



RF MEASUREMENT REPORT

FCC ID: 2AL4G-002

Applicant: AXENT Intelligence Inc.

Product: Intelligent Toilet

Model No.: TS026-3

Trademark: Axent-mint

FCC Classification: Part 15 Low Power Communication Device Transmitter (DXX)

FCC Rule Part(s): Part 15.249

Result: Complies

Received Date: 2023-10-08

Test Date: 2023-12-16 ~ 2023-12-21

Reviewed By:

Kevin Guo

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2310RSU010-U3	V01	Initial Report	2023-12-29	Valid

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1. General Information

1.1. Applicant

AXENT Intelligence Inc.

3 Musick Irvine, CA 92618, USA

1.2. Manufacturer

AXENT Intelligence Inc.

3 Musick Irvine, CA 92618, USA

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
	Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China
	Laboratory Accreditations
	A2LA: 3628.01 FCC: CN1166 VCCI: ☐ R-20025 ☐ G-20034 ☐ C-20020 ☐ T-20020 ☐ R-20141 ☐ G-20134 ☐ C-20103 ☐ T-20104
	CNAS: L10551 ISED: CN0001
☐	Test Site – MRT Shenzhen Laboratory
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China
	Laboratory Accreditations
	A2LA: 3628.02 FCC: CN1284
	CNAS: L10551 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
	Laboratory Accreditations
	TAF: 3261 FCC: 291082, TW3261
	ISED: TW3261

1.4. Product Information

Product Name	Intelligent Toilet
Model No.	TS026-3
EUT Identification No.	20231008Sample#18
SRD Specification	2411MHz (Only Receiver)
Radar Specification	24.0-24.25 GHz
Bluetooth Specification	Bluetooth-LE 1M Only
Power Type	120V, 60Hz
Operating Temp.	4-40°C
Remarks: 1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer. 2. The manufacturer declared the differences between the test sample and the final sample are the control switch in the control PCBA and different module bracket. Only the test sample was tested by the lab, and the final sample photos were provided by the manufacturer.	

1.5. Radio Specification

Working Frequency Range	24.0 ~ 24.25GHz
Modulation type	FSK
Antenna Gain	12 dBi
Antenna Type	PCB

2. Test Configuration

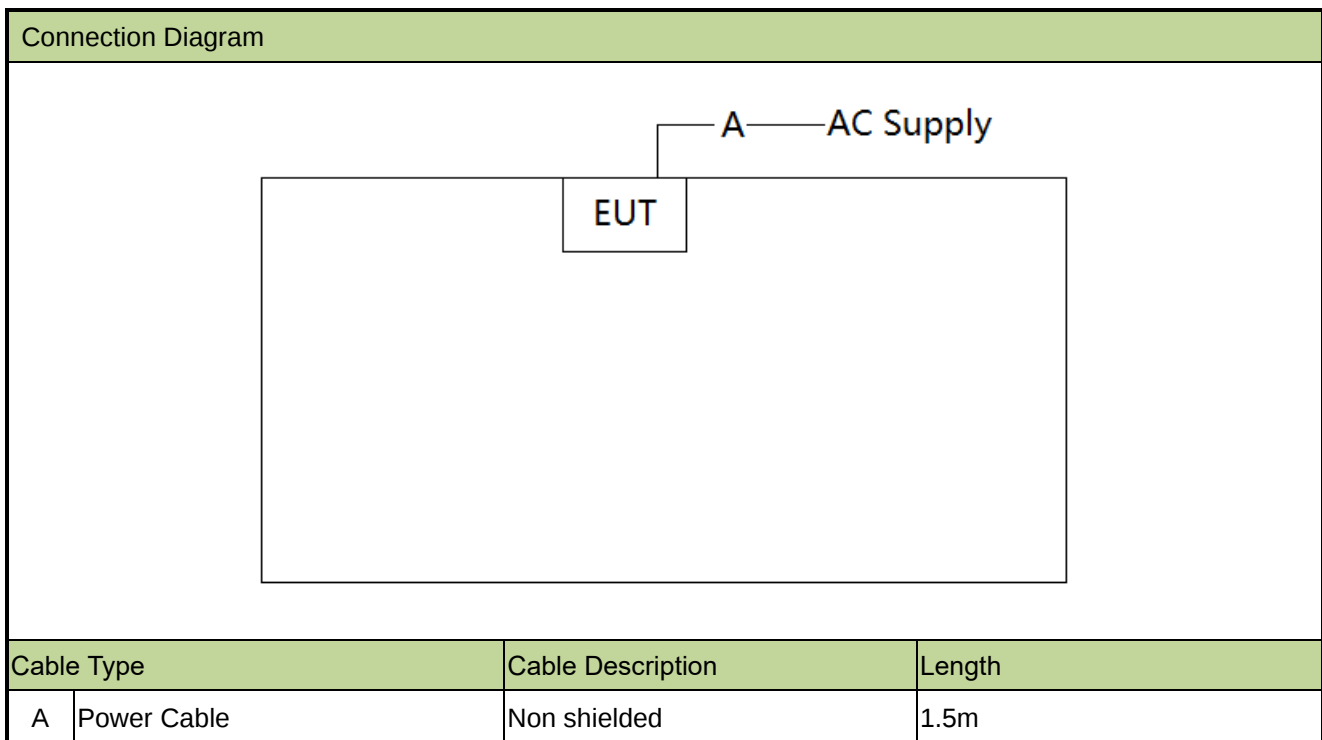
2.1. Test Mode

Mode 1: Transmitter (Tx) and Receiver (Rx) Work Simultaneously at 24GHz

Note: The test sample was provided by the manufacturer, which was configured into Collocated Tx/Rx mode after power on.

2.2. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.



2.3. Applied Standards

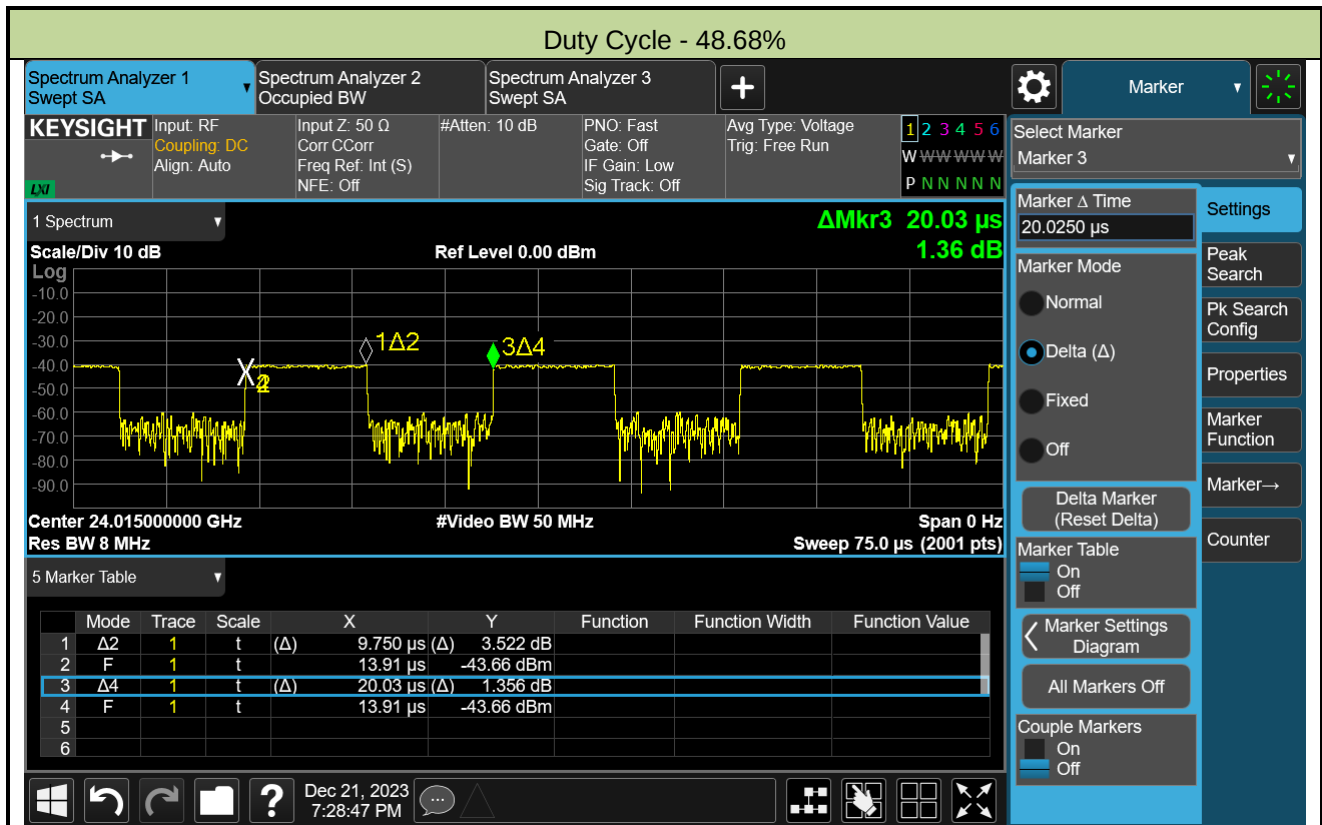
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.249
- ANSI C63.10-2013

2.4. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~ 75%RH

2.5. Duty Cycle



3. Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

This unit complies with the requirement of §15.203.

