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Electromagnetic Emissions Test Report and Application for Grant of Equipment Authorization pursuant to Industry Canada RSS-Gen Issue 1 / RSS 210 Issue 6 FCC Part 15 Subpart E on the OQO Transmitter Model: Model 02

UPN:	6026A-A5YWFS
FCC ID:	SHD-A5YWFS
GRANTEE:	OQO 1800 Illinois Street San Francisco, CA. 94124
TEST SITE:	Elliott Laboratories, Inc. 684 W. Maude Ave Sunnyvale, CA 94086
REPORT DATE:	September 15, 2006
FINAL TEST DATE:	August 9, August 11, August 15, August 25 and September 1, 2006

AUTHORIZED SIGNATORY: _____

Juan Martinez
Senior EMC Engineer

ACCREDITED
2016-01

REVISION HISTORY

Revision #	Date	Comments	Modified By
1	October 16, 2006	Initial Release	David Guidotti

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SCOPE

An electromagnetic emissions test has been performed on the OQO model Model 02 pursuant to the following rules:

Industry Canada RSS-Gen Issue 1
RSS 210 Issue 6 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15, Subpart E requirements for UNII Devices

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003
RSS-212 Issue 1 Test Facilities and Test Methods for Radio Equipment

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the OQO model Model 02 and therefore apply only to the tested sample. The sample was selected and prepared by Bob Hymes of OQO.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of OQO model Model 02 complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 1
RSS 210 Issue 6 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15, Subpart E requirements for UNII Devices

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

TEST RESULTS SUMMARY

UNII / LELAN DEVICES

Operation in the 5.15 – 5.25 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407(e)		Indoor operation only	Refer to user's manual	N/A	Complies
15.407(a) (1)		26dB Bandwidth	> 20 MHz	N/A – limits output power if < 20MHz	N/A
15.407(a) (1)	A9.2(1)	Output Power	17.0 dBm (0.050 W)	17 dBm	Complies
15.407(a) (1))	A9.2(1)	Power Spectral Density	3.94 dBm/MHz	4dBm/ MHz	Complies
	A9.5b	Peak Spectral Density	3.6 dBm/MHz	Shall not exceed the average value by more than 3dB	Complies

General requirements for all UNII/LELAN bands

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
	A9.5a	Modulation	Digital Modulation is used (OFDM)	Digital modulation is required	Complies
	RSP 100	99% bandwidth	17 MHz		
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	None		Complies
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz	53.8dBµV/m (489.8µV/m) @ 10439.2MHz		Complies (- 0.2 dB)
15.407(a)(6)	-	Peak Excursion Ratio	11.4 dB	< 13dB	Complies (- ?.? dB)
	A9.5c	Channel Selection	The device was tested at the highest, lowest and center channels in each operating range.	Device shall be tested on the top, bottom and center channels in each band	N/A
15.407 (c)	A9.5d	Operation in the absence of information to transmit	Operation is discontinued in the absence of information (Operational Description page)	Device shall automatically discontinue operation in the absence of information to transmit	Complies
15.407 (g)	A9.5e	Frequency Stability	Frequency stability is better than 20ppm (Operational Description page)		Complies
	A9.9g	User Manual information	Refer to Exhibit 6 for details		Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Internal to device		Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	46.0dBµV/m (199.5µV/m) @ 3854.5MHz		Complies (- 8.0 dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	52.5dBµV (421.7µV) @ 0.876MHz	Refer to standard	Complies (- 3.5 dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11, RSS 102 declaration and User Manual statements. Refer to SAR report	Refer to OET 65, FCC Part 1 and RSS 102	Complies
	RSP 100 RSS GEN 7.1.5	User Manual	Refer to manual	Statement required regarding non-interference	
	RSP 100 RSS GEN 7.1.5	User Manual	Refer to manual	Statement required regarding detachable antenna	

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The OQO model Model 02 is a Handheld PC. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is -5Vdc Volts, 3.5 Amps.

The sample was received on August 9, 2006 and tested on August 9, August 11, August 15, August 25 and September 1, 2006. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
OQO	Model 02	Handheld PC	19 (potassium)	TBD

OTHER EUT DETAILS

List any items from the test log.

ANTENNA SYSTEM

The EUT antenna is a internal flex .
The antenna is integral to the device.

ENCLOSURE

The EUT enclosure is primarily constructed of metal and plastic. It measures approximately 15 cm long by 5 cm Wide by 2 cm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

No support equipment was used during emissions testing.

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
EUT AC Power	AC/DC Adapter	2 wire	Unshielded	1.5

EUT OPERATION

The radio was transmitting at full power for 802.11b/g/a and bluetooth.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on August 9, August 11, August 15, August 25 and September 1, 2006 at the Elliott Laboratories Open Area Test Site #1 & #2 located at 684 West Maude Avenue, Sunnyvale, California. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission.

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003 and RSS 212.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003 and RSS 212. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003 / RSS 212.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 and RSS 212 specify that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

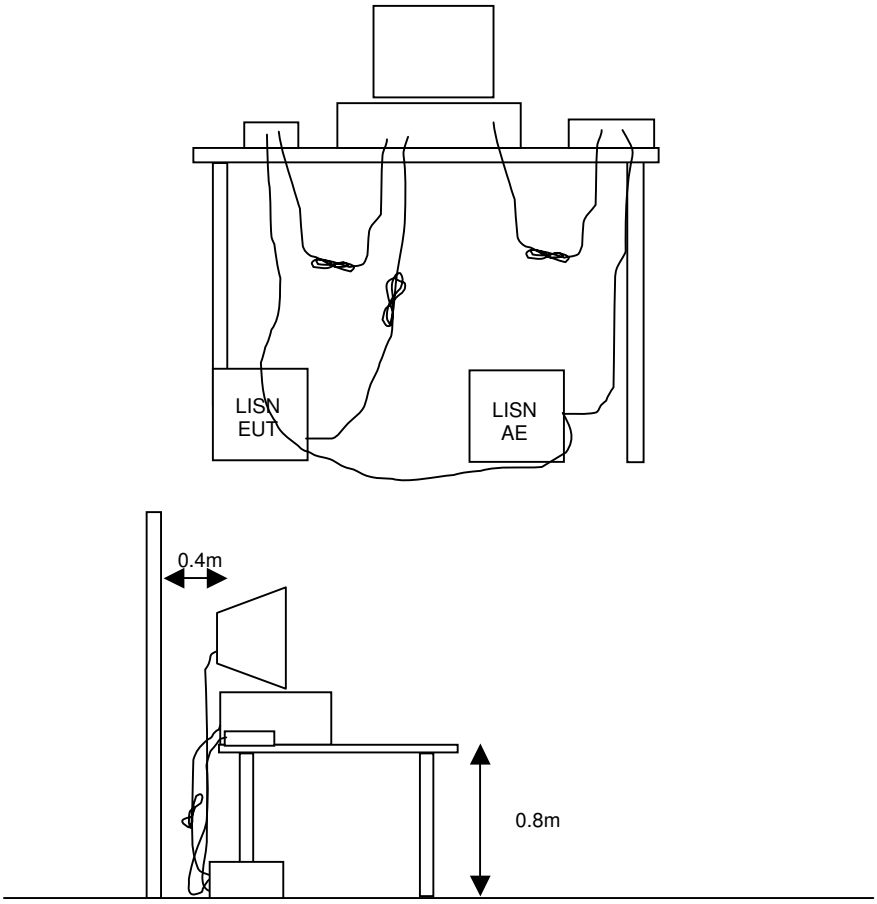
TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

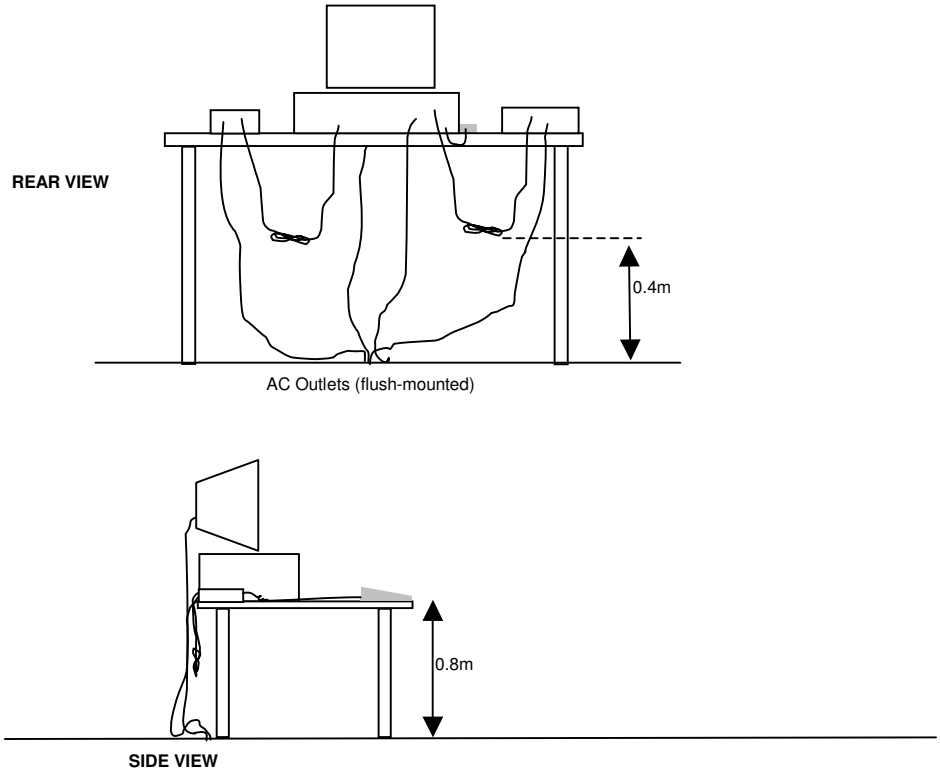


RADIATED EMISSIONS

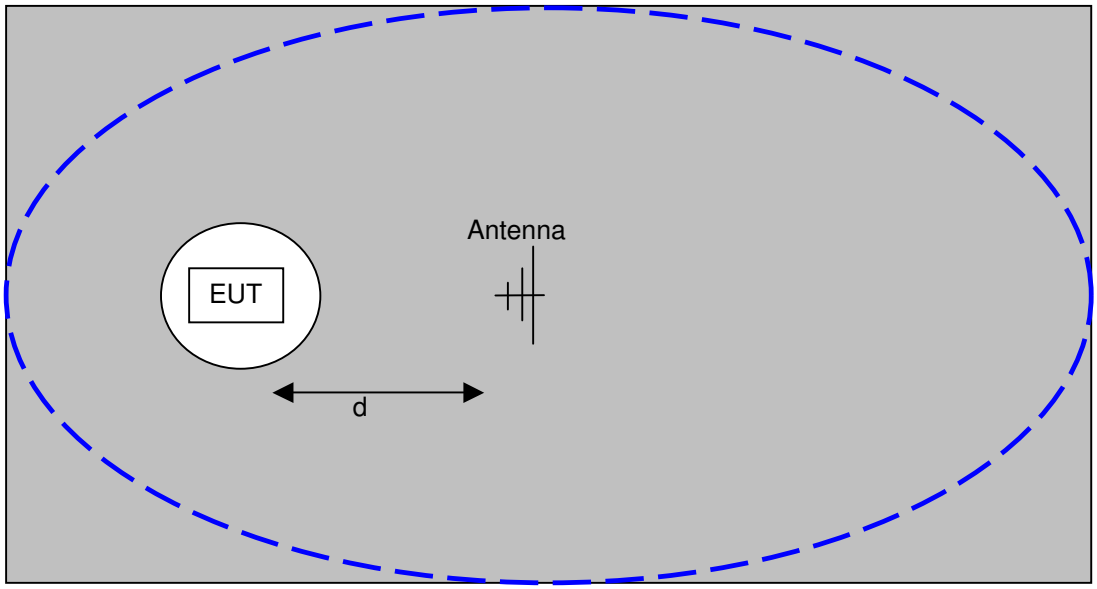
A preliminary scan of the radiated emissions is perfromed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

