



731 Enterprise Drive
Lexington, KY 40510

Telephone: 859-226-1000
Facsimile: 859-226-1040
www.intertek-etlsemko.com

TEST REPORT

Report Number: 102965577LEX-001
Project Number: G102965577

Report Issue Date: 7/7/2017

Product Name: 7100MHB

FCC Standards: FCC Part 22H and 24E Radiated
Spurious Emissions

ISED Standards: RSS-132 Issue 3, Rss-133 Issue 6
Radiated Spurious Emissions

Tested by:
Intertek Testing Services NA, Inc.
731 Enterprise Drive
Lexington, KY 40510

Client:
Lifeline System Inc.
111 Lawrence St
Framingham, MA 01702

Report prepared by

Bryan Taylor, Team Leader

Report reviewed by

Brian Lackey, Project Engineer



This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

TABLE OF CONTENTS

1 Introduction and Conclusion..... 3

2 Test Summary 3

3 Description of Equipment Under Test 4

4 Radiated Spurious Emissions (Transmitter)..... 6

5 Measurement Uncertainty 12

6 Revision History..... 13

1 Introduction and Conclusion

The tests indicated in section 2 were performed on the product constructed as described in section 3. 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 complied with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

The INTERTEK-Lexington is located at 731 Enterprise Drive, Lexington Kentucky, 40510. The radiated emission test site is a 10-meter semi-anechoic chamber. The chamber meets the characteristics of CISPR 16-1 and ANSI C63.4. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters. The test site is listed with the FCC under registration number 485103. The test site is listed with Industry Canada under site number IC 2042M-1.

2 Test Summary

Page	Test full name	FCC Reference	ISED Reference	Result
6	Radiated Spurious Emissions (Transmitter)	§2.1053, §22.917(a)(b), and §24.238(a)(b)	RSS-132 (5.5), RSS-133 (6.5.1)	Pass

Note: the conducted test that would also apply under FCC Part 22 and 24 were performed and reported at the modular level. See the UBLOX report for the SARA-U260 module for this additional data.

3 Description of Equipment Under Test

Equipment Under Test	
Manufacturer	Lifeline System Inc.
Model Number	7100MHB
Serial Number	1040000127 and 1040000129
Receive Date	7/6/2017
Test Start Date	7/6/2017
Test End Date	7/7/2017
Device Received Condition	Good
Test Sample Type	Production
Frequency Band	GSM850 824.2MHz – 848.8MHz GSM1900 1850.2MHz – 1909.8MHz UMTS Band V 826.4MHz – 846.6MHz UMTS Band II 1852.4MHz – 1907.6MHz
Modulation Type	WCDMA, GMSK, 8-PSK
Transmission Control	Base Station Simulator
Test Channels	GSM850 128, 190, 251 GSM1900 512, 661, 810 UMTS Band V 4132, 4182, 4233 UMTS Band II 9262, 9400, 9538
Antenna Type	Internal
Operating Voltage	3.7VDC Battery Pack

Description of Equipment Under Test

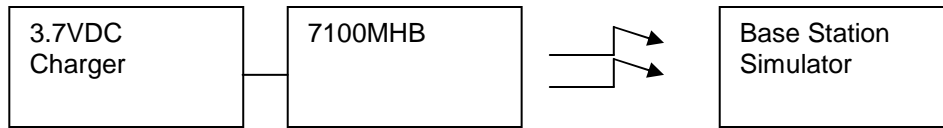
The 7100MHB is a wearable mobile help button used for personal emergency response applications.

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Transmitting a GSM or UMTS Signal

3.1 System setup including cable interconnection details, support equipment and simplified block diagram

3.2 EUT Block Diagram:



3.3 Cables:

Cables					
Description	Length	Shielding	Ferrites	Connection	
				From	To
Charging Cable	5ft	None	None	3.7VDC Charger	Test sample

3.4 Support Equipment:

No support equipment was used during the evaluation. The 7100MHB was tested in a stand alone configuration.

