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Report On

FCC Testing of the Duravit AG
Short Range Device Remote Control 596000098001
In accordance with FCC CFR 47 Part 15C

COMMERCIAL-IN-CONFIDENCE

FCC ID: 2ACSF596000098001

Document 708881474502 Report 01 Issue 1 August 2014

Product Service

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REPORT ON

FCC Testing of the
Duravit AG
Short Range Device Remote Control 596000098001
In accordance with FCC CFR 47 Part 15C

Document 708881474502 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

5 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

CONTENTS

Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
Duravit AG
Short Range Device Remote Control 596000098001
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 Short Range Device Remote Control 596000098001 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
	Short range device Remote Control
Model Number(s)	596000098001
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	N/A*	
2.2	15.249 (a)	Field Strength of Fundamental	Pass	
2.3	15.249 (a)(d), 15.209	Field Strength of Spurious Emissions	Pass	

Remark: *EUT is battery operated only.

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	Short Range Device Remote Control
MANUFACTURER	Duravit AG
TYPE	596000098001
SERIAL NUMBER	Engineering sample
TRANSMITTER OPERATING RANGE	2410~2473MHz
COUTRY OF ORIGIN	China
Channel Number	316
Channels Spacing	199.951172kHz
Modulation Type	MSK
Antenna Gain	0dbi
FCC ID	2ACSF596000098001
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	596000098001 is a Short Range Device Remote Control
MANUFACTURING DESCRIPTION	The Remote Control 596000098001 was powered by 3*1.5V AAA battery.

Channel	Freq(MHz)	Channel	Freq(MHz)
1	2410.0	161	2442.0
2	2410.2	162	2442.2
3	2410.4	163	2442.4
4	2410.6	.	.
5	2410.8	.	.
6	2411.0	.	.
.	.	313	2472.4
.	.	314	2472.6
.	.	315	2472.8
160	2441.8	316	2473.0

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) 596000098001 was a Duravit AG Short Range Device Remote Control. 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 3*AAA 1.5V battery.

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
Short Range Device Remote Control 596000098001
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

Not applicable. EUT is Battery Operated.

2.1.3 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.

Product Service

2.2 FIELD STRENGTH OF FUNDAMENTAL

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.249 (a)

2.2.2 Equipment Under Test and Modification State

Short Range Device Remote Control 596000098001 - 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 a test table 800mm 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	22.6°C
Relative Humidity	56.1%

Product Service

2.2.7 Test Results

2410 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
2409.654	H	55.418	38.429	88.847	-25.153	114.0	500	PK
2409.246	V	46.851	37.688	84.539	-29.461	114.0	500	PK

2442 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
2442.620	H	49.636	38.724	88.360	-25.640	114.0	500	PK
2442.145	V	50.680	37.851	88.531	-25.469	114.0	500	PK

2473 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
2473.740	H	46.776	38.998	85.774	-28.226	114.0	500	PK
2473.915	V	46.815	38.004	84.819	-29.181	114.0	500	PK

Remark: Form the peak reading test found the emission below the AV limit, so the average (AV) test doesn't need to be performed.

Limit Clause 15.249 (a) and A2.9

Fundamental Frequency (MHz)	Field Strength of Fundamental (millivolts/meter)
902 to 928	50
2400 to 2483.5	50
5725 to 5875	50
24000 to 24250	250

Product Service

2.3 FIELD STRENGTH OF SPURIOUS EMISSIONS

2.3.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.249 (a)(d), 15.209

2.3.2 Equipment Under Test and Modification State

Short Range Device Remote Control 596000098001 - 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 a test table 800mm 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 40GHz 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

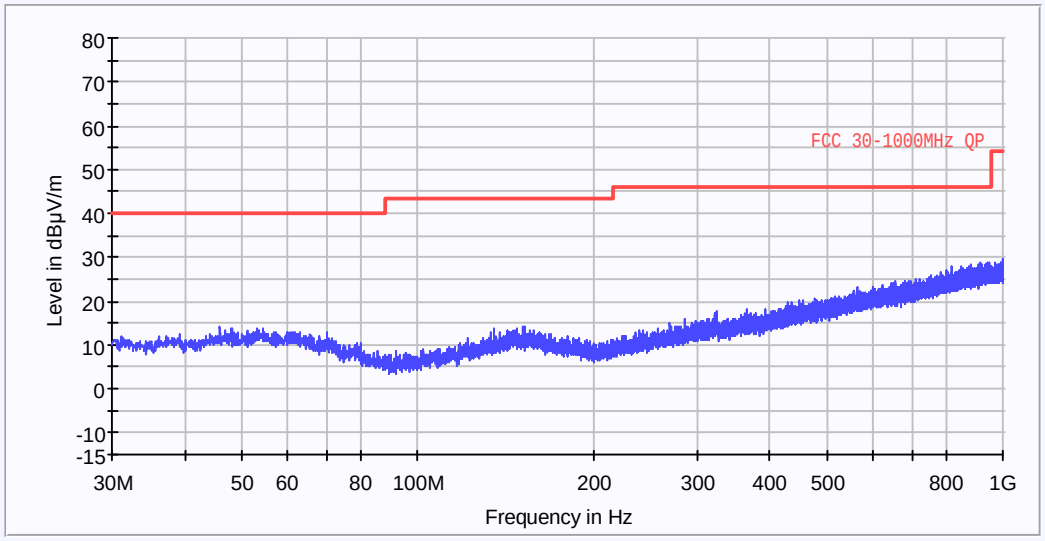
Ambient Temperature	22.6°C
Relative Humidity	56.1%

