TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Wiz4com Technologies SAS
CT9A9W

To: FCC Part 15.247: 2006 (Subpart C)

Test Report Serial No:
RFI/RPTE1/RP49249JD05A

This Test Report Is Issued Under The Authority Of Michael Derby, Radio Performance Service Leader: 	
Tested By: Ian Watch 	**Checked By: Michael Derby** 
Report Copy No: PDF01	
Issue Date: 06 July 2007	**Test Dates: 22 June 2007 to 27 June 2007**

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1. Client Information

Company Name:	Wiz4com Technologies SAS
Address:	9 Rue Maurice Trintignant Le Mans Cedex 9 72093 France
Contact Name:	Mr K Ben Ali

2. Equipment Under Test (EUT)

The following information (with the exception of the date of receipt) has been supplied by the customer:

2.1. Description of EUT

The equipment under test is a GSM and *Bluetooth* Device, using GSM 900/1800/1900 bands with integrated *Bluetooth*.

2.2. Identification of Equipment Under Test (EUT)

Description:	Cellular Mobile Phone
Brand Name:	Xenium 9@9W
Model Name or Number:	CT 9A9W
IMEI Number:	358233000053673
Hardware Version Number:	PR3
Software Version Number:	026 2000 2000 20000
FCC ID Number:	RXXCT9A9W
Country of Manufacture:	China
Date of Receipt:	22 June 2006

2.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

2.4. Accessories

The following accessories were supplied with the EUT during testing:

Description:	2 Pin Euro Charger
Brand Name:	Phillips
Model Name or Number:	DSA-5W-05 FEU
Serial Number:	050065
Cable Length and Type:	1.2m, 2 Core
Connected to Port	USB Port

Note: An adaptor was used to connect the European AC charger into a USA, 110 V, 60 Hz, mains socket.

2.5. Support Equipment

No support equipment was used to exercise the EUT during testing.

2.6. Additional Information Related to Testing

Intended Operating Environment:	Within BT Coverage		
Equipment Category:	*Bluetooth*		
Type of Unit:	Mobile Phone with BT		
Power Supply Requirement:	Nominal 110 V, 60 Hz AC Mains Supply Internal Battery Supply of 3.7 V		
Maximum Power Output (ERP)	-10.4 dBm		
Transmit Frequency Range:	2402 MHz to 2480 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480
Receive Frequency Range:	2402 MHz to 2480 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480

2.7. Port Identification

Port	Description
1	USB
2	SIM 1
3	SIM 2 Micro SD Card

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	FCC Part 15.247: 2006 Subpart C
Title:	Code of Federal Regulations, Part 15.247 (47CFR15) (Intentional Radiators operating within the band 2400 MHz to 2483.5 MHz)

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI C63.2 (1987)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2003)
Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)
Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

DA00-705 (2000)
Title: Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

3.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

There were no deviations from the test specification.

5. Operation and Configuration of the EUT during Testing

5.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated:

Transmitter tests were performed with the EUT in a *Bluetooth* Test Mode, transmitting on the bottom, middle or top channel, or hopping on all channels, as required.
A *Bluetooth* test set was used to communicate with the EUT during the test.

Idle mode tests were performed with the EUT powered on but not transmitting.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

The SIM was in SIM 1 holder.

The AC charger was connected and charging.

The EUT was connected to a *Bluetooth* test set via a wireless link.

6. Summary of Test Results

Range of Measurements	Specification Section Reference	Port Type	Compliancy Status
Idle Mode AC Conducted Emissions	Section 15.107	AC Mains	Complied
Idle Mode Radiated Spurious Emissions	Section 15.109	Antenna	Complied
Transmitter AC Conducted Emissions	Section 15.207	AC Mains	Complied
Transmitter 20 dB Bandwidth	Section 15.247(a)(1)	Antenna	Complied
Transmitter Carrier Frequency Separation	Section 15.247(a)(1)	Antenna	Complied
Transmitter Average Time of Occupancy	Section 15.247(a)(1)(iii)	Antenna	Complied
Transmitter Maximum Peak Output Power	Section 15.247(b)(1)	Antenna	Complied
Transmitter Radiated Emissions	Sections 15.247(d) & 15.209(a)	Antenna	Complied
Transmitter Band Edge Radiated Emissions	Sections 15.247(d) & 15.209(a)	Antenna	Complied

6.1. Location of Tests

All the measurements described in this report were performed at the premises of
RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ, UK.

FCC Site Registration Number: 90895

IC Site Registration Number: 3485

7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to section 8 for details of measurement uncertainties.

7.2. Test Results

7.2.1. Idle Mode AC Conducted Spurious Emissions: Section 15.107

The EUT was configured for AC conducted emission measurements, as described in Section 9 of this report.

Tests were performed to identify the maximum emission levels present on the ac mains line of the EUT.

Results:

Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Results
0.426000	Live	30.1	57.3	27.2	Complied
0.474000	Live	28.7	56.4	27.7	Complied
0.526000	Live	27.7	56.0	28.3	Complied
0.622000	Live	29.9	56.0	26.1	Complied
0.718000	Live	28.6	56.0	27.4	Complied
0.778000	Live	26.1	56.0	29.9	Complied
0.906000	Live	26.3	56.0	29.7	Complied
0.986000	Live	27.0	56.0	29.0	Complied
1.146000	Live	26.8	56.0	29.2	Complied
1.334000	Live	14.9	56.0	41.1	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Results
0.734000	Live	10.5	46.0	35.5	Complied

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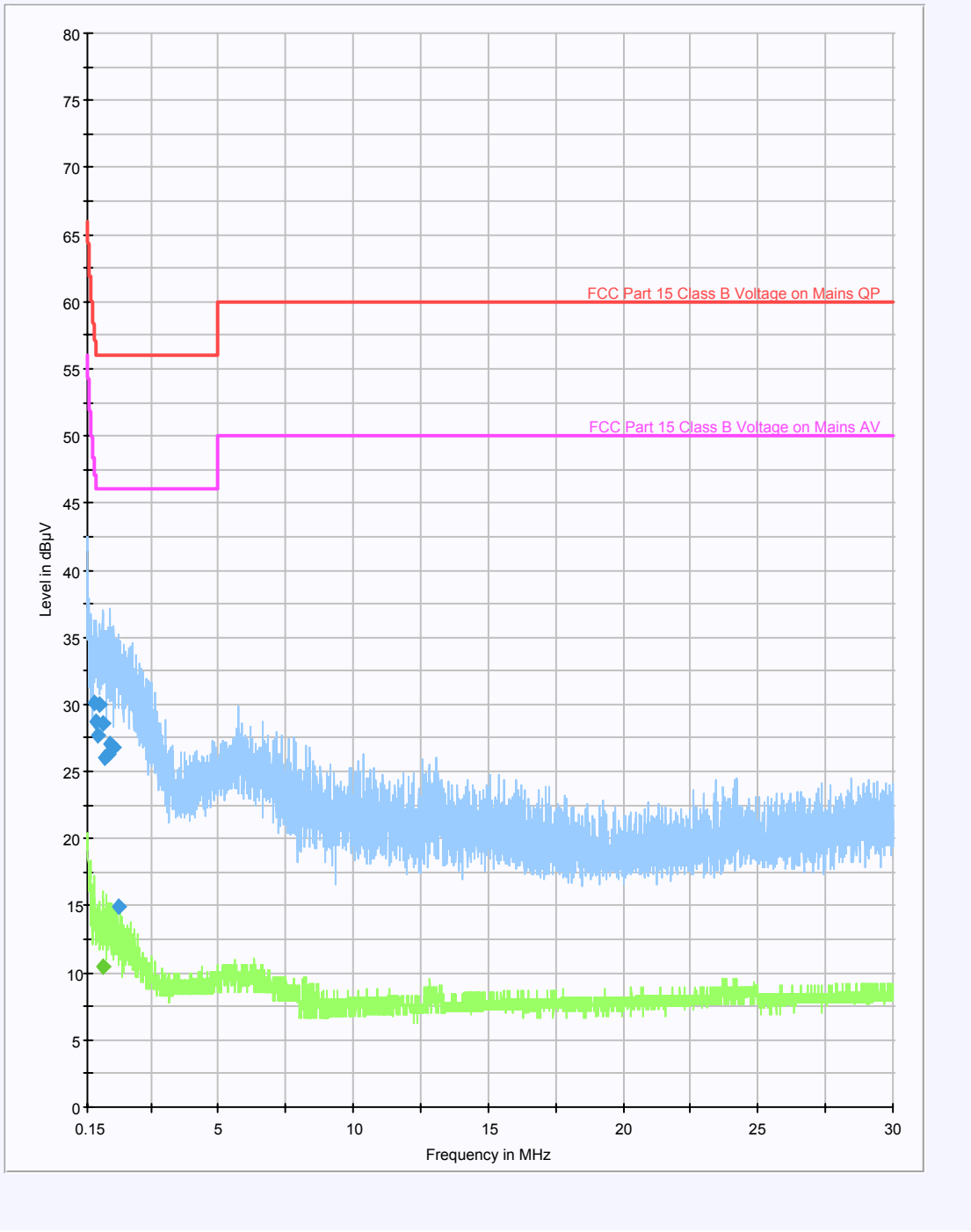
Idle Mode AC Conducted Spurious Emissions: Section 15.107 (Continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

7.2.2. Idle Mode Radiated Spurious Emissions: Section 15.109

The EUT was configured for radiated emission testing, as described in section 9 of this report.

Tests were performed to identify the maximum receiver or standby radiated emission levels.

