EMC TEST REPORT

(FULL COMPLIANCE)

Report Number: 102965577BOX-016
Project Number: G102965577

Report Issue Date: 06/08/2017

Model(s) Tested: 7100MHB (Bluetooth Low Energy)
Model(s) Not Tested but declared equivalent by the client: 7150MHB

Standards: FCC Part 15 Subpart C: 04/2017
FCC Part 15 Subpart B: 04/2017
RSS 247 Issue 2: 02/2017
RSS 102 Issue 5: 03/2015
ICES 003 Issue 6: 01/2016

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

Client:
Philips Lifeline.
111 Lawrence St
Framingham, MA 01702-8156
USA

Report prepared by Naga Suryadevara

Naga Suryadevara/EMC Engineer

Report reviewed by Michael F Murphy

Michael F Murphy/Technical Team Lead

Table of Contents

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. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	
4	Description of Equipment Under Test and Variant Models	
5	System Setup and Method	
6	Output Power and Human RF Exposure (CFR47 FCC Part 15 Subpart C (15.247): 04/2017 RSS 247: 02/2017 RSS 102: 03/2015)	Pass
7	Power Spectral Density (CFR47 FCC Part 15 Subpart C (15.247): 04/2017 RSS 247: 02/2017)	Pass
8	Occupied (99%) and 6 dB Bandwidth (CFR47 FCC Part 15 Subpart C (15.247): 04/2017 RSS 247: 02/2017)	Pass
9	Transmitter Spurious Emissions (Band Edge, Out of Band, Digital Device and Receiver) (CFR47 FCC Part 15 Subpart C (15.247): 04/2017 CFR47 FCC Part 15 Subpart B: 04/2017 RSS 247: 02/2017 ICES 003: 01/2016)	Pass
10	AC Mains Conducted Emissions (CFR47 FCC Part 15 Subpart B: 04/2017 ICES 003: 01/2016)	Pass
11	Revision History	

3 Client Information

This EUT was tested at the request of:

Client: Philips Lifeline
111 Lawrence St
Framingham, MA 01702-8156
USA

Contact: Bill Bekdash
Telephone: +972 9 9603900
Fax: None
Email: bill.bekdash@philips.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: Philips Lifeline
111 Lawrence St
Framingham, MA 01702-8156
USA.

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Medical alert system.	Philips Lifeline	7100MHB	1040000149 (Unit 1)
Medical alert system.	Philips Lifeline	7100MHB	1040000123 (Unit 2)
AC Adapter	Philips Lifeline	MANGO018-7.5B-USA2	(Not Labeled)

Receive Date:	04/20/2017
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
Medical alert system.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
Button (Internal Battery)	0.5A	N/A	Single
AC - DC Adapter (100-240VAC)	0.5A	50/60Hz	Single

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Bluetooth LE Transmit mode
2	Bluetooth LE Receive mode
3	Charging mode

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	X2.0.41619

Radio/Receiver Characteristics	
Frequency Band(s)	2402 – 2480 MHz
Modulation Type(s)	OFDM
Data rates	2 Mbps
Maximum Output Power	0.97 dBm (EIRP)
Test Channels	Channel low - 2402 MHz Channel middle - 2440 MHz Channel high - 2480 MHz
Occupied Bandwidth	1.867 MHz
Frequency Hopper: Number of Hopping Channels	N/A
Frequency Hopper: Channel Dwell Time	N/A
MIMO Information (# of Transmit and Receive antenna ports)	N/A
Equipment Type	Standalone Host
ETSI LBT/Adaptivity	N/A
ETSI Adaptivity Type	N/A
ETSI Temperature Category (I, II, III)	N/A
ETSI Receiver Category (1, 2, 3)	N/A
Antenna Type and Gain	Ceramic Chip Antenna, gain varies from 0.7 to 1.7 dBi

Variant Models:

The following variant models were not tested as part of this evaluation, but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

7150MHB

The models covered are 7100MHB and 7150MHB. The tested model covered in this report is the 7100MHB. It represents the worse-case of the 7100MHB and 7150MHB. According to the manufacturer, the 7150MHB help button is physically identical to the 7100MHB. They both have the exactly same hardware, including cellular, WiFi, Bluetooth modules. The only difference is in the firmware configuration on turning ON/OFF the ISM transceiver.

The 7100MHB is configured to use the ISM transceiver to report alarm and device status via 7000C or 7000L communicator when the 7100MHB user is at home. The 7150MHB is configured NOT to use the ISM transceiver, and report alarm and device status ONLY through the cell network. Note that when the 7100MHB is out of the 7000C or 7000L communicators range, it behaves exactly the same as 7150MHB

5 System Setup and Method

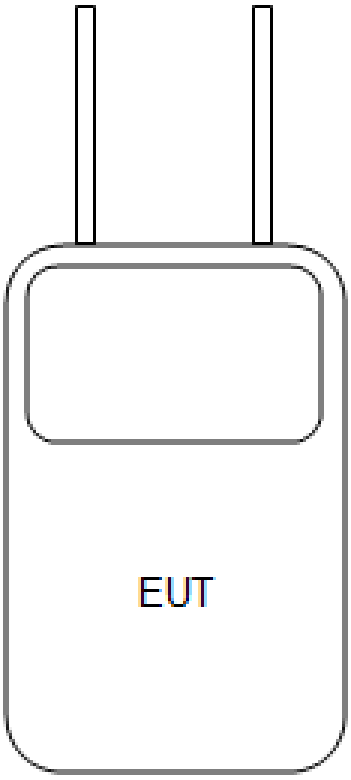
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
--	Adapter to charging cup (fixed)	2	None	None	Charger

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Laptop	Toshiba	Satellite-C55-B5272	5E247026P

5.1 Method:

Configuration as required by FCC Part 15 Subpart C: 06/2017, FCC Part 15 Subpart B: 06/2017, RSS 247 Issue 2: 02/2017, RSS 102 Issue 5: 03/2015, ICES 003 Issue 6: 01/2016, ANSI C 63.10: 2013 and ANSI C 63.4: 2014

5.2 EUT Block Diagram:



6 Output Power and Human RF Exposure

6.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C (15.247) and RSS 247.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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

Alternately, when C5 Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. “AF” is the Antenna Factor; “PA+CL” are Preamp and Cable Loss. These are already accounted for in the “Level” column.

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61 A	05/02/2016	05/02/2017
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	05/13/2016	05/13/2017
145-416'	Cables 145-420 145-423 145-424 145-408	Huber + Suhner	3m Track B cables	multiple	07/30/2016	07/30/2017

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xlsx	Intertek Boxborough	08/27/2010

6.3 Results:

The sample tested was found to Comply. The limit for maximum peak output power(conducted) is 1 watt (30 dBm) for devices with antenna gain less than 6dBi. Since test was performed in radiated fashion a limit of 36dBm is used.

