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Report On

FCC Testing of the Duravit AG
Electric Toilet 20000002002300
In accordance with FCC CFR 47 Part 15C

COMMERCIAL-IN-CONFIDENCE

FCC ID: 2ACSF20000002002300

Document 708881474503 Report 01 Issue 1 August 2014

Product Service

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REPORT ON

FCC Testing of the
Duravit AG
Electric Toilet 20000002002300
In accordance with FCC CFR 47 Part 15C

Document 708881474503 Report 01 Issue 1

August 2014

PREPARED FOR

Duravit AG
Werderstr.36, 78132 Hornberg, Germany

PREPARED BY

Hui TONG
Project Engineer

APPROVED BY

Wenwen Cheng
Project Engineer

DATED

7 August, 2014

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

Hui TONG

Product Service

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Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
Duravit AG
Electric Toilet 20000002002300
In accordance with FCC CFR 47 Part 15C

Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Duravit AG Electric Toilet 20000002002300 to the requirements of FCC CFR 47 Part 15C.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Duravit AG
	Electric Toilet
Model Number(s)	20000002002300
Serial Number(s)	Engineering sample
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15C (2014)
Incoming Release	Application Form
Date	27 June 2014
Order Number	Quote Acceptance Form
Date	29 June 2014
Start of Test	24 July 2014
Finish of Test	24 July 2014
Name of Engineer(s)	Hui TONG
Related Document(s)	ANSI C63.10: 2009

Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15C is shown below.

Section	FCC	Test Description	Result	Comments/Base Standard
Short range device wireless video transmitter DCS500T				
2.1	15.207	AC Line Conducted Emissions	Pass	
2.2	15.245 (a)	Field Strength of Fundamental	Pass	
2.3	15.245 (a), 15.209	Field Strength of Spurious Emissions	Pass	

Product Service

1.3 APPLICATION FORM

APPLICANT'S DETAILS	
COMPANY NAME :	Duravit AG
ADDRESS :	Werderstr.36, 78132 Hornberg, Germany
NAME FOR CONTACT PURPOSES : Sheldon He	
TELEPHONE NO: +86-21 5227 1278-627	FAX NO: E-MAIL: sheldon.he@cn.duravit.com

EQUIPMENT INFORMATION	
MANUFACTURING DESCRIPTION	Electric Toilet
MANUFACTURER	Duravit AG
TYPE	20000002002300
SERIAL NUMBER	Engineering sample
TRANSMITTER OPERATING RANGE	10.525GHz
COUTRY OF ORIGIN	China
Channel Number	1
Modulation Type	No modulation
Antenna Gain	8dbi
FCC ID	2ACSF20000002002300
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	20000002002300 is a Electric Toilet with detector function
MANUFACTURING DESCRIPTION	The Electric Toilet was powered by 120V AC / 60Hz

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) 20000002002300 was a Duravit AG Electric Toilet. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from 120VAC, 60Hz.

Test Site 1:
FCC Accreditation 767285
Test Firm Name: TÜV SÜD Certification and Testing (China) Co., Ltd.
Location: 10 Huaxia M. Rd., Wuxi, Jiangsu, 214100, China

Test Site 2:
FCC Accreditation 800392
QuieTek Technology (Suzhou) Co., Ltd.
No.99 Hongye RD.Suzhou Industrial Park Loufeng Hi-New-Tech Development Area,Suzhou,China

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.

Product Service

SECTION 2

TEST DETAILS

FCC Testing of the Duravit AG
Electric Toilet 20000002002300
In accordance with FCC CFR 47 Part 15C

Product Service

2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.207

2.1.2 Equipment Under Test and Modification State

Electric Toilet 20000002002300 set up the 10.525GHz detector distance maximum - Modification State 0

2.1.3 Date of Test

24 July 2014

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The EUT is set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