Results:

Electric Field Strength Measurements (Frequency Range: 30 MHz to 1000 MHz)

Frequency (MHz)	Antenna Polarity	Quasi-Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Note(s)
See Note Below					

Note(s):

1. *The emissions seen on the pre-scans were all found to be caused by the Bluetooth test set used to communicate with the EUT. These were also found to be below the specified limit.*

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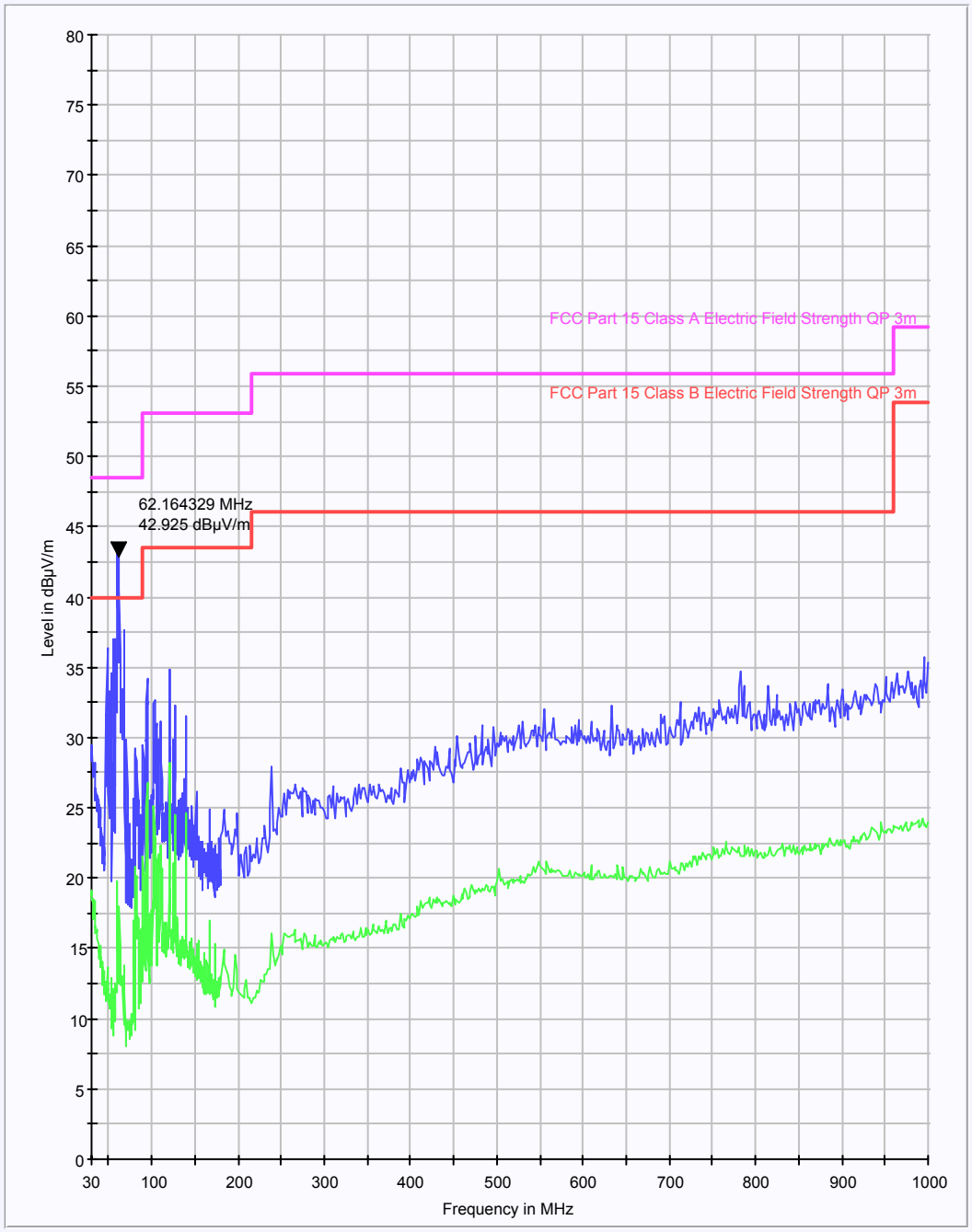
Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

7.2.3. Idle Mode Radiated Spurious Emissions: Section 15.109

Results:

Electric Field Strength Measurements (Frequency Range: 1 GHz to 12.5 GHz)

Highest Peak Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Results
3.895791	Vertical	53.1	-6.1	47.0	54.0	7.0	Complied

Note(s):

1. *No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading was recorded as shown in the table above. The peak level is compared to the average limit.*

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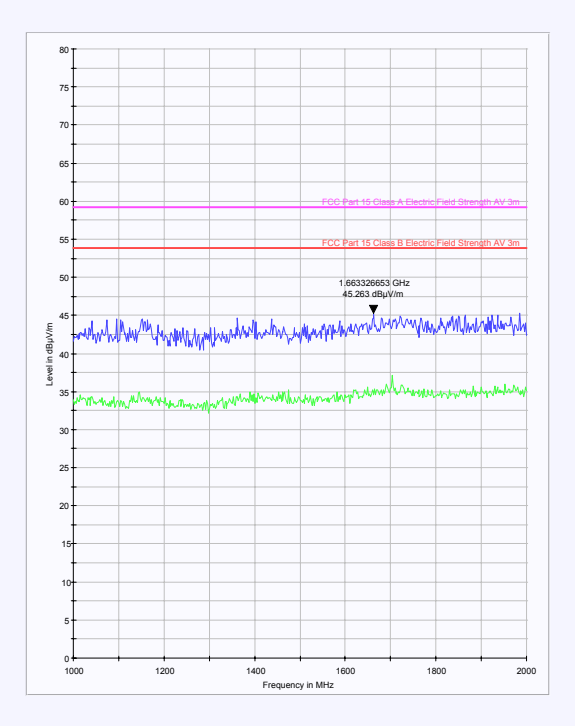
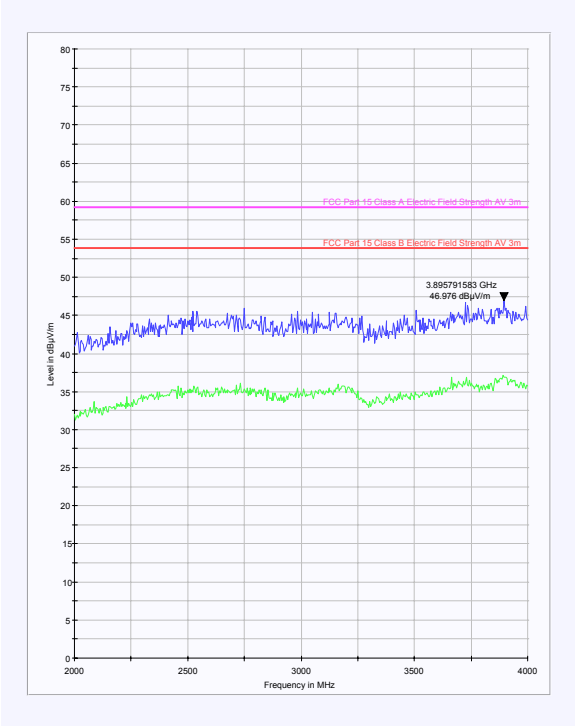
Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)





Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

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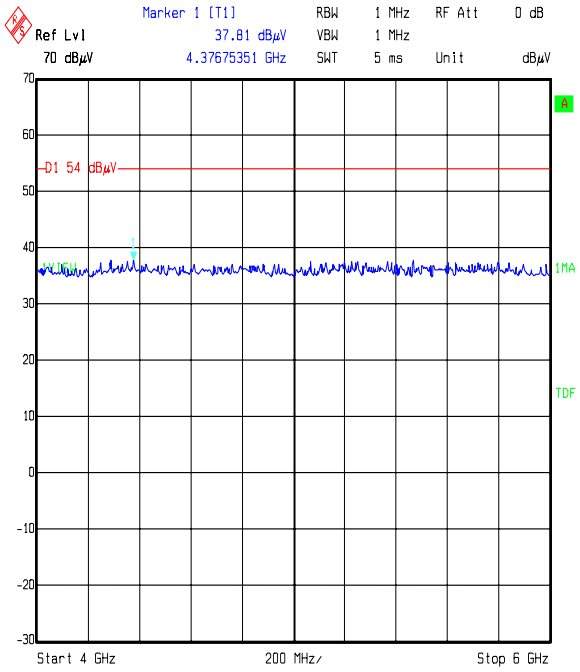
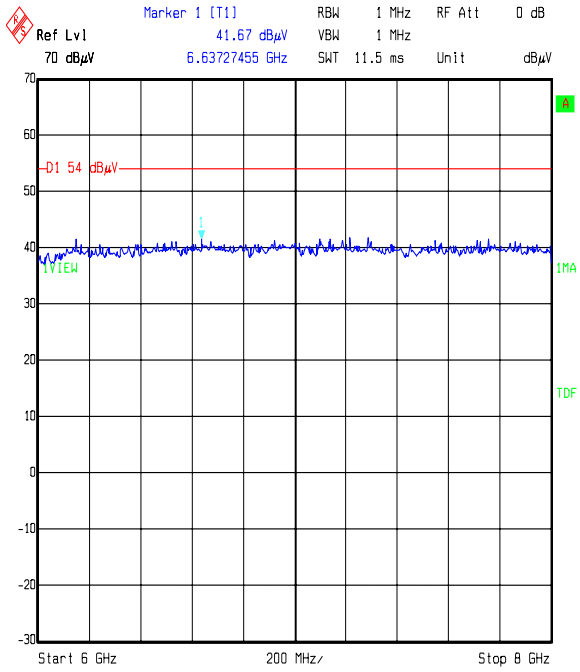
Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)



Title: 49249JD05 FCC15.247
Comment A: RX RADIATED EMISSIONS
Date: 26.JUN.2007 14:02:58



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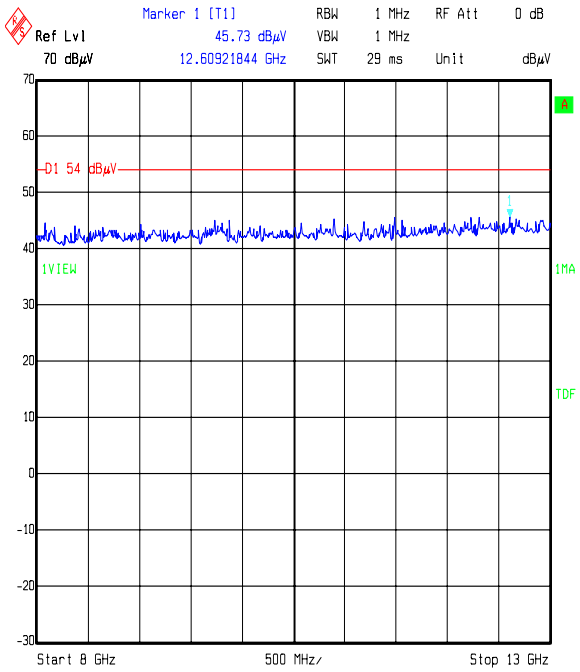
Comment A: RX RADIATED EMISSIONS
Date: 26.JUN.2007 14:06:45



Title: 49249JD05 FCC15.247
Comment A: RX RADIATED EMISSIONS
Date: 26.JUN.2007 14:28:44

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

7.2.4. Transmitter AC Conducted Spurious Emissions: Section 15.207

The EUT was configured for ac conducted emission measurements, as described in section 9 of this report.