6.4 Plots/Data:

Low Channel 2402 MHz

Company: Philips Lifeline — Antenna & Cables: HF — Bands: N, LF, HF, SHF
Model #: 7100MHB — Antenna: ETS002 05-13-2017.txt — ETS002 05-13-2017.txt
Serial #: As specified in the report — Cable(s): 3M track B_10k-18GHz.txt — NONE.
Engineers: Vathana Ven — Location: 10m Chamber — Barometer: DAV004 — Filter: NONE
Project #: G102965577 — Date(s): 04/05/17
Standard: FCC Part 15 Subpart C 15.247 — Temp/Humidity/Pressure: 21c — 32% — 1005mB
Receiver: R&S ESI (145128) 03-15-2017 — Limit Distance (m): 3
PreAmp: 145-014_07-01-2017.txt — Test Distance (m): 3
PreAmp Used? (Y or N): N — Voltage/Frequency: Internal Battery — Frequency Range: Frequencies Shown
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	EIRP Net dBm	EIRP Limit dBm	Margin dB	Bandwidth
Note: RF Output Power, 2402 MHz, X-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2402.000	85.84	32.15	5.11	33.30	0.00	-5.42	36.00	-41.42	5/10 MHz
PK	H	2402.000	92.23	32.15	5.11	33.30	0.00	0.97	36.00	-35.03	5/10 MHz
PK	V	2402.000	85.84	32.15	5.11	33.30	0.00	-5.42	36.00	-41.42	1/3 MHz
PK	H	2402.000	92.22	32.15	5.11	33.30	0.00	0.96	36.00	-35.04	1/3 MHz
Note: RF Output Power, 2402 MHz, Y-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2402.000	83.33	32.15	5.11	33.30	0.00	-7.93	36.00	-43.93	5/10 MHz
PK	H	2402.000	86.19	32.15	5.11	33.30	0.00	-5.07	36.00	-41.07	5/10 MHz
PK	V	2402.000	83.33	32.15	5.11	33.30	0.00	-7.93	36.00	-43.93	1/3 MHz
PK	H	2402.000	86.19	32.15	5.11	33.30	0.00	-5.07	36.00	-41.07	1/3 MHz
Note: RF Output Power, 2402 MHz, Z-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2402.000	87.01	32.15	5.11	33.30	0.00	-4.25	36.00	-40.25	5/10 MHz
PK	H	2402.000	85.31	32.15	5.11	33.30	0.00	-5.95	36.00	-41.95	5/10 MHz
PK	V	2402.000	87.01	32.15	5.11	33.30	0.00	-4.25	36.00	-40.25	1/3 MHz
PK	H	2402.000	85.31	32.15	5.11	33.30	0.00	-5.95	36.00	-41.95	1/3 MHz

Mid Channel 2440 MHz

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	EIRP Net dBm	EIRP Limit dBm	Margin dB	Bandwidth
Note: RF Output Power, 2440 MHz, X-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2440.000	84.67	32.22	5.14	33.30	0.00	-6.49	36.00	-42.49	5/10 MHz
PK	H	2440.000	90.85	32.22	5.14	33.30	0.00	-0.31	36.00	-36.31	5/10 MHz
PK	V	2440.000	84.67	32.22	5.14	33.30	0.00	-6.49	36.00	-42.49	1/3 MHz
PK	H	2440.000	90.85	32.22	5.14	33.30	0.00	-0.31	36.00	-36.31	1/3 MHz
Note: RF Output Power, 2440 MHz, Y-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2440.000	83.64	32.22	5.14	33.30	0.00	-7.52	36.00	-43.52	5/10 MHz
PK	H	2440.000	89.20	32.22	5.14	33.30	0.00	-1.96	36.00	-37.96	5/10 MHz
PK	V	2440.000	83.64	32.22	5.14	33.30	0.00	-7.52	36.00	-43.52	1/3 MHz
PK	H	2440.000	89.20	32.22	5.14	33.30	0.00	-1.96	36.00	-37.96	1/3 MHz
Note: RF Output Power, 2440 MHz, Z-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2440.000	88.11	32.22	5.14	33.30	0.00	-3.05	36.00	-39.05	5/10 MHz
PK	H	2440.000	82.81	32.22	5.14	33.30	0.00	-8.35	36.00	-44.35	5/10 MHz
PK	V	2440.000	88.11	32.22	5.14	33.30	0.00	-3.05	36.00	-39.05	1/3 MHz
PK	H	2440.000	82.81	32.22	5.14	33.30	0.00	-8.35	36.00	-44.35	1/3 MHz

High Channel 2480 MHz

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	EIRP Net dBm	EIRP Limit dBm	Margin dB	Bandwidth
Note: RF Output Power, 2480 MHz, X-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2480.000	83.27	32.29	5.18	33.33	0.00	-7.80	36.00	-43.80	5/10 MHz
PK	H	2480.000	89.35	32.29	5.18	33.33	0.00	-1.72	36.00	-37.72	5/10 MHz
PK	V	2480.000	83.27	32.29	5.18	33.33	0.00	-7.80	36.00	-43.80	1/3 MHz
PK	H	2480.000	89.35	32.29	5.18	33.33	0.00	-1.72	36.00	-37.72	1/3 MHz
Note: RF Output Power, 2480 MHz, Y-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2480.000	84.46	32.29	5.18	33.33	0.00	-6.61	36.00	-42.61	5/10 MHz
PK	H	2480.000	87.15	32.29	5.18	33.33	0.00	-3.92	36.00	-39.92	5/10 MHz
PK	V	2480.000	84.46	32.29	5.18	33.33	0.00	-6.61	36.00	-42.61	1/3 MHz
PK	H	2480.000	87.15	32.29	5.18	33.33	0.00	-3.92	36.00	-39.92	1/3 MHz
Note: RF Output Power, 2480 MHz, Z-axis											
Note: EIRP Obtained by applying the path loss correction for a 3m test distance, E(dBuV/m)@3m - 95.22 = dBm EIRP											
PK	V	2480.000	85.77	32.29	5.18	33.33	0.00	-5.30	36.00	-41.30	5/10 MHz
PK	H	2480.000	85.57	32.29	5.18	33.33	0.00	-5.50	36.00	-41.50	5/10 MHz
PK	V	2480.000	85.77	32.29	5.18	33.33	0.00	-5.30	36.00	-41.30	1/3 MHz
PK	H	2480.000	85.57	32.29	5.18	33.33	0.00	-5.50	36.00	-41.50	1/3 MHz

FCC SAR Exemption per KDB 447498

Maximum output power measured = 0.97 dBm = 1.25025 mW

a) For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following:

[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,[30] where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz

= (1.25025/5)*(sqrt(2.402))

= 0.3874 < 3.0 (below the limit SAR Exempt per FCC)

RSS 102 SAR Exemption

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance[4,5]

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

The exemption limits in Table 1 are based on measurements and simulations of half-wave dipole antennas at separation distances of 5 mm to 25 mm from a flat phantom, providing a SAR value of approximately 0.4 W/kg for 1 g of tissue. For low frequencies (300 MHz to 835 MHz), the exemption limits are derived from a linear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from a third order polynomial fit.

The measured maximum output power 1.25025 mW is less than 2 mW limit at 3500 MHz. So the device meets the SAR exemption requirements.

Test Personnel:	Vathana F. Ven VFV	Test Date:	04/05/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart C (15.247) RSS 247	Limit Applied:	As specified in section 6.3
Input Voltage:	Internal Battery		
Pretest Verification w/ Ambient Signals or BB Source:	Yes – Signal generator	Ambient Temperature:	21 ºC
		Relative Humidity:	32 %
		Atmospheric Pressure:	1005 mbars

Deviations, Additions, or Exclusions: None

7 Power Spectral Density

7.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C (15.247) and RSS 247.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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

Alternately, when C5 Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. “AF” is the Antenna Factor; “PA+CL” are Preamp and Cable Loss. These are already accounted for in the “Level” column.

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61 A	05/02/2016	05/02/2017
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	05/13/2016	05/13/2017
145-416'	Cables 145-420 145-423 145-424 145-408	Huber + Suhner	3m Track B cables	multiple	07/30/2016	07/30/2017

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xlsx	Intertek Boxborough	08/27/2010

7.3 Results:

The sample tested was found to Comply. The limit for power spectral density is 8dBm.

