EMC TEST REPORT

Report Number: 100764703BOX-001a
Project Number: G100764703

Report Issue Date: 7/12/2012

Product Designation: FD100SL

Standards: FCC 47CFR Part 15 Subpart C Section 15.231 (2012)
Industry Canada RSS-210 Issue 8 December 2010
Industry Canada RSS-Gen Issue 3 December 2010

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719

Client:
Philips Lifeline
111 Lawrence Street
Framingham, MA 01702

Report prepared by Reviewer

Nicholas Abbondante/Staff Engineer

Report reviewed by

Vathana F. Ven/Senior Project Engineer

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	
4	Description of Equipment Under Test	
5	System Setup and Method	
6	Fundamental Field Strength (CFR47 Part 15 Subpart C Section 15.231(b) IC RSS-210 Annex 1.1.2 and Table A)	Pass
7	Occupied Bandwidth (CFR47 Part 15 Subpart C Sections 15.215, 15.231(c) IC RSS-Gen Section 4.6, IC RSS-Gen A1.1.3)	Pass
8	Radiated Spurious Emissions (CFR47 Part 15 Subpart C Sections 15.205, 15.209, and 15.231(b)(1-3), IC RSS-Gen Section 7.2.2 Table 3 and Section 7.2.5 Table 5, IC RSS-210 Annex 1.1.2 and Table A)	Pass
9	Duty Cycle (CFR47 Part 15 Section 15.35 and Subpart C Section 15.231(b)(2) IC RSS-Gen Section 4.5)	Pass
10	5 Second Shut Off Time (CFR47 Part 15 Subpart C Section 15.231(a)(1) IC RSS-210 Section A1.1.1(a))	Pass
11	AC Line-Conducted Emissions (CFR47 FCC Part 15 Subpart C 15.207; IC RSS-Gen Section 7.2.4)	N/A, Battery
12	Revision History	

3 Client Information

This EUT was tested at the request of:

Company: Philips Lifeline
111 Lawrence Street
Framingham, MA 01702
Contact: Clyde Dottin
Telephone: 508-988-1313
Fax: 240-536-3263
Email: clyde.dottin@philips.com

4 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Emergency Alert Pendant (US Version)	Philips Lifeline	FD100SL	BOX1206150828-001
Emergency Alert Pendant (US Version)	Philips Lifeline	FD100SL	BOX1206150828-003

Receive Date:	06/15/2012
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
The FD100SL is an emergency alert pendant

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
3.6Volt Battery	NA	NA	NA

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	BOX1206150828-001 is configured as a normal operating device
2	BOX1206150828-003 is configured to transmit nearly continuously

5 System Setup and Method

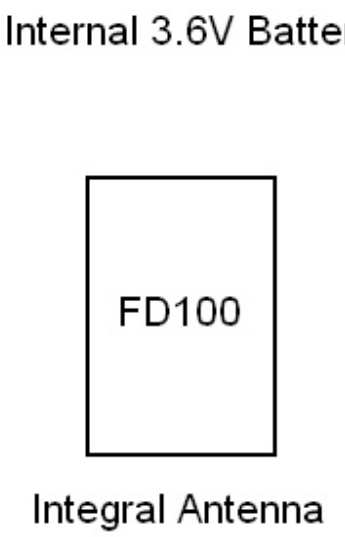
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
	NONE				

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
NONE			

5.1 Method:

Configuration as required by ANSI C63.4 (2003)

5.2 EUT Block Diagram:



6 Fundamental Field Strength

6.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

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

FS = RA + AF + CF - AG
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

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.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	08/23/2011	08/23/2012
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/04/2011	09/04/2012
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	08/15/2011	08/15/2012
Dav003'	Weather Station	Davis Instruments	7400	PE80529A39A	08/17/2011	08/02/2012

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough	Intertek	8/27/2010

6.3 Results:

The sample tested was found to Comply. The Fundamental field strength must meet the following limits:

Fundamental Frequency (MHz), excluding restricted band frequencies of RSS-Gen	Field Strength of the Fundamental (Note 1) (microvolts/m at 3 metres)	Field Strength of Unwanted Emissions (Note 1) (microvolts/m at 3 metres)
40.66-40.70	See Section A2.7	
70-130	1,250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (Note 2)	3,750	375
260-470 (Note 2)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

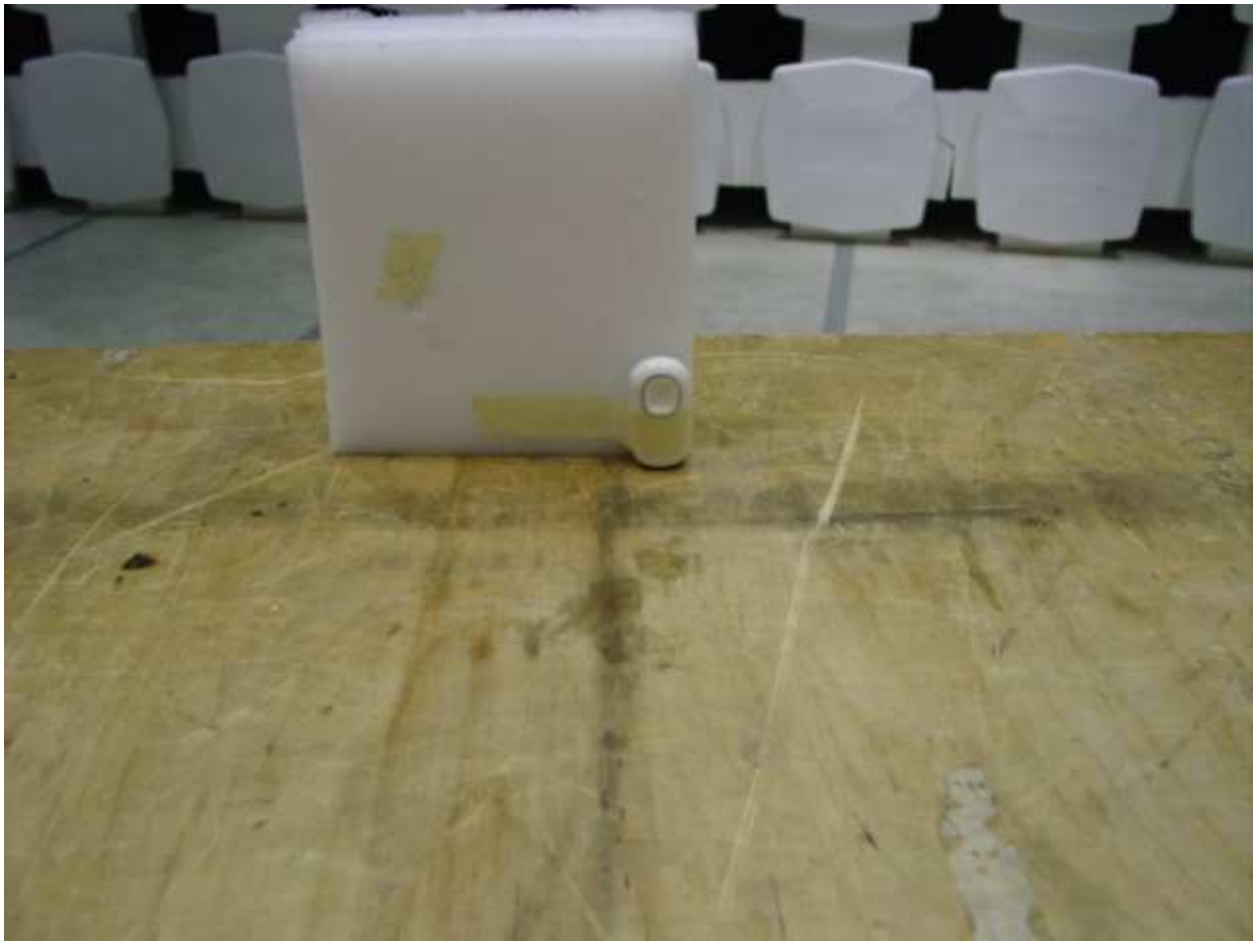
Note 1: Limits on the field strength of emissions, as shown in this table, are based on the average value of the measured emissions. As an alternative, compliance with the limits in this table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

* Linear interpolation with frequency F in MHz:
For 130-174 MHz: FS (microvolts/m) = (56.82 x F)-6136
For 260-470 MHz: FS (microvolts/m) = (41.67 x F)-7083

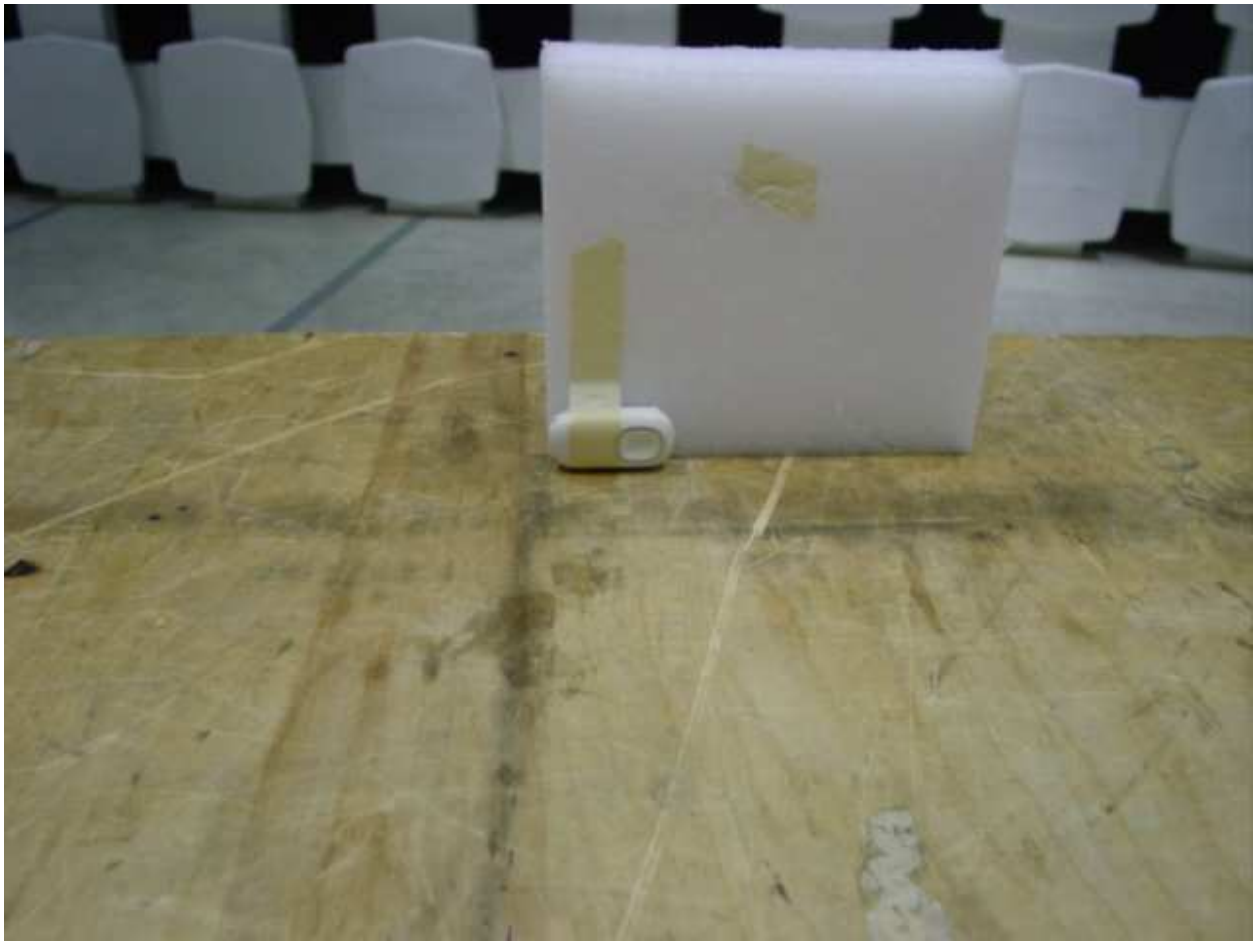
For a fundamental frequency of 319.5 MHz, this corresponds to a limit of 95.88 dBuV/m peak and 75.88 dBuV/m average at a 3 meter test distance.

6.4 Setup Photographs:

Orientation 1



Orientation 2



Orientation 3

6.5 Plots/Data:

Intertek

Radiated Emissions

Company: Philips Lifeline — Antenna & Cables: N — Bands: N, LF, HF, SHF
Model #: FD100SL — Antenna: 145106 V10m 08-15-2012.txt — 145106 H10m 08-15-2012.txt
Serial #: BOX1206150828-001 — Cable(s): 145-410 10mTrkA 09-04-2012.txt — NONE.
Engineers: John R. Cauvel — Location: 10M ALSE — Barometer: dav003 — Filter: NONE
Project #: G100764703 — Date(s): 06/28/12
Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 — Temp/Humidity/Pressure: 21 — 53% — 994
Receiver: R&S ESI (145128) 08-23-2012 — Limit Distance (m): 3
PreAmp: PRE145003 10-04-12.txt — Test Distance (m): 10
PreAmp Used? (Y or N): Y — Voltage/Frequency: 3.6V Battery — Frequency Range: 30-1000Mhz
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC
Note: Fundamental Field Strength (no preamp) Average obtained using 20.98 dB duty cycle factor applied to peak reading												
Note: Orientation 1												
PK	V	319.500	59.74	14.29	3.25	0.00	-10.46	87.74	95.88	-8.14	120/300 kHz	
AVG	V	319.500	38.76	14.29	3.25	0.00	-10.46	66.76	75.88	-9.12	120/300 kHz	
PK	H	319.500	44.16	14.19	3.25	0.00	-10.46	72.06	95.88	-23.82	120/300 kHz	
AVG	H	319.500	23.18	14.19	3.25	0.00	-10.46	51.08	75.88	-24.80	120/300 kHz	
Note: Orientation 2												
PK	V	319.500	53.09	14.29	3.25	0.00	-10.46	81.09	95.88	-14.79	120/300 kHz	
AVG	V	319.500	32.11	14.29	3.25	0.00	-10.46	60.11	75.88	-15.77	120/300 kHz	
PK	H	319.500	61.11	14.19	3.25	0.00	-10.46	89.01	95.88	-6.87	120/300 kHz	
AVG	H	319.500	40.13	14.19	3.25	0.00	-10.46	68.03	75.88	-7.85	120/300 kHz	
Note: Orientation 3												
PK	V	319.500	50.45	14.29	3.25	0.00	-10.46	78.45	95.88	-17.43	120/300 kHz	
AVG	V	319.500	29.47	14.29	3.25	0.00	-10.46	57.47	75.88	-18.41	120/300 kHz	
PK	H	319.500	60.53	14.19	3.25	0.00	-10.46	88.43	95.88	-7.45	120/300 kHz	
AVG	H	319.500	39.55	14.19	3.25	0.00	-10.46	67.45	75.88	-8.43	120/300 kHz	

Test Personnel: John R. Cauvel J.R.C — Test Date: 6-28-2012
Supervising/Reviewing Engineer: (Where Applicable) Nicholas Abbondante N/A — Test Levels: See Data
Product Standard: FCC CFR 47 Part 15 Subpart C and IC RSS-210
Input Voltage: 3.6V Battery — Ambient Temperature: 21 ºC
Pretest Verification w/ Ambient Signals or BB Source: **YES** — Relative Humidity: 53 %
Atmospheric Pressure: 995 mbars

Deviations, Additions, or Exclusions: None

7 Occupied Bandwidth

7.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
145128	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	08/23/2011	08/23/2012
145-410	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/04/2011	09/04/2012
145106	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	08/15/2011	08/15/2012
Dav003	Weather Station	Davis Instruments	7400	PE80529A39A	08/17/2011	08/02/2012

Software Utilized:

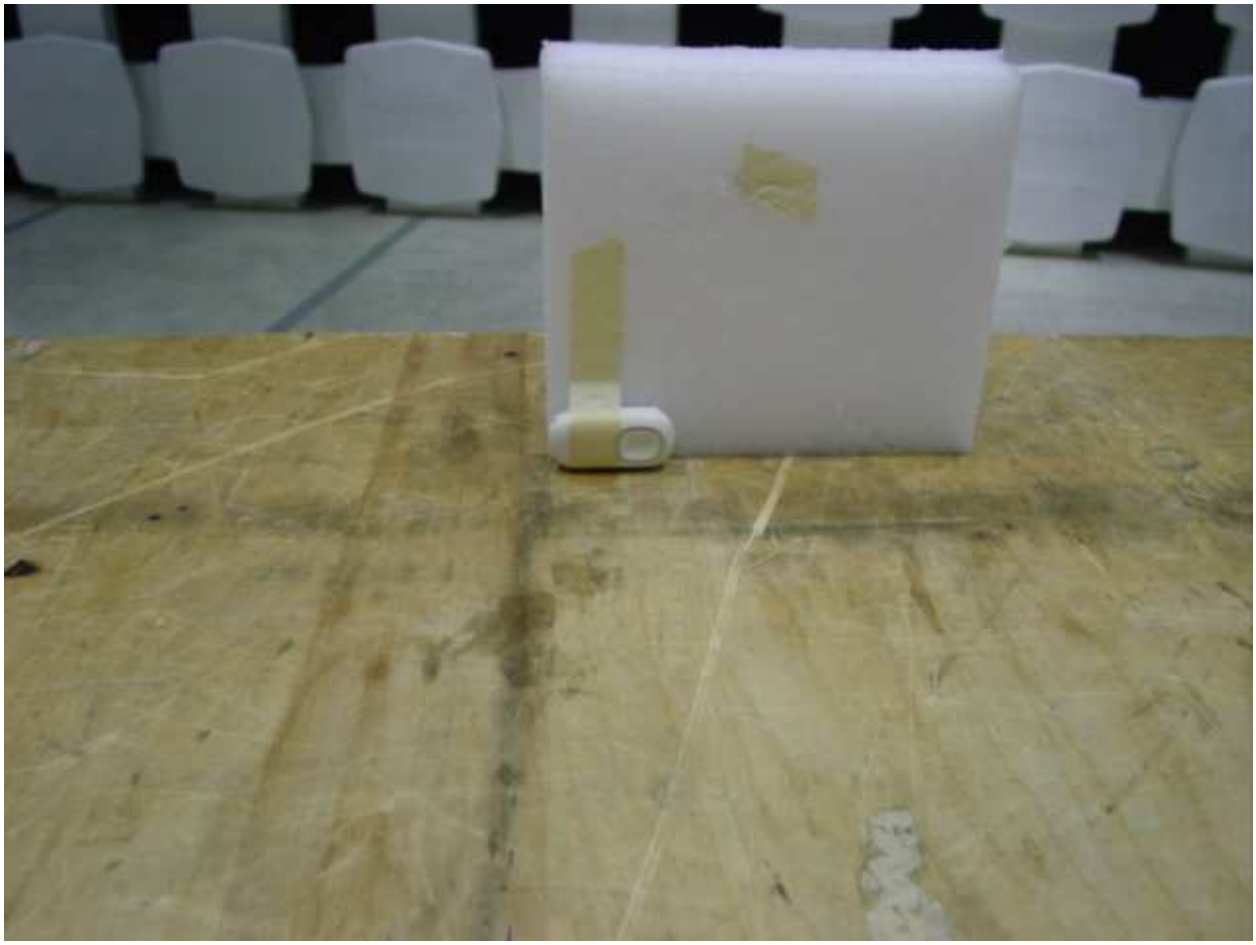
Name	Manufacturer	Version
None		

7.3 Results:

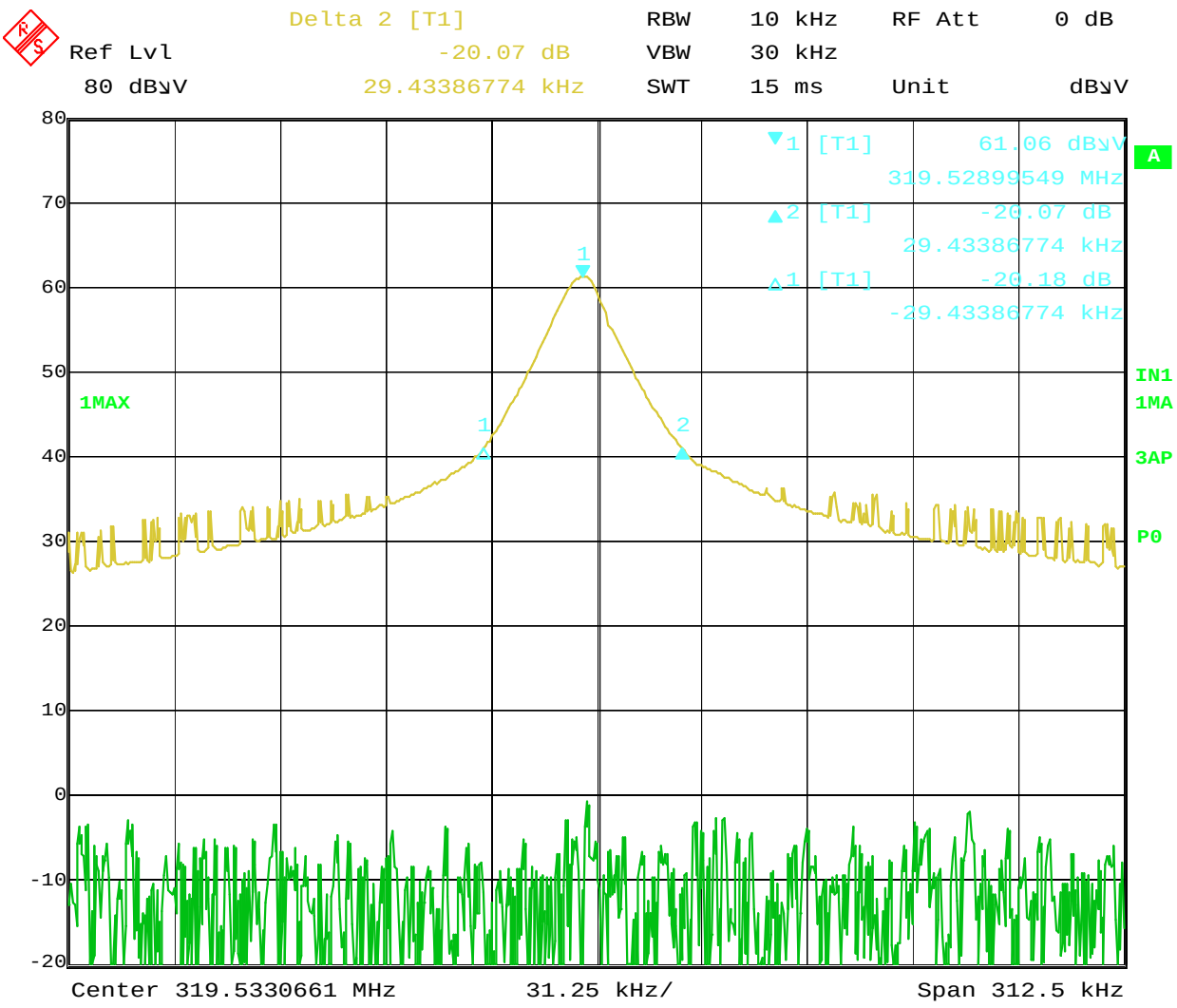
The sample tested was found to Comply. The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier. Therefore the bandwidth must not exceed 798.8 kHz.

7.4 Setup Photographs:

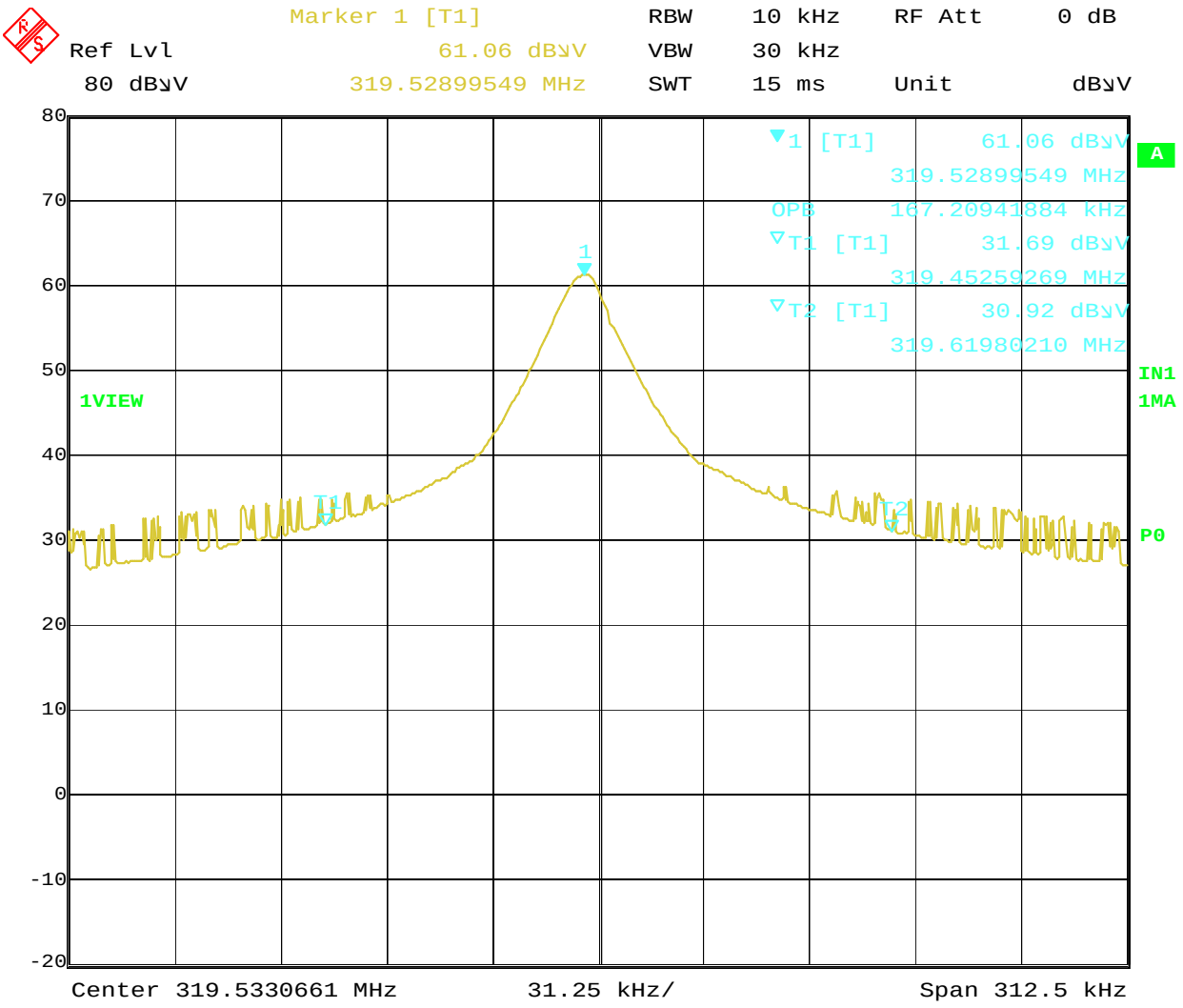
Orientation 2



7.5 Plots/Data:



20 dB Bandwidth



99% Power Bandwidth

Test Personnel:	John R. Cauvel J.R.C	Test Date:	6-28-2012
Supervising/Reviewing Engineer: (Where Applicable)	Nicholas Abbondante N/A		
Product Standard:	FCC CFR 47 Part 15 Subpart C and IC RSS-210	Test Levels:	See Data
Input Voltage:	3.6V Battery		
Pretest Verification w/ Ambient Signals or BB Source:	**YES**	Ambient Temperature:	21 ºC
		Relative Humidity:	53 %
		Atmospheric Pressure:	995 mbars

Deviations, Additions, or Exclusions: None

8 Radiated and Spurious Emissions

8.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210
.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

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

FS = RA + AF + CF - AG
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

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.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
145128	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	08/23/2011	08/23/2012
145-410	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/04/2011	09/04/2012
145106	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	08/15/2011	08/15/2012
Dav003	Weather Station	Davis Instruments	7400	PE80529A39A	08/17/2011	08/02/2012

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough	Intertek	8/27/2010

8.3 Results:

The sample tested was found to Comply. The spurious emissions must meet the following limits:

Fundamental Frequency (MHz), excluding restricted band frequencies of RSS-Gen	Field Strength of the Fundamental (Note 1) (microvolts/m at 3 metres)	Field Strength of Unwanted Emissions (Note 1) (microvolts/m at 3 metres)
40.66-40.70	See Section A2.7	
70-130	1,250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (Note 2)	3,750	375
260-470 (Note 2)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

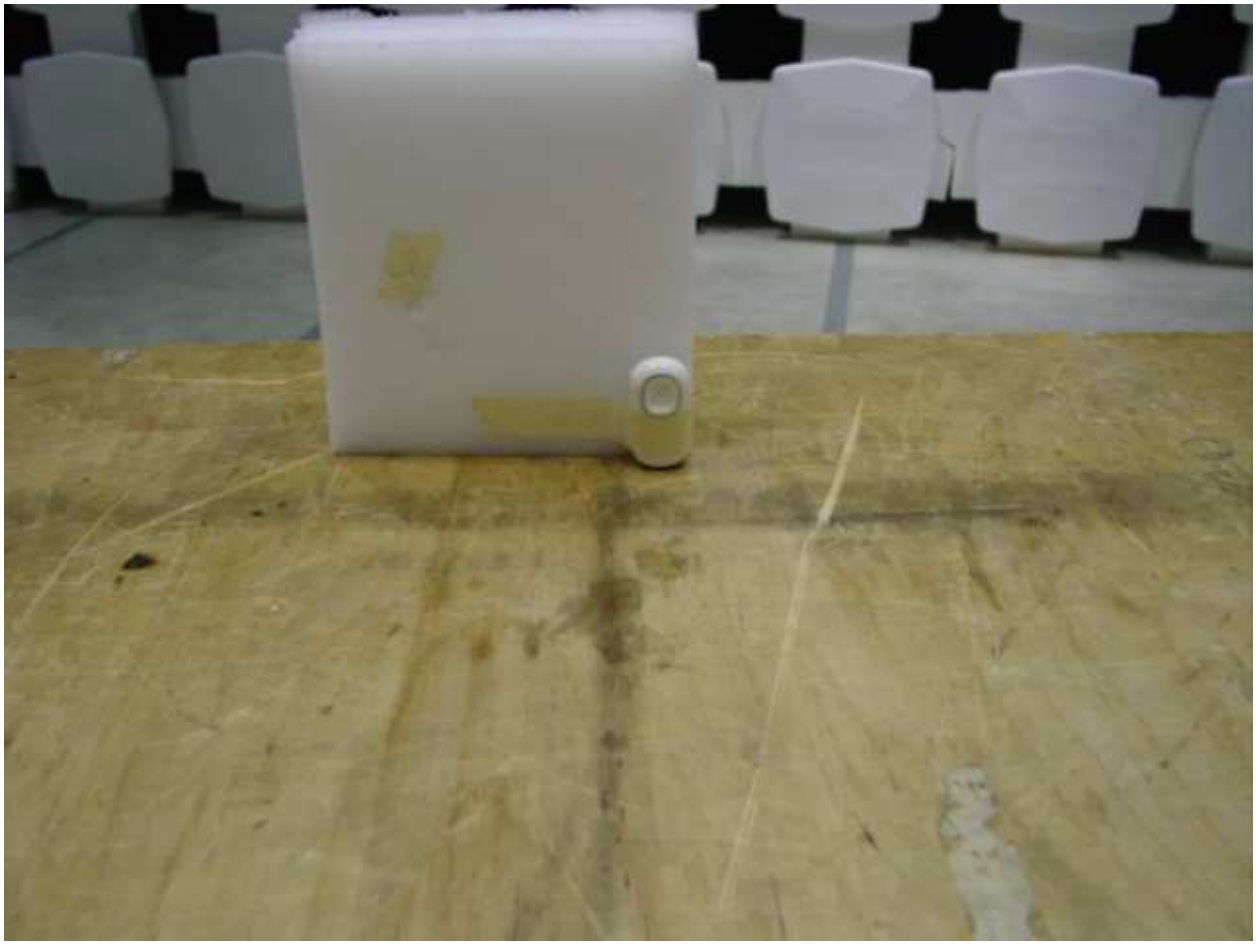
Note 1: Limits on the field strength of emissions, as shown in this table, are based on the average value of the measured emissions. As an alternative, compliance with the limits in this table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

* Linear interpolation with frequency F in MHz:
For 130-174 MHz: FS (microvolts/m) = (56.82 x F)-6136
For 260-470 MHz: FS (microvolts/m) = (41.67 x F)-7083

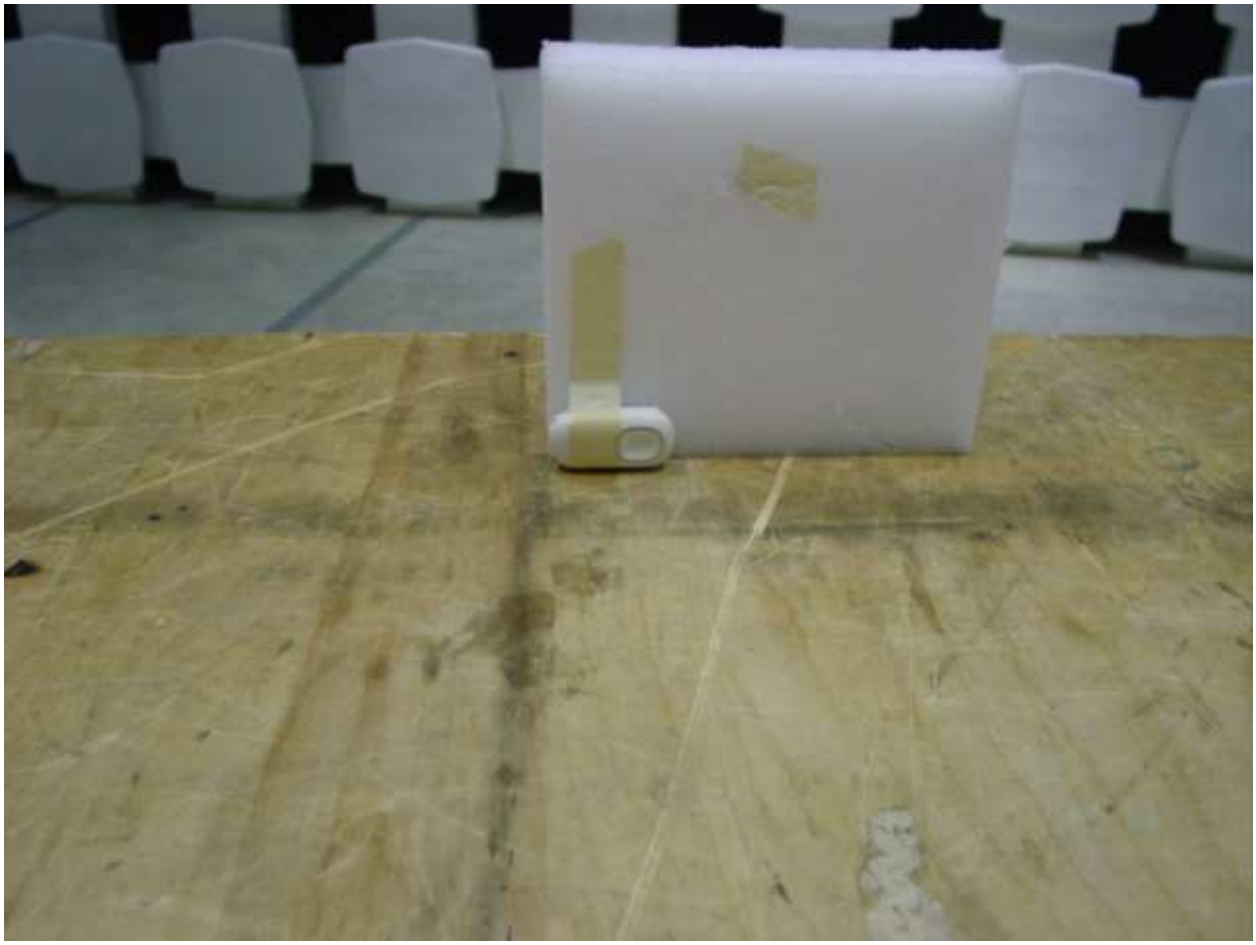
For a fundamental frequency of 319.5 MHz, this corresponds to a limit of 75.88 dBuV/m peak and 55.88 dBuV/m average at a 3 meter test distance.

8.4 Setup Photographs:

Orientation 1



Orientation 2



Orientation 3

8.5 Plots/Data:

Intertek

Radiated Emissions

Company: Philips Lifeline — Antenna & Cables: N — Bands: N, LF, HF, SHF
Model #: FD100SL — Antenna: 145106 V10m 08-15-2012.txt — 145106 H10m 08-15-2012.txt
Serial #: BOX1206150828-001 — Cable(s): 145-410 10mTrkA 09-04-2012.txt — NONE.
Engineers: John R. Cauvel — Location: 10M ALSE — Barometer: dav003 — Filter: NONE
Project #: G100764703 — Date(s): 06/28/12
Standard: FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210 — Temp/Humidity/Pressure: 21 — 53% — 994
Receiver: R&S ESI (145128) 08-23-2012 — Limit Distance (m): 3
PreAmp: PRE145003 10-04-12.txt — Test Distance (m): 10
PreAmp Used? (Y or N): Y — Voltage/Frequency: 3.6V Battery — Frequency Range: 30-1000Mhz
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
Note: Spurious emissions (noise floor at 960MHz), average obtained using 20.98 dB duty cycle factor												FCC
PK	V	639.000	31.11	19.70	4.38	28.30	-10.46	37.35	75.88	-38.53	120/300 kHz	
AVG	V	639.000	10.13	19.70	4.38	28.30	-10.46	16.37	55.88	-39.51	120/300 kHz	
PK	V	958.500	43.68	23.40	5.33	27.74	-10.46	55.13	75.88	-20.75	120/300 kHz	
AVG	V	958.500	22.70	23.40	5.33	27.74	-10.46	34.15	55.88	-21.73	120/300 kHz	
QP	V	960.000	15.22	23.40	5.33	27.73	-10.46	26.67	46.00	-19.33	120/300 kHz	RB

Intertek

Special Radiated Emissions

Company: Philips Lifeline | Antenna & Cables: N | Bands: N, LF, HF, SHF
Model #: FD100SL | Antenna: 145106 V10m 08-15-2012.txt | 145106 H10m 08-15-2012.txt
Serial #: BOX1206150828-001 | Cable(s): 145-410 10mTrkA 09-04-2012.txt | NONE.
Engineers: John R. Cauvel | Location: 10M ALSE | Barometer: dav003 | Filter: NONE
Project #: G100764703 | Date(s): 06/28/12
Standard: FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210 | Temp/Humidity/Pressure: 21 | 53% | 995
Receiver: R&S ESI (145128) 08-23-2012 | Limit Distance (m): 3
PreAmp: PRE145014 12-16-2012.txt | Test Distance (m): 3
PreAmp Used? (Y or N): Y | Voltage/Frequency: 3.6V Battery | Frequency Range: 1-3.2Ghz
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: Spurious emissions, average obtained using 20.98 dB duty cycle factor													
PK	H	1278.000	53.25	25.40	6.18	33.95	0.00	50.88	74.00	-23.12	1/3 MHz		RB
AVG	H	1278.000	32.27	25.40	6.18	33.95	0.00	29.90	54.00	-24.10	1/3 MHz		RB
PK	H	1597.500	68.22	27.50	7.04	33.74	0.00	69.02	74.00	-4.98	1/3 MHz	RB	RB
AVG	H	1597.500	47.24	27.50	7.04	33.74	0.00	48.04	54.00	-5.96	1/3 MHz	RB	RB
PK	H	1917.000	53.44	28.92	7.64	33.84	0.00	56.16	75.88	-19.72	1/3 MHz		
AVG	H	1917.000	32.46	28.92	7.64	33.84	0.00	35.18	55.88	-20.70	1/3 MHz		
PK	H	2236.500	55.96	30.35	8.30	34.05	0.00	60.56	74.00	-13.44	1/3 MHz	RB	RB
AVG	H	2236.500	34.98	30.35	8.30	34.05	0.00	39.58	54.00	-14.42	1/3 MHz	RB	RB
PK	V	2556.000	48.92	31.22	9.01	34.28	0.00	54.87	75.88	-21.01	1/3 MHz		
AVG	V	2556.000	27.94	31.22	9.01	34.28	0.00	33.89	55.88	-21.99	1/3 MHz		
PK	V	2875.500	51.14	33.62	9.89	34.43	0.00	60.22	74.00	-13.78	1/3 MHz	RB	RB
AVG	V	2875.500	30.16	33.62	9.89	34.43	0.00	39.24	54.00	-14.76	1/3 MHz	RB	RB
PK	V	3195.000	46.67	34.60	10.30	34.72	0.00	56.85	75.88	-19.03	1/3 MHz		
AVG	V	3195.000	25.69	34.60	10.30	34.72	0.00	35.87	55.88	-20.01	1/3 MHz		

Test Personnel: John R. Cauvel J.R.C
Test Date: 6-28-2012
Supervising/Reviewing Engineer: (Where Applicable) Nicholas Abbondante N/A
Product Standard: FCC CFR 47 Part 15 Subpart C and IC RSS-210
Test Levels: See Data
Input Voltage: 3.6V Battery
Pretest Verification w/ Ambient Signals or BB Source: **YES**
Ambient Temperature: 21 ºC
Relative Humidity: 53 %
Atmospheric Pressure: 995 mbars

Deviations, Additions, or Exclusions: None

9 Duty Cycle

9.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
145128	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	08/23/2011	08/23/2012
Dav003	Weather Station	Davis Instruments	7400	PE80529A39A	08/17/2011	08/02/2012

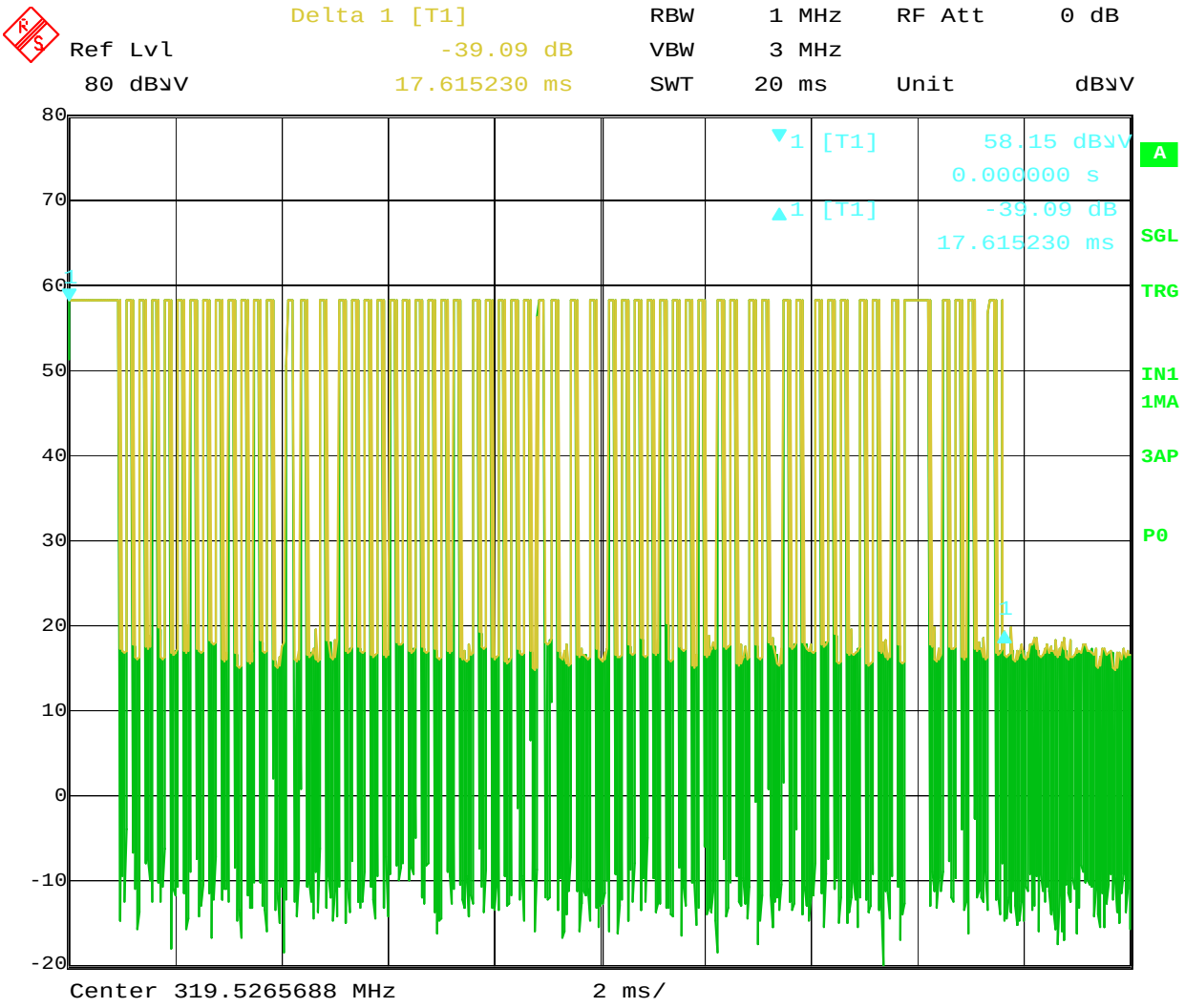
Software Utilized:

Name	Manufacturer	Version
None		

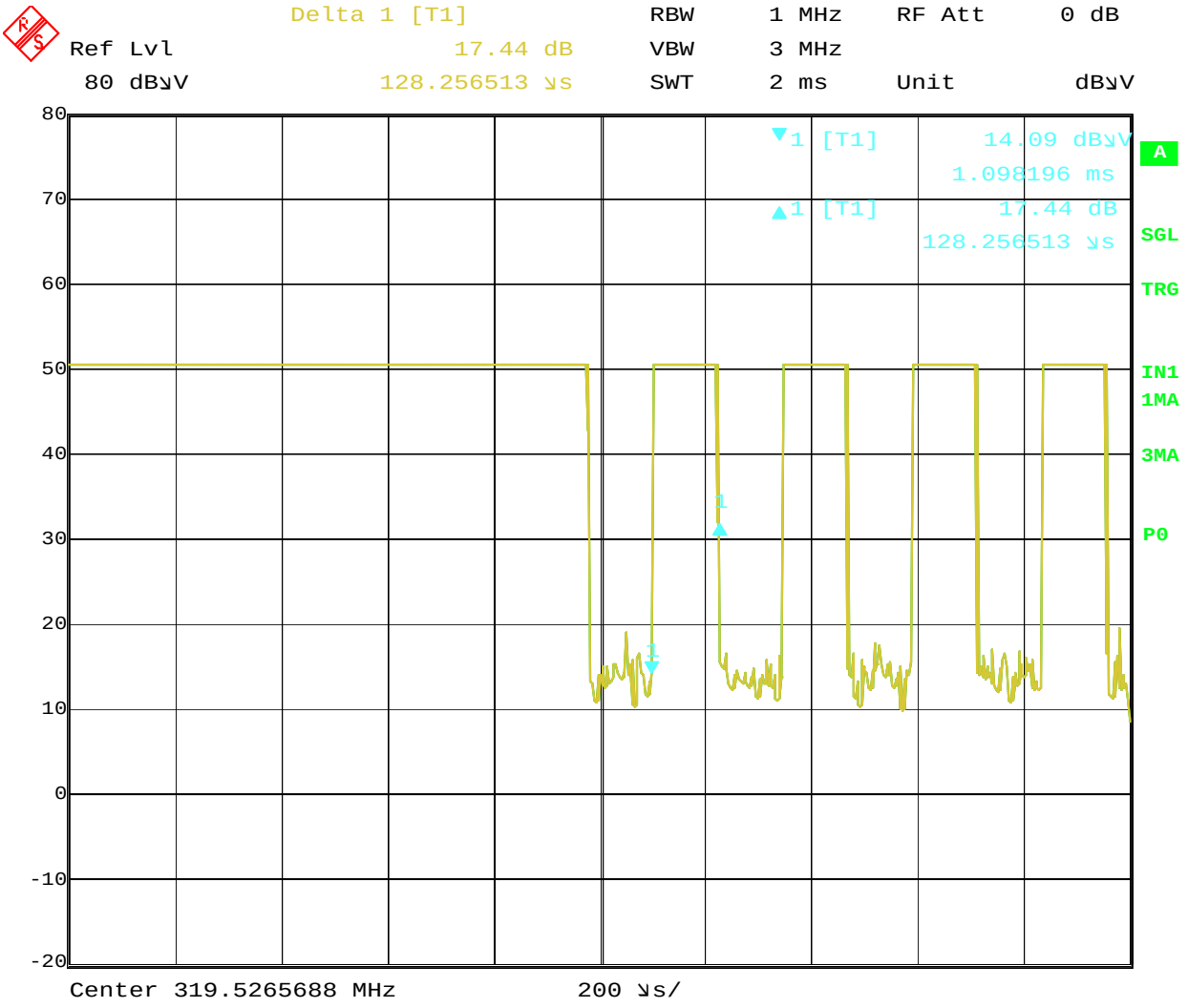
9.3 Results:

There is no limit on duty cycle, it is used to obtain the average value of emissions. The duty cycle average factor was determined to be 20.98 dB.

9.4 Plots/Data:

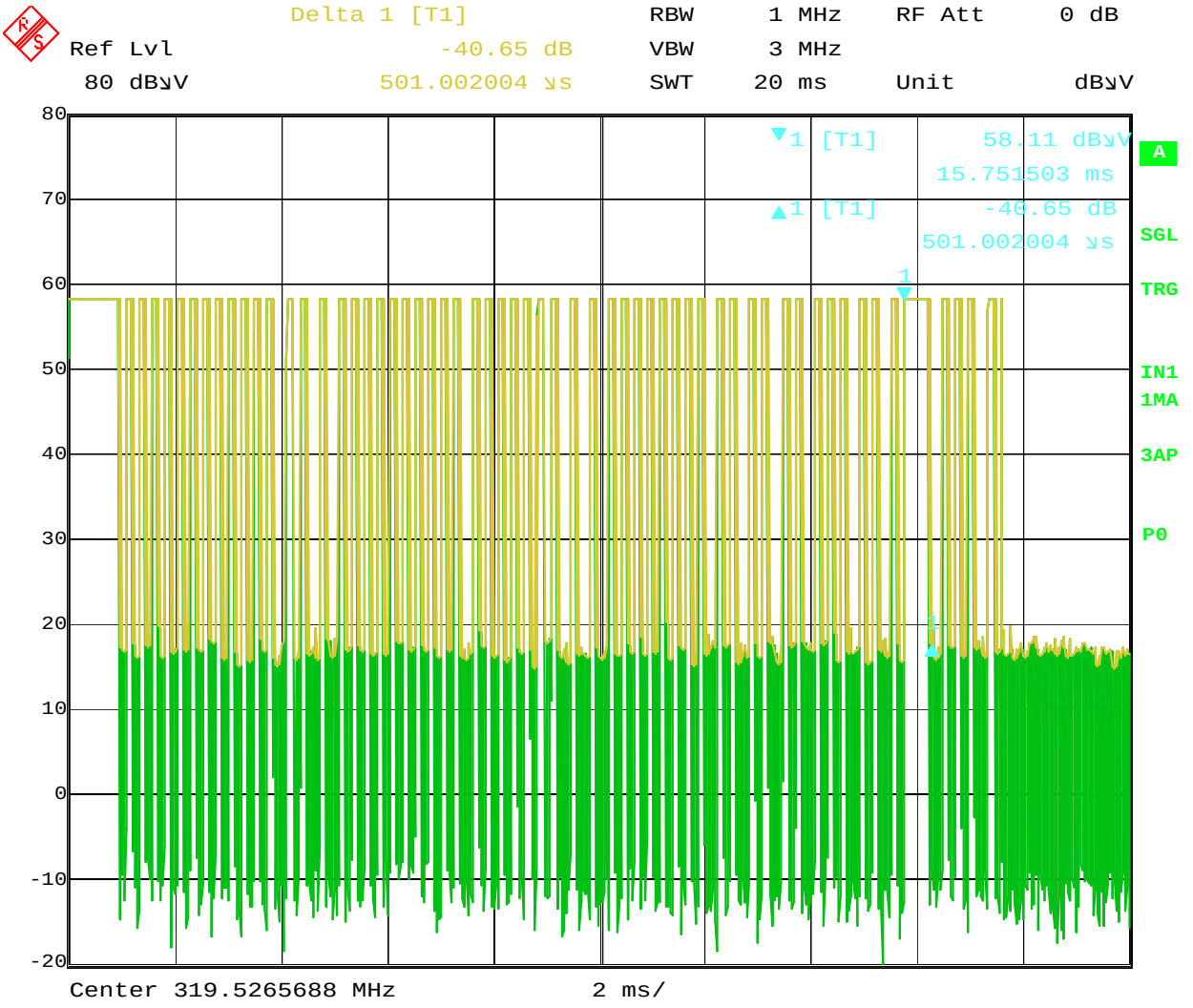


Complete 17.6ms pulse train consisting of 1 long word, 1 medium word, and ~58 short words

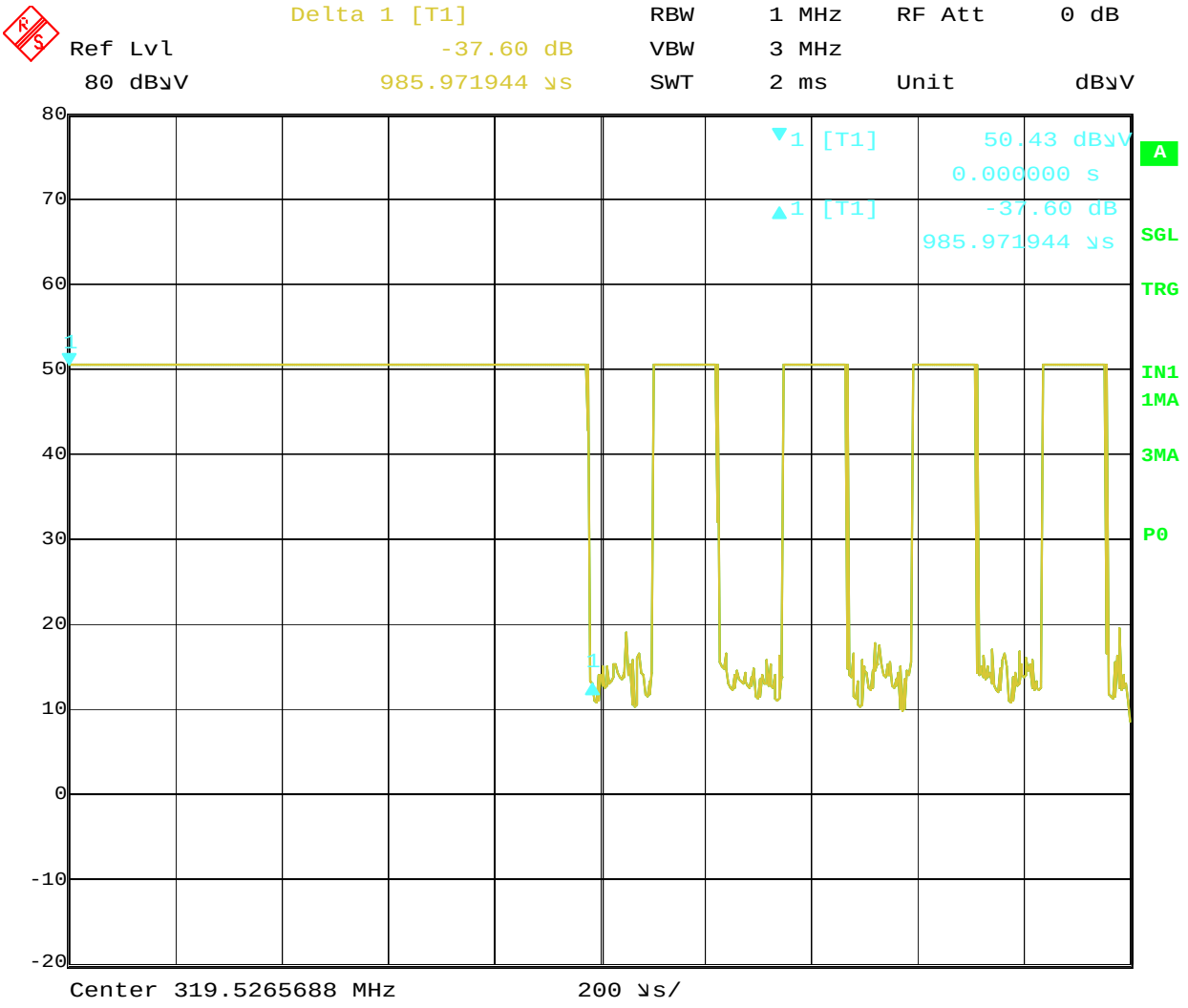


Date: 28.JUN.2012 23:07:11

128 us short word length

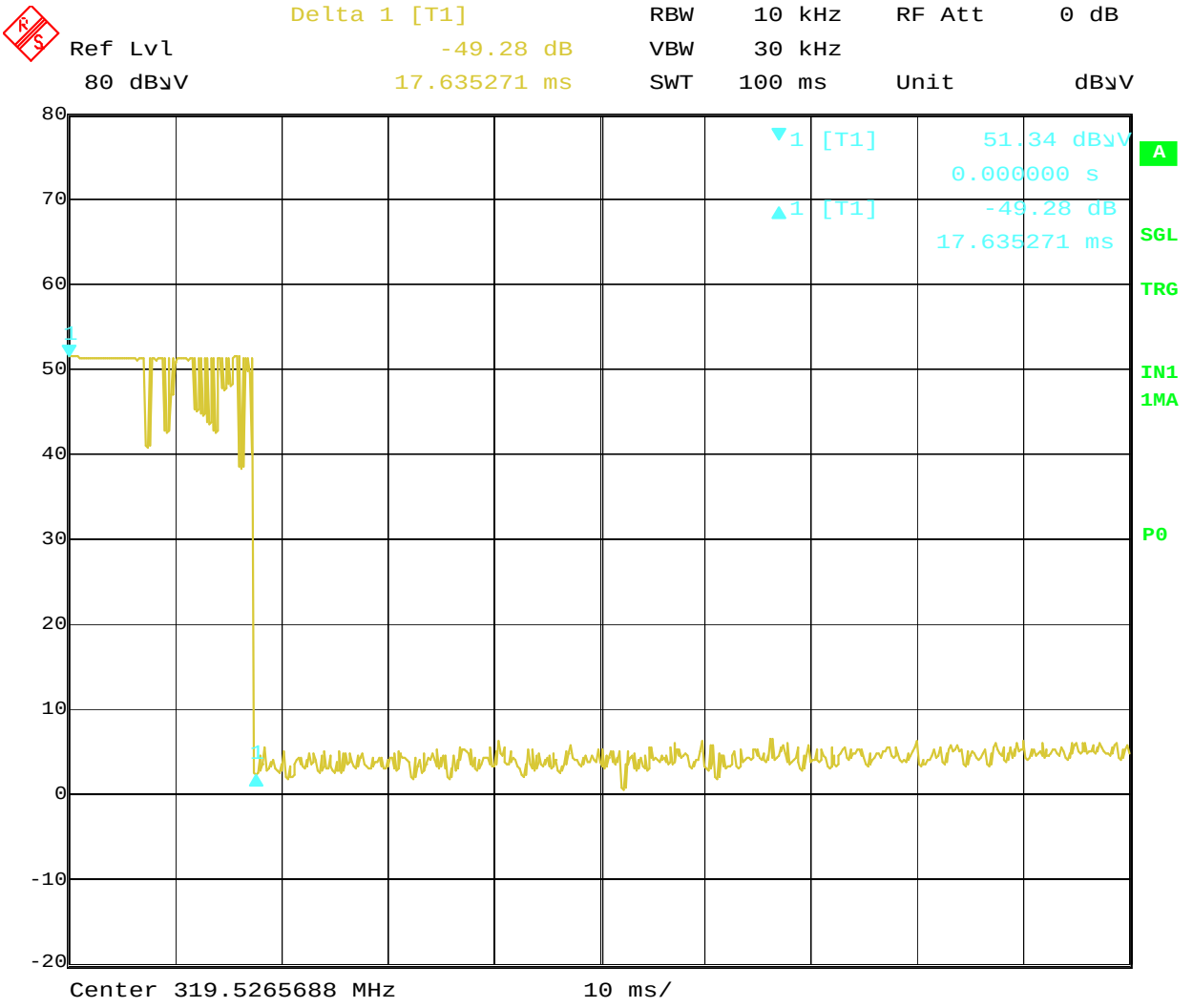


501 us medium word length



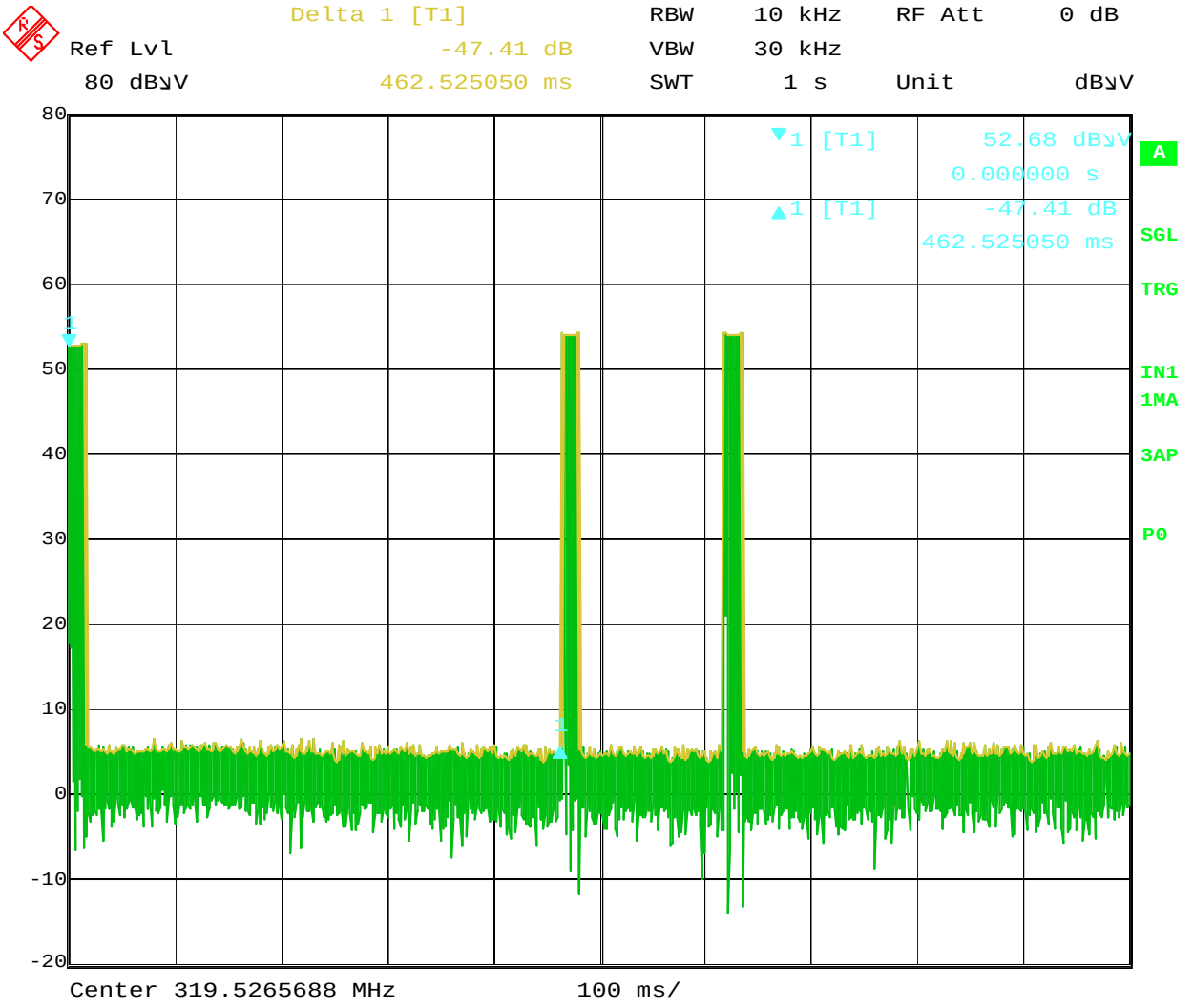
Date: 28.JUN.2012 23:04:13

986 us long word length



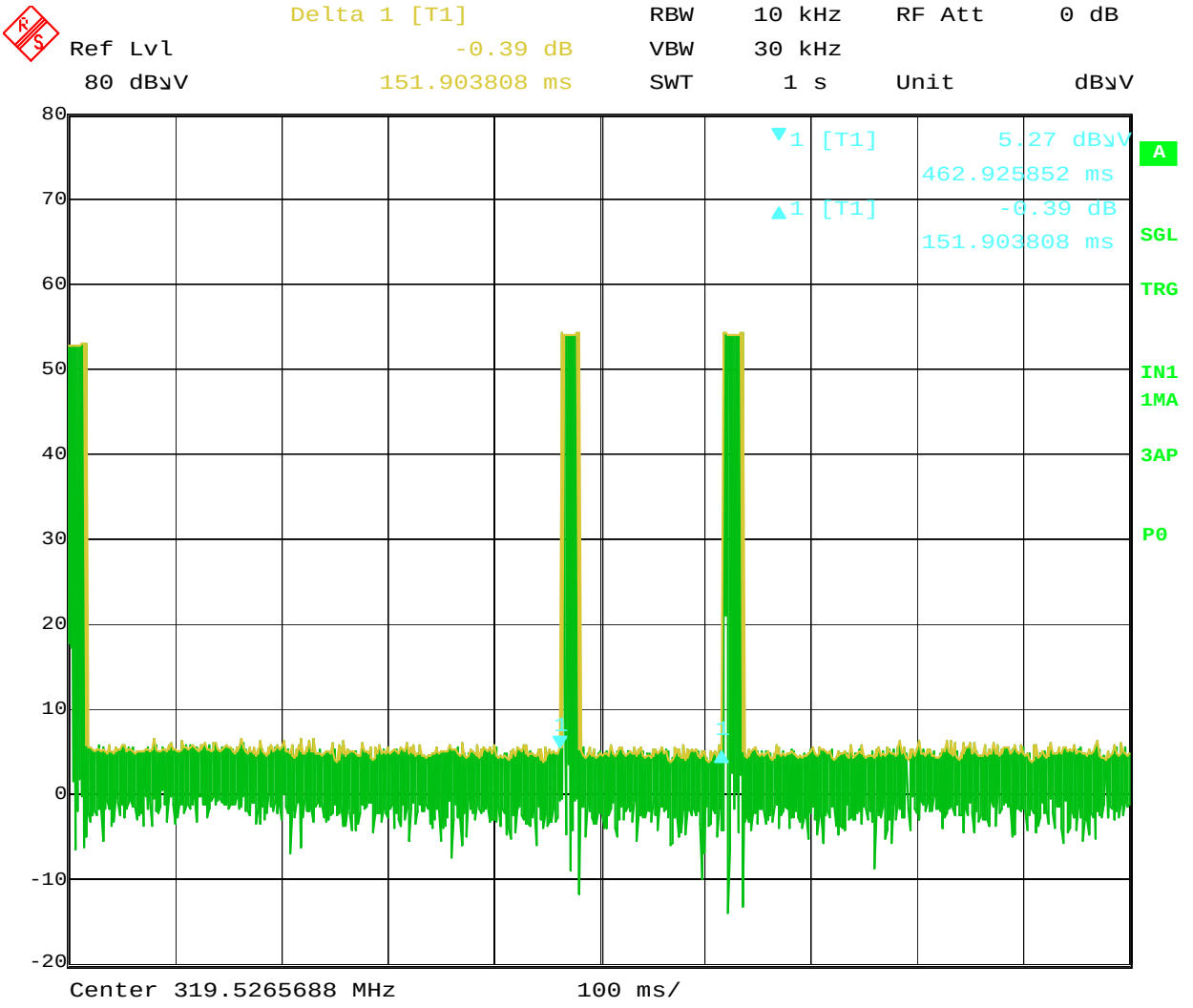
Date: 28.JUN.2012 22:53:47

17.6 ms burst shown with a 100ms span – only one burst



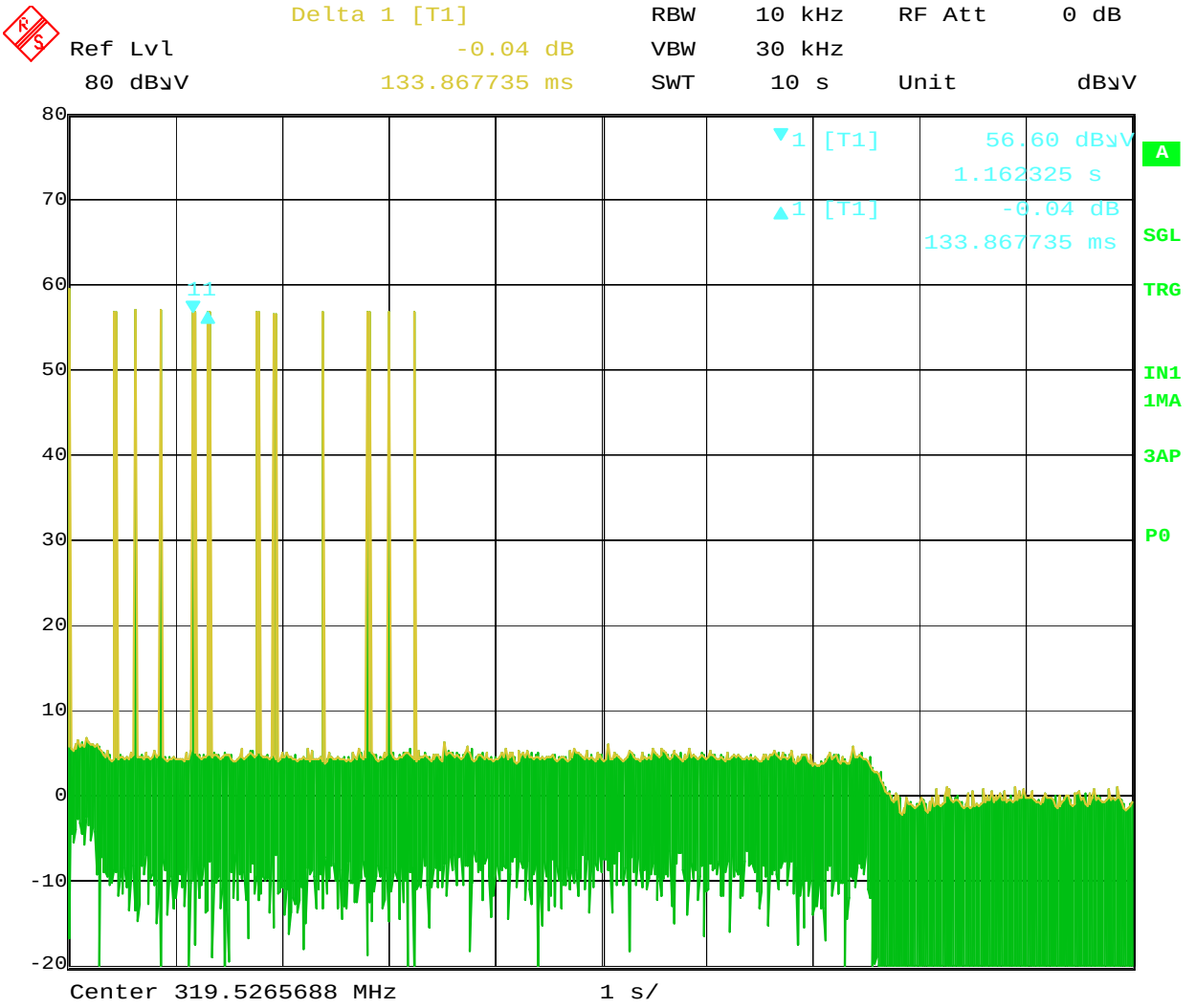
Date: 28.JUN.2012 22:57:26

Typical burst interval – long burst interval (always greater than 100ms)



Date: 28.JUN.2012 22:58:02

Typical burst interval – short burst interval (always greater than 100ms)



Date: 28.JUN.2012 23:00:11

Typical burst interval – long time domain snapshot. At 1s/division, the sequence of twelve pulses extends over nearly 3.5 seconds.

Note that the burst length is 17.6 ms consisting of 58 short 128.25us words, one medium 501 us word, and one long 986 us word. The burst interval is always at least 100 ms, and no more than one burst occurs in a 100 ms timeframe. Per the explanation below, the pulse train consists of 12 smaller pulse trains randomly spaced over 3.5 seconds.

Per Robert Venditti from Philips Lifeline:

> When the button is pushed, the device will send out one message consisting of 12 pulses randomly spaced over a ~3500 msec period. A feature of our system is to determine the location of the button push via the closest receiver. This is done by measuring the RSSI of the 12 pulses in one message. Because the RSSI reading of a single pulse can be noisy or affected by interference, it is important for the receiver to average the RSSI signal of all pulses received. The averaging of the pulses' RSSI is key in making the locating decision. Because the "closest receiver" concept is not an exact science when using RF signal strength, we were able to make it work reasonably well using the averaging of the pulse train.

Total on time in burst = 58*128.25us + 1*501us + 1*986us = 8.93 ms on time in burst
Pulse Train length = ~3.5s (>100ms)
Duty cycle percentage = 8.93/100 = 8.93%

The duty cycle correction factor is therefore 20*LOG(0.0893) = 20.98 dB

Test Personnel:	John R. Cauvel J.R.C	Test Date:	6-28-2012
Supervising/Reviewing Engineer: (Where Applicable)	Nicholas Abbondante N N A		
Product Standard:	FCC CFR 47 Part 15 Subpart C and IC RSS-210	Test Levels:	See Data
Input Voltage:	3.6V Battery		
Pretest Verification w/ Ambient Signals or BB Source:	**YES**	Ambient Temperature:	21 ºC
		Relative Humidity:	53 %
		Atmospheric Pressure:	995 mbars

Deviations, Additions, or Exclusions: None

10 5 Second Shut Off

10.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210
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TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
145128	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	08/23/2011	08/23/2012
Dav003	Weather Station	Davis Instruments	7400	PE80529A39A	08/17/2011	08/02/2012

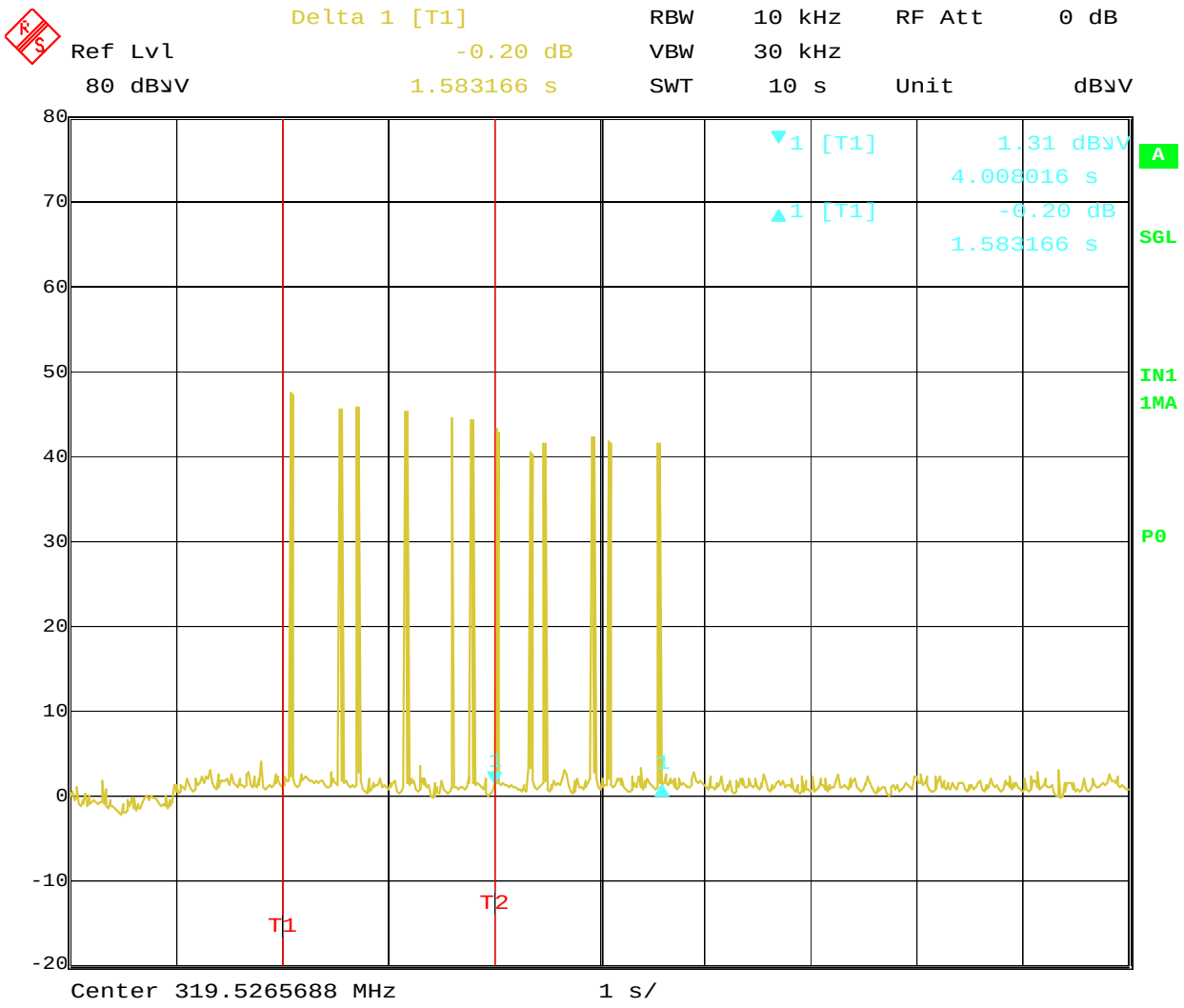
Software Utilized:

Name	Manufacturer	Version
None		

10.3 Results:

The sample tested was found to Comply. A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

10.4 Plots/Data:



Date: 28.JUN.2012 22:48:58

T1 corresponds to transmitter key on
T2 corresponds to transmitter button release
The measured shut off time after button press and release is 1.58s, with the overall pulse train being on the order of 3.5 seconds.

Test Personnel:	John R. Cauvel J.R.C	Test Date:	6-28-2012
Supervising/Reviewing Engineer: (Where Applicable)	Nicholas Abbondante NNA		
Product Standard:	FCC CFR 47 Part 15 Subpart C and IC RSS-210	Test Levels:	See Data
Input Voltage:	3.6V Battery		
Pretest Verification w/ Ambient Signals or BB Source:	**YES**	Ambient Temperature:	21 ºC
		Relative Humidity:	53 %
		Atmospheric Pressure:	995 mbars

Deviations, Additions, or Exclusions: None

11 Revision History

Revision Level	Date	Report Number	Notes
0	6/28/2012	100764703BOX-001	Original Issue
1	07/02/2012	100764703BOX-001a	Updated duty cycle calculation and corresponding average results reflecting details provided by Philips Lifeline.