Tests were performed to identify the maximum emission levels present on the ac mains line of the EUT.

Results:

Quasi-Peak Detector Measurements on Live and Neutral Lines

Top Channel

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Results
0.430000	Live	24.5	57.3	32.8	Complied
0.446000	Live	18.3	56.9	38.6	Complied
0.546000	Live	14.3	56.0	41.7	Complied
0.630000	Live	21.7	56.0	34.3	Complied
0.694000	Live	13.7	56.0	42.3	Complied
0.834000	Live	23.0	56.0	33.0	Complied
0.910000	Live	23.9	56.0	32.1	Complied
0.970000	Live	16.5	56.0	39.5	Complied
1.234000	Live	20.8	56.0	35.2	Complied
1.250000	Live	17.2	56.0	38.8	Complied

Average Detector Measurements on Live and Neutral Lines

Top Channel

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Note(s)
See Note Below					

Note(s):

1. *All emissions were below the specified Average limit, when measured with a Peak detector.*

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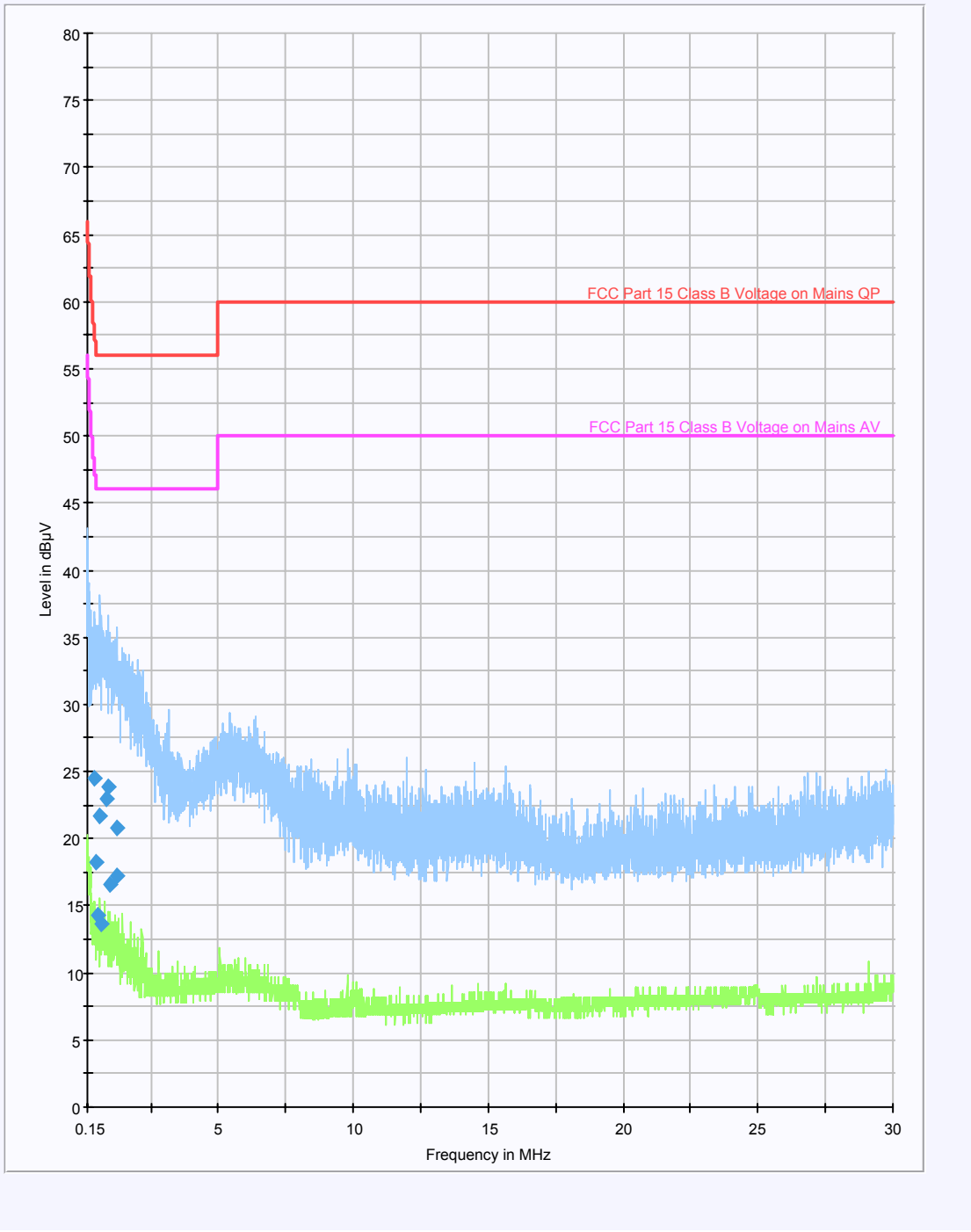
Transmitter AC Conducted Spurious Emissions: Section 15.207 (Continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

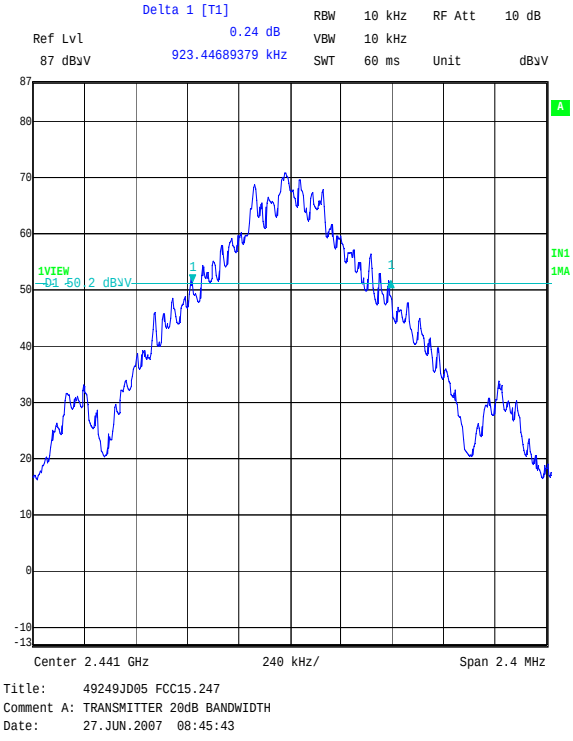
7.2.5. Transmitter 20 dB Bandwidth: Section 15.247(a)(1)

The EUT was configured for 20 dB bandwidth measurements, as described in section 9 of this report.

Tests were performed to identify the 20 dB bandwidth.

Results:

Transmitter 20 dB Bandwidth (kHz)	Limit (kHz)
923.447	None specified



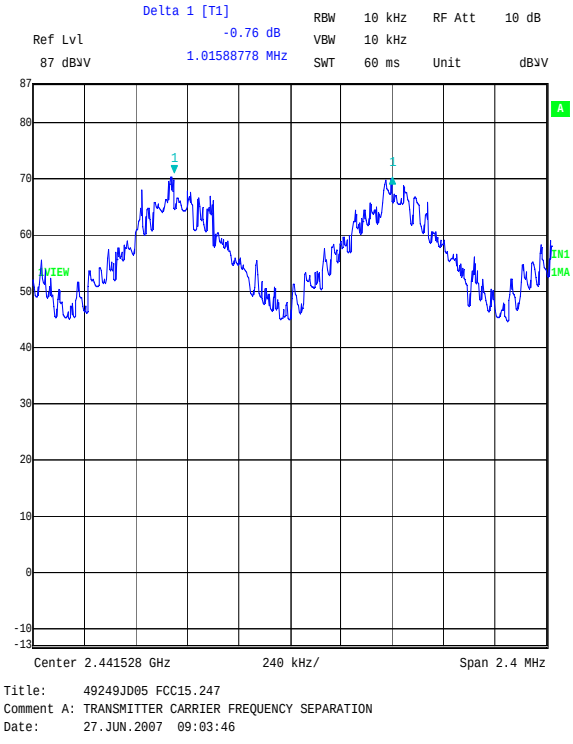
7.2.6. Transmitter Carrier Frequency Separation: Section 15.247(a)(1)

The EUT was configured for carrier frequency separation measurements, as described in section 9 of this report.

Tests were performed to identify the carrier frequency separation.

Results:

Transmitter Carrier Frequency Separation (kHz)	Limit ($^2/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Results
1015.888	615.631	400.257	Complied



7.2.7. Transmitter Average Time of Occupancy: Section 15.247(a)(1)(iii)

The EUT was configured for average time of occupancy measurements, as described in section 9 of this report.

Tests were performed to identify the average time of occupancy in number of channels (79) x 0.4 seconds. The calculated period is 31.6 seconds.