4 Radiated Spurious Emissions (Transmitter)

4.1 Test Limits

§ 2.1053

- (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.

§ 22.917

- (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

§ 24.238

- (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.2 Test Procedure

The EUT was placed on a non-conductive turntable. The measurement antenna was placed at a distance of 3 meters from the EUT. The EUT was forced to transmit at its maximum output power setting. During the tests, the antenna height and EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.

The frequency range up to tenth harmonic was investigated in order to identify the spurious emission. Once the spurious emissions were identified, the power of the emission was determined using the substitution method described in TIA-603-C. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and at the spurious emissions frequency.

4.3 Test Equipment Used:

Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	1302.6005.40	Rohde & Schwarz	ESU40	9/26/2016	9/26/2017
Signal Generator	3915	Rohde&Schwarz	SMB100A	9/20/2016	9/20/2017
Preamplifier	122005	Rohde&Schwarz	TS-PR18	11/17/2016	11/17/2017
Preamplifier	100050	Rohde&Schwarz	TS-PR26	11/17/2016	11/17/2017
Bilog Antenna	00051864	ETS	3142C	4/6/2017	4/6/2018
Biconnical Antenna	3958	ETS	3180B	3/28/2017	3/28/2018
Horn Antenna	00156319	ETS	3117	6/1/2017	6/1/2018
Horn Antenna	00154521	ETS	3117	11/14/2016	11/14/2017
Horn Antenna (18 – 40GHz)	00117798	ETS	3116c	6/5/2017	6/5/2018
Horn Antenna (18 – 26.5GHz)	LM8621	ETS	3160-09	3/21/2017	3/21/2018
High Pass Filter	1	Wainwright	WHKX12-2533.85-2710-1800-40SS	11/17/2016	11/17/2017
High Pass Filter	1	Wainwright	WHKX12-1028.5-1100-1500-40SS	11/17/2016	11/17/2017
Base Station Simulator	3956	Rohde&Schwarz	CMU200	9/25/2016	9/25/2017

4.4 Results:

All radiated spurious emissions were attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB which is equivalent to -13dBm.

Worst Case Spurious Measurements GSM850 Band

Radiated Spurious Emissions Measurement								
Test Engineer: Bryan Taylor			Start Date: 7/6/2017			End Date: 7/7/2017		
Temperature: 23.1C			Humidity: 54.10%			Pressure: 988.6mBar		
RBW: 1MHz			VBW: 3MHz					
Notes: Results represent the worst case from 3 orthogonal axis positions.								
			A	B	C	D	E	F
Band/Channel	Spurious Frequency (MHz)	Polarity	Device Reading (dBm)	Signal Generator Level (dBm)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Limit (dBm)	Radiated Spurious Emission Level (dBm)
GSM 850 Band Low Channel (128)	1648.4	H	-39.68	-22.52	5.69	5.90	-13	-22.30
	1648.4	V	-43.06	-24.53	5.69	5.90	-13	-24.31
	2472.6	H	-56.64	-35.36	6.96	5.79	-13	-36.53
	2472.6	V	-59.65	-36.78	6.96	5.79	-13	-37.95
	3296.8	H	-58.34	-37.04	8.18	7.64	-13	-37.58
	3296.8	V	-55.46	-33.43	8.18	7.64	-13	-33.97
	4121	H	-67.68	-46.1	9.04	8.81	-13	-46.33
	4121	V	-72.21	-50.45	9.04	8.81	-13	-50.68
	4945.2	H	-71.99	-48.76	9.81	9.98	-13	-48.59
4945.2	V	-69.66	-46.24	9.81	9.98	-13	-46.07	
GSM 850 Band Mid Channel (190)	1673.2	H	-42.43	-24.64	5.69	6.20	-13	-24.12
	1673.2	V	-43.69	-24.9	5.69	6.20	-13	-24.38
	2509.8	H	-64.29	-43.28	6.96	5.50	-13	-44.74
	2509.8	V	-60.47	-38.09	6.96	5.50	-13	-39.55
	3346.4	H	-66.04	-44.83	8.18	7.63	-13	-45.37
	3346.4	V	-63.07	-41.44	8.18	7.63	-13	-41.98
	4183	H	-71.79	-48.78	9.33	9.06	-13	-49.05
	4183	V	-71.04	-45.01	9.33	9.06	-13	-45.28
	5019.6	H	-67.53	-44.96	9.81	10.07	-13	-44.70
5019.6	V	-69.62	-47.27	9.81	10.07	-13	-47.01	
GSM 850 Band High Channel (251)	1697.6	H	-43.1	-25.35	5.69	6.20	-13	-24.83
	1697.6	V	-45.51	-26.58	5.69	6.20	-13	-26.06
	2546.4	H	-57.84	-36.04	7.14	5.50	-13	-37.69
	2546.4	V	-57.73	-35.54	7.14	5.50	-13	-37.19
	3395.2	H	-65.46	-44.03	8.18	7.73	-13	-44.48
	3395.2	V	-64.09	-42.47	8.18	7.73	-13	-42.92
	4244	H	-71.51	-49.02	9.33	9.14	-13	-49.21
	4244	V	-71.07	-48.62	9.33	9.14	-13	-48.81
	5092.8	H	-65.65	-42.67	10.20	10.13	-13	-42.74
5092.8	V	-68.36	-45.46	10.20	10.13	-13	-45.53	
								F=B-C+D