7.4 Plots/Data:

Low Channel 2402 MHz

Company: Philips Lifeline — Antenna & Cables: HF — Bands: N, LF, HF, SHF
Model #: 7100MHB — Antenna: ETS002 05-13-2017.txt — ETS002 05-13-2017.txt
Serial #: As specified in the report — Cable(s): 3M track B_10k-18GHz.txt — NONE.
Engineers: Vathana Ven — Location: 10m Chamber — Barometer: DAV004 — Filter: NONE
Project #: G102965577 — Date(s): 04/05/17
Standard: FCC Part 15 Subpart C 15.247 — Temp/Humidity/Pressure: 21c — 32% — 1005mB
Receiver: R&S ESI (145128) 03-15-2017 — Limit Distance (m): 3
PreAmp: 145-014_07-01-2017.txt — Test Distance (m): 3
PreAmp Used? (Y or N): N — Voltage/Frequency: Internal Battery — Frequency Range: Frequencies Shown
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	EIRP Net dBm	EIRP Limit dBm	Margin dB	Bandwidth
Power spectral density, 2402 MHz, X-axis											
PK	V	2402.000	71.61	32.15	5.11	33.30	0.00	-19.65	8.00	-27.65	3/10 kHz
PK	H	2402.000	78.10	32.15	5.11	33.30	0.00	-13.16	8.00	-21.16	3/10 kHz
Power Spectral Density, 2402 MHz, Y-axis											
PK	V	2402.000	69.28	32.15	5.11	33.30	0.00	-21.98	8.00	-29.98	3/10 kHz
PK	H	2402.000	71.47	32.15	5.11	33.30	0.00	-19.79	8.00	-27.79	3/10 kHz
Power Spectral Density, 2402 MHz, Z-axis											
PK	V	2402.000	72.17	32.15	5.11	33.30	0.00	-19.09	8.00	-27.09	3/10 kHz
PK	H	2440.000	71.46	32.22	5.14	33.30	0.00	-19.70	8.00	-27.70	3/10 kHz

Mid Channel 2440 MHz

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	EIRP Net dBm	EIRP Limit dBm	Margin dB	Bandwidth
Power Spectral Density, 2440 MHz, X-axis											
PK	V	2440.000	70.33	32.22	5.14	33.30	0.00	-20.83	8.00	-28.83	3/10 kHz
PK	H	2440.000	77.10	32.22	5.14	33.30	0.00	-14.06	8.00	-22.06	3/10 kHz
Power Spectral Density, 2440 MHz, Y-axis											
PK	V	2440.000	69.87	32.22	5.14	33.30	0.00	-21.29	8.00	-29.29	3/10 kHz
PK	H	2440.000	76.03	32.22	5.14	33.30	0.00	-15.13	8.00	-23.13	3/10 kHz
Power Spectral Density, 2440 MHz, Z-axis											
PK	V	2440.000	73.42	32.22	5.14	33.30	0.00	-17.74	8.00	-25.74	3/10 kHz
PK	H	2440.000	69.33	32.22	5.14	33.30	0.00	-21.83	8.00	-29.83	3/10 kHz

High Channel 2480 MHz

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	EIRP Net dBm	EIRP Limit dBm	Margin dB	Bandwidth
Power Spectral Density, 2480 MHz, X-axis											
PK	V	2480.000	68.89	32.29	5.18	33.33	0.00	-22.18	8.00	-30.18	3/10 kHz
PK	H	2480.000	74.40	32.29	5.18	33.33	0.00	-16.67	8.00	-24.67	3/10 kHz
Power Spectral Density, 2480 MHz, Y-axis											
PK	V	2480.000	70.38	32.29	5.18	33.33	0.00	-20.69	8.00	-28.69	3/10 kHz
PK	H	2480.000	72.76	32.29	5.18	33.33	0.00	-18.31	8.00	-26.31	3/10 kHz
Power Spectral Density, 2480 MHz, Z-axis											
PK	V	2480.000	71.25	32.29	5.18	33.33	0.00	-19.82	8.00	-27.82	3/10 kHz
PK	H	2480.000	71.76	32.29	5.18	33.33	0.00	-19.31	8.00	-27.31	3/10 kHz

Test Personnel:	Vathana F. Ven VFV	Test Date:	04/05/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart C (15.247) RSS 247	Limit Applied:	As specified in section 7.3
Input Voltage:	Internal Battery		
Pretest Verification w/ Ambient Signals or BB Source:	Yes – Signal generator	Ambient Temperature:	21 ºC
		Relative Humidity:	32 %
		Atmospheric Pressure:	1005 mbars

Deviations, Additions, or Exclusions: None

8 Occupied and 6dB Bandwidth

8.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C (15.247) and RSS 247.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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

Alternately, when C5 Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. “AF” is the Antenna Factor; “PA+CL” are Preamp and Cable Loss. These are already accounted for in the “Level” column.

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61 A	05/02/2016	05/02/2017
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	05/13/2016	05/13/2017
145-416'	Cables 145-420 145-423 145-424 145-408	Huber + Suhner	3m Track B cables	multiple	07/30/2016	07/30/2017

Software Utilized:

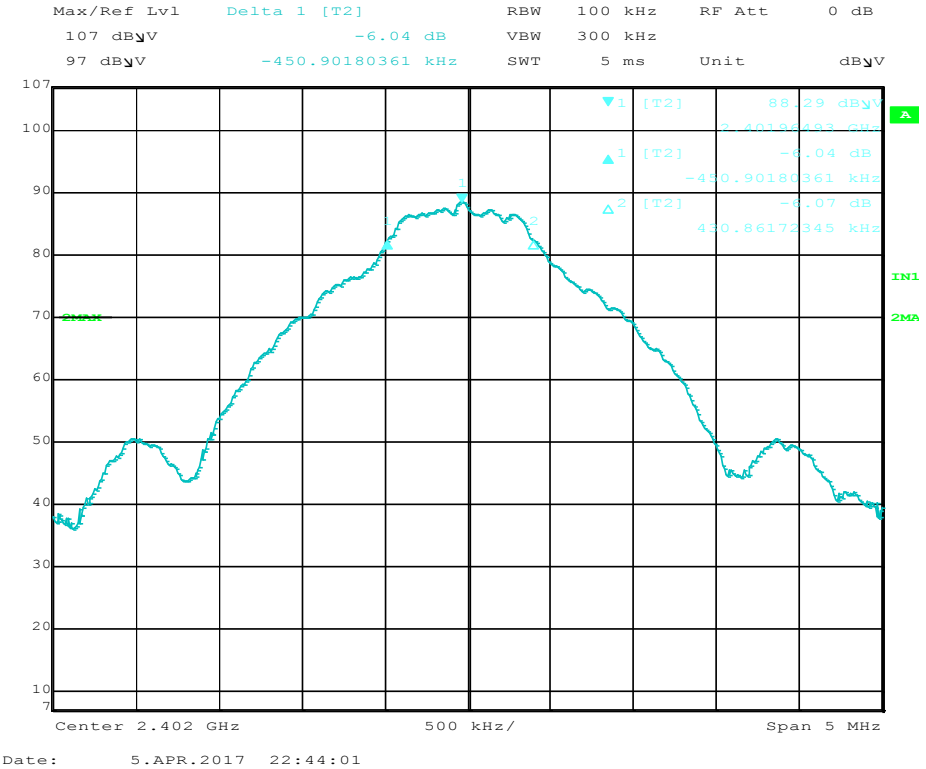
Name	Manufacturer	Version
None		

8.3 Results:

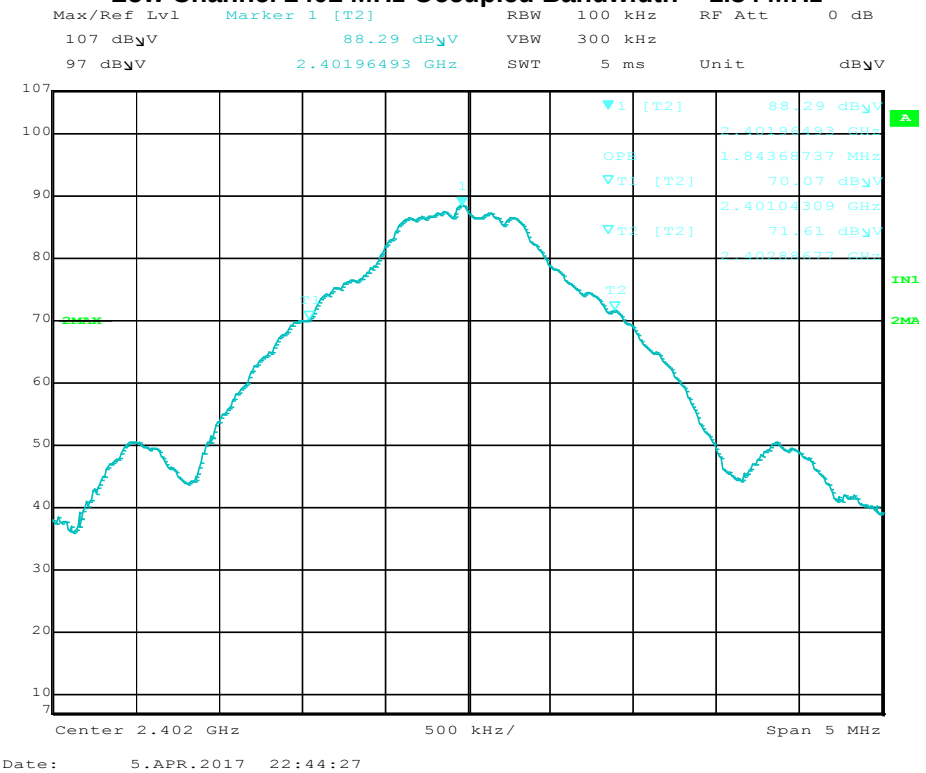
The sample tested was found to Comply. DTS devices shall have a minimum 6dB bandwidth of 500 kHz

8.4 Plots/Data:

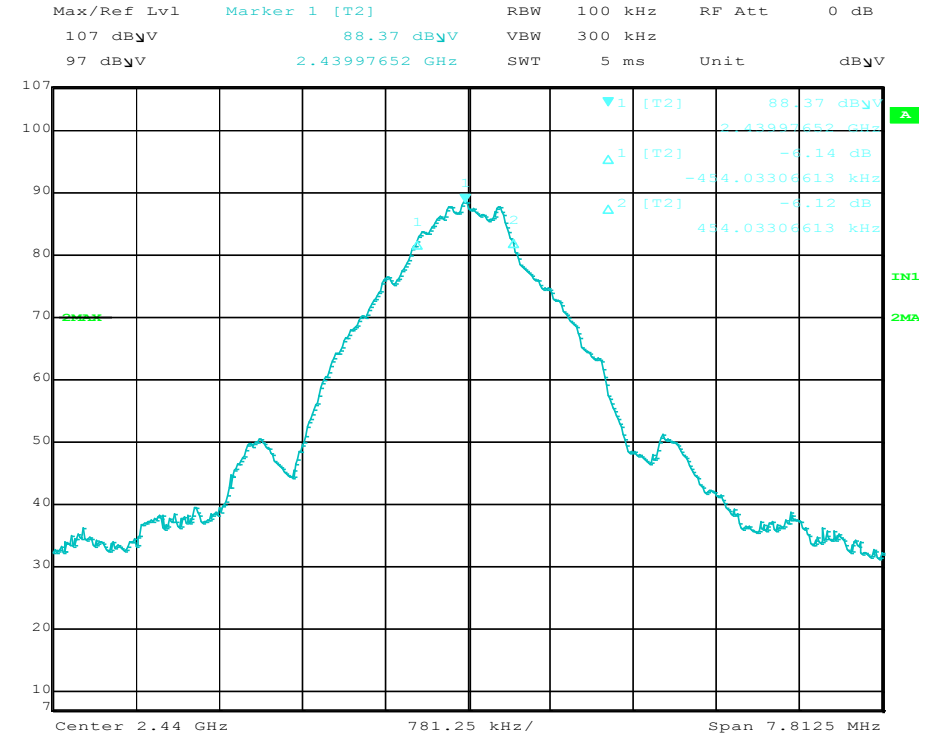
Low Channel 2402 MHz 6dB Bandwidth = 861.76 kHz