Results:

Emission Width (μs)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)	Results
2973.948	109	0.324	0.4	0.076	Complied

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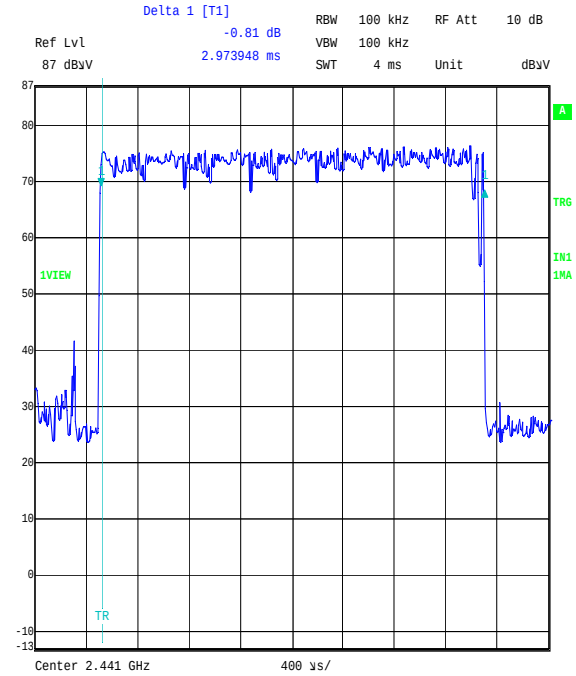
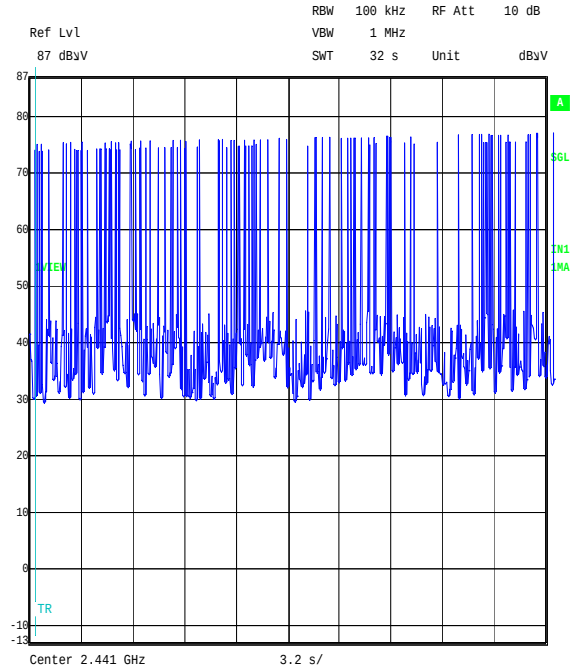
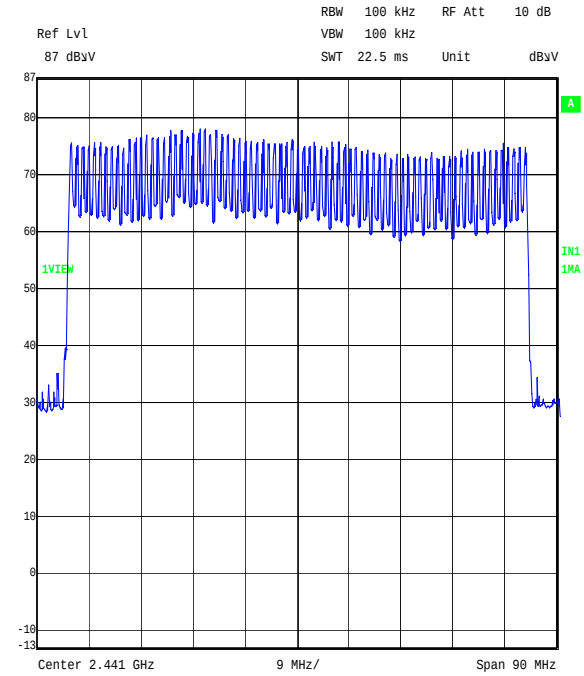
Transmitter Average Time of Occupancy: Section 15.247(a)(1)(iii) (Continued)



Title: 49249JD05 FCC15.247
Comment A: AVERAGE TIME OF OCCUPANCY, PULSE LENGTH
Date: 27.JUN.2007 09:15:21



Title: 49249JD05 FCC15.247
Comment A: AVERAGE TIME OF OCCUPANCY, NUMBER OF HOPS
Date: 27.JUN.2007 09:21:31



Title: 49249JD05 FCC15.247
Comment A: AVERAGE TIME OF OCCUPANCY, NUMBER OF CHANNELS
Date: 27.JUN.2007 09:10:21

7.2.8. Transmitter Maximum Peak Output Power: (EIRP) Section 15.247(b)(1)

The EUT was configured for transmitter peak output power measurements, as described in Section 9 of this report.

Tests were performed to identify the transmitter maximum peak output power (EIRP) of the EUT.

Results:

Battery Powered Devices

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	-10.4	30.0	40.4	Complied
Middle	-13.7	30.0	43.7	Complied
Top	-15.1	30.0	45.1	Complied

Note(s):

1. *These tests were performed radiated; therefore the EUT antenna gain is encompassed in the final result and not measurable.*

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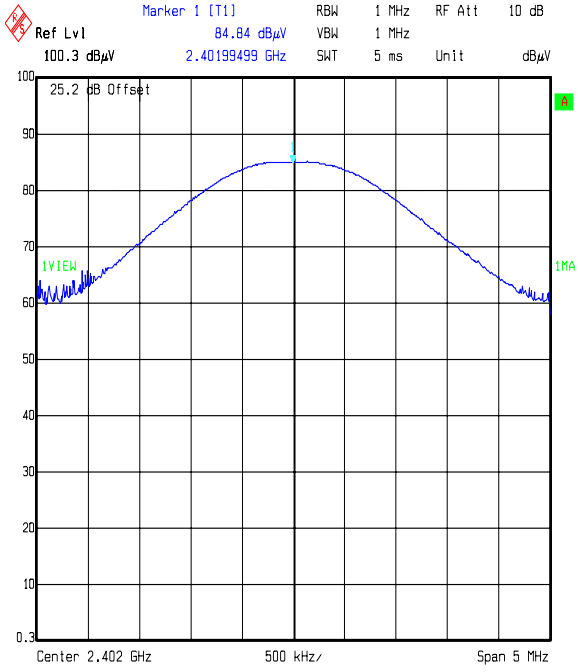
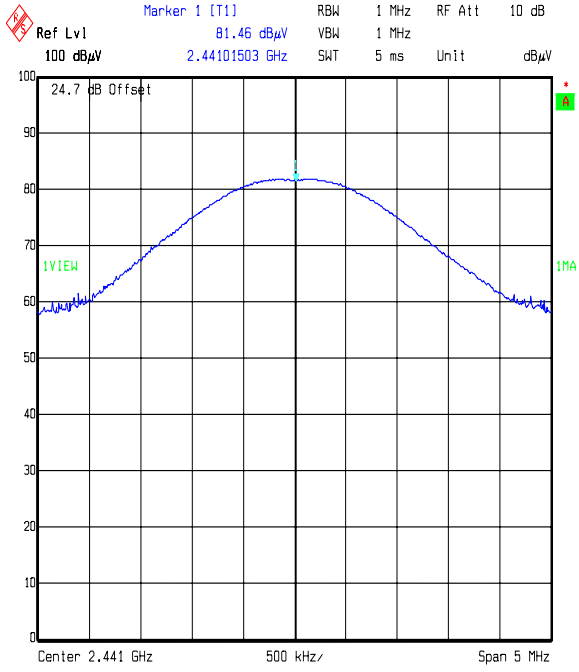
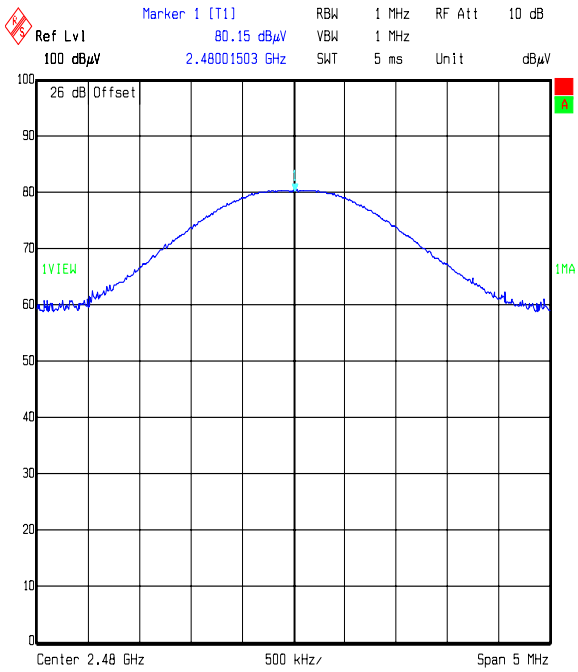
Transmitter Maximum Peak Output Power: (EIRP) Section 15.247(b)(1) (Continued)



Title: 49249JD05 FCC15.247
Comment A: EIRP BOTTOM CHANNEL
Date: 26.JUN.2007 15:33:15



Title: 49249JD05 FCC15.247
Comment A: EIRP MID CHANNEL
Date: 26.JUN.2007 15:36:15



Title: 49249JD05 FCC15.247
Comment A: EIRP TOP CHANNEL
Date: 26.JUN.2007 15:39:43

7.2.9. Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a)

The EUT was configured for radiated emission testing, as described in section 9 of this report.

Tests were performed to identify the maximum transmitter radiated emission levels.

Results:

Electric Field Strength Measurements: 30 MHz to 1000 MHz
(Emissions Occurring in the Restricted Bands)

Top Channel

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
See Note Below					

Note(s):

2. *The emissions seen on the pre-scans were all found to be caused by the Bluetooth test set used to communicate with the EUT. These were also found to be below the specified limit.*

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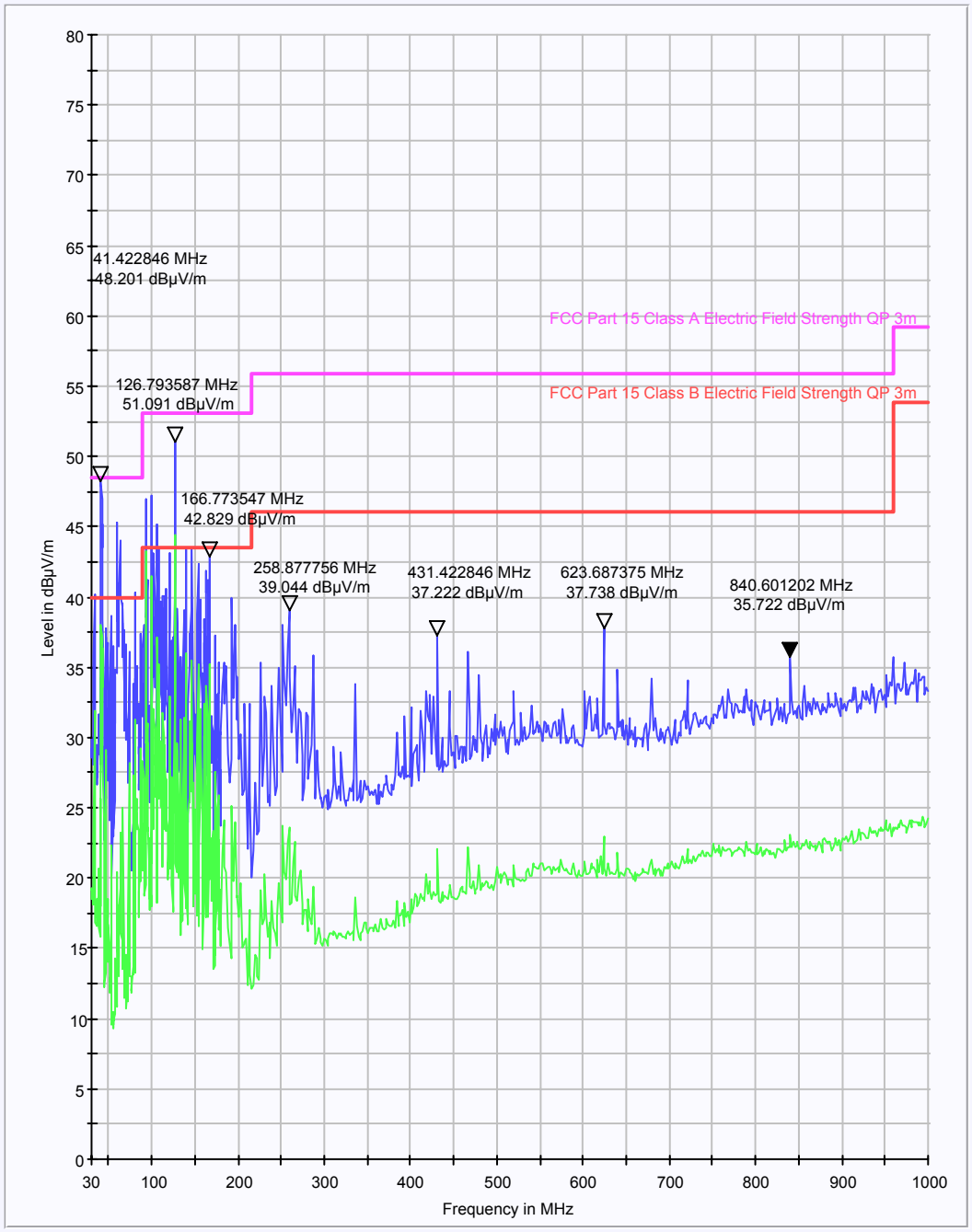
Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)