Worst Case Spurious Measurements GSM1900 Band

Radiated Spurious Emissions Measurement								
Test Engineer: Bryan Taylor			Start Date: 7/6/2017			End Date: 7/7/2017		
Temperature: 23.1C			Humidity: 54.10%			Pressure: 988.6mBar		
RBW: 1MHz			VBW: 3MHz					
Notes: Results represent the worst case from 3 orthogonal axis positions.								
			A	B	C	D	E	F
Band/Channel	Spurious Frequency (MHz)	Polarity	Device Reading (dBm)	Signal Generator Level (dBm)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Limit (dBm)	Radiated Spurious Emission Level (dBm)
GSM 1900 Band Low Channel (512)	3700.4	H	-56.68	-34.97	10.00	8.38	-13	-36.60
	3700.4	V	-57.11	-34.04	10.00	8.38	-13	-35.67
	5550.6	H	-71.14	-45.66	10.33	10.59	-13	-45.40
	5550.6	V	-70.63	-44.79	10.33	10.59	-13	-44.53
	7400.8	H	-75.89	-49.74	11.78	12.00	-13	-49.52
	7400.8	V	-74.6	-47.76	11.78	12.00	-13	-47.54
	9251	H	-75.42	-49.83	13.76	13.28	-13	-50.32
	9251	V	-73.96	-44.35	13.76	13.28	-13	-44.84
	11101.2	H	-75.02	-43.08	18.55	13.37	-13	-48.26
11101.2	V	-76.49	-42.44	18.55	13.37	-13	-47.62	
GSM 1900 Band Mid Channel (661)	3760	H	-59.52	-37.82	8.82	8.08	-13	-38.55
	3760	V	-59.95	-38.05	8.82	8.08	-13	-38.78
	5640	H	-70.45	-46.91	10.63	10.63	-13	-46.91
	5640	V	-69.93	-44.98	10.63	10.63	-13	-44.98
	7520	H	-76.18	-48.59	11.20	11.90	-13	-47.89
	7520	V	-75.07	-46.55	11.20	11.90	-13	-45.85
	9400	H	-76.11	-44.96	13.76	13.12	-13	-45.61
	9400	V	-73.28	-42.38	13.76	13.12	-13	-43.03
	11280	H	-75.86	-44.49	18.55	13.37	-13	-49.67
11280	V	-73.91	-42.05	18.55	13.37	-13	-47.23	
GSM 1900 Band High Channel (810)	3819.6	H	-58.42	-35.3	8.82	8.32	-13	-35.79
	3819.6	V	-59.01	-36.02	8.82	8.32	-13	-36.51
	5729.4	H	-69.53	-44.26	10.63	10.76	-13	-44.13
	5729.4	V	-68.38	-42.57	10.63	10.76	-13	-42.44
	7639.2	H	-69.37	-43.81	11.20	12.26	-13	-42.75
	7639.2	V	-73.85	-47.29	11.20	12.26	-13	-46.23
	9549	H	-73.53	-43.73	14.97	13.24	-13	-45.46
	9549	V	-74.62	-43.33	14.97	13.24	-13	-45.06
	11458.8	H	-73.18	-39.34	18.55	13.37	-13	-44.52
11458.8	V	-74.15	-39.54	18.55	13.37	-13	-44.72	
								F=B-C+D

