Microtest
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Test Report

Report No.: MTi240925003-04E2

Date of issue: 2024-11-07

Applicant: ZhiHaiHe Marketing (ShenZhen) Co.,Ltd

Product name: Varmilo VA80

Model(s): VA80

FCC ID: 2BDPP-VA80

Shenzhen Microtest Co., Ltd.

http://www.mtitest.cn

The test report is only used for customer scientific research, teaching, internal quality control and other purposes, and is for internal reference only.

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.
Tel: 0755-88850135-1439 Mobile: 131-4343-1439 (Wechat same number) Web: http://www.mtitest.cn E-mail: mti@51mti.com

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2. The test results in this test report are only responsible for the samples submitted

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5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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Test Result Certification	
Applicant:	ZhiHaiHe Marketing (ShenZhen) Co.,Ltd
Address:	Rm202, 2nd Floor, Block 3, 10th Industrial Zone, Tian Liao Community, YuTang Street, Guangming District, Shenzhen, China.
Manufacturer:	SHENZHEN ARBITER TECHNOLOGY CO.,LTD
Address:	Floor 2, 3 and 4, Bldg. A, Meisheng Industrial Park, Chongqing Rd., Fuhai St., Baoan Dist.,Shenzhen, Guangdong
Product description	
Product name:	Varmilo VA80
Trademark:	Varmilo
Model name:	VA80
Series Model(s):	N/A
Standards:	47 CFR Part 15.249
Test Method:	ANSI C63.10-2013
Date of Test	
Date of test:	2024-10-25 to 2024-10-28
Test result:	Pass

Test Engineer	:	Maleah Deng
		(Maleah Deng)
Reviewed By	:	David. Lee
		(David Lee)
Approved By	:	Leon chen
		(Leon Chen)

1 General Description

1.1 Description of the EUT

Product name:	Varmilo VA80
Model name:	VA80
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: DC 5V 500mA Battery: DC 3.7V 4000mAh, 14.8Wh
Accessories:	Cable: USB-A to USB-C cable 160cm Dongle*1
Hardware version:	V1.1
Software version:	V0203
Test sample(s) number:	MTi240925003-04S1001
RF specification	
Operating frequency range:	2402-2480MHz
Channel number:	40
Modulation type:	GFSK
Antenna(s) type:	PCB Antenna
Antenna(s) gain:	-1dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX-GFSK

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

Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
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:

For power setting, refer to below table.

Test Software:	SSCOM V5.13.1		
Mode	2402MHz	2440MHz	2480MHz
GFSK	4	4	4

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

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list			
Description	Model	Serial No.	Manufacturer
MI CHARGE(18W)	MDY-08-EH	YJ2808215006999	MI
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(d)	Pass
6	Emissions in frequency bands (below 1GHz)	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	Pass
7	Emissions in frequency bands (above 1GHz)	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	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
Band edge emissions (Radiated) Emissions in frequency bands (above 1GHz) Field strength of fundamental						
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	EWLAN1840 G	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.

5.1.1 Conclusion:

The antenna of the EUT is permanently attached. The EUT complies with the requirement of FCC PART 15.203.

6 Radio Spectrum Matter Test Results (RF)

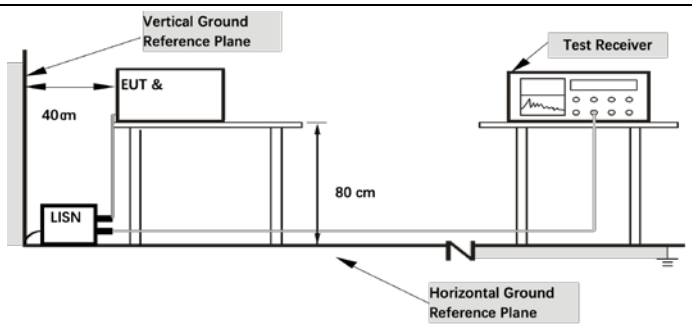
6.1 Conducted Emission at AC power line

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 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:

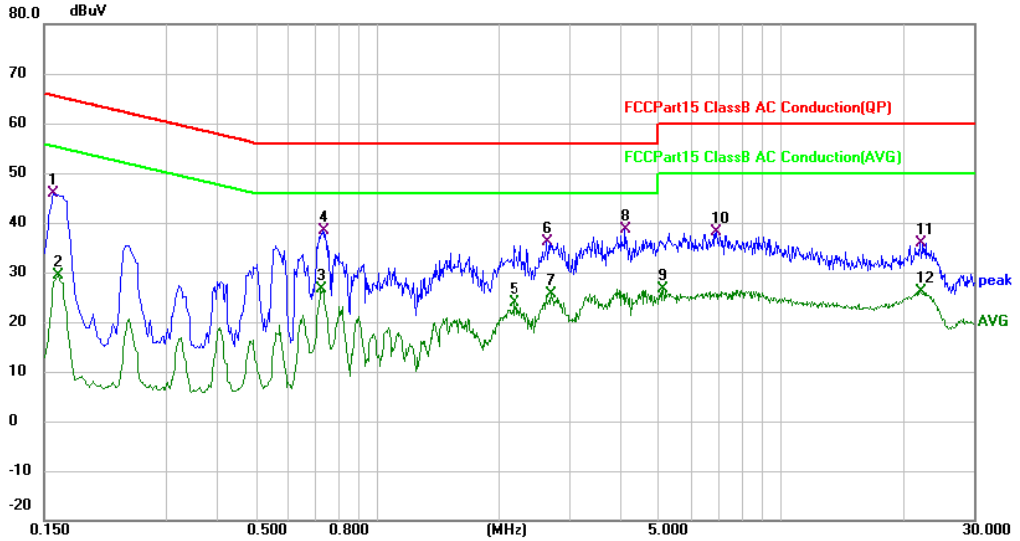
Operating Environment:					
Temperature:	25.9 °C	Humidity:	44 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.1.2 Test Setup Diagram:



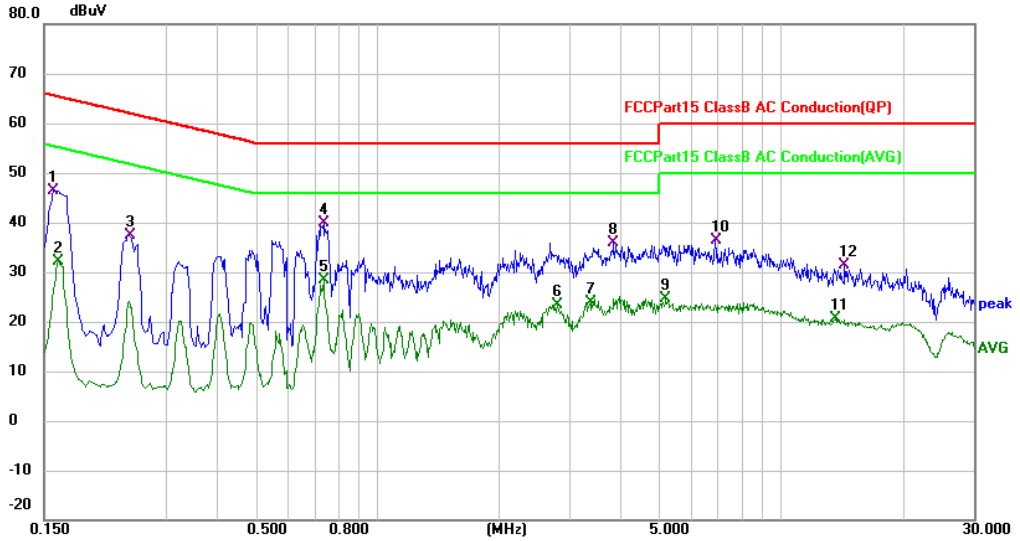
6.1.3 Test Data:

