EMC Test Report

Application for Grant of Equipment Authorization pursuant to

FCC Part 15 Subpart C

Model: UltraLink blood glucose meter

FCC ID:	I5QB
APPLICANT:	Lifescan Inc. - A Johnson & Johnson Co. 1000 Gibralter Dr. Milpitas, CA 95035-6312
TEST SITE(S):	Elliott Laboratories 684 W. Maude Avenue Sunnyvale, CA 94085
IC SITE REGISTRATION #:	2845A-2
REPORT DATE:	March 16, 2010
FINAL TEST DATES:	January 18 and January 19, 2010

AUTHORIZED SIGNATORY:

Suresh Kondapalli
Senior Engineer
Elliott Laboratories

ACCREDITED

Testing Cert #2016-01

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SCOPE

An electromagnetic emissions test has been performed on the Lifescan Inc. - A Johnson & Johnson Co. model UltraLink blood glucose meter, pursuant to the following rules:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

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

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.

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 Lifescan Inc. - A Johnson & Johnson Co. model UltraLink blood glucose meter complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Lifescan Inc. - A Johnson & Johnson Co. model UltraLink blood glucose meter and therefore apply only to the tested sample. The sample was selected and prepared by Brian H. Wallace of Lifescan Inc. - A Johnson & Johnson Co..

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS SUMMARY

DEVICES OPERATING IN THE 902 – 928 / 2400 – 2483.5 / 5725 – 5850 MHz BANDS

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.249 (a)	RSS 210 A2.9 (1)	Fundamental Signal Strength	87.7dBµV/m @ 916.500MHz (-6.3dB)	50mV/m @ 3m	Complies
15.249 (a) / 15.209	RSS 210 A2.9 (1) & Table 2	Radiated Spurious Emissions, 30 - 10000 MHz	53.0dBµV/m @ 6415.4MHz (-1.0dB)	Harmonics 500uV/m @ 3m or general limits	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	Integral		Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	24.6dBµV/m @ 930.006MHz		Complies (-21.4 dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	N/A-battery powered	Refer to standard	Complies

MEASUREMENT UNCERTAINTIES

ISO/IEC 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 Lifescan Inc. - A Johnson & Johnson Co. model UltraLink blood glucose meter is a Glucose Meter that is designed to Tx data to the partner device. 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 Battery operated at 3Volts 0.1 Amps.

The sample was received on January 18, 2010 and tested on January 18 and January 19, 2010. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
LifeScan Inc.	OneTouch UltraLink	Wireless GlucoseMeter (Used For Tx Tests)	P1ZWF002	I5QB
LifeScan Inc.	OneTouch UltraLink	Wireless GlucoseMeter (Used For Rx Tests)	P1ZWF00H	I5QB

ANTENNA SYSTEM

The antenna system used with the Lifescan Inc. - A Johnson & Johnson Co. model UltraLink blood glucose meter is integral to the device.

ENCLOSURE

The EUT enclosure is primarily constructed of Plastic. It measures approximately 9.5cm wide by 5.5cm deep by 2cm high.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

No support equipment was used during testing.

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
USB	Not populated	-	-	-

Note: If USB port is cabled, the EUT is prevented from running the glucose test, which will not enable the RF circuitry.

EUT OPERATION

During emissions testing the EUT was configured with custom software that allowed for continuous transmissions of approximately 15ms duration at 2 Hz rep rate. An additional sample was provided with the end-use software to demonstrate normal transmission packet activity.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on January 18 and January 19, 2010 at the test sites listed below. 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 and with industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
SVOATS #2	90593	2845A-2	684 West Maude Ave, Sunnyvale CA 94085-3518

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, on OATS sites, of predictable local TV, radio, and mobile communications traffic. The test site(s) contain 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.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. 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.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 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 specifies 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.

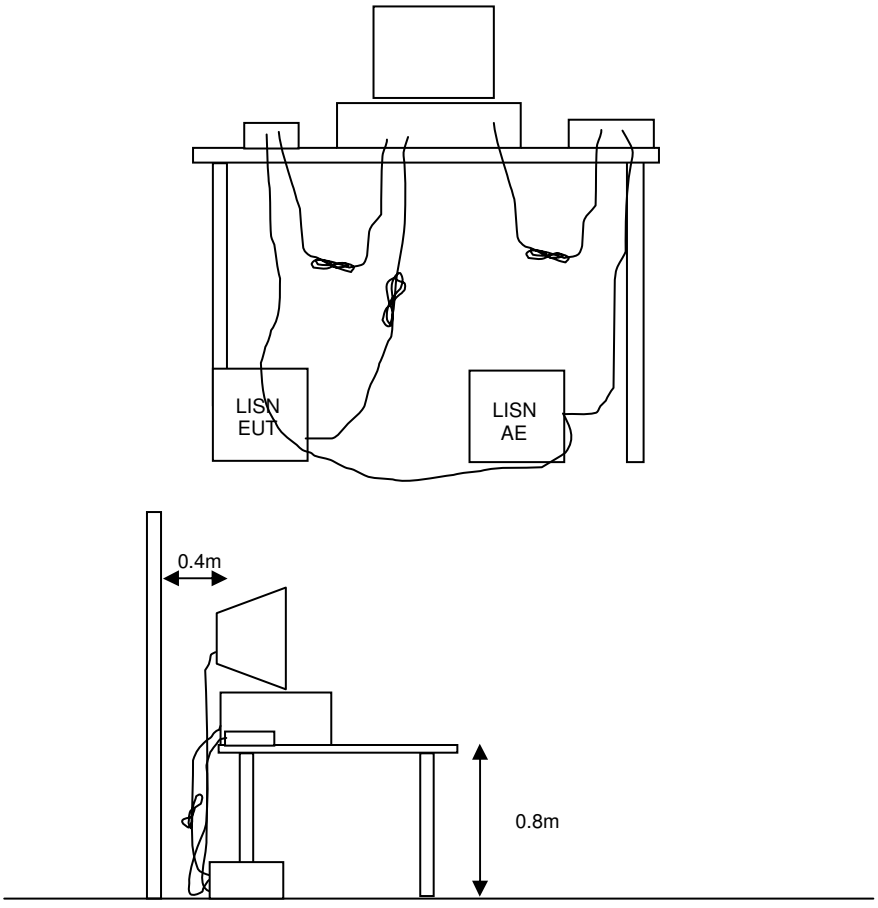


Figure 1 Typical Conducted Emissions Test Configuration

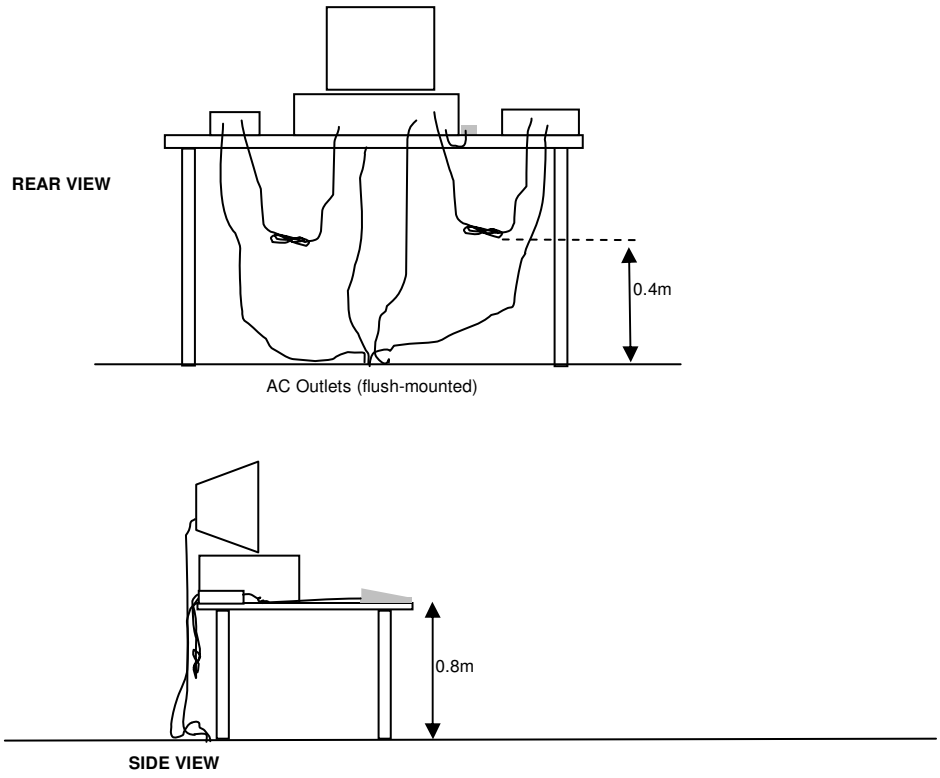
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed 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.

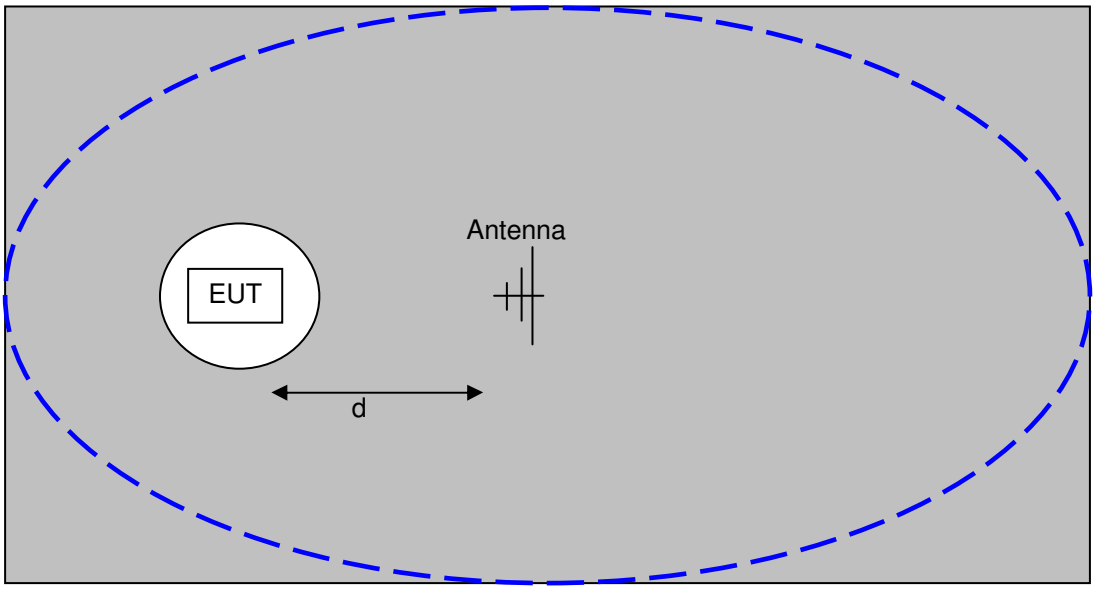
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

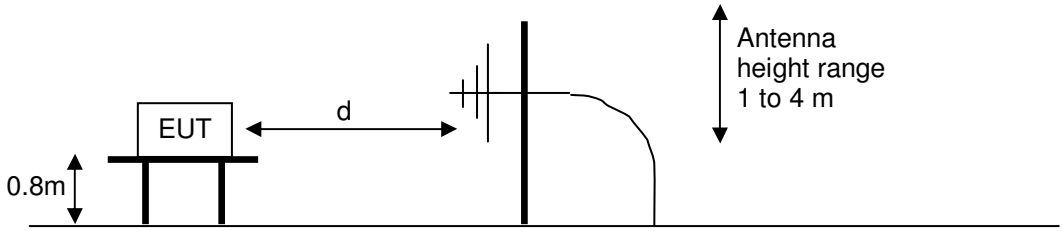
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



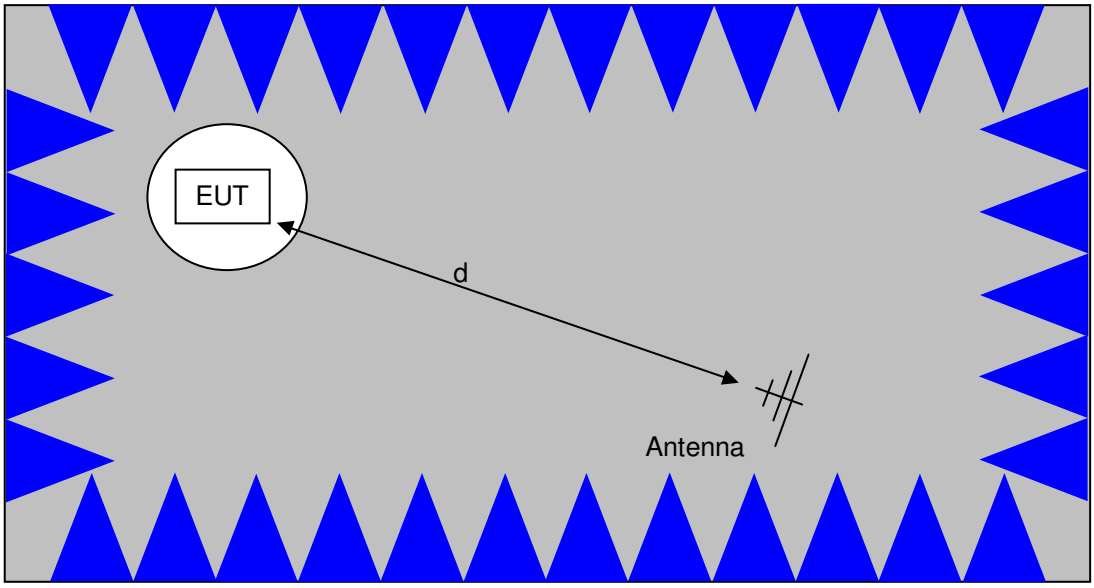
Typical Test Configuration for Radiated Field Strength Measurements



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.

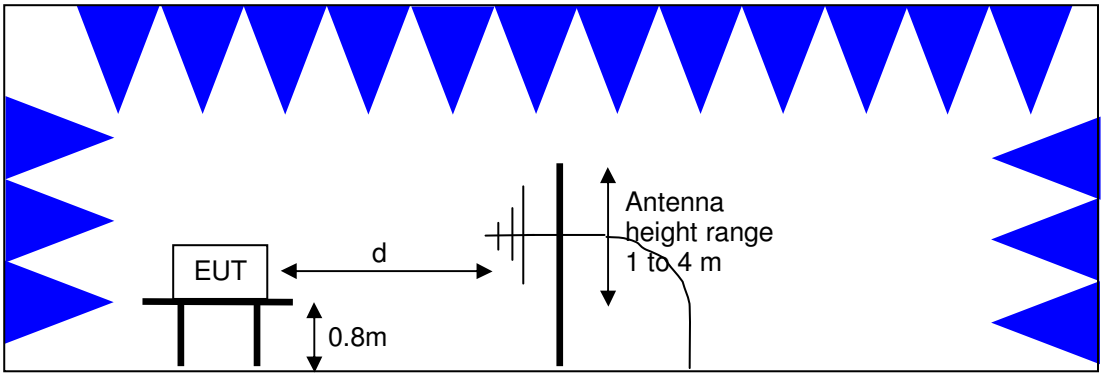


Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, 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

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

RADIATEDFUNDAMENTAL & SPURIOUS EMISSIONS SPECIFICATION LIMITS – 15.249 and RSS 210 A2.9

The table below shows the limits for the fundamental emission and for its harmonics. Harmonics that that fall in restricted bands[2] and all other spurious emissions are subject to the general limits of RSS 210 and FCC Part 15 Subpart C.

Frequency Range (MHz)	Limit for Fundamental @ 3m	Limit for Harmonics @ 3m
902 – 928	50,000 uV/m 94dBuV/m	500 uV/m 54dBuV/m
2400 – 2483.5	50,000 uV/m 94dBuV/m	500 uV/m 54dBuV/m
5725 - 5850	50,000 uV/m 94dBuV/m	500 uV/m 54dBuV/m

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

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

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:

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

where P is the eirp (Watts)

Appendix A Test Equipment Calibration Data

TX Spurious Emissions, 18-Jan-10
Engineer: Mark Hill

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	Log Periodic Antenna 300-1000 MHz	EL300.1000	55	03-Apr-10
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	18-May-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	19-Aug-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10
Tektronix	1 GHz, 4 CH, 5GS/s Oscilloscope	TDS5104	1435	04-Nov-10
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	11-Nov-10

Radiated Emissions, 30 - 3,000 MHz, 19-Jan-10
Engineer: Suhaila Khushzad

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	02-Sep-10
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	04-Jun-10
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447E	1606	30-Apr-10
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	10-Feb-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	17-Sep-10

Appendix B Test Data

T77988 12 Pages

Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		-
Emissions Standard(s):	FCC 15.249	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Lifescan Inc

Model

UltraLink Blood Glucose Meter

Date of Last Test: 1/19/2010

Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

Radiated Emissions

Test Specific Details

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

General Test Configuration

The EUT was located on the turntable for radiated emissions testing. The EUT was tested in all three orthogonal orientations.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 19.9 °C

Rel. Humidity: 85 %

Summary of Results

Run #	Test Performed	Limit	Result	Value / Margin
2	Transmiter Radiated Spurious Emissions, 30 - 10000 MHz	FCC 15.209 & 15.249 RSS 210/RSS GEN	Pass	53.0dBµV/m @ 6415.4MHz (-1.0dB)
3	99% Bandwidth (center channel)	RSS-GEN	N/A	212 kHz
4	Receiver Radiated Spurious Emissions, 30 - 3000 MHz	FCC 15.209 & 5.249 RSS 210/RSS GEN	Pass	24.6dBµV/m @ 930.006MHz (-21.4dB)

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:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

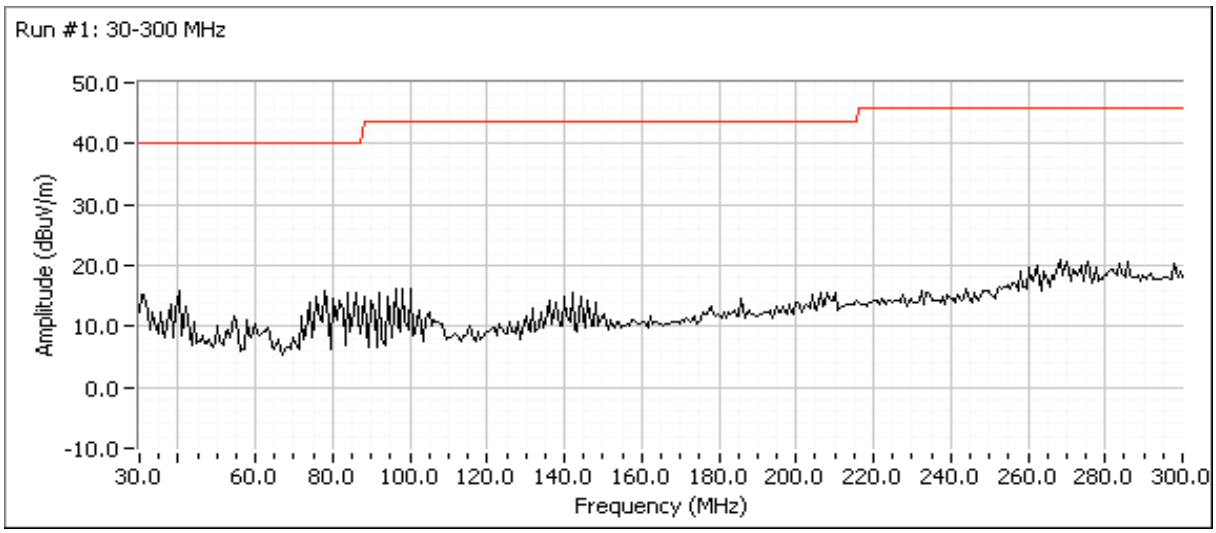
Run #1: Preliminary Radiated Emissions, 30 - 10000 MHz, Transmitter Spurious Emissions

Date of Test: 1/18/2009
Test Engineer: Mark H/Suresh K
Test Location: Chamber #2

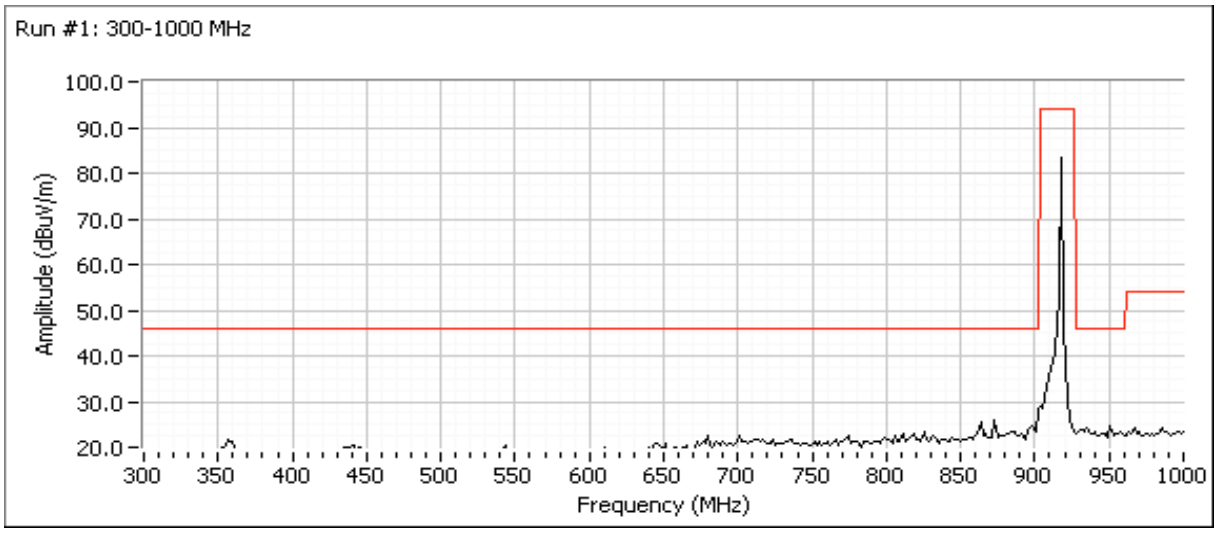
Config. Used: 1
Config Change: None
EUT Voltage: Battery Powered

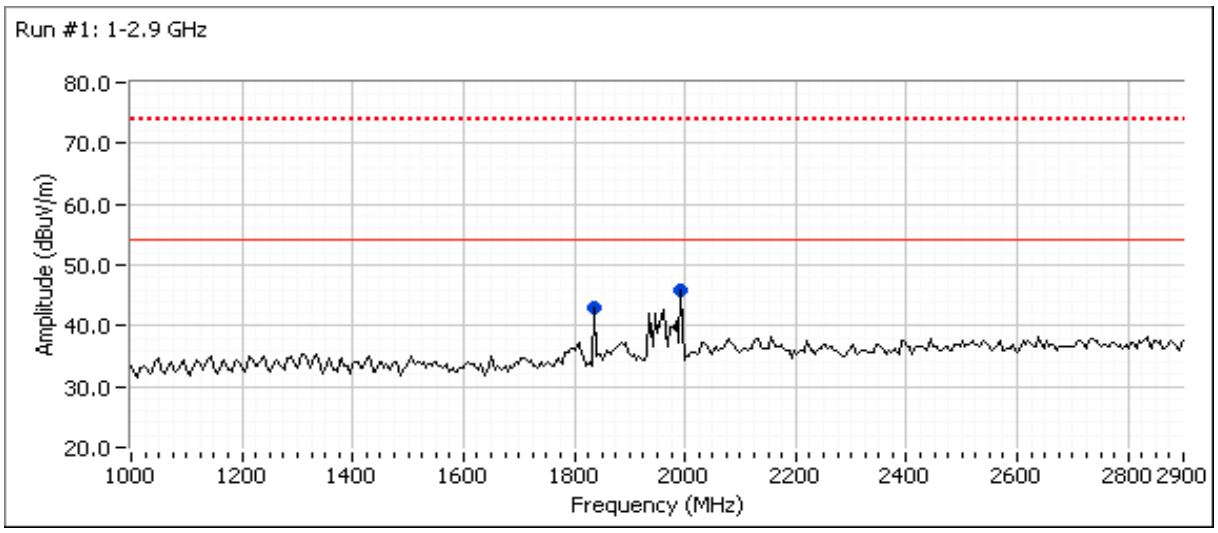
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 10,000 MHz	3	3	0.0

Note:	The limit in 15.249 for a fundamental signal in the 902 - 928 MHz is 50mV/m (94.0 dBuV/m), harmonics are limited to 500uV/m (54dBuV/m) and all other spurious are required to meet 15.209 limits.
Note:	The field strength of any spurious emissions may not exceed the field strength of the fundamental signal.



Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-





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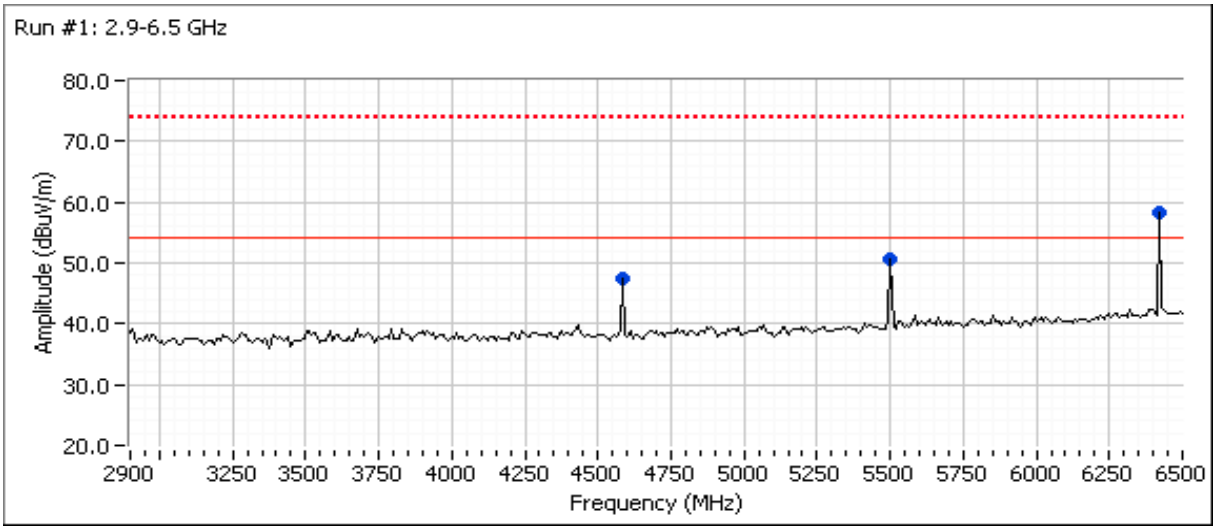
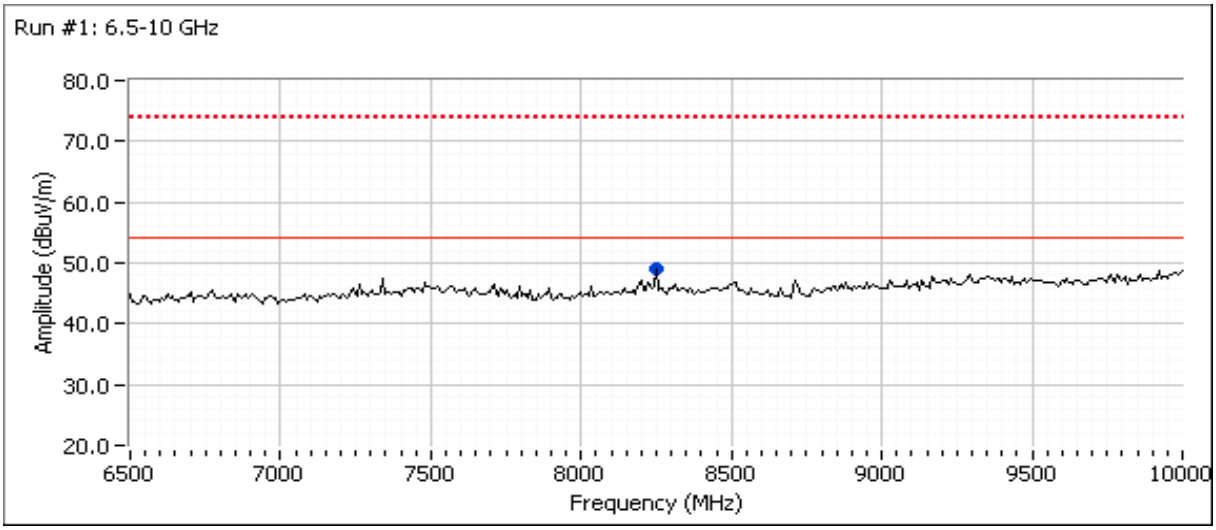
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-





Center Channel

Frequency	Level	Pol	RSS 210 / FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1833.000	43.0	V	54.0	-11.0	Peak	107	1.7	
1992.750	45.7	V	54.0	-8.3	Peak	135	1.7	ambient signal not from EUT
4582.500	47.5	V	54.0	-6.5	Peak	242	1.7	
5499.000	50.7	V	54.0	-3.3	Peak	325	1.7	
6415.500	58.3	V	54.0	4.3	Peak	173	1.7	
8248.500	49.2	V	54.0	-4.8	Peak	281	1.7	

Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

Run #2: Maximized Readings - Fundamental and Transmitter Spurious Emissions, 30 - 10,000 MHz

Date of Test: 1/18/2009
Test Engineer: Mark H/Suresh K
Test Location: SVOATS #2

Config. Used: 1
Config Change: None
EUT Voltage: Battery Powered

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 10,000 MHz	3	3	0.0

Center Channel
Fundamental Field Strength

Frequency	Level	Pol	RSS 210 / FCC 15.209		Detector	Azimuth	Height	Comments	Orientation
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
916.500	87.7	V	94.0	-6.3	PK	175	1.2	PK (0.100s)	On Edge
916.500	87.6	V	94.0	-6.4	PK	96	1.0	PK (0.100s)	Upright
916.500	82.1	V	94.0	-11.9	PK	123	1.2	PK (0.100s)	Flat
916.500	71.2	H	94.0	-22.8	PK	137	1.1	PK (0.100s)	On Edge
916.500	70.8	H	94.0	-23.2	PK	133	2.1	PK (0.100s)	Flat
916.500	67.5	H	94.0	-26.5	PK	170	1.0	PK (0.100s)	Upright

Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

Spurious Emissions

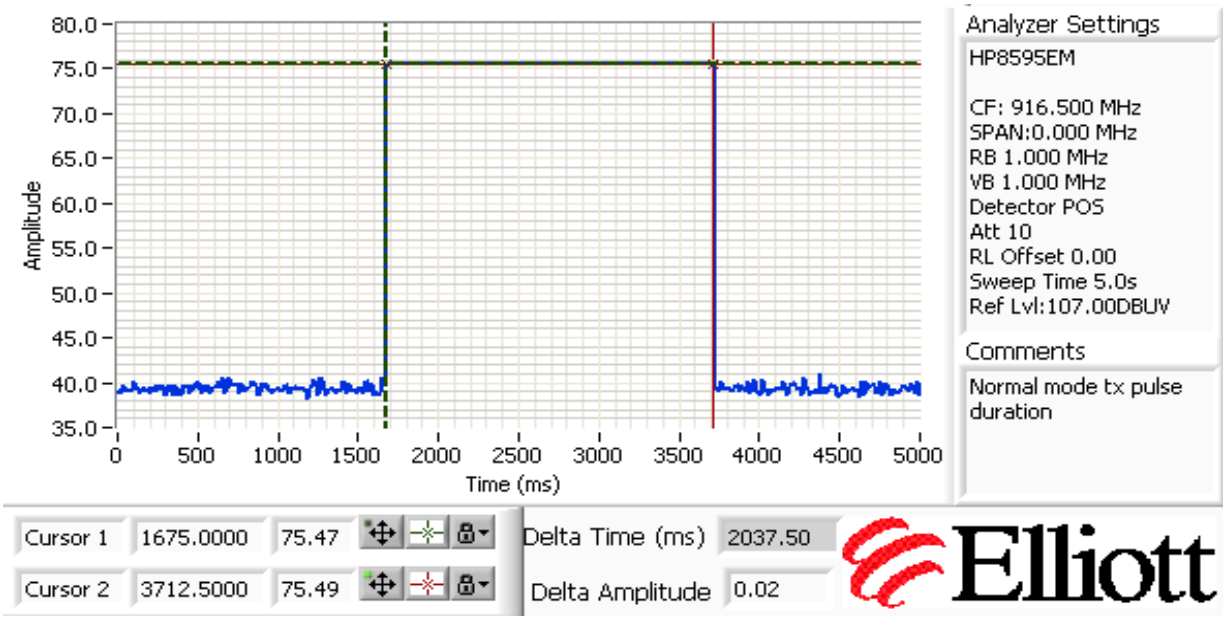
Frequency	Level	Pol	RSS 210 / FCC 15.209		Detector	Azimuth	Height	Comments	Orientation
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
960.000	26.3	V	46.0	-19.7	QP	175	1.2	QP (1.000s)	On Edge
6415.460	53.9	H	74.0	-20.1	PK	168	1.7	RB 1 MHz; VB: 1 MHz	On Edge
6415.350	57.9	V	74.0	-16.1	PK	236	1.0	RB 1 MHz; VB: 1 MHz	On Edge
5499.270	49.0	V	54.0	-5.0	PK	347	1.0	RB 1 MHz; VB: 1 MHz Note 2	On Edge
5499.860	49.7	H	54.0	-4.3	PK	93	1.6	RB 1 MHz; VB: 1 MHz Note 2	On Edge
1834.050	40.4	V	54.0	-13.6	PK	261	1.5	RB 1 MHz; VB: 1 MHz	On Edge
4581.480	41.6	V	54.0	-12.4	PK	92	1.0	RB 1 MHz; VB: 1 MHz	On Edge
8248.970	48.7	V	54.0	-5.3	PK	112	1.0	RB 1 MHz; VB: 1 MHz	On Edge
8249.170	48.5	V	54.0	-5.5	PK	98	1.0	RB 1 MHz; VB: 1 MHz	On Edge
1833.900	41.4	H	54.0	-12.6	PK	219	1.0	RB 1 MHz; VB: 1 MHz	On Edge
4581.770	41.6	H	54.0	-12.4	PK	105	1.0	RB 1 MHz; VB: 1 MHz	On Edge
8247.670	49.4	H	54.0	-4.6	PK	0	2.5	RB 1 MHz; VB: 1 MHz	On Edge
6415.350	**53.0**	**V**	**54.0**	**-1.0**	**Avg**	**236**	**1.0**	**RB 1 MHz; VB: 1 MHz Note 3**	**On Edge**
6415.460	49.0	H	54.0	-5.0	Avg	168	1.7	RB 1 MHz; VB: 1 MHz Note 3	On Edge
For Reference only - power reduced by 2 dB									
6415.940	55.9	V	54.0	1.9	PK	239	1.0	RB 1 MHz; VB: 1 MHz	

Note 1:	As the device can be hand-held or as the device can be operated in different orientations, measurements were made with the device in all three orientations
Note 2:	Peak measurement compared to average limit. Emission pulsing.
Note 3:	Average value calculated from peak measurement and duty cycle of -4.9dB

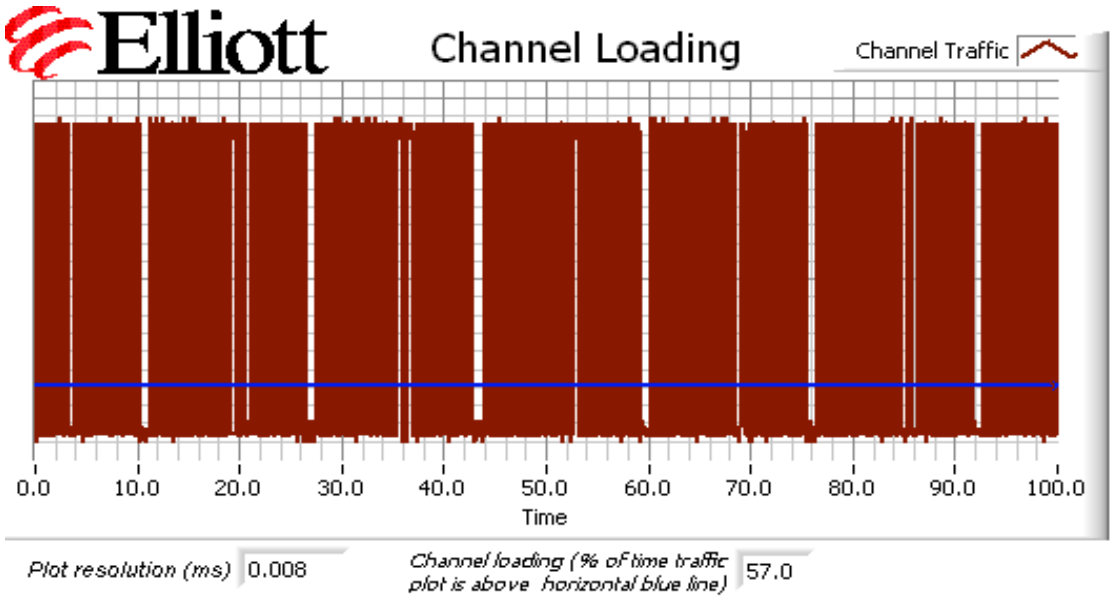
Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

Duty Cycle

Note, a second EUT running the normal operation software was evaluated for duty cycle. See below plots.



Complete Tx brust time of 2037ms was scanned and wrost case 100ms plot with highest TX on time is placed below



Time in milli seconds

Duty Cycle Correction = 20 * log (on time/100 ms) for pulse trains longer than 100ms.

Duty Cycle = 57% (-4.9dB)

Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

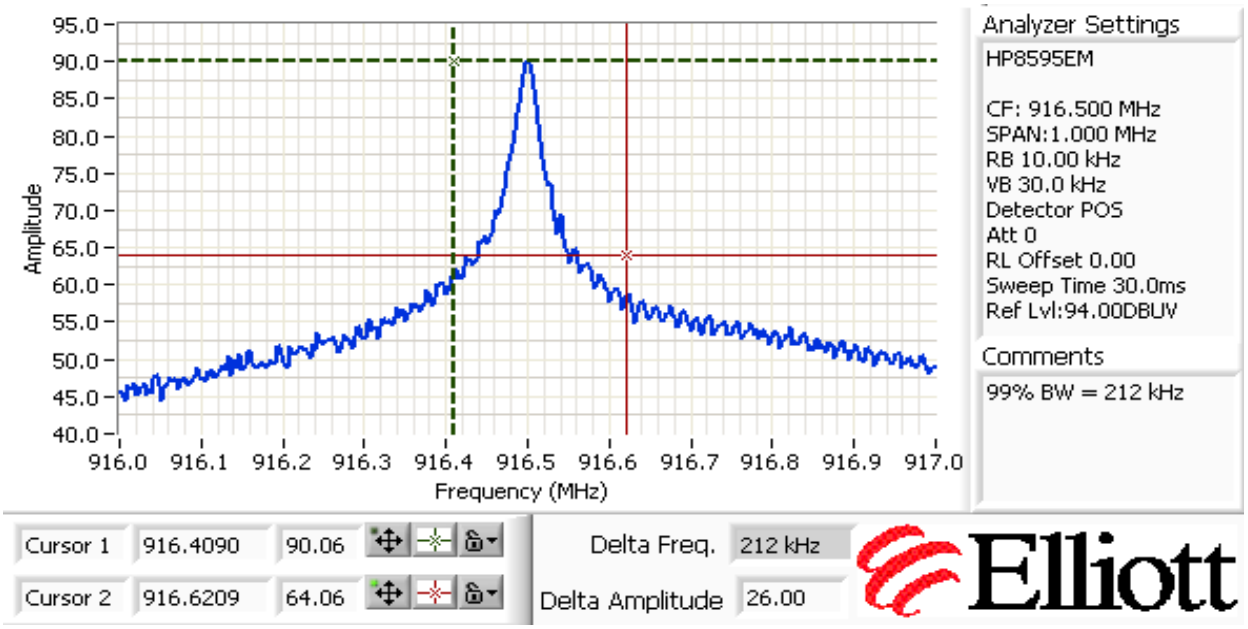
Run #3: Bandwidth Measurement(s)

Date of Test: 1/18/2010
Test Engineer: Mark Hill
Test Location: SVOATS2

Config. Used: 1
Config Change: No
EUT Voltage: DC

Power Setting	Frequency (MHz)	Resolution Bandwidth	Video Bandwidth	99% Bandwidth
34304	916.5	10kHz	30kHz	212kHz

Note 1:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



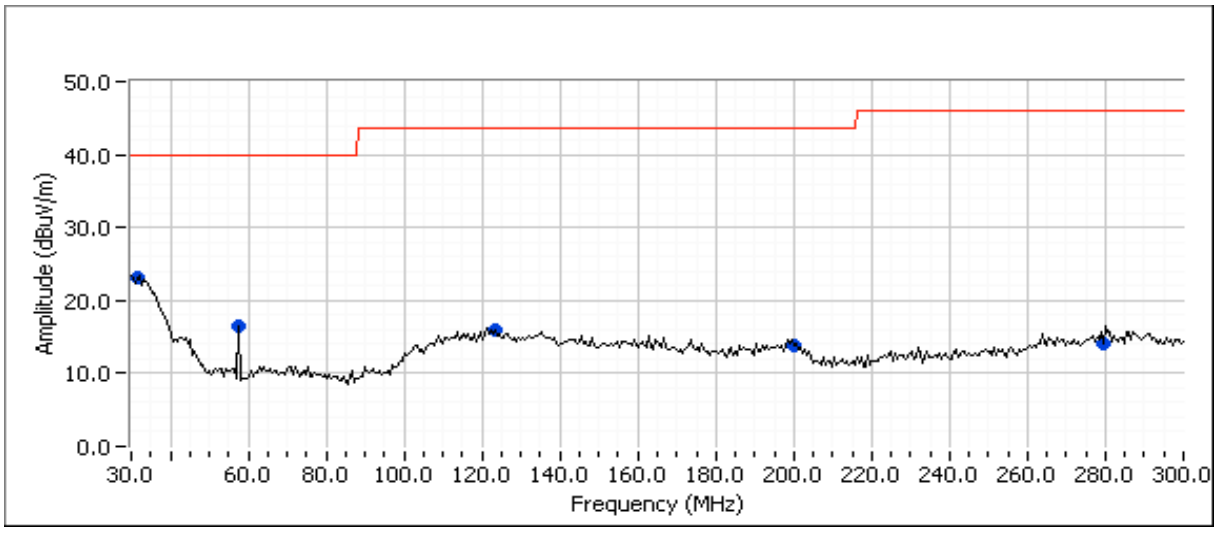
Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