4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2024-12-17	SIP-AC3
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2024-05-23	SIP-AC3
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06599	1 year	2024-09-24	SIP-AC3
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2024-10-09	SIP-AC3
Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2024-07-14	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2024-10-28	SIP-AC3
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2024-01-12	SIP-AC3
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06646	1 year	2024-08-04	SIP-AC3
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2023-12-22	SIP-AC3
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2024-02-26	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE11255	1 year	2024-08-13	SIP-AC3
Waveguide Harmonic Mixer	Keysight	M1970V	MRTSUE06271	3 years	2025-09-22	SIP-AC3
Waveguide Harmonic Mixer	Keysight	M1970W	MRTSUE06272	3 years	2025-09-29	SIP-AC3
mmWave Antenna	MI-WWAVE	261U-25/383	MRTSUE06273	N/A ^{Note1}	N/A	SIP-AC3
mmWave Antenna	A-INFO	LB-15-25-A	MRTSUE06409	N/A ^{Note1}	N/A	SIP-AC3
mmWave Antenna	A-INFO	LB-10-25-A	MRTSUE06410	N/A ^{Note1}	N/A	SIP-AC3
Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2024-06-29	SIP-AC3

Note 1: Standard gain horns need not be periodically calibrated. Antenna appearance and connector were checked and no damage.

Software	Version	Function
EMI V3	V 3.0.0	EMI Test Software
Controller_MF 7802BS	1.02	RE Antenna & turntable

5. Decision Rules and Measurement Uncertainty

5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement	
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$):	
9kHz~150kHz: 3.58dB	
150kHz~30MHz: 3.20dB	
Radiated Emission Measurement	
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$):	
Coaxial:	9kHz~30MHz: 2.61dB
Coplanar:	9kHz~30MHz: 2.62dB
Horizontal:	30MHz~200MHz: 3.79dB
	200MHz~1GHz: 3.91dB
	1GHz~40GHz: 4.99dB
	40GHz~50GHz: 3.96dB
	50GHz~75GHz: 4.01dB
	75GHz~110GHz: 3.99dB
Vertical:	30MHz~200MHz: 4.06dB
	200MHz~1GHz: 5.21dB
	1GHz~40GHz: 4.90dB
	40GHz~50GHz: 3.86dB
	50GHz~75GHz: 3.89dB
	75GHz~110GHz: 3.87dB
Occupied Bandwidth	
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$):	
2.7%	

6. Test Result

6.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass
15.205 15.209 15.249	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Radiated	Pass
15.215(c)	20dB Spectrum Bandwidth	Radiated	Pass

Notes:

1. The radiation measurements are performed in X, Y, Z axis positioning. The test results shown in the following sections represent the worst-case emissions.
2. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

6.2. AC Conducted Emissions Measurement

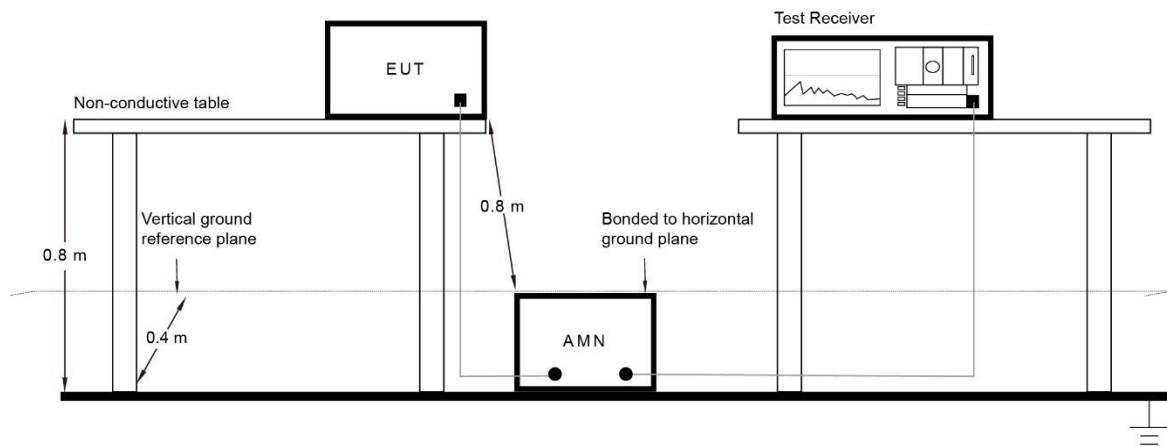
6.2.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBμV)	Average (dBμV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

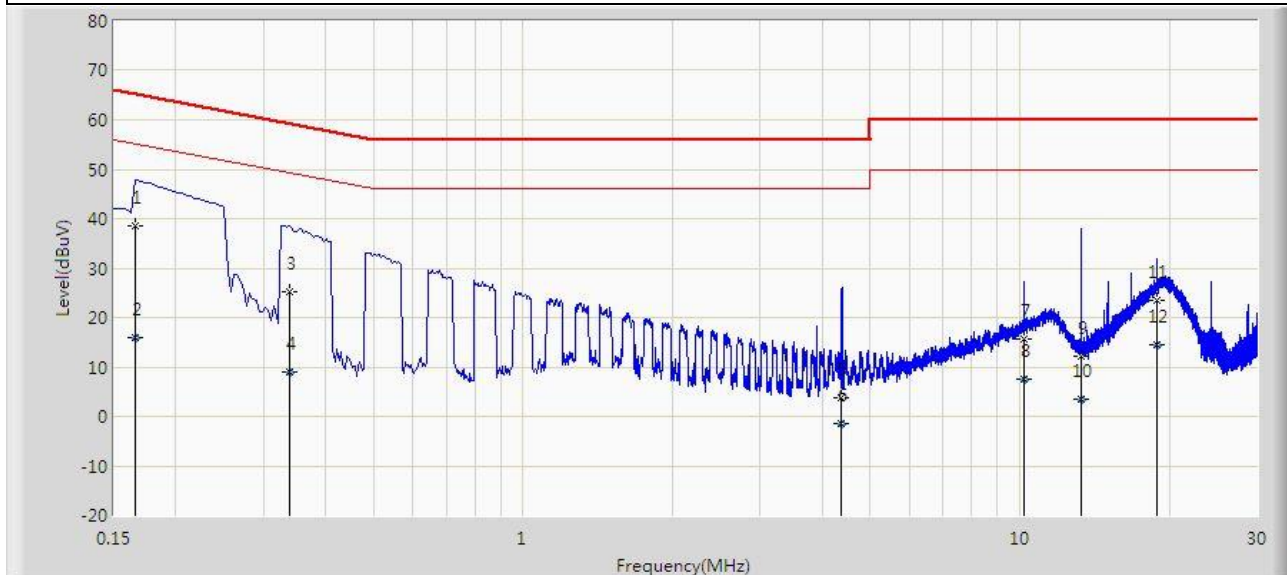
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.2.2. Test Setup



6.2.3. Test Result

Site: SIP-SR2	Test Date: 2023/12/21
Limit: FCC_Part15.207_CE_AC Power	Engineer: Mark Long
Probe: SIP-SR2-ENV216_101684_C	Polarity: Neutral
EUT: Intelligent Toilet	Power: AC 120V/60Hz
Test Mode 1	