Results:

Electric Field Strength Measurements (Frequency Range: 1 GHz to 25 GHz)
(Emissions Occurring in the Restricted Bands)

Highest Peak Level: Bottom Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.804027	Horizontal	43.3	-3.3	40.0	74.0	34.0	Complied

Highest Average Level: Bottom Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.804027	Horizontal	33.4	-3.3	30.1	54.0	23.9	Complied

Highest Peak Level: Middle Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.882004	Horizontal	44.0	-3.5	40.5	74.0	33.5	Complied

Highest Average Level: Middle Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.882004	Horizontal	35.7	-3.5	32.2	54.0	21.8	Complied

Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)

Highest Peak Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.960059	Horizontal	44.6	-3.7	40.9	74.0	33.1	Complied

Highest Average Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.960059	Horizontal	34.7	-3.7	31.0	54.0	23.0	Complied

Highest Peak Level: Hopping Mode

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.921713	Horizontal	43.7	-3.5	40.2	74.0	33.8	Complied

Highest Average Level: Hopping Mode

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.921713	Horizontal	30.2	-3.5	26.7	54.0	27.3	Complied

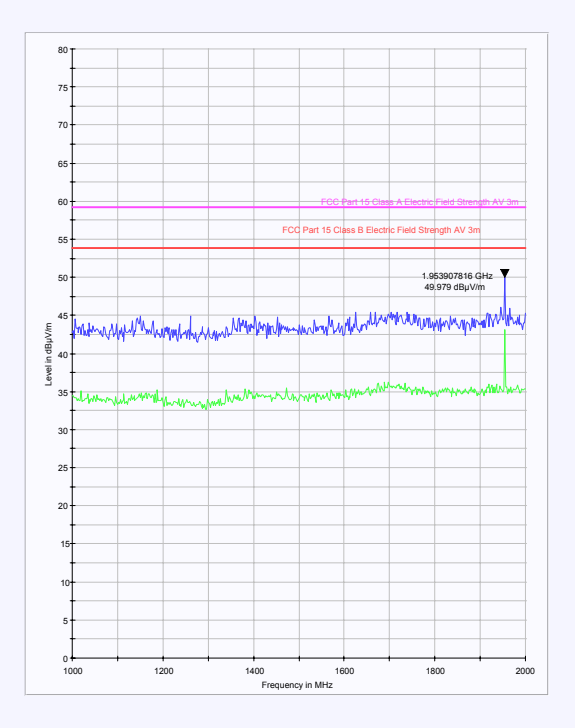
Note(s):

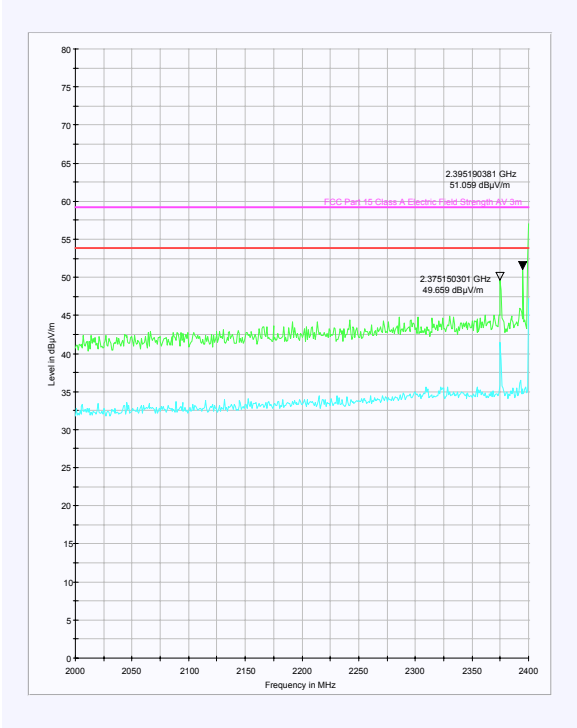
1. *The emissions seen on the pre-scans at 1.952998 GHz, 2.373416 GHz and 2.558551 GHz were all found to be caused by the Bluetooth test set used to communicate with the EUT. These were also found to be below the specified limit.*

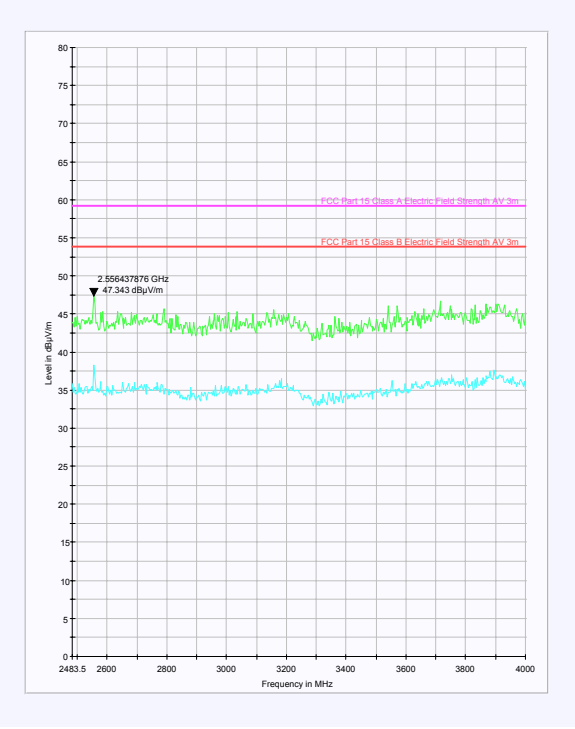
Test of: Wiz4com Technologies SAS
CT9A9W

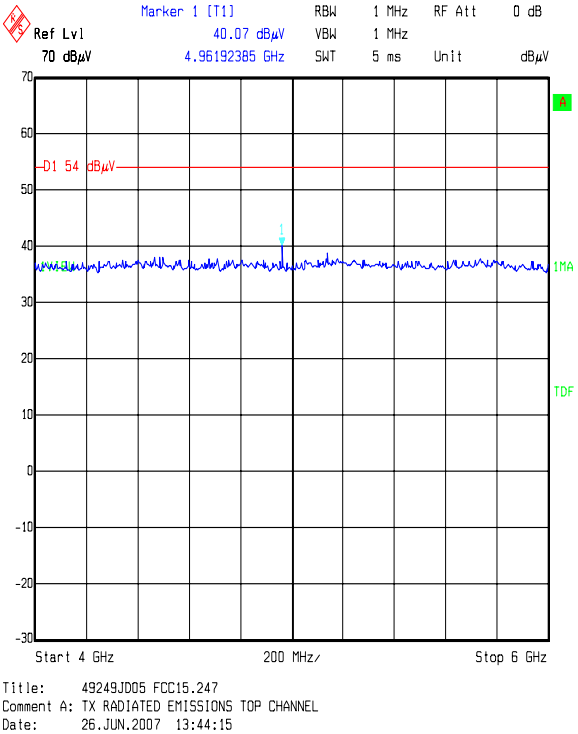
To: FCC Part 15.247: 2006 (Subpart C)

Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)







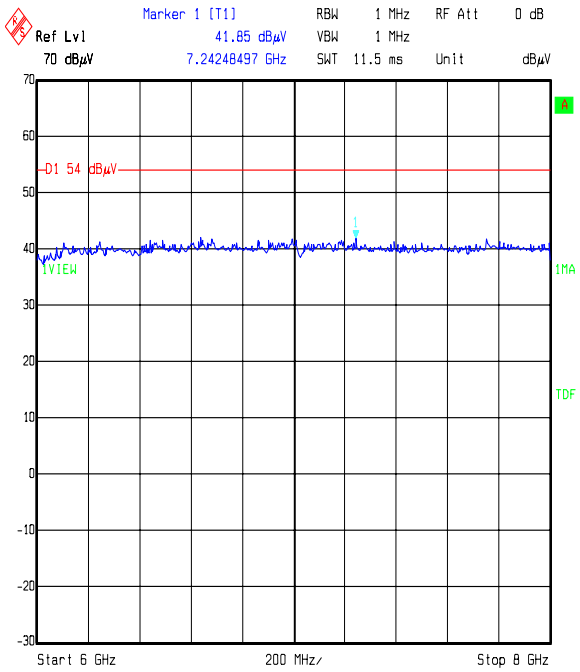


Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

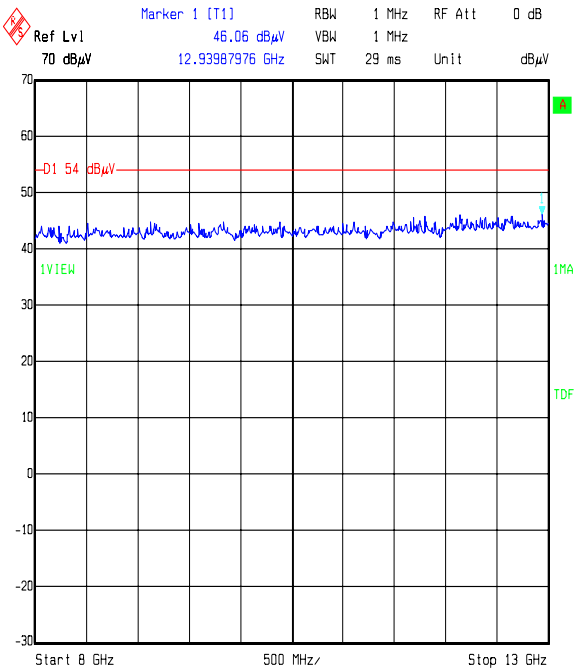
Test of: Wiz4com Technologies SAS
CT9A9W