Product Service

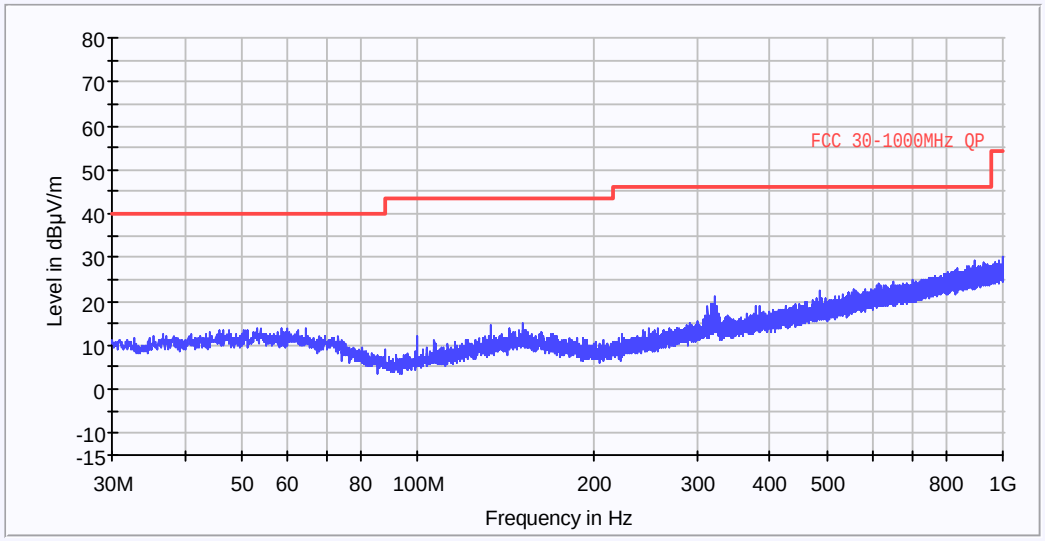
2.3.7 Test Results

30 MHz to 1 GHz

Horizontal Polarisation



Vertical Polarisation

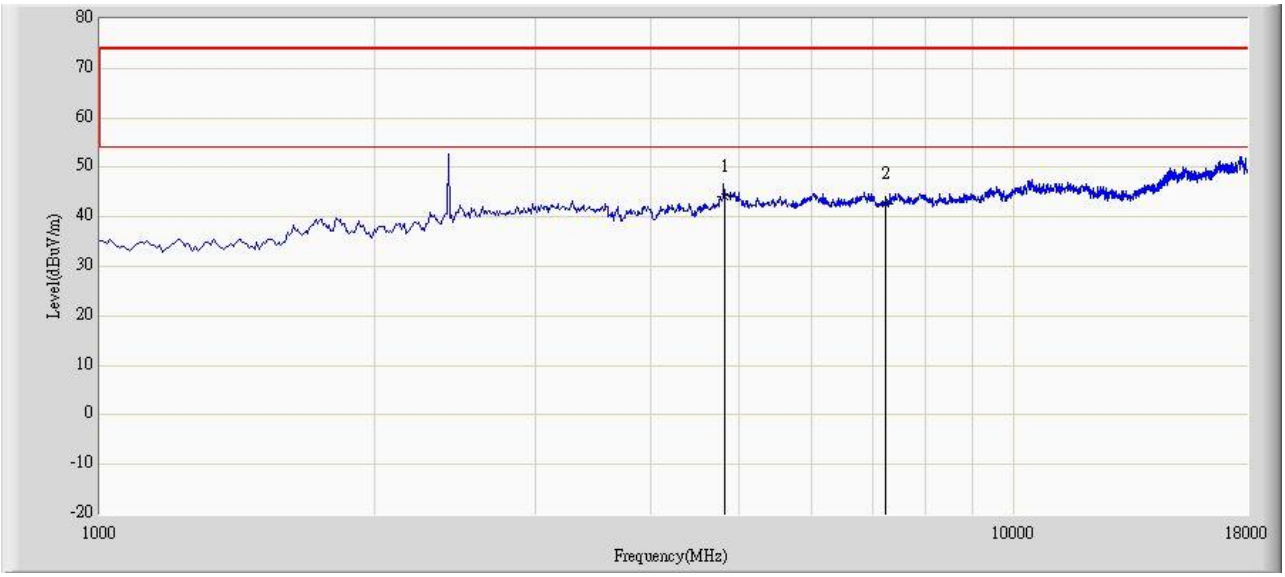


Product Service

1 GHz to 18 GHz

Tx: 2410MHz

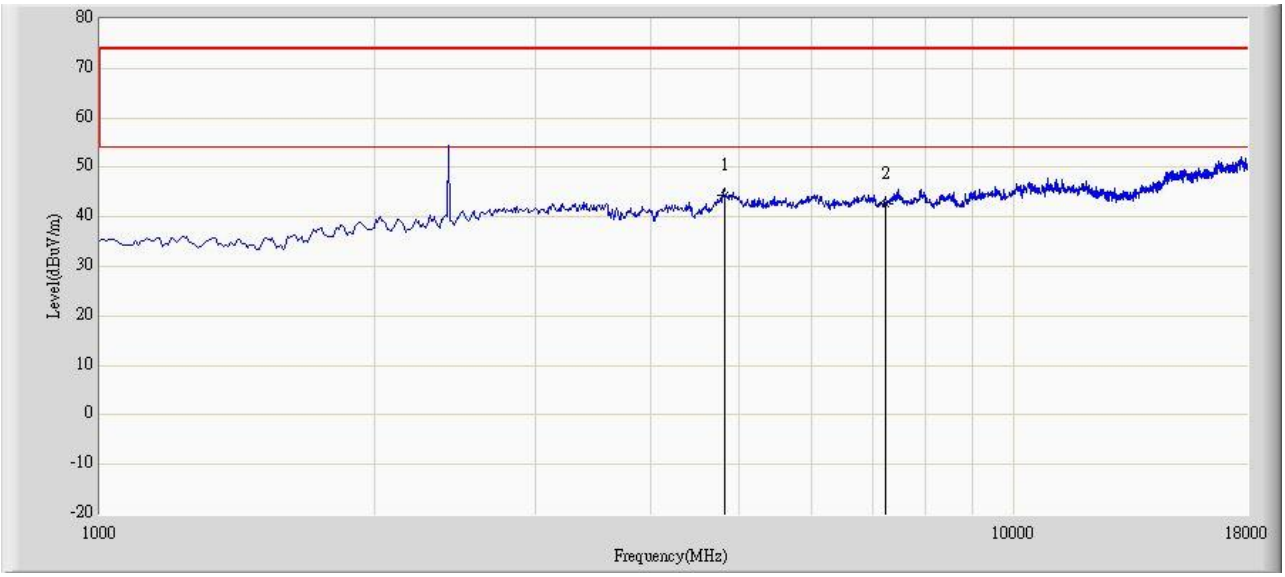
Horizontal Polarisation