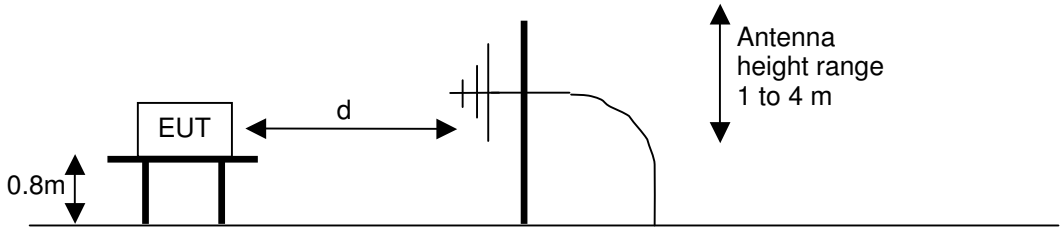
Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.



Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.



Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1] (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

[1] The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

FCC 15.407 (a) OUTPUT POWER LIMITS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 - 5250	50mW (17 dBm)	4 dBm/MHz
5250 - 5350	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

OUTPUT POWER AND SPURIOUS LIMITS –UNII DEVICES

The table below shows the limits for output power and output power density defined by FCC Part 15 Subpart E. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 - 5250	50mW (17 dBm)	10 dBm/MHz
5250 - 5350	250 mW (24 dBm)	11 dBm/MHz
5470 - 5725	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

The peak excursion envelope is limited to 13dB.

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

EXHIBIT 1: Test Equipment Calibration Data

1 Page

, 11-Aug-06
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	13-Jan-07
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	19-May-07
EMCO	Antenna, Horn, 18-26.5 GHz (SA40 30Hz)	3160-09 (84125C)	1150	12-Sep-06
Hewlett Packard	High Pass filter, 3.5 GHz	P/N 84300-80038	1157	24-Apr-07
EMCO	Antenna, Horn, 1-18 GHz (SA40)	3115	1386	11-Jul-07

EXHIBIT 2: Test Measurement Data

32 Pages

Elliott

EMC Test Data

Client:	OQO	Job Number:	J62637
Model:	Model 02	Test-Log Number:	T64964
		Project Manager:	Susan Pelzl
Contact:	Bob Hymes		
Emissions Spec:	FCC 15.247 & RSS-210	Class:	Radio
Immunity Spec:		Environment:	-

EMC Test Data

For The

OQO

Model

Model 02

Date of Last Test: 8/31/2006

Client:	OQO	Job Number:	J62637
Model:	Model 02	Test-Log Number:	T64964
		Project Manager:	Susan Pelzl
Contact:	Bob Hymes		
Emissions Spec:	FCC 15.247 & RSS-210	Class:	Radio
Immunity Spec:	Enter immunity spec on cover	Environment:	-

EUT INFORMATION

The following information was collected during the test sessions(s).

General Description

The EUT is a Handheld PC. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is -5Vdc, 3.5 Amps.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
OQO	Model 02	Handheld PC	19 (potassium)	

Other EUT Details

The following EUT details should be noted: N/A

EUT Antenna (Intentional Radiators Only)

The EUT antenna is an internal flex.
The antenna is integral to the device.

EUT Enclosure

The EUT enclosure is primarily constructed of metal and plastic. It measures approximately 15 cm long by 5 cm Wide by 2 cm high.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manger:	Susan Pelzl
Contact:	Bob Hymes		
Emissions Standard(s):	FCC 15.247 & RSS-210	Class:	Radio
Immunity Standard(s):	Enter immunity standard(s) on	Environment:	-

Test Configuration #1

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
EUT AC Power	AC/DC Adapter	2 wire	Unshielded	1.5

EUT Operation During Emissions Tests

The radio was transmitting at full power for 802.11b/g/a and bluetooth.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manger:	Susan Pelzl
Contact:	Bob Hymes		
Emissions Standard(s):	FCC 15.247 & RSS-210	Class:	Radio
Immunity Standard(s):	Enter immunity standard(s) on	Environment:	-

Test Configuration #2

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Sony (x2)	MDR-V300	Headset	-	-
Intellegent Stick	20	512MB USB Storage	-	-
Apple	iPOD A1019	Firewire Hard drive	U22325TEMMC	-
Netgear	DS104	Ethernet Hub	DS1413CDB107562	-
Samsung	171N	LCD Monitor	NB17HCJWB02528M	-
Attache	D64MB	USB Storage	511-040203002	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

Interface Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
USB #1	Intelligent Stick Model 20 USB Storage Device	None	Shielded Port (Direct Connection, No Cable)	N/A
Headset	Headset (MDRV300)	Audio Wire w/ Clamp-On Ferrite	Unshielded	3.0
Firewire #1	iPOD	Firewire w/ Integral Ferrites	Shielded	1.0
Firewire #2	Unterminated	Firewire w/ Integral Ferrites	Shielded	1.5
USB #2	Attache Model D64MB USB Storage Device	None	Shielded Port (Direct Connection, No Cable)	N/A
Line Out	Headset (MDRV300)	Audio Wire w/ Clamp-On Ferrite	Unshielded	3.0
Ethernet	Netgear	Cat 5 w/ Integral Ferrites	Shielded	3.0
VGA	Monitor	VGA Cable	Shielded	2.5
DC Power	Power Supply	Power Cable (5 Wire)	Unshielded	2.0

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manger:	Susan Pelzl
Contact:	Bob Hymes		
Emissions Standard(s):	FCC 15.247 & RSS-210	Class:	Radio

EUT Operation During Emissions

During emissions testing, the EUT was running the Windows XP operating system and displaying a "Scrolling H Pattern". An active LINK was established with the external USB, Firewire, and Ethernet devices.

The Bluetooth and 802.11b transceivers were operating by transmitting link beacons.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

FCC Part 15 Subpart E Tests

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 9/1/2006 8:23
Test Engineer: Juan Martinez
Test Location: SVOATS #2

Config. Used: 1
Config Change: None
EUT Voltage: 120V/ 60Hz

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions:

Temperature: 19 °C
Rel. Humidity: 70 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	17 dBm
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	3.94 dBm/ 1MHz
1	26dB Bandwidth	15.407(a)	Pass	> 20 MHz
1	99% Bandwidth	RSS 210	Pass	17 MHz
2	Peak Excursion Envelope	15.407(a) (6)	Pass	11.4 dB
3	Antenna Conducted Out of Band Spurious	15.407(b)	-	Not required, performed test radiated

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

Run #1: Bandwidth, Output Power and Power spectral Density

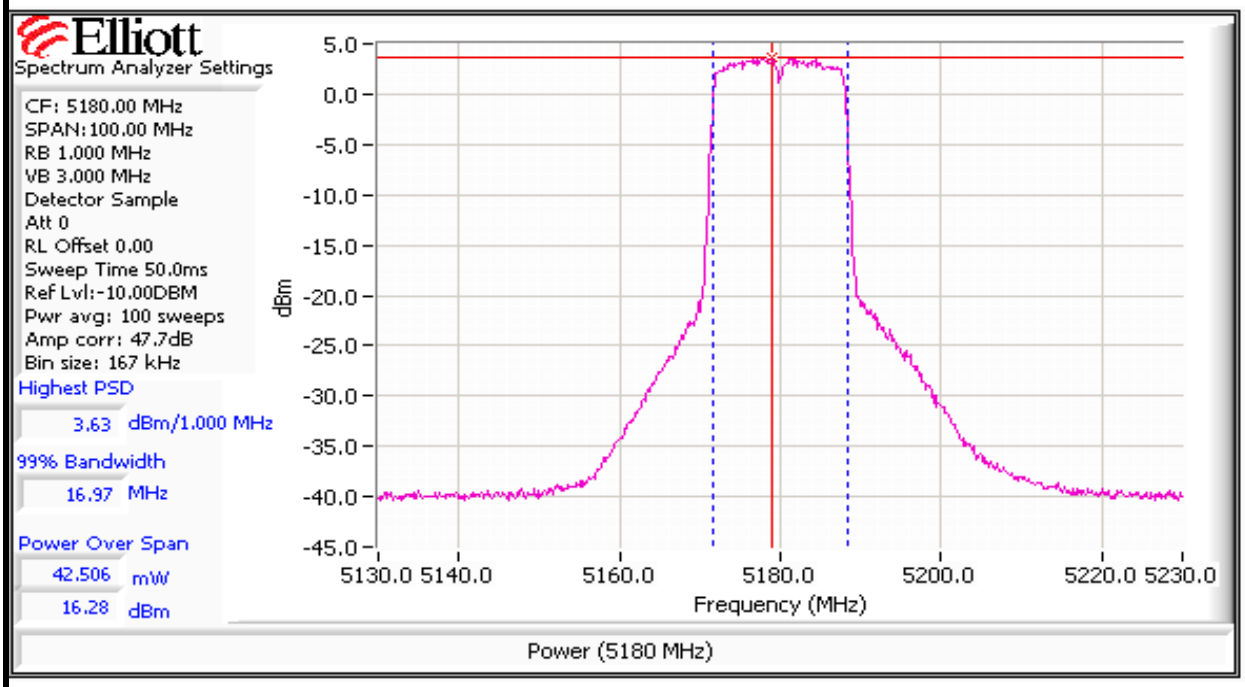
Antenna Gain: 0 dBi

Frequency (MHz)	Software Setting	Bandwidth		Output Power[1] dBm		Power (Watts)	PSD[2] dBm/MHz			Result
		26dB	99%[4]	Measured	Limit		Measured	FCC Limit	RSS Limit[3]	
5180	16.0	30.2	17.0	17.0	17.0	0.050	3.6	4.0	7.7	Pass
5220	15.0	30.7	17.0	16.1	17.0	0.041	3.6	4.0	6.8	Pass
5250	15.5	24.2	17.1	16.6	17.0	0.045	3.9	4.0	7.2	Pass