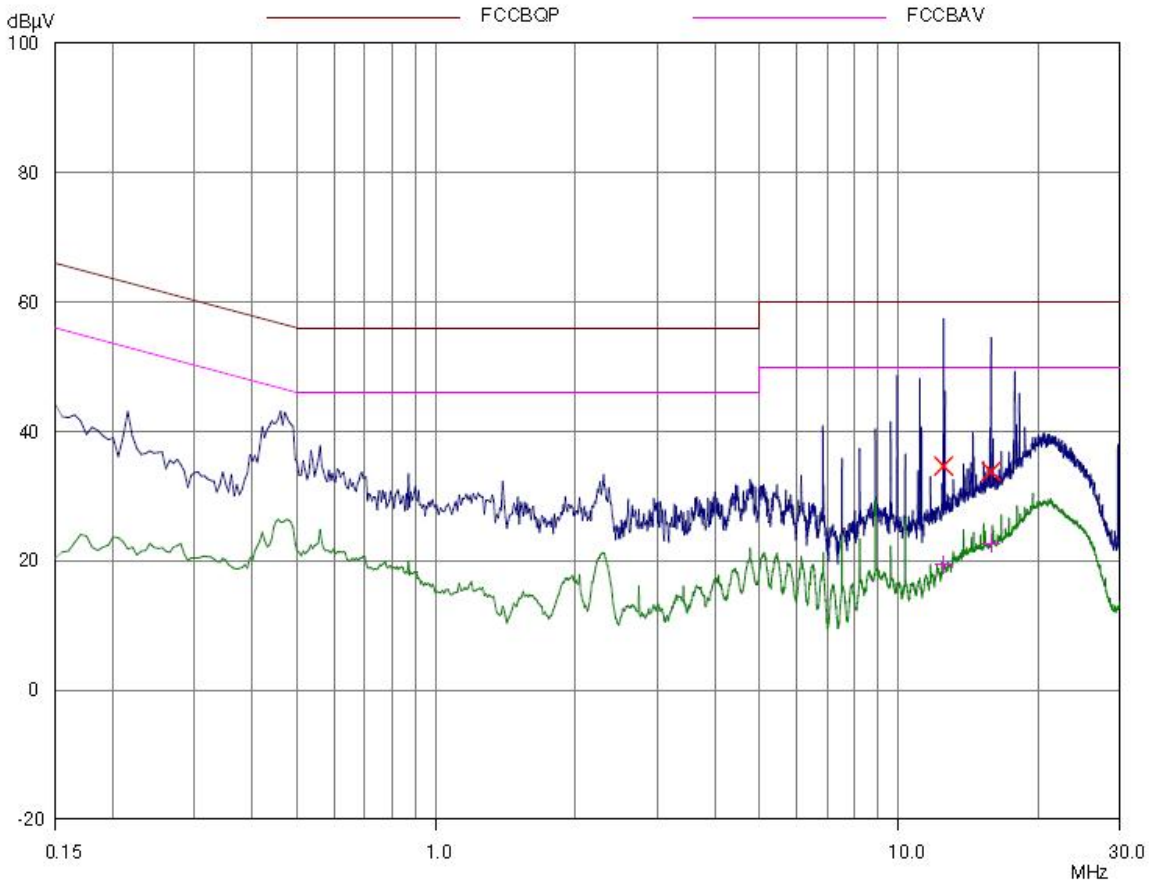
2.1.6 Environmental Conditions

Ambient Temperature	23.6°C
Relative Humidity	56.0%

Product Service

2.1.7 Test Results

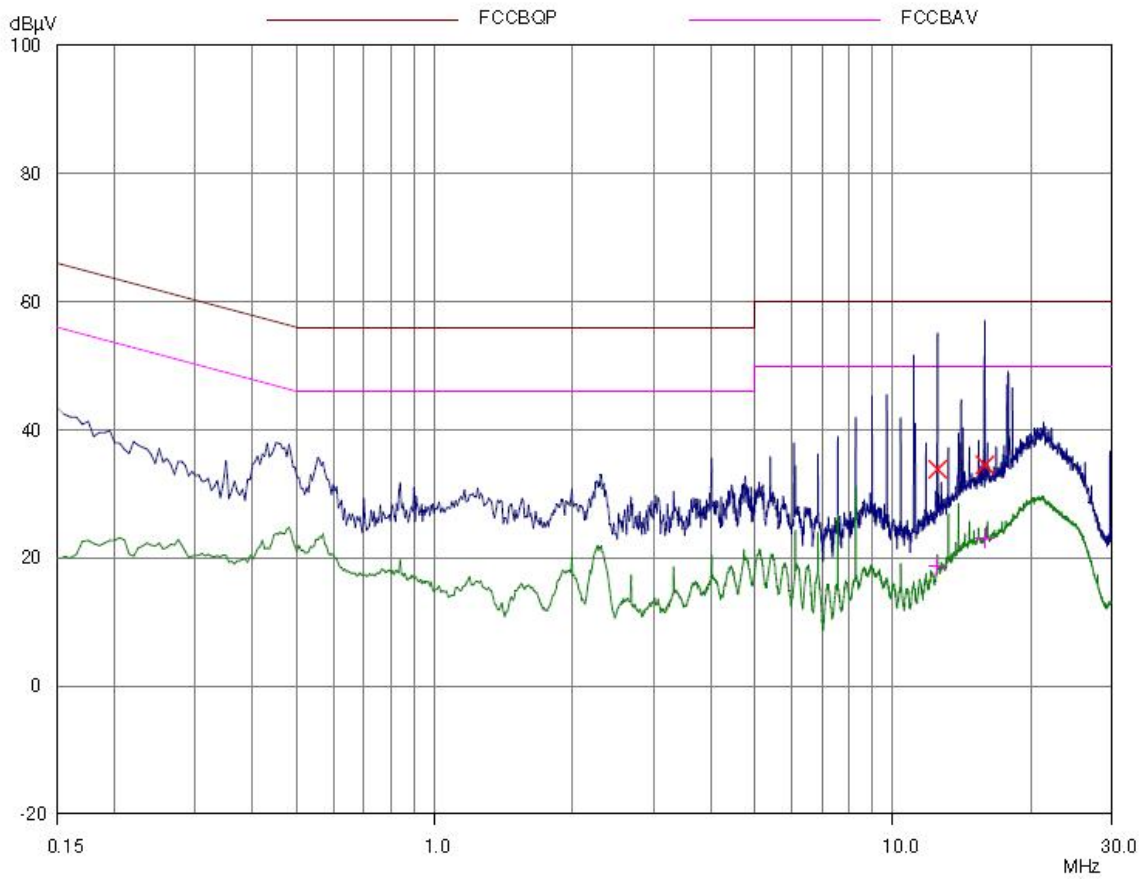
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
12.5	34.65	60.00	-25.35	19.38	50.00	-30.62
15.84	33.80	60.00	-26.20	22.66	50.00	-27.34

Product Service

Neutral Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
12.51	33.81	60.00	-26.19	18.67	50.00	-31.33
15.87	34.50	60.00	-25.50	23.08	50.00	-26.92

Product Service

2.2 FIELD STRENGTH OF FUNDAMENTAL

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.245 (b)

2.2.2 Equipment Under Test and Modification State

Electric Toilet 20000002002300 set up the 10.525GHz detector distance maximum - Modification State 0

2.2.3 Date of Test

24 July 2014

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

The EUT is placed on 12mm above the ground plane.

During formal measurement the spectrum analyser is tuned to the frequency of the fundamental. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum level occurs. Once the point of maximum emission has been determined the emission is measured.

2.2.6 Environmental Conditions

Ambient Temperature	23.6°C
Relative Humidity	56.0%

Product Service

2.2.7 Test Results

10525 MHz

Fundamental