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	4820.000	44.148	34.668	-29.852	74.000	9.481	PK
2			7230.000	42.778	31.207	-31.222	74.000	11.571	PK

Product Service

Vertical Polarisation



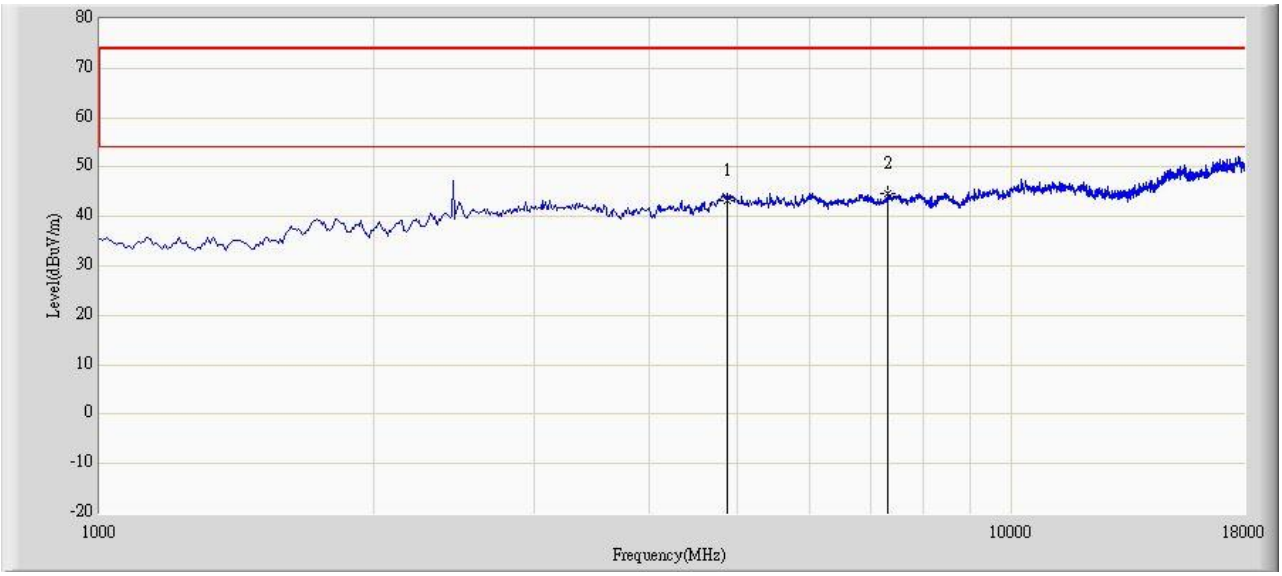
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	4820.000	44.376	34.977	-29.624	74.000	9.399	PK
2			7230.000	42.785	31.225	-31.215	74.000	11.560	PK

Product Service

1 GHz to 18 GHz

Tx: 2442MHz

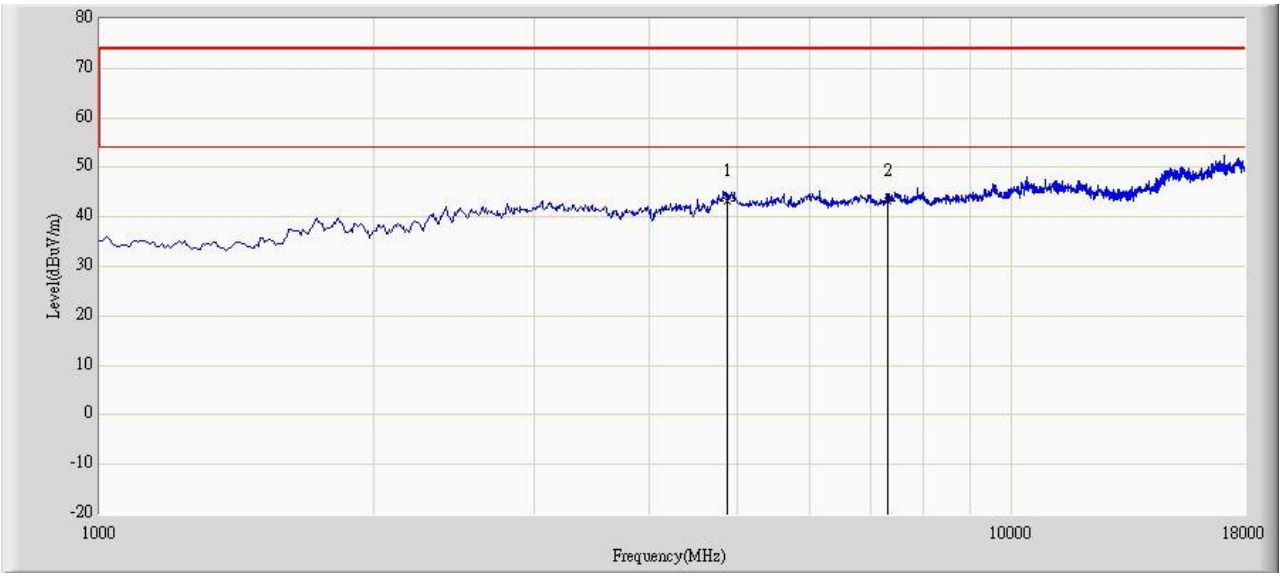
Horizontal Polarisation



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			4884.000	43.257	33.420	-30.743	74.000	9.837	PK
2		*	7326.000	44.582	32.870	-29.418	74.000	11.712	PK

Product Service

Vertical Polarisation



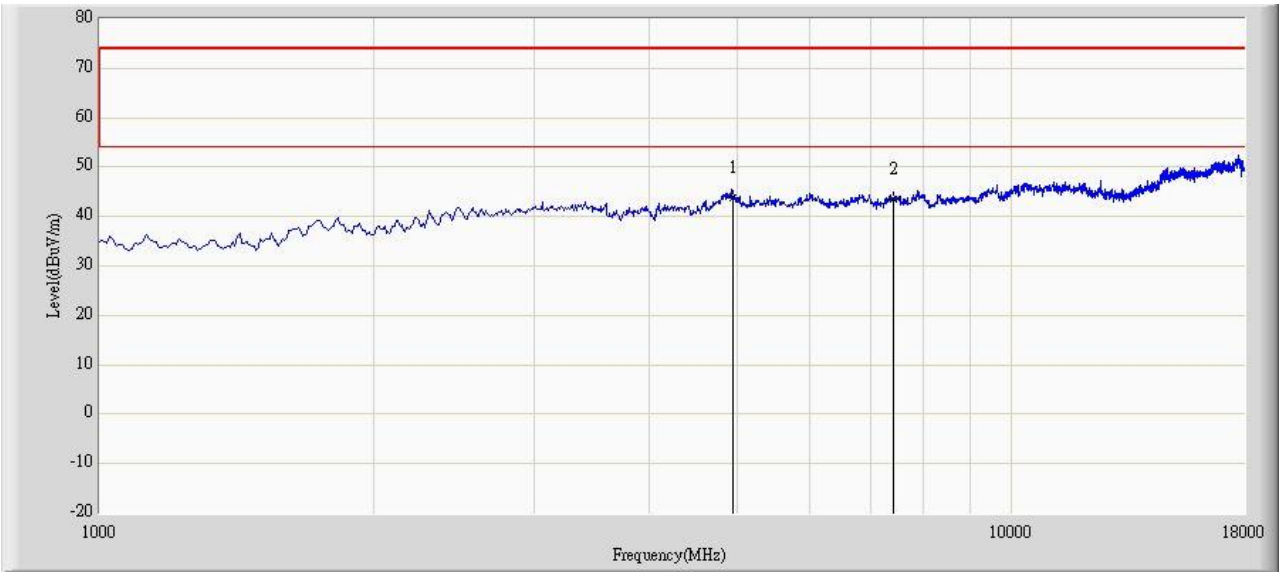
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			4884.000	43.139	33.288	-30.861	74.000	9.851	PK
2		*	7326.000	43.143	31.431	-30.857	74.000	11.712	PK

Product Service

1 GHz to 18 GHz

Tx: 2473MHz

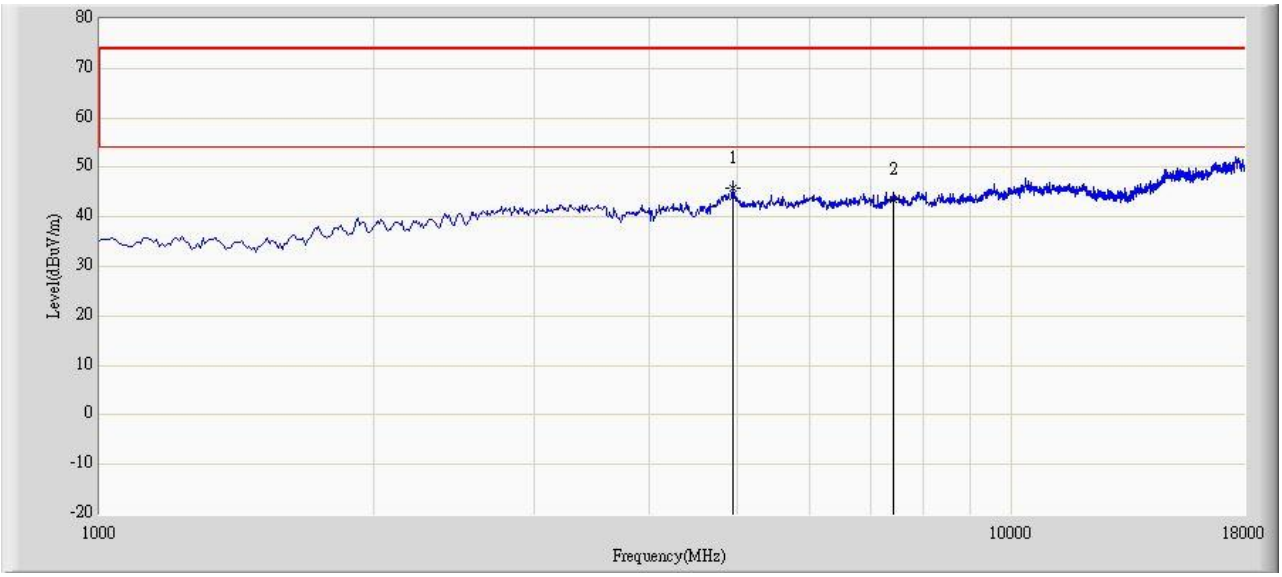
Horizontal Polarisation



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	4946.000	43.718	33.719	-30.282	74.000	9.998	PK
2			7419.000	43.430	31.612	-30.570	74.000	11.819	PK

Product Service

Vertical Polarisation



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	4946.000	45.895	35.783	-28.105	74.000	10.112	PK
2			7419.000	43.594	31.776	-30.406	74.000	11.819	PK

Remark: Form the peak reading test found the emission below the AV limit, so the average (AV) test doesn't need to be performed.

Limit Clause
15.249 (a) and A2.9

Fundamental Frequency (MHz)	Field Strength of Harmonics (microvolts/meter)
902 to 928	500
2400 to 2483.5	500
5725 to 5875	500
24000 to 24250	2500

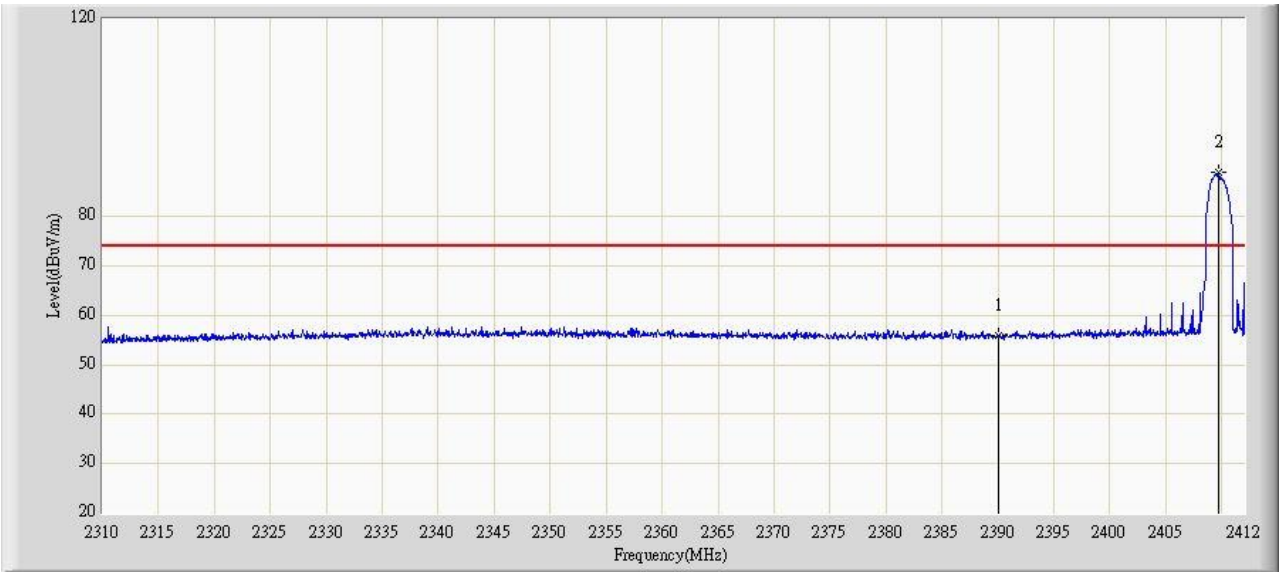
15.249 (d), 15.209

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

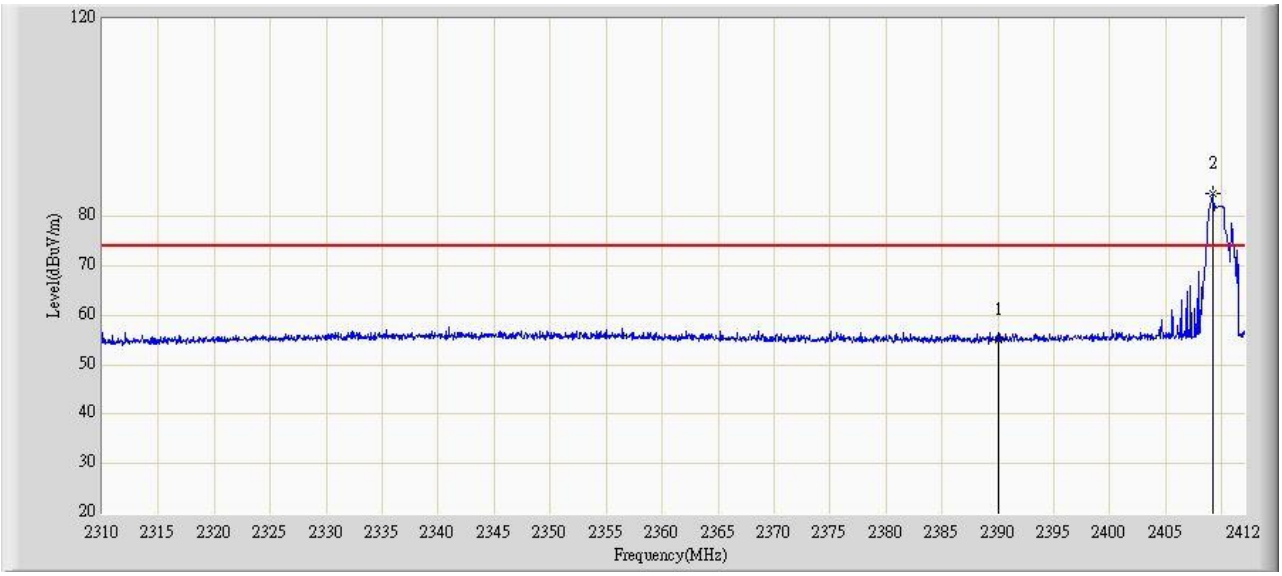
Band Edge Emissions

TX: 2410MHz
Horizontal Polarisation



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	55.836	17.583	-18.164	74.000	38.253	PK