To: FCC Part 15.247: 2006 (Subpart C)

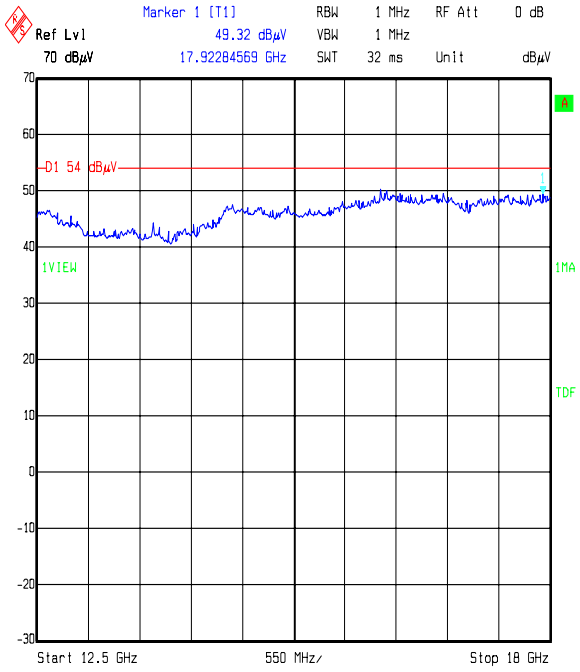
Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)



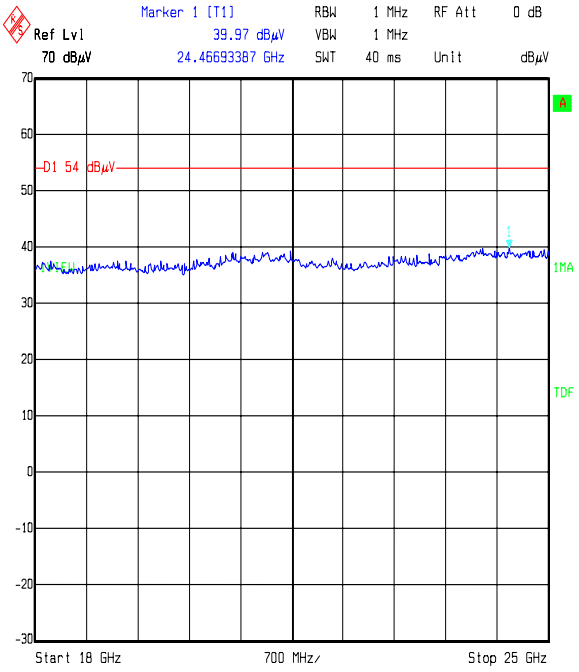
Title: 49249JD05 FCC15.247
Comment A: TX RADIATED EMISSIONS TOP CHANNEL
Date: 26.JUN.2007 14:12:10



Title: 49249JD05 FCC15.247
Comment A: TX RADIATED EMISSIONS TOP CHANNEL
Date: 26.JUN.2007 14:18:52



Title: 49249JD05 FCC15.247
Comment A: TX RADIATED EMISSIONS TOP CHANNEL
Date: 26.JUN.2007 14:34:43



Title: 49249JD05 FCC15.247
Comment A: TX RADIATED EMISSIONS TOP CHANNEL
Date: 26.JUN.2007 14:40:45

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

7.2.10. Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a)

The EUT was configured for band edge compliance of radiated emission measurements, as described in section 9 of this report.

Tests were performed to identify the maximum radiated band edge emissions.

Results:

Electric Field Strength Measurements

Peak Power Level Hopping Mode:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vertical	50.7	-6.5	44.2	65.0	20.8	Complied
2.4835	Vertical	54.8	-8.0	46.8	74.0	27.2	Complied

Average Power Level Hopping Mode:

Frequency (MHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vertical	35.3	-8.0	27.3	54.0	26.7	Complied

Note(s):

1. *The limit at 2.400 GHz is -20 dBc because it is not within a restricted band.*
2. *The limit at 2.4835 GHz is the FCC part 15.209 limit because it is within a restricted band.*

Test of: Wiz4com Technologies SAS
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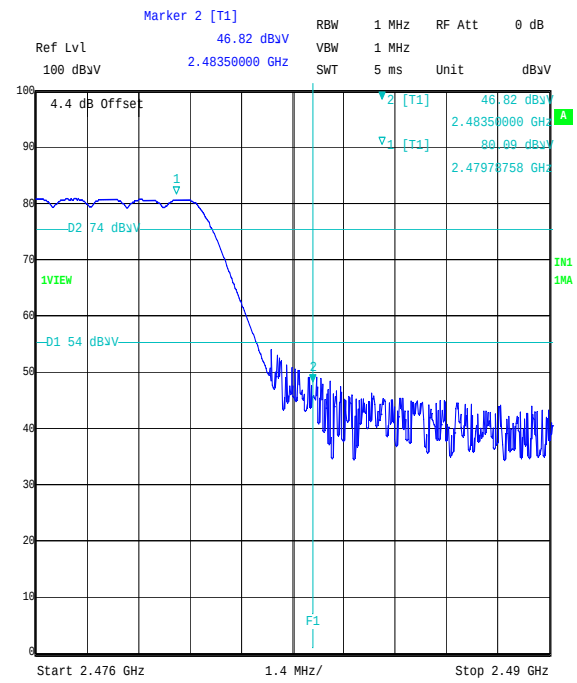
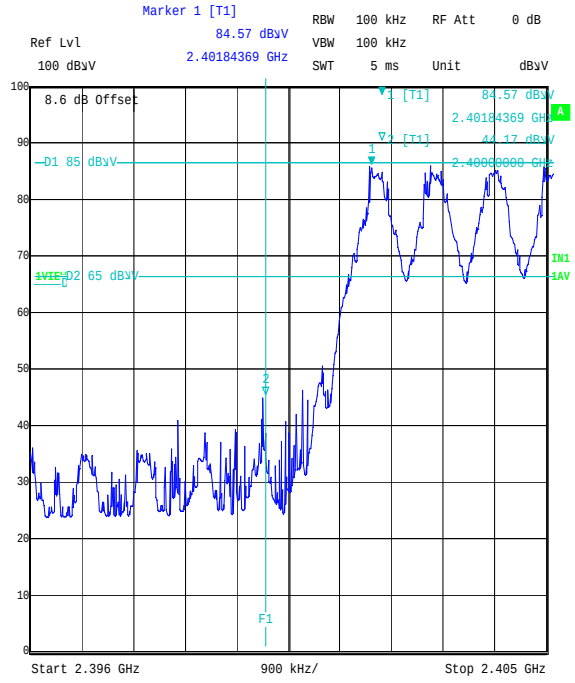
To: FCC Part 15.247: 2006 (Subpart C)

Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a) (Continued)



Title: 49249JD01 FCC15.247
Comment A: TX BAND EDGE HOPPING TOP CHANNEL PEAK
Date: 27.JUN.2007 10:09:49



Title: 49249JD01 FCC15.247
Comment A: TX BAND EDGE HOPPING BOTTOM CHANNEL PEAK
Date: 27.JUN.2007 10:32:30

Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a) (Continued)

Results:

Peak Power Level Static Mode:

Frequency (MHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vertical	49.9	-6.5	43.4	62.0	18.6	Complied
2.4835	Vertical	57.1	-8.0	49.1	74.0	24.9	Complied

Average Power Level Static Mode:

Frequency (MHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vertical	32.4	-8.0	24.4	54.0	29.6	Complied

Note(s):

1. *The limit at 2.400 GHz is -20 dBc because it is not within a restricted band.*
2. *The limit at 2.4835 GHz is the FCC part 15.209 limit because it is within a restricted band.*

Test of: Wiz4com Technologies SAS
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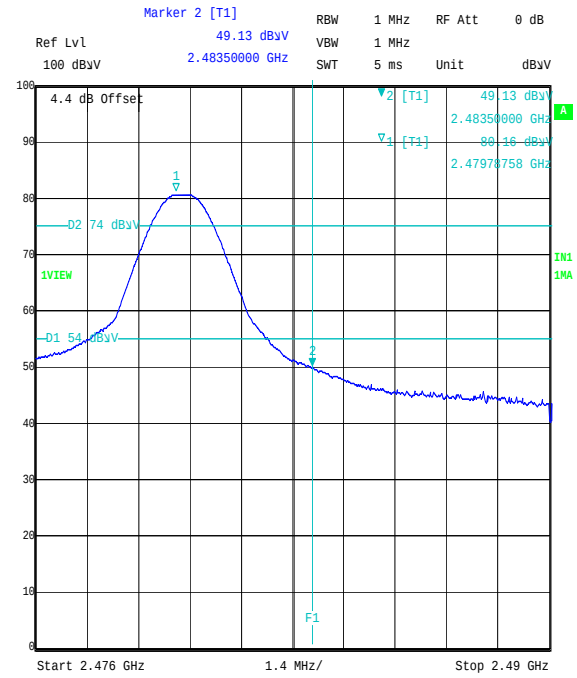
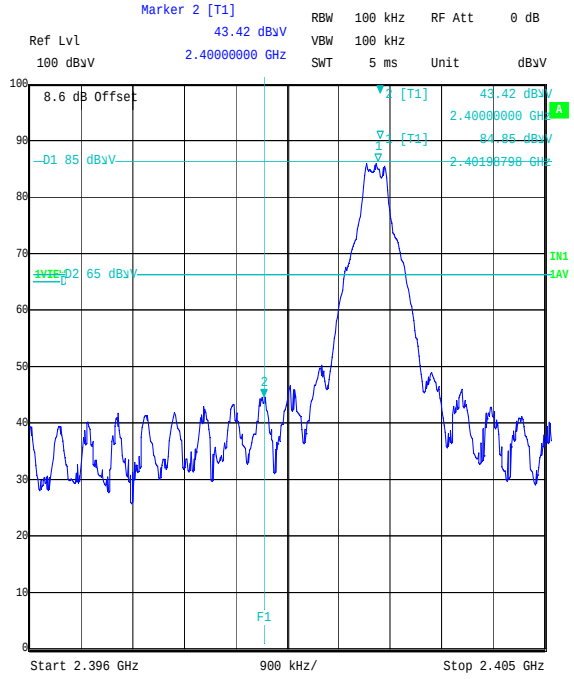
To: FCC Part 15.247: 2006 (Subpart C)

Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a) (Continued)



Title: 49249JD01 FCC15.247
Comment A: TX BAND EDGE STATIC TOP CHANNEL PEAK
Date: 27.JUN.2007 10:00:55



Title: 49249JD01 FCC15.247
Comment A: TX BAND EDGE STATIC BOTTOM CHANNEL PEAK
Date: 27.JUN.2007 10:27:31

8. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	+/- 3.25 dB
Transmitter Maximum Peak Output Power	Not applicable	95%	+/- 2.94 dB
Conducted Emissions Antenna Port	30 MHz to 40 GHz	95%	+/- 2.62 dB
Transmitter Carrier Frequency Separation	Not applicable	95%	+/- 0.01 ppm
Transmitter Average Time of Occupancy	Not applicable	95%	+/- 10 %
20 dB Bandwidth	Not applicable	95%	+/- 0.12 %
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Spurious Emissions	1 GHz to 40 GHz	95%	+/- 2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

9. Measurement Methods

9.1. AC Mains Conducted Emissions

AC mains conducted emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

The test was performed in a shielded enclosure with the equipment arranged as detailed in the standard on a wooden bench using the floor of the screened enclosure as the ground reference plane. The EUT was powered with 110V 60 Hz ac mains supplied via a line impedance stabilisation network (LISN).

Initial measurements in the form of swept scans covering the entire measurement band were performed in order to identify frequencies on which the EUT was generating interference. In order to minimise the time taken for these swept measurements, a peak detector was used in conjunction with the appropriate detector IF measuring bandwidths (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

Following the initial scans, a graph was produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested (at individual frequencies) using the appropriate detector function.

The test equipment settings for conducted emissions measurements were as follows:

Receiver Function	Initial Scan	Final Measurements
Detector Type:	Peak	Quasi-Peak (CISPR)/Average
Mode:	Max Hold	Not applicable
Bandwidth:	10 kHz	9 kHz
Amplitude Range:	60 dB	20 dB
Measurement Time:	Not applicable	>1 s
Observation Time:	Not applicable	>15 s
Step Size:	Continuous sweep	Not applicable
Sweep Time:	Coupled	Not applicable

9.2. Radiated Emissions

Radiated emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial measurements covering the entire measurement band in the form of swept scans in a shielded enclosure were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which the EUT should be re-measured in full on the open area test site. In order to minimise the time taken for the swept measurements, a peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. Following the initial scans, graphs were produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. Any emission within 20 dB of the limit were then measured on the open area test site, except in cases where the noise floor was within 20 dB of the limit, in these cases the highest point of the noise floor was measured.

Where an emission fell inside a restricted band, measurements were made at the appropriate test distance using a measuring receiver with a quasi peak detector for measurements below 1000 MHz and an average and peak detector for measurements above 1000 MHz. A peak detector was used for all other measurements.

For the final measurements the EUT was arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4.

All measurements on the open area test site were performed using broadband antennas in both vertical and horizontal polarisations.

On the open area test site, at each frequency where a signal was to be measured, the trace was maximised by rotating a turntable through 360°. The angle at which the maximum signal was observed was locked out. For frequencies below 1000 MHz the test antenna was varied in height between 1 m and 4 m in order to further maximise the target emission.

For frequencies above 1000 MHz where a horn antenna was used, height searching was performed to locate the optimal height of the horn with respect to the EUT. At this point the horn was locked off and the turntable was again rotated through 360° to maximise the target signal. It should be noted that the received signal from the EUT would diminish very quickly after it exits the beam width of the horn antenna, for this reason it may not be necessary to fully height search with the horn antennas.

Radiated Emissions (Continued)

At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT.

Scans were performed to the upper frequency limits as stated in section 15.33.

The final field strength was determined as the indicated level in dBμV plus cable loss and antenna factor.

The test equipment settings for radiated emissions measurements were as follows:

Receiver Function	Initial Scan	Final Measurements <1 GHz	Final Measurements ≥1 GHz
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak / Average
Mode:	Max Hold	Not applicable	Max Hold
Bandwidth:	(120 kHz <1 GHz) (1 MHz ≥1 GHz)	120 kHz	1 MHz
Amplitude Range:	100 dB	100 dB	100 dB
Step Size:	Continuous sweep	Not applicable	Not applicable
Sweep Time:	Coupled	Not applicable	Not applicable

9.3. Carrier Frequency Separation / 20 dB Bandwidth

The EUT and spectrum analyser was configured for radiated measurements, and as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

To determine the bandwidth and separation of each transmission channel the measurement analyser was configured to measure two adjacent channels whilst the EUT was in hopping mode. The spectrum analyser was configured with a resolution bandwidth and video bandwidth greater than 1% of the frequency span.

The analyser was set for a maximum hold scan to capture the profile of the signal. The peak points on the two adjacent channels were noted and the separation between them recorded.

To determine the occupied bandwidth, a resolution bandwidth of 10 kHz was used, which is greater than 1% of the 20 dB bandwidth. A video bandwidth of at least the same value was used.

The analyser was set for a maximum hold scan to capture the profile of the signal. The peak level was then determined, and a reference line was drawn 20 dB below the peak level.

The bandwidth was determined at the points where the 20 dB reference line intercepted the power envelope of the emission.

9.4. Average Time of Occupancy

The EUT and spectrum analyser was configured for radiated measurements, and as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

First the maximum packet length was determined on the centre channel.

The measurement analyser was configured to the time domain mode by setting the span to zero with a sweep time sufficiently wide enough to measure one pulse.

The EUT was configured to operate in normal mode of operation. The pulse width of one transmission was then recorded. The measurement analyser was then configured in zero span (in the time domain) and the sweep time was set to 32 seconds (the closest allowable setting to 31.6 seconds). This 32 second period was determined by multiplying the number of channels the device operates over (79) by 0.4 seconds.

The number of transmissions within this period was noted and multiplied by the pulse width recorded earlier. This gives the maximum occupancy over 31.6 seconds.

9.5. Effective Isotropic Radiated Power (EIRP)

EIRP measurements were performed in accordance with the standard, against appropriate limits.

The EIRP was measured with the EUT arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4. The transmitter was fitted with an integral antenna; therefore all radiated tests were performed with the unit operating into the integral antenna.

The level of the EIRP was measured using a spectrum analyser.

The test antenna was positioned in the horizontal polarity. The EUT was oriented in the X plane. The test antenna was then raised and lowered until a maximum peak was observed. The turntable was then rotated through 360 degrees and the maximum peak reading obtained. The height search was then repeated to take into consideration the new angular position of the turntable. The maximum reading observed was then recorded. This procedure was then repeated with the EUT oriented in the Y and Z planes. The highest reading taken in all 3 planes was recorded. The entire procedure was then repeated with the test antenna set in the vertical polarity.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a horn antenna. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution antenna was set to the horizontal polarity. The substitution antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

The test antenna was then raised and lowered to obtain a maximum reading on the spectrum analyser. The level of the signal generator output was then adjusted until the maximum recorded EUT level was observed. The signal generator level was noted. This procedure was repeated with both test antenna and substitution antenna vertically polarised. The EIRP was calculated as:-

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

Effective Isotropic Radiated Power (EIRP) (Continued)

Circumstances where the signal generator could not produce the desired a power substitution was performed with the signal generator set to 0 dBm. The radiated signal was maximised as previously described. The level indicated on the measuring receiver was noted. The delta between this level and the maximum level for the EUT was calculated and also noted. The EIRP of the signal generator was calculated using the above formulae. The recorded delta was added to the calculated EIRP to obtain the substituted EUT EIRP.

Delta (dB) = EUT – SG

where :

EUT = spectrum analyser indicated EUT raw level

SG = spectrum analyser indicated signal generator raw level

The signal generator actual EIRP is calculated as:

EIRP SG= Signal Generator Level - Cable Loss + Antenna Gain

The EUT EIRP is calculated as:

EIRP EUT = EIRP SG + Delta.

The test equipment settings for EIRP measurements were as follows:

Receiver Function	Setting
Detector Type:	Peak
Mode:	Not applicable
Bandwidth:	1 MHz
Amplitude Range:	100 dB
Sweep Time:	Coupled

9.6. Band Edge Compliance of RF Radiated Emissions

The EUT and spectrum analyser were configured as for radiated measurements and as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

To determine band edge compliance, the analyser resolution bandwidth was set to >= 1% of the analyser span. The video bandwidth was set to be ≥ to the resolution bandwidth. The sweep was set to auto and the detector to peak. The trace was set to max hold and a trace was produced.

A plot of the lower band edge of the allocated frequency band was produced. A marker was set to the level of the highest in band emission with a limit line set to 20 dB below this. The marker was then placed on the highest out of band emission (the specification states that either the band edge level must be measured or the highest out of band emission, whichever is the greater). The plots show that the highest out of band emission complies with the -20 dBc limit.

The above procedure was then repeated for the upper band edge except that, as the upper band edge fell on a restricted band edge (as defined in section 15.205(a)), the limit for the restricted band was applied instead of the -20 dBc limit, i.e. the general limits defined in section 15.209(a).

Final measurements were performed on the worst-case configuration as described in Part 15.31(i).

