.20	0.56	46.76	74.00	-27.24	peak
2		4880.000	39.58	0.56	40.14	54.00	-13.86	AVG
3		7320.000	42.40	7.54	49.94	74.00	-24.06	peak
4		7320.000	35.72	7.54	43.26	54.00	-10.74	AVG
5		9760.000	43.38	9.33	52.71	74.00	-21.29	peak
6	*	9760.000	37.26	9.33	46.59	54.00	-7.41	AVG

Mode1 / Polarization: Vertical / CH: M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4880.000	46.20	0.56	46.76	74.00	-27.24	peak
2		4880.000	39.58	0.56	40.14	54.00	-13.86	AVG
3		7320.000	42.40	7.54	49.94	74.00	-24.06	peak
4		7320.000	35.72	7.54	43.26	54.00	-10.74	AVG
5		9760.000	43.38	9.33	52.71	74.00	-21.29	peak
6	*	9760.000	37.26	9.33	46.59	54.00	-7.41	AVG

Mode1 / Polarization: Horizontal / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4960.000	49.34	0.66	50.00	74.00	-24.00	peak
2		4960.000	43.66	0.66	44.32	54.00	-9.68	AVG
3		7440.000	42.10	7.94	50.04	74.00	-23.96	peak
4		7440.000	36.63	7.94	44.57	54.00	-9.43	AVG
5		9920.000	43.33	9.69	53.02	74.00	-20.98	peak
6	*	9920.000	37.87	9.69	47.56	54.00	-6.44	AVG

Mode1 / Polarization: Vertical / CH: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4960.000	44.86	0.66	45.52	74.00	-28.48	peak
2		4960.000	38.92	0.66	39.58	54.00	-14.42	AVG
3		7440.000	42.91	7.94	50.85	74.00	-23.15	peak
4		7440.000	36.63	7.94	44.57	54.00	-9.43	AVG
5		9920.000	43.51	9.69	53.20	74.00	-20.80	peak
6	*	9920.000	37.93	9.69	47.62	54.00	-6.38	AVG

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix - EUT Photos

Statement

1. This report is invalid without the seal and signature of the laboratory.

2. The test results of this report are only responsible for the samples submitted.Client shall be responsible for representativeness of the sample and authenticity of the material.
3. The report shall not be partially reproduced without the written consent of the Laboratory.
4. This report is invalid if transferred, altered or tampered with in any form without authorization.
5. The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
6. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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