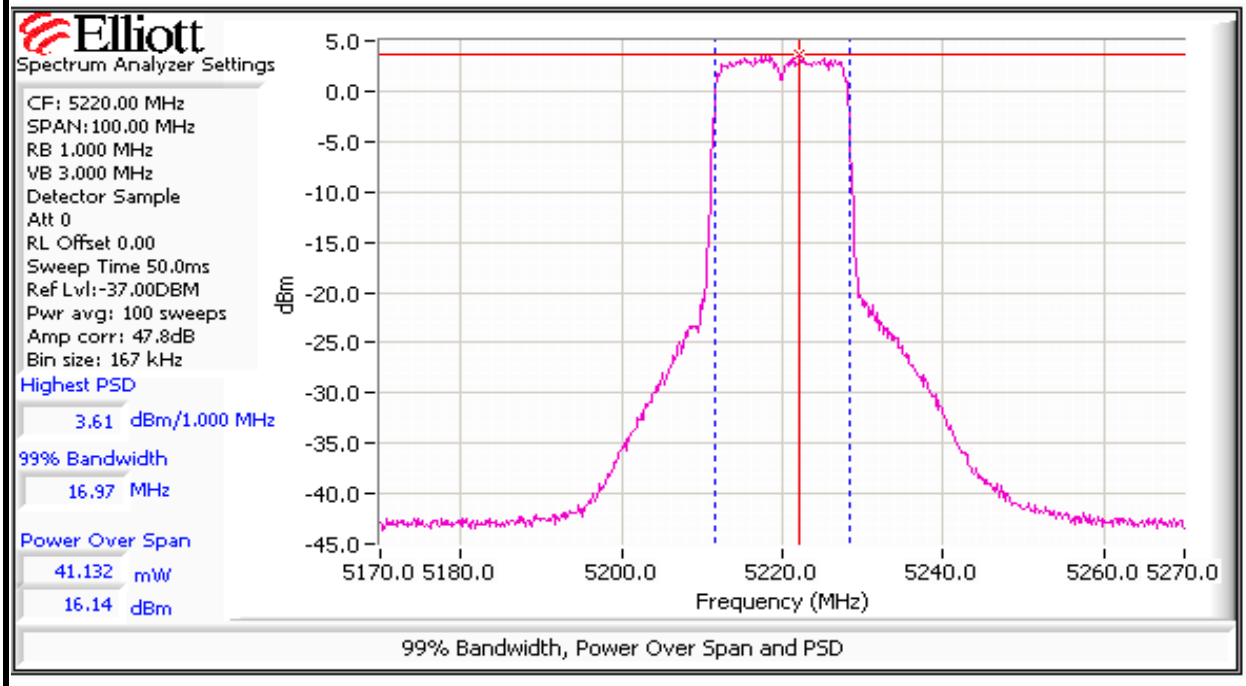
Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 100 MHz.
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS210, the measured value of the PSD (see note 3) must not exceed the average value (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB

For SAR comparison	
Average Power	
dBm	W
14.5	0.028
14.0	0.025
14.0	0.025

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

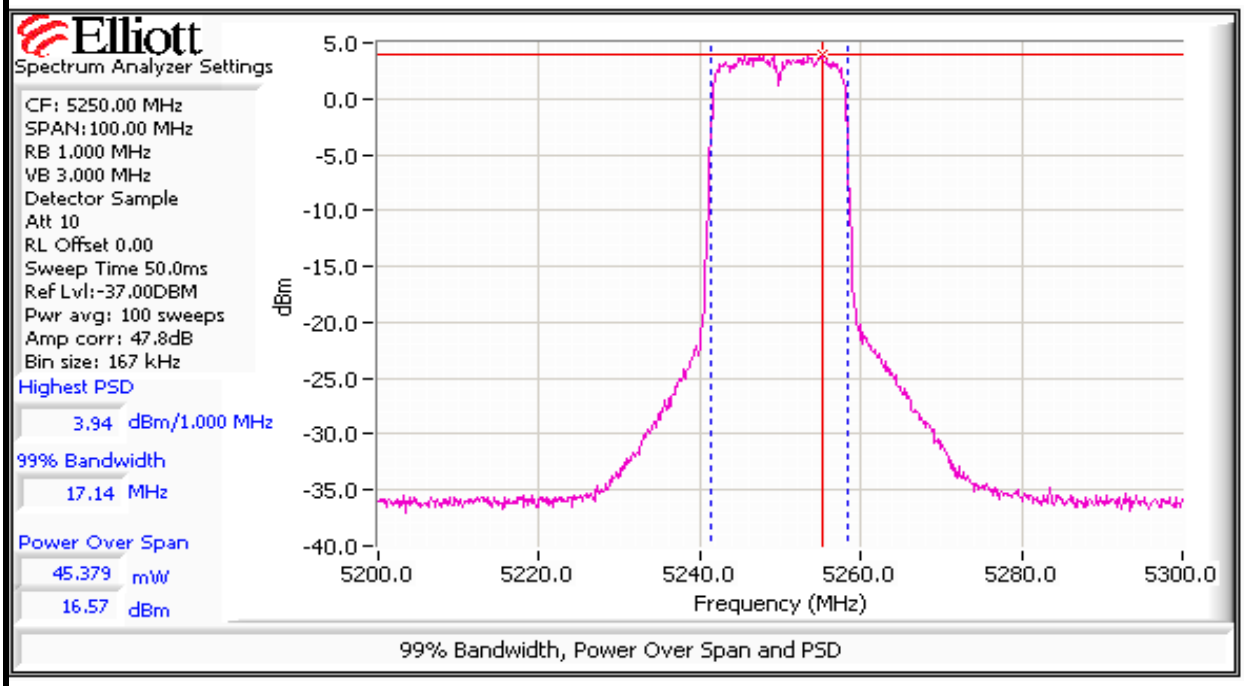


Power (5180 MHz)