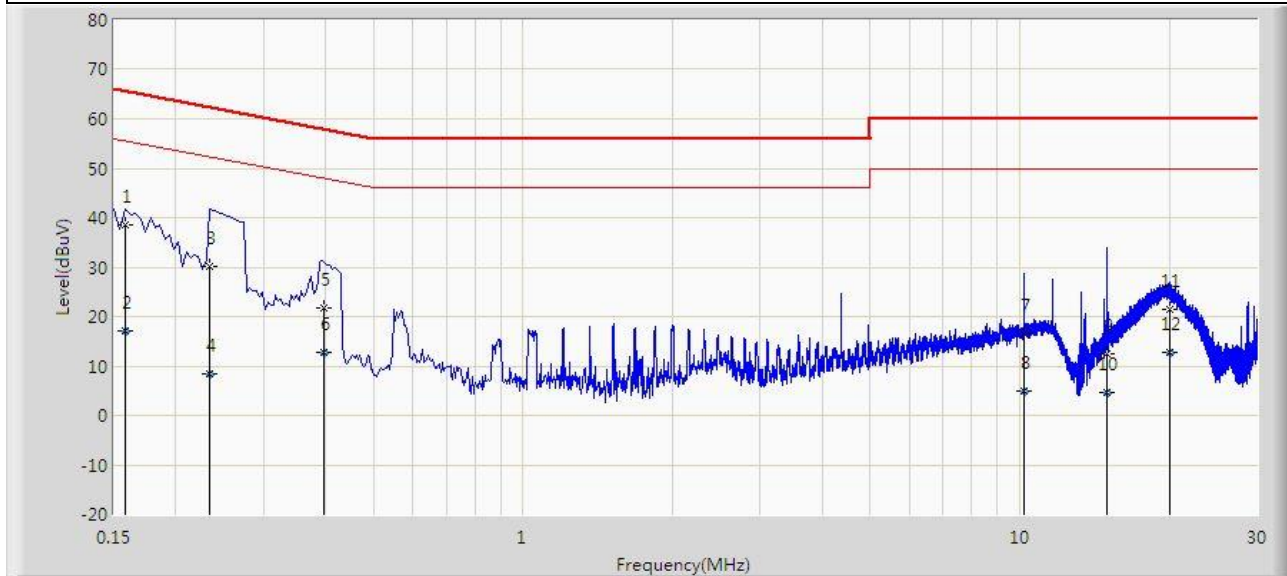
No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1	*	0.166	38.427	28.787	-26.732	65.158	9.640	QP
2		0.166	15.966	6.325	-39.193	55.158	9.640	AV
3		0.338	25.342	15.635	-33.911	59.252	9.707	QP
4		0.338	8.948	-0.759	-40.304	49.252	9.707	AV
5		4.378	3.728	-6.096	-52.272	56.000	9.824	QP
6		4.378	-1.574	-11.398	-47.574	46.000	9.824	AV
7		10.218	15.746	5.683	-44.254	60.000	10.063	QP
8		10.218	7.442	-2.622	-42.558	50.000	10.063	AV
9		13.278	12.047	1.895	-47.953	60.000	10.152	QP
10		13.278	3.509	-6.644	-46.491	50.000	10.152	AV
11		18.826	23.472	13.149	-36.528	60.000	10.322	QP
12		18.826	14.485	4.163	-35.515	50.000	10.322	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB).

Note 3: Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Site: SIP-SR2	Test Date: 2023/12/21
Limit: FCC_Part15.207_CE_AC Power	Engineer: Mark Long
Probe: SIP-SR2-ENV216_101684_C	Polarity: Line
EUT: Intelligent Toilet	Power: AC 120V/60Hz
Test Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1	*	0.158	38.643	28.720	-26.926	65.568	9.923	QP
2		0.158	16.961	7.038	-38.608	55.568	9.923	AV
3		0.234	30.208	20.280	-32.098	62.307	9.929	QP
4		0.234	8.348	-1.581	-43.958	52.307	9.929	AV
5		0.398	21.877	12.147	-36.018	57.895	9.730	QP
6		0.398	12.616	2.885	-35.279	47.895	9.730	AV
7		10.206	16.632	6.539	-43.368	60.000	10.093	QP
8		10.206	4.927	-5.166	-45.073	50.000	10.093	AV
9		14.990	12.343	2.113	-47.657	60.000	10.230	QP
10		14.990	4.692	-5.538	-45.308	50.000	10.230	AV
11		20.034	21.524	11.114	-38.476	60.000	10.410	QP
12		20.034	12.742	2.332	-37.258	50.000	10.410	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB).

Note 3: Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

6.3. Radiated Emission

6.3.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.249		
Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μ V/m)
902 ~ 928	50	500
2400 ~ 2483.5	50	500
5725 ~ 5875	50	500
24000 ~ 24250	250	2500
Note: FCC Part 15.249 (d), 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.		

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
0.009 ~ 0.490	$2400/F(\text{kHz})$	300
0.490 ~ 1.705	$24000/F(\text{kHz})$	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3
Note 1: The lower limit shall apply at the transition frequency.		
Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.		
Note 3: E field strength (dB μ V/m) = 20 log E field strength (μ V/m).		

6.3.2. Test Procedure

ANSI C63.10-2013 Section 6.3

ANSI C63.10-2013 Section 6.4

ANSI C63.10-2013 Section 6.5

ANSI C63.10-2013 Section 6.6

ANSI C63.10-2013 Section 9.12

Note: Far-field boundary calculation as below.

According to ANSI C63.10-2013, Clause 9, All measurements shall be made in the far-field of the measurement antenna. The far-field boundary for mm-wave antennas is $2D^2/\lambda$.

- For spurious and harmonic emissions testing, D is the largest antenna dimension of the measurement antenna in m;

For fundamental or out-of-band emissions, D is the largest antenna dimension of the EUT antenna or measurement antenna, whichever is largest.
- λ is the wavelength in m.

Far-field boundary calculation			
Frequency Range (GHz)	λ (m)	D (m)	$R_{(\text{Far Field})}$ (m)
24.00 ~ 24.25	0.012	0.096	1.536
40.00 ~ 50.00	0.006	0.046	0.705
50.00 ~ 75.00	0.004	0.036	0.648
75.00 ~ 100.00	0.0027	0.026	0.501

For 24.00 ~ 24.25GHz, Our measurement is performed at a minimum distance of 3.0m > $R_{(\text{Far Field})}$.

For 40.00 ~ 100.00GHz, Our measurement is performed at a minimum distance of 1.0m > $R_{(\text{Far Field})}$.

6.3.3. Test Setting

Measurement of harmonic and spurious emissions above 40 GHz

1. Connect the test antenna covering the appropriate frequency range to a spectrum analyzer via an external mixer.
2. Set spectrum analyzer RBW = 1MHz, VBW = 3MHz, peak & average detector.
3. Maximize all observed emissions. Note the maximum power indicated on the spectrum analyzer. Adjust this reading, if necessary, by the conversion loss of the external mixer used at the frequency under investigation and the external mixer IF cable loss.
4. Calculate the maximum field strength of the emission at the measurement distance.

5. Calculate the power density at the distance specified by the limit from the field strength at the distance specified by the limit.
6. Repeat the preceding sequence for every emission observed in the frequency band under investigation.

Measurement of harmonic and spurious emissions below 40 GHz

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3 x RBW
4. Detector = Peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

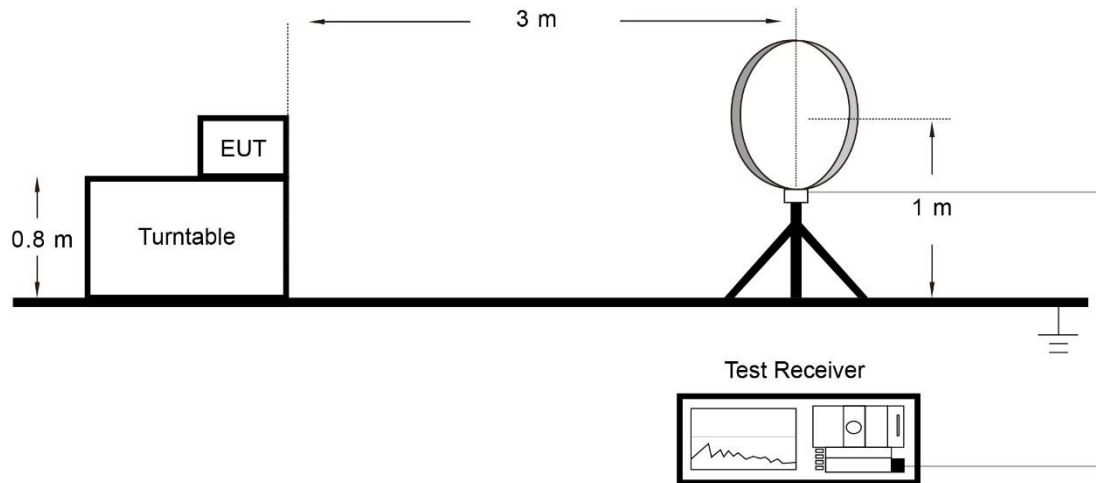
Frequency	RBW
9 ~ 150 kHz	200 Hz
0.15 ~ 30 MHz	9 kHz
30 ~ 1000 MHz	120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