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		0.1580	35.49	10.30	45.79	65.57	-19.78	QP	
2		0.1620	18.98	10.30	29.28	55.36	-26.08	AVG	
3		0.7260	16.14	10.48	26.62	46.00	-19.38	AVG	
4		0.7340	27.96	10.48	38.44	56.00	-17.56	QP	
5		2.1860	13.30	10.56	23.86	46.00	-22.14	AVG	
6		2.6380	25.49	10.56	36.05	56.00	-19.95	QP	
7		2.7139	15.01	10.56	25.57	46.00	-20.43	AVG	
8	*	4.1259	28.13	10.56	38.69	56.00	-17.31	QP	
9		5.1139	15.98	10.57	26.55	50.00	-23.45	AVG	
10		6.9339	27.40	10.62	38.02	60.00	-21.98	QP	
11		22.1620	24.71	11.06	35.77	60.00	-24.23	QP	
12		22.1620	15.11	11.06	26.17	50.00	-23.83	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		0.1580	36.11	10.30	46.41	65.57	-19.16	QP	
2		0.1620	21.92	10.30	32.22	55.36	-23.14	AVG	
3		0.2420	27.11	10.32	37.43	62.03	-24.60	QP	
4	*	0.7380	29.29	10.49	39.78	56.00	-16.22	QP	
5		0.7380	17.80	10.49	28.29	46.00	-17.71	AVG	
6		2.7980	12.77	10.56	23.33	46.00	-22.67	AVG	
7		3.3820	13.32	10.57	23.89	46.00	-22.11	AVG	
8		3.8740	25.43	10.57	36.00	56.00	-20.00	QP	
9		5.2019	14.13	10.58	24.71	50.00	-25.29	AVG	
10		6.9139	25.88	10.62	36.50	60.00	-23.50	QP	
11		13.6539	9.66	10.89	20.55	50.00	-29.45	AVG	
12		14.3818	20.46	10.93	31.39	60.00	-28.61	QP	

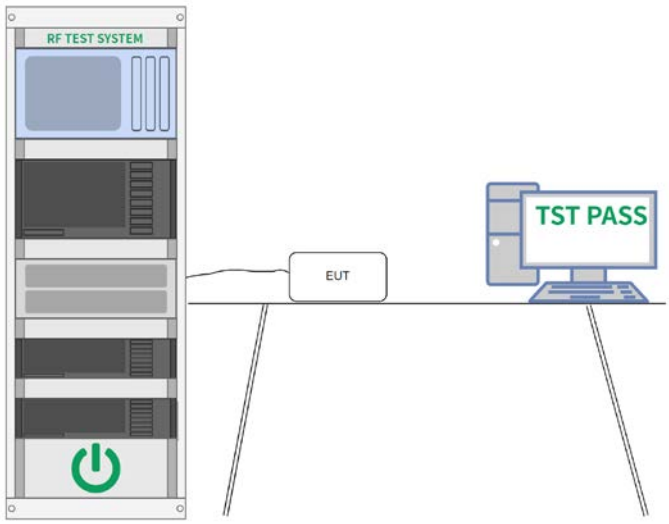
6.2 Occupied Bandwidth

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:	24 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

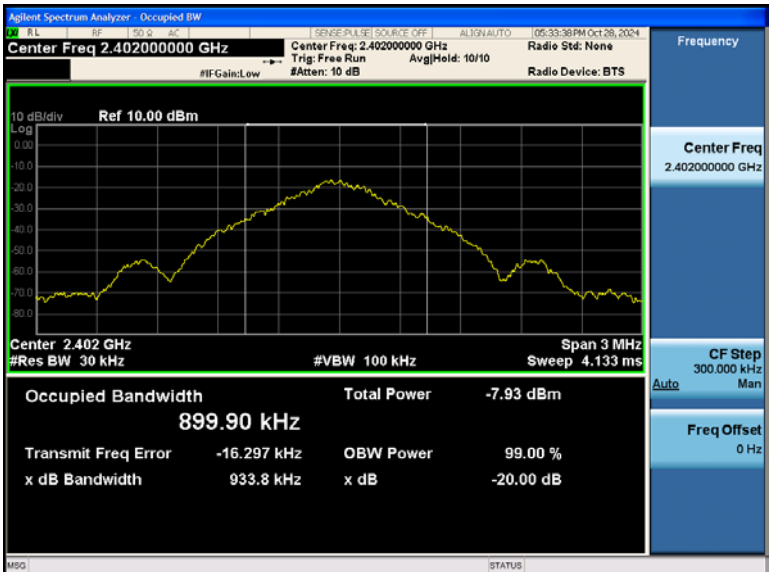
6.2.2 Test Setup Diagram:



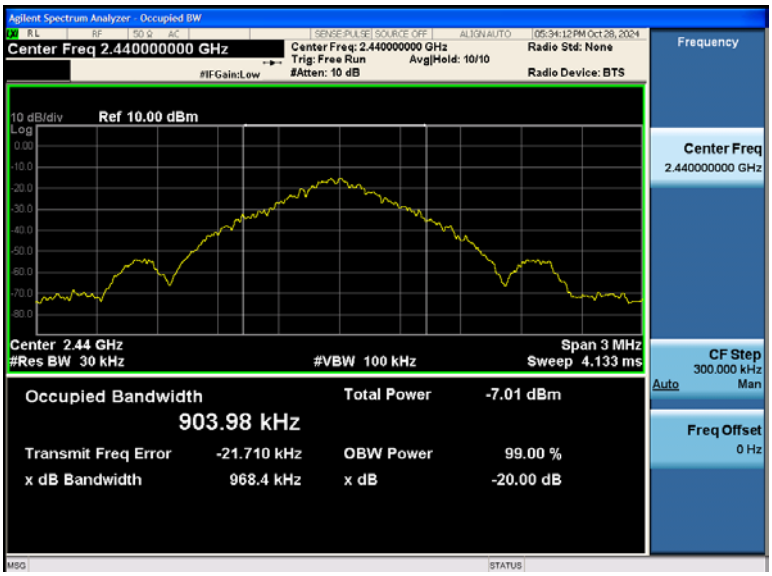
6.2.3 Test Data:

Test channel	Frequency (MHz)	20dB Bandwidth (KHz)	99% Bandwidth (KHz)
CH1	2402	933.8	899.90
CH19	2440	968.4	903.98
CH38	2480	879.5	901.25