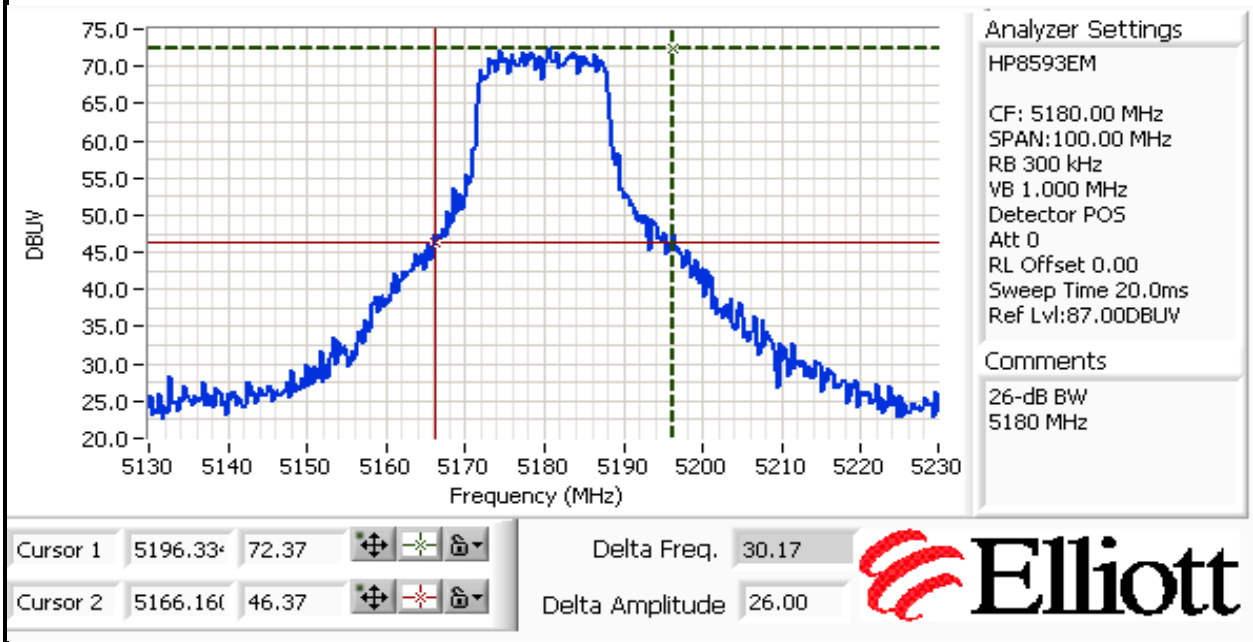


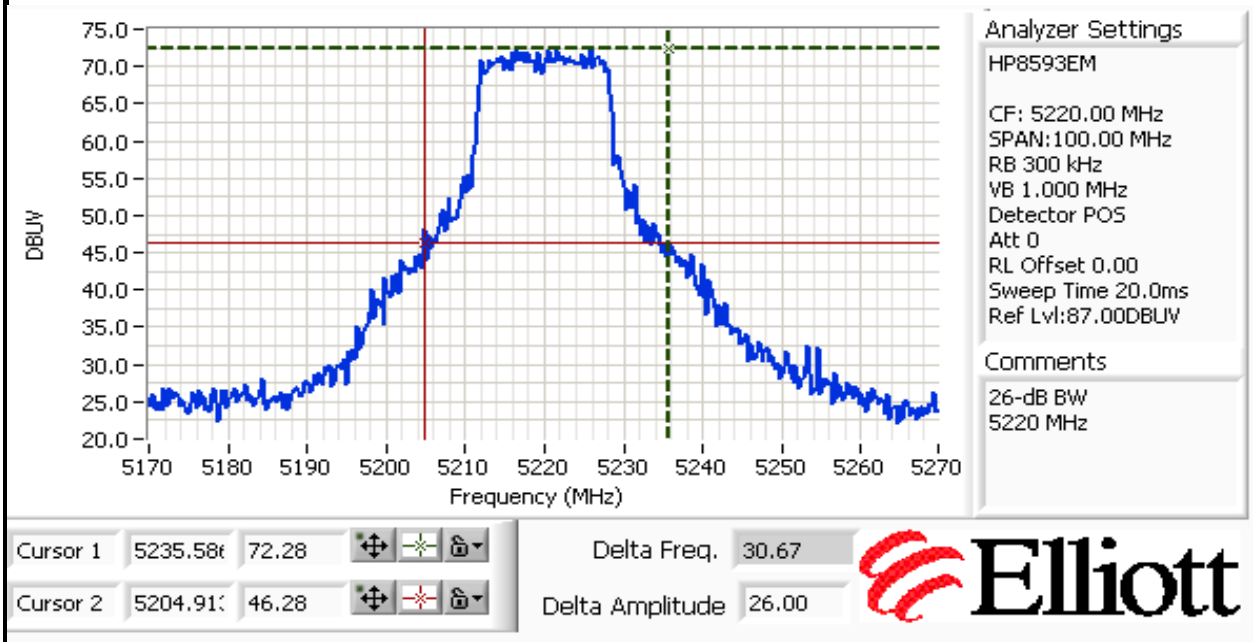
99% Bandwidth, Power Over Span and PSD

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

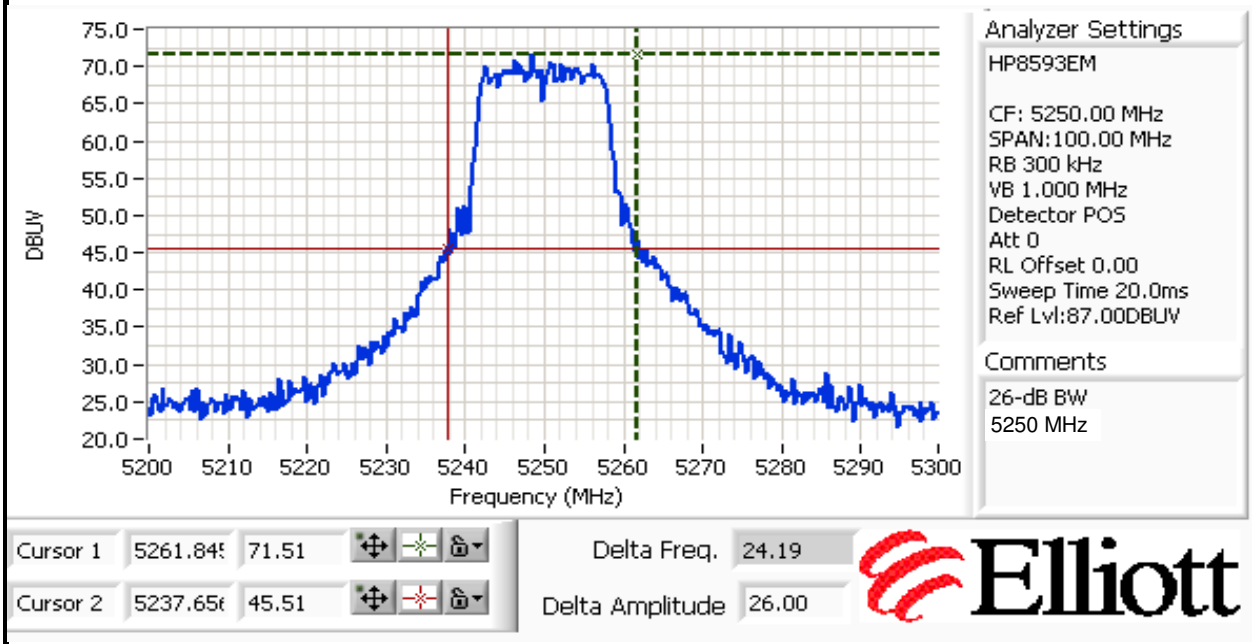


Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A





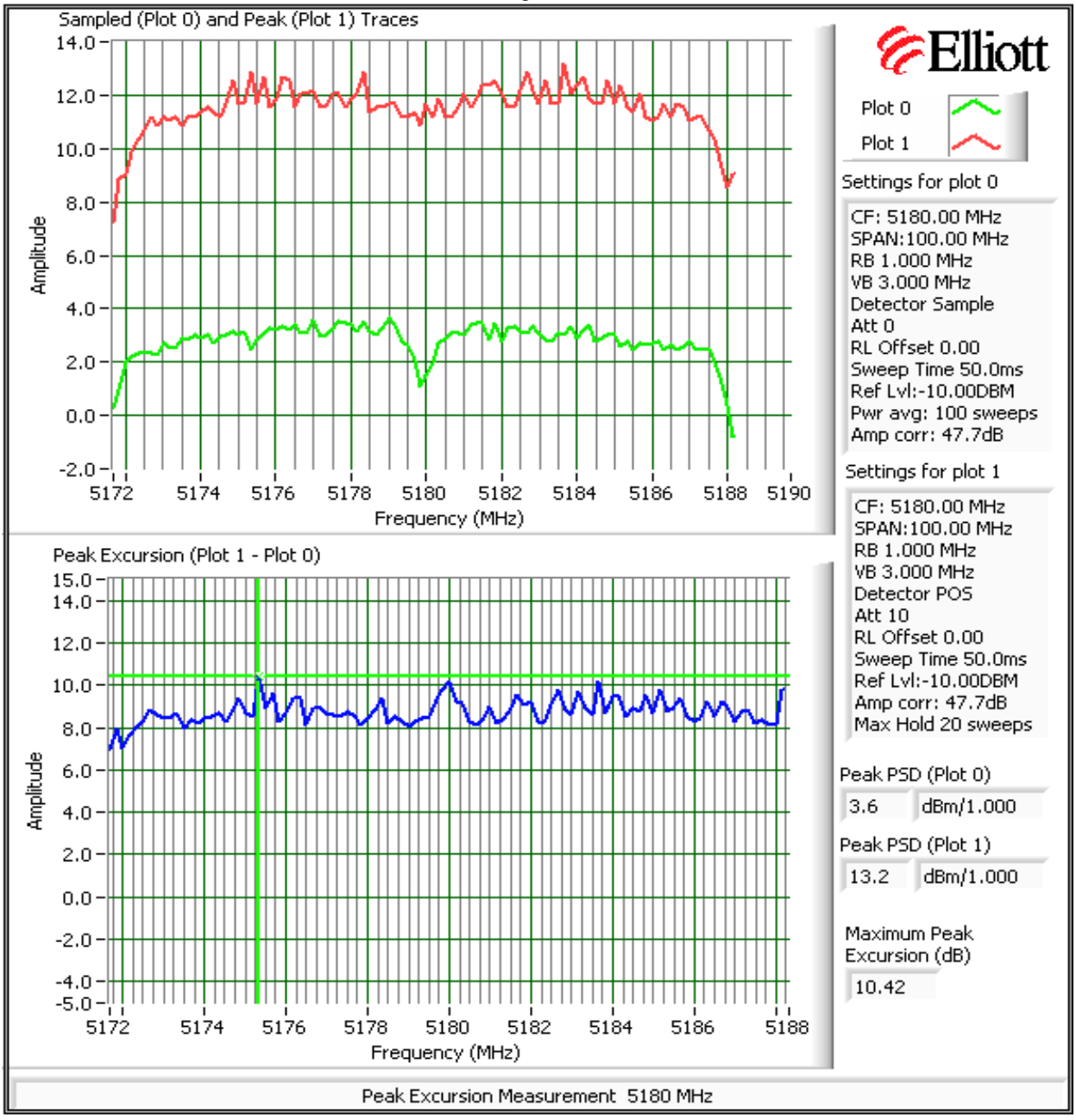
Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A



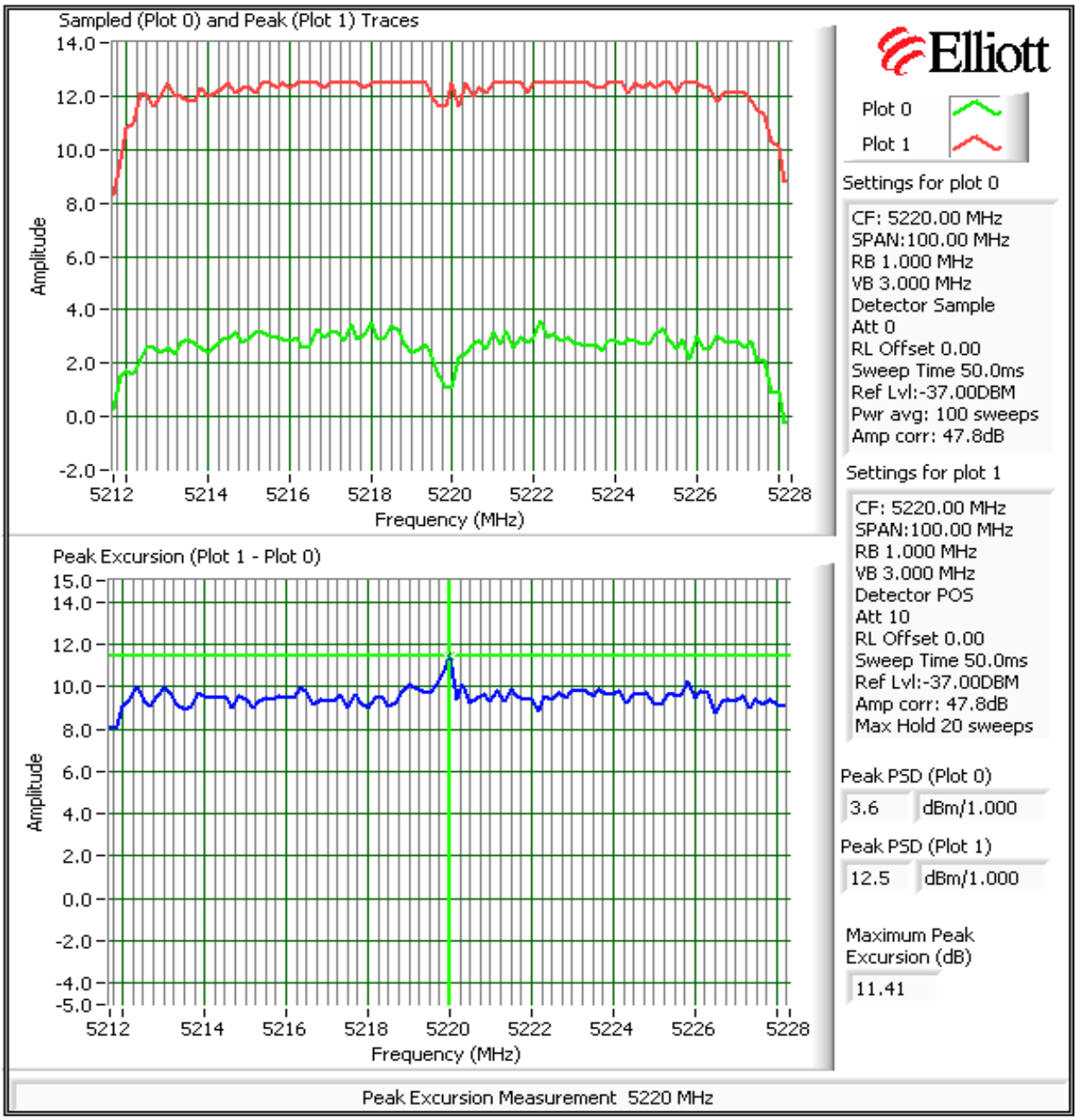
Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

Run #2: Peak Excursion Measurement

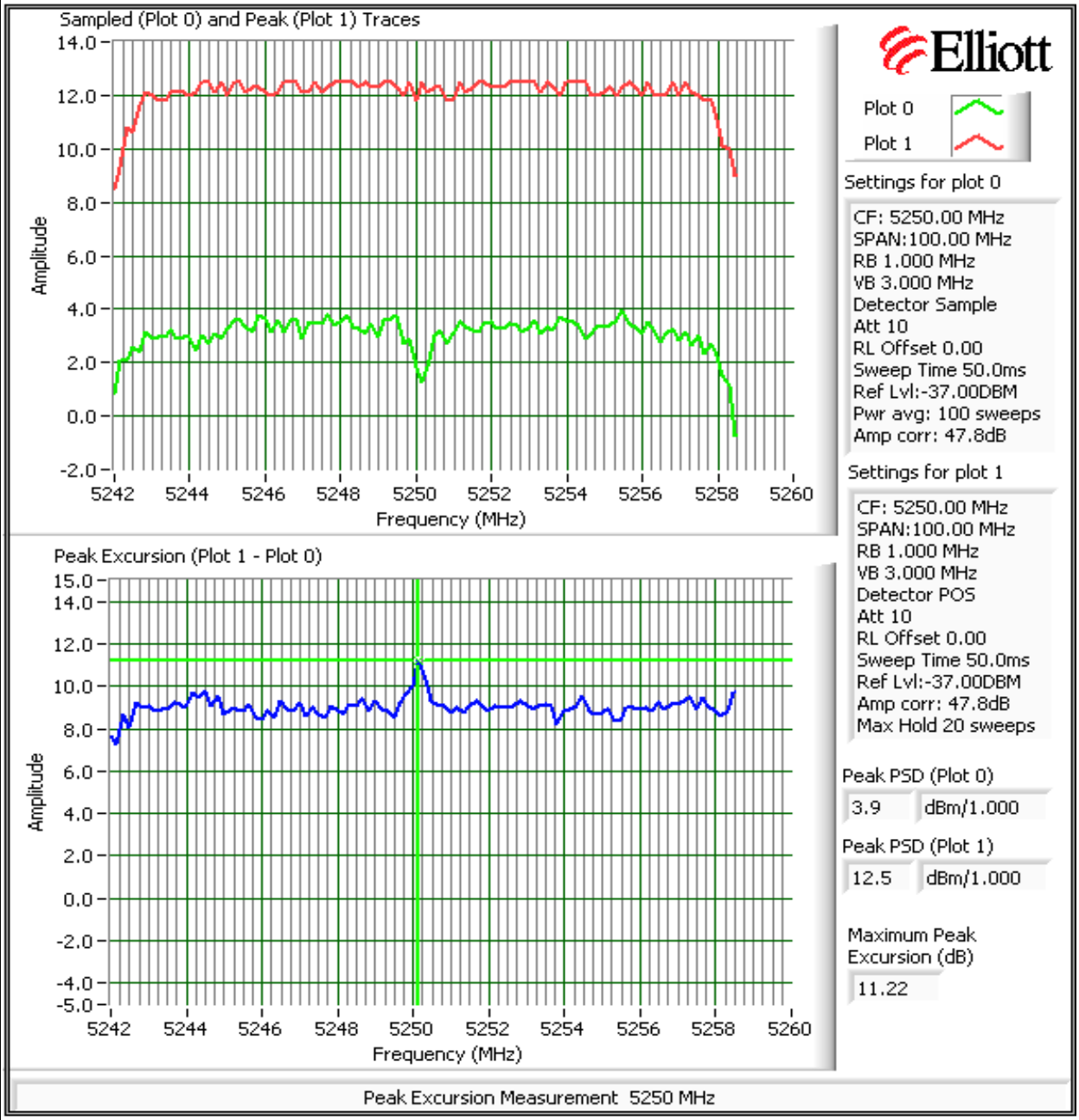
Plots Showing Peak Excursion



Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A



Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A



Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

Radiated Spurious Emissions (802.11a)

Test specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 8/15/2006
Test Engineer: Mehran Birgani
Test Location: SVOATS #2

Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 19 °C
Rel. Humidity: 58 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1 (802.11a Mode) 5150-5250 MHz	RE, 30 - 40000 MHz Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	53.8dBµV/m (489.8µV/m) @ 10439.2MHz (-0.2dB)
4 (802.11a Mode) 5725-5850 MHz	RE, 30 - 40000 MHz Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	53.7dBµV/m (484.2µV/m) @ 11492.0MHz (-0.3dB)

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 40000 MHz. Operating Mode: 802.11a (5150-5250 MHz)

Run #1a: Low Channel @ 5180 MHz with power setting of 17

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5181.730	94.1	H	-	-	AVG	207	1.8	Flat, RB = 1MHz, VB = 10Hz
5181.730	102.2	H	-	-	PK	207	1.8	Flat, RB = VB = 1MHz
5173.870	88.2	V	-	-	AVG	80	1.0	Flat, RB = 1MHz, VB = 10Hz
5173.870	97.1	V	-	-	PK	80	1.0	Flat, RB = VB = 1MHz
5177.200	90.8	H	-	-	AVG	164	1.2	Upright, RB = 1MHz, VB = 10Hz
5177.200	99.5	H	-	-	PK	164	1.2	Upright, RB = VB = 1MHz
5181.900	93.6	V	-	-	AVG	283	1.4	Upright, RB = 1MHz, VB = 10Hz
5181.900	102.3	V	-	-	PK	283	1.4	Upright, RB = VB = 1MHz
5181.830	90.0	H	-	-	AVG	63	2.1	Side, RB = 1MHz, VB = 10Hz
5181.830	98.9	H	-	-	PK	63	2.1	Side, RB = VB = 1MHz
5181.600	89.8	V	-	-	AVG	201	1.1	Side, RB = 1MHz, VB = 10Hz
5181.600	98.2	V	-	-	PK	201	1.1	Side, RB = VB = 1MHz

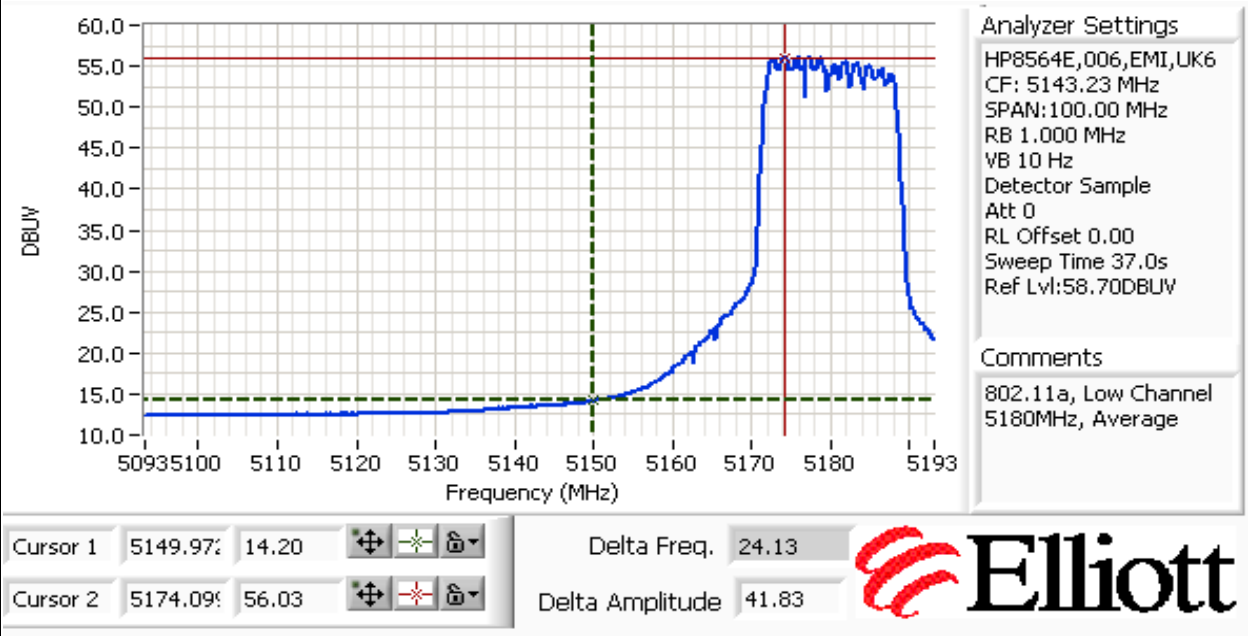
Band Edge Signal Field Strength

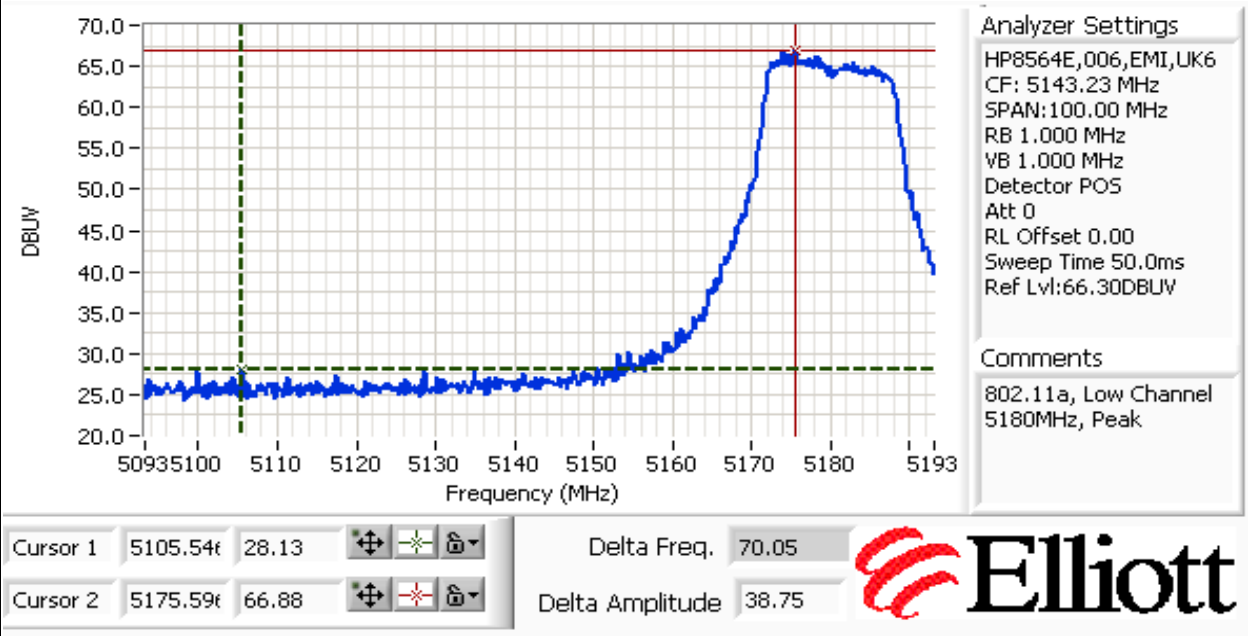
Delta Marker - Peak	38.8 dB	Delta between highest in-band and highest
Delta Marker - Average	41.8 dB	

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.970	52.3	H	54.0	-1.7	AVG	207	1.8	Flat, RB = 1MHz, VB = 10Hz
5105.540	63.4	H	74.0	-10.6	PK	207	1.8	Flat, RB = VB = 1MHz

Note 1:	Calculated by subtracting the marker delta values from the fundamental field strength measurements.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A





Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
10361.430	52.7	H	54.0	-1.3	AVG	189	1.3	Flat
10360.800	51.0	V	54.0	-3.0	AVG	187	1.3	Flat
10359.930	51.0	V	54.0	-3.0	AVG	282	1.0	Side
10361.030	49.1	H	54.0	-4.9	AVG	302	1.0	Side
10362.430	48.6	V	54.0	-5.4	AVG	341	1.0	Upright
10361.800	45.5	H	54.0	-8.5	AVG	323	1.2	Upright
10361.430	65.3	H	74.0	-8.7	PK	189	1.3	Flat
10359.930	63.4	V	74.0	-10.6	PK	282	1.0	Side
10360.800	62.9	V	74.0	-11.1	PK	187	1.3	Flat
10361.030	61.9	H	74.0	-12.1	PK	302	1.0	Side
10362.430	61.7	V	74.0	-12.3	PK	341	1.0	Upright
10361.800	57.9	H	74.0	-16.1	PK	323	1.2	Upright

Note 1:	All spurious and harmonics were measured and the worse case of 3 orientation of these that were above noise floor were recorded.

Run #1b: Middle Channel @ 5220 MHz with power setting of 15.0- re-tested on 8/01/2006 by JMM
Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
10439.210	53.8	H	54.0	-0.2	AVG	149	1.2	
10440.500	53.5	V	54.0	-0.5	AVG	131	1.3	
15668.030	48.9	H	54.0	-5.1	AVG	163	1.0	
10449.210	66.7	H	74.0	-7.3	PK	149	1.2	
10400.500	65.6	V	74.0	-8.4	PK	131	1.3	
15668.030	62.3	H	74.0	-11.7	PK	163	1.0	

Note 1:	All harmonics were measure, and worse case of 3 orientation of harmonics that were above noise floor were recorded.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

Run #1c: High Channel @ 5250 MHz with power setting of 15.5
Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
10499.0	53.7	H	54.0	-0.3	AVG	149	1.2	
15800.0	53.4	V	54.0	-0.6	AVG	131	1.3	
15719.0	48.7	H	54.0	-5.3	AVG	163	1.0	
10499.0	66.5	H	74.0	-7.5	PK	149	1.2	
15800.0	65.8	V	74.0	-8.2	PK	131	1.3	
15719.0	61.2	H	74.0	-12.8	PK	163	1.0	

Note 1:	All spurious and harmonics were measured and the worse case of 3 orientation of these that were above noise floor were recorded.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	N/A

Run #4: Radiated Spurious Emissions, 30 - 40000 MHz. Operating Mode: 802.11a (5725-5850 MHz)

Run #1a: Low Channel @ 5745 MHz with power setting of 12

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
11492.000	53.7	H	54.0	-0.3	AVG	356	1.0	Side
11489.700	46.3	V	54.0	-7.7	AVG	0	1.3	Side
11492.000	65.8	H	74.0	-8.2	PK	356	1.0	Side
11489.700	58.5	V	74.0	-15.5	PK	0	1.3	Side

Note 1:	All spurious and harmonics were measured and the worse case of 3 orientation of these that were above noise floor were recorded.

Run #1b: Center Channel @ 5785 MHz with power setting of 12

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
11569.600	52.9	H	54.0	-1.1	AVG	359	1.1	Side
11569.870	50.5	V	54.0	-3.5	AVG	297	2.2	Side
11569.600	64.5	H	74.0	-9.5	PK	359	1.1	Side
11569.870	61.6	V	74.0	-12.4	PK	297	2.2	Side

Note 1:	All spurious and harmonics were measured and the worse case of 3 orientation of these that were above noise floor were recorded.

Run #1c: High Channel @ 5825 MHz with power setting of 11

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
11650.130	53.5	H	54.0	-0.5	AVG	263	1.8	Side
11650.130	67.7	H	74.0	-6.3	PK	263	1.8	Side
11652.470	51.4	V	54.0	-2.6	AVG	314	1.2	Side
11652.470	63.1	V	74.0	-10.9	PK	314	1.2	Side

Note 1:	All spurious and harmonics were measured and the worse case of 3 orientation of these that were above noise floor were recorded.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

RSS 210 and FCC 15.247 Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 9/1/2006
Test Engineer: Mehran Birgani
Test Location: SVOATS #2
Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT was located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 54 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1 (802.11b Mode)	RE, 30 - 7500 MHz Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	33.2dBµV/m (45.7µV/m) @ 3256.5MHz (-20.8dB)
2 (802.11g Mode)	RE, 30 - 7500 MHz Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	32.7dBµV/m (43.2µV/m) @ 3256.5MHz (-21.3dB)
3 (802.11a Mode) 5150 - 5250MHz	RE, 30 - 18000 MHz Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	39.9dBµV/m (98.9µV/m) @ 3498.0MHz (-14.1dB)
4 (802.11a Mode) 5725 - 5850MHz	RE, 30 - 18000 MHz Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	46.0dBµV/m (199.5µV/m) @ 3854.5MHz (-8.0dB)

Modifications Made During Testing:

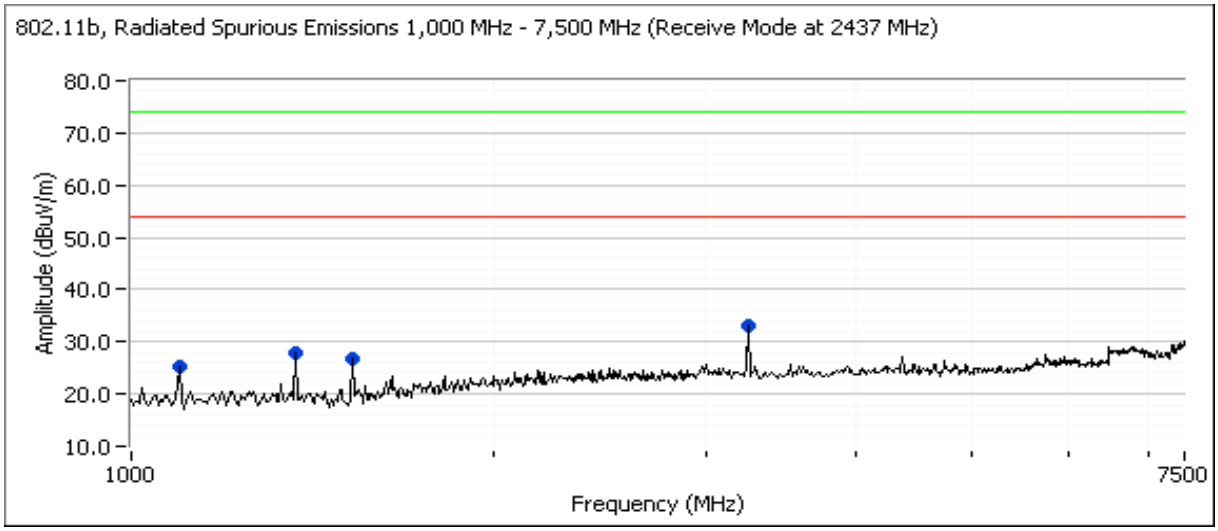
No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

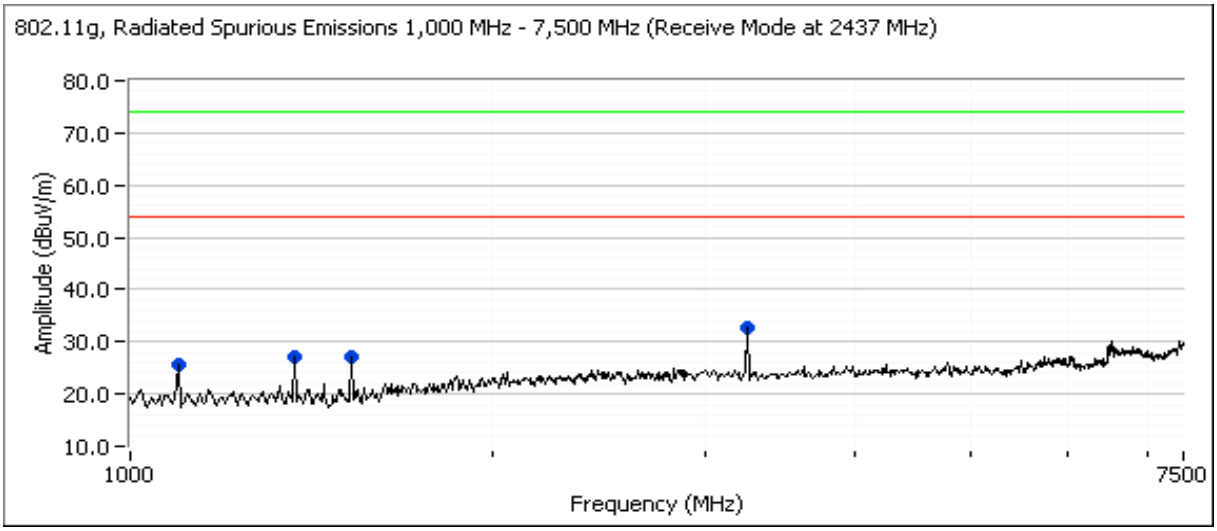
Run #1: Radiated Spurious Emissions, 30 - 7,500 MHz. Operating Mode: 802.11b @ 2437 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3256.500	33.2	V	54.0	-20.8	Peak	236	1.7	
1370.500	27.9	H	54.0	-26.1	Peak	195	1.7	
1527.250	26.8	H	54.0	-27.2	Peak	186	1.7	
1095.000	25.1	V	54.0	-28.9	Peak	28	1.7	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

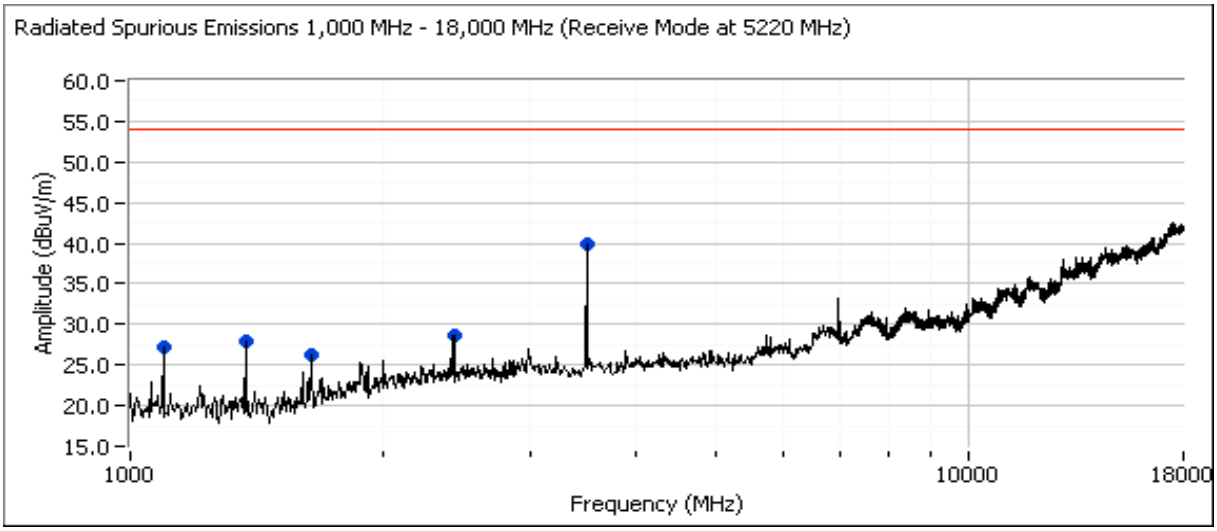
Run #2: Radiated Spurious Emissions, 30 - 7,500 MHz. Operating Mode: 802.11g @ 2437 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3256.500	32.7	H	54.0	-21.3	Peak	244	1.7	
1370.500	27.9	H	54.0	-26.1	Peak	195	1.7	
1527.250	26.8	H	54.0	-27.2	Peak	186	1.7	
1095.000	25.1	V	54.0	-28.9	Peak	28	1.7	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

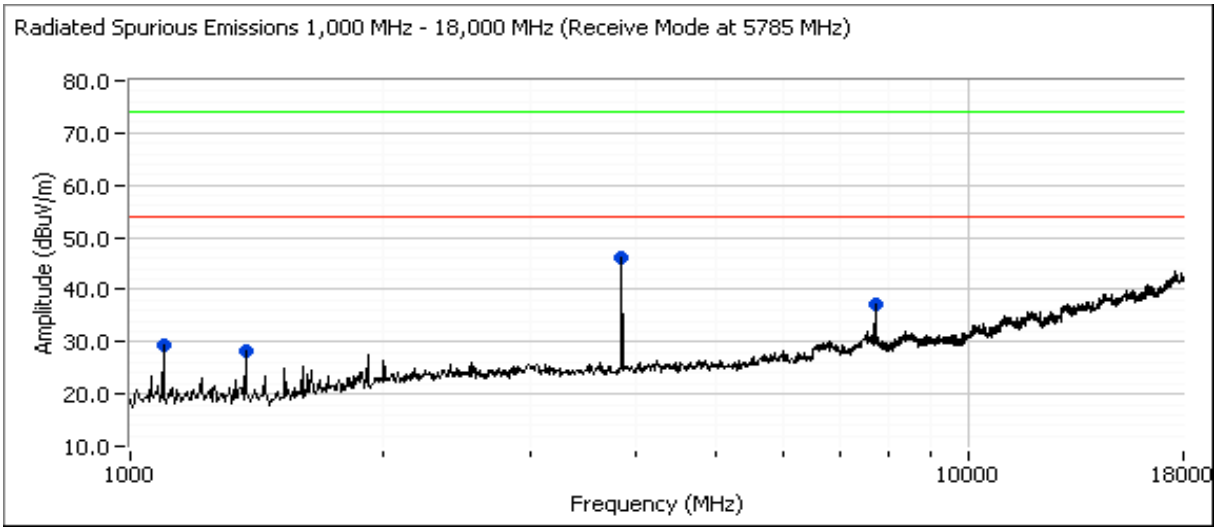
Run #3: Radiated Spurious Emissions, 30 - 18,000 MHz. Operating Mode: 802.11a @ 5220 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3498.000	39.9	V	54.0	-14.1	Peak	268	1.7	
2429.750	28.7	H	54.0	-25.3	Peak	73	1.7	
1370.500	28.0	H	54.0	-26.0	Peak	193	1.7	
1095.000	27.3	V	54.0	-26.7	Peak	277	1.7	
1641.250	26.3	V	54.0	-27.7	Peak	267	1.7	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Run #4: Radiated Spurious Emissions, 30 - 18,000 MHz. Operating Mode: 802.11a @ 5785 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3854.500	46.0	H	54.0	-8.0	Peak	188	1.7	
3854.500	46.0	H	54.0	-8.0	Peak	188	1.7	
7718.750	37.1	H	54.0	-16.9	Peak	260	1.7	
1095.000	29.4	H	54.0	-24.6	Peak	214	1.7	
1370.500	28.1	H	54.0	-25.9	Peak	166	1.7	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Conducted Emissions - Power Ports

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/7/2006 14:51
Test Engineer: Juan Martinez
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment.

A pre-liminary scan was peformed for Tx and Rx mode. It was determined scans that Tx mode was the worst case.

Ambient Conditions:

Temperature: 21.3 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 120V/60Hz	EN 55022 Class B	Pass	52.5dBµV @ 0.876MHz (-3.5dB)

Modifications Made During Testing:

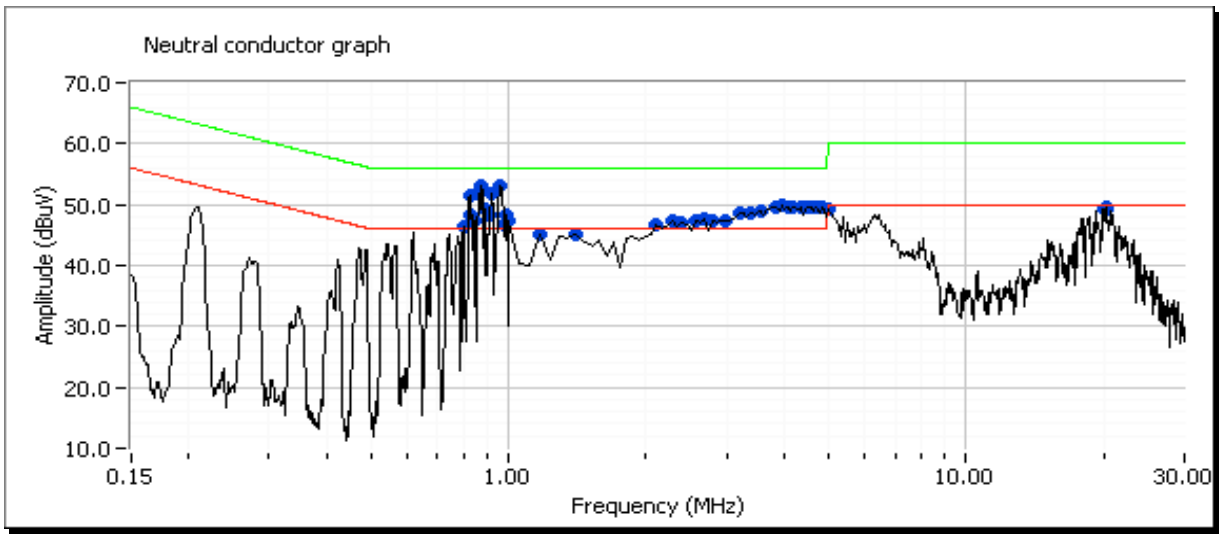
Modifications are detailed under each run description.

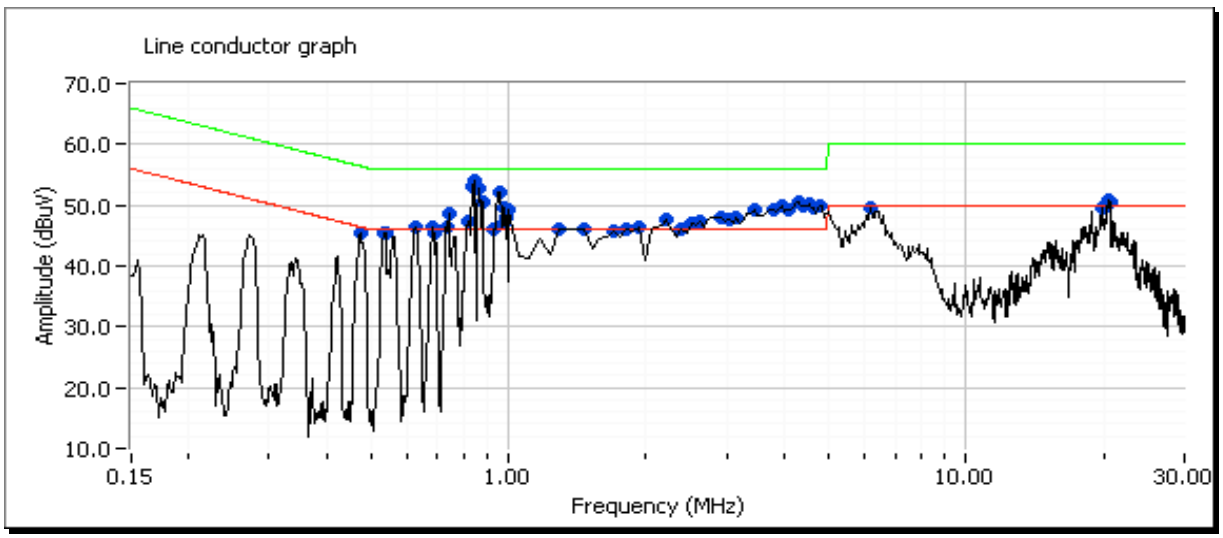
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Model 02





Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Model 02

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.909	51.9	neutral	56.0	-4.2	QP	
0.889	51.7	neutral	56.0	-4.3	QP	
0.875	51.1	neutral	56.0	-4.9	QP	
0.863	50.6	neutral	56.0	-5.4	QP	
0.841	50.3	neutral	56.0	-5.7	QP	
0.979	50.2	neutral	56.0	-5.8	QP	
0.961	49.8	neutral	56.0	-6.2	QP	
0.830	49.6	neutral	56.0	-6.4	QP	
0.823	49.6	neutral	56.0	-6.4	QP	
0.799	48.5	neutral	56.0	-7.5	QP	
0.991	47.7	neutral	56.0	-8.3	QP	
0.921	46.6	neutral	56.0	-9.4	QP	
0.889	35.2	neutral	46.0	-10.8	Average	
0.875	35.0	neutral	46.0	-11.0	Average	
0.830	34.6	neutral	46.0	-11.4	Average	
0.863	34.3	neutral	46.0	-11.7	Average	
0.823	34.1	neutral	46.0	-11.9	Average	
0.909	34.1	neutral	46.0	-11.9	Average	
0.841	34.0	neutral	46.0	-12.0	Average	
0.799	32.8	neutral	46.0	-13.2	Average	
0.979	30.6	neutral	46.0	-15.4	Average	
0.961	30.5	neutral	46.0	-15.5	Average	
0.991	28.1	neutral	46.0	-17.9	Average	
0.921	27.3	neutral	46.0	-18.7	Average	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Model 02

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.999	47.9	neutral	56.0	-8.1	QP	
4.503	46.7	neutral	56.0	-9.3	QP	
4.226	46.7	neutral	56.0	-9.3	QP	
4.566	46.5	neutral	56.0	-9.5	QP	
4.362	46.5	neutral	56.0	-9.6	QP	
4.711	46.3	neutral	56.0	-9.7	QP	
4.100	46.1	neutral	56.0	-9.9	QP	
3.870	46.0	neutral	56.0	-10.0	QP	
3.925	46.0	neutral	56.0	-10.0	QP	
3.434	45.6	neutral	56.0	-10.4	QP	
3.590	45.6	neutral	56.0	-10.4	QP	
4.815	45.4	neutral	56.0	-10.6	QP	
2.957	45.3	neutral	56.0	-10.7	QP	
3.232	44.9	neutral	56.0	-11.1	QP	
2.577	44.7	neutral	56.0	-11.3	QP	
2.252	44.4	neutral	56.0	-11.6	QP	
2.667	44.3	neutral	56.0	-11.7	QP	
4.711	32.0	neutral	46.0	-14.0	Average	
4.503	31.6	neutral	46.0	-14.5	Average	
4.226	31.3	neutral	46.0	-14.7	Average	
4.566	31.2	neutral	46.0	-14.8	Average	
4.362	30.6	neutral	46.0	-15.4	Average	
4.100	30.5	neutral	46.0	-15.5	Average	
3.590	30.5	neutral	46.0	-15.6	Average	
3.434	30.2	neutral	46.0	-15.8	Average	
3.232	30.2	neutral	46.0	-15.9	Average	
3.870	29.7	neutral	46.0	-16.3	Average	
3.925	29.5	neutral	46.0	-16.5	Average	
4.815	29.3	neutral	46.0	-16.7	Average	
2.577	29.1	neutral	46.0	-16.9	Average	
2.252	29.1	neutral	46.0	-17.0	Average	
0.999	28.7	neutral	46.0	-17.3	Average	
2.667	28.7	neutral	46.0	-17.3	Average	
2.957	28.6	neutral	46.0	-17.4	Average	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Model 02

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.876	52.5	Line 1	56.0	-3.5	QP	
0.863	51.8	Line 1	56.0	-4.2	QP	
0.931	51.8	Line 1	56.0	-4.3	QP	
0.957	51.7	Line 1	56.0	-4.3	QP	
0.843	51.3	Line 1	56.0	-4.7	QP	
0.833	51.2	Line 1	56.0	-4.8	QP	
0.981	50.9	Line 1	56.0	-5.1	QP	
0.819	50.7	Line 1	56.0	-5.3	QP	
0.975	50.7	Line 1	56.0	-5.3	QP	
0.741	47.0	Line 1	56.0	-9.0	QP	
0.732	46.5	Line 1	56.0	-9.5	QP	
0.876	36.3	Line 1	46.0	-9.7	Average	
0.833	35.8	Line 1	46.0	-10.2	Average	
0.538	45.8	Line 1	56.0	-10.2	QP	
0.534	45.7	Line 1	56.0	-10.3	QP	
0.628	45.7	Line 1	56.0	-10.3	QP	
0.819	35.7	Line 1	46.0	-10.3	Average	
0.863	35.2	Line 1	46.0	-10.8	Average	
0.682	45.0	Line 1	56.0	-11.0	QP	
0.686	44.9	Line 1	56.0	-11.1	QP	
0.475	44.7	Line 1	56.4	-11.7	QP	
0.931	34.2	Line 1	46.0	-11.8	Average	
0.957	33.8	Line 1	46.0	-12.2	Average	
0.538	33.8	Line 1	46.0	-12.2	Average	
0.475	33.9	Line 1	46.4	-12.5	Average	
0.843	33.2	Line 1	46.0	-12.8	Average	
0.741	33.2	Line 1	46.0	-12.8	Average	
0.534	32.9	Line 1	46.0	-13.1	Average	
0.732	32.3	Line 1	46.0	-13.7	Average	
0.628	31.8	Line 1	46.0	-14.2	Average	
0.975	31.7	Line 1	46.0	-14.3	Average	
0.981	31.6	Line 1	46.0	-14.5	Average	
0.686	31.4	Line 1	46.0	-14.7	Average	
0.682	30.3	Line 1	46.0	-15.7	Average	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
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Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Model 02

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.998	49.2	Line 1	56.0	-6.8	QP	
4.424	46.6	Line 1	56.0	-9.4	QP	
4.566	46.5	Line 1	56.0	-9.5	QP	
3.943	46.3	Line 1	56.0	-9.7	QP	
4.773	46.2	Line 1	56.0	-9.8	QP	
4.282	46.2	Line 1	56.0	-9.8	QP	
4.070	46.2	Line 1	56.0	-9.8	QP	
3.792	46.1	Line 1	56.0	-9.9	QP	
4.651	46.0	Line 1	56.0	-10.0	QP	
3.451	45.7	Line 1	56.0	-10.3	QP	
3.017	44.9	Line 1	56.0	-11.1	QP	
3.175	44.8	Line 1	56.0	-11.2	QP	
2.600	44.8	Line 1	56.0	-11.3	QP	
2.910	44.6	Line 1	56.0	-11.4	QP	
2.528	44.5	Line 1	56.0	-11.5	QP	
2.244	44.2	Line 1	56.0	-11.8	QP	
20.514	36.9	Line 1	50.0	-13.1	Average	
4.773	32.1	Line 1	46.0	-13.9	Average	
4.566	32.1	Line 1	46.0	-13.9	Average	
20.514	45.9	Line 1	60.0	-14.1	QP	
3.943	31.4	Line 1	46.0	-14.6	Average	
4.424	31.4	Line 1	46.0	-14.6	Average	
4.651	31.3	Line 1	46.0	-14.7	Average	
3.451	30.6	Line 1	46.0	-15.4	Average	
3.792	30.6	Line 1	46.0	-15.4	Average	
4.070	30.5	Line 1	46.0	-15.5	Average	
4.282	29.9	Line 1	46.0	-16.1	Average	
0.998	29.9	Line 1	46.0	-16.1	Average	
2.600	29.6	Line 1	46.0	-16.4	Average	
2.910	29.6	Line 1	46.0	-16.4	Average	
2.528	29.0	Line 1	46.0	-17.0	Average	
2.244	28.8	Line 1	46.0	-17.2	Average	
3.017	28.6	Line 1	46.0	-17.4	Average	
3.175	28.6	Line 1	46.0	-17.4	Average	

Client:	OQO	Job Number:	J62637
Model:	Model 02	T-Log Number:	T64964
		Account Manager:	Susan Pelzl
Contact:	Bob Hymes		
Standard:	FCC 15.247 & RSS-210	Class:	Radio

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Model 02

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
1.409	44.3	Line 1	56.0	-11.7	QP	
1.826	44.2	Line 1	56.0	-11.8	QP	
2.385	44.1	Line 1	56.0	-12.0	QP	
20.366	37.9	Line 1	50.0	-12.1	Average	
1.283	43.7	Line 1	56.0	-12.3	QP	
1.658	43.5	Line 1	56.0	-12.6	QP	
1.902	43.4	Line 1	56.0	-12.6	QP	
20.722	36.7	Line 1	50.0	-13.3	Average	
20.366	46.2	Line 1	60.0	-13.9	QP	
20.722	45.9	Line 1	60.0	-14.2	QP	
6.199	44.9	Line 1	60.0	-15.1	QP	
2.385	28.9	Line 1	46.0	-17.1	Average	
6.199	32.5	Line 1	50.0	-17.5	Average	
1.826	28.1	Line 1	46.0	-17.9	Average	
1.658	28.0	Line 1	46.0	-18.0	Average	
1.409	27.7	Line 1	46.0	-18.3	Average	
1.902	26.3	Line 1	46.0	-19.7	Average	
1.283	23.1	Line 1	46.0	-22.9	Average	

EXHIBIT 3: Photographs of Test Configurations

Pages

EXHIBIT 4: Proposed FCC ID Label & Label Location

EXHIBIT 5: Detailed Photographs of OQO Model Model 02Construction

Pages

EXHIBIT 6: Operator's Manual for OQO Model Model 02

Pages

EXHIBIT 7: Block Diagram of OQO Model Model 02

Pages

EXHIBIT 8: Schematic Diagrams for OQO Model Model 02

Pages

EXHIBIT 9: Theory of Operation for OQO Model Model 02

Pages

EXHIBIT 10: RF Exposure Information

Pages