Vertical Polarisation

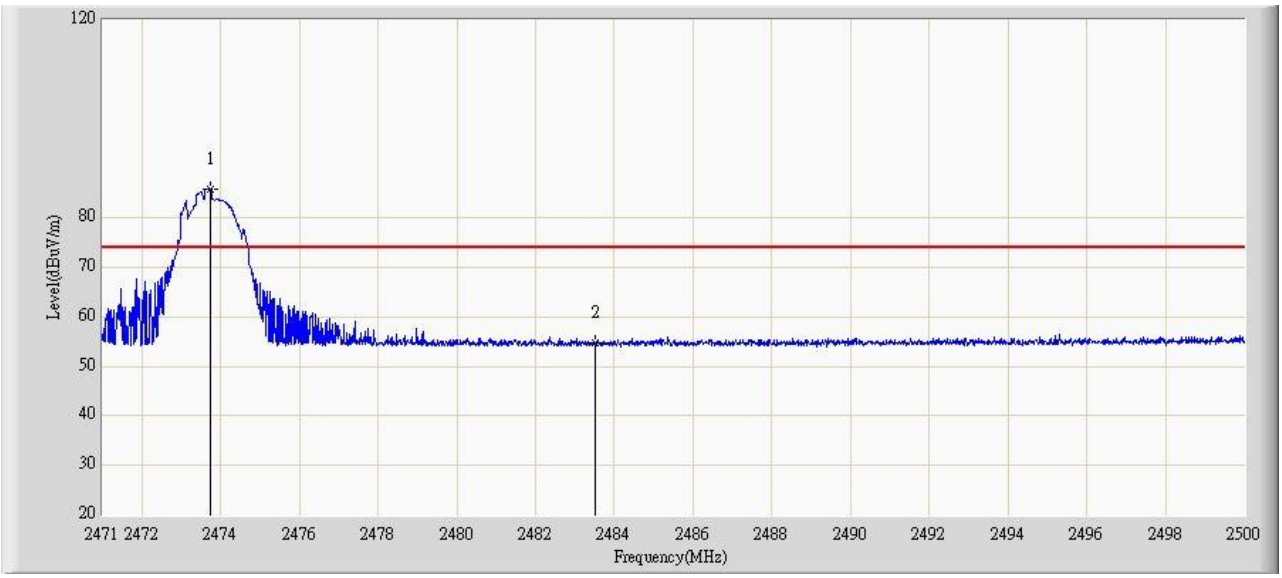


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	55.168	17.575	-18.832	74.000	37.593	PK

Product Service

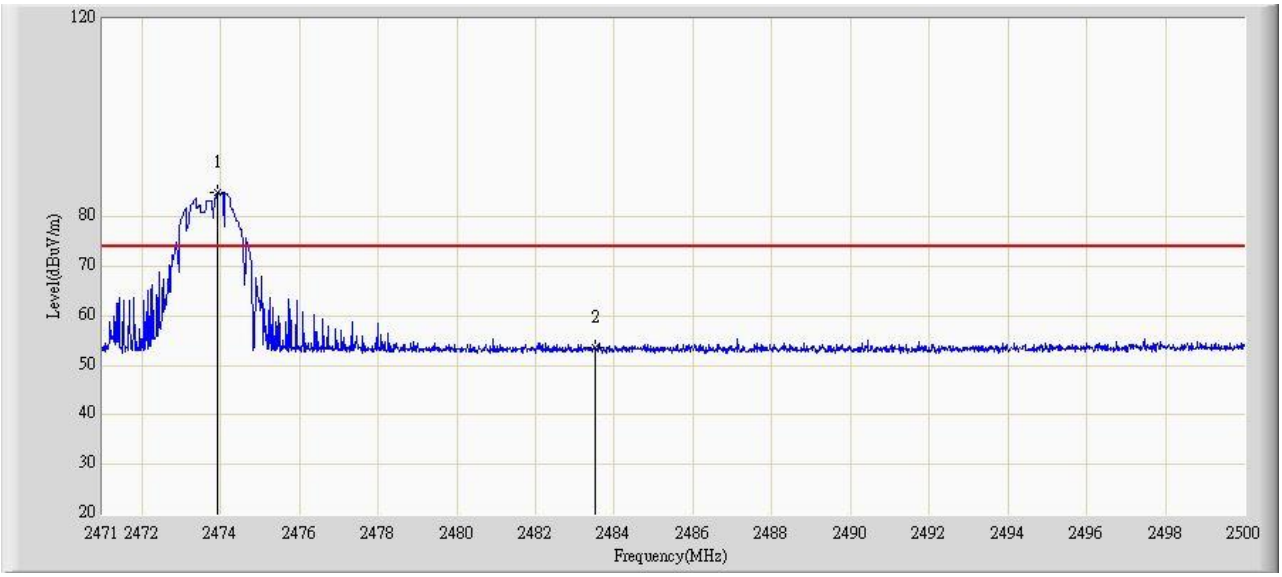
Band Edge Emissions

TX: 2473MHz
Horizontal Polarisation



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
2			2483.500	54.688	15.603	-19.312	74.000	39.084	PK