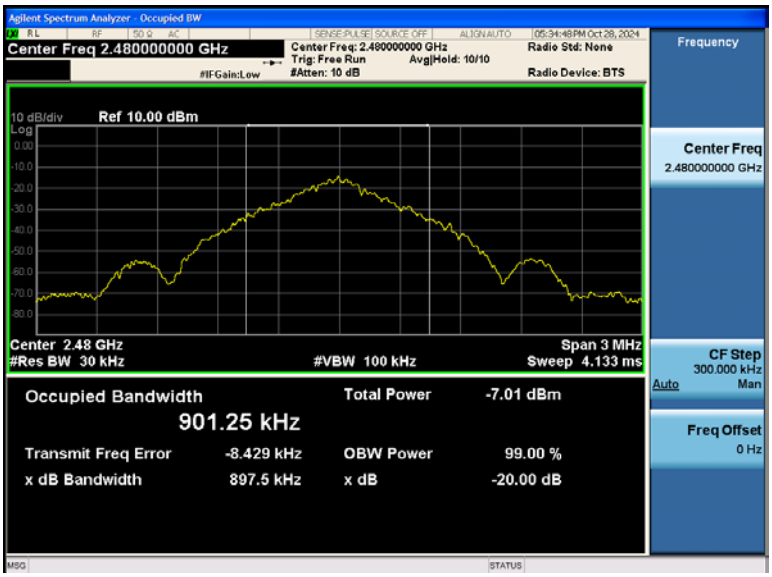
CH1



CH19



CH38



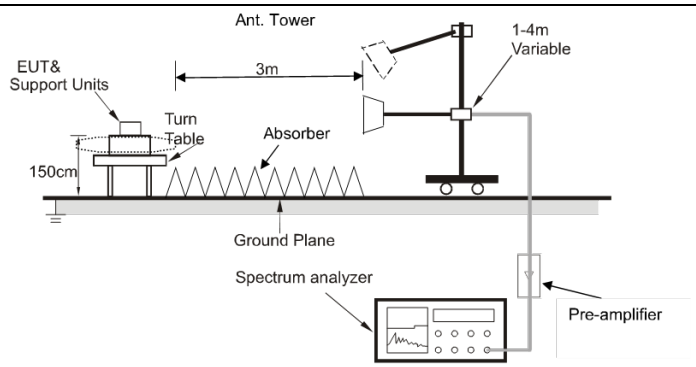
6.3 Field strength of fundamental

<table>
<tr><td>Test Requirement:</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>
The field strength of emissions in this band shall not exceed 2500 millivolts/meter.</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>

6.3.1 E.U.T. Operation:

<table>
<tr><td colspan="6">Operating Environment:</td></tr>
<tr><td>Temperature:</td><td>21.3 °C</td><td>Humidity:</td><td>40.2 %</td><td>Atmospheric Pressure:</td><td>98 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>

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2402	H	90.37	114	Peak	Pass
2402	H	90.18	94	AVG	Pass
2402	V	88.51	114	Peak	Pass
2402	V	88.33	94	AVG	Pass

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2440	H	88.51	114	Peak	Pass
2440	H	88.32	94	AVG	Pass
2440	V	86.11	114	Peak	Pass
2440	V	85.89	94	AVG	Pass

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2480	H	90.60	114	Peak	Pass
2480	H	90.40	94	AVG	Pass
2480	V	87.54	114	Peak	Pass
2480	V	87.34	94	AVG	Pass

6.4 Band edge emissions (Radiated)

Test Requirement:	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.
Test Limit:	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.

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

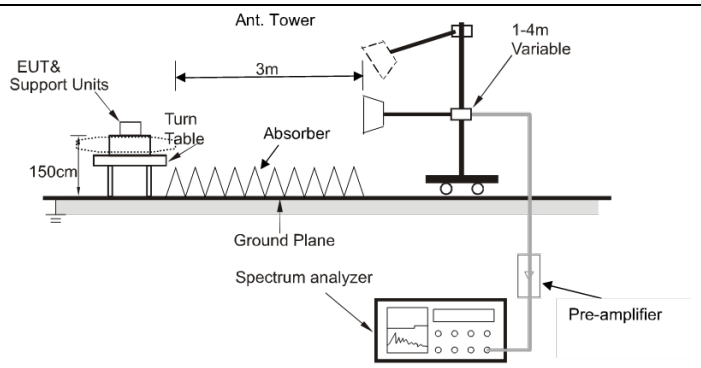
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
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.

Test Method:	ANSI C63.10-2013 section 6.6.4
Procedure:	ANSI C63.10-2013 section 6.6.4

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.3 °C	Humidity:	40.2 %	Atmospheric Pressure:	98 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