Fundamental Frequency (MHz)	Polarisation (Vertical/ Horizontal)	Reading Level	Factor	Field Strength	Over Limit	Limit		Type
		(dBµV/)	(dB)	dBµV/m	(dB)	(dBµV/m)	mV/m	AV/PK
10516.870	H	59.900	50.413	110.313	-17.687	128.0	2500	AV
10516.870	H	59.927	50.413	110.340	-37.660	148.0	25000	PK
10516.870	V	57.202	50.413	107.615	-20.385	128.0	2500	AV
10516.900	V	58.179	50.413	108.592	-39.408	148.0	25000	PK

Limit Clause 15.245 (b)

Fundamental Frequency (MHz)	Field Strength of Fundamental (millivolts/meter)
902 to 928	500
2435 to 2465	500
5785 to 5815	500
10500 to 10550	2500
24075 to 24175	2500

Product Service

2.3 FIELD STRENGTH OF SPURIOUS EMISSIONS

2.3.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.245 (b)(3), 15.209

2.3.2 Equipment Under Test and Modification State

Electric Toilet 20000002002300 set up the 10.525GHz detector distance maximum - Modification State 0

2.3.3 Date of Test

24 July 2014

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Procedure

A preliminary profile of the Spurious Radiated Emissions is obtained up to the 10th harmonic of the EUT's fundamental frequency. For frequencies from 30MHz to 18GHz the EUT is placed on 100mm above the ground plane. For frequencies above 18GHz, the EUT height is increased by 200mm to a height of 1000mm. This is to ensure the beam width of the measuring antenna gives sufficient vertical coverage of the EUT.