Vertical Polarisation

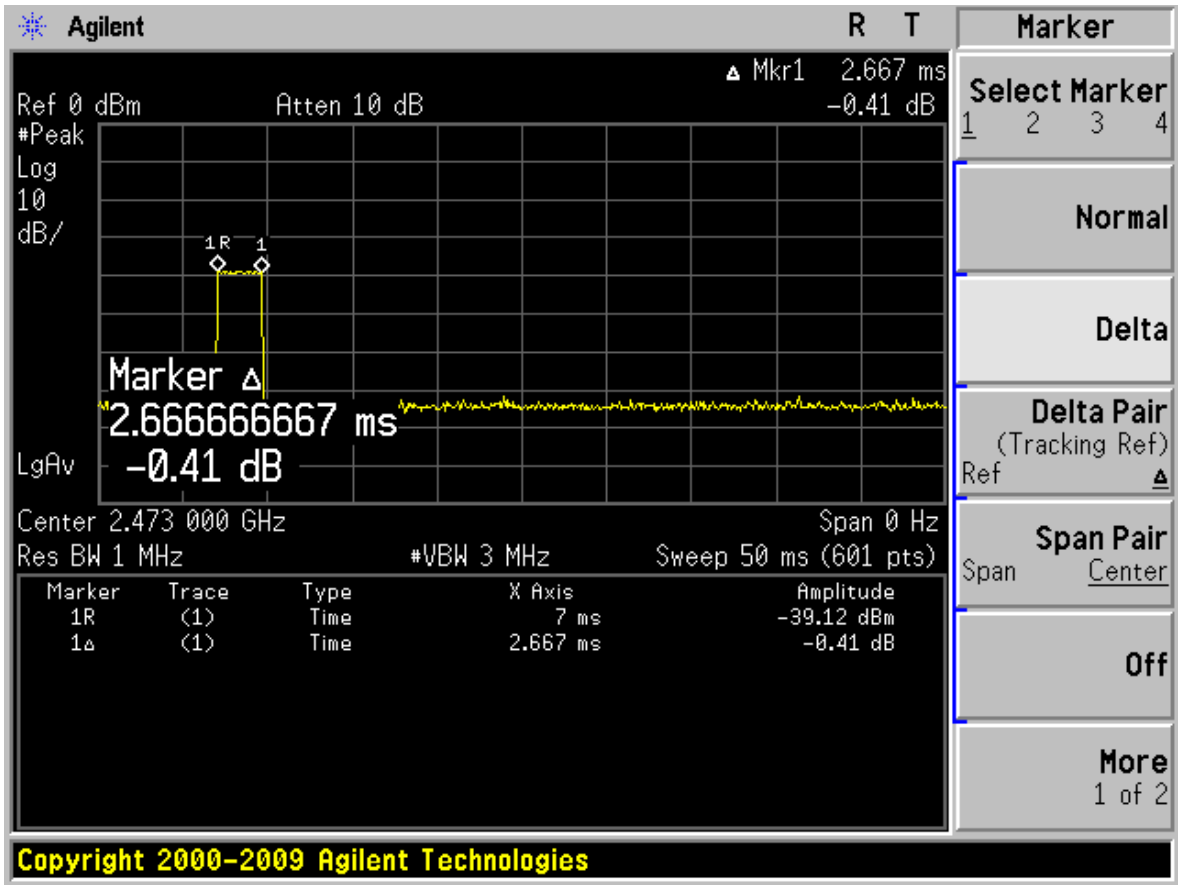


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
2			2483.500	53.522	15.471	-20.478	74.000	38.050	PK

Product Service

Duty Cycle Factor：

Measurement Result:
Time of Tx on = 2.667mS
Duty Cycle = 2.667 mS / 100 ms = 2.667%
Duty Cycle Factor = 20log(2.667%)= -31.48



Average Value:

Frequency (MHz)	Duty Cycle Correction Factor (dB)	PK Value (dBuV)	AV Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
2390.000	-31.48	55.836	24.356	54	-29.644	H
2390.000		55.168	23.688	54	-30.312	V
2483.500		54.688	23.208	54	-30.792	H
2483.500		53.522	22.042	54	-31.958	V

Remark: AV Value = PK Value + Duty Cycle Correction Factor (-31.48dB)

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 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