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	50.65	-4.83	45.82	74.00	-28.18	peak
2		2310.010	39.06	-4.83	34.23	54.00	-19.77	AVG
3		2390.000	49.13	-4.31	44.82	74.00	-29.18	peak
4		2390.000	38.34	-4.31	34.03	54.00	-19.97	AVG
5		2400.000	63.29	-4.25	59.04	74.00	-14.96	peak
6		2400.000	49.81	-4.25	45.56	54.00	-8.44	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	49.37	-4.83	44.54	74.00	-29.46	peak
2		2310.000	38.21	-4.83	33.38	54.00	-20.62	AVG
3		2390.000	49.17	-4.31	44.86	74.00	-29.14	peak
4		2390.000	38.90	-4.31	34.59	54.00	-19.41	AVG
5		2400.000	60.22	-4.25	55.97	74.00	-18.03	peak
6		2400.000	47.03	-4.25	42.78	54.00	-11.22	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	49.80	-4.21	45.59	74.00	-28.41	peak
2	*	2483.500	39.36	-4.21	35.15	54.00	-18.85	AVG
3		2500.000	48.87	-4.10	44.77	74.00	-29.23	peak
4		2500.000	38.33	-4.10	34.23	54.00	-19.77	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	C
1		2483.500	49.04	-4.21	44.83	74.00	-29.17	peak	
2	*	2483.500	38.72	-4.21	34.51	54.00	-19.49	AVG	
3		2500.000	48.51	-4.10	44.41	74.00	-29.59	peak	
4		2500.000	38.25	-4.10	34.15	54.00	-19.85	AVG	

6.5 Emissions in frequency bands (below 1GHz)

Test Requirement:	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)
Test Limit:	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

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.

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.
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.

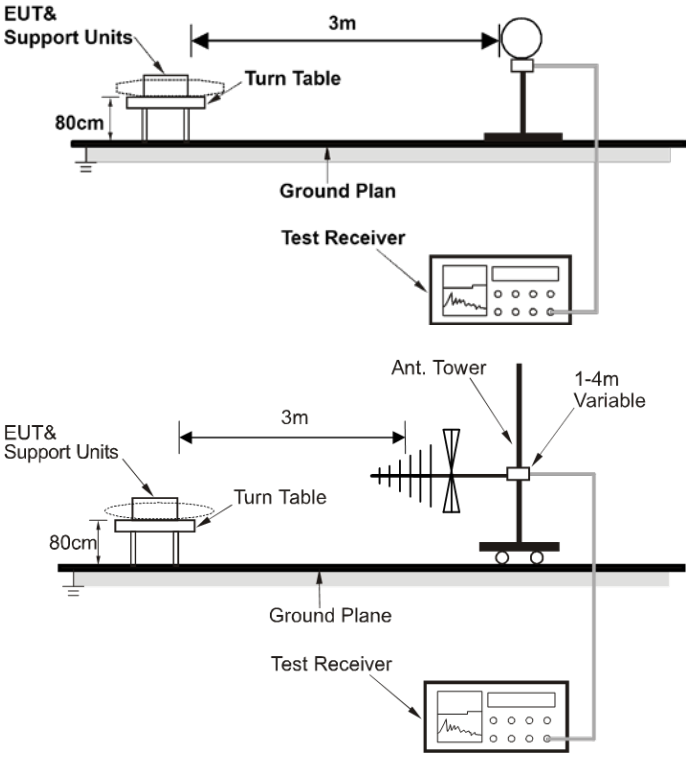
Test Method:	ANSI C63.10-2013 section 6.5
Procedure:	ANSI C63.10-2013 section 6.5

6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.3 °C	Humidity:	40.2 %	Atmospheric Pressure:	98 kPa

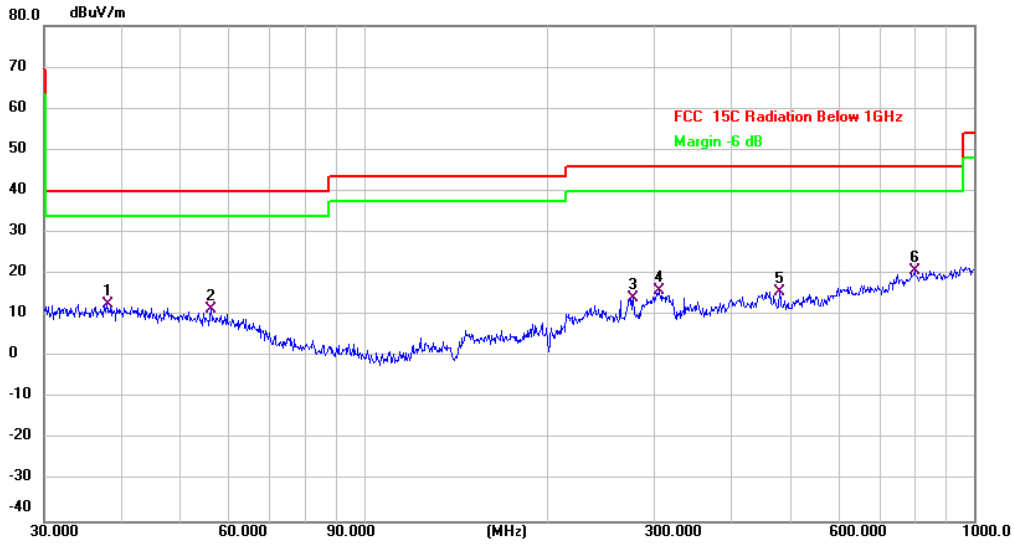
Pre test mode:	Mode1
Final test mode:	Mode1

6.5.2 Test Setup Diagram:



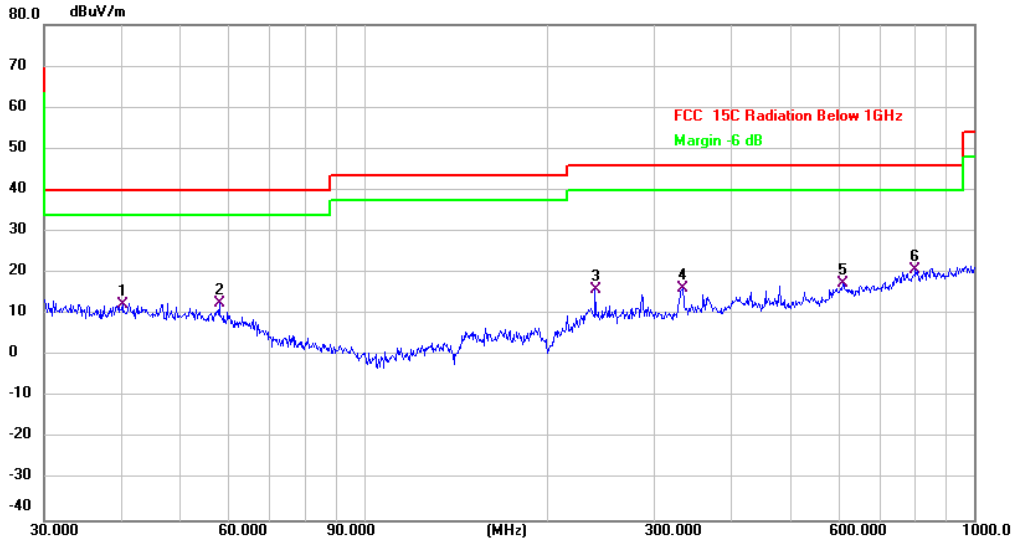
6.5.3 Test Data:

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		37.9450	26.71	-14.12	12.59	40.00	-27.41	QP	
2		56.1974	27.49	-16.05	11.44	40.00	-28.56	QP	
3		277.0935	30.30	-16.24	14.06	46.00	-31.94	QP	
4		305.6800	32.29	-16.41	15.88	46.00	-30.12	QP	
5		480.5276	29.97	-14.28	15.69	46.00	-30.31	QP	
6	*	798.9797	26.84	-6.05	20.79	46.00	-25.21	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		40.2757	36.81	-24.52	12.29	40.00	-27.71	QP	
2		57.9993	34.24	-21.47	12.77	40.00	-27.23	QP	
3		239.9874	35.21	-19.21	16.00	46.00	-30.00	QP	
4		333.6867	30.11	-13.93	16.18	46.00	-29.82	QP	
5		609.9217	28.62	-11.05	17.57	46.00	-28.43	QP	
6	*	801.7863	27.30	-6.53	20.77	46.00	-25.23	QP	

6.6 Emissions in frequency bands (above 1GHz)

Test Requirement:	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)
Test Limit:	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

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.