During characterisation the turntable azimuth is adjusted from 0 to 360 degrees with the measuring antenna in one polarity. It is then repeated for the other polarity. Any frequencies of interest are noted for formal measuring later. The distance from the measuring antenna to the boundary of the EUT is 3m. Above 18GHz this distance may be reduced to 1m.

During formal measurement the spectrum analyser is tuned to the frequency of the emission. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum emission level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum emission level occurs. Once the point of maximum emission has been determined the emission is measured. Emissions in the 30MHz to 1GHz range are measured using a CISPR Quasi – Peak detector function in a 120kHz bandwidth. Emissions in the range 1GHz to 60GHz require Peak and Average measurements. The Peak measurements are made using oa peak detector with 1MHz Resolution and Video bandwidths. The average measurements employ a peak detector with a Resolution bandwidth of 1MHz and a Video bandwidth of 10Hz. If measurements are made at a 1m measuring distance, then 10dB is added to the specification limit.

2.3.6 Environmental Conditions

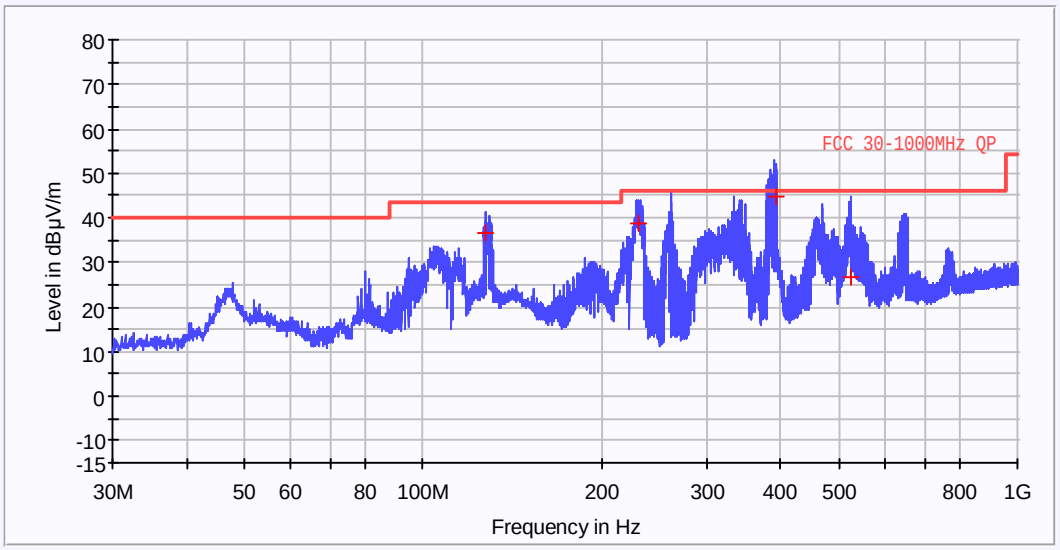
Ambient Temperature	23.6°C
Relative Humidity	56.0%