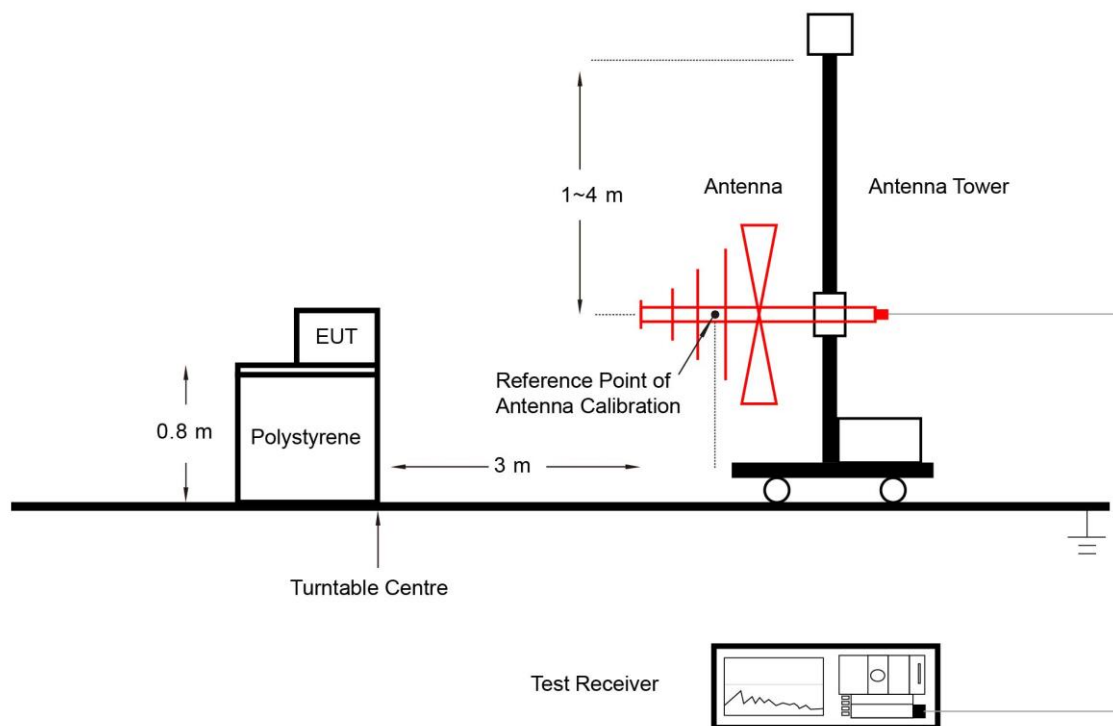
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. Set the VBW $\geq 3 \times$ RBW
4. Detector function = Average
5. Sweep time = auto couple
6. Trace mode = Max Hold
7. Allow max hold to run for suitable traces until the trace tend to stabilize.

6.3.4. Test Setup

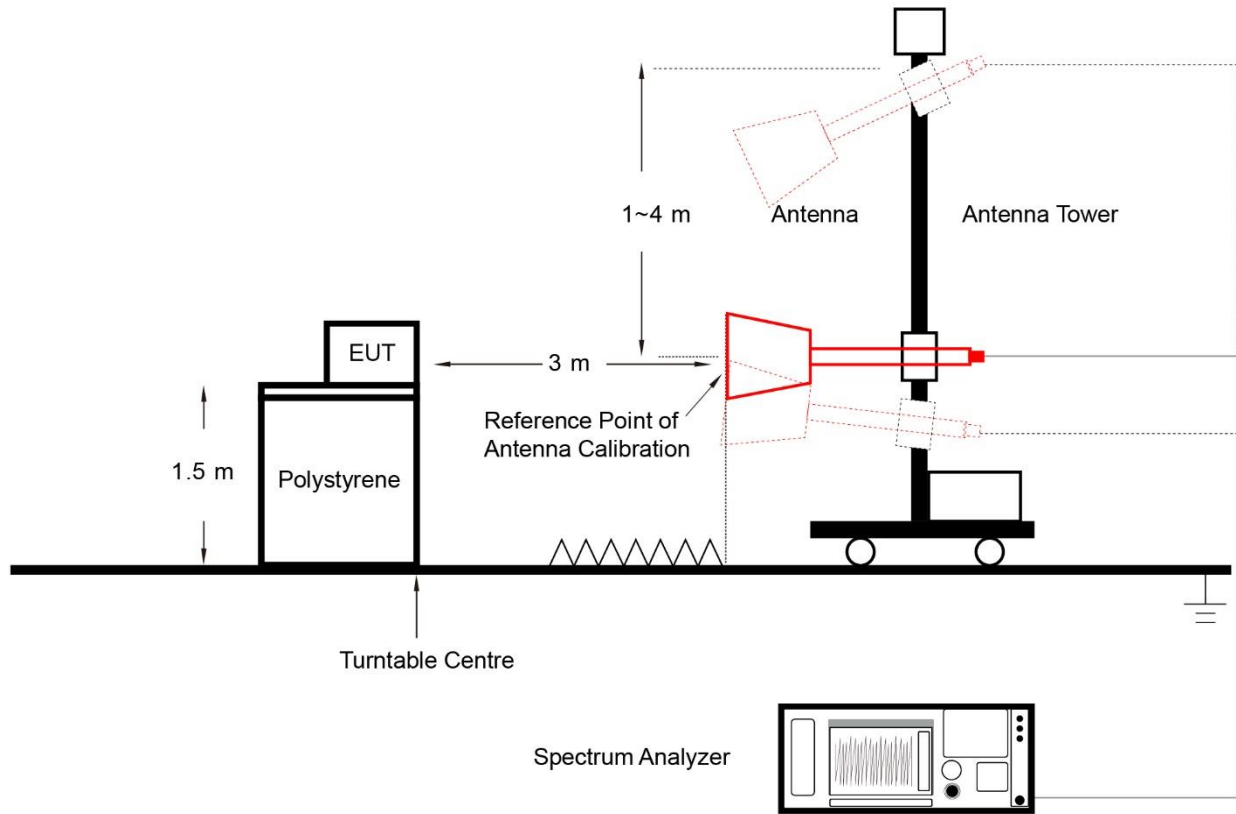
Below 30MHz Test Setup:



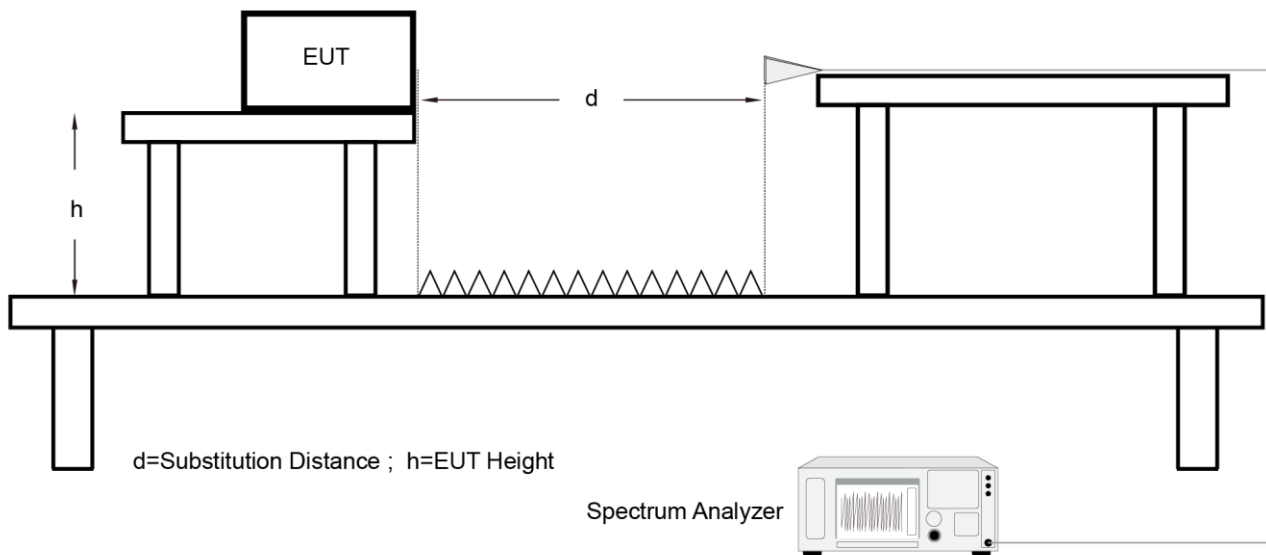
Below 1GHz Test Setup:



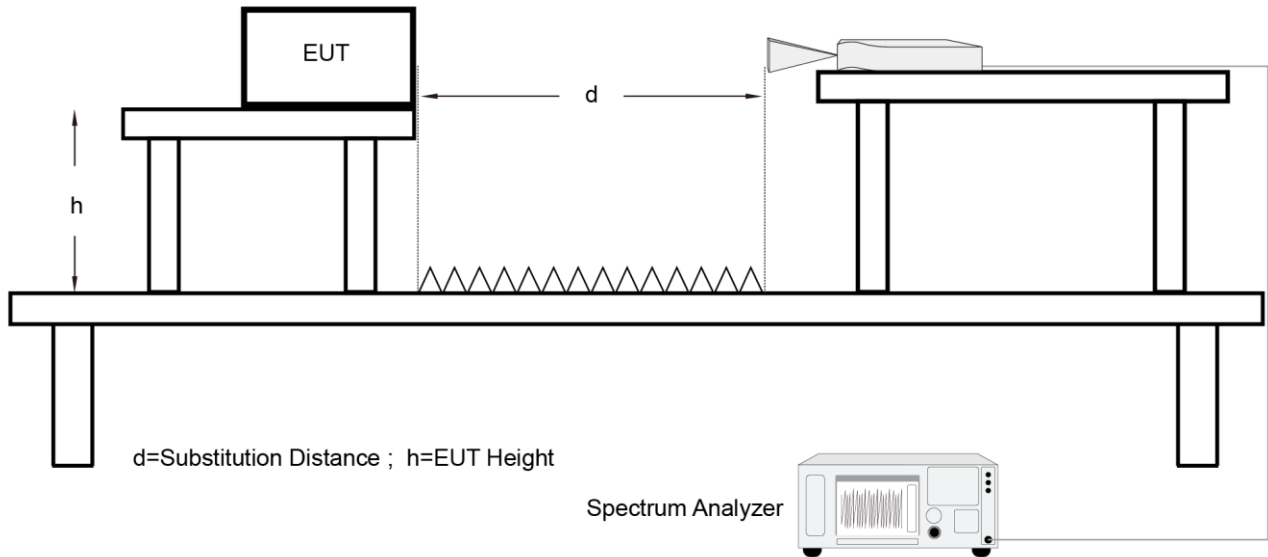
1GHz ~ 40GHz Test Setup:



40GHz ~ 50GHz Test Setup:



Above 50GHz Test Setup:



6.3.5. Test Result

Test Site	SIP-AC3	Test Date	2023-12-20
Test Engineer	Arvin Ding		

Frequency Band (GHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Result
Fundamental Radiated Emission (Horizontal)							
24.05 ~ 24.25	110.128	-8.812	101.316	128	-26.684	Peak	Pass
	104.663	-8.812	95.851	108	-12.149	Average	Pass
Fundamental Radiated Emission (Vertical)							
24.05 ~ 24.25	107.001	-8.812	98.189	128	-29.811	Peak	Pass
	101.780	-8.811	92.969	108	-15.031	Average	Pass
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m) Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)							

Test Site	SIP-AC3	Test Engineer	Mero Zhou
Test Date	2023-12-16	Test Frequency Range	Below 1GHz

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
95.960	11.000	13.019	24.019	43.500	-19.481	QP	Horizontal
143.490	18.900	17.977	36.877	43.500	-6.623	QP	Horizontal
167.255	15.700	18.077	33.777	43.500	-9.723	QP	Horizontal
191.505	24.400	15.435	39.835	43.500	-3.665	QP	Horizontal
202.175	18.200	15.175	33.375	43.500	-10.125	QP	Horizontal
287.535	17.600	18.534	36.134	46.000	-9.866	QP	Horizontal
52.310	9.500	18.386	27.886	40.000	-12.114	QP	Vertical
95.960	15.100	13.019	28.119	43.500	-15.381	QP	Vertical
143.490	13.400	17.977	31.377	43.500	-12.123	QP	Vertical
165.315	10.400	18.123	28.523	43.500	-14.977	QP	Vertical
191.505	20.100	15.435	35.535	43.500	-7.965	QP	Vertical
287.535	7.800	18.534	26.334	46.000	-19.666	QP	Vertical

Notes:

- Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)
- The amplitude of radiated emissions (frequency range from 9KHz to 30MHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Test Site	SIP-AC3	Test Engineer	Mero Zhou
Test Date	2023-12-16	Test Frequency Range	1 ~ 40 GHz

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
8225.000	48.554	-3.341	45.213	74.000	-28.787	Peak	Horizontal
13826.500	46.651	2.208	48.859	74.000	-25.141	Peak	Horizontal
17770.500	44.793	7.569	52.362	74.000	-21.638	Peak	Horizontal
17770.500	32.700	7.569	40.269	54.000	-13.731	Average	Horizontal
8905.000	48.376	-2.304	46.072	74.000	-27.928	Peak	Vertical
14115.500	45.666	2.878	48.544	74.000	-25.456	Peak	Vertical
17957.500	43.311	9.049	52.360	74.000	-21.640	Peak	Vertical
17957.500	31.330	9.049	40.379	54.000	-13.621	Average	Vertical
27801.000	56.704	-8.904	47.800	74.000	-26.200	Peak	Horizontal
36216.000	56.766	-5.368	51.398	74.000	-22.602	Peak	Horizontal
36216.000	44.690	-5.368	39.322	54.000	-14.678	Average	Horizontal
39186.000	52.538	-0.446	52.092	74.000	-21.908	Peak	Horizontal
39186.000	41.670	-0.446	41.224	54.000	-12.776	Average	Horizontal
28120.000	56.704	-9.069	47.635	74.000	-26.365	Peak	Vertical
36062.000	57.697	-5.340	52.357	74.000	-21.643	Peak	Vertical
36062.000	45.440	-5.340	40.100	54.000	-13.900	Average	Vertical
39186.000	53.072	-0.446	52.626	74.000	-21.374	Peak	Vertical
39186.000	41.690	-0.446	41.244	54.000	-12.756	Average	Vertical

Notes:

- Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)
- Average measurement was not performed when the peak level lower than average limit

Test Site	SIP-AC3	Test Engineer	Mero Zhou
Test Date	2023-12-16 ~ 2023-12.20	Test Frequency Range	40 ~ 100 GHz

Frequency (GHz)	Reading Level @1m (dBμV/m)	Factor (dB)	Measure Level @1m (dBμV/m)	Measure Level @3m (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)	Detector	Polarity
48.041	28.290	45.760	74.050	64.510	88.000	-23.490	Peak	Horizontal
48.018	28.320	45.760	74.080	64.540	88.000	-23.460	Peak	Horizontal
48.041	18.240	45.760	64.000	54.460	68.000	-13.540	Average	Horizontal
48.017	18.430	45.760	64.190	54.650	68.000	-13.350	Average	Horizontal
48.041	25.090	45.760	70.850	61.310	88.000	-26.690	Peak	Vertical
48.017	24.580	45.760	70.340	60.800	88.000	-27.200	Peak	Vertical
48.040	15.290	45.760	61.050	51.510	68.000	-16.490	Average	Vertical
48.017	13.440	45.760	59.200	49.660	68.000	-18.340	Average	Vertical
72.066	37.370	42.350	79.720	70.180	88.000	-17.820	Peak	Horizontal
72.066	30.273	42.350	72.623	63.083	68.000	-4.917	Average	Horizontal
72.066	30.400	42.350	72.750	63.210	88.000	-24.790	Peak	Vertical
72.066	21.554	42.350	63.904	54.364	68.000	-13.636	Average	Vertical
96.084	31.780	44.460	76.240	66.700	88.000	-21.300	Peak	Horizontal
96.084	23.075	44.460	67.535	57.995	68.000	-10.005	Average	Horizontal
96.084	30.810	44.460	75.270	65.730	88.000	-22.270	Peak	Vertical
96.084	23.153	44.460	67.613	58.073	68.000	-9.927	Average	Vertical

Notes:

- Measure Level @1m(dBμV/m) = Reading Level @1m(dBμV) + Factor (dB/m)
For between 40GHz ~ 50GHz
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)
For above 50GHz
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) + Mixer Conversion Loss (dB)
- Measure Level @3m(dBμV/m) = Measure Level @1.0(dBμV/m) + 20 * log(1.0m / 3m)
- The distance of testing is 1m.