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A027	Horn Antenna	Eaton	9188-2	301	08 Jun 2006	36
A028	Horn Antenna	Eaton	91888-2	304	08 Jun 2006	36
A031	Horn Antenna	Eaton	91889-2	557	08 Jun 2006	36
A1037	Bilog Antenna	Chase EMC Ltd	CBL6112B	2413	20 Sep 2006	12
A253	Horn Antenna	Flann Microwave	12240-20	128	17 Nov 2006	36
A254	Horn Antenna	Flann Microwave	14240-20	139	17 Nov 2006	36
A255	Horn Antenna	Flann Microwave	16240-20	519	17 Nov 2006	36
A256	Horn Antenna	Flann Microwave	18240-20	400	17 Nov 2006	36
A259	Bilog Antenna	Chase	CBL6111	1513	13 Mar 2007	12
A436	Horn Antenna	Flann	20240-20	330	24 Apr 2006	36
C1065	Cable	Rosenberger	UFA210-1-7872	0985	06 Jun 2007	12
C1164	Cable	Rosenberger	FA210A1015007070	43188-1	04 Jun 2007	12
C1165	Cable	Rosenberger	FA210A1020007070	43189-1	05 Jun 2007	12
C1167	Cable	Rosenberger	FA210A1030007070	43190-01	05 Jun 2007	12
C1192	Cable	Rosenburg	FA210A1015M3030	27141-07	31 May 2007	12

Test Equipment Used (Continued)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
C151	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Cal before use	-
C160	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Cal before use	-
C341	Cable	Andrews	None	None	Cal before use	-
C348	Cable	Rosenberger	UFA210A-1-1181-70x70	2993	Cal before use	-
C468	Cable	Rosenberger	UFA210A-1-3937-504504	98L0440	Cal before use	-
M024	Spectrum Monitor	Rohde & Schwarz	EZM	873 952/006	Not calibrated	-
M044	Receiver	Rohde & Schwarz	ESVP	891 845/026	06 Mar 2007	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	08 Sep 2006	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986_022	08 Sep 2006	12
M1263	EMI Test Receiver	Rohde & Schwarz	ESIB7	100265	25 Jan 2007	12
S201	OATS	RFI	1	None	25 May 2007	12
S202	OATS	RFI	2	S202-15011990	17 Nov 2006	12
S207	Bench Site	RFI	7	None	Not calibrated	-
S212	Screened Room	RFI	12	None	Not calibrated	-

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule. All equipment was within calibration at the time of the test.

Appendix 2. Test Configuration Drawings

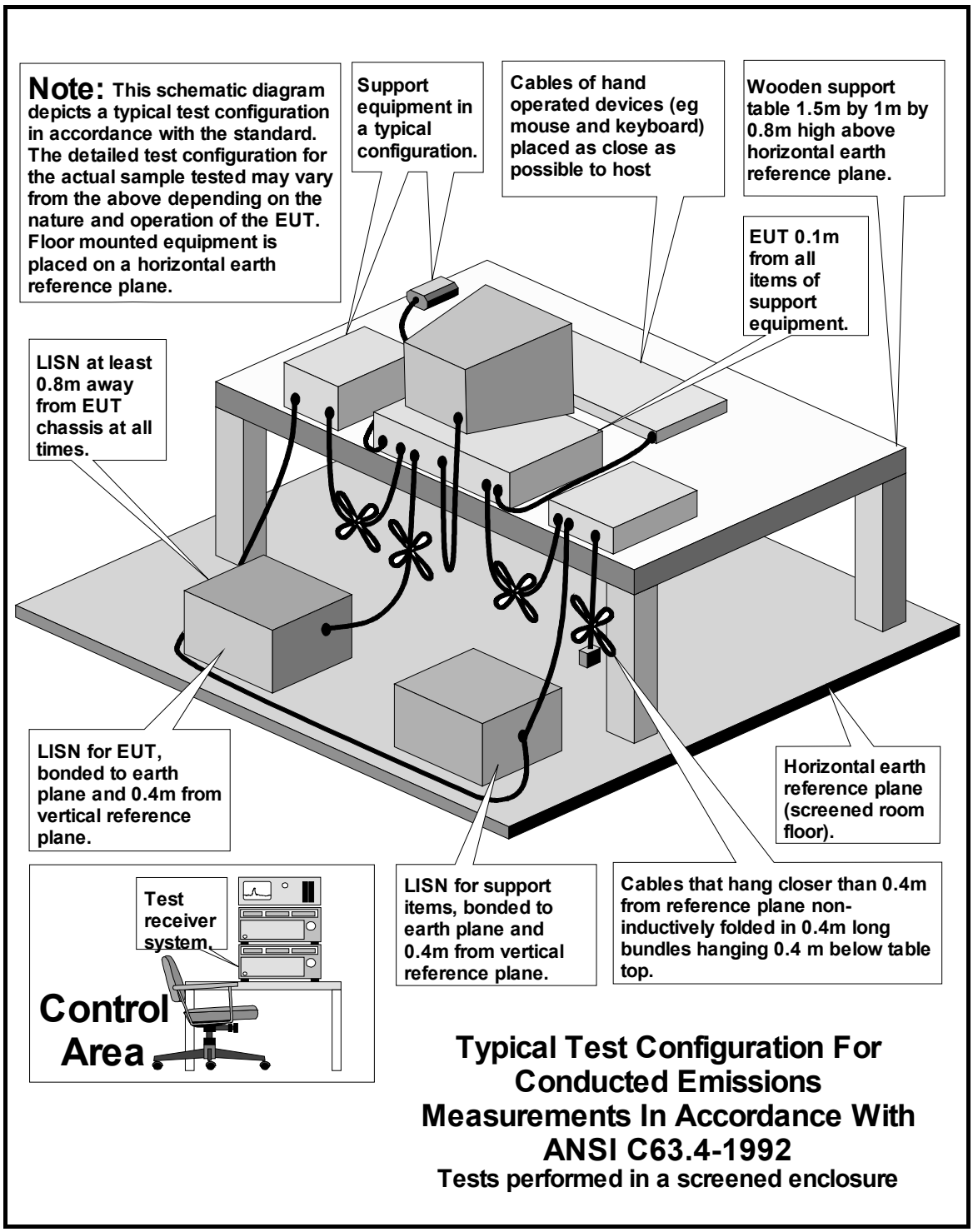
This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\49249JD05A\EMICON	Test configuration for measurement of conducted emissions.
DRG\49249JD05A\EMIRAD	Test configuration for measurement of radiated emissions.

Test of: Wiz4com Technologies SAS
CT9A9W

To: FCC Part 15.247: 2006 (Subpart C)

DRG\49249JD05A\EMICON

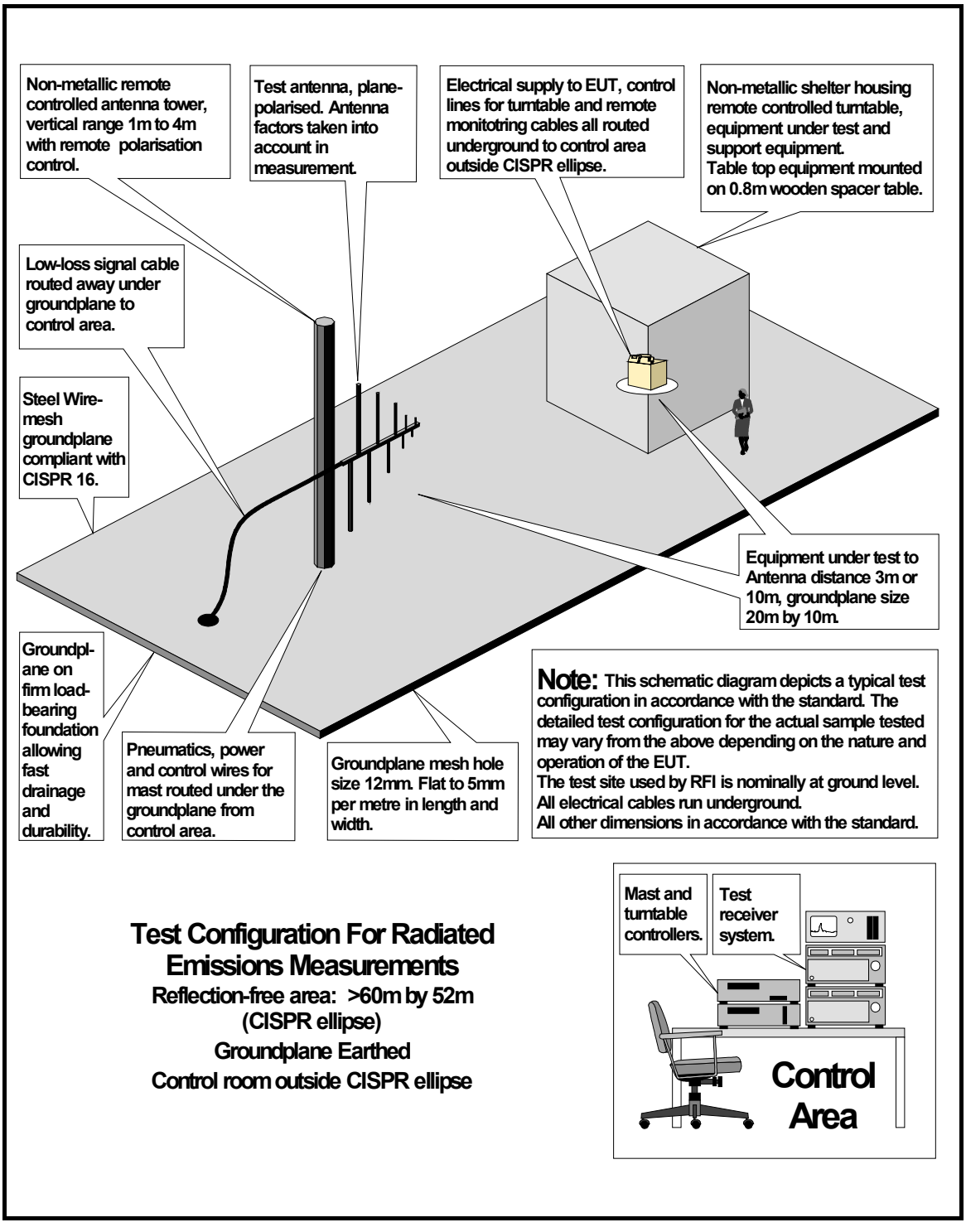


Note: This diagram is also valid for the latest version of ANSI C63.4-2003

Test of: Wiz4com Technologies SAS
CT9A9W

To: FCC Part 15.247: 2006 (Subpart C)

DRG\49249JD05A\EMIRAD



Test Configuration For Radiated Emissions Measurements
Reflection-free area: >60m by 52m (CISPR ellipse)
Groundplane Earthed
Control room outside CISPR ellipse

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