Product Service

2.3.7 Test Results

30 MHz to 1 GHz

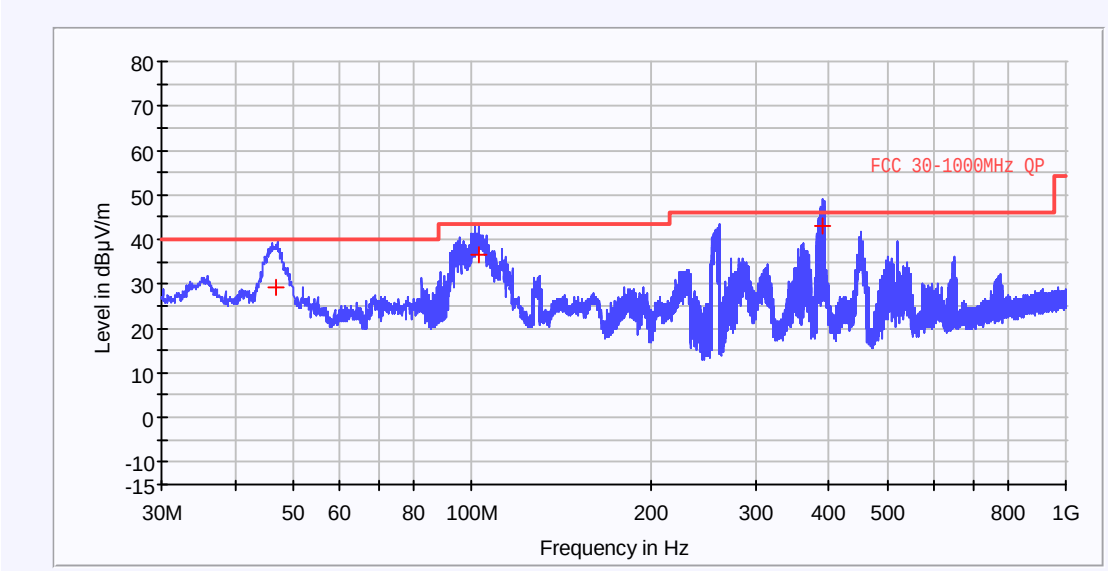
Horizontal Polarisation



Frequency (MHz)	Polarisation (Vertical/Horizontal)	Field Strength	Over Limit	Limit	Type
127.80	H	36.5	-12.0	43.5	QP
230.40	H	38.7	-10.4	46.0	QP
392.16	H	44.6	-5.2	46.0	QP
523.26	H	26.6	-2.2	46.0	QP

Product Service

Vertical Polarisation



Frequency (MHz)	Polarisation (Vertical/Horizontal)	Field Strength	Over Limit	Limit	Type
46.86	V	29.2	-10.8	40.0	QP
102.48	V	36.6	-6.9	43.5	QP
389.40	V	43.0	-3.0	46.0	QP

Product Service

Above 1GHz

Frequency (MHz)	Polarisation (Vertical/ Horizontal)	Field Strength	Over Limit	Limit	Type
		dBµV/m	(dB)	(dBµV/m)	AV/PK
4867.50	H	49.49	-24.51	74.00	PK
12424.00	H	56.65	-17.35	74.00	PK
21050.00*	H	80.23	-27.77	108.00	PK
4867.50	H	38.15	-15.85	54.00	AV
12424.00	H	43.78	-10.22	54.00	AV
21050.00*	H	74.15	-13.85	88.00	AV

Frequency (MHz)	Polarisation (Vertical/ Horizontal)	Field Strength	Over Limit	Limit	Type
		dBµV/m	(dB)	(dBµV/m)	AV/PK
4867.50	V	48.85	-25.15	74.00	PK
15152.00	V	62.08	-11.92	74.00	PK
21050.00*	V	83.75	-24.25	108.00	PK
4867.50	V	40.23	-13.77	54.00	AV
15152.00	V	44.69	-9.31	54.00	AV
21050.00*	V	75.48	-12.52	88.00	AV

Note: Emission was scanned up to 60GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit.

Remark:"*" is marked as harmonic frequency.

15.245(b)(1)

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in §15.205, shall not exceed the field strength limits shown in §15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For the second and third harmonics of field disturbance sensors operating in the 24075-24175 MHz band and for other field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.

Product Service

Limit Clause

15.245 (b)

Fundamental Frequency (MHz)	Field Strength of Harmonics (microvolts/meter)
902 to 928	500
2435 to 2465	500
5785 to 5815	500
10500 to 10550	2500
24075 to 24175	2500