Worst Case Spurious Measurements UMTS Band V

Radiated Spurious Emissions Measurement								
Test Engineer:	Bryan Taylor	Start Date:	7/6/2017	End Date:	7/7/2017			
Temperature:	23.1C	Humidity:	54.10%	Pressure:	988.6mBar			
RBW:	1MHz	VBW:	3MHz					
Notes:	Results represent the worst case from 3 orthogonal axis positions.							
			A	B	C	D	E	F
Band/Channel	Spurious Frequency (MHz)	Polarity	Device Reading (dBm)	Signal Generator Level (dBm)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Limit (dBm)	Radiated Spurious Emission Level (dBm)
WCDMA Band V Channel 4132	1652.8	H	-55.14	-37.98	5.69	6.20	-13	-37.46
	1652.8	V	-57.16	-38.63	5.69	6.20	-13	-38.11
	2479.2	H	-62.34	-41.06	6.96	5.79	-13	-42.23
	2479.2	V	-68.67	-45.8	6.96	5.79	-13	-46.97
	3305.6	H	-71.46	-50.16	8.18	7.63	-13	-50.70
	3305.6	V	-71.27	-49.24	8.18	7.63	-13	-49.78
	4132	H	-72.03	-50.45	9.04	8.81	-13	-50.68
	4132	V	-72.87	-51.11	9.04	8.81	-13	-51.34
	4958.4	H	-73.05	-49.82	9.81	10.05	-13	-49.58
	4958.4	V	-73.61	-50.19	9.81	10.05	-13	-49.95
WCDMA Band V Channel 4182	1672.8	H	-54.69	-36.9	5.69	6.20	-13	-36.38
	1672.8	V	-57.44	-38.65	5.69	6.20	-13	-38.13
	2509.2	H	-69.26	-48.25	6.96	5.50	-13	-49.71
	2509.2	V	-66.56	-44.18	6.96	5.50	-13	-45.64
	3345.6	H	-70.66	-49.45	8.18	7.63	-13	-49.99
	3345.6	V	-71.15	-49.52	8.18	7.63	-13	-50.06
	4182	H	-71.66	-49.4	9.33	9.06	-13	-49.67
	4182	V	-72.05	-49.53	9.33	9.06	-13	-49.80
	5018.4	H	-73.61	-51.04	9.81	10.07	-13	-50.78
	5018.4	V	-72.42	-50.07	9.81	10.07	-13	-49.81
WCDMA Band V Channel 4233	1693.2	H	-55.88	-38.13	5.69	6.20	-13	-37.61
	1693.2	V	-56.79	-37.86	5.69	6.20	-13	-37.34
	2539.8	H	-69.72	-47.92	6.96	5.50	-13	-49.38
	2539.8	V	-69.42	-47.23	6.96	5.50	-13	-48.69
	3386.4	H	-71.66	-50.23	8.18	7.73	-13	-50.68
	3386.4	V	-70.79	-49.17	8.18	7.73	-13	-49.62
	4233	H	-72.54	-50.05	9.33	9.14	-13	-50.24
	4233	V	-73.26	-50.81	9.33	9.14	-13	-51.00
	5079.6	H	-73.27	-50.29	10.20	10.13	-13	-50.36
	5079.6	V	-73.24	-50.34	10.20	10.13	-13	-50.41
								F=B-C+D