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.
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.

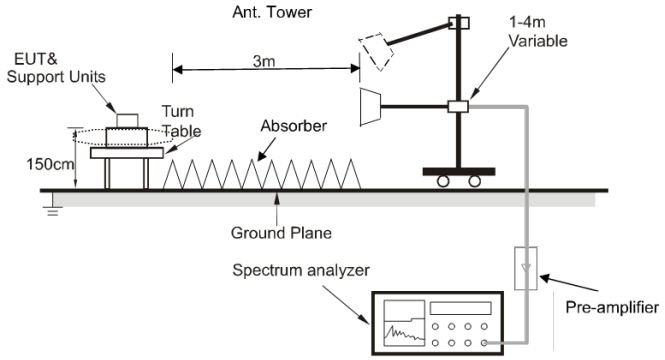
Test Method:	ANSI C63.10-2013 section 6.6
Procedure:	ANSI C63.10-2013 section 6.6

6.6.1 E.U.T. Operation:

Operating Environment:					
Temperature:	21.3 °C	Humidity:	40.2 %	Atmospheric Pressure:	98 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	53.68	0.53	54.21	74.00	-19.79	peak
2		4804.000	47.70	0.53	48.23	54.00	-5.77	AVG
3		7206.000	50.62	7.90	58.52	74.00	-15.48	peak
4	*	7206.000	41.23	7.90	49.13	54.00	-4.87	AVG
5		9608.000	45.27	8.85	54.12	74.00	-19.88	peak
6		9608.000	39.39	8.85	48.24	54.00	-5.76	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	50.60	0.53	51.13	74.00	-22.87	peak
2		4804.000	44.70	0.53	45.23	54.00	-8.77	AVG
3		7206.000	52.88	7.90	60.78	74.00	-13.22	peak
4	*	7206.000	42.22	7.90	50.12	54.00	-3.88	AVG
5		9608.000	44.91	8.85	53.76	74.00	-20.24	peak
6		9608.000	38.99	8.85	47.84	54.00	-6.16	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	51.43	0.56	51.99	74.00	-22.01	peak
2		4880.000	42.60	0.56	43.16	54.00	-10.84	AVG
3		7320.000	48.26	7.54	55.80	74.00	-18.20	peak
4	*	7320.000	39.65	7.54	47.19	54.00	-6.81	AVG
5		9760.000	45.46	9.33	54.79	74.00	-19.21	peak
6		9760.000	36.91	9.33	46.24	54.00	-7.76	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		4880.000	48.59	0.56	49.15	74.00	-24.85	peak
2		4880.000	41.63	0.56	42.19	54.00	-11.81	AVG
3		7320.000	52.06	7.54	59.60	74.00	-14.40	peak
4	*	7320.000	43.29	7.54	50.83	54.00	-3.17	AVG
5		9760.000	44.85	9.33	54.18	74.00	-19.82	peak
6		9760.000	40.41	9.33	49.74	54.00	-4.26	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	51.14	0.66	51.80	74.00	-22.20	peak
2		4960.000	42.49	0.66	43.15	54.00	-10.85	AVG
3		7440.000	48.41	7.94	56.35	74.00	-17.65	peak
4	*	7440.000	41.33	7.94	49.27	54.00	-4.73	AVG
5		9920.000	45.08	9.69	54.77	74.00	-19.23	peak
6		9920.000	37.43	9.69	47.12	54.00	-6.88	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	48.29	0.66	48.95	74.00	-25.05	peak
2		4960.000	40.57	0.66	41.23	54.00	-12.77	AVG
3		7440.000	52.68	7.94	60.62	74.00	-13.38	peak
4	*	7440.000	43.01	7.94	50.95	54.00	-3.05	AVG
5		9920.000	44.07	9.69	53.76	74.00	-20.24	peak
6		9920.000	37.47	9.69	47.16	54.00	-6.84	AVG

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix - EUT Photos

----End of Report----