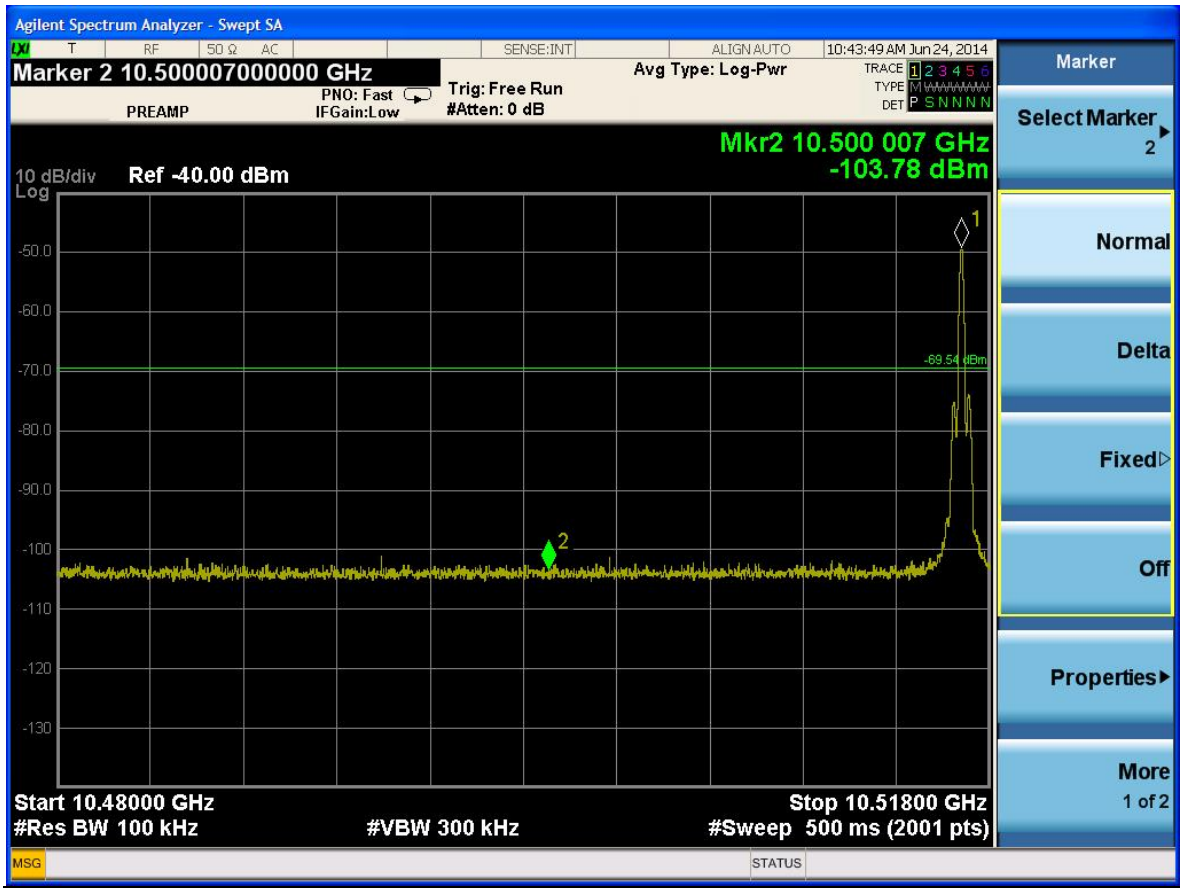
15.209

Frequency (MHz)	Field Strength (microvolts/meter)
0.009 to 0.490	2400/F (kHz)
0.490 to 1.705	24000/F (kHz)
1.705 to 30.0	30
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