Worst Case Spurious Measurements UMTS Band II

Radiated Spurious Emissions Measurement								
Test Engineer:	Bryan Taylor	Start Date:	7/6/2017	End Date:	7/7/2017			
Temperature:	23.1C	Humidity:	54.10%	Pressure:	988.6mBar			
RBW:	1MHz	VBW:	3MHz					
Notes:	Results represent the worst case from 3 orthogonal axis positions.							
			A	B	C	D	E	F
Band/Channel	Spurious Frequency (MHz)	Polarity	Device Reading (dBm)	Signal Generator Level (dBm)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Limit (dBm)	Radiated Spurious Emission Level (dBm)
UMTS Band II Channel 9262	3704.8	H	-68.79	-47.08	10.00	8.38	-13	-48.71
	3704.8	V	-65.21	-42.14	10.00	8.38	-13	-43.77
	5557.2	H	-71.87	-46.39	10.63	10.59	-13	-46.43
	5557.2	V	-71.37	-45.53	10.63	10.59	-13	-45.57
	7409.6	H	-73.51	-47.36	11.78	12.00	-13	-47.14
	7409.6	V	-74.66	-47.82	11.78	12.00	-13	-47.60
	9262	H	-74.34	-48.75	13.76	13.28	-13	-49.24
	9262	V	-75.62	-46.01	13.76	13.28	-13	-46.50
	11114.4	H	-75.78	-43.84	18.55	13.37	-13	-49.02
	11114.4	V	-76.23	-42.18	18.55	13.37	-13	-47.36
UMTS Band II Channel 9400	3760	H	-67.24	-45.54	8.82	8.08	-13	-46.27
	3760	V	-66.74	-44.84	8.82	8.08	-13	-45.57
	5640	H	-71.85	-48.31	10.63	10.63	-13	-48.31
	5640	V	-70.39	-45.44	10.63	10.63	-13	-45.44
	7520	H	-75.64	-48.05	11.20	11.90	-13	-47.35
	7520	V	-75.59	-47.07	11.20	11.90	-13	-46.37
	9400	H	-73.89	-42.74	13.76	13.12	-13	-43.39
	9400	V	-74.11	-43.21	13.76	13.12	-13	-43.86
	11280	H	-75.41	-44.04	18.55	13.37	-13	-49.22
	11280	V	-76.82	-44.96	18.55	13.37	-13	-50.14
UMTS Band II Channel 9538	3815.2	H	-67.24	-44.12	8.82	8.32	-13	-44.61
	3815.2	V	-67.41	-44.42	8.82	8.32	-13	-44.91
	5722.8	H	-71.85	-46.58	10.63	10.76	-13	-46.45
	5722.8	V	-71.24	-45.43	10.63	10.76	-13	-45.30
	7630.4	H	-75.64	-50.08	11.20	12.26	-13	-49.02
	7630.4	V	-76.54	-49.98	11.20	12.26	-13	-48.92
	9538	H	-77.03	-47.23	14.97	13.24	-13	-48.96
	9538	V	-76.38	-45.09	14.97	13.24	-13	-46.82
	11445.6	H	-75.94	-42.1	18.55	13.37	-13	-47.28
	11445.6	V	-76.21	-41.6	18.55	13.37	-13	-46.78
								F=B-C+D

5 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of $k = 2$, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

Parameter	Uncertainty	Notes
Radiated emissions, 30 to 1000 MHz	+3.9dB	
Radiated emissions, 1 to 18 GHz	+4.2dB	
Radiated emissions, 18 to 40 GHz	+4.3dB	
Power Port Conducted emissions, 150kHz to 30 MHz	+2.8dB	

6 Revision History

Revision Level	Date	Report Number	Notes
0	7/7/2017	102965577LEX-001	Original Issue