6.4. Radiated Restricted Band Edge Measurement

6.4.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [$\mu\text{V}/\text{m}$]	Measured Distance [Meter]
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

6.4.2. Test Procedure

ANSI C63.10-2013 Section 6.3

ANSI C63.10-2013 Section 6.6

ANSI C63.10-2013 Section 6.10

6.4.3. Test Setting

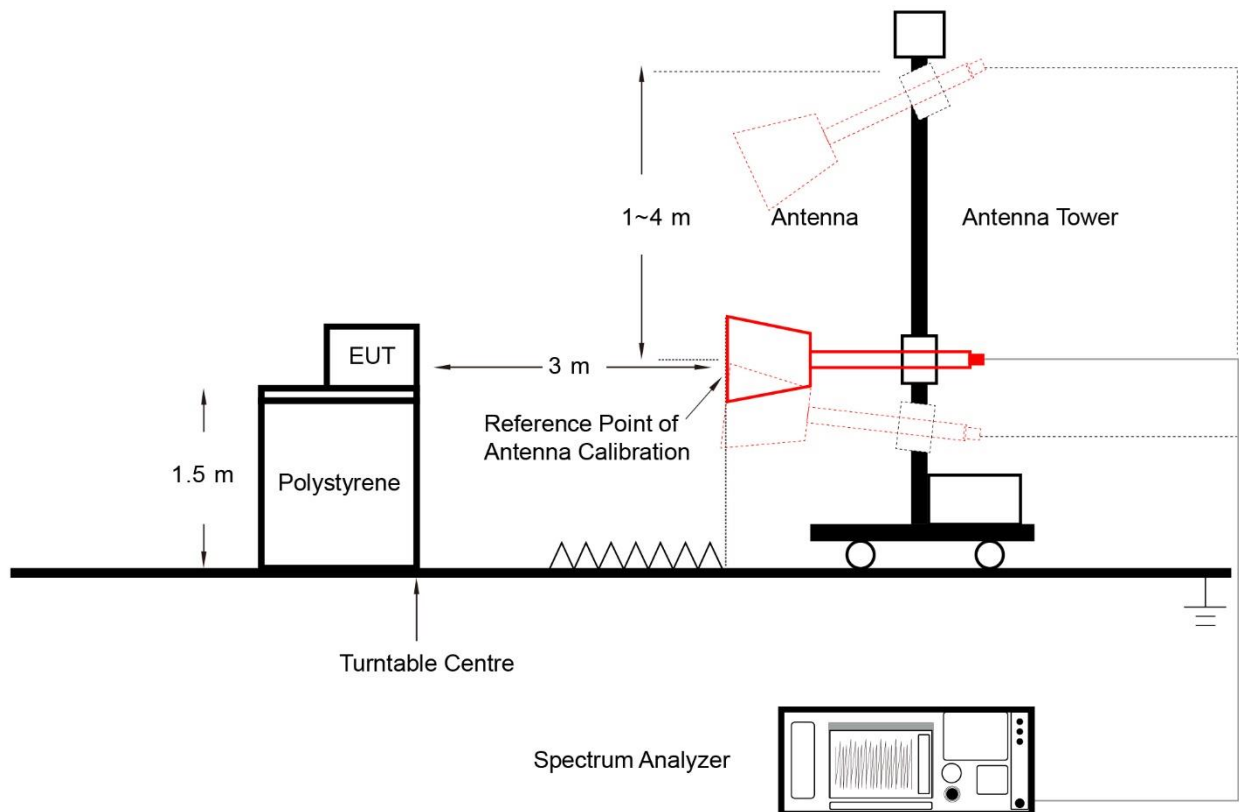
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

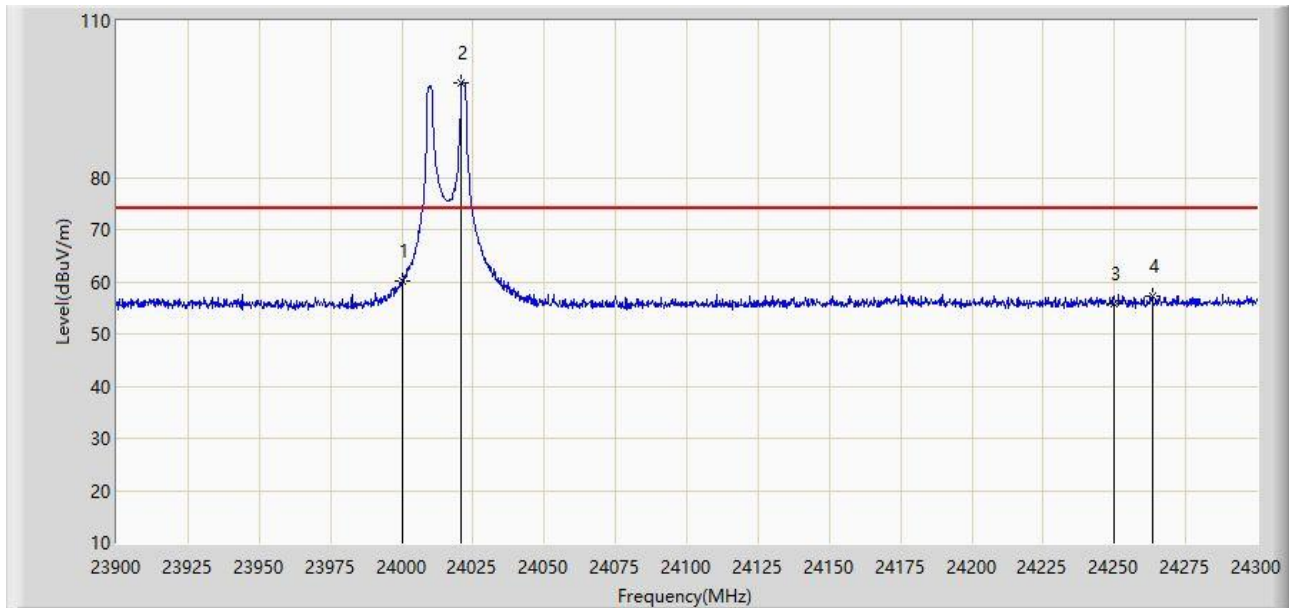
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. Set the VBW $\geq 3 \times$ RBW
4. Detector function = Average
5. Sweep time $\geq$ (number of points in sweep) $\times$ (transmission symbol period).
6. Trace mode = Average
7. Allow max hold to run for suitable traces until the trace tend to stabilize.

6.4.4. Test Setup



6.4.5. Test Result

Site: SIP-AC3	Test Date: 2023/12/20
Limit: FCC Part15.249_BandEdge(3m)	Engineer: Arvin Ding
Probe: BBHA 9170_00935_18-40GHz-New	Polarity: Horizontal
EUT: Intelligent Toilet	Power: AC 120V/60Hz
Test Mode 1	