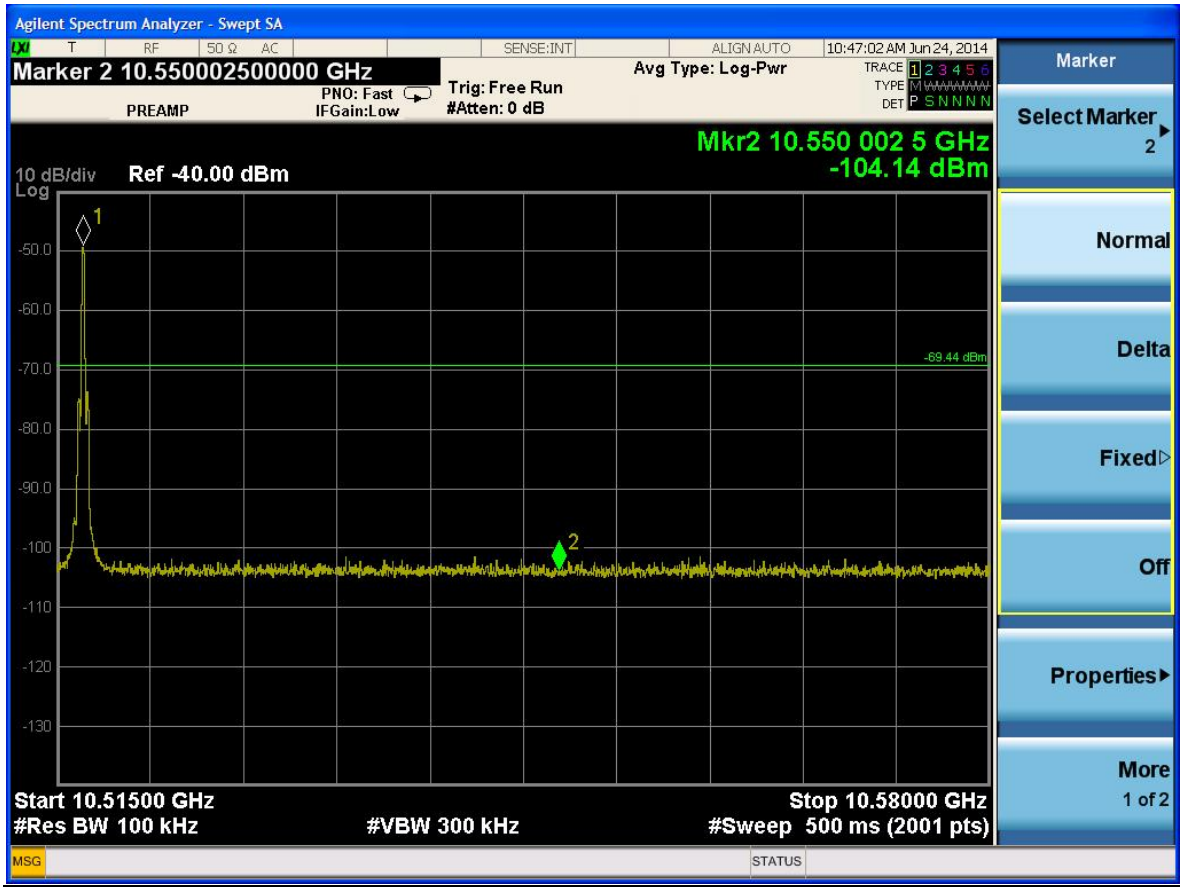
Product Service

Band Edge Emissions

The requirement is to ensure the 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified, is contained within the frequency band designated in the rule section under which the equipment is operated.



Product Service



Product Service

2.4 OCCUPIED BANDWIDTH

2.4.1 Specification Reference

FCC CFR 47 Part 2: 2008, Clause 2.1049(h)

2.4.2 Equipment Under Test and Modification State

Electric Toilet 20000002002300 set up the 10.525GHz detector distance maximum - Modification State 0

2.4.3 Date of Test

24 July 2014

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2: 2008.

Connect EUT's antenna terminal to the spectrum analyser via a low loss cable with transmitting mode.

Adjust the centre frequency of the spectrum analyser on the frequency be measured, and set for peak detector mode; max hold trace mode RBW=100 KHz and VBW=300 KHz.

The span of the analyzer approximately 2 to 3 times the channel bandwidth shall be set to capture all products of the modulation process, including the emission skirts. Use the marker-to-peak function to set the marker to the peak of the emission.

Use the OBW function to measure -20db bandwidth and 99% emission bandwidth..