Low Channel 2402 MHz Occupied Bandwidth = 1.84 MHz

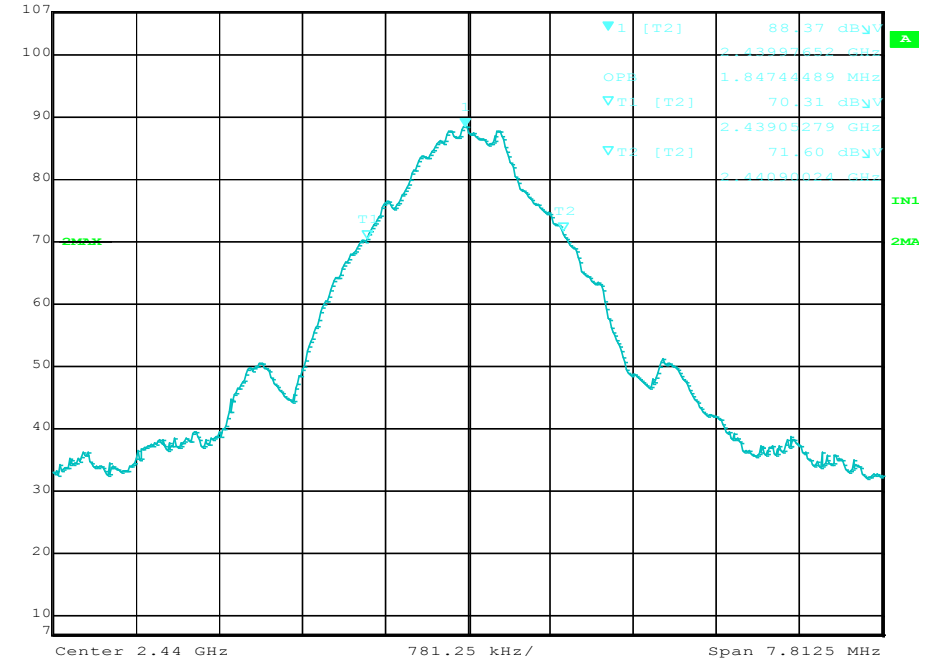


Mid Channel 2440 MHz 6dB Bandwidth = 868.066 kHz



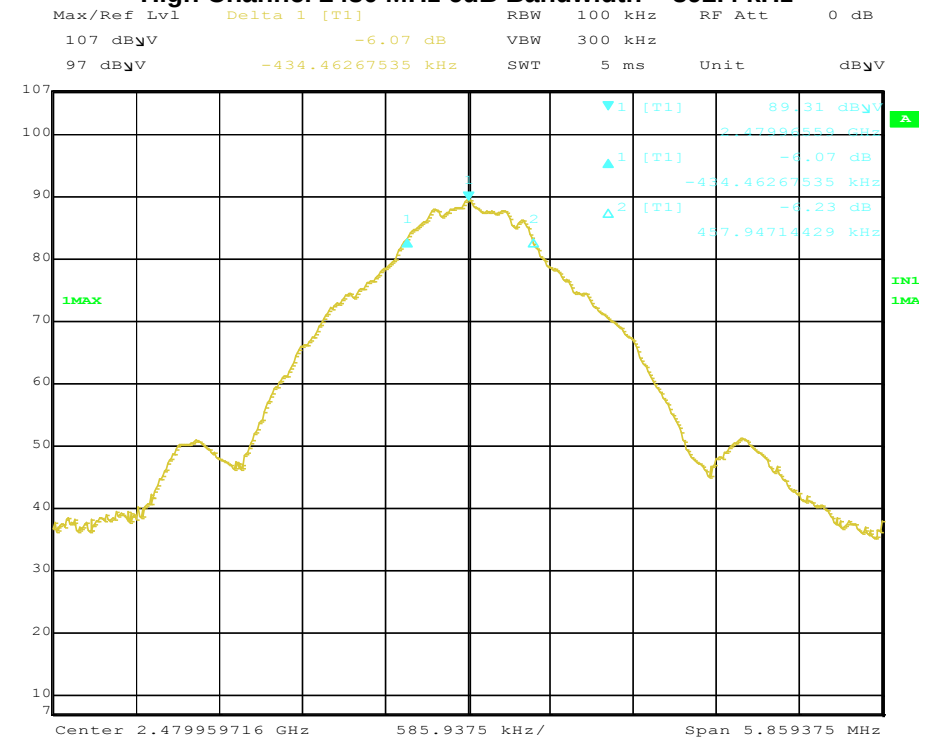
Date: 5.APR.2017 20:04:34

Mid Channel 2440 MHz Occupied Bandwidth = 1.847 MHz



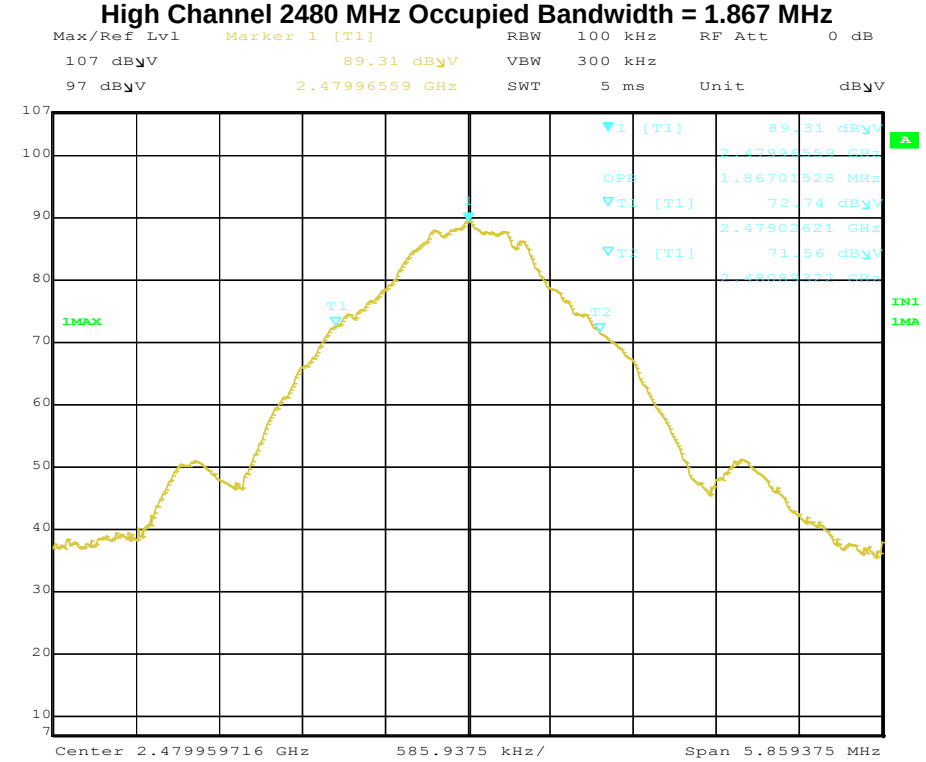
Date: 5.APR.2017 20:05:04

High Channel 2480 MHz 6dB Bandwidth = 892.4 kHz



Date: 5.APR.2017 18:37:02

High Channel 2480 MHz Occupied Bandwidth = 1.867 MHz



Date: 5.APR.2017 18:37:38

Test Personnel:	Vathana F. Ven VFV	Test Date:	04/05/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart C (15.247) RSS 247	Limit Applied:	As specified in section 8.3
Input Voltage:	Internal Battery		
Pretest Verification w/ Ambient Signals or BB Source:	Yes – Signal generator	Ambient Temperature:	21 ºC
		Relative Humidity:	32 %
		Atmospheric Pressure:	1005 mbars

Deviations, Additions, or Exclusions: None

9 Radiated Emissions (Transmitter Spurious - Out of Band and Band edge Emissions, Digital Device and Receiver)

9.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C (15.247), RSS 247, FCC Part 15 Subpart B and ICES 003.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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

Alternately, when C5 Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. “AF” is the Antenna Factor; “PA+CL” are Preamp and Cable Loss. These are already accounted for in the “Level” column.

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61 A	05/02/2016	05/02/2017
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	05/03/2016	05/03/2017
145-410'	Cables 145-420 145-421 145-422 145-406	Huber + Suhner	10m Track A Cables	multiple	07/30/2016	07/30/2017
PRE10'	30-1000MHz pre-amp	ITS	PRE10	PRE10	12/16/2016	12/16/2017
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	05/13/2016	05/13/2017
145014'	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	05/27/2016	05/27/2017
EMC04'	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	09/14/2016	09/14/2017
REA004'	3GHz High Pass Filter	Reactel, Inc	7HSX-3G/18G-S11	06-1	02/17/2017	02/17/2018
PRE9'	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	08/23/2016	08/23/2017
CBLHF2012 -2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/08/2017	02/08/2018
CBLHF2012 -5M-1'	5m 9kHz-40GHz Coaxial Cable - SET 1	Huber & Suhner	SF102	252676001	02/08/2017	02/08/2018
145-416'	Cables 145-420 145-423 145-424 145-408	Huber + Suhner	3m Track B cables	multiple	07/30/2016	07/30/2017

Software Utilized:

Name	Manufacturer	Version
None		

9.3 Results:

The sample tested was found to Comply.