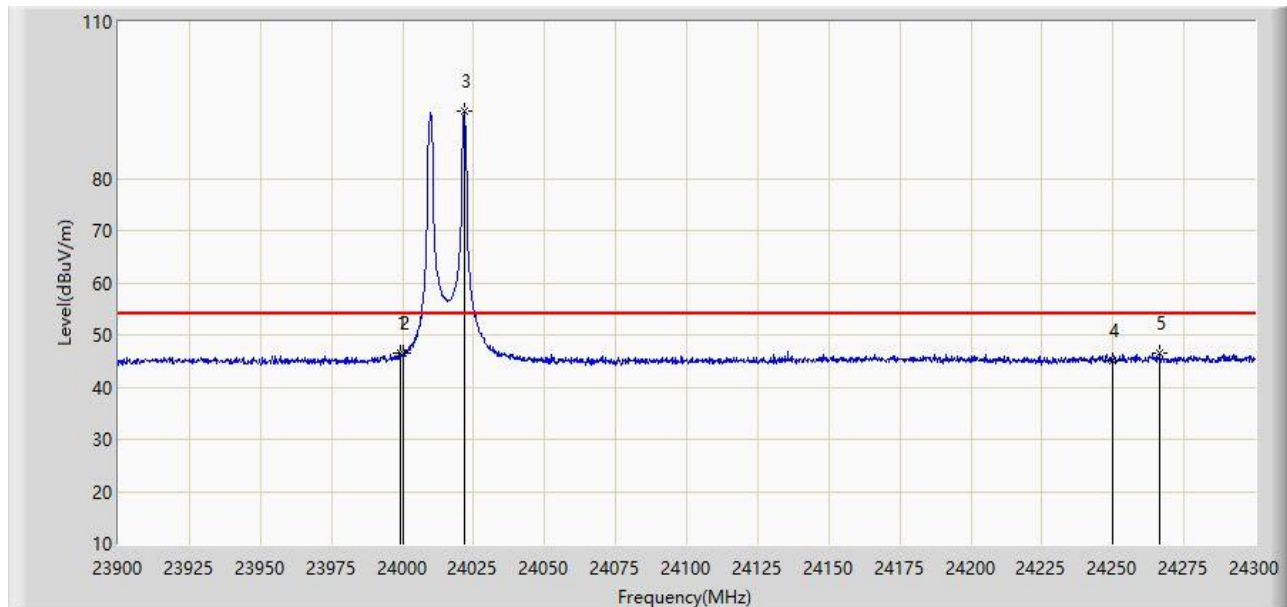
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	24000.000	60.232	69.097	-13.768	74.000	-8.865	PK
2		24021.000	98.090	106.903	N/A	N/A	-8.812	PK
3		24250.000	55.688	64.081	-18.312	74.000	-8.393	PK
4		24263.199	57.127	65.476	-16.873	74.000	-8.348	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: SIP-AC3	Test Date: 2023/12/20
Limit: FCC Part15.249_BandEdge(3m)	Engineer: Arvin Ding
Probe: BBHA 9170_00935_18-40GHz-New	Polarity: Horizontal
EUT: Intelligent Toilet	Power: AC 120V/60Hz
Test Mode 1	



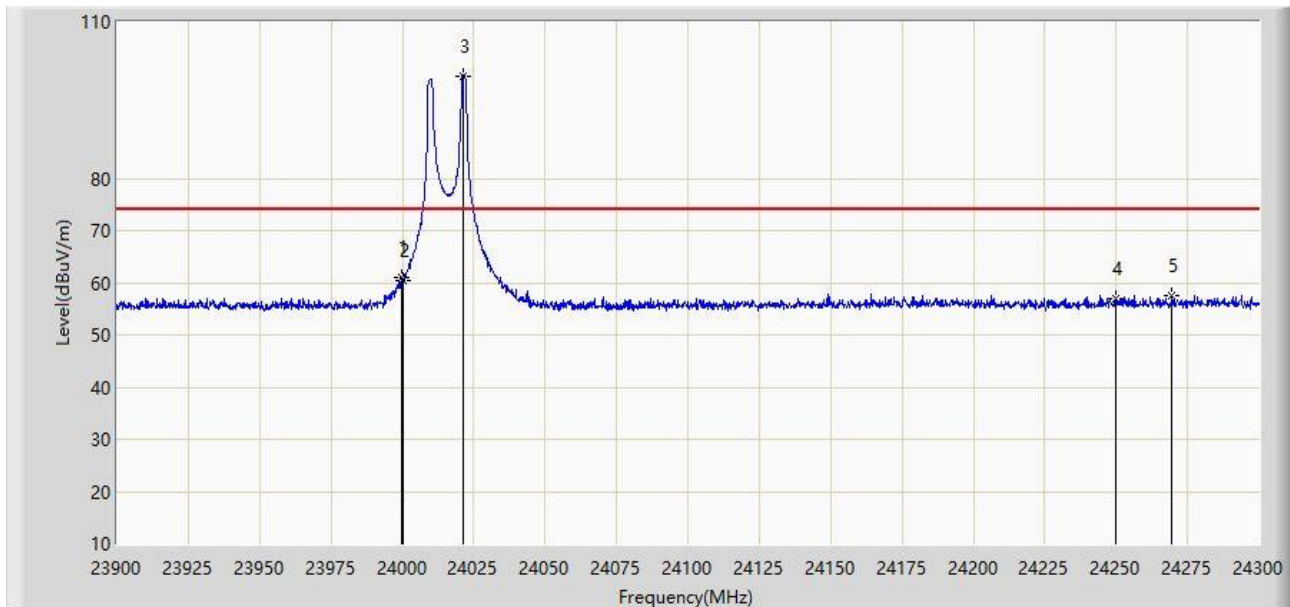
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	23999.000	46.591	55.450	-7.409	54.000	-8.859	AV
2		24000.000	46.541	55.406	-7.459	54.000	-8.865	AV
3		24021.600	92.940	101.750	N/A	N/A	-8.810	AV
4		24250.000	45.120	53.513	-8.880	54.000	-8.393	AV
5		24266.400	46.472	54.810	-7.528	54.000	-8.339	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: SIP-AC3	Test Date: 2023/12/20
Limit: FCC Part15.249_BandEdge(3m)	Engineer: Arvin Ding
Probe: BBHA 9170_00935_18-40GHz-New	Polarity: Vertical
EUT: Intelligent Toilet	Power: AC 120V/60Hz
Test Mode 1	



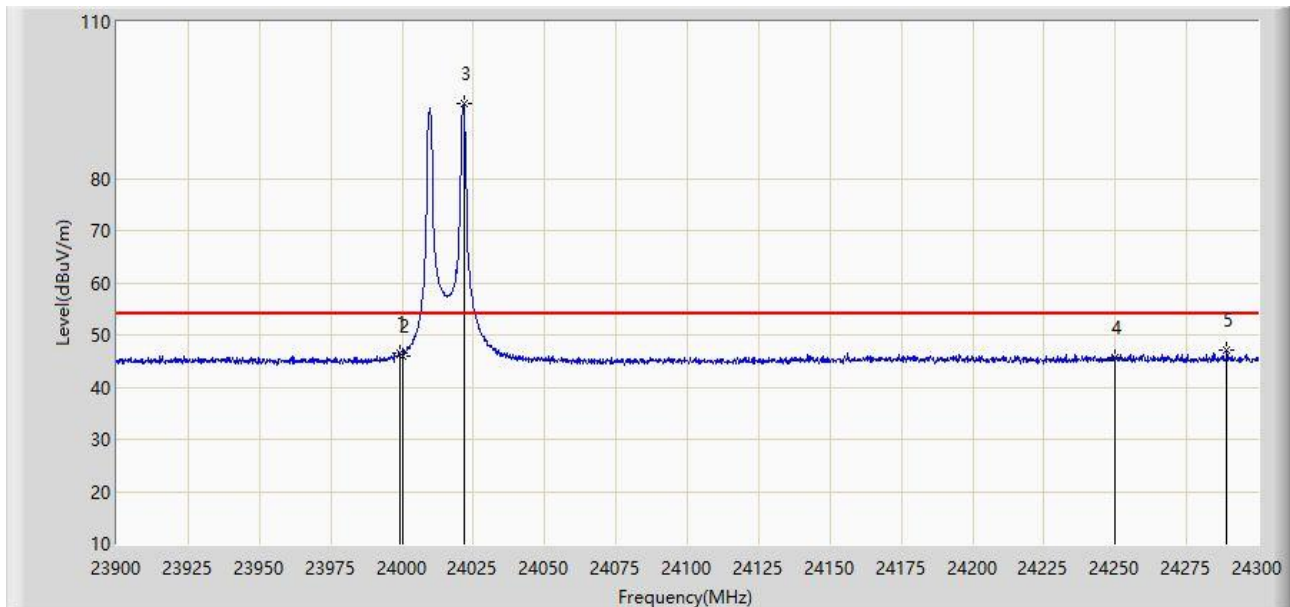
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	23999.801	60.915	69.779	-13.085	74.000	-8.864	PK
2		24000.000	60.452	69.317	-13.548	74.000	-8.865	PK
3		24021.199	99.598	108.410	N/A	N/A	-8.812	PK
4		24250.000	56.864	65.257	-17.136	74.000	-8.393	PK
5		24269.600	57.552	65.879	-16.448	74.000	-8.327	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: SIP-AC3	Test Date: 2023/12/20
Limit: FCC Part15.249_BandEdge(3m)	Engineer: Arvin Ding
Probe: BBHA 9170_00935_18-40GHz-New	Polarity: Vertical
EUT: Intelligent Toilet	Power: AC 120V/60Hz
Test Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		23999.400	46.602	55.464	-7.398	54.000	-8.861	AV
2		24000.000	45.926	54.791	-8.074	54.000	-8.865	AV
3		24021.600	94.225	103.035	N/A	N/A	-8.810	AV
4		24250.000	45.533	53.926	-8.467	54.000	-8.393	AV
5	*	24289.199	46.995	55.311	-7.005	54.000	-8.315	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

6.5. 20dB Spectrum Bandwidth Measurement

6.5.1. Test Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission in the specific band.

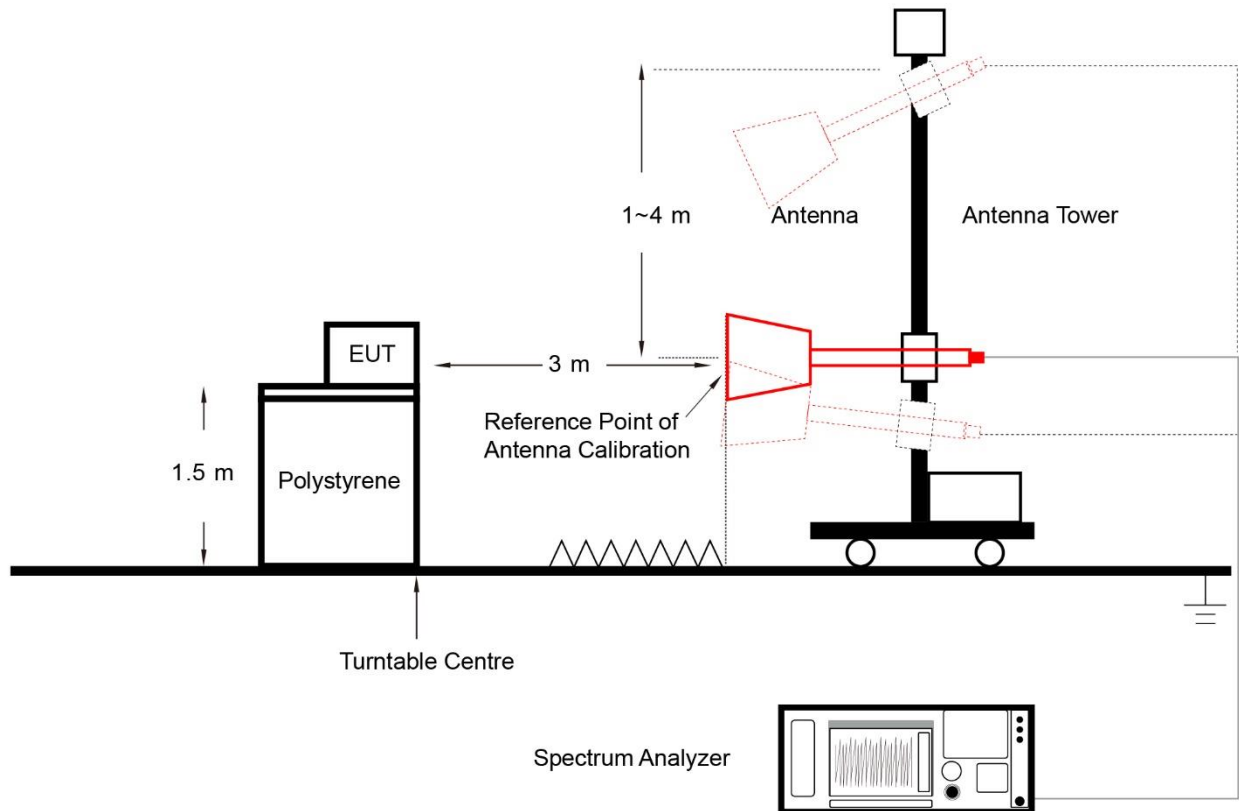
6.5.2. Test Procedure

ANSI C63.10-2013 Clause 6.9.2

6.5.3. Test Setting

1. Set the spectrum span range to overlap the nominal center frequency
2. Set RBW = 1% ~ 5% of the OBW
3. $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize and marker the highest level
8. Use Occupied BW function to determine two frequencies, one at the lowest frequency and the other at the highest frequency

6.5.4. Test Setup



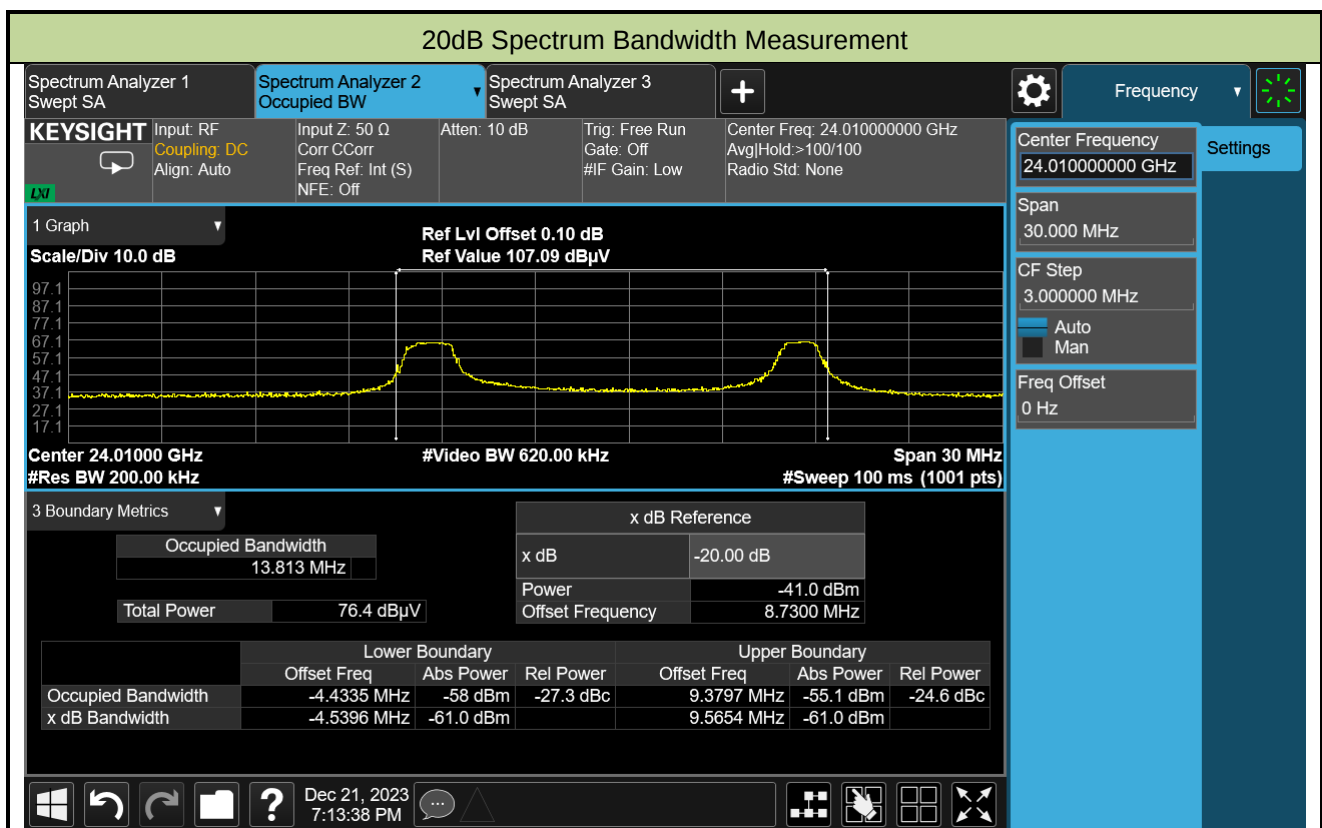
6.5.5. Test Result

Test Site	SIP-AC3	Test Date	2023-12-21
Test Engineer	Mero Zhou		

20dB Bandwidth (MHz)	F _L (MHz)	F _L Limit (MHz)	F _H (MHz)	F _H Limit (MHz)	Result
14.105	24005.4604	≥ 24000	24019.5654	≤ 24250	Pass

Note: Low Frequency (F_L) = Center Frequency + Lower Boundary;

High Frequency (F_H) = Center Frequency + Upper Boundary.



Appendix A - Test Setup Photograph

Refer to “2310RSU010-UT” file.

Appendix B - EUT Photograph

Refer to “2310RSU010-UE” file.