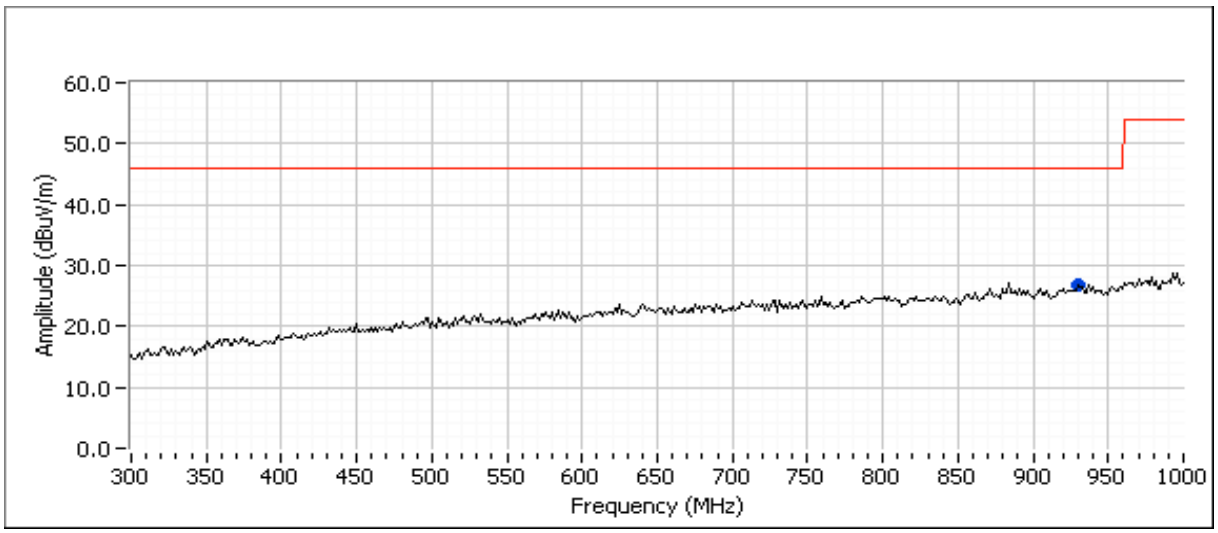
Run #4: Receiver Spurious Emissions(On Edge)

Date of Test: 1/19/2010
Test Engineer: Suhaila Khushzad
Test Location: Chamber #4

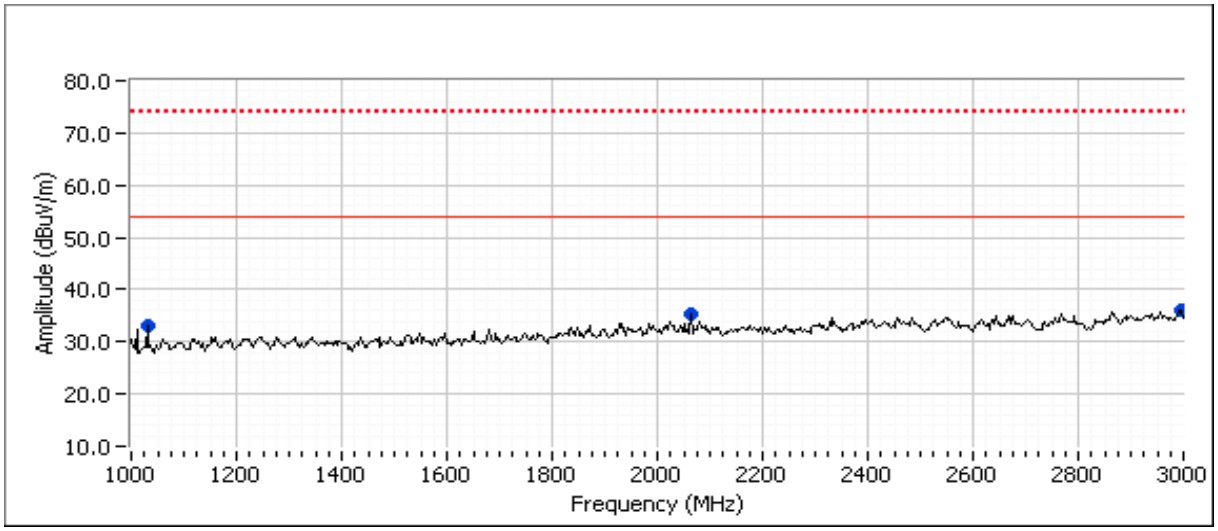
Config. Used: 1
Config Change: None
EUT Voltage: Battery Powered

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 3000 MHz	3	3	0.0





Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-



Center Channel

Frequency	Level	Pol	FCC 15.109/RSS GEN		Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
930.006	24.6	H	46.0	-21.4	QP	328	1.0	QP (1.00s)	On Edge
31.607	18.3	V	40.0	-21.7	QP	349	1.5	QP (1.00s)	On Edge
55.755	6.1	H	40.0	-33.9	QP	346	3.5	QP (1.00s)	On Edge
122.451	12.4	H	43.5	-31.1	QP	346	2.0	QP (1.00s)	On Edge
198.251	11.0	V	43.5	-32.5	QP	346	3.5	QP (1.00s)	On Edge
278.673	11.7	H	46.0	-34.3	QP	217	3.5	QP (1.00s)	On Edge
1029.960	28.5	V	54.0	-25.5	AVG	221	1.8	RB 1 MHz; VB: 10 Hz	On Edge
1030.060	37.4	V	74.0	-36.6	PK	221	1.8	RB 1 MHz; VB: 1 MHz	On Edge
2053.280	26.7	V	54.0	-27.3	AVG	245	1.0	RB 1 MHz; VB: 10 Hz	On Edge
2058.310	38.0	V	74.0	-36.0	PK	245	1.0	RB 1 MHz; VB: 1 MHz	On Edge
2988.340	28.7	V	54.0	-25.3	AVG	54	1.0	RB 1 MHz; VB: 10 Hz	On Edge
2985.370	39.3	V	74.0	-34.7	PK	54	1.0	RB 1 MHz; VB: 1 MHz	On Edge

Client:	Lifescan Inc	Job Number:	J77747
Model:	UltraLink Blood Glucose Meter	T-Log Number:	T77988
		Account Manager:	Deepa Shetty
Contact:	Brian Wallace		
Standard:	FCC 15.249	Class:	-

Run #5: Receiver Spurious Emissions(Up Right)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 300 MHz	3	3	0.0