9.4 Plots/Data:

30-12500 MHz – Spurious Emissions (Digital Device and Receiver)

				30 - 1000 MHz - Battery							
QP	V	37.989	27.12	15.33	1.29	40.72	0.00	3.01	30.00	-26.99	120/300 kHz
QP	H	41.120	27.68	13.32	1.31	40.72	0.00	1.59	30.00	-28.41	120/300 kHz
QP	H	288.120	29.23	13.44	3.09	40.68	0.00	5.07	36.00	-30.93	120/300 kHz
QP	H	299.976	26.19	13.50	3.14	40.69	0.00	2.14	36.00	-33.86	120/300 kHz
QP	V	303.120	24.21	13.76	3.16	40.69	0.00	0.44	36.00	-35.56	120/300 kHz
QP	V	333.190	23.56	14.37	3.33	40.73	0.00	0.53	36.00	-35.47	120/300 kHz
				30 - 1000 MHz - Charging							
QP	V	37.989	26.98	15.33	1.29	40.72	0.00	2.87	30.00	-27.13	120/300 kHz
QP	H	41.190	27.59	13.27	1.31	40.72	0.00	1.45	30.00	-28.55	120/300 kHz
QP	H	288.090	28.78	13.44	3.09	40.68	0.00	4.62	36.00	-31.38	120/300 kHz
QP	V	312.120	27.12	14.08	3.21	40.70	0.00	3.71	36.00	-32.29	120/300 kHz
QP	H	326.170	25.23	14.18	3.29	40.73	0.00	1.97	36.00	-34.03	120/300 kHz
QP	V	353.120	24.45	14.72	3.43	40.75	0.00	1.86	36.00	-34.14	120/300 kHz

Note: No emissions above noise floor were detected above 1 GHz

30-1000 MHz – Transmitter Spurious Emissions (Tx on Low Channel)

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
				30 - 1000 MHz Tx mode - X axis							
QP	V	38.060	25.02	15.28	1.29	40.72	0.00	0.86	30.00	-29.14	120/300 kHz
QP	V	126.210	25.64	13.98	2.15	40.66	0.00	1.10	33.50	-32.40	120/300 kHz
QP	H	287.938	27.00	13.44	3.08	40.68	0.00	2.84	36.00	-33.16	120/300 kHz
QP	V	299.976	25.70	13.70	3.14	40.69	0.00	1.85	36.00	-34.15	120/300 kHz
QP	H	332.120	23.22	14.10	3.32	40.73	0.00	-0.09	36.00	-36.09	120/300 kHz
QP	V	358.190	23.50	14.86	3.45	40.76	0.00	1.06	36.00	-34.94	120/300 kHz
				30 - 1000 MHz Tx mode - Y axis							
QP	V	38.060	24.12	15.28	1.29	40.72	0.00	-0.03	30.00	-30.03	120/300 kHz
QP	V	129.200	26.19	13.92	2.18	40.66	0.00	1.62	33.50	-31.88	120/300 kHz
QP	V	286.980	25.87	13.44	3.08	40.68	0.00	1.71	36.00	-34.29	120/300 kHz
QP	V	299.976	26.23	13.70	3.14	40.69	0.00	2.38	36.00	-33.62	120/300 kHz
QP	H	332.120	24.22	14.10	3.32	40.73	0.00	0.91	36.00	-35.09	120/300 kHz
QP	H	358.190	23.49	14.76	3.45	40.76	0.00	0.95	36.00	-35.05	120/300 kHz
				30 - 1000 MHz Tx mode - Z axis							
QP	V	38.060	23.29	15.28	1.29	40.72	0.00	-0.86	30.00	-30.86	120/300 kHz
QP	V	126.760	25.64	13.96	2.16	40.66	0.00	1.10	33.50	-32.40	120/300 kHz
QP	V	287.020	27.23	13.44	3.08	40.68	0.00	3.07	36.00	-32.93	120/300 kHz
QP	V	299.976	26.19	13.70	3.14	40.69	0.00	2.34	36.00	-33.66	120/300 kHz
QP	H	332.120	24.21	14.10	3.32	40.73	0.00	0.90	36.00	-35.10	120/300 kHz
QP	H	358.190	23.56	14.76	3.45	40.76	0.00	1.02	36.00	-34.98	120/300 kHz

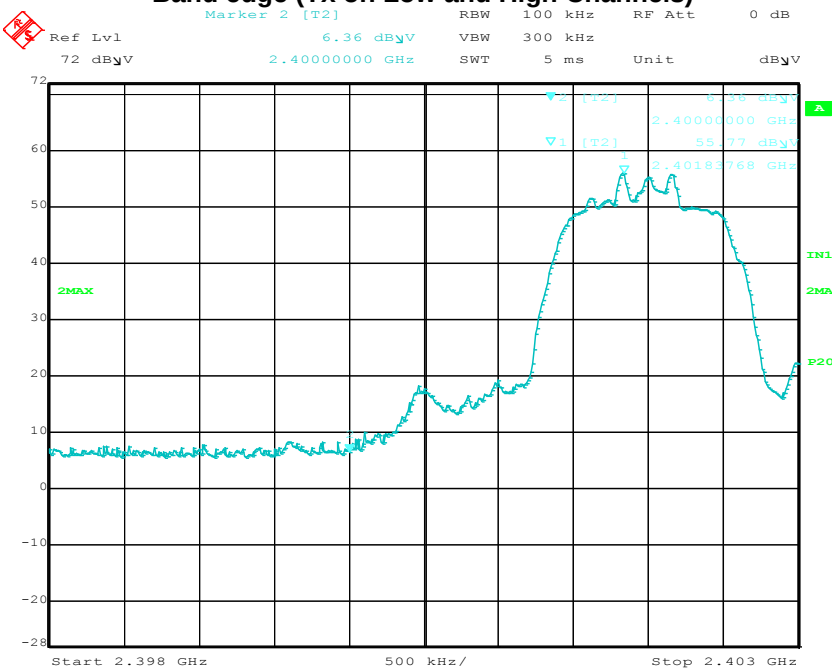
Note: All testing was performed with EUT Tx on low channel where max power was measured

1-40 GHz - Transmitter Spurious Emissions (Tx on Low, Mid and High Channels)

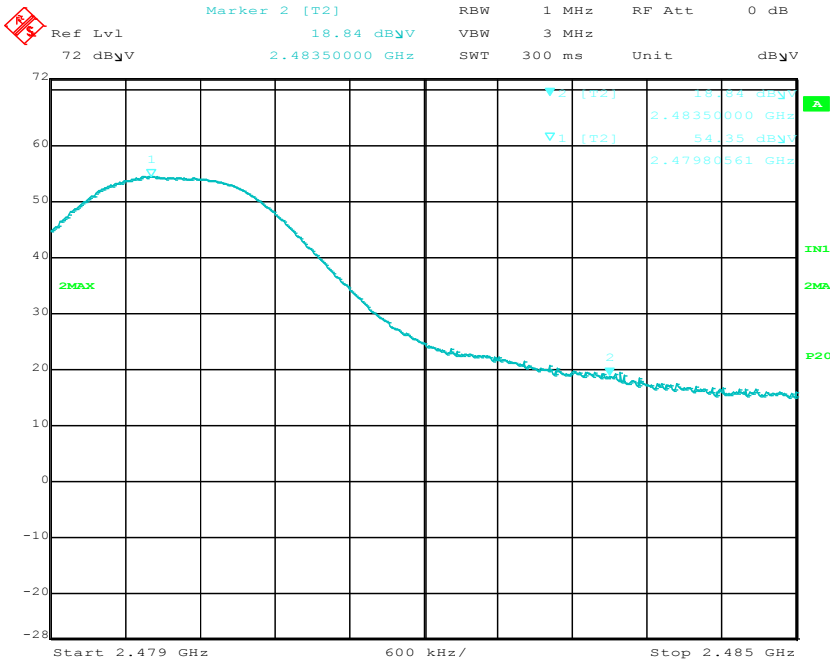
Note: Spurious Emissions, X-axis, Lo Channel											
PK	H	4804.000	37.67	33.59	9.16	33.88	0.00	46.54	74.00	-27.47	1/3 MHz
AVG	H	4804.000	24.78	33.59	9.16	33.88	0.00	33.65	54.00	-20.36	1/3 MHz
PK	H	7206.000	41.08	36.28	10.84	34.63	0.00	53.57	74.00	-20.43	1/3 MHz
AVG	H	7206.000	28.99	36.28	10.84	34.63	0.00	41.48	54.00	-12.52	1/3 MHz
PK	H	9608.000	37.82	39.20	13.14	35.06	0.00	55.09	74.00	-18.91	1/3 MHz
AVG	H	9608.000	24.43	39.20	13.14	35.06	0.00	41.70	54.00	-12.30	1/3 MHz
PK	H	12010.000	35.54	39.58	14.98	33.36	0.00	56.73	74.00	-17.27	1/3 MHz
AVG	H	12010.000	22.50	39.58	14.98	33.36	0.00	43.69	54.00	-10.31	1/3 MHz
Note: Spurious Emissions, Y-axis, Lo Channel											
PK	H	4804.000	37.67	33.59	9.16	33.88	0.00	46.54	74.00	-27.47	1/3 MHz
AVG	H	4804.000	24.78	33.59	9.16	33.88	0.00	33.65	54.00	-20.36	1/3 MHz
PK	H	7206.000	46.31	36.28	10.84	34.63	0.00	58.80	74.00	-15.20	1/3 MHz
AVG	H	7206.000	35.56	36.28	10.84	34.63	0.00	48.05	54.00	-5.95	1/3 MHz
PK	H	9608.000	37.82	39.20	13.14	35.06	0.00	55.09	74.00	-18.91	1/3 MHz
AVG	H	9608.000	24.43	39.20	13.14	35.06	0.00	41.70	54.00	-12.30	1/3 MHz
PK	H	12010.000	35.54	39.58	14.98	33.36	0.00	56.73	74.00	-17.27	1/3 MHz
AVG	H	12010.000	22.50	39.58	14.98	33.36	0.00	43.69	54.00	-10.31	1/3 MHz
Note: Spurious Emissions, Z-axis, Lo Channel											
PK	H	4804.000	37.67	33.59	9.16	33.88	0.00	46.54	74.00	-27.47	1/3 MHz
AVG	H	4804.000	24.78	33.59	9.16	33.88	0.00	33.65	54.00	-20.36	1/3 MHz
PK	H	7206.000	45.80	36.28	10.84	34.63	0.00	58.29	74.00	-15.71	1/3 MHz
AVG	H	7206.000	35.34	36.28	10.84	34.63	0.00	47.83	54.00	-6.17	1/3 MHz
PK	H	9608.000	37.82	39.20	13.14	35.06	0.00	55.09	74.00	-18.91	1/3 MHz
AVG	H	9608.000	24.43	39.20	13.14	35.06	0.00	41.70	54.00	-12.30	1/3 MHz
PK	H	12010.000	35.54	39.58	14.98	33.36	0.00	56.73	74.00	-17.27	1/3 MHz
AVG	H	12010.000	22.50	39.58	14.98	33.36	0.00	43.69	54.00	-10.31	1/3 MHz
Note: Spurious Emissions, X-axis, Mid Channel											
PK	H	4880.000	40.67	33.76	9.28	33.89	0.00	49.82	74.00	-24.18	1/3 MHz
AVG	H	4880.000	30.10	33.76	9.28	33.89	0.00	39.25	54.00	-14.75	1/3 MHz
PK	H	7320.000	41.21	36.71	10.97	34.73	0.00	54.16	74.00	-19.84	1/3 MHz
AVG	H	7320.000	29.15	36.71	10.97	34.73	0.00	42.10	54.00	-11.90	1/3 MHz
PK	H	9760.000	37.12	39.62	13.35	35.04	0.00	55.05	74.00	-18.95	1/3 MHz
AVG	H	9760.000	23.90	39.62	13.35	35.04	0.00	41.83	54.00	-12.17	1/3 MHz
PK	H	12200.000	36.10	39.32	14.88	32.94	0.00	57.37	74.00	-16.63	1/3 MHz
AVG	H	12200.000	22.82	39.32	14.88	32.94	0.00	44.09	54.00	-9.91	1/3 MHz
Note: Spurious Emissions, Y-axis, Mid Channel											
PK	H	4880.000	37.67	33.76	9.28	33.89	0.00	46.82	74.00	-27.18	1/3 MHz
AVG	H	4880.000	24.54	33.76	9.28	33.89	0.00	33.69	54.00	-20.31	1/3 MHz
PK	H	7320.000	37.95	36.71	10.97	34.73	0.00	50.90	74.00	-23.10	1/3 MHz
AVG	H	7320.000	24.61	36.71	10.97	34.73	0.00	37.56	54.00	-16.44	1/3 MHz
PK	H	9760.000	37.12	39.62	13.35	35.04	0.00	55.05	74.00	-18.95	1/3 MHz
AVG	H	9760.000	23.99	39.62	13.35	35.04	0.00	41.92	54.00	-12.08	1/3 MHz
PK	H	12200.000	35.68	39.32	14.88	32.94	0.00	56.95	74.00	-17.05	1/3 MHz
AVG	H	12200.000	22.71	39.32	14.88	32.94	0.00	43.98	54.00	-10.02	1/3 MHz
Note: Spurious Emissions, Z-axis, Mid Channel											
PK	H	4880.000	37.67	33.76	9.28	33.89	0.00	46.82	74.00	-27.18	1/3 MHz
AVG	H	4880.000	24.54	33.76	9.28	33.89	0.00	33.69	54.00	-20.31	1/3 MHz
PK	H	7320.000	37.95	36.71	10.97	34.73	0.00	50.90	74.00	-23.10	1/3 MHz
AVG	H	7320.000	24.61	36.71	10.97	34.73	0.00	37.56	54.00	-16.44	1/3 MHz
PK	H	9760.000	37.12	39.62	13.35	35.04	0.00	55.05	74.00	-18.95	1/3 MHz
AVG	H	9760.000	23.99	39.62	13.35	35.04	0.00	41.92	54.00	-12.08	1/3 MHz
PK	H	12200.000	35.68	39.32	14.88	32.94	0.00	56.95	74.00	-17.05	1/3 MHz
AVG	H	12200.000	22.71	39.32	14.88	32.94	0.00	43.98	54.00	-10.02	1/3 MHz
Note: Spurious Emissions, X-axis, Hi Channel											
PK	H	4960.000	38.89	33.94	9.41	33.90	0.00	48.33	74.00	-25.67	1/3 MHz
AVG	H	4960.000	24.94	33.94	9.41	33.90	0.00	34.38	54.00	-19.62	1/3 MHz
PK	H	7440.694	42.35	36.88	11.10	34.82	0.00	55.50	74.00	-18.50	1/3 MHz
AVG	H	7440.694	31.80	36.88	11.10	34.82	0.00	44.95	54.00	-9.05	1/3 MHz
PK	H	9920.000	38.75	39.92	13.57	35.02	0.00	57.22	74.00	-16.78	1/3 MHz
AVG	H	9920.000	25.26	39.92	13.57	35.02	0.00	43.73	54.00	-10.27	1/3 MHz
Note: Spurious Emissions, Y-axis, Hi Channel											
PK	H	4960.000	40.67	33.94	9.41	33.90	0.00	50.11	74.00	-23.89	1/3 MHz
AVG	H	4960.000	29.34	33.94	9.41	33.90	0.00	38.78	54.00	-15.22	1/3 MHz
PK	H	7440.694	42.29	36.88	11.10	34.82	0.00	55.44	74.00	-18.56	1/3 MHz
AVG	H	7440.694	31.24	36.88	11.10	34.82	0.00	44.39	54.00	-9.61	1/3 MHz
PK	H	9920.000	38.75	39.92	13.57	35.02	0.00	57.22	74.00	-16.78	1/3 MHz
AVG	H	9920.000	25.26	39.92	13.57	35.02	0.00	43.73	54.00	-10.27	1/3 MHz
Note: Spurious Emissions, Z-axis, Hi Channel											
PK	H	4960.000	40.53	33.94	9.41	33.90	0.00	49.97	74.00	-24.03	1/3 MHz
AVG	H	4960.000	29.49	33.94	9.41	33.90	0.00	38.93	54.00	-15.07	1/3 MHz
PK	H	7440.694	42.43	36.88	11.10	34.82	0.00	55.58	74.00	-18.42	1/3 MHz
AVG	H	7440.694	31.24	36.88	11.10	34.82	0.00	44.39	54.00	-9.61	1/3 MHz
PK	H	9920.000	38.75	39.92	13.57	35.02	0.00	57.22	74.00	-16.78	1/3 MHz
AVG	H	9920.000	25.26	39.92	13.57	35.02	0.00	43.73	54.00	-10.27	1/3 MHz

Note: No emissions other than the ones listed above were detected in the frequency range of 1-40 GHz. Hand scans were performed in the range of 18-40 GHz at 30 cm distance.

Band edge (Tx on Low and High Channels)



The emission at band edge is found to be 20dB lower than the fundamental



The emission at restricted band edge meets the general requirements as indicated below

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
PK	V	2483.500	18.84	32.22	5.18	0.00	0.00	56.25	74.00	-17.75	1/3 MHz
AVG	V	2483.500	4.56	32.22	5.18	0.00	0.00	41.97	54.00	-12.03	1/3 MHz

Note: Band edge was performed on X –axis and no change in emission was detected on Y and Z axis.

Test Personnel:	Vathana F. Ven VFV	Test Date:	04/05/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart C (15.247) RSS 247	Limit Applied:	FCC 15.209
Input Voltage:	Internal Battery 120VAC 60Hz		
Pretest Verification w/ Ambient Signals or BB Source:	Yes – Signal generator	Ambient Temperature:	21 ºC
		Relative Humidity:	32 %
		Atmospheric Pressure:	1005 mbars

Deviations, Additions, or Exclusions: None

10 AC Mains Conducted Emissions

10.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C, FCC Part 15 Subpart B, RSS 247 and ICES 003.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
AC Line Conducted Emissions	150 kHz - 30 MHz	2.8dB	3.4dB
Telco Port Emissions	150 kHz - 30 MHz	3.2dB	5.0dB

As shown in the table above our conducted emissions U_{lab} is less than the corresponding U_{CISPR} 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 Calculations

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN or ISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

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:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 μV/m

Alternately, when C5 Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. “TF” is the Transducer Factor; in this case LISN or ISN loss.

10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV002'	Weather Station	Davis Instruments	7400	PE80519A93	06/01/2016	06/01/2017
ROS002'	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	07/29/2016	07/29/2017
DS22'	Attenuator, 20dB	Mini Circuits	20dB, 50 ohm	DS22	09/08/2016	09/08/2017
CBLBNC7'	30 ft 50 ohm coax, BNC - BNC	ITT Pomona	RG 58 C/U	CBLBNC7	01/10/2017	01/10/2018
LISN34'	LISN - CISPR16 Compliant 9kHz-30MHz	Com-Power	LI-215A	191956	06/27/2016	06/27/2017

Software Utilized:

Name	Manufacturer	Version
Compliance 5	Teseq	5.26.46.46

10.3 Results:

The sample tested was found to Comply.

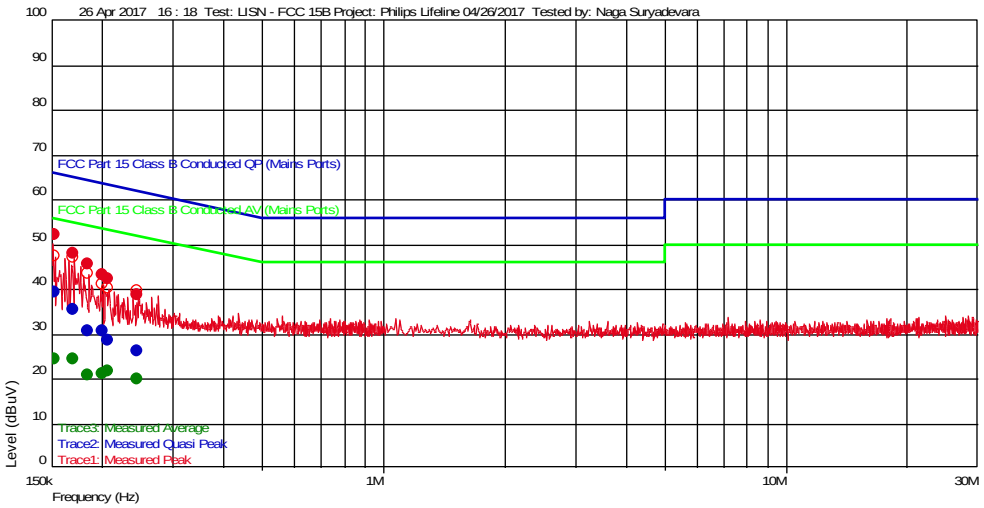
10.4 Plots/Data:

120VAC 60Hz – Charging Mode

Test Information

Test Details	User Entry	Additional Information
Test:	LISN – FCC15 Class B	
Project:	Philips Lifeline 04/26/2017	
Test Notes:	120VAC 60Hz - Charging	
Tested by:	Naga Suryadevara	
Test Started:	26 Apr 2017 16 : 18	

Prescan Emission Graph



Measured Peak Value
Measured Quasi Peak Value
Measured Average Value
Maximum Value of Mast and Turntable
Swept Peak Data
Swept Quasi Peak Data
Swept Average Data

Emissions Test Data

Trace2: Measured Quasi Peak

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
246.05 k	26.00	1.034	20.621	61.889	-35.89	9 k		N
207.8 k	28.57	1.272	20.620	63.293	-34.72	9 k		N
185.7 k	30.51	1.732	20.620	64.227	-33.72	9 k		L1
201.0 k	30.65	1.314	20.620	63.569	-32.92	9 k		L1
170.4 k	35.34	2.172	20.620	64.941	-29.60	9 k		N
152.55 k	39.36	2.687	20.620	65.860	-26.50	9 k		N

Trace3: Measured Average

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
185.7 k	20.77	1.732	20.620	54.227	-33.45	9 k		L1
201.0 k	21.00	1.314	20.620	53.569	-32.57	9 k		L1
246.05 k	19.72	1.034	20.621	51.889	-32.17	9 k		N
207.8 k	21.50	1.272	20.620	53.293	-31.80	9 k		N
152.55 k	24.27	2.687	20.620	55.860	-31.59	9 k		N
170.4 k	24.30	2.172	20.620	54.941	-30.64	9 k		N

Test Personnel:	Naga Suryadevara N.S	Test Date:	04/26/2017
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B ICES 003	Limit Applied:	Class B
Input Voltage:	120VAC 60Hz		
Pretest Verification w/ Ambient Signals or BB Source:	Yes	Ambient Temperature:	22 ºC
		Relative Humidity:	38 %
		Atmospheric Pressure:	1002 mbars

Deviations, Additions, or Exclusions: None

11 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	06/08/2017	102965577BOX-016	NS	MFM	Original Issue