2.4.6 Environmental Conditions

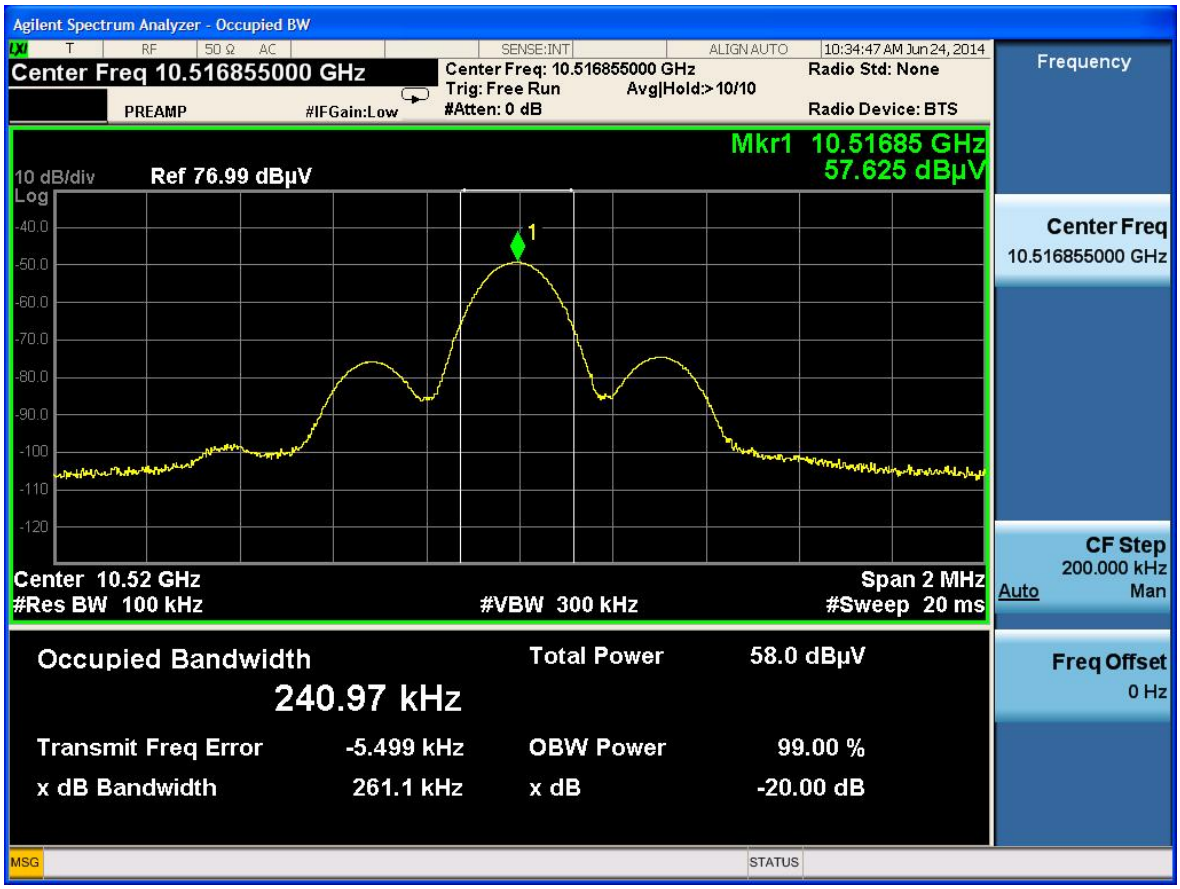
Ambient Temperature	23.6°C
Relative Humidity	56.0%

Product Service

2.4.7 Test Results

Frequency (GHz)	20dB Occupied Bandwidth (kHz)
10.525	261.1

Frequency (GHz)	99% Occupied Bandwidth (kHz)
10.525	240.97



Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Section 2.1 – AC Line Conducted Emissions

	Model Number	Manufacturer	Description	Calibration Date	Interval(year)
■ -	ESHS30	Rohde & Schwarz	EMI Test Receiver	2013.5.27	1
■ -	NSLK8127	Schwarzbeck	LISN	2013.7.14	1
■ -	No.2	Jinlida	Shielding Room	N/A	N/A

Section 2.1 and 2.2- Field Strength of Fundamental and Field Strength of Spurious Emissions

	Model Number	Manufacturer	Description	Calibration Date	Interval(year)
■ -	ESU8	Rohde & Schwarz	EMI Test Receiver	2014.01.07	1
■ -	VULB9168	Schwarzbeck	Broadband Antenna	2013.12.27	2
■ -		TDK	10m Chamber	2014.02.14	1

Quick Suzhou AC-5

Instrument	Manufacturer	Type No.	Serial No.	Calibration Date	Interval(year)
Spectrum Analyzer	Agilent	N9010A	MY48030494	2013.03.30	1
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.03	1
Preamplifier	QuieTek	AP-040G	CHM-0906001	2013.05.03	1
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15	1
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2012.06.08	2
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2013.11.24	2
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2014.03.01	1
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2014.03.01	1
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2014.03.01	1
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2014.01.11	1

Product Service

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Field Strength of Fundamental	30MHz to 1GHz: ± 3.79 dB (Test Site 1) 1GHz to 40GHz: ± 5.4 dB (Test Site 2)
Field Strength of Spurious Emissions	30MHz to 1GHz: ± 3.79 dB (Test Site 1) 1GHz to 40GHz: ± 5.4 dB (Test Site 2)
AC Line Conducted Emissions	± 3.21 dB (Test Site 1)

Product Service

SECTION 4

DISCLAIMERS AND COPYRIGHT

Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT