TEST REPORT

Report No.: HK11011230-1

Logitech Inc.

Application
For
Certification
(Original Grant)
(FCC ID: DZLS00113)

Transceiver

Prepared and Checked by:

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Approved by:

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Location: Intertek Testing Services Hong Kong Ltd.

Chan Chi Hung, Terry
Assistant Supervisor
Date: March 25, 2011

GENERAL INFORMATION

Logitech Inc.
BRAND NAME: Logitech, MODEL: S-00113

FCC ID: DZLS00113

Grantee:	Logitech Inc.
Grantee Address:	6505 Kaiser Drive, Fremont, California 94555, USA.
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Manufacturer:	Shenzhen Synchron Electronics Co., Ltd.
Manufacturer Address:	No. 9 Mei Li Road, Xia Mei Lin, Fu Tian Area, Shenzhen, China.
Brand Name:	Logitech
Model:	S-00113
Type of EUT:	Transceiver
Description of EUT:	WRLS SPKR ADAPTER, BT
Serial Number:	N/A
FCC ID:	DZLS00113
Date of Sample Submitted:	January 28, 2011
Date of Test:	February 02 to March 15, 2011
Report No.:	HK11011230-1
Report Date:	March 25, 2011
Environmental Conidtions:	Temperature: +10 to 40°C Humidity: 10 to 90%

SUMMARY OF TEST RESULT

Logitech Inc.
BRAND NAME: Logitech, MODEL: S-00113

FCC ID: DZLS00113

TEST SPECIFICATION	REFERENCE	RESULTS
Maximum Peak Output Power	15.247(b)	Pass
20 dB Bandwidth	15.247(a)	Pass
Number of Hopping Frequencies	15.247(a)	Pass
Channel Separation	15.247(a)	Pass
Average Channel Occupancy Time	15.247(a)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Radiated Spurious Emissions	15.247(d)	Pass
Transmitter Power Line Conducted Emissions	15.207	Pass
Antenna Requirement	15.203	Pass (See Note 1)
Digital Device Radiated Emission	15.109	Pass
Digital Device Conducted Emission	15.107	Pass

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Table of Contents

1.0 General Description

1.1 Product Description

The product S-001133 is a Bluetooth audio converter operating at 2402MHz to 2480MHz powered by an AC/DC adaptor. There is one synchronize button on the device. When it is synchronized with a Bluetooth audio device wirelessly, it delivers analog audio through its 2 audio outputs: The RCA audio output and the headphone output.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All radiated measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been placed on file with the FCC.

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

The device was powered by AC/DC adaptor (Model: EFS00500501000UL, Input: 120VAC 60Hz, Output: 5.0VDC 1.0A).

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the devices. Once the unit enters test mode, it transmits the RF Signal continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Equipment Modification

Any modifications installed previous to testing by Logitech Inc. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services Hong Kong Ltd.

2.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

1. 1 x 1m RCA audio cable with termination (Provided by Intertek)
2. 1 x 1m headphone audio cable with termination (Provided by Intertek)

3.0 Emission Results

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

RR = 18.0 dBµV
LF = 9.0 dB

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 4804.000MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 19.0 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.393 MHz

For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conducted photos.pdf.

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgment: Passed by 7.51 dB

4.0 **Measurement Results**

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(1):

The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). Maximum antenna gain for this transmitter is 0 dBi.

Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2402	0.51	1.115
Middle Channel:	2441	-0.02	0.993
High Channel:	2480	0.26	1.064

EUT dBm max. output level = 0.51 dBm (Limit: ≤ 30 dBm)

For RF Safety, the information is saved with filename: RF exposure.pdf.

4.2 Hopping Channel 20dB RF Bandwidth, FCC Rule 15.247(a)(1)(i):

Setting:
- Hopping function turned off
- Span = ~ 2 to 3 times the 20dB bandwidth, centred on a hopping channel
- RBW >= 1% of 20dB bandwidth, VBW >= RBW
- Repeat the test with different mode of operation (e.g. maximum data rate, modulation formats etc)

Frequency (MHz)		20 dB Bandwidth (kHz)
Lowest Channel:	2402	840
Middle Channel:	2441	840
Highest Channel:	2480	840

Limit: N/A

Refer to the following plots for 20 dB bandwidth sharp:
Plot B2A: Low Channel 20dB RF Bandwidth
Plot B2B: Middle Channel 20dB RF Bandwidth
Plot B2C: High Channel 20dB RF Bandwidth

For electronic filing, the above plots are saved with filename: 20dB.pdf

4.3 Minimum Number of Hopping Frequencies, FCC Rule 15.247(a)(1)(i):

Setting:
• Hopping function enabled
• Span = frequency band of operation
• RBW >= 1% of the span, VBW >= RBW
• It may be necessary to break the span into sections, in order to show all of the hopping frequencies:

Mode of operation	No. of hopping channels
Normal operation mode	79

Limit: Number of hopping channels ≥ 15

For electronic filing, the above plots are saved with filename: chno.pdf

4.4 Minimum Hopping Channel Carrier Frequency Separation, FCC Rule 15.247(a)(1):

Setting:
• Hopping function enabled
• Span = wide enough to capture the peaks of two adjacent channels
• RBW >= 1% of the span, VBW >= RBW

Channel Separation	(KHz)
Channel 39 and Channel 40	1000

Limit: ≥ 2/3 20dB bandwidth of hopping channel = 560KHz

For electronic filing, the above plots are saved with filename: fsepa.pdf

4.5 Average Channel Occupancy Time, FCC Ref.: 15.247(a)(1)(iii):

The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 2ms for transmitter unit, the SPAN was set to ZERO SPAN, and the TRIGGER was set to VIDEO. The time duration of the transmission so captured was measured with the MARKER DELTA function.

The SWEEP was then set to the time required by the regulation (0.4 seconds × Number of hopping channels employed" seconds for 2400-2483.5MHz). The analyzer was set to SINGLE SWEEP, the total ON time was added and compared against the limit (0.4 seconds).

Transmitter Unit (Worst-case: Operation)
Average occupancy time in the period of 31.6s = 0.625 ms x 5 x 106.6 = 0.334 s

Limit: ≤ 0.4 seconds

4.6 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

Plot B6A.1 – B6A.2: Lowest Channel Emissions
Plot B6B.1 – B6B.2: Middle Channel Emissions
Plot B6C.1 – B6C.2: Highest Channel Emissions
Plot B6D.1 – B6D.2: Modulation Products Emission at bandedges

The plots showed all spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

For electronic filing, the above plots are saved with filenames: obantcon.pdf.

4.7 Out of Band Radiated Emissions, FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Not required, since all emissions are more than 20 dB below fundamental.

4.8 General radiated emission limit for spurious emissions at bandedge and within restricted band, FCC Rule 15.257(d):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The following data list the significant emission frequencies, the limit and the margin of compliance.

Frequency (MHz)	OATS radiated field strength at carrier frequency measured at 3m (dBµV/m)		Attenuation (dBc)	Calculated radiated field strength at the bandage (dBµV/m)	
	Peak	Average		Peak	Average
2483.5	101.4	71.3	49.73	51.67	21.57

Limit:
The average radiated field strength at bandedge should be smaller that 54 dBµV/m and the peak radiated field strength at bandedge should be smaller that 74 dBµV/m.

4.9 Radiated Spurious Emissions

Applicant: Logitech Inc. Date of Test: March 10, 2011
Model: S-00113
Worst-Case Operating Mode: Transmitting

Table 1

Radiated Emissions

Channel 00

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2402.000	105.4	33	29.4	101.8	30.1	71.7	--	--
V	4804.000	53.1	33	34.9	55.0	30.1	24.9	54.0	-29.1
V	7206.000	45.5	33	37.9	50.4	30.1	20.3	54.0	-33.7
V	9608.000	44.0	33	40.4	51.4	30.1	21.3	54.0	-32.7
V	12010.000	45.3	33	40.5	52.8	30.1	22.7	54.0	-31.3
V	14412.000	46.0	33	40.0	53.0	30.1	22.9	54.0	-31.1

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2402.000	105.4	33	29.4	101.8	--	--
V	4804.000	53.1	33	34.9	55.0	74.0	-19.0
V	7206.000	45.5	33	37.9	50.4	74.0	-23.6
V	9608.000	44.0	33	40.4	51.4	74.0	-22.6
V	12010.000	45.3	33	40.5	52.8	74.0	-21.2
V	14412.000	46.0	33	40.0	53.0	74.0	-21.0

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

Applicant: Logitech Inc. Date of Test: March 10, 2011
Model: S-00113
Worst-Case Operating Mode: Transmitting

Table 2

Radiated Emissions

Channel 39

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2441.000	105.6	33	29.4	102.0	30.1	71.9	–	--
V	4882.000	52.7	33	34.9	54.6	30.1	24.5	54.0	-29.5
V	7323.000	45.9	33	37.9	50.8	30.1	20.7	54.0	-33.3
V	9764.000	44.2	33	40.4	51.6	30.1	21.5	54.0	-32.5
V	12205.000	45.4	33	40.5	52.9	30.1	22.8	54.0	-31.2
V	14646.000	47.6	33	38.4	53.0	30.1	22.9	54.0	-31.1

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2441.000	105.6	33	29.4	102.0	–	--
V	4882.000	52.7	33	34.9	54.6	74.0	-19.4
V	7323.000	45.9	33	37.9	50.8	74.0	-23.2
V	9764.000	44.2	33	40.4	51.6	74.0	-22.4
V	12205.000	45.4	33	40.5	52.9	74.0	-21.1
V	14646.000	47.6	33	38.4	53.0	74.0	-21.0

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

Applicant: Logitech Inc. Date of Test: March 10, 2011
Model: S-00113
Worst-Case Operating Mode: Transmitting

Table 3

Radiated Emissions

Channel 78

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2480.000	105.0	33	29.4	101.4	30.1	71.3	--	--
V	4960.000	52.9	33	34.9	54.8	30.1	24.7	54.0	-29.3
V	7440.000	45.7	33	37.9	50.6	30.1	20.5	54.0	-33.5
V	9920.000	44.0	33	40.4	51.4	30.1	21.3	54.0	-32.7
V	12400.000	44.9	33	40.5	52.4	30.1	22.3	54.0	-31.7
V	14880.000	47.6	33	38.4	53.0	30.1	22.9	54.0	-31.1

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2480.000	105.0	33	29.4	101.4	–	--
V	4960.000	52.9	33	34.9	54.8	74.0	-19.2
V	7440.000	45.7	33	37.9	50.6	74.0	-23.4
V	9920.000	44.0	33	40.4	51.4	74.0	-22.6
V	12400.000	44.9	33	40.5	52.4	74.0	-21.6
V	14880.000	47.6	33	38.4	53.0	74.0	-21.0

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

4.10 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

Based on the Bluetooth Specification Version 2.0 / 2.1 + EDR, the transmitter ON time for each timeslot of Bluetooth is 625μs. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take (5+1) x 625μs = 3.75ms. For one period for a pseudo-random hopping through all 79 RF channels, it takes: 79 x 3.75ms = 296.25ms.

The dwell time for DH5 is 5 x 625μs = 3.125ms

Therefore,

Duty Cycle (DC) = Maximum On time in 100ms/100ms
= 3.125ms/100ms
= 0.03125

Average Factor (AF) of Bluetooth in dB = 20 $\log_{10}$ (0.03125)
= -30.1 dB

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

6.0 Product Labelling

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Miscellaneous Information

The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor (calculation and timing diagram).

9.1 Measured Bandwidth

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz to 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2003) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50dB below the level of the fundamental or to the general radiated emissions limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

9.2 Discussion Pulse Desensitivity

Pulse desnesitivity is not applicable for this device. The effective period (Teff) is approximately 625μs for a digital "1" bit which illustrated on technical specification, with a resolution bandwidth (3dB) of 1MHz, so the pulse densensitivity factor is 0dB.

9.3 Calculation of Average Factor

Based on the Bluetooth Specification Version 2.0 / 2.1 + EDR, the transmitter ON time for each timeslot of Bluetooth is 625μs. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take (5+1) x 625μs = 3.75ms. For one period for a pseudo-random hopping through all 79 RF channels, it takes: 79 x 3.75ms = 296.25ms.

The dwell time for DH5 is 5 x 625μs = 3.125ms

Therefore,

Duty Cycle (DC) = Maximum On time in 100ms/100ms
= 3.125ms/100ms
= 0.03125

Average Factor (AF) of Bluetooth in dB = $20 \log_{10} (0.03125)$
= -30.1 dB

9.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2003. A typical or an unmodulated CW signal at the operating frequency of the EUT has been supplied to the EUT for all measurements. Such a signal is supplied by a signal generator and an antenna in close proximity to the EUT. The signal level is sufficient to stabilize the local oscillator of the EUT.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

9.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements were made as described in ANSI C63.4 - 2003.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

10.0 **Confidentiality Request**

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: request.pdf.

11.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Biconical Antenna	Log Periodic Antenna
Registration No.	EW-2251	EW-0954	EW-0446
Manufacturer	R&S	EMCO	EMCO
Model No.	ESCI	3104C	3146
Calibration Date	Oct. 22, 2009	Apr. 14, 2010	Apr. 26, 2010
Calibration Due Date	Apr. 22, 2011	Oct. 14, 2011	Oct. 26, 2011

Equipment	Spectrum Analyzer	Double Ridged Guide Antenna
Registration No.	EW-2188	EW-1015
Manufacturer	AGILENTTECH	EMCO
Model No.	E4407B	3115
Calibration Date	Dec. 27, 2010	Feb. 09, 2010
Calibration Due Date	Dec. 31, 2011	Aug. 09, 2011

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-2666	EW-0192	EW-0699
Manufacturer	R&S	R&S	R&S
Model No.	ESCI7	ESH3-Z5	ESH3-Z2
Calibration Date	Oct. 12, 2010	Nov. 30, 2010	Dec. 24, 2009
Calibration Due Date	Oct. 12, 2011	Nov. 30, 2011	Jun. 24, 2011

3) 15.247 Test

Equipment	Spectrum Analyzer
Registration No.	EW-2329
Manufacturer	R&S
Model No.	FSP3
Calibration Date	Jun. 29, 2010
Calibration Due Date	Jun. 29, 2011